

PROCEEDINGS

OF THE

ACADEMY OF NATURAL SCIENCES

OF PHILADELPHIA.

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ACADEMY OF NATURAL SCIENCES
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1860.

January 3d.

Vice President BRIDGES in the Chair.

Forty members present.

Papers were presented for publication entitled,

“Descriptions of new species of fossils, probably Triassic, from Virginia,” by Wm. M. Gabb.

“Descriptions of new species of Cretaceous Fossils,” by Wm. M. Gabb.

“Catalogue of the shell-bearing Mollusca found in the vicinity of Mohawk, N. Y.,” by James Lewis, M. D.

Permission being granted, the Report of the Biological Department for December was read and ordered to be printed with the Proceedings of the month.

Mr. Lea, in referring to the death of Augustus E. Jessup, one of our old members, mentioned that the deceased was elected in 1818, and that he had been an ardent student of mineralogy and a most persevering collector, being in the habit of visiting on foot and collecting largely from distant localities. In 1819 he accompanied Major Long's expedition to the Rocky Mountains as mineralogist and geologist, and handed in his report to the Department, but for some reason, unknown at present, it was not inserted in the Journal of that Expedition as published. Having entered into an active business career, in which he was eminently successful, he retired in the year 1853 with an ample fortune, having made many friends by his probity, punctuality and liberality. He was frank and open in his manners, prompt and just in his dealings and liberal in his views. While immersed in the cares of a large business, he did not forget his early attachment to the Academy. He was unable, from his residence being at some distance, to attend the meetings, but he watched with pleasure the growth and usefulness of our institution, and was always ready to contribute liberally to promote the objects of Natural History. He died suddenly, on the 17th day of December, 1859, at his residence in Wilmington, Del., in his 63d year.

In conclusion Mr. Lea offered the following resolutions:

Resolved, That in the decease of our fellow member, Augustus E. Jessup, we have lost an old, esteemed and valued associate, who, through a long and suc-
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cessful career had not ceased to promote the objects, which, in early life, attached him to the study of Natural History.

Resolved, That while the members are sensible of the loss they have sustained, they are not forgetful of the sorrows of his afflicted family, to whom they offer their condolence.

Which were adopted.

January 10th.

Mr. LEA, President in the Chair.

Forty-nine members present.

The following papers were presented for publication :

"Appendix to the paper entitled *New Genera and Species of North American Tipulidæ with short palpi*," by R. Osten Sacken.

"Contributions to American Lepidopterology, No. 3," by Brackenridge Clemens, M. D.

Mr. Lea having stated some facts in relation to the history of Anthracite, Dr. Pickering mentioned that Mr. Shoemaker's first load of Anthracite was taken to the factory of Mr. Samuel Wetherill, at the corner of 12th and Cherry streets, but in consequence of the impossibility of burning it, it was buried.

Permission being granted, the following resolutions were passed, in relation to the application made this evening by Dr. Evans, for the operation of the Academy, in his efforts to transport the meteorite now lying near Port Orford, W. T.

Resolved, That the Academy will cheerfully co-operate with Dr. Evans in his endeavors to rescue for science the meteorite of Washington Territory.

Resolved, That a Committee of three be appointed to prepare a memorial in such form as may, in their opinion, conduce to the carrying out of the views of Dr. Evans, a draft of the same to be reported at the next meeting.

The death of Peter A. Browne, late a member of the Academy, at Philadelphia, on the 9th instant, was announced.

January 17th.

Mr. LEA, President, in the Chair.

Forty-five members present.

The following papers were presented for publication :

"Additional new species of Fossils to a paper by T. A. Conrad."

"Notes on the nomenclature of North American Fishes," by Theo. Gill.

"On the pertinence of *Alosa teres*, *DeKay*, to the genus *Dussumiezia*, *Val.*," by Theo. Gill.

Pursuant to the order of the last meeting the Committee to prepare a memorial in aid of Dr. Evans' attempts to procure the meteorite near Port Orford, W. T., reported and was discharged.

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January 24th.

Vice President BRIDGES in the Chair.

Forty members present.

A paper entitled the Mexican Humming Birds, No. 1, by Rafaci Montes de Oca was presented for publication.

Mr. Lea exhibited some specimens of *Unionidae*, and remarked that he had often been asked as to the number of species which inhabited the United States, a question he could not answer, as he had never made a separate catalogue of such species. Recently he had been requested by the Secretary of the Smithsonian Institution to furnish a list for publication by that Institution, which he had just finished and sent to Washington. In making the list he had used the manuscript which he had prepared for a new and enlarged edition (4) of his "*Synopsis*." From the list he had carefully eliminated the synonyms, and there remained in it the extraordinarily large number of five hundred and twenty species which have been described, inhabiting the Rivers, Lakes and Pools of the United States and Territories, and he stated that he had some 30 to 40 in his possession not yet named or described.

These 520 may be thus divided:—

Unio,	441 species.
Margaritana,	26 do.
Anodonta,	53 do.

 520

New species in Mr. Lea's possession, but yet not described, 30

 550

Mr. Lea further remarked that it was very probable that at least 100 more species would be added to this list, as inhabiting within the present limits of the United States, as almost every naturalist, searching in unexplored waters, was constantly discovering new forms. In reflecting on the profusion of this kind of animal life in the United States, the naturalist is astonished at the great number of forms characteristic of the various species, and he is the more struck with the extent of it, when a comparison is made with the small number of species which inhabit the continent of Europe, there not being in the fresh waters of that quarter of the globe more perhaps than ten species, viz: seven *Uniones*, one *Margaritana*, one *Monocondylæa*, and one *Anodonta*. Mr. Lea stated that he had taken great pains to procure specimens from all parts of Europe, and he was satisfied that there were 98 synonyms made by European authors, for the single species of *Anodonta cygnea*, Draparnaud, the *Mytilus cygneus* of Linnæus, and the synonymy is nearly as profusely erroneous, in *Unio pictorum*, *Unio tumidus*, *Unio Batavus* and *Unio littoralis*.

Mr. Slack remarked, in connection with the bones presented this evening, that they were discovered some two weeks since by Mr. O. C. Herbert, in his marl pits, near Marlborough, Monmouth Co., N. J., at a depth of twenty-five feet beneath the surface. Having received information of their discovery from Mr. Hopper, of Freehold, on Monday week, Mr. S. visited the pits and procured the specimens from Mr. H. They consist of fragments of the femur and fibula of the Mosasaurus, and are of great interest, the long bones of this reptile having until recently been unknown.

On motion of Mr. Slack, the thanks of the Academy were ordered to be tendered to Messrs. J. M. Hopper and O. C. Herbert, of Monmouth Co., N. J., and also to Mr. Edward L. Perkins, for donations presented by them.

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Jan. 31st.

MR. LEA, President, in the Chair.

Forty-four members present.

The report of the Biological Department for the present month was read.

On report of a Committee of the Biological Department, the paper entitled "Remarks on errors in the Anatomical Diagnosis of Cancer, by J. J. Woodward, M. D.," was recommended for publication in a Medical Journal.

On report of the respective Committees the following papers were ordered to be published in the Journal of the Academy :

"Reflections upon the nature of the temporary star of the year 1572, an application of the Nebular Hypothesis, by Alexander Wilcox, M. D."

"Descriptions of New Cretaceous and Eocene Shells of Mississippi and Alabama, also with notes on Eocene fossil shells, by T. A. Conrad."

"Descriptions of new species of Fossils, probably Triassic, from Virginia, by W. M. Gabb."

"Descriptions of new species of Cretaceous fossils, by W. M. Gabb."

"Additional new species of Fossils to a paper by T. A. Conrad."

And the following in the Proceedings :

Contributions to American Lepidopterology.—No. 3.

BY BRACKENRIDGE CLEMENS, M. D.

TINEINA.

The plan of these papers will hereafter be changed, and no diagnosis of genera will be given, except when there is doubt respecting the identity of the European and American groups, and when the genera are new. The intention of giving some conception of the systematic arrangement of the group Tineina will therefore be abandoned, and the subsequent papers be confined simply to the description of species. I find myself compelled to adopt this course, in consequence of perceiving, as I advance in the recognition of generic groups, that the diagnoses of the families heretofore cited are too limited, and that, in order to represent my conception of these groups, I shall be obliged to make them more comprehensive. These changes, together with generic synopses of the families, will be best treated in a monograph of the Tineina, which will be undertaken as soon as the collection of the writer represents, with some degree of completeness, the genera found in our country. In order that the accomplishment of this may not be too long delayed, contributions of specimens are respectfully solicited from collectors, either in accordance with the call from the Secretary of the Smithsonian Institution, in the Report for 1858, or the request made at the present time. Contributions may be sent to the Smithsonian Institution, or to myself, but, in the latter case, the charges for carriage must be prepaid; and should the contributor desire it, a suite of named specimens will be returned to him. Full directions for the collection and preservation of Lepidoptera are contained in the Smithsonian Report for 1858, and may be had on application to the Secretary of the Institution.

COLEOPHORA Zeller.

Stalk of antennæ clothed with erect scales to the middle.

C. *coruscipennella*.—Labial palpi and head bronzy green. Antennæ,

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basal half bronzy green, with a reddish violet reflection; terminal half white, annulated with brown. Fore wings uniform, bronzy green, with the apical portion reddish violet, or of a reddish, coppery hue. Hind wings dark brown; cilia the same.

Stalk somewhat thickened, with scales not erected.

C. laticornella.—Labial palpi and head brownish ochreous. Antennæ pale brownish ochreous towards the base, becoming white with an ochreous tinge toward the tip, and annulated with dark brown throughout. Fore wings rather deep, uniform brown, with a whitish ochreous streak along the costa, from the base to the costo-apical cilia, narrowing behind, and not reaching beyond the subcostal nervure. Hind wings rather dark brown; cilia the same.

Antennal stalk simple; basal joint thickened with scales.

C. cœnosipennella.—Labial palpi and head white. Antennæ white, annulated with dark brown; basal joint white. Fore wings dull yellow, with a white streak along the basal portion of inner margin, one along the costa, and one along the subcostal nervure, separated from the former by a narrow line of the general hue; an oblique, white streak along the disk, and inclined to the inner angle, and one in the fold, with three rather faint, oblique, white streaks between the terminal portions of the costal and discal streaks. Hind wings rather dark gray; cilia fulvous.

C. infuscatella.—Labial palpi brownish gray. Head pale leaden gray, whitish on the sides and above the eyes. Antennæ gray, annulated with dark brown. Fore wings grayish brown, with a white streak along the costa to the tip, and one along the inner margin; a white streak along the fold, and one parallel to it along the middle of the wing, and somewhat dilated on the inner margin; cilia grayish brown. Hind wings gray; cilia the same.

C. cretaticostella.—Labial palpi white. Head white, tinged with yellowish. Antennæ white, annulated with brownish. Fore wings shining yellow, with rather a broad white streak along the costa, extended nearly to the tip; somewhat streaked with ochreous, and the tip rather deep ochreous. The inner margin of the wing is whitish. Hind wings ochreous brown; cilia the same.

INCURVARIA Haworth.

I. russatella.—Head ochreous. Antennæ dark brown, ochreous at the base, and annulated with ochreous. Thorax purplish brown. Fore wings deep fuscous, with a beautiful purple reflection. Near the base of the wing is a very pale yellow band, broadest on the inner margin, and a costal and dorsal spot of the same hue opposite each other, a little beyond the middle of the wing. Hind wings pale fuscous tinged with purplish red; cilia pale brown.

The wing structure of the following species departs from that of the genus. Both wings are pointed, the fore wings with a single discal nervure, given off to the inner margin and the hind wings with two discal nervules branching from a common stalk.

I. Acerifoliella.—*Ornix Acerifoliella* Fitch, Reports, 1 and 2, p. 269. Head reddish ochreous. General hue a fine metallic green; fore wings without markings. I am indebted to the kindness of Dr. Fitch for a specimen of this insect.

PLUTELLA Schrank.

P. vigilaciella.—Head white, with fuscous before and behind the eyes. Labial palpi white; exterior of second joint fuscous. Antennæ ochreous, annulated with white, especially towards the tips. Thorax white; tegulae dark 1860.]

fuscous. Fore wings white, streaked with ochreous, with a dark ochreous streak at the base of the fold, margined on the inner side with dark brown. The inner border, from near the base to the tip of the wing, is closely dotted with dark brown; and on the costa, toward the tip, are a few dots of the same hue, and in the middle of the wing an elongated dark brown dot; cilia white and dark brown intermixed. Hind wings dark gray. Abdomen dark gray.

P. limbipennella.—Head pale ochreous. Labial palpi whitish: tuft dark brown. Antennæ brown, slightly annulated with white. Thorax yellowish white; tegulæ dark brown. Fore wings cinereous brown, dusted with dark brown, with a dark brown sinuated streak along the fold, and the inner marginal portion of the wing pale yellowish white, with three rounded projections toward the fold. Hind wings brown, with a purplish hue; cilia brownish ochreous. Abdomen dark brown.

P. mollipedella.—Head and thorax pale brownish ochreous. Fore wings pale brownish ochreous, somewhat paler along the costa, and dotted with dark brown, with a fuscous, sinuated streak in the fold, *narrowly edged with ochreous gray*. The inner marginal portion of the wing pale brownish ochreous, with three projections toward the fold, *and the inner border dotted with dark brown* to the tip of the wing. Hind wings dark gray; cilia brownish ochreous.

GRACILARIA Zeller.

G. superbifrontella.—Labial palpi yellow, tipped with brownish. Antennæ dull yellow, with very faint brownish rings. Head stramineous, tinged with reddish violet on the forehead. Thorax stramineous, with tegulæ externally striped with reddish violet. Fore wings beautiful reddish violet, with a shining stramineous patch on the inner margin at the base, and a large costal triangle of the same hue, reaching almost across the wing, and extending along the costa from the basal third, nearly to the apex. Hind wings blackish gray; cilia dark fuscous.

This insect must approach very closely the European *Swederella*.

The larva may be found, in the middle of July, in cones, on the leaves of *Hamamelis Virginica* (Witch Hazel), and the imago appears early in August. The head of the larva is pale green; body pale green, darker colored by the ingesta, with the tenth ring whitish, and the cervical shield pale brown.

G. fulgidella.—Head and antennæ yellowish white. Fore wings white, with a silvery lustre, with a dark brown blotch near the base, not extended across the wing. Rather beyond the middle of the wing is a broad, dark brown band, with the exterior margin darkest, and *sharply angulated just above the inner margin*. The apical portion of the wing contains two rather broad, dark brown costal streaks, somewhat confluent in the middle of the wing, with a white costal spot between them. The extreme apex of the wing is dark brown, with a white costal streak before it, and opposite the costal white spot is another, at the interior angle, sometimes two not distinctly separated. Hind wings dark fuscous; cilia the same.

G. venustella.—Labial palpi white, with a blackish spot near the middle, and one near the tip. Antennæ dark brownish. Head silvery white. Fore wings dark cinereous, with a purplish hue, and white along the inner margin from the base to the middle. At the basal third of the wing is a small, white costal spot; three oblique, equidistant, slender white bands, dark margined on both sides, the *first* about the middle of the wing, the *second* and *third* converging at the inner margin, with a white spot at the extreme apex, dark-margined on both sides by short streaks; cilia cinereous and white intermixed. Hind wings blackish gray; cilia rather paler.

G. strigifinitella.—Labial palpi yellowish white, dotted with dark brown, and with two dark brown rings before the tip. Head and antennæ dull yellow. Fore wings brownish gray suffused with dark brown, with the inner margin, from near the base to the middle, varied with white and dark brown; on the middle of costa a white streak, and a few small, costal, dark brown blotches. Near the tip, on the inner margin, a slender, very oblique white streak, dark margined on both sides, which crosses an oblique streak of the same hue from the costa, likewise dark-margined on both sides above the streak from the inner margin, and curved beneath, forming a white hinder-marginal line in the cilia, beneath the tip, and extending nearly to the apex of the wing. Beyond these, toward the base, in the apical third of the wing, are two oblique, dark brown costal streaks, with a short, white one between them, the first irregular and somewhat diffused, the second margined behind with brownish yellow. Apical portion of the wing dark brown. Hind wings dark brown; cilia somewhat paler.

G. violacella.—Head and face pale yellowish, tinged with reddish violet. Labial palpi yellowish white, annulated at the tip with brownish. Fore wings with the external half pale, shining, cream yellow, interior half suffused with a pale violet iridescence. About the middle of the costa are a few separated blackish brown dots, and in the middle of the wing a blackish brown comma spot, and near the tip an atom of the same hue. The posterior part of the fold somewhat suffused with fuscous; cilia reddish fuscous. Hind wings dark gray, with a reddish tinge; cilia reddish fuscous.

ARGYRESTHIA Hübner.

A. oreasella.—Labial palpi silvery white. Head silvery white; forehead and face faintly tinged with pale golden brown. Antennæ silvery, annulated with dark brown. Fore wings silvery white, with a pale golden brown streak at the base of the costa. About the middle of the wing is an oblique, dark golden brown band, broadest on the inner margin, and tapering to the costa, beyond which is a narrower, oblique band of the same hue produced in the middle, as a rather broad, somewhat curved streak toward the tip, behind which it is arrested; cilia pale golden brown, with a darker hinder-marginal line; hind wings dark gray; cilia the same.

Another specimen, on the middle of the inner margin, has a rectangular, golden brown patch, not extended to the costa, with an irregular, obliquely placed patch of the same hue on the inner margin, near the tip, and slightly connected with a small costal patch placed midway between the patches, on the inner margin. The tip of the wing is golden brown, and is scarcely connected with the second patch by a posteriorly produced portion.

Taken on wing, June, July.

ORNIX Zeller.

O. trepidella.—Labial palpi yellowish white, annulated with dark brown near the tip. Head dark brown. Antennæ dark brown, slightly annulated with whitish. Fore wings dark purplish, dusted with dark brown. Along the costa are several short, oblique, obscure yellowish streaks, with dark brown streaks between, extending from the middle of the wing to the tip, obliquely placed till near the apex. Hind wings dark gray; cilia the same.

O. festinella.—Labial palpi silvery gray, with the second joint at the apex annulated with dark brownish. Head dull brownish gray. Antennæ dark brown, annulated with whitish. Fore wings grayish, somewhat suffused with brownish from the base to the middle, with the costa at base dark brown. From the middle to the tip freely dusted with dark brown, with several whitish, rather obscure costal streaks, becoming plainer near the tip, and two or three on the inner margin, near the tip. At the tip are a few dark
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brown scales, with the cilia of extreme apex white; cilia grayish, with dark brown tipped scales intermixed. Hind wings pale gray; cilia similar. Abdomen blackish, tipped with yellowish ochreous.

O. Cratægifoliella.—Labial palpi whitish. Head dark brown and gray intermixed. Antennæ dark brown, faintly annulated with whitish. Fore wings dark brown, with a purplish hue. Along the inner margin, from the base to the anal angle, whitish, dusted with dark brownish. In the fold at the base is a dark brown streak, and a small blotch of the same hue beyond the middle, nearly reaching to the inner margin. Toward the tip are a few whitish, costal streaks, and at the apex a small, round, dark brown spot, in a whitish patch, with a circular, dark brown apical line behind it; cilia blackish gray. Hind wings blackish gray; cilia rather paler. Abdomen blackish, tipped with dull yellow.

The larva mines the leaves of *Cratægus tomentosa* (Black Thorn), in September, and becomes a pupa early in October, weaving a reddish brown cocoon in a turned down edge of the leaf. The pupa case is thrust from the end of the cocoon at maturity, the imago appearing early in May. There is, doubtless, a summer brood, but I have not sought for it. The head of the larva is brown; the body greenish white, with the dorsum reddish brown.

HYPONOMEUTA Zeller.

H. multipunctella.—Labial palpi, head, antennæ and thorax, white. Thorax with a black spot on the front of tegulæ, and a few spots of the same hue on the disk. Fore wings white, with the costa at the base blackish, and longitudinal rows of distinct black dots; two of which, one along the inner margin and one along the fold, are very plain. Hind wings blackish gray.

BEDELLIA? Stainton.

This genus is represented by a single species, in Europe. It was, therefore, a surprise to myself, when I found the species described below, corresponded to the European not only in structure but in ornamentation. There is, however, a slight difference in the neururation of the posterior wings of the two insects when compared with Mr. Stainton's delineation, and hence I give a full generic diagnosis of the American species.

The anterior wings are narrow and pointed, and the posterior very narrow, almost setiform. The discoidal cell of the anterior is acute behind, with three subcosto-marginal nervules, the last of which arises at the apex of the cell, together with the apical nervule, which sends off, at about its middle, a nervulet to the inner margin, and is furcate near the tip of the wing. The median nervure sends only a single branch to the inner margin. Both the costal and sub-median nervures are short. The posterior wings without discoidal cell; the costal nervure is very short; the sub-costal runs through the middle of the wing, and sends a branch to the inner margin, rather beyond the middle, and is furcate at its extremity, the lower branch proceeding to the tip, along the inner margin. Above the subcostal nervure is a rather indistinct, parallel fold. The median nervure is long, well marked, and simple; placed near the inner margin of the wing.

Head rough above, and in front, between the antennæ, almost tufted; face smooth, moderately broad, and rounded. Ocelli none. Eyes moderately prominent, round, and partially covered with hairs from above. Antennæ as long as the anterior wings, filiform, simple; basal joint squamose. No maxillary palpi. Labial palpi very short, pointed, and rather porrected, with two joints only distinguishable. Tongue naked and short.

B. ? Staintoniella.—Labial palpi and head ochreous, the latter somewhat reddish ochreous above. Antennæ ochreous. Fore wings ochreous, dusted with dark fuscous, but leaving a streak of the general hue along the

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inner margin. Hind wings dark gray; cilia rather dark ochreous. Abdomen dark brown and ochreous mixed.

COSMIOTES.

Fore wings rather narrowly ovate-lanceolate, with the discoidal cell closed acutely. The sub-costal nervure is attenuated toward base of the wing, and subdivides into three marginal branches, the first of which arises at about its middle, and sends from the angle of the disk a *trifid branch*, which is either forked on the costa by an exceeding short branch before the tip, and gives rise at about its middle to a branch to the inner margin, or is trifid at its extreme tip. The median is two or three-branched near its end. The sub-median is simple. Hind wings are without a discoidal cell; and the costal nervure is moderately long. The sub-costal runs through the middle of the wing, (is central), and is furcate near the tip. The median is well indicated, with *two or three* short, approximated branches about the middle of the inner margin.

Size very small. Head smooth. Without ocelli. Forehead rather elevated and rounded; face rounded, and nearly equally broad. Eyes very small, oval, and somewhat sunken, scarcely visible in front. Labial palpi moderately long and slender, smooth, and somewhat recurved; the second joint slightly compressed laterally. No maxillary palpi. Antennæ inserted laterally; basal joint short and rather thick, with a few cilia at the base before; stalk simple, slender, and scarcely as long as the body. Tongue naked, and about as long as the labial palpi.

§ *Median vein of hind wings two-branched. Apical vein trifid at the tip.*

C. illectella.—Labial palpi and head yellowish brown. Antennæ fuscous. Fore wings fuscous, dusted with dark brown, with a broad, transverse silvery white band near the middle of the wing, a spot of the same hue on the costa near the tip, and an opposite one on the inner margin, nearly joining it in the middle of the wing. The extreme apex of the wing has a silvery streak in the cilia, margined behind with a row of dark brown atoms on their ends. Hind wings grayish brown; cilia the same.

§§ *Median vein of hind wing three-branched. Apical vein forked on the costa, with a nervulet to the inner margin.*

C. maculoscella.—Labial palpi dull yellowish. Head dark brownish. Antennæ fuscous. Fore wings shining silvery grayish, suffused with dark golden brown, with a rather obscure silvery band in the middle of the wing and a silvery spot on the costa just before the tip. The extreme apical portion of the wing is blackish brown; cilia grayish brown. Hind wings grayish, dusted with dark brown; cilia grayish brown.

§§ *Medio-posterior and central veins opposite the space between the second and third sub-costo marginals.*

C. madarella.—Head dark silvery gray. Antennæ dark brown, yellowish white at the tips. Fore wings dark golden brown, silvery gray at the base, with an oblique, pale golden band near the middle of the wing, the costal portion being nearest the base. On the costa, near the tip, is a pale golden spot, with a spot of the same hue opposite on the inner margin, and one in the middle of the wing before the tip; cilia pale brown, dotted with dark brown. Hind wings grayish brown; cilia rather darker.

COSMOPTERYX? Hübner.

The anterior wings are rather narrow, and *slenderly caudate*. The discoidal cell is elongate and very narrow, and *closed acutely behind* with *three* sub-costo-marginal nervules, the first arising about the middle of the wing. The median sends *four* nervules to the inner margin, the first arising midway be-
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tween the first and second subcostal branches, and the last from the apex of the discoidal cell, together with an apical branch, which almost immediately sends off a nervulet to the inner margin, whilst the apical proceeds through the middle of the slender, acicular caudate extremity to its tip. At the basal third of the wing, the sub-costal nervure becomes attenuated. The costal is nearly coincident with the margin; the sub-median furcate at the base. The posterior wings are narrow, almost setiform, and without a discoidal cell. The sub-median is central, simple, and faintly indicated until near the tip, when it becomes furcate. The median, which is better defined, runs near the inner margin, and subdivides into *three branches* to the inner margin. The costal is coincident with the marginal.

Head perfectly smooth, advanced, long, and flattened above; forehead very convex and globose; face full, rounded, and somewhat retreating. Ocelli none. Eyes flattened, scarcely visible in front, oval. Antennæ nearly as long as the anterior wings; basal joint long, slender, and clavate; stalk setaceous and simple. *Maxillary palpi extremely short, scarcely perceptible.* Labial palpi very long, slender, much recurved, and pointed; the second joint somewhat compressed toward the end, shorter than the third. Tongue scaled, as long as the thorax beneath.

C. ? gemiferella.—Labial palpi dark greenish brown, with a silvery stripe on the front of the third joint, and another behind, continued to the second joint. Face, head, and thorax, dark greenish brown, with a narrow, central, silvery line continued to the thorax, and one of the same hue above the eyes on each side. Antennæ dark greenish brown, with two silvery lines on the basal joint, the stalk annulated with silvery, and a broad, silvery ring before the tip, which is likewise silvery. Fore wings dark greenish brown to the middle, and from the apical third to the tip, with an orange-colored patch rather beyond the middle of the wing, extended across the wing, and a little produced along the costa behind, having a large, transverse, oval, smooth patch of elevated, silvery scales somewhat violet-hued, on its internal margin the patch extending nearly across the wing; another smaller and similar, nearly round one behind it, on the inner margin, and another small one on the costa, behind the produced portion, with a white costal streak above it in the cilia. All these patches are somewhat black-margined. Near the base of the wing are three short, silvery streaks, one nearly on the disk, one near the fold beneath it, and an oblique one above it, near the costa. The cilia of the extreme apex is silvery white, black-margined above, with a violet silvery scale in the middle of the wing, before the tip. The inner margin, at the base of the wing, is silvery. Hind wings dark brown; cilia somewhat paler.

The ornamentation of this insect is very elegant. Taken on wing in June, July.

EUDARCIA.

Head and face rough. Without ocelli. Eyes small, hemispherical quite prominent, with a naked space above? Labial palpi short, rather smooth, and separated; the third joint somewhat less thick than the second, and nearly as long. Maxillary palpi long, folded, and five or six-jointed. Antennæ, basal joint moderately long, approximated on the front, simple, and full as long as the anterior wings. Tongue naked and very short, scarcely as long as the labial palpi, and not reaching beyond the front.

Fore wings with the subcostal nervure attenuated at the base; at the basal third arises a long marginal branch, and about its middle a furcate branch, and thence the subcostal is faintly indicated to the discal nervure, beyond which it reappears as a furcate branch to the costa behind the tip. The discoidal cell is closed, and sends a single branch to the inner margin behind the tip. The median subdivides into three approximate branches. The sub-median is furcate at the base. In the hind wing the costal nervure is

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rather long and distinct; subcostal simple, and obsolete from the middle to the base; discoidal cell *unclosed*, with an independent discal nervule, faintly indicated from the base, and *furcate* at the apical third. The median strongly indicated and bifid rather beyond the middle of the inner margin.

E. simulatricella.—Head brownish ochreous. Antennæ ochreous, annulated with dark brown. Fore wings dark brownish, with a white band about the basal third of the wing, a white spot on the costa, near the middle, and one on the inner margin, a little behind it, and a white transverse streak near the tip. Hind wings dark brown; cilia the same.

This insect has considerable resemblance to an *Incurvaria*. Its neuration, however, places it in a very distinct group.

ANTISPILA Herrich-Schäffer, Frey.

A. Nysæfoliella.—Head above dark brown. *Face, labial palpi, and fore feet shining yellowish ochreous*. Antennæ dark brown; basal joint yellowish ochreous. Fore wings dark brown, with a greenish reflection, and the base with a bright coppery hue. Near the base is a rather broad, bright golden band, broadest on the inner margin, where it is nearest the base, and *constricted at the fold of the wing*; a spot of the same hue on the costa, at the apical third of the wing, and one on the inner margin, midway between this and the band; cilia somewhat coppery, and rather grayish at the inner angle. Hind wings purple brown; cilia grayish ochreous.

The larva mines the leaves of *Nysa multiflora* in September. The head is dark brown; first segment dark brownish; body very pale green with dark atoms along the dorsum; ventral surface with a line of two black spots. After the last molting the first segment is black, and the dorsal spots become a black, vascular line. When full fed, the larva weaves an oval cocoon within the mine, and cutting the two skins of the leaf into a correspondent form, permits it to fall to the ground. There is thus left an oval hole in the deserted mine. The imago appear during the following May.

A. cornifoliella.—*Head, face, labial palpi, and fore feet dark brown*. Antennæ dark brown; basal joint somewhat ochreous. Fore wings rather dull dark brown, with a coppery hue. Near the base is a rather narrow, golden band, *not constricted on the fold, and rather indistinct toward the costa*, where it is somewhat suffused with a coppery hue, and nearest the base on the inner margin. At the apical third of the wing is a small golden spot, and nearly opposite, on the inner margin, another of the same hue, with the hinder portion of the wing tinged with a bright reddish coppery hue; cilia dark grayish. Hind wings purplish brown; cilia somewhat paler, with a coppery hue.

The larva mines the leaves of *Cornus florida*, in September. It may possibly be a variation of *Nysæfoliella*. The larvæ of the insects are very like each other, but I don't know whether that of *Cornifoliella* undergoes the same change of coloration after the last molting as that of *Nysæfoliella*. The head and shield dark brown; body nearly white, with seven minute, black points along the dorsum, and eight on the ventral surface, somewhat larger, and more distinct. Its mode of preparing for pupation is the same as the previous species, but whilst the individuals of *Nysæfoliella* on a single tree are almost innumerable, those of *Cornifoliella* are not abundant.

ASPIDISCA.

Fore wings with no discoidal cell. The subcostal nervure traverses the middle of the wing, attenuated from the base to the basal third, where it gives origin to a long, marginal branch, which reaches the costa at the apical third of the wing; near the tip it subdivides into three short branches, one of which is delivered to the costa behind the tip, one to the tip, without attaining the 1860.]

extreme apex, and one to the inner margin, somewhat behind the second marginal branch. *The median nervure is wanting.* The sub-median simple. Hind wings with no discoidal cell. The subcostal nervure is central and attenuated towards the base, and at about its apical third delivers a branch to the inner margin, and is bifid behind the tip of the wing. The median is simple. The submedian obsolete or wanting.

Size extremely small. Head and face smooth, covered with closely appressed scales. Face rather broad, and somewhat produced beneath into a point. Forehead rounded. Ocelli none. Eyes extremely small, not visible from above, and scarcely visible in front. Antennæ held extended at the sides, very short, scarcely *one-half* as long as the anterior wings, rather thick, obtuse, and roughened with scales. Maxillary palpi none. Labial palpi none. Tongue none.

A. splendoriferella.—Head golden. Antennæ fuscous, tinged with golden. Fore wings, from the base to the middle, leaden gray, with a splendent lustre, and from the middle to the tip golden, with a broad, nearly straight, metallic, silvery streak, extending from the costa near the tip to the middle of the wing, and dark-margined on both sides. This is nearly joined by a dorsal streak of the same hue, almost opposite to it, with converging dark margins, and with a blotch of dark brown scales adjoining it behind. In the costo-apical cilia is a short, blackish brown streak, parallel to the dark margin of the silvery costal streak.

At the tip is a black, apical spot, with metallic, silvery scales in its centre, and a few silvery scales in the cilia above and beneath it. A blackish brown hinder marginal line in the cilia, interrupted by a silvery streak in the cilia beneath the apical spot, and the cilia yellowish brown. Hind wings leaden gray; cilia yellowish brown.

The larva mines the leaves of *Cratægus tomentosus* early in September. The mine appears at first as a very narrow line, and is subsequently expanded into a small, transparent blotch. At maturity, the larva weaves a cocoon between the cuticles, and cuts a small oval disk. This is sometimes carried quite a distance, and is ultimately secured to some object by one of its ends tied down on a little button of white silk. It enters the pupa state toward the latter part of September, and appears as an imago early in spring.

The mature larva has a head much smaller than the first ring, rounded above, and elliptical. The body is flattened, and tapers posteriorly from the anterior rings. The segments are rather deeply incised, the thoracic obtusely rounded at the sides, and the rest with a minute lateral nodule or mammilla. It is without legs or prolegs, but on the second and third thoracic rings, on both the dorsal and ventral surfaces, are spots or cup-like depressions, one on each side, capable of being contracted and expanded. So, likewise, from the sixth to the ninth inclusive, on the ventral surface are transversely placed oval spots, similar to the thoracic, and one on each segment. On the segment next the last is a protuberance, both dorsal and ventral, with two cup-like depressions on each surface. These are not supplied with hooks, and if they are substitutes for feet, must act like suckers. They are all pale brown. The head is dark brown; the body brown, with blackish along the dorsal and ventral surfaces.

When the larvæ are young, it is extremely difficult to discover their mines, and the transparent blotch is not much larger than the cocoon, leaving a space in which the "frass" is collected.

DIACHORISIA.

Fore wings pointed, narrowly ovate-lanceolate; discoidal cell closed behind by a very faintly indicated nervure, with a faintly indicated secondary cell. The subcostal nervure obscurely indicated from the secondary cell to the base of the wing, with a long and distinct marginal nervure from near the base,

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one from the middle of the secondary cell, and three from the end of it to the costa. Three nervules from the discal nervure to the inner margin, beneath the tip. The median without branches; beyond the discal, it proceeds to the inner margin, as a single short vein; perhaps it may be bifid. The submedian is simple. Hind wings lanceolate, clothed with scales, with the discoidal cell closed by a very faintly indicated nervure. The costal nervure is long, and extends nearly to the tip of the wing. The subcostal is simple, and wanting from near the origin of the discal nervure, where it is slightly produced inwardly, but well indicated thence to near the tip. The discal nervure gives rise to a discal branch which quickly becomes bifid, and its branches well defined near to the tip, above and beneath. The median is well indicated, and is three-branched, the last very faintly connected with the second. No submedian nervure.

Size very small. Head rough and hairy above and in front. Ocelli none. Eyes rather large, round, and salient, not set on a naked circular portion of the head, nor with a naked space above the eyes. Antennæ about one-half as long as the anterior wings, inserted laterally, and microscopically pubescent beneath; basal joint moderately long, stalk roughened with scales. Maxillary palpi rather long and folded. Labial palpi moderate, slender, smooth, cylindrical, separated, and somewhat drooping; the third joint nearly as long as the second, which has a few bristles at its end and beneath. Tongue ?.

D. velatella.—Labial palpi dark brownish. Head brownish gray. Antennæ grayish fuscous, with the basal joint whitish, having a blackish, external streak. Fore wings whitish, dusted with dark fuscous, with a few dark fuscous spots along the costa, and one of the same hue about the middle of the disk, beneath which, on the fold, is another of the same hue. Toward the apex, in the middle of the wing, beneath the last costal spot, is a small, dark fuscous spot, sometimes connected toward the base of the wing with a dusted streak of the same hue; cilia whitish, somewhat dotted with dark fuscous. Hind wings grayish brown; cilia the same.

The relationship of this insect to *Incurvria* and its allied genera, especially to *Acerifoliella* and to *Eudarcia*, is very obvious.

BUCCULATRIX? Hübner.

The anterior wings lanceolate; the discal cell is closed acutely behind, with the subcostal nervure faintly indicated from the middle of the wing to the base, and sending four nervules to the costa, the first about the basal third, and its origin from the subcostal faintly indicated; the three others arising near the apical portion of the wing, with the subcostal between the second and last rather faintly indicated; the third nervule scarcely noticeable, and the last branch arising from the apex of the discoidal cell. The median is strongly indicated throughout, and sends off to the inner margin at its posterior end, a very faintly indicated branch, whilst the apical branch, which appears to be a continuation of it, becomes bifid behind the tip of the wing. The posterior are narrowly lanceolate, without discoidal cell. The subcostal nervure is central, and subdivides beyond the middle of the wing into three branches, two to the inner margin, and one along the exterior margin to the tip. The median nervure is simple.

Size extremely small. Head rough, tufted in the middle. Face smooth and retreating. Eyes salient, visible in front. Antennæ with a spreading, basal eye-cap, expanded above the eyes; stalk very slender, simple, scarcely more than one-half so long as the body. No labial or maxillary palpi. Tongue naked, very short, not one-half as long as the anterior coxæ.

B. coronatella.—Face yellowish-white. The head with the tuft pale orange chrome; the eye-caps pale yellow, touched behind with orange chrome. Antennæ yellow, dotted above with dark brown. Fore wings pale orange 1860.]

chrome, with a whitish patch near the base above the fold, one nearly opposite, on the inner margin, and one about the middle of the wing, on the costa. Near the tip of the wing is a rather indistinct, narrow, whitish band, becoming somewhat diffuse on the inner margin, about the middle of the cilia; extreme apex of the wing whitish, mixed with scales of the general hue: cilia grayish fulvous. Hind wings dark gray; cilia fulvous gray. Abdomen pale orange chrome, with a dark brownish stripe along the dorsum, varied with fulvous.

PYRALIDINA. Fam. HERMINIDÆ.

EPIPASCIA.

Anterior wings with two approximated, subcosto-marginal nervules arising near the end of the disk, with a short nervulet to the costa, from near the tip of the subcosto-apical nervule; the origin of the post apical is midway between the discal and marginal nervulet; the subcosto-inferior and discal have coincident origins. The discal is nearly circularly curved, and is continued to the disco-central nervule which anastomoses by contact with the medio-superior. Median three-branched. Submedian furcate at the base. In the posterior wings the discal nervure is long, with a sweeping curve, and, as in the anterior wings, is continued to the disco-central nervule, anastomosing by contact with the medio-superior.

Head with ocelli. Eyes round, rather large and salient. Maxillary palpi short, scaly and porrected. Labial palpi smooth, recurved, but not exceeding the vertex, cylindrical and pointed; third joint rather short, and indistinctly marked. Tongue scaled at the base, and nearly as long as the thorax beneath. Antennæ with an articulated appendage arising from the basal joint, thrown backwards, and as long as the thorax, and clothed with scales and spreading hairs at its tip; the stalk is exterior to it, slender, its joints roughened with scales, and finely ciliated beneath.

E. superatalis.—Head yellowish. Labial palpi yellowish, dusted with dark ochreous, with a dark brown spot at the base of the third joint. Antennæ brownish, annulated with yellow, the antennal appendage yellow, dusted with blackish brown, especially exteriorly. Fore wings pale yellowish, dusted with dark brownish to an irregular dark brown line, crossing the nervules from the costa to the inner margin, beyond which it is dull reddish brown. About the middle of the costa is a blackish brown spot, a small one of the same hue on the discal nervure; a minute one at the base, and the base of the fold, with the inner margin at the base tinted with reddish brown. On the posterior margin of the wing is a line of dark brown dots. Hind wings fuscous, with a dark brown round spot near the exterior margin of the base, and a brownish marginal line, with one of the same hue in the cilia.

From Edward Norton, of Farmington, Conn.

SPHINGINA. Fam. ÆGERIIDÆ.

TROCHILUM Scopoli.

I regard this genus as synonymous with the *Ægeria* of Dr. Harris; it includes, likewise, the group he has characterized by this name.

Both wings transparent. Antennæ little thickened at the tips. Abdomen sessile, tufted at the tip. Hind tarsi very slender and smooth, as long as the tibiae.

T. acer ni.—Head and labial palpi deep reddish orange, the former white in front of the eyes. Antennæ bluish black, the basal joint reddish orange in front. Thorax ochreous yellow, with the tegulæ in front touched with pale bluish black. Abdomen bluish black, varied with ochreous yellow; terminal tuft deep reddish orange. Fore wings with the margins and median nervure bluish black, dusted with yellowish; a large discal, bluish black patch; termi-

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nal portion of the wing ochreous yellow, with a blackish, subterminal band, and the nervules blackish; the hinder margin bluish black, and the cilia deep fuscous. Hind wings with a black discal patch; nervules blackish, and hinder margin blackish. Under surface of the body ochreous yellow, with a bluish black patch on each side of the second abdominal segment. The middle and posterior tibiæ annulated with bluish black at their ends, the anterior blackish, with the coxæ touched with reddish orange. All the tarsi touched with blackish above. The larva bores the trunk of the maple.

NOTE.—In the November number, 1859, the following corrections should be made:

In the first line of the note on p. 317, *preceding* should read *succeeding*.

In Division II., of the Table of species, on p. 318, *an* should read *no*.

On page 327, for *vitigenella* read *vitigenella*.

Appendix to the paper entitled *New Genera and Species of North American Tipulidæ with short palpi, &c.*

BY R. OSTEN SACKEN.

The following are some additions and corrections to my paper, suggested by the examination of the entomological collections of the British Museum, the Jardin des Plantes, and the Museum of the University of Berlin, as well as of some private collections.

The British Museum afforded me the desired information about the *Limnobiæ* described by Mr. Walker in his "List of Specimens, etc."

L. simulans Walk. is my *Dicranomyia defuncta*. Mr. Walker, (l. c. p. 45) describes this species as "*pale yellow, legs yellow, tips of the thighs, of the shanks, and of the feet, black,*" etc.; whereas, in reality, the body is *cinereous, the legs are dark brown, almost black*, with a whitish ring before the tip of the femora, etc. Mr. Walker's description was drawn from a single old and faded specimen; no wonder, therefore, that it could not be identified.

L. badia Walk. seems to be my *Dicranomyia humidicola*. The only specimen in the British Museum is without legs. The characteristic mark of the species, the *white ring at the tip of the tibiæ*, was therefore not mentioned in the description. (Walker, l. c. p. 46.)

Anisomera longicornis Walk. appears to be the species which I have identified for it.

Not having seen Mr. Saunders's collection, I have not been able to identify the *Limnobiæ ignobilis, prominens, biterminata, and turpis* described by Mr. Walker in the *Diptera Saundersiana*.

In the Museum of Berlin I have found a considerable number of undetermined *Limnobiæ* and *Eriopteræ* from Georgia, most of which I have been able to identify with the species described in my paper. Only a few were new to me. I will give here a list of these species, as an addition to the knowledge of their geographical distribution. Some observations and corrections to my descriptions, especially when they were drawn from a limited number of specimens, may also find their place here.

Limnophila adusta in two (♂ ♀) specimens. The brown line in the middle of the thorax was hardly apparent. The tips of the femora were distinctly infuscated.

Limnophila imbecilla (?) A single ♂ specimen, which had the neuration of the wings, the long verticils, etc., of said species, but the coloring of the body of which was somewhat different, namely, *brownish ferruginous, shining on 1860.*]

the thorax. This coloring may have been merely accidental, and produced perhaps after the death of the specimen.

Limnophila pavonina, a single ♂ specimen, slightly different from the specimen from which my description was drawn. The first joint of the antennæ is cinereous, the second brown, the following are orange. The tip of the antenna is brownish. The abdomen shows a brown stripe along the middle of the tergum and indications of such stripes along the lateral margins. The brown spots on the wings are more confluent than in my specimen, so that the outlines of the ocelli and ocelliform marks are less distinct than is mentioned in my description.

Limnophila tenuipes Say. *Limnophila n. sp.* (one specimen.) *Amaopis inconstans*. *Teucholabis complexa*. *Teucholabis n. sp.* (with a ferrugineous, shining thorax.) *Geranomyia communis*. *Gnophomyia tristissima*. *Gnophomyia lugubris*. *Dicranoptycha sobrina*. *Dicranoptycha sororcula*. *Erioptera venusta*. *Eriocera n. sp.* (? very like the cinereous specimens mentioned at the end of my description of *Eriocera fuliginosa*.)

Nov. gen. et sp. (?) of my group of *Tipulæ anisomeraeformes*, and very like *Eriocera*, but distinguished by the presence of a petiolated areolet and the antennæ, which are a little longer, especially those of the ♂. The species is easily distinguished by the color of the tarsi, which are *white*, except at the base.

In the same museum I saw *Gonomyia blanda* and *Limnophila luteipennis*, from South Carolina; *Rhipidia domestica*, from Brazil, (!) and *Rhamphidia brevirostris*, from South Carolina. The latter had the thorax a little darker, and the three stripes on it more distinctly marked than in my specimens; nevertheless, I hardly doubt of their identity.

I succeeded besides by examining the dipterological collections in Europe, in ascertaining, as I had hoped, the occurrence, in other parts of the world than in North America, of some of the new genera adopted in my paper.

Gnophomyia occurs in Brazil and in Europe. I saw two elegant species of this genus (*Gnophomyia nigrina* Wied., and *n. sp.?*) in the Berlin Museum, and a European species (taken near Berlin) in a private collection.

Dicranoptycha is also European. The *Limnobia cinerascens* Meig., (syn. *L. rufescens* Schum.?) belongs to this genus, as I ascertained in Mr. Loew's collection.

Antocha is also found in Europe; a species very like my *A. opalizans* occurs there. (Mr. Loew's collection.)

Dactylolabis the *L. dilatata* Loew from Croatia, (described in his *Neue Beiträge*, 4tes Heft,) belongs to this subgenus. The remarkable dilatation of the anterior margin of the wing, in the stigmatal region, which is peculiar to this species, is hardly perceptible in my *D. montana*; still it exists, although in a rudimental state; besides this, the structure of the ♂ forceps, (as far as could be ascertained from dry specimens,) that of the antennæ, and the situation of the spots on the wings, coincide in both species.

Epiphragma. A Brazilian species of this subgenus, very like my *E. solatrix*, is in the Berlin Museum; another, from Venezuela, is in Mr. Loew's collection.

Teucholabis. Two species from Brazil in the Berlin Museum; one of them is exceedingly like *T. complexa*.

A further object which I had, in examining the collections in Europe, was to ascertain the possible identity of some of the American species, which I had described as new, with European ones. The general result of my observations is, that *although cases of apparent analogy are not unfrequent, those of real identity seem to be much rarer*. My *L. tristigma* is very distinct from *L. tripunctata*

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Meig. The position of the clouds round the stigma is quite different in these species; likewise, the insect which I have redescribed under the name of *L. morio* *Fabr.* is different from the European insect of that name. Although I had no American specimen at hand for comparison, I could perceive at once that the wings of the European ones were less infuscated. I restore, therefore, to the American species the name of *L. morioides*, which I at first intended for it.

Limnophila fasciata *Linn.* and *Rhipidia maculata* *Meig.* have not struck me as being different from the American species which I have re-described under the same names; still, as I had no specimens of the latter for comparison, I would not rely on a mere impression.

My *Analopis inconstans* has the greatest resemblance with *Limnobia littoralis* *Meig.* My *A. auripennis* is closely related to *A. occulta*. Other cases of analogy which I observed are between *Pedicia albivittata* *Walk.*, and *P. rivosa*, *Dactylolabis montana* *O. Sack.*, and *Limnophila sexmaculata* *Meig.*, *Limnobia cinctipes* *Say.* and *L. annulus* *Meig.*, *L. solitaria* and *L. quadrinotata*.

In establishing the genus *Elephantomyia*, I had ventured the supposition that *Toxorhina* *Loew* had been founded on female specimens only, and that, if the males were known, the venuration of their wings would be found to be like that of the males of *Limnobia rhyrchus* *Westw.*, that is, considerably different from the females. This supposition has proved correct. Mr. Loew has obtained since several male specimens of *Toxorhina* (fossil.) They have a distinct radial vein, which, as usual, runs between the cubital and the radial areæ. The question of the synonymy of *Limnobia rhyrchus* and *Toxorhina* may therefore be considered as settled.

The examination of specimens of *Macrochile* *Loew* included in amber, proved that this genus, like my *Protoplasa*, has the anal angle of the wing square and not rounded.

NOTE.—In the analytical table on p. 232 (Proc. 1859,) the fifth line should be continuous with the fourth, the species *L. fuscovaria* forming in fact the group *Dicranophagma*.

Catalogue of the Mollusks in the vicinity of Mohawk, New York.

BY JAMES LEWIS, M. D.

The following Catalogue embraces the various species of shell-bearing *Mollusca*, observed in the vicinity of Mohawk, Herkimer Co., N. Y., and in various small Lakes a few miles south of Mohawk. Some of the species referred to have been entered here, from a single dead specimen.

- Unio complanatus* *Lea.* Erie canal and Mohawk river. Common.
radiatus *Lamarck.* Lakes. Abundant.
cariosus *Say.* Mohawk river. Nearly or quite extinct.
ochraceus *Say.* " " " " "
Tappanianus *Lea.* " " Very rare.
luteolus *Lam.* " " Very rarely seen.
Margaritana rugosa *Barnes.* Canal and river. Common.
marginata *Say.* " " Not plenty.
undulata *Say.* Lakes. One seen in river. Rare.
Anodonta fluviatilis *Lea.* Canal. Rare. Streams south, less rare.
lacustris *Lea.* Lakes. Abundant. (Nov. sp.)
Lewisii *Lea.* Canal. " "
edentula *Say.* " Rare. Streams south, common.
Ferussaciana *Lea.* Canal and rivers. Small and rare
imbecilis *Say.* " " "
subcylindracea *Lea.* Herkimer.

- Cyclas sulcata* Lam. (similis Say.) Lakes. Common.
 ———? River. Rare. (nov. sp)? Rare.
striatina Lam. (edentula Say.) Canal and rivers. Common.
transversa Say. Canal and rivers. Smaller than from the west.
rhomboidea Say. (elegans Ad.) Lakes. Rare.
partumeia Say. Stagnant waters.
occidentalis Prime. Boggy streams and meadows. Plenty.
- Pisidium* *virginicum* Bgl. (dubium Say.) River. Not very plenty.
abditum Hald. Stagnant waters. Plenty.
compressum Prime. Rivers and small streams. Not rare.
equilaterale Prime. River east of Herkimer. Rare.
ferrugineum Prime. River and lakes.
ventricosum Prime. Lakes and stagnant pools.
- Paludina* *integra* Say. Canal and river. Very plenty in canal.
decisa Say. " " Very plenty in river.
rufa Hald. " " Not plenty. Recently introduced.
- Melania* *subularis* Lea. " " Common.
exilis Hald. " " "
virginica Say. Canal. Recently introduced. Not plenty. Local.
- Amnicola* *limosa* Say. Canal and river. Plenty.
lustrica Say. " " Plenty in river.
pallida Lea. Lakes. Not very plenty.
tenipes? Hald. Lakes. Not very plenty.
- Valvata* *tricarinata* Say.* Mohawk river plenty. Canal less plenty.
 ——— var. simplex of *tricarinata* Say, in Thompson's Vermont shells.
 Whorls round, simple, (inornate); apex elevated; umbilicus wide and deep; epidermis blue, varying to brown, but not green, nor iridescent.
sincera Say. Lakes. Very rare. 1 to 1000 of the above.
- Lymnaea* *elodes* Say. Canal, ditches, pools, &c. varieties *emarginata* and *catascopium*, I have ascertained, may be produced from the eggs of *elodes*, by change of station.
desidiosa Say. Stagnant pools, margins of streams and lakes.
humilis Hald.? " " "
umbilicata Adams " " in wood lots. (is not *caperata* Say.)
gracilis Jay. Schuyler's lake, Otsego Co. Plenty.
appressa Say. Little Lakes. A single dead shell observed.
columella Say. Lakes. Not abundant nor large.
- Physa* *heterostropha* Say. Everywhere in pools, lakes and small brooks.
ancillaria Say. May be a var. of preceding. Rivers, very rare.
hypnorum Drap. Stagnant pools. Small and rare.
- Planorbis* *trivolvus* Say. Common.
bicarinatus Say. Common. In some localities, (lakes) white.
campanulatus Say. Lakes. Less common than the preceding.
armigerus Say. Stagnant waters. Common.
hirsutus Say. Lakes. Rare.
exacutus Say. Lakes. Very rare.
parvus Say. Stagnant waters. Very plenty.
- Ancylus* *tardus* Say. Mohawk river. Common on stones and Uniones.
parallelus Hald. Lakes. Common on water plants.
fuscus Adams. Lakes or waterfalls. Less abundant.

* A variety occurs in Little Lakes, which presents much diversity of carination, some specimens being almost entirely destitute of carinae, but retaining the characteristic iridescent green tinge. Those specimens in which the carinae are obsolete have the upper surface of the whorls flattened, and the spire somewhat depressed. The conclusions of authors, who suppose these varieties run into the following, are erroneous.

- Helix* *albolabris* Say.
alternata Say.
arborea Say.
chersina Say. Rarely seen.
concava Say.
electrina Gould.
fallax Say. Small var.
fuliginosa Griffith. Rare and solitary.
hydrophila Ingalls. Very plenty and gregarious.
indentata Say. Rarely seen.
intertexta Binney.
lineata Say. Not plenty.
inornata Say. Rare.
minuta Say. Very plenty in damp grounds.
minuscula Binney. Only very recently observed, and quite rare.
monodon Rackett. Our most common *Helix*.
palliata Say.
Sayii Binney. Very rare.
striatella Anthony.
thyroides Say. Rare.
- Succinea* *obliqua* Say.
vermeta Say. (Is not avara.)
ovalis Gould.
- Bulimus* *lubricus* Brug.
- Pupa* *pentodon* Say.
contracta Say.
- Vertigo* *ovata* Say.
Gouldii Bin.

Carychium *exiguum* Say.

I have made some experiments for the purpose of ascertaining if various species of *Uniones* would bear transplanting. The following species have been placed in the Erie Canal, at various times, but no evidence has yet been had of their multiplying: *Unio radiatus* from Schuyler's Lake. *Unio camptodon* Say, from Ohio; *U. parvus* Say, from Ohio; *U. undulatus* Bar., from Ohio; *U. cariosus* Say, from Troy, N. Y.; *An. implicata* Say, from Troy, N. Y.

A variety of *Lymnæa* known as *catascopium* Say, abounds in the Canal, and it is very usual for their eggs to be washed over the sides of an aqueduct into a small creek, where they come to maturity, to be washed into the river with the fall floods. One or two favorable seasons have enabled me to ascertain that those which came to maturity have the form of *elodes*. A small pool of stagnant water, formerly the bed of the Canal previous to its enlargement, is populated by thousands of *Lymnæa* that formerly formed part of the Canal family. These vary in their forms in different seasons; some retain the form of *catascopium*, others diverge to *emarginata*, but a larger number are *elodes*. The *Paludina* of the Lakes I regard as *decisa*, but they are probably not the same as the shells of the Canal and River that have that name.

Notes on the Nomenclature of North American Fishes.

BY THEO. GILL.

The following notes are selected from a large number on American and foreign fishes in the possession of the author. Others upon North American fishes are reserved until a more complete examination can be made; it is hoped that the following may, in the mean time, be of service to the student of American Ichthyology.

1860.]

1. *Labrax chrysops Girard*.—There is little doubt that the *Labrax albidus* of Dr. Dekay* and the *Labrax osculatii* of Filippi† are identical with the *Labrax chrysops*. Filippi, although acquainted with the work of Dekay, compares his *Labrax osculatii* only with the *L. lineatus Cuv.*, and chiefly distinguishes it from that species by its higher body and lingual dentition. The specimens, from which the species of Filippi was described, were sent to the Museum of Milan by the traveller to whom it was dedicated, (M. Osculati,) and are stated by Filippi to have been obtained in Lake Ontario. Notwithstanding this, Filippi has stated that it is an inhabitant of the sea and the rivers of the United States. "Hab. in mare et fluvis confederationis Americanæ."

2. *Lepomis achigan Gill*.—Rafinesque‡ first indicated the *Cichla fasciata* of Lesueur or *Centrarchus obscurus* of Dekay, under the name of *Bodianus achigan*. His specific name must be preserved.

3. *Ambloplites rupestris Gill*.—The *Bodianus rupestris* of Rafinesque, described in December, 1817,§ appears to be the same as the species subsequently named *Cichla ænea* by Lesueur.

4. *Pomotis maculatus Gill*.—The common sun fish of New York was first named *Morone maculata* by Mitchell.|| His specific name should be retained.

(*Corinia oxyptera Dekay*.¶)—This is a species of the genus *Serranus*.

5. *Orthopristis fulvo-maculatus Gill*.—If the genus *Orthopristis* is valid, the *Hæmulon fulvo-maculatum* of Dekay** must be referred to it under the above name. That species differs very little, if at all, from the *Orthopristis duplex* of Dr. Girard.†† The two are probably identical.

6. *Sargus ovicephalus Gill*.—The common sheep's-head was first named by Bloch‡‡ from the description of Schoepf.§§

PALINURICHTHYS Gill.

This name is proposed as a substitute for *Palinurus* of Dekay. The latter name having been applied to a well-known genus of crustaceans, it is inadmissible in any other branch of the animal kingdom.

7. *Palinurichthys perciformis Gill*.—Syn. *Palinurus perciformis Dekay*, Zoology of New York, Fishes, p. 118.

PERCINA Haldeman.||||

The type of this genus is congeneric with the type of the subsequently established genus, *Pileoma* of Dekay. The latter name is therefore a synonym of *Percina*, and must be suppressed.

8. *Percina semifasciata Gill*.—Syn. *Pileoma semifasciata Dekay*, Zoology of New York, Fishes, p. 16.

ASTROSCOPUS Brev.

Under this name, Mr. Brevoort proposes to separate from *Uranoscopus* the

* Dekay, Zoology of New York, Fishes, p. 13, pl. 51, fig. 165.

† Filippi, Revue et Magasin de Zoologie, 2d series, vol. v. p. 164.

‡ Rafinesque, American Monthly Magazine and Critical Review, vol. ii. p. 120.

§ Loc. cit., vol. ii. p. 120.

|| Mitchell's Report in part on the fishes of New York, p. 19, Jan., 1814.

¶ Dekay, loc. cit., p. 77, pl. xxx. fig. 96.

** Dekay, loc. cit., p.

†† Girard, Proc. Acad. Nat. Sci., Philadelphia, 1859.

‡‡ Bloch, Schneider., Systema Ichthyologiae, p. 280.

§§ Schoepf in Schriften der Gesellschaft Naturf. Freunde zu Berlin, vol. viii. p. 152, 1788.

|||| Haldeman, Journ. Acad. Nat. Sci., vol. viii. p. 330, 1842.

American *U. anoplos* of Cuvier. *Astroscopus* differs from *Uranoscopus* by a less completely armed head, and by the absence of an exsertile filament to the membrane behind the symphysis of the lower joint. To this genus is also to be referred the *Uranoscopus y-graecum* of Cuvier and Valenciennes.

9. *Astroscopus anoplos* *Brev.*—Syn. *Uranoscopus anoplos* *Cuv.* and *Val.* *Hist. Nat. des. Poissons*, vol. viii, p. 493.

(*Lepisoma cirrhosum* *Dekay*.)—This fish, described as a new genus of the family of Percoids, is the common *Chinus pectinifer* of Valenciennes, † a West Indian species, which is the type of the genus *Labrosomus* of Swainson. ‡

LEPTOBLENNIIUS Gill.

This genus is founded on the *Blennius serpentinus* of Dr. D. H. Storer. It differs widely from *Blennius* by the elongated form of the body, the shape of the head, absence of superciliary tentacles, &c. It is equally distinct from the genus *Pholis*.

10. *Leptoblennius serpentinus* *Gill.*—Syn. *Blennius serpentinus* *Storer*, *Hist. of the Fishes of Mass.*, p. 91, pl. xvii. fig. 1.

MOLACANTHUS Sw.§

The genus called by Dekay *Acanthosoma* had been previously named by Swainson *Molacanthus*, and that appellation has been accepted by the Prince of Canino. || Swainson founded his genus on the *Diodon mola* of Pallas, a species to which Dekay has referred in his remarks on *Acanthosoma carinatum*.

11. *Molacanthus carinatus* *Gill.*—Syn. *Acanthosoma carinatum* *Dekay*, *Zoology of New York Fishes*, p. 350, pl. 4, fig. 179.

Dr. Richardson has figured in the *Ichthyology of the Voyage of the Sulphur*, ¶ a species of *molacanthus*, which he has named *Orthogoriscus spinosus* *Cuv.*, citing for that name the *Règne Animal*, vol. i. p. 370. On reference to the volume of Cuvier, it will be seen that the name of *Orthogoriscus spinosus* is attributed to Bloch of Schneider; in a foot note to the genus enumerating the species, it is again referred to as *Orthogoriscus hispidus*. The latter is the name given to the species in the *Systema Ichthyologiæ*,** and the former was probably due to an oversight of Cuvier. The species of Richardson is also, perhaps, a distinct species from the *Molacanthus hispidus* *Bon.*, and is an inhabitant of the Chinese seas.

On the Pertinence of the *ALOSA TERES* Dekay, to the Genus *DUSSUMIERA* Val.

BY THEO. GILL.

In the ichthyological volume of "Zoology of New York, ††" Dr. Dekay has described a halecod fish to which he has given the name of *Alosa teres*. He has characterized the genus *Alosa* as having the characters of *Clupea* (body compressed,) but distinguished by the tongue and the roof of the mouth being smooth or edentulous. Notwithstanding this definition, he has without

* Dekay, loc. cit., p. 41, pl. 30, fig. 91.

† Cuv. Val. *Hist. Nat. des Poissons*, vol. xi.

‡ Swainson, *Nat. Hist. of Fishes, &c.*, vol. ii, pp. 75 and 277, 1839.

§ Swainson, *Nat. Hist. of Fishes, Amphibians and Reptiles*, vol. ii. p. 329.

|| Bonaparte, *Catalogo Metodico dei Pesci Europei*, p. 87.

¶ Richardson, loc. cit., p. 125, pl. 2, figs. 10 and 11.

** Bl. Schn., loc. cit., p. 511.

†† *Zoology of New York Fishes*, p. 262, pl. 40, fig. 128.

hesitation, referred to the genus the above fish which he describes as having the "body cylindrical," and with its tongue covered "with asperities on its surface." In the "Histoire Naturelle des Poissons,"* Valenciennes, misled perhaps by the generic definition of Dekay, has described what appears to be a true *Alosa*, as the *Alosa teres* of Dekay. In the same volume † he has described a fish to which he has given the name of *Dussumiera acuta*; this fish is there stated to have a most close superficial resemblance to the sardines of the Clupeoid family, but as being separated from them on account of the smooth belly, and as being more nearly related to *Butirinus*, between which genus and *Elops* it was believed that it should be placed.

Subsequently, Mr. James C. Brevoort, in his "Notes on the Figures of Japanese Fish," ‡ (originally published in the second volume of the Narrative of the United States Expedition to Japan, under Commodore Perry,) in a note on *Clupea micropus* of Temminck and Schlegel, corrected the erroneous reference of Valenciennes, and noticed the near affinity of the *Alosa teres* to the genus *Dussumiera*.

Recently, in the Proceedings of the Philadelphia Academy, § Dr. Charles Girard has referred the same species to the genus *Harengula* of Valenciennes, on account of the presence of teeth upon the maxillar bones, the tongue, the palatines, and the pterygoidians, whilst the vomer is toothless." In dentition, *A. teres* does indeed agree with *Harengula*, but is totally separated from that genus by the form of the body, and is correctly referable to *Dussumiera*, which has teeth upon the same bones, and otherwise agrees with *Alosa teres*.

The species must, consequently, be hereafter called *Dussumiera teres*, and its synonymy will be as follows:

Dussumiera teres Brevoort.

Synonymy.

- Alosa teres* Dekay, Zoology of New York Fishes, p. 262, pl. 40, fig. 128, 1842
 " " Troschel, Bericht in Archiv. fur Naturgeschichte, 1844, vol. ii p. 245, (abstract).
 " " Storer, Synopsis of the Fishes of North America, p. , ib. in Memoirs American Academy, vol. ii., p. 460, (compiled,) 1846.
 " " Baird, Report on Fishes of New Jersey coast, p. 35; ib. in Ninth Annual Report Smithsonian Institution, p. 349, 1855.
Dussumiera sp. Brevoort, Notes on some figures of Japanese Fish, p. 27; ib. in Narrative of Expedition to Japan, vol. ii., p. 279, 1807.
Harengula teres Girard, Proc. Acad. Nat. Sci., Philad'a, p. 158, May, 1859.
 (Not "*Alausa teres* Dekay;" Val. Hist. Nat. des Poissons, vol. xx. p. 423.)

—————

Prodromus descriptionis animalium evertibratorum, quæ in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit

W. STIMPSON.

PART VIII. CRUSTACEA MACRURA.

THALASSINIDEA.

359. *GEBIA SUBSPINOSA*, NOV. SP. *G. majori* affinis. *Foeminae* manus pedum primi paris intus spina una prope pollicem, || et duabus ad basin dac.

* Hist. Nat. des Poissons, vol. xx., p. 423.

† Hist. Nat. des Poissons, vol. xx., p. 467.

‡ Loc. cit., p. 27.

§ Loc. cit., May, 1859.

|| *Pollex nobis est digitus immobilis.*

tyli armata; pollex intus bidentatus, dentibus minutis; dactylus superne carinatus, carina crenulata. Pedes primi, secundi, tertiique paris prope basin spina acuta armati.

Hab.—In sinu "Simon's Bay" ad Promont. Bonae Spei; in fundo arenoso. prof. 8 org.

360. *GEBIA CARINICAUDA*, nov. sp. *G. majori* affinis. Carapax antice angustior, dentibus minus prominentibus, fronte spinulis erectis sat validis pectinata. Pedum primi paris manus infra spina versus pollicem instructa; pollex intus subtiliter denticulatus; dactylus superne carinatus, carina laevi. Pedum tertii paris *foeminae* coxa spina parvula super aperturam genitalem armata. Sulci laterales segmentorum abdominalium validi, segmenti penultimi validiores. Abdominis segmentum ultimum carina transversa acuta prope basin ornatum; lamellae laterales valide carinatae, marginibus terminalibus spinulis crenulatae. Long. 1.77; carapacis long. 0.56; carap. regionis anterioris lat. 0.19; regionis post. lat. 0.29 poll.

Hab.—In portu "Hong Kong;" sublittoralis in locis limoso-sabulosis.

361. *GEBIA PUGETTENSIS*, Dana; U. S. Expl. Exped., Crust., i. 510, pl. xxxii. f. 1. Stimpson; Bost. Jour. Nat. Hist., vi. 48, pl. xxi.—Ad oras Californiae.

362. *CALLIANASSA PETALURA*, nov. sp. Parva. Antennae externae carapace plus duplo longiores. Pedes primi paris *foeminae* eis maris similes; pedis dextri merus brevis, robustus, subtus dente valido basali instructus quam merus ipse vix tertia parte brevior, antrorsum porrecto, serrato; carpus longior quam latior et quam merus multo longior, marginibus parce dilatatis et laevibus; manus elongata, quam carpus angustior; palma quam carpus non brevior, superne margine laevis, subtus serrata et ciliata; digitus palma quarta parte brevior, sat gracilis, pilosi. Pes primus sinister gracillimus, mero inferne edentato. Lamellae caudales parvae, laeves, glabrae, rotundatae, subaequales; segmentum caudale in *foemina* quam in maribus latius, margine posteriore leviter sinuatum; lamellae externae marginibus externis incrassatae vel pulvinatae, in maribus longe ciliatae. *Foeminae* long. 1.57; long. carapacis, 0.36; long. carpi manus dactylisque chelipedis majoris, 0.70 poll.

Hab.—In portu "Simoda" Japoniae.

363. *CALLIANASSA CALIFORNIENSIS*, Dana; Proc. Acad. Nat. Sci. Philad., vii. 175. Stimpson; Bost. Jour. Nat. Hist. vi. 489, pl. xxi. f. 4.—Ad oras Californiae prope urbem "San Francisco."

ASTACIDEA.

364. *IBACUS NOVEMDENTATUS*, Gibbes; Proc. Am. Assoc. 1850, p. 193. Inter *I. ciliatum* et *I. peronii*;—an distinctus? Specimen nostrum dentes octo laterales habet. In Mari Sinensi prope "Hong Kong;" fundo limoso prof. 20 org.

365. *PARRIBACUS ANTARCTICUS*, Dana; U. S. Expl. Exped., Crust., i. 517, pl. xxxii. f. 6. *Scyllarus antarcticus*, Fabr. *Ibacus antarcticus*, M. Edw.—Ad insulas Hawaienses et ad insulam "Tahiti."

366. *SCYLLARUS SIEBOLDII*, De Haan; Fauna Japonica, Crust. 153, pl. xxxvi., et xxxvii. f. 1.—Ad insulam "Ousima."

367. *ARCTUS SORDIDUS*, nov. sp. Carapax latus, sed non latior quam longior; crista mediana tridentata, dente anteriore parvo, juxta frontem sito; crista laterali dentibus duobus super oculum et dente uno paullo remoto armata; angulis antero-lateralibus prominentibus. Antennarum articulus secundus utrinque dente uno solum valido armatus, angulo anteriore acuto prominente, crista valida sed laevi; articulus quartus margine antico dentibus quatuor magnis obtusis, et dente uno acuto intus uni-denticulato introrsum sito armatus. Sternum antice bifurcatum, furcis triangularibus, dentiformibus. Fusco-1860.]

luteus; pedes nigro quadri-annulati; abdominis segmentum primum nigro uni-maculatum. Foeminae long. 2.2 poll. *A. urso* (*Scyllaro arcto*,) Auct. affinis. Ab *A. rugoso* differt abdominis segmento tertio non gibboso.

Hab.—In portu "Hong Kong;" f. conchoso p. 8 org. vulgaris.

368. *PALINURUS LALANDEI*, Milne-Edwards; Hist. Nat. des Crust. ii. 293.—Ad Promont. Bonae Spei.

369. *PANULIRUS ORNATUS*, Gray. *Palinurus ornatus*, Bosc., M. Edwards; Hist. Nat. des Crust. ii. 296 (?)—Prope oras insulae "Hong Kong."

370. *PANULIRUS INTERRUPTUS*, Stimpson. *Palinurus interruptus*, Randall; Jour. Acad. Nat. Sci. Philad., viii. 137.—California.

371. *PANULIRUS PENICILLATUS*, Gray, Dana. *Palinurus penicillatus*, (Oliv.) M. Edwards; Hist. Nat. des Crust. ii. 299.—Ad insulam "Tahiti."

372. *PANULIRUS JAPONICUS*, Gray. *Palinurus japonicus*, Siebold, De Haan; Fauna Japonica, Crust. 158, pl. xli. et xlii.—Ad oras Japonicas prope urbem "Simoda."

373. *ASTACUS NIGRESCENS*, Stimpson; Bost. Jour. Nat. Hist. vi. 492.—California.

CARIDEA.*

374. *CRANGON CAPENSIS*, nov. sp. *C. vulgari* paullo affinis, in spinâ medianâ carapacis, etc. Carapax medio parce carinatus, carina dente minuto in medio armata; dentibus v. spinis lateralibus nullis. Maxillipedes externi squamam vel appendicem antennalem superantes. Pedum primi paris palma obliqua, fere longitudinalis. Pedes quinti eos primi paris superantes. Abdomen vix carinatum; cauda valde compressa. Long. foeminae, 0.9 poll. *C. affini*, De Haan, proximus.

* Simulacrum carapacis Carideorum.



- | | |
|-----------------------|---|
| A. Regio gastrica. | 1. Spina supraorbitalis, (interdum duae.) |
| B. Regio branchialis. | 2. Angulus orbitae externus, interdum spiniformis. |
| C. Regio cardiaca. | 3. Spina antennalis. |
| D. Regio hepatica. | 4. Spina branchiostegiana (in generibus <i>Leander</i> et <i>Pandalus</i> conspicua.) |
| E. Regio orbitalis. | 5. Spina pterygostomiana |
| F. Regio antennalis. | 6. Spina hepatica (in <i>Palaemonibus</i> , <i>Penaeis</i> , etc.) |
| G. Regio frontalis. | |
- a. Sutura v. sulcus cervicalis;—pars dorsalis in *Stenopis*, *Sicyoniis*, *Alpheis* etc plus minusve distincta, pars antero-lateralis in quibusdam *Penaeis* et *Leandris*.
 b Sutura cardiaco-branchialis, raro distincta.
 c. Sulcus antennalis, et c' hepaticus, in *Penaeis* multis valde conspicuus.
 d Sulcus gastro-orbitalis, in *Crangonibus*.
 e. Sulcus gastro-frontalis, in *Penaeo* monocero.
 f. Sulcus gastro-hepaticus, in *Stenopis*, *Penaeis*, etc.
 g. Sulcus orbito-antennalis, in *Alpheo* et *Spongicola*.

[Jan.

Hab.—In sinu "Simon's Bay," Promont. Bonae Spei; f. arenoso, prof. 12 org.

375. CRANGON CARINICAUDA, nov. sp. Carapax depressus, pubescens, septemcarinatus; carinis levibus, retrorsum distinctis; mediana antice obsoleta; tribus lateralibus approximatis, quarum prima et tertia unispinosis, spinis ad quartam anteriorem carapacis sitis. Rostrum valde angustatum, longitudinaliter sulcatum, extremitate bifidum. Pedes primi crassi, palma obliqua magis longitudinali; secundi quam tertii robustiores sed dimidia breviores, non inflexi, carpo manique quam merus breviores, manu chelata digitis rectis parallelis; tertii filiformes; quarti quintique valde graciles; quinti primos superantes. Abdomen insculptum, sulcis plerisque transversis, pubescentibus; segmentis tertio, quarto quintoque gibbosis, valide carinatis. Long. 0.66; carap. long. 0.16; carap. lat. 0.139 poll.

Hab.—In portu Sinensi "Hong Kong."

376. CRANGON FRANCISCORUM, Stimpson; Crust. and Echin. Pacific Coast of N. Am., 55.; Bost. Jour. Nat. Hist. vi. 495, pl. xxii. f. 5.

Hab.—In portu "San Francisco," Californiae.

377. CRANGON NIGRICAUDA, Stimpson; Crust. and Echin. Pacific Coast of N. Am., 56.; Bost. Jour. Nat. Hist. vi. 496, pl. xxii. f. 6. *C. vulgaris*, Owen, Dana. (non Fabr.)

Hab.—In portu "San Francisco," Californiae.

378. CRANGON PROPINQUUS, nov. sp. *C. vulgari* et *C. nigricaudae* valde affinis, sed abdominis segmento quarto (et interdum tertio quoque,) in adultis carinato. Segmentum ultimum extremitate spinulis sex armatum. A *C. nigricauda* differt pedum primi paris manu angustiore, palma magis obliqua, digitoque immobili longiore. A *C. affini* maxillipedibus externis et pedibus quintis brevioribus ut in *C. vulgari*. Long. 2.5 poll.

Hab.—Prope oras boreales Japoniae; in fundis arenosis limosisque prof. 4-20 org.

379. CRANGON SALEBROSUS, Owen; Beechey's Voy. Zool. 88, pl. xxvii. f. 1.—In sinu "Avatska" Kamtschatkae; vulgaris in fundo limoso, inter *Eudendria* ad prof. 10 org.

380. CRANGON BOREAS, Fabr., Milne-Edwards; Hist. Nat. des Crust. ii. 342; Règne Anim., pl. li. - 2. Owen; Beechey's Voy., Zool. 87. Brandt; Sib. Reise, Zool. 114.—In freto Beringiano et in Oceano Arctico; ad prof. 10-26 org.

381. CRANGON ANGUSTICAUDA, De Haan; Fauna Japonica, Crust. 183, pl. xlv. f. 15.—In portibus "Simoda" et "Hakodadi," Japoniae; sublittoralis, vulgaris inter algas.

382. CRANGON INTERMEDIUS, nov. sp. Carapax laevis, nitidus, medio carinatus, carina bi-spinosa, spina anteriore debili prope rostrum sita, altera mediana, valida; latera spinis quatuor armata, duabus in margine antico, una valida in superficie laterali, et una minuta prope carinam. Rostrum elevatum prominens, non acuminatum. Maxillipedes externi graciles, appendicem antennalem superantes. Pedes primi apicem appendicium non attingentes; secundi tertius paullo breviores; quarti quintique longi, eis *C. boreae* multo graciliores, sed dactylis longis, curvatis. Sternum inerme. Abdomen superfacie marginibusque inferioribus laeve; carina parvula, sed in segmento antepenultimo acuta, in penultimo duplicata; segmento ultimo valde elongato, minuyente, extremitate fere acuto. *Foeminae* long. 1.7; carap. long. 0.38; segmenti abdominis ultimi long. 0.32 poll. Facie et armatura carapacis *Nectocrangoni lari* similis.

Hab.—In mari Beringiano prope Promontorium "Chepoonski," ad prof. 40 org.

383. NECTOCRANGON LAR, Brandt; Sib. Reise, Zool. 115. *Crangon lar*, Owen, 1860.]

Beechey's Voy., Zool. 88, pl. xxviii, f. 1. *Argis* lar*, Kroyer; Tidsskrift, iv. 255; pl. v. f. 45-62.—In sinu "Avatska," in freto Beringiano, et in Oceano Artico; fundis limosis prof. 10-20 org.

384. SABINEA SEPTEMCARINATA, Owen; App. to Ross' Voy. 82. Kroyer; Tidsskrift, iv. 244, pl. iv. f. 34-40 et pl. v. f. 41-44. *Crangon septemspinus*, Sabine.—In Oceano Artico, prope oras Siberiae.

385. NICA EDULIS, Risso; Milne-Edwards; Hist. Nat. des Crust. ii. 364.—In sinu "Funchal" insulae Madeirae; f. arenoso, p. 15 org.

386. NICA MACROGNATHA, nov. sp. Corpus robustum, minus compressum. Carapax sat latus, leviter depressus, laevis, non carinatus, rostro brevi, quam oculi multo brevior, acuminato. Antennularum flagellum breve. Maxillipedes externi grandes, extremitates antennularum fere attingentes; mero crasso, pedibus primi paris non angustiore, et carapace vix tertia parte brevior. Pedes primi robusti; pes dexter vel chelatus robustior, sed quam sinister paullo brevior. Abdominis segmentum terminale dorso longitudinaliter late sulcatum et paribus duobus aculeorum armatum; extremitate aculeis sex pectinatum, duabus longis, duabus mediocribus et duabus brevibus. Long. 1 poll. *N. eduli* etc. valde affinis. Ab *N. eduli* differt corpore robustiore, et rostro brevior; ab *N. hawaiiensi*, oculis minoribus, et pedibus primi paris brevioribus; ab *N. japonico*, maxillipedibus externis longioribus, et segmento ultimo abdominis aculeis dorsalibus armato.

Hab.—In portu "Hong Kong;" f. conchoso, p. 8 org.

HIPPOLYSMATA, nov. gen. Carapax rostro sat longo verticaliter dilatato et dentato instructus. Antennulae flagellis duobus longis instructae. Mandibulae valde incurvatae, nec bipartitae nec palpigerae. Maxillipedes externi elongati exognatho flagelloque instructi; articulo ultimo gracili. Pedes I mi—4 ti flagello instructi. Pedes primi crassiusculi, chelati, manu oblonga; secundi filiformes, chelati, carpo multi-annulato. Abdomen dorso laeve. *Lysmatae* affinis, sed antennulis flagellis duobus tantum praeditis. Ab *Hippolyte* differt mandibularum formâ.

387. HIPPOLYSMATA VITTATA, nov. sp. Carapax per dimidiam anteriorem carinatus, rostro apicem articuli penultimi pedunculi antennularum attingente, superne septem-dentato, dentibus gracilibus antorsum porrectis, dente posteriore vel primo parce ante medium carapacis sito, et dente secundo intervallo duplo remoto; rostro infra prope extremitatem tridentato, dentibus parvis. Margo carapacis anterior utrinque spina sub oculo et dente minuto acuto pterygostomiano armatus. Antennularum flagellum externum corpore fere duplo longius; parte basali inerassata, pedunculo non brevior, infra ciliata. Appendix antennarum extremitatem pedunculi antennularum attingens. Maxillipedes externi appendices multo superantes; exognatho longitudine tertiam partem endognathi adequante. Pedes primi paris apicem appendicium attingentes; pedum secundi paris carpus 20-articulatus; pedes postici longi. Segmentum caudale triangulare, dorso paribus duobus aculeorum armatum. Color pallide ruber; corpus coccineo-vittatum. Long. 1.3 poll.

Hab.—In portu "Hong Kong;" f. limoso p. sex. org.

TOZEUMA†, nov. gen. Corpus valde elongatum, lanceolatum, utrinque attenuatum, compressum. Rostrum gracile longissimum, interdum corpore vix brevius. Antennulae breves, flagellis duobus instructae. Appendix antennarum longa. Mandibulae sat robustae, valde incurvatae, nec bipartitae nec palpigerae. Maxillipedes externi brevissimi, exognatho nullo, et flagello nullo praediti. Pedes breves epipodis destituti. Pedes primi brevissimi, crassiores,

* Nomen Kroyeri praecoccupatum est.

† Τοζευμα, telum.

chelati; secundi filiformes, chelati, carpo tri-articulato. Abdomen dorso dentibus armatum; articulo ultimo elongato fere lanceolato.

388. *TOZEUMA LANCEOLATUM*, nov. sp. Corpus gracillimum, in maribus valde compressum. Carapax ecarinatus. Rostrum aciculiforme, quam corpus vix quarta parte brevius, superne obtuse-rotundatum, superficie carapace continuum; infra serratum et versus basin lamellatum. Margo carapacis anterior sub oculo acutus, et ad angulum antero-lateralem spina acuta armatus. Antennulae appendicem antennarum adequantes, flagello externo omnino incrassato et quam internum multo brevior. Antennae rostro breviores; squamis elongatis, longitudine tertiam partem rostri aequantibus, vix minuentibus, latitudine quartam longitudinis aequante. Abdomen superne carinatum et acute tridentatum, (segmentis 3tio 4to 5toque dentigeris); segmento ultimo lamellis lateralibus longiore, dorso paribus tribus aculeorum armato. Animal vivum fere pellucidum, rostro, cauda, et ventre rubris exceptis. Long., rostro incluso, 2.5; alt. thoracis, 0.18 poll.

Hab.—In portu "Hong Kong;" in fundo limoso prof. sex. org. sat vulgaris.

LATREUTES,* nov. gen. *Rhynchocyclus* affinis. Carapax dorso spina mediana armatus. Rostrum grande, elongatum, lamellatum, cultriforme, margine superiore recto vel rectiusculo. Antennulae bi-flagellatae, squama basali brevi, orbiculata, sub oculo celata. Antennarum appendix acuta. Mandibulae robustae, breves, valde incurvatae. Maxillipedes externi breves, exognatho flagelloque instructi. Pedes primi, secundi, tertii, quartique paris flagello instructi. Pedum secundi paris carpus tri-articulatus.

389. *LATREUTES ENSIFERUS*. *Hippolyte ensiferus*, Milne-Edwards; Hist. Nat. des Crust. ii. 374. Goodsir; Ann. Mag. Nat. Hist. xv. 74. Dana; U. S. Expl. Exped., Crust., i. 562.—In Oceano Atlantico, lat. bor. 30°—35°; vulgaris in *Sargasso*.

390. *LATREUTES DORSALIS*, nov. sp. Elongatus et compressus. Carapax dorso carinatus et dentibus duobus armatus, dente anteriore spiniformi antrorsum porrecto, dente posteriore obtuso fere obsolescente. Rostrum cultriforme carapace non brevius, antennulas et appendices antennarum superans, paulo reflexo; marginibus supra infraque subtiliter partim denticulatis. Margo carapacis anterior prope angulum antero-lateralem dentibus minutis spiniformibus pectinatus. Antennularum pedunculus flagellorum tertiam partem longitudine adequans; flagella aequalia. Antennarum pedunculus eum antennularum non superans; appendix elongato-triangularis, vel lanceolata, valde acuta. Maxillipedes externi apicem pedunculi antennarum attingentes. Pedes breves, et, primis exceptis, graciles. Pedum secundi paris carpi articulus secundus articulus primum tertiumque junctos adequans. Abdomen obtuse-carinatum, dorso undulatum, marginibus infernis inerme; segmento caudali aculeis dorsalibus carente, aculeis extremitatis longis. Color coccineus; dorsum albo univittatum. Long. 0.8 poll.

Hab.—In sinu "Hakodadi" Japoniae; vulgaris in fundo conchoso, prof. 8 org.

RHYNCHOCYCLUS, Stm. (*Cyclorhynchus*, De Haan;—nom. praeoc.) Rostrum grande, orbiculatum, lamellatum. Antennulae flagellis duobus instructae; pedunculo brevi; squama basali orbiculata, sub oculo celata. Maxillipedes externi breves, exognatho flagelloque instructi. Pedes Imi—4ti flagello instructi. Carpus pedum secundorum tri-articulatus.

391. *RHYNCHOCYCLUS PLANIROSTRIS*. *Cyclorhynchus planirostris*, De Haan; Fauna Japonica, Crust., 175, pl. xlv. f. 7.—In sinu "Hakodadi," et prope oras boreales insulae "Nippon;" in fundis sabulosis arenosisque prof. 10—20 org.

*λατρευτής, cultor.

392. *RHYNCHOCYCLUS MUCRONATUS*, nov. sp. Dorsum carapacis spina una solum armatum, mediana, valida et spiniformi. Rostrum ovatum, quam in *C. planirostri* angustius, appendices antennarum paullo superans, extremitate valide mucronatum, margine antico supra infraque sex-denticulatum. Margo anterior carapacis spina sub oculo armatus, et ad basin antennarum spinis minutis octo pectinatus. Abdomen ecarinatum; segmento tertio dorso sat prominente. Color pallide fuscus, albo-maculatus. Pedes subrufi. Long. 1 poll.

Hab.—In freto "Ly-i-moon" prope Hong Kong; f. conchoso p. 25 org.

393. *RHYNCHOCYCLUS COMPRESSUS*, nov. sp. Corpus compressum. Carapax crista valida dorsali instructus bi-dentata, dentibus obtusis, dente anteriore majore et spina minuta antice armato. Rostrum latius (altius) quam longius, appendices antennarum superans, oblique truncatum; margine superiore concavo, laevi; margine supero-anteriore sex-dentato; margine inferiore convexo, arcuato, laevi. Spina infra-ocularis minuta. Margo carapacis ad insertionem antennarum tri-denticulatus. Maxillipedes externi extremitate obtusi et spinis validis corneis septem armati. Pedes toti valde breves. Carpus pedum primi paris obtusus. Abdomen dorso obtusum. Color purpureo-fuscus, dorso paullo ceruleus. Long. 0.75 poll.

Hab.—In portu "Jackson" Australiae; f. algoso p. 2 org.

394. *GNATHOPHYLLUM FASCIOLATUM*, nov. sp. *G. eleganti* valde affinis, colore excepto. Corpus obesum. Carapax dorso obtuse carinatus, carina retrorsum obsoleta et antrorsum rostro continua; rostro brevi, apicem articuli antepenultimi antennularum pedunculi non attingente, superne oblique truncato, paullo concavo et sexdentato, extremitate acuto, carinis lateralibus juxta marginem inferiorem laevem sitis. Oculi grandiores. Segmentum caudale aculeis duobus marginalibus versus extremitatem, et duobus longis ad extremitatem armatum. Corpus album, pellucidum, fasciis linearibus transversis purpureo-fuscis ad 10 ornatum; pedunculis oculorum bi-vittatis; maxillipedibus externis superficie annulis quatuor eidem coloris notatis. Long. 0.8; carapacis lat. 0.23 poll.

Hab.—In portu "Jackson" Australiensi; in fundo limoso prof. sex org.

395. *ATYOIDA BISULCATA*, Randall; Jour. Acad. Nat. Sci. Philad., viii. 140; pl. v. f. 5. Dana; U. S. Expl. Exped. Crust. i. 540, pl. xxxiv. f. 1.—Ad insulam "Hawaii."

396. *ATYOIDA TAHITENSIS*, nov. sp. *A. bisulcatae* valde similis, (an diversa?) sed rostro paullo brevior, latiore et magis depresso; flagello externo antennularum quam internum dimidia brevior; et angulo postero-inferiore segmenti abdominis quinti minus acuto. Long. 1 poll.

Hab.—In aquis dulcibus insulae "Tahiti."

397. *CARDINA GRANDIROSTRIS*, nov. sp. Rostrum carapace vix brevius, appendices antennarum superans, extremitate gracile paullo reflexum; crista dorsali supra oculos fere recta et denticulis minutis ad 20 serrata, denticulo postico supra basin pedunculorum oculorum sito; cristae parte quarta anteriore edentula, denticulo uno mediano et duobus apicalibus exceptis; rostri margine inferiore obscure 8—10-denticulato. Pedum primi paris carpus quam manus multo brevior; secundi paris carpus valde gracilis et manu parce longior. Segmentum caudale lamellis lateralibus quarta parte brevius, dorso paribus sex aculeorum instructum. Long. 1 poll. *C. denticulatae* affinis sed rostro longiore. A *C. longirostri* differt dentibus rostri superne magis numerosis.

Hab.—Ad insulam "Loo Choo."

398. *CARDINA LEUCOSTICTA*, nov. sp. Rostrum circiter carapacis longitudine, pedunculo antennularum longius; margine superiore recto, dentibus tenuibus ad 17+3 armato, apicem versus parce resimo et edentulo; margine inferiore

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10-dentato. Spina antennalis alte posita. Pedes gracillimi; posteriorum merus margine inferiore spinulis longis 2—5 armatus. Color obscure-fuscus, maculis vel stigmis minutis crebris albis notatus. Long. 1 poll. A *C. denticulata* differt rostro recto magis denticulato.

Hab.—In flumine prope urbem "Simoda" Japoniae.

399. *CARIDINA MULTIDENTATA*, nov. sp. Rostrum medium articuli ultimi pedunculi antennularum attingens; crista dorsali lamellato-dilatata, arcuata, supra bases oculorum oriente, et denticulis 20—30 serrata; extremitate robusta, acuta, vix denticulata; margine inferiore 14-denticulato. Margo carapacis anterior spina antennali armatus. Pedes secundi paris pedunculum antennularum superantes; carpo manu longiore; digitis depressis, penicillis densis, latis, fere flabelliformibus. Dactyli pedum posteriorum breves, septimam partem articuli penultimi longitudine non superantes. Segmentum caudale dorso non concavum, paribus quinque aculeorum instructum; lamellae laterales grandes, segmento caudale fere duplo longiores, extremitatibus productis subtriangularibus. Long. 1.5 poll.

Hab.—Ad insulas "Bonin;" in rivulis montanis.

400. *CARIDINA SERRATA*, nov. sp. Rostrum breve, articulum antepenultimum pedunculi antennularum vix superans, elongato-triangulari et ad basin sat latum in plano horizontali, extremitate acutum; crista dorsali sat dilatata, arcuata et dentibus 14 serrata. Pedes secundi paris longi, appendices antennarum superantes; carpo valde gracili; manu robusta, penicillis quam in manibus primis multo longioribus. Long. 0.75 poll.

Hab.—Ad insulam "Hong Kong;" in rivulis.

401. *CARIDINA ACUMINATA*, nov. sp. Thorax sat compressus. Rostrum breve, oculos parce superans, trigonum, ad basin horizontaliter latum, ad extremitatem paulo deflexum; marginibus totis levibus; crista dorsali non dilatata, dorso continua. Antennularum flagella longitudine aequalia. Manuum penicilli parvi, breves. Pedes postici spinulis asperi; tertii et quinti paris quam quarti paris longiores. Color olivaceus, punctatus. Long. 1 poll.

Hab.—Ad insulas "Bonin;" in rivulis montanis.

402. *CARIDINA BREVIROSTRIS*, nov. sp. Corpus gracile. Rostrum brevissimum, oculis brevius, trigonum; margine superiore obtuso, laevi. Margo carapacis ad basin antennarum inermis. Manus primi paris digiti breves, quam palma multo breviores. Pedum posteriorum dactyli robusti, vix curvati; et quartam partem articuli penultimi longitudine aequantes. Long. 0.5 poll. *C. acuminatae* affinis, rostro brevior.

Hab.—Ad insulam "Loo Choo;" in aquis dulcibus.

403. *CARIDINA EXILIROSTRIS*, nov. sp. Rostrum ei *C. typi* fere simile, sed minus;—valde gracile, compressum, angustum, acutum, medium articuli penultimi antennularum pedunculi parce superans; margine superiore laevi, carapace continuo; margine inferiore obsolete 2-3-dentato. Pedes secundi paris longi, valde graciles; manu parva, compressa; carpo manu longiore. Pedum posteriorum dactyli tertiam partem articuli penultimi longitudine aequantes. Long. 1.25 poll.

Hab.—Ad insulam "Loo Choo;" in aquis dulcibus.

404. *ALPHEUS RAPAX*, Fabr.; Suppl. Ent. Syst., 405. De Haan; Fauna Japonica, Crust. 177, pl. xlv. f. 2.—Prope oras Sinenses in lat. bor. 23°; in fundo limoso prof. 6—20 org.

405. *ALPHEUS AVARUS*, Fabr.; Suppl. Ent. Syst., 440 *A. strenuus*, Dana; U. S. Expl. Exped., Crust. i. 543, pl. xxxiv. f. 4.—Ad insulas "Hawaii," "Bonin" et "Ousima;" in portibus "Simoda" et "Hong Kong;" et in freto 1860.]

"Gaspar;" littoralis vel sublittoralis sub lapidibus in sabulo habitans;—interdum in aquis sat profundis.

406. ALPHEUS BIS-INCISUS, De Haan; Fauna Japonica, Crust. pl. xlv. f. 3. *A. avarus*, De Haan; (non Fabr.) l. c. p. 179.—In sinu "Kagosima" Japoniae; in fundo nigro-arenoso ad prof. 20 org.

407. ALPHEUS PACHYCHIRUS, nov. sp. Frons lata, truncata. Carapax inter oculos carinatus, carina postice obsolescente, antice marginem frontalem vix superante; palpebris valde tumidis, sed aequae marginem non superantibus. Antennularum pedunculi articulus penultimus quam antepenultimus paullo longior. Antennae carentes spina basali externa; appendice quam pedunculus multo brevior. Maxillipedes externi sat graciles, articulo ultimo brevi, elongato-ovato, extus depresso et parce concavo, marginibus longe ciliato. Pedum primi paris manus extroversa, digito exteriori. Manus major crassissima, rotundata, laevis, superne et versus digitos pilosa, sinibus nullis; digitis valde brevibus; dactylo dimidiam palmae non aequante, hamato, apice acuto. Manus minor *maris* dimidiam majoris magnitudine adequans, valde robusta, superne pilosa; digitis palmâ non brevioribus; dactylo dilatato, intus concavo et dense pubescente, prope apicem contracto. Manus minor *foeminae* parva, valde gracilis, digitis brevibus, teretibus. Pedum tertii paris merus paullo dilatatus et apice inferiori dente armatus. Dactyli pedum sex posticorum breves. Segmentum caudale medio depressum. Long. 1 poll. *A. frontali*, M. Edw., affinis, sed fronte minus prominente et paullo rostrata; articulo pedunculi antennularum penultimo brevior, etc.

Hab.—Ad insulam "Loo Choo."

408. ALPHEUS STREPTOCHIRUS, nov. sp. Frons inter oculos sat angusta, leviter carinata; rostrum breve, spiniforme; orbita rotundato-convexa, spinula minuta armata. Articulus antennularum pedunculi penultimus antepenultimo sesqui longior. Antennarum spina externa basis obsoleta; pedunculus longitudine appendicis fere aequalis. Maxillipedum externorum articulus ultimus angustus, minuscens, extremitate pilosus. Manus major versus extremitatem extrorsum torta, et constricta vel utrinque excavata; palma superne pilosa, antice spinulis duabus armata, latere externo vel inferiore tri-sulcata, sulco mediano longiore postice deflexo, sulcis exterioribus antice sinibus marginalibus confluentibus; pollex brevissimus; dactylus exterior, brevis, latus, valde curvatus. Manus minor *maris* robusta; digitis compressis non hiantibus, palma paullo brevioribus; dactylo perlato. Pedum tertiorum quartorumque merus compressus, sed non dilatatus, extremitate infra dente armatus. Long. 0.5 poll.

Hab.—Ad insulas "Cape de Verdes;" inter nulliporas ad prof. 20 org.

409. ALPHEUS BREVIPES, nov. sp. Carina frontalis et orbitae antrorsum acutae, apicibus marginem frontalem vix superantibus. Apices orbitarum introrsum curvati. Antennae spina externa non armatae; appendice parva, acuta, quam pedunculus brevior. Maxillipedes externi parvi. Manus major crassissima, inflata, rotundata, laevis, extrorsum torta, antice paullo contracta sed non excavata; dactylus exterior, brevis, obtusus. Manus minor exilis, digitis brevibus, nec hiantibus nec dilatatis. Pedum secundorum articulus carpi secundus primo duplo longior. Pedes tertii quartique breves, compressi; mero lato, inferne unidentato; art. penultimo inferne spinuloso; dactylo gracile, curvato, simplici vel inermi. Pedes quinti quartis multo breviores, valde graciles. Long. 0.5 poll.

Hab.—Ad insulas Hawaiianenses; inter ramos madreporarum.

410. ALPHEUS COLLUMIANUS, nov. sp. Frons inter oculos carinata; rostrum breve, spiniforme: orbita margine spinula armata. Antennularum pedunculus hirsutus; articulo penultimo antepenultimo sesqui longiore. Antenna extus basin spina parva armata; appendice parva, gracili, acuta, pedunculi apicem

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vix attingente. Maxillipedum ext. articulus ultimus gracilis, dense setosus. Manus major ei *A. streptochiri* similis. Manus minor maris compressa, digitis non dilatatis, vix hiantibus, longitudine palmam adaequantibus. Pedes tertii quartique mediocres, compressi, basi spina minuta armati; mero lato, inferne spinuloso et apicem unidentato; articulo penultimo spinulis sex validis inferne armato; dactylo longo valde gracili, minus curvato, versus apicem dente minuto armato. Long. 0.75 poll.

Hab.—Ad insulas “Bonin;” inter corallia viventia ad prof. 1 org.

411. *ALPHEUS NEPTUNUS*, Dana; U. S., Expl. Exped., Crust. i. 553, pl. xxxv. f. 5. Maxillipedes externi elongati, apice spinulosi. Manus majoris palma spina ad basin digitorum armata. Pedum secundorum articulus carpi quartus tertio duplo longior. Pedum posticorum dactyli bi-unguiculati, unguiculo secundo dorsali vel in facie anteriore posito.

Hab.—Prope insulam “Ousima;” in fundo arenoso prof. 30 org. Etiam in portu “Hong Kong.”

412. *ALPHEUS BIUNGUICULATUS*, nov. sp. *A. neptuno* valde affinis, sed dentibus frontibus brevioribus; palma manus majoris spina ad basin dactyli carente; pedibus posticis brevioribus, dactylis biunguiculatis, unguiculo secundo ventrali. Pedum tertii quartique paris merus inferne spinulis non armatus. Long. 0.5 poll.

Hab.—Ad insulas Hawaienses; inter madreporas.

413. *ALPHEUS SPINGER*, nov. sp. *A. neptuno* affinis. Corpus robustum. Dentes frontales validi, acuti; rostrum apicem articuli pedunculi antennularum penultimi fere attingens; spinae orbitales rostro dimidia breviores. Antennae basi spina brevi sed gracile armatae. Antennularum squama basalis acuta, brevis. Maxillipedum externorum articulus ultimus pilosus, apice spinulis gracillimis armatus. Manus major crassissima, rotundata, laevis, nuda; palma inermi; pollice intus bidentato; dactylo compresso, margine superiore acuto. Pedum secundorum carpi articulus primus articulos quatuor sequentes adequans. Pedum trium posticorum merus linearis, inermis, nudus; unguiculus secundus dactyli minutus ventralis, retrorsum curvatus. Long. 1 poll.

Hab.—Ad insulas “Amakirrima” prope “Loo Choo.”

414. *ALPHEUS LAEVIS*, Randall; Jour. Acad. Nat. Sci. Philad., viii. 141. Dana; U. S. Expl. Exped., Crust. i. 556, pl. xxxv. f. 8.—Ad insulam “Hawaii.”

415. *ALPHEUS GRACILIPES*, nov. sp. *A. laevi* frontem affinis. Orbitae antice acutae, potius quam spiniferae. Antennularum squama basalis apex spiniformis, apicem articuli pedunculi antepenultimi attingens; art. penultimus antepenultimo fere duplo longior. Antennae basi spina minuta armatae; appendice pedunculum superante. Maxillipedes externi graciles, articulo ultimo quam penultimus tertia parte modo longior, apice sparsim longe pilosus. Manus major recta, elongata, triplo longior quam latior; margine superiore versus basin dactyli canaliculato, inferiore levi. Manus minor mediocrius, digitis palma parce brevioribus, non hiantibus. Pedum secundorum carpi articulus secundus primo vix brevior, quintus quarto longior. Pedes postici valde graciles, mero angusto inermi; articulo penultimo infra quadri-acuteato; dactylo gracili, longo, unguiculo unico. Long. 0.6 poll.

Hab.—Ad insulam “Tahiti;” inter corallia ad prof. org. una.

Genus *BETAEUS*, Dana; U. S. Expl. Exped., i. 558.—Frons superficie levis ecarinata, margine recta, sinuata, vel dentata. Antennularum squama vel spina basalis longissima. Manus forma similes, et plerumque subaequales. Pedum secundorum carpi articulus primus praelongus.

416. *BETAEUS AUSTRALIS*, nov. sp. Corpus et abdomen gracilia, sub-compress-
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sa, levia. Frons superficie aequalis, margine convexa, levis, interdum media convexa. Antennularum pedunculus robustus, cylindricus, ei antennarum aequalis; squama basali longa, apice spiniformi, articulo penultimo superante. Antennarum appendix pedunculi apicem non attingens; flagellum mediocris longitudinis, parte basali crassum. Maxillipedes ext. apicibus non spinosi. Pedes primi paris elongati, aequales; mero inferne aspero; carpi marginibus anticis dilatatis et 4-5-dentatis, basin manus circumdantibus; manu elongata, levi, punctata, inferne paullo pilosa; digitis gracilibus, longitudinalibus, palmâ brevioribus, hiantibus, intus bidentatis, apicibus decussatis. Pedum secundorum carpi articulus primus tres sequentes conjunctos adaequans. Pedes postici graciles; mero carpoque cylindricis inerimibus apicibus incrassatis; articulo penultimo carpo multo graciliore, subtiliter spinuloso. Segmentum caudale elongatum. Color viridis. Long. 1 poll.

Hab.—Portu Jacksonensi Australiae; sublittoralis inter rupes et algas.

417. *BETAETUS TRISPINOSUS*, nov. sp. Frons rostro longo aciculiformi et dentibus duobus orbitalibus acuminatis rostro dimidia brevioribus armata. Antennulae grandes; pedunculo appendicem antennarum multo superante; articulo pedunculi penultimo ultimo fere duplo longiore et antepenultimo aequali; spina basali medium penultimi attingente. Antennae extus basi inermes; pedunculo apicem appendicis non attingente. Maxillipedum ext. articulus ultimus gracilis, quam penultimus plus duplo longior, apice tenuis, breviter ciliatus. Pedes anticî fere aequales; manu elongata, palma duplo longiore quam altiore, paullo compressa, laevi, margine inferiore integra, margine superiore longitudinaliter profunde canaliculata et prope dactylum sinuata; digitis palma vix dimidia brevioribus, compressis, intus versus basin dentatis; dactylo lunato. Pedum secundorum carpi art. primus dimidiam longitudinis carpi formans, art. secundus tertio parce longior et quinto multo brevior. Pedes postici valde graciles; quattorum quintorumque merus nec dilatatus nec inferne armatus; articulus penultimus apicem inferne aculeo longo armatus; dactylus tertiam partem art. penultimi longitudine aequans. Segmentum caudale elongato-subtriangulare, apice parvo truncato. Long. 0.6 poll.

Hab.—Portu Jacksoniensi; inter spongias e fundo limoso prof. sex org.

ARETE,* nov. gen. *Betaeo* affinis, sed oculis sub carapace non celatis. Carapax sat compressus, dorso elevato, arcuato. Rostrum breve, elongato-triangulatum, superne obtusum. Antennulae bi-flagellatae, squamis basilibus grandibus. Maxillipedes ext. eis *Alpei* fere similes. Pedes primi grandes, aequales, manibus inversis depressis, dactylo exteriori. Pedes secundi breves, carpis quadriarticulatis.

418. *ARETE DORSALIS*, nov. sp. Corpus leve, nitidum. Dorsum obtusum. Rostrum apicem art. penultimi antennularum pedunculi attingens; basi utrinque profunde canaliculatum. Oculi retractiles (?), pedunculis sub carapace semper celatis. Orbita angulo externo spina armata. Antennae breves. Antennularum pedunculi art. ultimus articulos duos praecedentes conjunctos adaequans; squama basali medium art. ultimi attingente. Antennarum appendix brevis, lata, pedunculum vix superans. Pedes primi paris leves; carpo crasso, margine antico basin manus circumdante; manu (digitis inclusis) duplo longiore quam latiore, et carapace dimidia brevior; digitis depressis, non hiantibus, extus laevibus, intus denticulatis, apicibus hamatis; dactylo palma tertia parte brevior. Pedum secundorum carpi art. primus art. sequentes conjunctos adaequans; art. quartus articulos secundum tertiumque. Pedes postici inter se aequales, sat breves, leves, subcylindrici; dactylis bi-ungiculatis. Color obscure-purpureus. Long. 0.5 poll.

Hab.—In freto "Ly-i-moon," prope insulam "Hong Kong;" inter rupes sublittorales.

* Ἀρετη, nom. propr.

419. HIPPOLYTE ACULEATA, M. Edw; Hist. Nat. des Crust. ii. 380. *Cancer aculeatus*, O. Fabr., Fauna Groenl., No. 217. *Hippolyte armata*, Owen, Beechey's Voy. Zool., p. 88, pl. xxvii. f. 2. *H. cornuta*, Owen, l. c., p. 89, pl. xxviii. f. 2.—In freto "Seniavine" et in sinu "Avatska," e fundo limoso prof. 10-15 org. Etiam in Oceano Arctico; prof. 20-30 org.

420. HIPPOLYTE RECTIROSTRIS, nov. sp. Robusta. Carapax cristatus, tertia parte posteriore excepta; margine antico, spina antennali et spina pterygostomiana praedito. Rostrum horizontale, apicem antennularum pedunculi attingens, margine superiore recto, sex-dentato,* dentibus aequalibus et aequidistantibus; tribus posterioribus in carapace sitis; margine inferiore antice paulo dilatato et quadridentato, dentibus minutis. Antennulae appendicem antennarum vix superantes. Maxillipedes externi robusti, appendices antennarum superantes; epignatho, † neque exognatho praediti. Pedes primi graciles, manu elongata, digitis gracilibus palma multo brevioribus. Pedes primi, secundi, tertiique paris epipodo† praediti. Abdominis dorsum leve, ecarinatum, sed segmento tertio paulo acutum. Segmentum caudale quatuor paribus aculeorum dorsalium armatum. Long. 1.5 poll.

Hab.—Portu "Hakodadi" Japoniae borealis; in locis profundis maris.

421. HIPPOLYTE CRISTATA, nov. sp. Carapax tertia parte anteriore carinatus; margine antico spina antennali et spina pterygostomiana armato. Rostrum gracile, fere horizontale, pedunculo antennularum parce brevius; crista superiore sex-dentata, supra oculos arcuata, dentibus duobus posterioribus in carapace, dente posteriore aliis minore et remotiore, dente anteriore etiam minore et ab apice rostri paulo remoto; apice subtus bidentato. Antennulae apicem appendicis antennarum non superantes. Maxillipedes ext. graciles, hunc attingentes apicem, epignatho non vero exognatho instructi. Pedes primi, secundi, tertiique paris epipodo instructi. Pedum secundorum carpus septem-articulatus. Abdomen ecarinatum. Tria aculeorum segmenti caudalis ultimi lateralium paria. Long. 1 poll. Ab *H. palpatore*, *brevirostrique* differt maxillipedibus externis brevioribus; ab *H. picta*, pedibus secundo tertioque epipodo instructis; ab *H. layi* rostro brevior.

Hab.—Portu "San Francisco" Californiae; fundo arenoso prof. 5-10 org.

422. HIPPOLYTE BREVIROSTRIS, Dana, U. S. Expl. Exped., Crust. i. 556, pl. xxxvi. f. 5.—In portu "San Francisco."

423. HIPPOLYTE BOREALIS, Owen; Appendix to Ross' Voyage, p. 24, pl. i. f. 3. Kroyer; Monog. Fremstilling af Hippolyte's Nordiske Arter, p. 122, pl. iii, f. 74-77.—In profundis Oceani Arctici.

424. HIPPOLYTE POLARIS, Owen; App. to Ross' Voy. p. 85. Kroyer; Monog. Fremst. Hippol. p. 116, pl. iii. f. 78-81. *Alpheus polaris*, Sabine.—In profundis sabulosis Oceani Arctici.

425. HIPPOLYTE CAMTSCHATICA, nov. sp. Gracilis. Carapax antice breviter carinatus; margine antico spina antennali et spina pterygostomiana minutissima armato. Rostrum subcultratum, carapace non brevior, apicem appendicis antennarum attingens, superne quinque-dentatum, dentibus subaequalibus et aequidistantibus, dente secundo supra oculorum basin sito; orista inferiore paulo dilatato, quinque-dentato, dentibus primo ultimoque minutis; apice gracillimo, acutissimo. Antennarum appendices grandes. Maxillipedes ext. antennarum pedunculum paulo superantes et medium appendicis attingentes, epignatho non vero exognatho praediti. Pedes longi, epipodo destituti. Abdomen leve, ecarinatum; articulo tertio modice prominente. Segmentum caudale paribus quinque aculeorum dorsalium armatum. Long. 1 poll. Ab *H. sitchaensi* differt rostro magis acuto et inferne magis dentato.

* Margine cristae carapacis dorsalis semper incluso.

† Epignathus et epipodus=flagellum.

426. *HIPPOLYTE PANDALOIDES*, nov. sp. Corpus gracile, fusiforme. Carapax per dimidiam anteriorem carinatus; margine antico spina antennali solum armato. Rostrum gracillimum, fere rectum, horizontale, quam carapax multo longius et appendices antennarum multo superans, superne 10-12 dentatum, dentibus duobus posterioribus in carapace, anterioribus fere obsoletis; crista inferiore decemdentata, dentibus quam superiores majoribus. Appendices antennarum grandes carapace non breviores, antennulas superantes. Maxillipedes externi brevissimi, pedunculum antennarum non superantes, epignatho non vero exognatho instructi. Pedes epipodo destituti; secundi paris carpus septem-articulatus; posticorum merus margine inferiore spinulosus. Abdomen ecarinatum, sed segmento tertio prominens; segmento ultimo paribus sex aculeorum dorsalium armato. Color viridis. Long. 1.75 poll.

Hab.—Sinu "Hakodadi;" inter lapides ad prof. 2 org.

427. *HIPPOLYTE GENICULATA*, nov. sp. Maxillipedes ext. epignatho non vero exognatho instructi; pedes epipodo destituti. *H. pandaloidea* valde affinis, robustior, rostro brevior, quam carapax non longiore, superne quadridentato, inferne septem-dentato, medio paulo dilatato. Abdomen segmento tertio forte geniculatum, valde prominens, compressum, cristatum. Color obscure-purpureus, linea dorsali alba. Long. 2 poll.

Hab.—Cum praecedente.

428. *HIPPOLYTE GRACILIROSTRIS*, nov. sp. Carapax levis, antice brevissime carinatus; margine antico spina pterygostomiana solum armato. Rostrum gracillimum, rectum, paulo deflexum, breve, articulum penultimum pedunculi antennularum non superans, superne sex-dentatum, dentibus aequalibus, duobus posticis in carapace; apice bi-denticulato; margine inferiore denticulis duobus approximatis apice paulo remotis armato. Maxillipedes ext. appendices antennarum parce superantes, exognatho epipodoque praediti. Pedes primi secundi tertii epipodo instructi; tertii quarti quintique paris graciles. Abdomen dorso leve ecarinatum; segmentum ultimum paribus quatuor aculeorum dorsalium praeditum. Long. 0.75 poll.

Hab.—Portu "Hakodadi;" in regione laminariarum.

429. *HIPPOLYTE LEPTOGNATHA*, nov. sp. Carapax per dimidiam anteriorem carinatus et dentatus; margine antico spina antennali et pterygostomiana armato. Rostrum pedunculum antennularum superans, appendicis antennarum apicem vero non attingens, horizontale; crista superiore antrosum integra, retrorsum 4-5-dentata, dentibus posticis tribus vel quatuor in carapace; crista inferiore antice paulo dilatata et dentibus parvulis tribus vel quatuor instructa. Appendices antennarum antennulas adaequantes vel paulo superantes. Maxillipedes ext. exiles, pedunculum antennarum superantes, appendices vero multo breviores, exognatho epignathoque instructi. Pedes lmi 2di 3tiique paris epipodo praediti; 2di paris carpus septem-articulatus, articulo tertio aliis longiore. Abdomen dorso laeve, ecarinatum; segmento tertio sat prominente; segmento ultimo paribus quatuor aculeorum. Pallide rubra, albo variegata. Long. 1 poll.

Hab.—Sinu "Hakodadi;" vulgaris in fundis algoso-arenosis, prof. 2-6 org.

430. *HIPPOLYTE TURGIDA*, Kroyer; Monog. Fremst. Hippol., 100, pl. ii, f. 57-58; pl. iii, f. 59-63.—In Oceano Arctico ad prof. 35 org.; et in freto "Seniavine;" fundo sabuloso, 10-20 org.

431. *HIPPOLYTE OCHOTENSIS*, Brandt.; Sibir. Reise, 120, pl. v, f. 17.—In sinu "Hakodadi."

432. *HIPPOLYTE SPINA*, White; Brit. Mus. Cat. Crust., 1847, p. 76. Bell; Brit. Crust. 284. *H. sowerbei*, Lam'k; Kroyer; Monog. Fremst. Hippol., 90, pl. ii, f. 45-54.—In freto "Seniavine;" (prope fretum Beringianum;) in fundis limosis prof. 10-20 org.

433. *HIPPOLYTE GIBBA*, Kroyer; Monog. Fremst. Hippol. 80, pl. i, f. 30, 31, et pl. ii, f. 32-37.—In freto "Seniavine" et in Oceano Arctico; fundis limosis et arenosis prof. 20-30 org.

434. *HIPPOLYTE PECTINIFERA*, nov. sp. Corpus breve, altum. Carapax lamina dentata antrorsum latescente cristatus; regione orbitali utrinque spinis tribus in serie longitudinali instructa; margine antico infra oculum spinis duabus (antennali et pterygostomiana forti) armato. Rostrum latissimum, suborbiculatum, (ei *Rhynchoeycli* simili,) antennularum pedunculum superans, superne 25-dentatum, dentibus posterioribus majoribus, dente postico ad tertiam partem anteriorem carapacis posito; margine inferiore bidentato, dentibus antrorsum sitis et quam superiores majoribus. Antennularum squamae basales validae acutae ab pedunculo divergentes; flagella brevia subaequalia. Antennae corpore breviores; appendice ovata, antrorsum acuta, rostrum superante. Max. ext. exognatho epignathoque instructi. Pedes toti (secundis exclusis) breves et robusti; primi secundi tertique paris epipodo instructi; dactyli pedum posticorum eis *H. aculeatae* similes. Epimera abdominis segmentis 1-6 dentibus spinisve 4-5 pectinata, spina anteriore vulgo longiore. Segmentum caudale paribus tribus aculeorum dorsalium munitum. Color pallide purpureus, margine carapacis antico et apicibus digitorum albis. Long. 0.75 poll.

Hab.—Sinu "Hakodadi;" f. conchoso org. 8.

435. *HIPPOLYTE FABRICII*, Kroyer; Monog. Fremst. Hippol. p. 69, pl. i, f. 12-20.—In sinu "Avatska."

VIRBIUS,* nov. gen. *Hippolytae* affinis. Dorsum carapacis rostrique ecarinatum. Mandibulae non palpigerae. Maxillipedes externi breves, exognatho non vero epignatho instructi. Pedes epipodo destituti. Pedum primi paris carpus antice excavatus; secundi paris carpus tri-articulatus. *Hippolyte acuminata*, *viridis*, *smaragdina*, *obliquimana*, *exilirostrata*, *varians* et *Prideauxiana* ad hoc genus pertinent.

436. *VIRBIUS AUSTRALIENSIS*, nov. sp. Carapax levis, spina orbitali instructus, spina antennali parvula, pterygostomiana nulla. Rostrum carapace vix brevius, superne laeve, basi horizontaliter latiuscum, apice acutum, margine inferiore cristatum et sexdentatum. Antennulae breves, pedunculo quam rostrum dimidia breviori, flagello interno externo duplo longiore. Antennarum appendices grandes, oblongae, rostrum superantes, intus apicem antrorsum dilatata; pedunculus extus spina armatus ad basin appendicis. Maxillipedes ext. apicem antennarum pedunculi non attingentes; articulo ultimo valde compresso, non duplo longiore quam latiore et quam art. penultimus non longiore. Pedes secundi apicem antennarum pedunculi non attingentes. Pedes postici parvi, articulo penultimo subtus spinulis armato; dactylo intus multi-unguiculato. Abdomen laeve forte geniculatum. Segmentum caudale paribus duobus aculeorum dorsalium munitum. Color viridis. Long. 1.5 poll.

Hab.—In portu Jacksoniensi Australiae; inter algas ad prof. org. 2.

437. *VIRBIUS ACUTUS*, nov. sp. Carapax spina supra-orbitali et antennali armatus; angulo antero-inferiore acuto. Rostrum gracillimum, pedunculum antennularum superans, appendices antennarum vero brevius, superne in medio unidentatum; crista inferiore prope apicem quadridentata. Max. ext. breves, versus basin lati. Pedum secundorum carpi articuli subaequales, ultimus paullo longior. Pedum posticorum dactyli intus breviter spinosi, apice bi-unguiculati. Abdomen ecarinatum geniculatum, segmento tertio acute prominens. Appendices caudales parvi. Segmentum caudale paribus quatuor aculeorum plerumque munitum, tribus approximatis, pari posteriore remoto. Color purpureus, variegatus. Long. 0.5 poll.

Hab.—Ad insulam "Loo Choo;" littoralis in rupibus algalis.

* *Virbius*, *Hippolyti* filius.

438. *VIRBIUS KRAUSSIANUS*, nov. sp. Carapax latiusculus, spina supra-orbitali et antennali armatus; spina pterygostomiana nulla. Rostrum gracile, pedunculum antennularum paulo longius, apicem appendicium antennarum vero non attingens, superne basi bidentatum, apice tridentatam, margine inferiore quadridentatam. Flagella antennularum subaequalia, appendices ant. vix superantia. Max. ext. articulus ultimus penultimo fere duplo longior. Abdomen ecarinatum, forte geniculatum; segmentis caudalis aculeorum paribus duobus. Long. 0.7 poll.

Hab.—In sinu "Simon's Bay," prope Promontorium Bonae Spei.

439. *VIRBIUS ACUMINATUS*. *Hippolyte acuminata*, Dana; U. S. Expl. Exped., Crust., i. 562, pl. xxx, f. 1.—In Oceano Atlantico.

Genus *RHYNCHOCINETES*, M. Edw. Maxillipedes externi exognatho epignathoque instructi; pedes primi, secundi, tertii, quartique paris epipodo praediti.

440. *RHYNCHOCINETES RUGULOSUS*, nov. sp. *R. typo* Chilensi valde affinis, sed superficie carapacis transversim striolata vel rugulosa, rugis quam in *R. typo* magis conspicuis et crassioribus. Rostrum parte anteriore marginis superioris tridentatum, subtus 12-dentatum. Digni pedum primi paris superne nudi. Long. 2 poll.

Hab.—In portu Jacksoniensi Australiae; sublittoralis inter rupes.

*OGYRIS**, nov. gen. Carapax parce cristatus, non rostratus. Oculi longissimi, pedunculos antennarum superantes, pediculis gracillimis. Antennulae bi-flagellatae, pedunculo extus processu spiniformi ad basin praedito. Antennarum appendix parvus, pedunculo multo brevior. Mandibulae graciles, profunde bipartitae, palpo laminato, biarticulato instructae. Maxillipedes secundi non pediformes; externi grandes, longi, exognatho gracili instructi; articulo endognathi ultimo brevi, pilis plumosis longis vestito. Pedes exopodo destituti; primi secundique paris chelati; carpus secundi paris triarticulatus. Pedes 3tii 4ti 5tisque paris inter se dissimiles, non chelati. Abdomen inerme, lamellis caudalibus brevibus, externis angustis.

441. *OGYRIS ORIENTALIS*, nov. sp. Carapax pubescens, crista dorsali laevissima, dentibus 4—5 minutis antrorsum armata. Orbita angulo externo acuta vel spina armata. Oculi carapace non dimidia breviores, pedunculos antennularum superantes, pediculis pubescentibus basi valde incrassatis. Antennulae carapace non longiores, flagellis gracilibus, longitudine aequalibus, externo versus vasin paulo incrassato. Antennae corpore tertia parte breviores, appendice parvo subovali. Maxillipedes externi extremitates antennularum fere attingentes, ad commissuram ultiman geniculati. Pedes sex postici pilosi, tertii quartique paris crassi, tertii breviores, quinti longi filiformes. Abdomen dorso laeve convexum, extremitate segmenti ultimi late rotundata, lamina caudalibus exterioribus incrassatis, extrorsum curvatis, acutis. Long. 1 poll.

Hab.—In mari Sinensi, et in sinu "Kagosima;" in fundis arenosis 5—25 org. prof.

442. *PANDALUS GONIURUS*, nov. sp. Corpus gracile nudum. Rostrum tenue, carapace tertia parte longius, superne 9-dentatum, dentibus sparsis, tribus posterioribus in carapace sitis, duobus posticis minoribus approximatis et ab aliis magis remotis; marginis superioris parte dimidia anteriore edentulo: apice bifurcato vel bidentato, dente superiore minore; margine inferiore 7-dentato. Antennulae rostro non breviores. Antennarum appendices carapacis longitudine. Pedes primi omnino graciles, pedunculum antennarum superantes. Pedum posticorum dactyli longiores. Abdomen segmento tertio geniculatum, plus minusve acute compresso, prominente, vix vero dentato. Long. 2 poll. *P. annulicorni* affinis, rostro longiore, et abdominis segmenti tertii dorso compresso.

* *Ὠγυρίς*, nomen insulae maris Indici.

Hab.—In sinu "Avatska" Kamtschatkae; in fundo limoso prof. 10 org. vul-garis.

443. *PANDALUS PRENSOR*, nov. sp. Gracilis. Rostrum thorace vix brevius, apicem antennarum appendicium non attingens; margine superiore 14-dentato, (dentibus 6 posticis in carapace,) tertia parte versus apicem edentulo; apice tridentato; margine inferiore quinque-dentato.* Antennula, rostro fere duplo longiores. Maxillipedes externi apicem antennarum appendicium fere attingentes, exognatho destituti. Pedes primi omnino graciles. Pedes tertii majores, subprehensiles; articulo penultimo plus minusve dilatato, subcurvato, postice convexo, palma spinulosa, dactylo longo, ad palmam retractili. Pedes quarti quintique paris tertiis minores, dactylis brevibus. Abdomen dorso laeve, rotundatum; segmento penultimo carapace demidia brevior; segmento ultimo quinque aculeorum instructo paribus. Subtranslucidus, pallide coccineo-maculatus. Long. 2 poll.

Hab.—Sinu "Hakodadi;" fundo conchoso, prof. 8 org.

444. *PANDALUS ROBUSTUS*, nov. sp. Corpus breve robustum. Rostrum carapacis

$$\frac{8+11}{7}+3$$
 longitudine, appendices antennarum paullo superans; dentibus $\frac{8+11}{7}+3$ armatum, margine superiore versus apicem edentulum. Antennulae rostro vix longiores. Maxillipedes ext. apicem appendicium ant. attingentes; exognatho destituti. Pedes primi e basi graciles. Pedum tertiorum articulus penultimus rectus, superficie asper; dactylus robustus et quam iste pedum quattorum quintonumque multo longior. Abdomen dorso laeve, rotundatum; segmento sexto perbrevis, longitudine carapacis tertiae partis; segmento caudali dorso pubescente, quinque aculeorum armato paribus. Long. 2 poll.

Hab.—Sinu "Hakodadi," in profundis.

445. *PANDALUS GRACILIS*, nov. sp. Corpus gracile. Rostrum carapace lon-

$$\frac{7+10}{8}+3$$
 gius, appendices antennarum superans, et dentibus $\frac{7+10}{8}+3$ armatum, margi-
 nis superioris tertia parte anteriore edentulum. Antennulae rostro parum longiores. Maxillipedes ext. medium appendicium antennarum vix superantes; exognatho destituti. Pedum tertiorum articulus penultimus gracilis, laevis, sparsim pilosus, margine inferiore sparsim aculeatus; dactylus quam iste quarti quintique paris parum longior. Pedes quarti quintique graciliores, mero sub-
 tus spinuloso. Abdomen dorsi medio prominens, sed rotundatum; segmento sexto carapace plus dimidia brevior; ultimo quinque aculeorum armato paribus. Long. 1.25 poll.

Hab.—Sinu "Hakodadi."

446. *PANDALUS ESCATILIS*, nov. sp. Corpus pubescens coccineo-variegatum. Carapax dimidia anteriore carinatus, margine antico spina antennali, et pterygostomia prope antennae insertionem sita armatus. Rostrum longum gracile, horizontale vel resimum, carapace multo longior, superne regulariter 60-denticulatum, (dente postico ad quintam anteriorem long. carap. sito,) inferne serratum, dentibus quam superiores minoribus. Maxillipedes externi exognatho instructi; endognatho ei *P. annulicornis* simili. Pedes gracillimi; primi paris apicem rostri attingentes, secundi paris eum maxillipedum externorum. Pedes 3tii 4ti 5tique paris rostrum multo superantes; mero subtus spinis sparsis armato; articulo antepenultimo quam merus multo graciliore. Long. 2.5 poll. *P. narwal* affinis, sed differt rostro magis subtiliter et regulariter serrata, et pedibus posticis spinosis. A *P. priste* differt in maxillipedibus externis.

Hab.—Prope insulam Madeirae; in profundis.

* En formula talis dentionis, $\frac{6+8}{5}+3$.

447. *PANDALUS LEPTORHYNCHUS*, nov. sp. Corpus gracillimum. Carapax vix cristatus, spina una dorsali in regione gastrica armatus: margine antico spina supra-orbitali, antennali et pterygostomiana instructo. Rostrum tenuissimum, fere filiforme, carapace non brevius, superne dente unico antrorum porrecto versus basin armatum, subtus dentibus minutis duobus, uno mediano, altero versus apicem acutum sito. Antennularum pedunculus gracillimus, rostro quarta parte brevior; squama basali lata, apice externo spiniformi; flagellum pedunculo non longius. Antennarum appendices rostro non breviores. Pedes exiles; tertii quarti quintique paris prehensiles;—dactylo ad latus posticum art. penultimi retractili. Abdomen forte geniculatum, segmento tertio carina perobtusata armato; segmento sexto praelongo. Subpellucidus, lineis flavis, punctisque nigris ornatus. Long. 1 poll.

Hab.—Portu Jacksoniensi Australiæ; ad littora arenosa et algosa.

448. *PONTONIA MACULATA*, nov. sp. Foeminae corpus sat gracile. Carapax inermis. Rostrum art. penultimum antennularum pedunculi attingens, gracile, superne depressum, subtus acute cristatum, apice truncatum, marginibus edentulis. Oculi grandiores. Antennularum flagellum pedunculo brevius sed appendicem antennarum multo superans. Antennae corpore dimidia breviores, appendice carapace plus dimidia breviores, sed pedunculum antennularum paullo superantes, apice rotundato-obtusæ. Max. externorum art. antepenultimus gracilior. Pedum secundorum manus minor (?) gracilis, digitis intus edentulis; (manus altera deest.) Pedum 3 posticorum dactyli uncinati, intus dente armati. Abdomen spinis nullis ad basin segmenti caudalis armatum. Pellucida, maculis minutis purpureis conspersa. Long. 0.75 poll. A *P. tridacnae* differt forma elongata, rostro graciliore, etc.

Hab.—Ad insulas "Bonin;" in Tridacnis.

449. *CORALLIOCARIS* GRAMINEA*. *Oedipus gramineus*, Dana; U. S. Expl. Exp., Crust. i. 574, pl. xxxvii. f. 3.—Ad insulam "Hong Kong;" in madreporis.

450. *CORALLIOCARIS SUPERBA*. *Oedipus superbus*, Dana; U. S. Expl. Exped., Crust. i. 573, pl. xxxvii. f. 2.—Ad insulam "Tahiti;" in corallis.

451. *CORALLIOCARIS LAMELLIROSTRIS*, nov. sp. Corpus depressum. Rostrum longum, pedunculum antennularum superans sed apicem appendicis antennarum non attingens, basi angustum; crista superiore dilatata, sexdentata, dente postico supra oculos sito; apice acuminato; margine inferiore apicem versus etiam dilatato, 4-5-denticulato. Antennulae appendices antennarum non superantes. Antennae corpore dimidia longiores. Max. externi planati sed sat angusti. Pedes primi apicem appendicium ant. attingentes, manibus vix hirsutis. Pedes secundi inaequales, manu majore (foeminae) valde gracili, digitis parvis, palma dimidia brevioribus, dactylo distorto non dilatato. Pedum posticorum dactyli eis *C. macrophthalmae* similes, vix setosi. Abdomen segmento tertio prominens. Color viridis; carapax longitudinaliter, abdomenque transverse rubro-fasciata. Long. 0.75 poll.

Hab.—Ad insulam "Loo Choo;" inter corallia ad prof. 2. org.

452. *HARPILIUS DEPRESSUS*, nov. sp. Corpus late depressum. Carapax spina hepatica armatus. Oculi grandes, et, lateraliter porrecti, margines carapacis multo superantes. Rostrum longum, apicem antennarum appendicium fere attingens, crista inferiore parce dilatata, septem-dentata, dente postico parum post oculos sito; crista inferiore versus apicem valde dilatata, quadridentata, dentibus validis. Antennulae breviores, appendicem antennarum apicem superantes. Antennae corpore non longiores. Maxillipedes externi valde graciles, articulis ultimo penultimoque conjunctis antepenultimo adequanti-

* Etym. *καράλλιον*, corallium; *κρίεις*, squilla. Nomen *Oedipus* Danae praecipatur.

bus, hoc in foeminis quam in maribus multo latiore. Pedes secundi grandes. laeves; ischii, meri, carpique apicibus dentibus spiniformibus armatis; manu carapace duplo longiore, digitis palma dimidia brevioribus, intus forte 2-3-dentatis. Pedes postici robusti, dactylis curvatis apice fere obtusis. Abdomen gracile; segmento ultimo acuto, pari unico aculeorum dorsalium instructo. Long. 0.7 poll.

Hab.—Ad insulam "Hawaii;" inter madreporas.

453. *ANCHISTIA DANAE*, nov. sp. Corpus breve robustum. Carapax sat latus, spina hepatica armatus; margine antico spina supra-orbitali et antennali instructo. Rostrum parce dilatatum, pedunculum antennularum non attingens, dentibus superne septem, subtus tribus armatum. Oculi grandes, lateraliter margines carapacis multo superantes. Antennulae appendices antennarum superantes; flagello robusto quam flagellum tenue longiore, extremitate bifido. Appendices ant. apice sat latae. Mandibularum processus molaris ramus superior apice trifidus, ramus alter 5-6-dentatus, dentibus aliquibus scalpriformibus. Pedes primi carpum secundorum superantes. Pedes postici gracillimi. Segmentum caudale apice aculeis duobus longis instructum. Long., 0.5 poll.

Hab.—Ins. "Tahiti;" in corralis.

454. *ANCHISTIA BRACHIATA*, nov. sp. Carapax spina hepatica et antennali armatus; spina supra-orbitali nulla. Rostrum gracile, paullo resimul, appendices antennarum non superantes, superne dentibus 5+ armatum, dente secundo supra oculos sito, subtus dentibus 2+ (apice in sp. nostro fracto). Oculi grandes. Antennarum appendices longae, angustae, extrorsum curvantes, carapace longiores. Pedes secundi inaequales; carpus sinistri appendices ant. superans; carpo meroque basi angustatis, versus apicem incrassatis; mero apice inferiore uni-spinoso; carpo apicem superne bi-spinosa subtus uni-spinosa; manu incrassata quam carpus plus duplo longiore; digitis quam palma non dimidia parte brevioribus, paullo contortis, intus singulo dentibus duobus parvis acutisque armatis; dactylo margine superiore extus dilatato. Pes secundi paris dexter minor, digitis longioribus compressis nec distortis nec dentatis. Abdominis segmentum penultimum breve. Long. 0.8 poll.

Hab.—Portu "Lloyd" ad insulas "Bonin."

455. *ANCHISTIA GRANDIS*, nov. sp. *A. ensifronti* affinis, major. Rostrum angustum et appendices ant. non superans, margine superiore basi non concavo, septem-dentato, dente postico aliis paullo remoto, dente antico juxta apicem sito. Antennularum pedunculi art. penultimus inferne extusque paullo dilatatus. Appendices antennarum carapace non breviores, angustae, minuens sed apice truncatae. Pedes secundi paris corpore longiores; mero apicem append. ant. attingente, subtus spina armato; carpo ad apicem intus uni-spinoso; manu robusta, carpo fere triplo longiore; digitis palma dimidia brevioribus, medio hiantibus. Pedes quarti apicem appendicium antennarum attingentes. Long. 1.2 poll.

Hab.—Ad insulam "Ousima."

UROCARIS,* nov. gen. Corpus gracile, compressum; abdomen longum, segmento penultimo praecipue elongato. Rostrum superne cristatum, dentatum, subtus rectum edentulum. Oculorum pedunculi longiores. Antennulae eis *Palaemonis* similes. Mandibulae non palpigerae. Maxillipedes externi pedesque cum genere *Palaemone* conveniunt.—Typus *U. longicaudata* in littoribus Carolinensibus habitans, rostro brevi, crista superiore supra oculos valde dilatata, arcuata, octodentata; dactylis pedum posteriorum biunguiculatis; abdomine quinquies longiore quam carapax, segmento tertio valde tumido, segmento penultimo gracile carapace non brevior.

456. *UROCARIS LONGIPES*, nov. sp. Carapax spina hepatica et antennali armatus. Rostrum gracile, rectum, minuens, appendicium antennarum apicem non attingens, crista superiore minus dilatata, septem-dentata, dente postico

*Etym. *ὀυρά*, cauda; *καρπός*, squilla.

aliis paulo remotiore, denticulo minuto inter dentes sextum et septimum atque uno inter dentem septimum et apicem; margine inferiore integro non ciliato. Antennularum flagellum crassum breve, tertia parte extrema a flagello tenui separatum, hoc corpore non dimidia brevior; flagellum internum externo tenui brevius. Antennarum appendices mediocres. Pes secundi paris sinister longissimus, inermis; ischii apice apicem appendicium ant. fere attingente; mero carpo longiore; manu cylindrica merum carpumque conjunctos adequante, digitis brevibus, palmae long. quartam partem vix aequantibus. Pedes postici gracillimi, dactylis simplicibus. Abdominis segmentum penultimum minus elongatum. Pellucida, lineis duabus coccineis ornata, torporis facie inferiore etiam coccinea, manu majore pallide rubra. Long. corporis, 0.65; pedis grandis, 0.7 poll.

Hab.—Prope insulam "Ousima;" fundo arenoso, prof. 20 org.

457. *PALAEMONELLA TENCIPES*, Dana; U. S. Expl. Exped., Crust., i. 582; pl. xxxviii, f. 3.—Ad insulam "Ousima;" inter algas reticulatas in sinibus arenosis minus profundis.

Genus LEANDER, Desmarest, Ann. Soc. Entom. de France, vii. 87. Carapax spina antennali et spina branchios-tegiana armatus; spina hepatica nulla. Species plerumque maricolae. Typus *Palaemon natator*, M. Edw.

458. LEANDER NATATOR. *Palaemon natator*, M. Edw.; Hist. Nat. des Crust. ii. 393. Dana; loc. cit., i. 588; pl. xxxviii, f. 11.—In Oceano Atlantico, lat. bor. 30°—35°, etc.; vulgaris in Sargasso.

459. LEANDER DEBILIS. *Palaemon debilis*, Dana; U. S. Expl. Exped., Crust., i. 585; pl. xxxviii, f. 6, 7.—Ad insulas Hawainenses et ad "Loo Choo;" in littoribus arenosis.

460. LEANDER LONGICARPUS, nov. sp. Rostrum longum, carapace paulo longius et appendices ant. multo superans, gracile, reflexum, superne, ad basin convexum et quinquedentatum, (dente secundo supra oculos sito,) dimidia versus apicem edentulum; crista inferiore paulo dilatata et 4-vel 5-dentata. Antennularum flagella duo externa parce conjuncta. Max. ext. gracillimi, in adultis pedunculum antennarum superantes. Pedes tenues; primi paris apicem appendicium ant. non attingentes; secundi paris hunc superantes apicem sed carpo longo cum non attingente, manu debili, carpo dimidia brevior. Pedes postici nudi. Segmentum abdominis penultimum lamellarum lateralium fere longitudine. Long. 1.5 poll. *P. debili* affinis, sed dentibus rostri inferioribus paucioribus et pedibus secundi paris longioribus.

Hab.—Portu "Hong Kong" Sinensi.

461. LEANDER PAUCIDENS. *Palaemon paucidens*, De Haan; Fauna Japonica, Crust., 170, pl. xlv, f. 11. Rostrum in sp. nostris superne 5-6 dentatum, prope apicem non edentulum.

Hab.—Prope urbem Japonicam "Simoda;" in aquis dulcibus fluvii, mari non remotis.

462. LEANDER PACIFICUS, nov. sp. Corpus robustum. Rostrum carapace non brevius, antennarum appendices superans; crista superiore dentata, (dente tertio vel quarto supra oculos sito,) versus apicem edentula; apice tridentato; crista inferiore dilatata, 4-vel 5-dentata, dentibus fortibus, dente anteriore apice remoto. Antennularum flagella duo externa parce conjuncta, flagello extremo crasso, pedunculo paulo longiore et margine interno valide serrato. Maxillipedes ext. minutiscentes, antennarum pedunculum parce superantes. Pedes primi paris apicem antennularum appendicium attingentes; secundi paris sat robusti, hunc superantes apicem, manu paulo incrassata, digitis palma brevioribus; pedes postici robustiores, fere nudi et inermes, quinti paris antennarum pedunculum parum superantes. Color pallide viridescens, corpore rubro-vel olivaceo-lineato. Long. 2.5 poll.

Hab.—In Oceano Pacifico vulgaris, littoralis in rupium fassis;—ad insulas "Hong Kong" et "Hawaii," etiam in portu "Simoda."

[Jan.

463. *LEANDER SERRIFER*, nov. sp. Rostrum appendices antennarum non superans, crista superiore fere recta, novem-dentata, dentibus posterioribus 1 et 2 inter se et ab aliis paullo remotioribus, dente tertio vel quarto supra oculos sito, dente anteriore ab apice paullo remoto, (dentium duorum spatio); apice acuto superne bi-denticulato; crista inferiore dilatata, maxime tridentata. Antennularum flagella duo externa parce conjuncta. Pedes primi paris apicem appendicium ant. attingentes, ischio meroque quam carpus robustioribus; secundi paris longi, sat robusti, carpo appendicium ant. apicem attingente, et quam manus non brevioribus, manu elongata, quater longiore quam latiore, digitis palma tertiæ parte brevioribus. Pedes postici mediocres. Segmentum abdominis penultimum lamellis exterioribus multo brevius. Long., 1.75 poll.

Hab.—Portu "Hong Kong," et sinibus insulae "Ousima;" littoralis.

464. *LEANDER INTERMEDIUS*, nov. sp. Spina branchiostegiana longa, acutissima, retrorsum sita, margine paullo remota, ut facile pro hepatica haberetur. Rostrum tenue, appendices ant. superans, reflexum, superne septem-dentatum, (dente tertio supra oculos,) subtus quadridentatum; apice bifido vel bidentato. Oculi grandes. Antennulae corpore non breviores; flagellis duobus externis per dimidiam longitudinis flagelli crassi conjunctis. Maxillipedes externi pedunculum antennarum parce superantes. Pedes secundi paris appendices ant. parum superantes; manu paullo incrassata carpo vix longiore, digitis palmae longitudine. Pedes postici mediocres, aculeis sparsim armati; dactylis longioribus. Pellucidus, flavo-lineatus, et interdum sparsim nigro-punctatis. Long., 1 poll.

Hab.—In portu Jacksoniensi Australiae; fundis algo-so-arenosis prof: 2 org.

Genus *PALAEON*, Fabr. Carapax spina hepatica armatus. Species omnes fluvicolae.

465. *PALAEON ASPER*, nov. sp. Descr. maris adulti. Carapax spinulis vel granulis acutis corneis plus minusve exasperatus. Rostrum apicem appendicium antennarum fere attingens; crista dorsali dilatata, recta vel parce convexa, 12- vel 14-dentata, dente posteriore paullo remotiore, dente quarto supra oculos sito; crista inferiore 3- vel 4-dentata. Pedes secundi paris corpore non breviores, cylindrici, instar carapacis exasperati, interdum breviter pubescentes; mero apicem antennarum appendicium superante; carpo palma manus parce longiore; digitis palma tertia parte brevioribus, non hiantibus, interdum dense hirsutis, intus prope basin dentibus 1-2 armatis; pollice intus lobo marginis crenulato ad basin praedito. Pedes postici sat longi, extremitates versus graciles, minuscentes; dactylis tertiam partem long. penultimi adaequantibus. Pedes ultimi paris appendices ant. superantes. Segmentum abdominis ultimum apice leviter tridentatum, dente mediano prominentiore, utrinque aculeis duobus margine instructo, aculeo interno longiore. Color olivaceus vel glaucus, viridescens. Long. corporis 5 poll. Juniores laeves, glabri, subpellucidi. A *P. lanceifronti* differt crista rostri superiore minus expansa; *P. ornato*, rostro magis dentato, etc.

Hab.—In fluvii et rivulis Sinenses prope urbem "Canton."

466. *PALAEON BONINENSIS*, nov. sp. Carapax laevis. Rostrum appendicibus ant. brevius, crista superiore supra oculos plus minusve convexa, versus apicem parce concava, dentibus 11 ad 13 armata aequalibus et aequidistantibus, dente sexto supra oculos sito; crista inferiore tridentata. Antennularum flagellum internum breve, externo dimidia fere brevius. Pedes robusti; secundi paris subcylindrici, granulati sed quam in multis speciebus leviores; carpo manu plus dimidia brevioribus; digitis palma tertia parte brevioribus, granulatis, non pubescentibus, sparsim pilosis, intus basi 2- vel 3-dentatis, dentibus interdum fere obsolete. Pedes postici breves crassi, subtiliter et breviter spinulosi; dactylis robustis brevioribus. Pedes quinti paris mediam appendicium ant. attingentes. Color obscure viridis; pedum ambulatoriorum apices flavi. Long. corporis 4; pedum secundorum 3 poll.

Hab.—Insulis "Bonin;" in rivulis montanis.

1860.]

467. *THALASSOCARIS** LUCIDA. *Regulus lucidus*, Dana; U. S. Expl. Exped., *Crust.*, i. 598; pl. xxxix., f. 5.—In Oceano Pacifico; lat. bor. 27½°, long., orient. 138¼°.

CAULURUS, † nov. gen. Carapax latiusculus, dorso sutura cervicali notatus. Rostrum breve. Oculi grandes. Antennularum pedunculus longus, gracilis, squama basali nulla. Antennarum appendix fere linearis, basi angusta, apice truncata. Maxillipedes secundi paris non pediformes, tertii paris pediformes, robusti, cylindrici, exognatho praediti. Pedes exopodo instructi; primi secundique paris chelati; secundi graciliores longi; reliqui simplices. Abdomen dorso inerme; segmento sexto praelongo, gracillimo. *Oplophoro* differt abdomine et appendice antennarum inermibus, segmento penultimo praelongo, etc.

468. *CAULURUS PELAGICUS*, nov. sp. Rostrum spiniforme vel dentiforme, oculis plus dimidia brevius. Regio gastrica dente mediano erecto prope basin rostri armata. Margo carapacis anterior dente praeorbitali, spina antennali parvula et spina pterygostomiana armatus. Antennularum pedunculus carapace non brevior, articulo antepenultimo articulos penultimum et ultimum junctos superante. Antennarum pedunculus longissimus filiformis, ei antennularum multo gracilior; appendix carapacis longitudine et sexies longior quam latior, apice quam basis latiore, rotundato-truncato, extus spina brevi armato; margine appendicis interno sparsim fimbriato paribus 15 setarum plumosarum gracilibus. Pedes secundi gracillimi prope manum constricti. Manus primi secundique paris breves. Abdominis segmentum sextum quatuor praecedentes junctos fere superans, gracillimum, subcylindricum; lamellae caudales segmento sexto tertia parte breviores. Translucidus, visceribus coccineis. Long. 0.25 poll.

Hab.—In Oceano Pacifico, lat. bor., 34°, long. orient. 126°; nocte repertus.

LEPTOCHELA, ‡ nov. gen. Carapax laevis, vix cristatus, latere margineque spinis destitutus. Rostrum brevissimum, spiniforme. Antennulae bi-flagellatae. Mandibulae inflexae, late compressae, palpo brevi, ovato, uni-articulato praeditae. Maxillipedes secundi non pediformes endognathi art. ultimo spinis longis armato. Maxillipedes tertii exognatho instructi. Pedes toti exopodo instructi; primi secundique paris compressi, chelati, manu gracili, digitis longis parallelis. Pedes postici breves. Abdomen segmenti antepenultimi angulo dorsali postico plus minusve geniculatum vel abruptum; appendicibus ventralibus primi paris birameis. *Pasiphaeae* affinis, mandibulis vero palpigeris, maxillipedibus secundis non pediformibus.

469. *LEPTOCHELA GRACILIS*, nov. sp. Corpus compressum. Carapax glaber, antrorsum acute carinatum, carina laevi. Rostrum acutum, oculis brevius. Oculi breves, grandiores, globosi. Antennulae oblique compressae, corpore dimidia breviores, flagello superiore longiore. Antennae vix antennulis longiores, appendice minore acuto-triangulari, gracili, sed pedunculos antennularum aliquantum superante. Mandibularum corona margine interno dentata, medio profunde fissa. Maxillipedes ext. graciles, apicem appendicium ant. attingentes, exognatho endognathi art. antepenultimum superante. Pedum exopodi longiores, primi secundique paris apicem ischii attingentes, posticorum medium meri. Pedes primi secundique paris appendices ant. superantes; carpo palma manus brevior, manu ad basin digitorum constricta, digitis palma longioribus. Pedes postici compressi, minuscentes, plus minusve lateraliter porrecti, quam secundi paris plus dimidia breviores; ischio brevissimo, subtus spina armato; dactylo hirsuto, apice rotundato inermi. Abdomen compressum antrorsum ecarinatum, segmento antepenultimo acute carinato,

* *Etym.* *θάλασσα* mare; *καρίς*, squilla. *Regulus* nomen Danae praeoccupatum.

† *Etym.* *καυλός*, caulis, *ὄψα* cauda.

‡ *Etym.* *λεπτός*, tener; *χέλη*, chela.

angulo superiore postico spina armato; segmento ultimo canaliculato, apice aculeis duobus longis armato, aliis brevioribus interjacentibus. Lamella caudalis interna superne canaliculata, externa margine exteriori spinulis armata. Long. 1 poll.

Hab.—Sinu "Kagosima;" in profundis.

470. *LEPTOCHELA ROBUSTA*, nov. sp. Corpus robustum minus compressum. Carapax ecarinatus, rostro gracillimo, oculis brevius. Antennulae carapace vix longiores, pedunculo robusto. Antennarum appendix latior, sed acute triangulata. Mandibularum corona margine interno non fissa. Pedes latiores. Abdomen segmento antepenultimo nec carinatum nec spina armatum. Praecedenti affinis, sed omnino multo robustior. Long. 1 poll.

Hab.—Mari Sinensi, prof. 20 org. Prope insulam "Loo Choo" quoque.

471. *SICYONIA CRISTATA*, De Haan; Fauna Japonica, Crust., 194; pl. xlv. f. 10.—In sinu "Kagosima;" fundo conchoso et arenoso, prof. 20 org.

472. *SICYONIA PARVULA*, De Haan; l. c. 195; pl. xlv. f. 6.—In sinu "Kagosima."

473. *SICYONIA OCELLATA*, nov. sp. Carapax tomentosus. Crista carapacis rostrique convexa, septem-dentata, dentibus antrorsum magnitudine decrescentibus. Rostrum angustum, parce deflexum, articulum antennularum pedunculi penultimum non superans, apice tridenticulatum, margine inferiore integrum. Antennarum flagellum depressum utroque margine ciliatum. Pedes graciles; digitis primi secundi tertique paris palmis longitudine subaequalibus. Abdomen profunde insculptum, porcis transversis, rugatis; segmentorum epimeris triangularibus, inermibus; segmento ultimo basi lato, depresso, extremitatem versus, in medio profunde canaliculato, apice aculeis tribus instructo, mediano longiore. Color griseus, purpureo-varegiatus; carapax utrinque oculo nigro albo-marginato ornatus, in latere retrorsum sito; abdomen lateribus albo-maculatum. Long. 1.25 poll.

Hab.—Portu "Hong Kong;" in fundo conchoso prof. 8 org. vulgaris. In mari Sinensi quoque, lat. bor. 24°; ad prof. 20 org.

474. *PENAEUS STENODACTYLUS*, nov. sp. Descr. foeminae. Corpus compressum, nudum. Carapax elongatus, carinatus, (quarta parte posteriore excepta,) laevis, nisi dorso subtiliter granulato; spina hepatica distincta, sulcis proximis brevibus et tenuibus; spina antennali minuta, carina et sulco antennali obsoletis; margine antico alibi inermi. Rostrum rectum vel parum resinuum, oculis vix longius; crista superiore 8-dentata, dente postico aliis remoto et paulo ante medium carapacis sito, dente quarto supra oculos; margine inferiore edentulo. Oculi crassi, articulum antepenultimum antennularum pedunculi non superantes, articulo basali (basiophthalmite) spina brevi ad angulum superiorem armato. Antennarum appendices longae. Maxillipedes ext. graciles, appendices antennarum superantes. Pedes compressi; digitis primi, secundi tertique paris longis. Pedes quarti late compressi, hirsuti, antrorsum porrecti oculos non superantes; quarti paris gracillimi longissimi, appendices ant. multo superantes, nudi, extremitates versus styliformes, dactylo recto, dimidiam partem carapacis longitudine fere adaequante. Abdominis segmenta quartum quintum sextumque carinata; segmenti penultimi appendix interna cultrata, quam externa multo augustior. Pallide carneus. Long. 1.5 poll.

Hab.—Portu "Hong Kong;" fundo limoso prof. sex org.

475. *PENAEUS PODOPHTHALMUS*, nov. sp. Descr. foeminae. Corpus elongatum, compressum, superficie ut videtur glabrum, subtiliter vero punctatum. Carapax elongatus, leviusculus, cristatus, (tertia parte posteriore excepta,) spina hepatica minuta, sulcis proximis distinctis sed brevibus; spina antennali brevi, sulco antennali obsoleto; spina orbitali nulla. Rostrum breve, oculis dimidia brevius; crista dorsali septemdentata, dente postico aliis remoto et ad tertiam 1860.]

anteriorum carapacis sito, dente quarto supra orbitam sito; marginibus dentium subtiliter serrulatis; margine rostri inferiore edentulo. Oculorum pedunculi valde elongati sed carapace plus dimidia breviores, articulis *basi et coxa* parvis, *podophtalmito* longo gracili ad basin turgido. Antennulae praelongae, carapace multo longiores; pedunculo carapace tertia parte brevior, articulo antepenultimo ad podophtalmiti basin recipiendum superne excavato, processu laminiformi interno minimo; flagellis aequalibus. Antennarum appendices antennularum pedunculo breviores. Mandibularum palpi pergrandes. Maxillipedum externorum exognathus non multiarticulatus. Pedes breves compressi; digitis manuum longis. Abdomen compressum. Pallide carneus. Long. 1.3 poll.

Hab.—Portu "Hong Kōng;" fundo limoso prof. sex. org.

476. *PENAEUS CANALICULATUS*, Oliv.; Encyc. Meth. 660. M. Edw.; Hist. Nat. des Crust. ii., 414. (Vix De Haan.)—In portu Sinensi "Hong Kong," et ad insulam "Loo Choo."

477. *PENAEUS SEMISULCATUS*, De Haan; Fauna Jap., Crust., 191, pl. xlvi, f. 1.—Ad oras Sinenses prope insulam "Hong Kong."

478. *PENAEUS MONODON*, Fabr.; Suppl., 408. M. Edw.; Hist. Nat. des Crust., ii. 416.—Prope oras Sinenses, lat. bor. 23°.

479. *PENAEUS MONOCERUS*, Fabr.; Suppl., p. 409. M. Edw.; Hist. Nat. des Crust., ii. 415. De Haan; l. c., 192; pl. xlvi. f. 2.—Ad oras insularum "Hong Kong" et "Loo Choo."

480. *PENAEUS CURVIROSTRIS*, nov. sp. Descr. foeminae. Corpus superficiei granulis minutis acutisque asperum. Carapax fere ad extr. posticam obtuse carinatus non vero canaliculatus; sulco cervicali antice distincto, profundo, prope marginem anticum oriente, retrorsum attenuato sulco cardiaco-branchiali continuo, hoc latiusculo, paullo conspicuo, porca laevi definito; spina hepatica valida extrorsum prominente; sulco gastro-hepatico laevi; spina antennali longa, acuta; carina antennali fere acuta, sulco laevi, postice tomentoso; sulco gastro-frontali ei *P. monoceri* simile, minus profundo; spina orbitali minuta, distincta vero et acuta. Rostrum articulum ultimum antennularum pedunculi attingens, curvato-resimum, apice gracile truncatum vel subbifurcatum; crista superiore octo-dentata, dente postico aliis spatiis duobus remoto, dente tertio supra orbitas sito; margine inferiore edentulo ciliato. Rostrum carinae laterales acutae, in carapace obsolescentes: sulci laterales vero leves, fere obsoleti. Antennularum processus basalis internus gracilis, minuscens, non spatulatus; flagella pedunculo paullo breviora. Maxillipedes externi extus nudi. Pedes tertii paris basi secundis non angustiores, spina destituti. Pedes ultimi graciles, oculis attingentes. Sternum inter bases pedum quatorum quintonumque plus minusve scutatum, inaequale, medio profunde excavatum; antrorsum obtuse triangulatum, margine dilatato laminiformi, arcuato, paullo prominente; unciis lateralibus nullis. Abdomen segmentis 3tio—6to carinatum, breviter quoque in secundo; cauda ei *P. monoceri* fere simili. Long. 3.5 poll. *P. velutino* affinis, rostro curvato, carina antennali acuta etiam differt.

Hab.—Portu "Simoda" Japoniae.

481. *PENAEUS VELUTINUS*, Dana; U. S. Expl. Exped., Crust., i. 604; pl. xl. f. 4.—In mari et ad insulas Sinenses, in sinibus insulae "Ousima," et in portibus "Kragosima" "Simoda" et "Hakodadi" Japoniae; vulgaris in fundis arenosis prof. 5-30 org.

MICROPROSTHEMA,* nov. gen. Corpus depressum, obesum, superficiei varie sculptum vel spinulis ornatum. Carapax minus induratus, dorso sulco cervicali valido notatus. Rostrum mediocre, gracile, elongato-triangulatum, non

**Etym.* μικρος, parvus; πρόσθεμα, appendix.

laminiforme, dorso spinis armatum. Oculi parvi. Antennularum pedunculus brevissimus, ad basin processu unciformi extus praeditus, lamella interna nulla; flagella duo, longa, cylindrica. Antennae in plano antennularum sitae; pedunculo etiam brevissimo, ad basin processu laminato cochleariformi intus instructo, appendice minima, cultrata vel sublnata, pedunculo extus adjuncta sed introrsum porrecta, margine interno longe ciliata; flagello mediocris longitudinis. Mandibulae per-robustae, processu antico obtuso, edentulo; processu interno globato laevi; palpo ei *Stenopi* simili. Maxillipedes externi breves, sublaminati, extus spinis armati; exognatho longo. Pedes exopodo brevi instructi; primi secundique paris gracillimi, manu minuta instructi; tertii paris grandes, manu maxima, lata, cristata; quarti quintique paris longi, neque annulati, dactylo minuto, biunguiculato. Abdomen foeminae latum, appendicibus ventralibus longis gracilibus, introrsum porrectis, primi paris uniramis.

482. *MICROPROSTHEMA VALIDA*, nov. sp. Descr. foeminae. Corpus crassum, non altius quam latius. Carapax omnino spinulosus, spinis inaequalibus, in dorso et regione hepatica majoribus, in lateribus fere longitudinaliter seriatis; margine antico circa basin antennae spinis tribus armato. Rostrum parvum, antennarum pedunculi longitudine; crista dorsali rostro duplo longiore, septem-spinosa; cristis lateralibus in carapace rostro divergentibus et 3-4-spinosis. Oculi parvi, corneis pedunculis angustioribus. Antennulae corpore quarta parte breviores; antennae eo non breviores. Antennarum appendix tertiam partem carapacis longitudine adaequans; pedunculus appendice paullo brevior. Maxillipedes externi apicem appendicium ant. attingentes; ischio dilatato apice externo unispinoso; mero extus bispinoso. Pedes tertii grandes, mero carpo aequali et quam ischium duplo longiore, et, simili carpo, trigono, acute granuloso, marginibus spinuloso; manu carapace non brevior, duplo longiore quam latiore, superne cristata, crista inermi; digitis valde compressis non hiantibus; pollice intus bidentato, dactylo unidentato, dentibus magnis. Abdomen carapace tertia parte longius, medio (seg. tertio) breviter carinatum; segmentis 1mo—3tio transversim costatis, et in latere tuberculo spiniformi armatis; epimeris segmentorum 1mi—5ti acute prominentibus et carinatis; segmentis sexto ultimoque planatis horizontalibus; ultimo lato tenui, partimbicarinato, apice rotundato, margine laterali unispinoso. Obscure fusca; unicolor. Long. 0.65; thoracis lat. 0.24 poll.

Hab.—In sinu insulae "Ousima;" sublittoralis, in locis lapillosis algosisque.

Genus *SERGESTES*, M. Edw. Carapax dorso sutura v. sulco cervicali distincte notatus et regione branchiali longitudinaliter bicostatus.

483. *SERGESTES PACIFICUS*, nov. sp. Carapax minus elongatus, rostro brevissimo conico resimo, et spina vel dente praeorbitali armatus; spina hepatica quam in *S. Frisii* magis posterior. Oculi breves, articulo antennularum basali plus tertia parte breviores. Antennularum pedunculi carapace parce breviores; articulo ultimo quam penultimus multo longiore. Pedes eis *S. atlantici* fere similes, eis *S. Frisii* multo majores; primi paris quam maxillipedes externi et eis secundi paris breviores; quarti paris eis tertii tertia parte breviores; quinti dimidiam quartorum fere adequantes; dactylis quasi articulatis longe setosis. Abdominis segmentum penultimum, quartum quintumque junctos longitudine fere aequans; lamella caudalis exterior margine externo dente minuto infra medium armata. Long. 1.25 poll.

Hab.—Oceano Pacifico, lat. bor. 27½°, long. orient. 138°.

484. *SERGESTES VIGILAX*, nov. sp. *Foeminae* corpus gracile. Carapax elongatus, gracilis, sulcis costisque distinctis; spina hepatica prope tertiam anteriorem sita minuta, extrorsum porrecta. Rostrum minutum, compressum, subtriangulatum, resimum, dorso convexum. Oculi praelongi, dimidiam fere carapacis longitudine, articulo pedunculi antennularum penultimum superantis, subfungiformes, corneis globosis, pediculis gracillimis. Antennularum
1860.]

pedunculi articulus basalis minor, ultimo brevior. Antennarum appendix ei *S. oculati* similis, extremitatem versus angustata, oculis longior. Maxillipedes externi grandes, dimidia basali incrassati, reliqua angustata, articulo ultimo praecedenti dimidia fere brevior, obtuso, setarum fasciculis tribus inferne instructo. Pedes quarti mediocres. Abdomen dorso inerme; segmento penultimo non duplo longiore quam latiore, quartum quintumque junctos longitudine fere adaequante; lamella caudali exteriori extus dente minuto versus basin armato. Long. 0.75 poll. *S. oculato* differt maxillipedibus externis multo crassioribus, et pedibus quarti paris longioribus. A *S. laciniato* oculis longioribus.

Hab.—Oceano Atlantico prope insulas "Azores."

485. *SERGESTES MACROPHthalmus*, nov. sp. Carapax spina hepatica et spinis supra-orbitalibus armatus, interdum et spina erecta dorsali ad extremitatem posticam. Rostrum brevissimum, resimum, apice antrorsum flexum. Oculi praelongi, fungiformes, carapace tertia parte breviores, apicem pedunculi antennularum fere attingentes; pediculis gracillimis. Antennularum pedunculi art. ultimus quam basalis non brevior. Antennarum appendix recta, angusta, regulariter minuscens, apice truncata, apicem antennularum pedunculi vix attingens. Maxillipedes externi eis *S. vigilacis* similes. Pedes thoracici secundi tertique paris longissimi filiformes, apicibus paulo incrassati; quarti paris (antrorsum porrecti) art. secundum maxillipedum ext. attingentes. Pedes abdominales mediocres. Abdominis segmentum quintum interdum et quartum spina dorsali minutissima armatum; segmentum penultimum latum, quartum quintumque junctos longitudine fere aequans, subtus convexum; segmentum ultimum parvum. Lamellae caudalis exterioris margo externus supra medium dente minutissimo armatus. Long. 0.7 poll.

Hab.—Oceano Pacifico, lat. bor. $27\frac{1}{2}^{\circ}$, long. orient. $138\frac{1}{2}^{\circ}$; etiam lat. bor. 35° , long. occ. 155° .

486. *SERGESTES LONGICAUDATUS*, nov. sp. Rostrum minutum, spiniforme, rectum, horizontale, dorso unidentatum. Oculi longi sed apicem art. basalis antennularum pedunculi vix attingentes, clavati, corneis vix discretis. Antennularum pedunculi articulus basalis art. penultimum et antepenultimum junctos longitudine aequans. Antennarum appendix apicem ped. antennularum non attingens, latior, intus margine convexa, ei *S. serrulati* similis. Maxillipedes ext. gracillimi. Pedes graciles, tertii paris praelongi, quarti paris non valde breviores. Abdomen dorso inerme; segmento penultimo praelongo, quartum quintumque junctos longitudine multo superante, ultimo duplo longiore. Lamellae caudalis exterioris margo externus infra medium dente armatus, infra dentem concavus. Pedes abdominales praelongi. Long. 0.75 poll.

Hab.—Oceano Pacifico, lat. bor. 40° , long. occ. 155° .

487. *SERGESTES ANCYLOPS*, Kroyer; Det. Kongl. Danske Vid. Selsk. Skrifter, [5], Nat. og Math. Afd., 4de Bind; p. 262; pl. iii. f. 8 a-e.—In Oceano Atlantico prope insulam Madeirae vulgaris.

SERGIA,* nov. gen. Pedes quarti quintique paris sat longi et dactylo palmiformi instructi. Reliqua cum *Sergeste* fere conveniunt.

488. *SERGIA REMIPES*, nov. sp. *Foeminae* carapax valde elongatus, sat depressus; sulco cervicali distincto; spina hepatica nulla. Rostrum minutum spiniforme, acutum, curvatum, dorso dente vel spina armatum. Oculi subfungiformes, tertiam partem carapacis longitudine aequantes, apicem art. penultimi antennularum pedunculi attingentes. Antennarum appendix linearis, oculos paulo superans. Maxillipedes externi et pedes sex anteriores subserati vel rugoso-marginati pilis simplicibus fasciculati. Maxillipedes ext. pedunculum antennularum paulo superantes. Pedes quarti quintique paris graciles cylindrici, fere nudi, setis plumosis sparsis solum instructi, dactylis lamini-

* *Sergia*, nom. propr.

formibus subovatis. Pedes quarti quintis paullo longiores sed carapace vix longiores. Pedes abdominales longi, primi paris carapace longiores, pedunculo ramos fere adaequante. Abdomen dorso compressum, segmentis quinto sextoque acutum vel spinigerum; segmento sexto quinto longiore et spina minuta ad angulum infero-posteriorem armato. Lamella caudalis exterior margine externo spina aculeiformi infra medium armata. Long. 0.6 poll.

Hab.—Oceano Pacifico, lat. bor. $27\frac{1}{2}^{\circ}$, long. orient. $138\frac{1}{2}^{\circ}$.

The Mexican Humming Birds.

BY RAFAEL MONTES DE OCA,

Of Jalapa, Mexico.

No. I.

CAMPYLOPTERUS DE LATTREI Gould.

Mellisuga De Lattrei Gray.

De Lattre's Sabre Wing, Gould, Monograph, part x.

This beautiful Humming Bird, or *colibri*, is generally known in Mexico by the name of *Chupa-mirto real azul*, or Royal blue Myrtle-sucker. It comes abundantly to the vicinity of Jalapa, Coatepec and Orizaba, in the months of October and November, and is mostly found eating the honey of a plant called *Masapan*. It is one of those birds that do not rise early in the morning to hunt their food, for very few are found earlier than nine o'clock in the morning, and from that time till twelve or one o'clock appears to be their breakfast hours. During this time they are but very seldom seen to alight, and for a very short time only in any one place, for they go constantly from flower to flower, sucking the honey, and from one place to another, describing in their flight a part of a circle, and sometimes almost touching the ground. In the same manner also they are seen to come, so that by placing oneself where there are such plants in blossom, it is easy to shoot several specimens in one morning without walking very far or moving much about. During the remainder of the day, very few are to be seen, and it is very probable that they go into the woods, where they find certain kinds of mosquitoes, with which I have often found their craws well filled.

This bird is extremely shy, but is very easily tamed, most probably on account of its gluttonous disposition; for once caged and provided with a little cup containing syrup, without any trouble he finds it readily when he is hungry, and I have seen them feasting in this manner, half an hour after having been made prisoners. It is difficult to keep them alive, and I have never been able to preserve them for a longer time than two months, which, I think, is more on account of the want of exercise than of the coming of the winter season as is generally believed here, for I have found, though rarely, in the middle of what we call a severe winter, the handsomest specimens that I have ever seen.

The aversion that the males of this species bear to each other as well as to all of their kind is very remarkable. It is very seldom that two meet together without there ensuing an aerial battle worthy of a most magnificent picture. It commences with a sharp, choleric shriek, which makes them swell out their throats, and raising all the feathers of their bodies, and spreading open their tails, they begin to fight with their wings and bills, and the least powerful soon tumbles to the ground or else runs away. I have never seen one of these battles last longer than about ten seconds, and in the specimens that I have had under my notice in cages, nearly always this fighting has ended in the splitting of the tongue of one of the two, which then surely dies on account of not being able to eat.

The place of incubation of this bird is very probably Guatemala, where it is
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also found abundantly, and to which country it certainly migrates in the latter part of November. I have never found nor heard that it goes farther north than the first mentioned places above. The nest I have never found.

This species of humming bird, in the general appearance of its body, is of a deep metallic shining turquoise blue, of the most beautiful shade; the upper part of the head is brown tinged with bronze green, the upper wing and tail coverts shining bronze green, the wing feathers are purplish black with the vanes of the three principal ones on each side black, very wide and resembling whalebone. The tail is bright bluish black, with the three feathers of each side having about three quarters of an inch of a pure white, and sometimes the fourth partakes of a little of the white also. The upper part of each leg is covered with white downy feathers, running apparently into each other in a line of the same color below the under tail coverts; the feet are purplish black; the bill black, resembling whalebone. Total length of this specimen is $5\frac{3}{4}$ inches, wing $3\frac{3}{4}$, tail $2\frac{1}{4}$, bill $1\frac{1}{2}$ inches.

The female is about half an inch smaller than the male, and her appearance is, in the upper part of the body, upper wing and tail coverts, of a metallic bronze green; the upper part of the head is bronze, tinged with yellowish bronzed green. The breast is of a light iron gray, with the sides tinged with bronze green. The throat feathers have the points tinged with blue of the same shade as the male. The wings are purplish black, but the vanes of the side quills are not half so strong as those of the male; the tail is very much like that of the male, with the difference of the two middle feathers, which are bronzed green. The under tail coverts are tinged with the same color, with the edges of light iron gray, like the breast. The feet and bill are of the same size and color as those of the male.

The Reports of the Publication Committee and the Committee on Proceedings were read and adopted.

Pursuant to the By-Laws of the Academy an election of the members of the Standing Committees for 1860 was held, with the following result:—

1. *Ethnology*, J. A. Meigs, S. S. Haldeman, T. G. Morton. 2. *Comparative Anatomy and General Zoology*, Joseph Leidy, J. M. Corse, J. H. Slack. 3. *Mammalogy*, John LeConte, J. H. Slack, Wm. Camac. 4. *Ornithology*, John Cassin, T. B. Wilson, S. W. Woodhouse. 5. *Herpetology and Ichthyology*, Robert Bridges, J. Cheston Morris, John L. LeConte. 6. *Conchology*, T. A. Conrad, W. G. Binney, W. S. W. Ruschenberger. 7. *Entomology and Crustacea*, R. Bridges, John L. LeConte, E. T. Cresson. 8. *Botany*, E. Durand, A. J. Brazier, J. Carson. 9. *Geology*, I. Lea, Chas. E. Smith, J. P. Lesley. 10. *Mineralogy*, Wm. S. Vaux, J. C. Trautwine, W. G. E. Agnew. 11. *Palæontology*, Joseph Leidy, T. A. Conrad, Wm. M. Gabb. 12. *Physics*, B. H. Rand, Wm. M. Uhler, Jas. C. Booth. 13. *Library*, Wm. S. Vaux, Robert Bridges, Joseph Leidy. 14. *Proceedings*, John L. LeConte, Joseph Leidy, Wm. S. Vaux, W. S. W. Ruschenberger, J. C. Fisher.

A communication was read from Mr. P. B. Duchailu, giving a statement of claims made by him against the Academy, and on motion, the subject was referred to a committee of five, consisting of Messrs. Ruschenberger, Jeanes, Vaux, Powel and Stewardson.

[Jan.

February 7th.

Mr. LEA, President, in the Chair.

Forty-nine members present.

The following were presented for publication :

“ Descriptions of new species of American Fluvial Gasteropods, by J. G. Anthony.”

“ Supplement to a Catalogue of the Venomous Serpents in the Museum of the Academy of Natural Sciences, by E. D. Cope.”

“ Catalogue of the Calamarian Serpents in the Museum of the Academy of Natural Sciences, with notes and descriptions, by E. D. Cope.”

Mr. Binney called attention to a species of *Leda*, presented this evening, which, Dr. Gould states, is common to Japan and Massachusetts.

A discussion on geographical distribution then took place, in which Dr. Le Conte mentioned that he had prepared a map representing the provinces of geographical distribution of Coleoptera in the territories of the United States; he divides the temperate part of the continent into three (or perhaps four) districts: 1. *Atlantic*, extending westwardly to the longitude of the mouth of the Platte; 2. *Central*, extending from the mouth of the Platte to the Sierra Nevada; 3. *Pacific*, including the water shed of the maritime Pacific coast. These districts are each divided into several provinces, and with larger collections the Central, as at present defined, may be found to be in reality two districts, limited by the Rocky Mountains; of these the eastern will be called the *Central*, and the western the *Interior* district. This map accompanies a memoir on the Coleoptera of Kansas, Nebraska and New Mexico, published in the Smithsonian Contributions to Knowledge.

Mr. Binney remarked, that having prepared for the Smithsonian Institution a catalogue of the terrestrial and fluvial Gasteropods of North America, he was able to present the following results:

Of the boreal regions but little is known. The only data we have are from Greenland. Both the fresh water and land species are peculiar to that country, excepting the European *Helix hortensis*, which has been introduced also in Canada and New England.

Of Mexico also but little is known. A few of its land species are found in Texas; they are, however, confined to that region, not extending farther north. The genera are more tropical than in the rest of the continent. Fluvial species are very rare in Mexico, judging from the few data we have. The species appear different from those of the Atlantic region.

On the west coast the species of land shells are quite distinct from those of the Atlantic region, excepting *Bulimus zebra*; the genera, however, are the same, though fewer in number. Among the fluvial species are found eleven species of Pulmonates, which also inhabit the Atlantic region.

In the Atlantic region are two or three species of land shells found in Europe, and a few fluvial Pulmonates. The occurrence of the Asiatic species quoted from the United States may well be doubted.

The following table shows the facts presented by Mr. Binney. It is necessarily imperfect, owing to the small amount of material, the somewhat confused synonymy, &c.

Column 1 contains the species found in the Pacific region.

Column 2, those of the Atlantic region.

Column 3, those common to the Pacific and Atlantic region.

Column 4, those of Mexico, excepting the west coast.
 Column 5, those common to Mexico and the Atlantic region.
 Column 6, those of Greenland.

Class GASTEROPODA.			1	2	3	4	5	6	Total
Order <i>PECTINIBRANCHIATA</i> .									
Suborder <i>ROSTRIFERA</i> .									
<i>Family.</i>	<i>Subfamily.</i>	<i>Genus.</i>							
AMPULLARIADÆ.....		Ampullaria.....	0	4	0	5	0	0	9
CYCLOPHORIDÆ.....	CYCLOTINÆ.....	Cyclotus.....	0	0	0	1	0	0	1
	CYCLOPHORINÆ.....	Cyclophorus.....	0	0	0	2	0	0	2
	LICININÆ.....	Ctenopoma.....	0	1	0	0	0	0	1
	CYCLOSTOMINÆ.....	Tudora.....	0	0	0	1	0	0	1
		Cistula.....	0	0	0	1	0	0	1
		Chondroperna.....	0	1	0	2	0	0	3
HELICINIDÆ.....		Helicina.....	0	6	0	22	2	0	26
		Schazicheilæ.....	0	0	0	3	0	0	3
LITTORINIDÆ.....		Amnicola.....	2	18	0	0	0	0	20
TRUNCATHELLIDÆ.....		Truncatella.....	1	4	0	1	1	0	5
MELANIADÆ.....		Melania.....	9	292	0	4	0	0	305
		Gyrotoma.....	0	10	0	0	0	0	10
		Leptoxis.....	3	54	0	0	0	0	57
		Io.....	10	0	0	0	0	0	10
VIVIPARIDÆ.....		Viviparus.....	4	60	0	1	0	1	66
		Bithinia.....	0	0	0	0	0	1	1
VALVATIDÆ.....		Valvata.....	0	8	0	1	0	0	9
Order <i>SCUTIBRANCHIATA</i> .									
Suborder <i>PSEUDOBRANCHIA</i> .									
PROSERPINADÆ.....		Ceres.....	0	0	0	2	0	0	2
Order <i>PNEUMOBANCHIATA</i> .									
Suborder <i>GEOPHILA</i> .									
TESTACELLIDÆ.....		Glandina.....	2	6	0	16	2	0	22
ARIONIDÆ.....		Arion.....	1	1*	0	0	0	0	2
HELICIDÆ.....		Tebennophorus.....	0	2	0	0	0	0	2
		Limax.....	1	3	0	0	0	1†	4
		Vitrina.....	0	1	0	1	0	1	3
		Simpulopsis.....	0	0	0	3	0	0	3
		Succinea.....	4	15	0	2	0	1	22
		Helix.....	29	111‡	0	31	6	2‡	167
		Bulimus.....	9	17‡	0	26	4	0	48
		Spiraxis.....	0	0	0	17	0	0	17
		Orthalicus.....	1	2	1	3	1	0	4
		Macroceramus.....	0	1	0	0	0	0	1
		Achatina.....	1	3	0	5	0	0	9
		Pupa.....	0	12	0	0	0	1	13
		Vertigo.....	0	4	0	0	0	0	4
		Cylindrella.....	0	4	0	15	0	0	19
VERONICELLIDÆ.....		Veronicella.....	0	1	0	0	0	0	1
ONCHIDIADÆ.....		Onchidium.....	1		0	0	0	0	1
Suborder <i>LIMNOPHILA</i> .									
AURICULIDÆ.....	MELAMPINÆ.....	Melampus.....	1	8	0	1	1	0	9
	AURICULINÆ.....	Alexia.....	0	1	0	0	0	0	1
		Blauneria.....	0	1	0	0	0	0	1
		Leuconia.....	0	1	0	0	0	0	1
		Carychium.....	0	1	0	0	0	0	1
LIMNEADÆ.....		Limnea.....	13	45	5	4	0	4	61
		Pompholyx.....	1	0	0	0	0	0	1
		Physa.....	10	30	2	3	0	0	41
		Planorbis.....	11	31	3	4	0	1	44
		Ancylus.....	4	10	0	0	0	0	14
			117	770	11	177	17	13	1048

* Imported.

† Two species imported.

‡ Found also in the Atlantic region, and imported.

‡ One species imported.

[Feb.

February 11th.

Mr. LEA, President, in the Chair.

Forty-nine members present.

A paper was presented for publication, entitled :

“Descriptions of new species of *Cyrena* and *Corbicula* in the Cabinet of the Academy of Natural Sciences of Philadelphia, by Temple Prime.

Mr. Lea remarked that when Mr. Binney, at the last meeting, called the attention of the members to a reversed *Paludina* on the table, the discussion taking a wide range, he (Mr. Lea) stated that an abnormal reversed character sometimes occurred in the genus *Unio*, and he then mentioned that he had specimens of various species where this condition was very remarkable. He also then stated that among *Helices*, in a semi-domesticated position—in gardens, hedge-rows, &c., in England and on the continent—it was not a very rare circumstance to find heterostrophe individuals; he had quite a number; but that among the immense number of our own species which had passed under his eyes, he had found only a single specimen which was heterostrophe, viz. : a *Helix hirsuta*, Say. Mr. Lea went on to say that he had prepared himself to exhibit, to-night, his specimens alluded to, and to which he now called the attention of the members. He was glad to see by the December number of the Proceedings of the Boston Soc. Nat. Hist. received by post to-day, that Prof. Agassiz had made a communication to the Society on “reversed bivalve shells,” exhibiting a specimen of the *Unio ligamentinus*, Lamarck, observing that “it was quite rare and generally not easily observed.” Mr. Lea exhibited twenty-one specimens of various species which were all abnormal as regarded their lateral teeth, some having a single one in both valves, others being simply reversed as to the double and single cardinal and lateral teeth; others having double lateral teeth in both valves, and others again having a treble lateral tooth in the left valve, and a double one in the right valve. The first reversed *Unio* he had seen was a specimen of *complanatus* from the mill-dam at Bristol, Penna., about 25 years since; afterward he had found one in the Schuylkill, and subsequently found them occasionally among thousands of specimens sent by friends from various parts of the United States. From Dr. Lewis, of Mohawk, he had received some very fine specimens.

The following table will exhibit the various abnormal forms of *Uniones* in Mr. Lea's collection :

Single lateral tooth in each valve.

- Unio complanatus*, Lea, (*Mya complanata*, Solan.) Schuylkill River, Pa.
- “ *occidens*, Lea, Wisconsin.
- “ *purpuratus*, Lam., Claiborne, Ala.
- “ *ventricosus*, Bar., St. Lawrence, Montreal.

Single lateral tooth in the left, and double in the right valve.

- Unio complanatus*, Lea, 2 specimens, Bristol, Pa., and Mohawk, N. Y.
- “ *alatus*, Say, Ohio River.
- “ *Hopetonensis*, Lea, Darien, Geo.
- “ *nasutus*, Say, Arkansas.
- “ *radiatus*, Lam., Petersburg, Vir.

Double lateral tooth in both valves.

- Unio complanatus*, Lea, 6 specimens, Mohawk, N. Y.
- “ “ “ Genesee, N. Y.
- “ “ “ Schuylkill, Pa.
- “ *corrugatus*, Lam., Pondichery, India.

Treble lateral tooth in the left, and double in the right valve.

Unio corrugatus, Lam., Bengal.

Treble lateral tooth in the left, and partly treble in the right valve.

Unio gibbosus, Barnes, Fox River, Wisconsin.

" *corrugatus*, Lam., India.

Mr. Lea stated that in his first paper published in the Trans. Am. Phil. Soc. in 1827, he paid attention to the difference of the teeth, and in 1829 he published a description of that remarkable *Unio* from the Schuylkill, described under the name of *heterodon*, from the very peculiar and aberrant form of the double lateral tooth being placed in the *right* valve, and the single in the *left* one. This was the first form of the kind which had ever come under his notice. A few years subsequently he found the first specimen of an abnormal character, conforming exactly to the normal condition of the *heterodon*, and this was in the Bristol specimen. Since that period he observed closely the abnormal forms of the species, and the result is given in the previous table. But it must be impressed on the zoologist's mind, that the form of teeth which is normal in one species, may be abnormal in another, because, while there is impressed on every species a law as regards its form,—and the general one of this species of *Unio* is to have the lateral tooth double in the left, and single in the right valve, and the cardinal either the same or double in both,—yet aberrant forms from this are quite numerous, as will be found in the following table of species. He wished the attention of the members to the fact that what was abnormal in some individuals of a species, would be perfectly normal in others; thus, in *complanatus*, when the lateral teeth are found double in the right, and single in the left, they are reversed, and therefore abnormal; but in the *heterodon* this condition of the teeth is normal, and so it will be with other conditions of other species, even so far removed from the typical *Unio* as in the *eximius*, Lea, from Siam, which has a treble lateral tooth in the left, and a double one in the right valve as its normal form, for this is imitated by the specimen of *corrugatus* exhibited, which has the treble tooth in the left valve, and double one in the right, which in this case is remarkable, its normal condition being that of the typical *Unio*.

In the following table will be found most of the species which, while they are perfectly normal, are still aberrant from the typical *Unio*, all of them but two having been described by Mr. Lea.

Cardinal tooth single in both valves.

Unio Bengalensis, Lea, Bengal.

Cardinal tooth double in the right, and single in the left valve.

Unio Corrianus, Lea, Bengal.

" *lamellatus*, Lea, Bengal.

" *bilineatus*, Lea, Bengal.

" *contradens*, Lea, Java?

" *gravidus*, Lea, Siam.

" *tumidulus*, Lea, Siam.

" *humilis*, Lea, Siam.

" *sagittarius*, Lea, Siam.

" *substriatus*, Lea, Siam.

" *Dunkerianus*, Lea, Brazil.

" *Cambodianus*, Lea, Siam.

" *consobrinus*, Lea, China.

" *Layardii*, Lea, Ceylon.

" *plicatulus*, Lea, Borneo.

" *vittatus*, Lea, Australia.

" *Wilsonii*, Lea, Australia.

" *Mauritanus*, Lea, Indian Ocean.

Unio bulloides, Lea, Rio Plata, S. Am.

“ *atratus*, (*Niäa*, Swain.) Chili.

“ *Araucanus*, Philippi, Chili.

“ *piceus*, Lea, Uruguay, S. Am.

Cardinal and lateral teeth double in both valves.

Unio phaselus, Lea, Siam.

“ *scobinatus*, Lea, Siam.

Lateral tooth double in the right valve only.

Unio heterodon, Lea, Penn.

Lateral tooth double in both valves.

Unio nucleus, Lea, Siam.

Lateral tooth treble in the left, and double in the right valve.

Unio eximius, Siam.

Cardinal tooth treble in the right valve.

Unio funebris, Lea, Uruguay River, S. Am.

Cardinal tooth treble in both valves, and lateral tooth treble in the right, and double in the left valve.

Unio trifidus, Lea, Buenos Ayres, S. Am.

It is not pretended that the last table is entirely complete. The object is accomplished to shew that the teeth of different species vary *normally*, and that individuals of the *species* vary *abnormally*.

As regards the genus *Triquetra*, Klein, (*Hyria*, Lamark,) which has cardinal and lateral teeth in both valves, so far as observed the lateral tooth in the left valve is double, and in the right single.

The cardinal tooth in both valves is usually lamellar and multiplied, and articulate closely. In some cases it is much longer than in others of the same species. In one specimen of *T. subviridis*, Klein, in Mr. Lea's cabinet, the cardinal tooth is almost the same length of the lateral tooth; and in two specimens both teeth have transverse striæ like *Prisodon*, Schum. (*Castalia*, Lam.) which of course is an aberrant form. The *Triquetra contorta*, Lea, is an aberrant species, the cardinal teeth in both valves being obtusely conical and double in both valves. I have never met with any abnormal form of teeth in any of the species of *Triquetra*, but so few specimens get into the cabinets that if they do exist none have yet been detected.

The genus *Prisodon*, the teeth of which are so nearly the same as those of *Unio* as to induce M. Deshayes to put it in that genus, are almost identical with some of the species, except in character of transverse parallel striæ: and even this characteristic of the genus is absent in some of Mr. Lea's specimens of *truncatus*, Schum., (*ambigua*, Lam.) If, however, the lobes of the mantle are united behind so as to form two tubes, there would be no propriety in placing it with the *Uniones*, as the mantle is never united in that part in them.

Prof. R. E. Rogers made some remarks on the debitemenization of coal, and also communicated the following facts having reference to the propagation of concussion from rock-blasting to strata at a distance, as exemplified in the effect upon the water of wells.

A well, sixty feet in depth, with the water rising within ten feet of the surface, had, previous to the occurrence, been yielding a large supply of water to an extensive factory, when, immediately upon the discharge of a heavy blast in a stone quarry about four hundred yards distant, the water began to fall, and soon altogether disappeared.

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Another well, remote from the last mentioned one, had been yielding a good supply of water for more than a year. A blast of ordinary violence was discharged in an excavation for stone, three hundred yards distant from it, whereupon the water quickly and entirely disappeared. The proprietor directed a boring to be made in the bottom of the well six feet in depth and a blast to be set off in it.

The result was as curious as the one which preceded it. The water at once reappeared, and the supply has since been steady and in great abundance.

Dr. Leidy observed that the remarks of Prof. Rogers, had reminded him of the so-called Hillsboro coal or Albertite, of Albert Co., New Brunswick. This substance Dr. L. regards as a variety of Asphaltum and not as coal. The latter consists of the fossil remains of plants. The Albertite is a product resulting from the distillation of bitumenous coals or shales. Coal always presents in microscopic section the remains of vegetable structure; Albertite is perfectly amorphous. Coals are stratified or interstratified with other substances; the Albertite presents many evidences of being an injected material into fissures of the surrounding shales.

The number of the Proceedings for January was laid upon the table.

February 21st.

Mr. LEA, President, in the Chair.

Thirty-five members present.

A paper was presented for publication entitled:

"The Mexican Humming Birds, No. 2, by Rafael Montes de Oca."

Mr. Slack remarked that the two teeth of the *Mosasaurus missouriensis*, presented by him this evening, had been procured for him from the marl pits of Mr. Coward, about two miles west of Freehold, N. J., through the exertions of Mr. Hopper, of Freehold, N. J., a gentleman to whom the Academy is largely indebted for cretaceous fossils. This is the eleventh specimen of the *Mosasaurus missouriensis* identified by Mr. Slack, found within a radius of ten miles from Monmouth Court House.

Dr. Leidy announced that the valuable collection of fossils of Mr. Eli Bowen had been purchased by subscription and presented to the Academy.

February 28th.

Mr. LEA, President, in the Chair.

Forty-four members present.

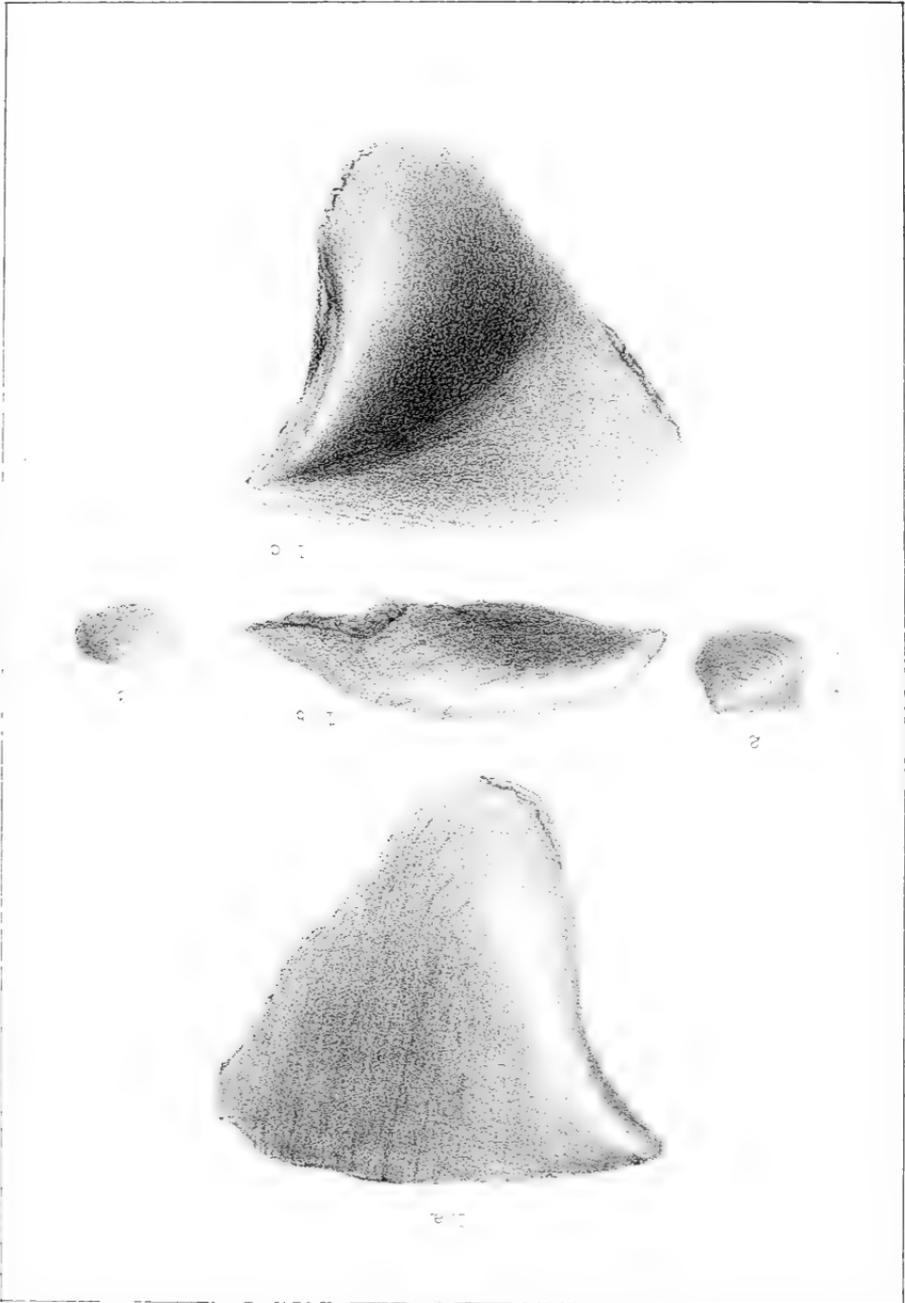
The Report of the Biological Department for the present month was read.

On report of a committee of the Biological Department, the paper entitled, "Method of painting moist anatomical preparations, by H. D. Schmidt, M. D.," was recommended for publication in the Proceedings of the Department.

And the following were ordered to be printed in the Proceedings:

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Illustrations of some Fossils described in the Proceedings of the Academy of
Natural Sciences.

BY T. A. CONRAD AND WM. M. GABB.

Pl. 1, fig. 1, a, b, c, *Myalina deltoidea* Gabb, Proc. Acad. 1859, p. 297.

Pl. 1, fig. 2, *Posidonia Moorei* Gabb, Proc. Acad. 1859, p. 297.

Pl. 1, fig. 3, *Myacites pensylvanicus* Conrad, Proc. Acad. 1857,
p. 166.

The first two, *Myalina deltoidea* and *Posidonia Moorei* are carboniferous; *Myacites pensylvanicus* is triassic, from Phœnixville, Pennsylvania.

Descriptions of New Species of American Fluviatile Gasteropods.

BY J. G. ANTHONY.

MELANIA ANGUSTISPIRA, Anthony.—Shell thick, elongate, very slender; color reddish-brown, with a narrow pale line at the suture; whorls 9-10, lower ones subconvex, smooth, upper ones flattened and carinate near their bases: sutures slight; aperture narrow-ovate, within pale purple; columella regularly curved; sinus not remarkable.

Hab.—Tennessee.

My Cab.; Cab. Hugh Cuming, London; A. N. S. Philada.; State Collection, Albany, N. Y.; Smithsonian Collection, Washington, D. C.

Obs.—May be compared with *M. exilis*, Hald., than which it is more slender, more attenuate, and of more solid texture; its color is also entirely different, being more like *M. Warderiana*, Lea, but wanting the peculiar bulbous form of that species. The carinations do not extend to the three lower whorls; upon these they are entirely wanting. It is a peculiarly slender and graceful species.

M. DECORATA, Anthony.—Shell short, thick, ovate; whorls about five, but truncate so as to show only two or three remaining; whorls prominently ribbed and intersected by revolving striæ, forming nodules where they cross each other; dark bands also revolve around the whorls, giving them a highly decorative appearance; columella often thickened by a callous deposit; sinus small.

Hab.—Oostanulla River, Georgia.

My Cab.; Cab. Hugh Cuming, London; A. N. S. Philada.; State Collection, Albany, N. Y.; Smithsonian Collection, Washington, D. C.

Obs.—I collected some two hundred specimens of this species in Oostanulla River, Ga., in 1853, and then supposed they would prove to be merely the young of *M. cœlatura*, Con. Closer examination and comparison, however, has convinced me that they are not identical. Many of the specimens are decidedly mature, and differ from "cœlatura" by the greater regularity of their folds, which are also interrupted by a revolving raised line near the sutures, and by their dark bands and less elongate form; cannot well be compared with any other.

M. ADUSTA, Anthony.—Shell conical, smooth, shining; color dark brown, with a pale line near the sutures; whorls 7-8, flat; body whorl rather large, subangulated and with somewhat coarse lines of growth; sutures distinct, but not remarkable; aperture ovate, dark purple within; outer lip curved, columella deeply rounded, a broad sinus at base.

Hab.—Tennessee.

My Cabinet; Cab. H. Cuming, London; Cab. A. N. S. Philada.; State Collection, Albany, N. Y.; Smithsonian Collection, Washington, D. C.

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Obs.—A neat, pretty species, of rather plain appearance. Compared with *M. gracilior*, nob., it is broader, shorter, and of darker color; the broad deep cincture on the body-whorl and beautiful red bands in the interior, so conspicuous in *M. gracilior*, are also wanting. From "athleta" it differs by its shorter, more acute form, and by the absence of folds. It is less slender than *M. viridula*.

M. BICINCTA, Anthony.—Shell conical, elevated, spire very acute; whorls 7, upper ones bicarinate, and body whorl encircled by three or four carinæ, the upper two of which are prominent, while the lower two are often striæ merely; color dark olive brown, very shining, and relieved by a faint or yellow narrow band near the suture; sutures distinct; aperture ovate, and brown within; columella deeply indented.

Hab.—Tennessee.

My Cabinet; Cab. Hugh Cuming, London; A. N. S. Philada.; State Collection, Albany, N. Y.; Smithsonian Collection, Washington, D. C.

Obs.—A beautifully distinct and well-marked species of that group which *M. bella*, Conrad, may be considered most fitly to represent. May be distinguished from *M. bella* by its broader and more acute form, more distinct carination and absence of the beaded line so characteristic of that species. Lines of growth conspicuous and crowded. Differs from *M. bicostata*, nob., by its less robust form, darker color, and by the form of its spire, which diminishes more rapidly towards the apex.

M. ABCSIDA, Anthony.—Shell ovate, smooth, olivaceous, thick; spire obtuse, composed of five low whorls nearly flat; body whorl large, occupying nearly the entire length of the shell; aperture not broad but long, subrhombic, more than half the length of the shell; columella deeply rounded and indented; outer lip much curved and produced; sinus broad and conspicuous.

Hab.—Alabama. My Cabinet.

Obs.—A ponderous species, whose chief characteristic is its square form and short truncate spire, resembling in that respect *M. planospira*, nob. It differs from that species, however, by its more elongate form, narrow, rhombic aperture, and by having several revolving striæ at base. It is a solid shell of compact texture, and seems to be rare, as only two specimens have come under my notice.

M. BICOSTATA, Anthony.—Shell conical, light horn color, rather thick; spire elevated, acute; whorls 11-12, strongly carinate near the apex, and decidedly so on each succeeding whorl, not excepting even the body-whorl in most cases, though sometimes obsolete there; carinæ often in pairs, near to, and parallel with each other; sutures deeply impressed, often with a decided furrow at that point, caused by the carinæ. Aperture broadly elliptical, or subrhombic; within dirty white or obscurely banded; columella deeply rounded, with a well-marked sinus at base.

Hab.—Tennessee, near Athens.

My Cabinet; Cab. Hugh Cuming, London; Cab. A. N. S. Philada.; State Collection, Albany, N. Y.; Smithsonian Collection, Washington, D. C.

Obs.—Appears to be a very abundant and rather variable species. Several hundred individuals have come under my notice. It cannot well be confounded with any other species, though of a form by no means uncommon. The sharp double carina will at once generally determine it. Occurs abundantly near Athens, in small streams.

M. FUNEBRALIS, Anthony.—Shell conic, smooth, solid, of a dark chesnut color; spire elevated and generally abruptly truncate; whorls from 3 to 5 only remaining, slightly convex; aperture ovate, within bluish; columella white, tinged occasionally with purple; sinus small.

Hab.—Tennessee.

My Cabinet; Cab. Hugh Cuming, London; A. N. S. Philada.; State Coll., Albany, N. Y.; Smithsonian Collection.

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Obs.—A very neat, pretty species, with no very decided character to distinguish it from allied species. May be compared with *M. brevispira*, nob., but is far more solid in its texture, of a darker color, and its surface is more polished and shining; much less slender too than *brevispira*, and that species is never so abruptly decollate. It appears to be an abundant species.

M. GLAUCA, Anthony.—Shell conical, folded, of a green color on the lower whorls, often modified by a brown tinge on the upper ones; whorls 10, slightly convex, with prominent longitudinal ribs, obsolete on the body-whorl; sutures well defined, but not deeply marked; aperture ovate, livid within and with occasionally a faint rosy tinge there; columella angulated at the middle; sinus well defined.

Hab.—Tennessee. My Cabinet.

Obs.—A stout species, with prominent, curved ribs on all the upper whorls, those on the body-whorl being less clearly defined or else absolutely wanting. Color a beautiful apple-green, relieved by a broad yellow band near the suture; and this color often passes into a yellowish brown on the upper whorls. Near the apex the folds are often traversed by four or five prominent striæ, which pass over without being interrupted by the longitudinal ribs. May be compared with *M. viridula*, nob., as to color, but is less slender, and the ribs at once distinguish it.

M. INFRAFASCIATA, Anthony.—Shell conical, smooth, solid, of a pale brown color, form moderately slender and elevated; whorls 8-9, decollate, slightly concave; sutures distinct; lines of growth curved and very distinct; body-whorl decidedly concave, with a well-marked ridge revolving near the summit of the aperture, so as to make a tolerably sharp angle near the middle of the body-whorl; two or three coarse striæ revolve parallel with it; below this is a dark brown band, continued around the base of the shell; aperture rhombic-ovate, livid and banded within; columella strongly incurved, with a callous deposit its whole length and well-defined sinus at base.

Hab.—Tennessee.

My Cab.; Cab. H. Cuming; A. N. S. Philada.; State Coll., Albany, N. Y.; Smithsonian Collection.

Obs.—Compared with *M. gradata*, nob., it is more elongate, more solid, and has not the carina and regularly graded whorls so characteristic of that species. Less conical than *M. canaliculata* Say, and less broad. Like *M. annulifera*, Con., in form, but has not the revolving costæ of that species.

M. PAUCICOSTA, Anthony.—Shell conical, nearly smooth, of a dark greenish horn color; spire obtusely elevated; whorls nearly flat, with a few distinct longitudinal ribs on the upper ones; body-whorl entirely smooth; sutures well marked; aperture ovate, within livid or purple; columella rounded; sinus small.

Hab.—Tennessee.

My Cab.; Cab. H. Cuming, London; A. N. S. Philada.; State Coll., Albany, N. Y.; Smithsonian Collection.

Obs.—Belongs to a group of which *nitens* may be considered the type. From that species it differs, however, by its more robust form and stronger ribs. There is also a marked peculiarity in this species not often observed in the genus; the spire being acute at the apex, increases regularly for the first four or five turns, and then suddenly expanding, becomes as it were distorted in appearance. The ribs are distant from each other and very strongly expressed, differing in this respect from *M. athleta*, which it otherwise resembles. It is a beautiful and appears to be an abundant species.

M. OCCULTA, Anthony.—Shell conic, smooth, rather thin; color lemon-yellow, inclining to brown, with a darker brown band on each whorl, increasing to two on the body-whorl; whorls 7-8, rather convex; suture deeply impressed; aperture ovate, within dusky white, with the outer bands seen faintly through its
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substance; columella beautifully rounded; outer lip produced, a small sinus at base.

Hab.—Wisconsin.

My Cab.; Cab. H. Cuming, London; A. N. S. Philada.; State Coll., Albany, N. Y.; Smithsonian Collection.

Obs.—A very beautiful and lively species. Bears some resemblance to *M. pulchella*, nob., but is less elongate, more delicately colored, and of a less solid texture; the bands are often obsolete, and never so distinctly expressed as in *pulchella*; its spire is also more acute and the whorls more rounded. Compared with *M. brevispira*, nob., which in form it resembles, it is more attenuate, has a greater number of whorls, and its bands also distinguish it. Its delicate yellow color also is not a common character in the genus, and forms a prominent mark for determination.

M. OPACA, Anthony.—Shell ovate, thick, smooth, of a dark brown color; spire short, composed of about six convex whorls; body-whorl large, subangulated in the centre; sutures indicated by a narrow lighter line, and very distinct; aperture ovate, livid within; columella indented and tinged with purple; outer lip a little curved; sinus not remarkable.

Hab.—Alabama. My Cabinet.

Obs.—A dusky inconspicuous shell of no great beauty. Only two specimens have ever come under my notice, but I am persuaded, nevertheless, that they are distinct—cannot well be compared with any other species. More smooth than *M. athleta*, nob., and devoid of ribs, which that species has. Its dark, dirty, brown color down to about the middle of the body-whorl and pale olive-green underneath, together with its purple columella, may sufficiently distinguish it.

M. PULCHERRIMA, Anthony.—Shell conical, carinate, elevated, acute; whorls 6–8, flat, upper ones obscurely ribbed longitudinally; body whorl sharply angulated, with a dark brown band directly upon the carina, and 2 or 3 below it, one of which is very near the carina. Upper whorls with 2 bands each, widely separated; sutures distinct, rendered more so by the neighboring carina; aperture ovate, within 3 or 4 banded; columella rounded and indented, sinus small.

Hab.—North Carolina.

My Cabinet, Cabinet H. Cuming, London; Acad. Nat. Sci. Phila.; State Collection Albany, New York; Smithsonian Collection.

Obs.—A small but remarkably beautiful species; its bright yellow ground and conspicuous dark lines give, by contrast, a lively and pleasant character to the shell. Compared with *M. nigrocincta*, nob., it is a larger species, its colors are more decided, and its carina are also a prominent mark of difference. *M. clara* nob. is a larger and more globose species, its bands are broader and it has no carina. It seems to be an abundant species, varying occasionally in some of its characters, but always easily recognized. More than 100 specimens are before me.

M. TENEBROCINCTA, Anthony.—Shell conic-ovate, smooth, rather thick; spire rather obtusely elevated; whorls 6–7, nearly flat, but with an obtuse carina below the middle of each, and one more decided between that and the suture; suture well marked and with a pale band near it;—lines of growth decided; aperture linear-ovate, within dusky and having 2 dark bands there,—sinus very decided.

Hab.—Tennessee.

My Cabinet, Cabinet H. Cuming, London; Acad. Nat. Sci. Phila.; State Collection, Albany, New York; Smithsonian Collection.

Obs.—Compared with *M. valida* nob. it is smaller, less robust, more slender, and may also be distinguished from that plain species by its more lively exterior—the dark brown band or bands, contrast finely with the general color of the shell, and with a light band near the sutures.

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M. VALIDA, Anthony.—Shell ovate-conic, smooth, olivaceous, thick; spire obtusely elevated, decollate; whorls flat, only about 6 remaining; sutures distinct; lines of growth very strong, amounting to varices on the body whorl; aperture ovate, bluish white within; columella strongly curved, or indented about the middle, white; sinus well developed at base; body whorl obscurely, concentrically striate, the striæ forming faint nodules where they intersect the varices.

Hab.—Tennessee.

My Cabinet; Cab. of H. Cuming, London; A. N. S. Phila.; State Coll. Alb. N. Y.; Smithsonian Collection.

Obs.—This species may be compared with *M. tenebrocineta* herein described— from that species it may be distinguished by its more robust form, uniform dark olivaceous color and the absence of the dark bands so conspicuous in that species. It has a very solid, compact form, and this with its regular, uniform size up to the point of decollation, may serve to distinguish it from all others.

M. GRAVIDA, Anthony.—Shell ovate, smooth, thick; spire obtusely elevated; whorls 7-8, nearly flat; sutures well defined; lines of growth fine, but very distinct; body whorl large, subangulated; aperture oval, livid inside; columella deeply indented, covered with a white callus; outer lip curved forward, and with the columella forming a small sinus at base.

Hab.—Alabama. My Cabinet.

Obs.—A stout, heavy shell, in form and color resembling in some degree *M. solida*, Lea, but is more ovate than that species. Color light brown, smooth but not very shining—lines of growth very distinct and curved. A few indistinct striæ occur at the base of the shell—the lower part of the columella is often tinged with a golden hue.

M. GROSSA, Anthony.—Shell ovate, folded, thick; spire obtusely elevated, composed of about 8 convex whorls rapidly attenuating to an acute apex; whorls folded, except the last two; body whorl tumid, smooth; color of epidermis light greenish olive; aperture elliptical, whitish inside; columella rounded; outer lip much curved, with a well marked sinus at base.

Hab.—Tennessee. My Cabinet.

Obs.—A short thick species whose chief characteristics are its bulbous form, and short but prominent ribs on the upper whorls. All the whorls but the last are remarkably narrow and crowded—lines of growth prominent—4 or 5 striæ revolve around the base or the shell. Resembles *M. glandula*, nob., in form, but its different color and texture, with its prominent ribs, will at once distinguish it.

M. PONDEROSA, Anthony.—Shell conic, broad, smooth, olivaceous, thick; spire considerably but not acutely elevated; whorls 7-8, subconvex; lines of growth curved and strong; sutures distinct; aperture rhombic, rather small, whitish within; columella indented, outer lips much curved forwards forming a broad well marked sinus at base.

Hab.—Tennessee. My Cabinet.

Obs.—One of the most ponderous of the genus. In form it resembles *M. canaliculata*, Say, but has not the channel of that species, and differs also in the aperture. The body whorl is strongly keeled about the middle and has another and less clearly defined carina about midway between the first and the suture above. The lines of growth are very strong and occasionally varicose. A strong deposit of white callus is found upon the columella, which is much thickened near the base.

M. TÆNIOLATA, Anthony.—Shell conic-ovate, striate, thick; spire elevated but not acute, composed of 6-7, nearly flat whorls; sutures not distinct; aperture sub-rhombic, small, banded within; columella indented, callous at its lower portion, and with a small but distinct sinus at base.

Hab.—Alabama. My Cabinet.

Obs.—A fine, showy, robust species, of a dark yellow color, enlivened by
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several dark brown bands, generally 2 on each whorl; body whorl angulated; with one band directly upon the sharp angle, another in close proximity, and a third quite distant and near the base of the shell. Band obsolete on the first two or three whorls. Surface coarsely striate and obscurely ribbed.

MELANIA GLANS, Anthony, being preoccupied, I propose to change the name to *M. GLANDULA*.

M. ASSIMILIS, Anthony.—Shell small, short, conic, not thick; spire acute, composed of about 7 flat whorls; sutures very distinct, of a light horn color; aperture small, ovate, dusky within; columella indented; body whorl angulated; sinus not broad, but well formed.

Hab.—Tennessee. My cabinet.

Obs.—A small delicate species; compared with *M. pallidula*, nob., it is more slender and elevated, has a greater number of whorls, and is devoid of bands. From *M. angulata*, nob., it differs in being more slender, more carinate, and having a more elevated spire.

M. CUBICOIDES, Anthony.—Shell ovate, smooth, thick; whorls 6—7, flat, the upper ones rapidly enlarging to the body whorl, which is broad, and acutely angulated; sutures distinct, rendered more so by a sharp carination on the lower part of each whorl; aperture broadly ovate, within whitish; columella deeply indented; sinus small.

Hab.—Wabash River, Indiana. My Cabinet.

Obs.—One of the short, thick species, in form not unlike *M. cuspidata*, nob., but differing by its sharp carinated body whorl and imbricated spire; the body whorl is also strongly striate and obscurely ribbed; these longitudinal ribs are very faint, but sufficiently distinct at the sharp carina near the summit of the aperture to modify its outline into a waving subnodulous line.

M. HYBRIDA Anthony.—Shell conical, elevated, nearly smooth, horn colored; whorls 8—9, upper ones carinated deeply, lower ones entirely smooth; color reddish brown, or dark horn color; sutures distinctly impressed; aperture small, ovate, tinged with rose color or violet within; columella rounded but not deeply indented; sinus small.

Hab.—Tennessee.

My Cabinet; Cab. H. Cuming, A. N. S. Philada.; State Coll., Albany, N. Y.; Smithsonian Collection, Washington, D. C.

Obs.—A neat, pretty species, with no very strong distinctive characters; from *intertexta*, nobis, which it somewhat resembles; it may be distinguished by its less acute form, less numerous whorls, and by its want of reticulated surface so peculiar to that species. Bears some resemblance, to *M. bella*, Con., but differs in form of outline and aperture, and has no beaded line; is also more elevated than *M. bella*.

M. VERSIPELLIS, Anthony.—Shell small, ovate, folded, rather thin; spire not elevated, but acute, composed of about 7 flat whorls; whorls of the spire all more or less folded, penult and body whorl smooth; body whorl bulbous, sub-angulated, concentrically striate; color olivaceous, ornamented with dark brown bands, of which four are on the body whorl and one only on the spiral ones, located upon or near the shoulder of each volution: aperture elliptical, about half the length of the shell, banded within.

Hab.—Tennessee. My Cabinet; Cab. H. Cuming.

Obs.—A small and somewhat variable species as to coloration, though very constant in other characters; it is sometimes very dark both as to bands and general color, and often very light with bands scarcely distinguishable and many varieties between; it seems not to be a very common species.

M. COGNATA, Anthony.—Shell ovate, short, smooth, moderately thick; spire obtusely elevated, consisting of 5—6 convex whorls; color brownish-yellow with three dark brown bands about the middle of the body whorl, and one very obscure one at the suture; suture deeply impressed; aperture broad-

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ovate, not large, exhibiting the bands inside; columella deeply rounded, indented and callous; sinus none.

Hab.—Tennessee. My Cab.; Cab. H. Cuming; A. N. S., Philada.

Obs.—A short, pretty species, with no very marked characters, though easily recognised as distinct on examination; in form and coloring somewhat like *M. compacta*, nobis, but far less solid and heavy than that species; the spire is more elevated and acute and the surface smoother. It most nearly resembles, perhaps, *M. coronilla*, nobis, but is less elevated and has not the peculiar crowning ribs of that species, which is sufficient at once to distinguish it. It is also more robust.

M. CORNEOLA, Anthony.—Shell small, conical, rather thin; spire short and not very acute, composed of five or six subconvex whorls; whorls all more or less folded and with revolving raised striæ which give them a subnodulous appearance; the body whorl has four or five faint bands which appear also within the aperture; aperture small, ovate, sinus small.

Hab.—Alabama. My Cabinet.

Obs.—This is a small and not very remarkable species, nor can it well be compared with any other. One is at first view forcibly reminded of *Columbella avara*, Say, which it resembles both in size and general appearance. The bands alluded to are often interrupted and never very fully expressed; body whorl subangulated below the middle; does not seem to be a very abundant species. Only six individuals are before me.

M. GRATA, Anthony.—Shell conic, elevated, smooth, thick; whorls 9, flat, terminating in an acute apex, the first three or four whorls being carinated; color light greenish-yellow, ornamented by a single dark band on the spiral whorls, and four similar bands on the body whorl, giving the shell a truly lively and beautiful appearance; sutures very distinct; aperture ovate, banded within; columella deeply indented and curved at base, where there is a small but rather broad sinus.

Hab.—Alabama. My Cabinet.

Obs.—The colors in this species are finely contrasted, and the general appearance is very lively and pleasing; the bands on the body whorl are not uniformly distributed, the upper and lower ones being widely separated, while the central ones are very close together and less distinct. Altogether it is one of our most beautiful species.

M. GERMANA, Anthony.—Shell carinate on the body whorl; form rhombic; substance rather thin; varying in color from ash grey to dark brown; whorls six, upper ones smooth; suture very distinct; aperture rhombic, within brownish, with a white area near the outer edge; columella rounded or angularly indented, slightly callous; sinus small.

Hab.—Cahawba River, Alabama. My Cabinet.

Obs.—This is another of the short, rhombic species, which are represented most fitly by *M. rhombica*, nob., and includes *M. angulata*, nob., *M. cubicoides*, nob., *M. cristata*, nob., and many others. From *M. rhombica*, it differs in being shorter and less slender, and by wanting the regular concentric striæ so conspicuous on the upper half of that species; it is also less slender than *M. angulata*, nob., and more solid. From all other species it may readily be distinguished.

M. GRISEA, Anthony.—Shell ovate, smooth, thick, of a dull grey color; whorls 7, convex; sutures very distinct; body whorl obscurely ribbed, and having two or three inconspicuous bands revolving around it; aperture large, ovate, banded within; columella deeply indented, with a white callus, unusually thickened at the summit of aperture; sinus broad but not distinct.

Hab.—Tennessee River, North Alabama. My Cabinet.

Obs.—A single specimen only of this species has come under my notice, but I cannot consider it referable to any described species. The bands are very

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obscure, scarcely perceptible, and those within the aperture are arrested before reaching the edge of the lip. The ribs which are inconspicuous on the spire become more decided on the body whorl, and sometimes appear as varices there; the spire is very obtusely elevated.

M. iostoma, Anthony.—Shell ovate-conic, smooth; spire obtusely elevated; whorls about six, subconvex; body whorl exhibiting uncommonly strong lines of growth, curved and varicose; color greenish olive, shining; sutures distinct; body whorl strongly but not sharply angulated on the middle; aperture broad-ovate, within light purple, which becomes very deep on the columella, which is regularly rounded: outer lip somewhat produced, and having a well developed sinus at base.

Hab.—Tennessee.

My Cabinet; Cab. Hugh Cuming, London; A. N. S., Philada.; Smithsonian Collection.

Obs.—This species approaches nearest in form and color to *M. glans*, nob., now changed to *glandula*, from which it differs in being less globular, of a lighter color generally, and by the angulated body whorl. Compared with *M. pinguis*, Lea, it is less obese, more elongate, and has not the rapidly attenuating spire of that species. From all others it is readily distinguished.

M. intertexta, Anthony.—Shell conical, acute, and highly elevated; whorls about ten, each strongly ribbed longitudinally and furnished also with revolving striæ, which becoming more elevated near the suture, arrest the ribs at that point; sutures decidedly impressed; aperture pyriform, not large, whitish within; columella slightly rounded, not indented; sinus distinct, but small.

Hab.—Tennessee.

My Cab.; Cab. H. Cuming; A. N. S., Philada.; State Coll., Alb., N. Y.; Smithsonian Collection.

Obs.—A very abundant species. About two hundred specimens are now before me, and present characters remarkably uniform. May be compared with *M. bella*, Conrad, but differs by its more elongate and sharply elevated form; its ribs are more decided, and it has not the bead-like prominences, so common in *M. bella*, and kindred species. From *M. arachnoidea*, nob., it may be distinguished by its less elongate but more acute form, difference of aperture and less number of whorls; the striæ revolve around the whorls and over the folds without being arrested by them, giving the surface a woven appearance: hence its name.

M. rigida, Anthony.—Shell conic, elevate, carinate, rather thin; whorls 8—9, carinate and banded; sutures distinctly marked; aperture small, elliptical, whitish within; columella indented; sinus small but very distinct.

Hab.—Tennessee.

My Cabinet; Cab. H. Cuming; A. N. S., Philada.; State Coll., Alb., N. Y.; Smithsonian Collection, Washington, D. C.

Obs.—This is one of those sharply keeled *Melanix* of which *M. bella*, Con., *M. carino-costata* and *M. oblita*, Lea, may be considered good examples. The whorls of the spire have each two carinæ, with generally a dark band between them, though this is sometimes wanting; the body whorl has four or five of these carinæ and generally two bands, one of which revolves within the aperture. To the touch this species has a peculiarly rough feel.

M. gracillima, Anthony.—Shell conic, thin, brownish; spire very slender, elevated, composed of eight convex whorls, the upper ones folded and striate, the lower ones smooth, the striæ being replaced by indistinct, slender, brown lines; sutures very deeply impressed, a sharp carina on the lower portion of each whorl, rendering them quite distinct; aperture small, ovate, banded inside; columella indented; sinus small.

Hab.—South Carolina.

My Cabinet.

Obs.—A peculiarly slender, graceful species, in form somewhat like *M. strigosa*, Lea, but more folded and more slender. The striæ on the upper whorls are very distinct where they intersect the folds, and give the shell a tuberculous appearance; the folds are arrested by the carina, which is elevated. The brown lines on the body whorl are often slightly elevated, but nevertheless, indistinct, and are about four in number. A faint line or band of a yellow color revolves around the upper portion of the two lower whorls.

GYROTOMA.

As some confusion exists regarding the name of this genus, the following notes are given:—

The genus *Melatoma* was established by Swainson, and first given to the world in 1840, in his "Treatise on Shells and Shell Fishes," published in London, founded, as he says, (p. 202,) "upon a remarkable Ohio shell sent him many years before by his old friend Prof. Rafinesque." "It has," he remarks, "the general form of a *Pleurotoma* and of a *Melafusus*, with a well-defined sinus or cleft near the top of the outer lip, while the inner, though thin, is somewhat thickened above." The other characters named by him are such as are generally considered rather specific than generic, and the pleurotoma-like cut in the outer lip as applied to a fluviatile univalve is altogether sufficient to indicate the new genus. The specimen alluded to by Swainson, and from which his generic description was drawn, was an imperfect one, and the species has not since been identified by American naturalists. This is less to be wondered at when we consider how very local the genus has always been, and how few specimens have found their way into our collections. The waters of Alabama have as yet monopolized this interesting genus, and it is probable that even there it is confined almost, if not quite, exclusively to the Coosa and its tributaries.

On p. 342 Swainson gives the following generic description, adding a figure: "Fusiform, longitudinally ribbed; a deep sinus at the top of the outer lip; base contracted, channel wide."

Mr. Swainson's figure is quite unsatisfactory. His genus *Melatoma* is referred doubtfully to *Clionella* by H. and A. Adams, and has not prevailed for this genus in America or Europe. I have therefore decided not to make use of it in this case.

Subsequently this genus has been noticed by various authors, and other names have been applied to it. In 1841 or 1842, Dr. J. W. Mighels sent me specimens of one species under the name of *Apella scissura*; but his generic name was never published, and his species, if not identical with any which Mr. Lea afterwards described, seems to have been overlooked and forgotten.

On the 14th of December, 1842, Mr. Lea read a paper before the American Philosophical Society, in which he describes *Melania excisa* and *Anculosa incisa*. In his remarks upon these species he alludes to the pleurotoma cut in the superior part of the upper lip, and at the same time suggests the possibility of its being necessary, in consequence of that character, to construct a new genus, which he proposed to call "Schizostoma." Mr. Lea finding his name "Schizostoma" preoccupied in Palæontology, changed it to "Schizochilus." (March 5, 1852, *Obs.* v. p. 51.) In a paper read May 2d, 1845, Mr. Lea, in a foot-note to page 93, first indicates the generic characters of *Schizostoma* as follows:—"Testa vel conica vel fusiformis; labrum superne fissura; apertura ovata; columella lævis, incurva;" and describes six additional species.

In the above concise definition of the genus it will at once be noted that the fissure at the upper part of the outer lip is after all the essential character; and Mr. Lea himself seems to be aware of this, since of the six species then described he states the aperture to be elliptical in five cases and rhomboidal in the other, although his generic character is "aperture ovate;" indeed in the species described by him but a single one has the aperture ovate, and that one is described as an *Anculosa*.

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It may be doubted whether Mr. Lea's first name will not eventually prevail, since, before he published *Schizostoma*, Bronn's genus of the same name (*Lethea* Geogn. i. 95, 1835-1837), had been called a synonym of *Bifrontia* (*Omalaxis*) of Deshayes. (*Vide* Desh. in Lam. ix. p. 104.) Indeed, H. and A. Adams (Gen. Rec. Moll. i. 305) do not appear correct in giving preference to *Gyrotoma* over *Schizostoma*, Lea, on account of *Schizostoma*, Bronn, since (on p. 244) the latter name is placed in the synonymy of *Omalaxis*.

Another generic name *Schizostoma* is quoted in Hermann's Index. I have not obtained access to the work containing this description, but its date is said to be anterior to Mr. Lea's description.

Mr. Lea's second name, *Schizochilus*, had previously been used in Coleoptera but withdrawn before Mr. Lea's description was published.

Mr. Shuttleworth, in July, 1845, (*Mittheilungen der Naturforschenden Gesellschaft in Bern*, p. 88.) gives another description of the genus under the name of *Gyrotoma*, founded on two species from the Coosa River, descriptions of which are also given.

The generic name of Mr. Shuttleworth has been adopted in H. and A. Adams' *Genera of Recent Mollusca* (i. p. 305, Feb., 1854.)

Dr. Gray also (*Guide to Mollusca*, i. p. 103, 1857) adopts Shuttleworth's name.

Such being the confused state of the synonymy of the genus, we have decided to adopt, at least temporarily, the earliest name concerning which no doubt exists.

Only about ten species of this genus have as yet been published, eight of which are by Mr. Lea in 1842 and 1845, since which time few specimens have been collected, and but two new species added. I now propose to add descriptions of nine new species to the number already known, in one of which, "*G. salebrosa*," we note a character not hitherto observed, except in what was perhaps the original type of the genus, viz., a nodulous coronation upon or near the suture, which nodules by lateral compression assume the form of folds or plaits, thus approximating the longitudinal ribs of *Gyrotoma costata*, Swainson. *Gyrotoma bulbosa*, nob., herein described, also exhibits this character, though far less decidedly; and as specimens become more common, we may hope to re-discover the original type so long unknown.

GYROTOMA RECTA, Anthony.—Shell smooth, cylindrical, yellowish, thick; spire short, originally furnished with about 5 low whorls, of which 3 are nearly lost by truncation; fissure moderately broad, not quite direct and not remarkably deep; sutures lightly impressed; aperture narrow ovate, occupying about 3-5ths of the length of the shell; within dusky and obscurely banded; columella callous, thickened abruptly at the fissure.

Length of shell 11-16 in. Length of aperture 7-16. Breadth of shell $\frac{3}{4}$ in. Breadth of aperture 3-16.

Hab.—Coosa River, Alabama. My Cabinet.

Obs.—This is the most cylindrical species I have ever seen in this genus. In its general form and coloring it most nearly resembles *G. demissa*, nob., but is longer, more elevated, smoother, and is ornamented with bands, which on that species are entirely wanting; these bands on the body whorl are three in number, of which the middle one is the narrowest and least distinct; they are widely distant from each other; the cord-like cincture is very prominent in this species and the fissure is farther removed from the suture than is usual. It is altogether a beautiful and graceful species.

GYROTOMA DEMISSA, Anthony.—Shell short, robust, thick, truncate, of a dark horn color; spire flat by truncation, exhibiting traces of about four whorls; body whorl cylindrical; fissure broad, waved, and rather deep; aperture elliptical, within whitish; columella thickened along its whole extent, but most so at the fissure.

Length of shell 10-16 in. Length of aperture 7-16. Breadth of shell 7-16. Breadth of aperture 4-16. My Cabinet.

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Obs.—A fine cylindrical species, whose chief characteristics are its very smooth, polished surface, plain russet color, and flat, truncate spire; the lines of growth are unusually strong in this species, and the darker lines indicating the terminus of previous mouths are very distinct and numerous, evidencing frequent and many pauses in its growth; the columella is much bent near its base, and a narrow but distinct sinus is formed at about the middle space between the outer lip and columella. A single specimen only is before me, but seems so very distinct from all others that I have no hesitation in considering it new.

GYROTOMA QUADRATA, Anthony.—Shell short, smooth, fusiform, rather thick, olivaceous; spire short, composed of about 4 very low whorls, the upper two being partially obliterated by erosion; fissure rather broad, waved, but not remarkably deep; sutures distinct; whorls distinctly but not squarely shouldered; aperture elliptical, occupying more than half the length of the shell; within 3 banded; columella with a light callous deposit.

Length of shell 9-16 in. Length of aperture 6-16 in. Breadth of shell 7-16 in. Breadth of aperture 3-16 in.

Hab.—Coosa River, Alabama. My Cabinet; Cab. H. Cuming, London.

Obs.—The most remarkable characteristic at first view of this species is its short, square form; its color is dark, and the bands which are very broad are not very distinct; hence its general aspect is not so pleasing to the eye as many others; the fissure is broadly separated from the body of the shell, outer lip very sharp and sinuous, forming, with the columella, a small not very distinct sinus at base. In form it approaches most nearly perhaps to *G. salebrosa*, nob., but is more delicate in texture, thinner, and has no armature as in that species.

GYROTOMA BULBOSA, Anthony.—Shell striate, ovate, moderately thick, dark olive; spire obtusely elevated, subtruncate, 4 whorls only remaining; whorls of the spire subconvex; sutures very distinct, rendered more so by the shouldering of the whorls; body whorl inflated, subangulated a little below the suture, from which angle it shelves towards it, and having 2 or 3 dark, broad bands revolving round it; lines of growth curved and very distinct, almost like crowded ribs; fissure perfectly strait, very narrow and not deep; aperture rather long, of a dusky color within and ornamented by 3 broad and distinct bands there; columella smooth, except at the lower part, where it is slightly thickened.

Length of shell 9-16 in. Length of aperture 5-16 in. Breadth of shell $\frac{3}{8}$ in. Breadth of aperture 3-16 in.

Hab.—Coosa River, Alabama. My Cabinet.

Obs.—A short ovate species resembling in some respects *G. ovalis*, nob., herein described; it is less elevated than that species, more ventricose, and its surface is rougher; indeed, there seems to be indications of obscure folds on the body whorl of this species near the suture, which in very old specimens may be more fully expressed, and thus bring it into close affinity with *M. salebrosa*, nob. These folds, which were noted by Swainson as a generic character in his original type, and which are wanting in all the species since published, and now re-discovered, are exceedingly interesting in that connexion.

GYROTOMA OVALIS, Anthony.—Shell smooth, oval, olivaceous, moderately thick; spire obtusely elevated, composed of about 5—6 convex whorls, of which 2 are generally lost by truncation; sutures deeply impressed; aperture broadly elliptical, banded within; fissure direct, exceedingly narrow and very deep, extending nearly one half around the shell; columella slightly curved by a callus.

Length of shell 10-16 in. Length of aperture 7-16 in. Breadth of shell 7-16 in. Breadth of aperture 4-16 in.

Hab.—Coosa River, Alabama. My Cabinet.

Obs.—A fine symmetrical species remarkable for its regularly oval form and
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unusually deep, linear fissure; the whorls are somewhat shouldered, though not so much so as in many of the species; the spiral whorls are furnished with two broad bands, one near the top of each and the other widely separate and near the succeeding whorl, being often half concealed by it; there are 3 bands on the body whorl equidistant from each other; compared with *G. bulbosa*, nob., which it most nearly resembles, it is longer, more linear, and has not the rapidly attenuating spire of that species nor its roughly striate surface.

GYROTOMA AMPLA, Anthony.—Shell smooth, ovate, rather thick, olivaceous; spire not elevated, but acute; whorls 6—7, subconvex; sutures well defined; fissure broad, rather deep and waved; aperture moderate, elliptical, flesh colored and banded within; columella smooth, or slightly thickened only at the fissure; body whorl striate, and banded; whorls of the spire not banded, but having a thickened cord-like line near the suture.

Length 11-14 in. Breadth 7-16 in. Length of aperture 7-17 in. Breadth of aperture 4-16 in.

Hab.—Coosa River, Alabama. My Cabinet.

Obs.—A fine symmetrical species of this interesting genus which hitherto has not been very productive in species. Compared with *Schizostoma funiculatum*, Lea, which it most nearly resembles, it is smoother, thinner, more acute, and has not the double cord-like lines of that species. Most if not all the species of *Gyrotoma* have the fissure gradually filled up behind as it is pushed forward in the process of growth, by a cord-like line more or less prominent, often so much so as to produce quite a shoulder at the suture, and this species is so marked, but it has no cord-like line in the middle of the body whorl as described in *funiculatum*.

GYROTOMA SALEBROSA, Anthony.—Shell fusiform, robust, thick, nodulous, of a dusky olive color; spire truncated, leaving scarcely more than the body whorl, but indicating by traces on the truncation the loss of three or four others; fissure moderately open, waved, not deep; body whorl, roughly nodulous at the upper part and ornamented by three dark bands below; aperture ample, ovate, dusky within and bounded with three broad bands; columella deeply rounded, covered with a thick deposit of callus, white at its lower portion, but tinged with dark brown at the fissures.

Length of shell $\frac{3}{4}$ in. Breadth of shell $\frac{1}{2}$. Length of aperture $9\frac{1}{2}$ -16. Breadth of aperture 5-16.

Hab.—Coosa River, Alabama. My Cabinet.

Obs.—This species presents the unusual characteristic of a nodulous surface, which character has not been observed in any species hitherto described by any American author. These nodules are very conspicuous and much compressed laterally, so as to present very much the appearance of coarsely folded ribs, thus furnishing a close approximation to the original type from which Swainson formed the genus; on this account it becomes exceedingly interesting, as indicating great variety in the specific forms of this genus, giving assurance that among the many varied forms yet to be discovered we may at last find the identical species sent by Rafinesque to Swainson. These compressed nodules will at once distinguish it from all other species.

GYROTOMA CARINIFERA, Anthony.—Shell conic, thick, dark brown; spire obtusely elevated, truncate, though not abruptly so, six whorls remain, one or two having apparently been lost by truncation; carinations elevated, subacute and found on all the whorls, two on each of the spiral ones and three to four on the body whorl; fissure direct, broad, and moderately deep, extending about 1-5th around the shell; sutures irregular, much modified by the carinæ, and often concealed in part by them; aperture ovate and banded within; columella much rounded, callous at the lower part only; outer lip irregularly waved, its outline modified by the carinæ on the body whorl. No sinus.

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Length of shell $\frac{7}{8}$ in. Breadth of shell $\frac{1}{2}$ in. Length of aperture $5\frac{1}{2}$ -16 in.
Breadth of aperture $\frac{1}{4}$ in.

Hab.—Coosa River, Alabama. My Cabinet.

Obs.—This species cannot well be confounded with any other yet described. In general form and in its armature one is very forcibly reminded of *Melania annulifera*, Con., from which it differs, however, not only generically, but by its more ovate base; the carinæ are lighter in color than the general body of the shell, and are slightly irregular or sub-nodulous in outline; it is a stout, heavy species, and has a smaller aperture proportionally than is common in the genus; the bands within the aperture are five in number, very dark, and the three central ones are disposed to be confluent; a dark broad band revolves around the base of the shell. Compared with *Schizoztoma pagoda*, Lea, it differs in color, in its more elongate form, and by the character of its carinæ, which are more uniform, the main variation being that they are more diffused on the whorl, whereas, in Mr. Lea's species they are particularly conspicuous near the apex.

GYROTOMA ROBUSTA, Anthony.—Shell fusiform, robust, thick, of a dark olive color; spire obtuse, consisting of one perfect whorl remaining, with marks of two or three more, lost by truncation; body whorl broad, ornamented by three obscure, dark, wide bands; fissure rather broad, curved, not deep, closed behind by a cordlike cincture, very prominent, beneath which and close to it is a narrow depression or furrow; aperture narrow, ovate, banded inside; columella well rounded and covered by callus; lines of growth very distinct and much curved, rendering the shell rough by their prominence.

Length of shell $\frac{7}{8}$ in. Breadth of shell 9-16. Length of aperture 10-16.
Breadth of aperture 5-6.

Hab.—Coosa River, Alabama. My Cabinet.

Obs.—This is a large, robust species, somewhat resembling *Melania ampla*, nob. in form, and not unlike it in coloring; it is about the largest species I have seen in this genus, and certainly not the least beautiful; compared with *G. salebrosa*, nob., herein described, it is larger, smoother, more inflated, and has not the rib-like prominences so characteristic of that species; the lower part of the columella is somewhat flattened and thickened, and another thickening takes place at the aperture, leaving a thinner space between the two points.

ANCULOSA ORNATA, Anthony.—Shell conic, rather thick, smooth; spire elevated, composed of about five convex whorls; suture distinct; color dark yellow, polished, with dark brown bands revolving around the shell; three bands visible on the body whorl and only one upon the volutions of the spire; aperture ovate, livid and banded within; columella furnished with a callus, often tinted with rose color; sinus very small.

Hab.—North Carolina. My Cabinet; Cab. Hugh Cuming, London; A. N. S., Phila.; State Coll., Alb., N. Y.; Smithsonian Collection.

Obs.—A fine species, so much elevated as readily to be taken for a *Melania*; the dark bands on a yellow ground give it a lively appearance; about one hundred specimens are before me, and present very little variation; the dark bands within the aperture are very conspicuous, one being near the upper angle, two others near each other, but widely separated from the first, and a fourth near the base of the shell; the middle bands are often confluent, and all of them are arrested by a broad area before they reach the outer edge.

ANCULOSA LIGATA, Anthony.—Shell ovate, smooth, of a dark green color, rather thick; spire obtusely elevated, composed of about four whorls; suture very distinct; upper whorls flattened, body whorl constricted at the middle, banded; aperture ovate, banded within; columella deeply indented, callous; no sinus at base.

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Hab.—Alabama. My Cabinet; Cab. Hugh Cuming; A. N. S., Philad.; State Coll., Albany, N. Y.; Smithsonian Collection.

Obs.—This species, of which I have some twenty or thirty individuals before me, seems remarkably constant in character for an *Anculosa*, and not readily mistaken for any other; its color, which is a dirty dark green, is but poorly relieved by the faint bands on the whorl; nevertheless, it is an interesting species, and one which will always attract attention; its most prominent character is the constriction on the body whorl, which gives the appearance of a cord having been drawn tightly around it while in a yielding state.

ANCULOSA CORPULENTA, Anthony.—Shell ovate or broad ovate, smooth, thick; spire rather elevated; composed of 4–6 subconvex whorls; suture decidedly impressed; aperture very broad, ovate, ample, banded inside; columella well rounded, slightly covered with white callus, and with a slight indication of sinus at base.

Hab.—North Carolina. My Cabinet; Cab. Hugh Cuming, London; A. N. S., Philada.; State Coll. Albany, N. Y.; Smithsonian Collec., Washington, D. C.

Obs.—Cannot well be confounded with any of its congeners; it is unusually elevated for an *Anculosa*, resembling more a *Paludina* in that respect; the whorls are regularly but not abruptly shouldered, and are often excavated with a narrow channel at the middle; striæ and even indistinct carinæ are often visible, but are not a constant character; the bands within the aperture are not always well defined and are sometimes wanting altogether; when present they are generally five in number, and are arrested by a narrow white space at the outer lip; body whorl often subangulated.

Occurs in Dan river, North Carolina, in company with *Anculosa canalifera*, nob., and appears to be very common. Several hundred specimens of various ages are now before me.

ANCULOSA CANALIFERA, Anthony.—Shell ovate, costate, of a brown color, thin; spire acutely elevated, composed of 5–6 sharply carinate whorls; suture not very distinct; aperture about half the length of the shell, ovate, banded inside; columella deeply indented; sinus none.

Hab.—North Carolina, in Dan river.

My Cabinet; Cab. Hugh Cuming, London; A. N. S., Phila.; State Coll., Albany, N. Y.; Smithsonian Coll., Washington, D. C.

Obs.—One of our most curious and beautiful species, which no one can easily mistake; the whole shell is crossed with sharp, elevated costæ running around the whorls and corresponding deep grooves between them; about five costæ on the body whorl; a less number on the spire volutions; these ribs appear as dark bands in the interior of the aperture, and there is a broad non-elevated band at the base of the shell; differs from *Anc. costata*, nob., by the size and prominence of its ribs and by its elevated spire.

ANCULOSA VIRIDULA, Anthony.—Shell ovate, of a uniform dark green color, rather thin; spire much elevated, composed of 4–5 convex whorls; sutures very distinct; aperture ovate, large, about half the length of the shell, livid inside; columella well rounded; has a broad but not well defined sinus.

Hab.—Tennessee. My Cabinet; Cab. Hugh Cuming, London; A. N. S., Philada.; Smithsonian Coll., Washington, D. C.

Obs.—In form and coloring this species resembles *Paludina decisa*, Say, when that is about half grown, and but for its operculum one would hardly deem it an *Anculosa*; it is a plain, unadorned species, not liable to be confounded with any other; its body whorl is large and subangulated; lines of growth well defined and close; it has a slight disposition to shouldering at the suture; it is not an abundant species so far as at present known.

ANCULOSA PATULA, Anthony.—Shell ovate, of an uniform dark horn color, rather thin; whorls 4–5, convex; sutures very distinct; aperture semicircu-

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lar, within whitish; columella only slightly rounded, somewhat flattened by a callous deposit, more or less tinged with dirty red.

Hab.—Tennessee. My Cab.; Cab. Hugh Cuming, London; A. N. S., Philadelphia; State collection, Albany, N. Y.; Smithsonian collection.

Obs.—Resembles none other of the genus; its color, which is of a dull dark brown, and its semicircular mouth, remarkable for its length and breadth, are prominent marks of distinction; the body whorl is very much inflated and angulated or subangulated; the interior aperture is often blotched with irregular, dirty brown spots; spire elevated and acute, rapidly diminishing to the apex; the lines of growth are strong, and on some specimens a single prominent varix may be noticed.

ANCULOSA ELEGANS, Anthony.—Shell subglobose, smooth, thick; spire depressed, consisting of 3–4 flat whorls; color fine glossy dark yellow, ornamented with darker bands, of which five are on the body whorl; aperture obliquely ovate and banded within; columella deeply curved, with a heavy callous deposit; sinus very small.

Hab.—Alabama. My Cabinet.

Obs.—A highly ornamental species, which cannot be compared with any other; its bands on a yellow ground render it very lively; it is heavier and smoother than *A. ampla*, nobis, not so broad in the aperture and far more beautiful; neither is it so much shouldered as that species.

ANCULOSA ZEBRA, Anthony.—Shell subglobose, smooth, moderately thick; spire obtusely elevated, but slightly decorticated, and composed of four convex whorls; sutures distinctly impressed; aperture broad, ovate, within bluish, with the epidermal colors seen faintly through; columella rounded, covered with callus, which is thickened at the upper part.

Hab.—Alabama. My Cabinet.

Obs.—This species presents an appearance not often seen in the genus, by its mottled, variegated epidermis; the general ground color is gamboge yellow, but it is varied by blotches of very dark brown or reddish, often running into diagonal lines, which gives the shell a very lively and pleasant look. Only one other species is described as being similarly marked, viz., *A. flammata*, Lea; that species I have never seen, but the description does not warrant me in considering the two identical.

In old specimens the spire is often produced and somewhat nodulous, while the longitudinal bands become broken into irregular lines, so interrupted as to become scarcely more than quadrangular spots; it is one of our most beautiful species. About a dozen specimens are before me.

IO TURRITA, Anthony.—Shell conic, elevated, horn colored, spinous; spines rather short and heavy, about seven on each whorl; whorls nine; aperture pyriform, about one-third the length of the shell, and irregularly banded within; columella rounded, slightly twisted and forming a short, narrow canal at base.

Length of shell $2\frac{1}{2}$ in. Breadth of shell $\frac{3}{4}$ in. Length of aperture $\frac{7}{8}$ in. Breadth of aperture $\frac{7}{16}$ inch.

Hab.—Tennessee.

Obs.—This is the most slender and elongate species of this genus which has come under my notice, and although a single specimen only has as yet been discovered, its claims to rank as a species will hardly be questioned; its long, slender form, stout, closely set spines, and small aperture will at once distinguish it from its congeners; two faint bands traverse each whorl, one of which lies precisely in the plane of the spines; lines of growth very distinct, nearly varicose.

IO BREVIS, Anthony.—Shell conic, ovate, horn colored, spinous; spines short, thick, five on each whorl; whorls about seven; aperture elliptical or pyriform, one-half the length of the shell; columella rounded and sinuous
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near the base, forming with the outer lip a broad, well defined canal at the base.

Length of shell 2 in. Breadth of shell $1\frac{1}{4}$ in. Length of aperture 1 in. Breadth of aperture $\frac{3}{4}$ inch.

Hab.—Tennessee. My Cab.; Cab. Hugh Cuming, London; A. N. S., Philadelphia; State collection, Albany, N. Y.; Smithsonian collection, Washington, D. C.

Obs.—Another of the short, heavy forms in this genus, so unlike the normal type of *Io spinosa*; we think no one need confound it with any other species; its short, heavy, flattened spines jutting out like so many miniature spear heads and its peculiarly twisted columella will readily characterize it. The columella is also covered with a dense callous deposit, increased in thickness at its upper part, and often blotched with dark red at that point; irregular, ill defined, but broad bands are seen in the interior, often faintly visible on the epidermis. Appears to be a rather common species in some localities, of which I possess some hundreds of specimens.

Io INERMIS, Anthony.—Shell conical, smooth, thick; moderately elevated, composed of 7—8 flattened whorls; suture very distinct; upper whorls slightly coronated by an obscure row of low spines nearly concealed by the preceding whorl; shell otherwise perfectly smooth or only occasionally or obscurely nodulous on the body whorl; lines of growth very strong and much curved; aperture pyriform, curved to the left, banded within; columella twisted, callous, thickened above; sinus long and curved.

Length of shell 2.1-1.6 in. Breadth of shell 1 in. Length of aperture 1 inch. Breadth of aperture $\frac{1}{2}$ inch.

Hab.—Tennessee. My Cab.; Cab. Hugh Cuming, London; A. N. S., Philadelphia; State collection, Albany, N. Y.; Smithsonian collec., Washington, D. C.

Obs.—Remarkable mainly for its plain, unadorned exterior and smooth epidermis; its color is also lighter than "spinosa" or "fluviatilis". No spines are visible on the body whorl of this species generally, but I have a few specimens which may perhaps belong to it, and which have a few obscure spines near the aperture; these are, however, little more than knobs. Some hundreds of this species have come under my notice.

Io SPIROSTOMA, Anthony.—Shell conical, broadly ovate, horn colored, spinous: spines short, thick, seven to eight on each whorl; whorls about nine; aperture ovate, about half the length of the shell; columella and outer lip much and regularly twisted, and forming a well defined sinus at base.

Length of shell $1\frac{3}{4}$ in. Breadth of shell $1\frac{1}{4}$ in. Length of aperture 1.5-1.6 in. Breadth of aperture $\frac{1}{2}$ inch.

Hab.—Tennessee. My Cab. and Cab. Hugh Cuming, London.

Obs.—This is truly a most remarkable species of this highly interesting genus of Mollusks; its difference from the ordinary type of *Io spinosa* is too marked to admit of its being confounded with that, or indeed any other species; its stout, ovate form, short, heavy spines, and, above all, the peculiar and graceful curvature of its outer lip, are prominent characteristics and readily distinguish it. Among several thousand specimens of *Io* in my possession, but three adult individuals of this species have been noticed, although I have a dozen or more which seem to be immature forms of it; it may therefore be considered as not only one of the most aberrant and beautiful forms of *Io*, but also one of the rarest.

Paludina Lima, Anthony.—Shell ovate, rather thin, dark green; spire obtusely elevated and composed of six convex whorls, which are strongly striate or subcarinate; sutures very distinct, and the upper part of each whorl being flattened renders it more conspicuous; aperture broad-ovate, about half the

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length of the shell, livid within; columella slightly rounded and callous deposit small; umbilicus none.

Length $1\frac{1}{4}$ inches. Breadth $\frac{3}{4}$ inch.

Hab.—South Carolina. My Cab.; Cab. H. Cuming, London; A. N. S., Philada.; Smithsonian collection, Washington, D. C.

Obs.—In general form not unlike our Western *P. integra*, Say, from which it differs, however, by its revolving, raised striae and by its carina, which are also well developed; the lines of growth are very strong, and decussating with the stria give the surface a beautifully rough appearance, which suggests its specific name. It is really one of our handsomest species, and so unlike all others that no American species can readily be mistaken for it. In most specimens the body whorl is very strongly carinate about the middle, and the outer lip is considerably produced as in *P. subsolida*, nob.

PALUDINA DECAPITATA, Anthony.—Shell globular, thin, of a light green color; spire truncate, but never elevated under any circumstances, composed of about four very flat whorls; aperture broad, ovate, one-half the length of the shell, within dusky white; columella regularly but not deeply rounded, with a slight deposit of callous, and having a very small linear umbilicus at base.

Hab.—Tennessee. My Cabinet.

Obs.—A single specimen only is before me, and therefore I claim it as a new species with some hesitation; it seems to me, however, too unlike any of the ordinary forms in this genus to warrant its being included with any of them; it is the most globose of any species hitherto published, if we except the small, round forms which were long since removed, and very properly too, to *Amnicola*; the spire is entirely wanting, but traces of the sutures show the number of whorls; and its present appearance forbids the idea of its ever having had an elevated spire.

PALUDINA HUMEROSA, Anthony.—Shell ovate, thick, bright green, imperforate; spire rather obtusely elevated, composed of about 5—6 convex whorls; upper whorls smooth, body whorl and preceding one strongly striate and granulate or subgranulate; sutures very distinct; aperture ovate, nearly one-half the length of the shell, livid within.

Length about half an inch.

Hab.—Alabama. My Cabinet.

Obs.—A single specimen only is before me, but it is sufficiently distinct; its granulated surface and the broad shouldering of the whorls are its chief characteristics; compared with *P. genicula*, Con., it is more slender, darker in color, and its granulated surface is of itself a sufficient distinction.

PALUDINA EXILIS, Anthony.—Shell turritid, smooth, rather thick; color light apple green; spire elevated, composed of about seven volutions; suture well marked; aperture small, broad-ovate, livid within; body whorl distinctly angulated, subumbilicate, and with very distinct lines of growth; columella well rounded and curved with a callous deposit, connecting perfectly with the outer lip thus forming a continuous rim.

Length $1\frac{1}{4}$ inches. Breadth $\frac{3}{4}$ inch.

Hab.—Mississippi. My Cab.; Cab. H. Cuming, London; A. N. S., Philadelphia; State collection, Albany, N. Y.; Smithsonian collection.

Obs.—One of the most slender of our American species; *Paludina subsolida*, nob., is more ponderous, more globose, and has a larger aperture; no other species approaches it in general appearance; the whorls of this species taper more rapidly to an acute apex than in most of the species; compared with *P. integra*, Say, it is more slender, more solid, and the aperture is much smaller.

PALUDINA SUBSOLIDA, Anthony.—Shell ovate, imperforate, very thick; color light green, verging to brown in old specimens; spire much elevated, composed of 6—7 inflated whorls; sutures very distinct; aperture broad-ovate, 1860.]

about one-third of the length of the shell, within white; lip curved forward and forming a very conspicuous, subacute tip near its base; columella well rounded, a thick callous deposit covering the umbilicus.

Length 2 inches; breadth $1\frac{1}{4}$ inches.

Hab.—Illinois. My Cab.; Cab. Hugh Cuming, London.

Obs.—This is the most ponderous species in the genus, far exceeding *P. ponderosa*, Say, in that respect; compared with that species it is not only much more solid and heavy, but its spire is proportionally more elongate, whorls more convex, while the body whorl is less ventricose, and the aperture is uncommonly small for a *Paludina* of its size; the body whorl is disposed to be angulated near its middle; all the whorls are more or less shouldered and the lines of growth are very conspicuous; the body whorl is obscurely striate concentrically, and its surface thereby modified so as to present a faintly sculptured appearance, and the striae being somewhat finely undulated the appearance under a microscope is very pleasing.

Supplement to "A Catalogue of the Venomous Serpents in the Museum of the Academy," etc.

BY E. D. COPE.

Species 19. *Teleuraspis Castelnau* Cope. Another specimen, obtained in a collection made between Fort Riley and Pike's Peak, Kansas, with *Sceloporus undulatus*, *Ablabes occipitalis*, *Bascanion flaviventris*, etc. As the same collection, however, contained a specimen of *Liophis reginæ*, the occurrence of the South American serpent in question was doubtless the result of accident or mistake.

P. 345. After *Elaps altirostris* insert

64. *E. Hemprichii* Jan, Rev. et Mag. de Zoologie, 1858, p. 524.

One spec.

Surinam.

Dr. Colhoun.

Our specimen differs from those described by Prof. Jan with respect to the number of gastrosteges included in the black rings. In those the central ring covers but one plate; in ours, four, the lateral ones six or seven. The great breadth of these rings compared with the light spaces, distinguishes it at once from any other species which we have seen. The muzzle is short, and the nostrils widely separated. Total length 11 inches. Gastrosteges 181, anal 1, urosteges 27.

P. 346, species 51. A more careful examination of the two specimens here assigned, with a mark of doubt, to *Elaps Marcgravii*, has convinced us that neither of them belong to that species, and that they are in fact distinct from each other. The smaller we believe to be undescribed. After filiformis *Gthr.* it is the most slender South American *Elaps*. Upon comparing it with a young *E. lemniscatus*, which has a head of the same size, the proportions of the body and tail are nearly similar, but the number of sets of rings is rather less. The head is not so broad posteriorly, and the occipital plates are a little more elongate. The principal difference, however, lies in the distribution of colors on the head. This is entirely black above and below as far as three scales behind the occipitals, except a yellow band behind the post-oculars. This covers the sixth upper labial, one temporal above it, anterior third of the occipitals, hinder edge of superciliaries, and greater part of the vertical. Superior labials seven, third and fourth coming into the orbit. Distance from the black of the head to first ring, eleven scales. Eight sets of rings, the middle not twice as wide as the external ring, which is as broad as the yellow interval. Gastrosteges 197; anal 1; urosteges 19 pair. Length 11 in. 9 l.

We propose calling this species *Elaps melanogenys*.

One specimen, presented by Dr. Wilson; locality unknown.

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E. Gravenhorstii Jan, loc. cit. p. 524, resembles this species, but has a black half-collar only, and a longer tail. The preocular is very small, separated from the nasal by the contiguous post-frontal and superior labial. In our species the preocular is unusually large, and in contact with the nasal.

Species 53. The three specimens here referred to *frontalis* *D. & B.* belong to a species nearly allied to *lemniscatus*, apparently undescribed. The most prominent differences are, the exact equality of the black rings in width, the shorter intervals between the triads, and the position of the first ring which touches the occipital and last labial shields. In *lemniscatus*, its vars. *frontalis* and *baliocoryphus*, in *Maregravii* and *decoratus*, the first black ring is several scales behind the angle of the mouth, the intermediate space being red; also the central ring of each three is wider than the external. Distance between the middle and outer of the three rings in our specimens of *lemniscatus* two and three scales; in *isozonus* (as we now call this serpent) four. In the former the anterior part of the occipitals is crossed by a black band; in the latter they are entirely white, (red?), except a little black at the posterior ends.

E. isozonus nob.—Sets of rings twelve. No. 1, gastrosteges 201; anal 1, entire; urosteges 28, first 9 entire. No. 2, 218; anal 1, divided; urosteges 26. No. 3, 213 gastrosteges; anal 1, divided; urosteges, 29, two entire. We do not know the part of South America inhabited by this serpent.

Species 54. The specimen here described as *Elaps baliocoryphus* is, as we now believe, a variety of the *lemniscatus*. It resembles the figure of the var. *frontalis* *D. & B.* ("Maregravii" *Pr. Max.*) in *Abbild. Naturgeschichte Brasiliens*, differing in having an additional red (white) band across the fronts of the occipitals. Whether *Maregravii* *D. & B.* be a variety of *lemniscatus*, as believed by Dr. Günther, or not, the latter is certainly liable to great variation in the distribution of colors on the head.

In place of *E. baliocoryphus*, insert

54. *E. filiformis* Günther, Proc. Z. S. 1859, p. 86.

The head of our specimen is so badly mutilated that the characters could not be made out without difficulty. We are, however, much gratified to be able to record our probable possession of the interesting species described as above. It may be known from other American *Elapses* by its excessively elongate form and the possession of but one postocular. In a few particulars it differs from Dr. Günther's description. The nasal plates are two: two temporals bound the upper border of the sixth labial shield, the anterior of which reaches the postocular. There is no light-colored band across the post-frontals. Triads of rings nineteen, disposed as in the description.

Preocular acute anteriorly, just touching the nasals; hence the post-frontals are bent down, and almost reach the labials. Third, fourth and fifth superior labials narrow and high, eye resting on the suture of the last two. Gastrosteges 308; anal 1, divided; urosteges 42. Length 21 in. 9 l.

One sp.

Dr. Wilson.

To assist further in the identification of the species of *Elaps* having the rings arranged by threes, we have prepared the following table. Those marked with an asterisk are not in the Museum of the Academy.

A. Postoculars two.

Head compressed, lanceolate.

Labials not reaching the occipitals.

ALTIROSTRIS Cope.

Head depressed.

Sixth superior labial reaching the occipital.

*DECORATUS Jan.

Sixth superior labial not reaching the occipital.

† Posterior part of occipitals included in a black collar or half-collar.

a. Neck surrounded by a narrow yellow ring.

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- Cephalic plates black; an imperfect postocular cross-band. *ELEGANS Jan.
 Red, bordered with black. SURINAMENSIS Cuv.
- b. Neck covered by the black collar. *GRAVENHORSTII Jan.
 Post-frontals touching the labials.
 Post-frontals not touching the labials; *GRAVENHORSTII Jan.
 Genieal shields entirely black. MELANOGENYS Cope.
 Red or yellow;
 Scales between middle and outer black ring red. ISOZONUS Cope.
 Black with large white spots. DISSOLEUCUS Cope.
- †† Occipital shields not traversed by a black collar or half-collar.
- a. Rings absent on the belly, divided and alternating above. ALTERNANS D. & B.
- b. Rings entire;
 The middle one of each three more than twice as wide as the outer. *DUMERILII Jan.
 Not more than twice as wide as the outer,
 But twice as wide as the red spaces between the triads. HEMPRICHI Jan.
 Not twice as wide.
 First black ring just touching occipitals ISOZONUS Cope.
 Some distance behind them;
 Before the eyes uniform black. *MARGRAVII D. & B.
 A red band. LEMNISCATUS Schu.
- B. Postoculars one. FILIFORMIS Gthr.
- Body very slender.
- Species 57. *Platurus fasciatus* Daud., add
 One sp. Raiatea. Dr. J. Wilson, U. S. N.
- Species 63. *Pelamis bicolor* Daud., add
 One sp. Pacific coast of Panama. Dr. J. Wilson, U. S. N.

We correct the following typographical errors in the Catalogue:—

Page 332, line 20, for "those" read these.

- " 333, " 35: for "Proteroglyphis" read Proteroglyphes.
 " 338, " 12: for "Dr. Coleman Pemberton" read Dr. J. P. Coleman.
 " 338, " 19: for "plants" read flanks.
 " 341, *Pelias berus*: for "var. niger Bell," read var. *prester* Linn.
 " 342, line 11: for "BRACHYCRANION," read BRACHYCRANION.
 " 343, " 19: for "H. pallidiceps Gray" read H. pallidiceps,
Gthr.
 " 343, " 33: for "SEPEDON Cuvier" read SEPEDON Merrem.
 " 344, *Bungarus fasciatus*: for "Three sp." read Five sp.
 " 345, line 37: for "E. Bertholdi," read E. Bibroni.
 " 347 " 5: for "Hydrophia," read Hydrophis.

Catalogue of Colubridæ in the Museum of the Academy of Natural Sciences of Philadelphia. I. Calamarinæ.

BY E. D. COPE.

4. COLUBRIDÆ.

Essential char.—Superior maxillary bone horizontal, articulating with the anterior frontal by a lateral process; its anterior prolongation bearing teeth neither perforated nor channelled for the reception of a venom duct. The posterior prolongation uniting to the ectopterygoid by a horizontal, oblique

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articulation. Superior processes of the caudal vertebræ not elongated; hypapophyses bifid.

Char. not universal.—Top of head plated. Belly protected by broad plates. Tail cylindrical. Penis simple.*

The *Chersydrus granulatus* has a compressed tail somewhat resembling that of the sea snake's, and adapted to habits similar in many respects. Yet even in external form it bears a greater resemblance to that of some of the Boas, having a prehensile character. A comparison of the caudal vertebræ of this serpent and the *Hydrophis pelamidoïdes* shows the following differences: In the latter the neural spines are slender and greatly elongated, and the pleurapophyses† slender, elongated, and but little diverging. The "appendages" of the latter, which in all serpents appear in the last dorsal and first caudal vertebræ, and are doubtless the homologues of the re-verted processes on the ribs of birds, partake of the same nature. The hypapophyses are similar to those of the dorsal vertebræ, being undivided, with the exception of those upon the first two vertebræ, whose pleurapophyses are destitute of the appendage. These are slightly bifid.

In the *Chersydrus* the structure is entirely that of the Colubers. The neural spines are short and compressed; the pleurapophyses short and diverging; and the hypapophyses bifid, and their lateral moieties separated. Thus in addition the difference in the armature of the mouth, the structure of the tail separates this genus from the sea snakes. Its position appears to us to be between the Homalopsinæ and Boiæ,—connected to the latter by *Xenodermus Reinwt.*, as indicated by Dumeril and Bibron.

CALAMARINÆ.

CALAMARIA Boie. Type *C. Linnaei*.

Isis, 1827, p. 519.

65. *C. Gervaisii* D. & B., vii. p. 63.

Four sp.

Philippine Is.

Mr. Cuming.

One (young).

ASPIDURA Wagler. Type *A. brachyorrhos*.

Naturlich. Syst. der Amphib. p. 191.

66. *A. brachyorrhos*, Gthr. Cat. Brit. Mus. 14. *Scytale brachyorrhos* Boie. Isis, 1827, 517. *A. scytale*, D. & B., vii. 178 ("Wagler" D. & B. et Gthr.).

One sp.

Ceylon.

Mr. Cuming.

67. *A. trachyprocta nobis*.

Form stout, not elongate. Tail short, thick, one-eighth of total length. Scales in fifteen rows, broad, not imbricate, smooth. The scales in the four or five rows each side of the anus, for a distance of from four or five scales in front to nine or ten behind the anus, are marked each with a small recurved tubercle near the anterior border. Anal shield entire. Superior labials six, last largest; the eye resting on the fourth. Inferior labials five. Posterior pair of genæ shields separated by a central complementary plate. Head shields similar to those of *A. brachyorrhos*, except that the occipitals are more rounded posteriorly, and the lower postoculars larger. Gastrosteges 135, 1 entire anal, 21 entire urosteges, and a small central postanal plate. Total length 8 in. 2 l. Tail 1 in.

Coloration.—Upper surface of head and body deep brown, becoming lighter on the third and fourth longitudinal rows of scales, and contracted on the tail to a narrow median vitta. A blackish brown band passing through the eye,

* *Coronella cana* is one exception, fide Schlegel.

† These were inadvertently alluded to, Proceedings, 1859, p. 333, as "hæmal spines."

and along the adjacent edges of the scales of the second and third rows, indistinct on the sides, but distinct on the tail. Superior labials and throat yellowish; belly grayish, largely varied with black, which forms an irregular longitudinal band.

This is a more robust serpent than the well-known *brachyorrhos*, and has a shorter and thicker tail. While this has 21 urosteges, our specimen of the other has 32. The latter has the scales in 17 rows (15 Günther), and they are more elongate and imbricate; it has not the supplementary genaeal plate, and above all, the peculiar tuberculation of the ischiadic region. This exists elsewhere only—as far as we know—in the *Trachischium rugosum Gthr.*, of the Himmelayas, also a Calamarian, and is doubtless an assistance to the animals in burrowing in the earth, and among unyielding objects.

Another difference between this serpent and the *brachyorrhos* is seen in the less elongated form of the head of the former, the rather shorter labials, and much shorter genaeals. The eye, too, is a trifle longer, and more anterior. The coloration is quite different; we only note here, the absence of the large neck spots in *trachyrocta*.

One sp. Ceylon. Mr. Cuming.

HALDEA Baird & Girard. Type *H. striatula*.

Catal. Rept. Smiths. Inst. Serp. p. 122, 1853. *Conocephalus* Dumeril. Prodrome de la Classification des Reptiles Ophidiens, pp. 43 et 46, 1852, and Günther Cat. Brit. Mus. p. 17. Not of Thunberg, 1812, (Orthoptera.)

68. *H. striatula* B. ♂ *D. Conocephalus striatulus* D. & B., Erp. Gen. et Gthr. l. c.

Two sp.	S. Carolina.	Dr. Edwd. Hallowell.
One sp.	N. Carolina.	?
One sp.	Richmond, Va.	Smithsonian Inst.
One sp.	N. America.	?

TROPIDOCOLONIA nobis. Type *T. lineatum*.

Microps Hallowell Proc. Acad. Nat. Sci. viii. 1856. Not of Megerle, 1823, (Coleoptera Oedemeritæ.)

This genus is allied to *Isechnognathus* D. ♂ *B. Streptophorus* and *Elapoidis* agree with it in having divided urosteges, carinate scales and two internasals, but differ thus, *Streptophorus*, two post-, no preocular; *Elapoidis*, one post-, two preoculars; *Tropidocolonia*, two post-, one preocular.

69. *T. lineatum* nob. *Microps lineatus* Hallow. l. c. Two sp. Kansas. Dr. Hammond.

STREPTOPHORUS D. & B. Type *S. Sebæ*.

Erp. Gen. vii. 514.

70. *S. Sebæ* D. ♂ *B. Elapoides fuscatus* Hallow. Journ. Acad. iii. 35, pl. 4.

One sp.	Honduras.	Dr. Woodhouse.
Two sp.	?	Gard. of Plants.

71. *S. atratus* nobis. *Coluber atratus* Hallow. Proc. Acad. Nat. Sci. ii. p. 245, 1845. *Streptophorus Drozii* D. & B. vii. 518, 1854, Günther l. c.

We are glad to be able to restore the name given by Dr. Hallowell to this species many years before that of the *Erpetologie Generale*. The specimen described by him is rather paler than the others—justifying the expression, "lead colored." The "six" superior labials is an anomaly, other specimens having seven. None of the specimens have the dark color on the chin and throat mentioned by Dumeril—but this is not probably an important character, as Günther does not allude to it.

Four sp. Venezuela, within 200 miles of Caraccàs. Dr. Ashmead.

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72. *S. bifasciatus* D. & B. vii. 520.—In this species the carinæ are very strong, and present on every row of scales. It is of a slender, elongate form as mentioned by its describers, resembling the species of *Ablabes* in its proportions. For this reason we question the propriety of removing this genus from the neighborhood of *Ichnognathus*, where Dumeril places it, and it is only the Calamarian form of *S. atratus* that induces us to consent to the position assigned by Günther. Our specimens of species being fresh, we will note: that the superior surface is not properly black, but deep slate; and that the collar and inferior labial plates are light yellow. The black upon the *gastrosteges* covers an extent rather wider than each white lateral band.

Three specimens, Jalapa, Mexico, Sr. Raphael M. De Oca.
One “ “ “ “ “ “ Mr. Pease.

TANTILLA Bd. & Grd. Type *T. coronata*.

Catalogue Serp., p. 131.

This genus appears to be quite distinct from *Rhabdosoma* D. & B., being characterized by a more slender body, longer tail, divided anal, and a loreal plate, either united to the postfrontals or wanting. The latter two peculiarities also distinguish it from *Rhabdion* D. & B. Posterior maxillary teeth equal to the anterior, smooth. Perhaps *Rhabdosoma elaps* Gthr. l. c. 241, belongs here; its anal scute is, however, entire.

73. *T. Hallowelli* nob. *Tantilla gracilis* Hallow., Proc. Acad. Nat. Sci. viii. p. 246.

This species is accurately described as cited, and the differences between it and *T. gracilis* pointed out. These, we think, are of specific value, and accordingly name it after Dr. Hallowell, as a slight recognition of his many valuable contributions to herpetology.

The form of this species is more like that of *Haldea striatula* B. & G., than *Carphophiops amoena*. The locality, "Indianola," assigned by Dr. Hallowell, is probably a mistake, being copied from Baird & Girard's Catalogue. We have one specimen brought from Kansas by Dr. Hammond.

74. *T. reticulata* nob.—Vertical plate broad, slightly angular in front, projecting posteriorly for half its length between the occipitals. Occipitals and both pair of frontals rather broad. Rostral broad, visible from above. Nostril in the posterior part of prenasal; postnasal in contact with first and second superior labials, preocular, post- and prefrontals. Two postoculars, upper one in contact posteriorly with the occipital, the lower touching one temporal. A second temporal equal to the first, and a third very small one behind it. Superior labials, seven last largest, third and fourth entering the orbit both low. Four genials, anterior in contact with inferior rostral. Scales in fifteen rows, last one slightly larger. *Gastrosteges* 148, postabdominal 1 divided, *urosteges* 67 pair. Total length 10 in. 3 l.; tail 3 in.

Color above chestnut brown, much darker posteriorly, extending upon the tips of the *gastrosteges*. Anteriorly the scales are edged with darker, presenting a reticulated appearance. Central dorsal row of scales lighter, forming a pale vitta, disappearing on the tail. Third and fourth rows on each side also lighter, forming indistinct bands. A collar of the same pale yellow brown crosses the ends of the occipitals. Cephalic plates clouded and edged with darker; a deep brown mark extending from the occipitals to the mouth across the yellowish labials. Beneath pale yellow, deepening posteriorly.

One specimen, Cocuyas de Veraguas, New Grenada, R. W. Mitchell.

This species seems to be much like the *T. coronatum* B. & G., but has a much longer tail, and broader head-shields; the upper post-ocular, not the lower, is in contact with the temporal in the latter. See Pacif. R. R. Report, x. Reptiles, pl. 38, fig. 96.

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RHABDOSOMA D. & B. Type R. semidoliatum.

Erpet. Gen. vii. 90.

75. R. semidoliatum D. & B.

Two specimens,	Mexico,	?
Six "	Jalapa, Mexico,	Sr. R. M. De Oca.
One " (young)	" "	Mr. Pease.

This species appears to be very common in central Mexico. The spaces between the black spots on the dorsal region, described by authors as white, are in life of a beautiful vermilion color.

76. R. fuliginosum nobis. *Coluber fuliginosus* Hallowell, Proc. Acad. Nat. Sci. ii. p. 243, 1845. ? *Isoscelis et Rhabdosoma maculatum* Günther, Cat. Brit. Mus. 204, 241, 1858.

Six superior maxillary teeth on each side in a continuous series, the anterior longer than the posterior, but not longer than the middle two. Seven inferior maxillaries on each side regularly increasing in length anteriorly. This peculiar dentition induced us to consider this serpent a Lycodont, but subsequent examination and comparison with Dr. Günther's description of his *Rhabdosoma maculatum* has persuaded us that the two species are very similar, possibly identical. The most material difference is, that the *maculatum* has seven superior labial plates, the *fuliginosum* six. Of those of the latter, the third is elongated, and with the fourth entering the orbit. Genials one pair; vertical broader in front than its greatest length. Postoculars two, temporals three; loreal long and narrow. Color reddish brown, a darker shade crossing each occipital obliquely and uniting behind them into a dorsal band, which is soon broken into spots. These are obsolete on the middle and hinder part of the body. No lateral series of spots. Belly immaculate. See Hallowell l. c.

One specimen, Near Caraccas, Dr. S. A. Ashmead.

77. R. torquatum D. & B. vii. p. 101. "*Brachyorrhos torquatus* H. Boie, Erpét. de Java."

Superior labials eight, fourth and fifth coming into the orbit. One postocular; one pair of genials. The color of our specimen is a very deep brown, so dark that the transverse series of black spots can only be seen in certain lights. The opalescent play of colors is unusually beautiful on this account. Beneath dark brown, posteriorly finely punctulated with darker.

One specimen, Surinam, Dr. Hering.

78. R. crassicaudatum D. & B. vii. 103.

Seventeen longitudinal rows of scales; two postoculars; seven superior labials, third and fourth entering the orbit. In these important particulars our specimen is similar to those of Dumeril, but the coloration is totally distinct. Though much bleached by the alcohol, the animal was, probably, pale brown, each scale tipped with darker, with a dorsal vitta of the same extending from the occipitals to the end of the tail. Beneath yellow, immaculate.

One specimen, Surinam, Dr. Hering.

CARPHOPHIPS Gervais. Type C. amoena.

Diet. Nat. Hist. Univers. (dir. par M. C. D'Orbigny,) iii. p. 191, 1843. *Carphophis* Dumeril, Prodrome de la class. des Rept. Ophidiens, pp. 43 et 46, 1852. Erp. Gen. vii. p. 131, 1854. Günther l. c. 17, 1858. Not of Gervais l. c. 191, 1843. *Celuta* B. & G., Cat. Serp. 129, 1853.

This genus is characterized by Gervais as cited, who refers to Dumeril and Bibron; but we cannot find it published by the latter prior to 1852. *Carphophis Gerv.* has the characters of *Calamaria Boie*, and hence cannot be applied to the *Coluber amoenus* Say.

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79. *C. amoena nobis*. *Coluber amaenus* Say, Jour. Acad. Nat. Sci. iv. 237. *Calamaria amoena* Schl. Ess. Phys. Serp. 31. *Brachyorrhos amoenus* Holbr. Am. Herp. iii. 115. *Carphophiops vermiformis* Gervais, Dict. Univ. d'Hist. Nat. iii. 191. *Carphophis amoena* Dum. & Bibr. vii. 131. *Celuta amoena* B. & G. l. c. 129.

Four specimens,	Pennsylvania,	?
Two " "	" "	Drs. Holbrook and Hallowell.
" " "	Beesley's Point, N. J.,	Mr. Samuel Ashmead.
One " "	Cape May Co., N. J.,	Mr. Tiffany.
" " "	Virginia,	Jno. Cassin, Esq.
Two " "	S. Carolina,	Smithsonian Institution.
One " (young)		Dr. Harlan.

VIRGINIA Bd. & Grd. Type *V. Valeriae*.

Catal. Rept. p. 127.

This genus is characterized by the elongated form of the shields of the head, and the distinctness of the latter from the body. There are two small nasal plates, as in *Rhabdosoma*.

80. *V. Valeriae* Bd. & Grd. l. c.

One specimen, ? ?

HOMALOSOMA Wagl. Type *H. lutrix*.

Nat. Syst. Amph. 190, 1830.

81. *H. lutrix* D. & B. vii. p. 110.

Two specimens, Cape of Good Hope, Garden of Plants.

OLIGODON Boie. Type *O. subquadratum*.

Isis 1827, p. 519.

82. *O. sublineatum* D. & B. vii. p. 57.

One specimen, Ceylon, Mr. Cuming.

Genera 11. Species 18. Specimens 54.

The stoutness of the body and tail, and the shortness of the latter, the indistinctness of the head, and the general firmness and rigidity, are characters by which the greater number of the species of this sub-family may at once be recognized. But as in some genera, certain of these peculiarities vanish, thus approximating them to other groups, we have followed M. Dumeril in employing the dentition, which is here quite characteristic. Elsewhere, however, it evidently fails to characterize natural groups, as urged by Dr. Günther in his invaluable catalogue of the Colubrine snakes in the British Museum. We have, therefore, omitted the genera *Rhinostoma*, *Phimophis** and *Homalocranium*, which have the posterior superior maxillaries grooved, and are perhaps more nearly allied to *Scytale*. A single specimen of *Scytale coronatum*, of a variety near that called *S. Newiedii* in the *Erpetologie Generale* was described by us, Proc. of this Acad., 1859, p. 294, as *Olisthenes eupheus*. Our conviction of its generic distinctness was grounded upon the peculiar form of the rostral plate, which while offering strong characters among some serpents, here varies with the individual.

* *Phimophis Guerini*, the only species. It is *Rbinosimus Guerini* of Dumeril and Bibron, but the generic name was applied to certain species of *Curculionidæ*, by Latreille, more than fifty years previously.

Descriptions of new species of *Cyrena* and *Corbicula* in the Cabinet of the Academy of Natural Sciences of Philadelphia.

BY TEMPLE PRIME.

1. *Cyrena ponderosa* Prime. C. testasubtrigona, inaequilaterali, transversim irregulariter striata, epidermide brunnea vestita, valvis crassis, solidis; intus candidissima; umbonibus parvis, obliquis, erosis; dentibus cardinalibus tribus; dente laterali postico compresso, antico brevior, acuto.

Shell somewhat triangular, inequilateral, lines of growth irregular, epidermis brown, valves heavy; interior white; umbones small oblique, eroded; three cardinal teeth; posterior lateral tooth compressed, anterior one short and prominent.

Long. 1 4-5; lat. 1 3-5; diam. 1 2-5 poll.

Hab.—Philippine Islands.

This shell is remarkable by its weight in proportion to its size. It may be compared to the *Cyrena Bengalensis Lamarck*, from which it differs, however, in being heavier, having less prominent beaks, and by being slightly more inflated; its epidermis is darker and more heavily sulcated.

2. *Cyrena Corbiculaeformis* Prime. C. testa trigona, sub-inflata, inaequilaterali, intus violacea, epidermide brunnea vestita, umbonibus tumidis; dentibus cardinalibus tribus, inaequalibus; lateralibus praelongis.

Shell triangular, somewhat inflated, inequilateral, beaks prominent, posterior margin angular, three cardinal teeth, the two posterior ones of nearly the same size, anterior one less developed; lateral teeth elongated, not prominent; interior of the valves bluish-white; epidermis glassy, lines dark brown.

Long. 1 3-10; lat. 1 2-10; diam. 0 7-10 poll.

Hab.—Cochin in Malabar.

This species is different from any *Cyrena* known to me, but bears much resemblance in its general form to certain species of *Corbicula*.

3. *Corbicula rotunda* Prime. C. testa parva, orbiculata, subaequilaterali, tumidula, subtrigona, solidiuscula, epidermide flavescens vestita; regulariter striata; umbonibus tumidis; intus alba; dentibus cardinalibus inaequalibus; lateralibus elongatis, angustis, subaequalibus, arcuatis, tenuissime striatis.

Shell small, somewhat inflated, nearly equilateral, interior white, epidermis yellow, lines of growth delicate and very regular; umbones prominent; cardinal teeth unequal in size; lateral teeth elongated, carved, finely denticulated.

Long. 0 7-10; lat. 0 6-10; diam. 0 6-10; poll.

Hab.—Surinam River, Guyana.

Compared to the *Corbicula Paranaensis Adams*, this species differs in being more inflated, in having larger beaks and by its more regular lines of growth, which give it somewhat the appearance of an Eastern species.

The Humming Birds of Mexico.

BY RAFAEL MONTES DE OCA.

Of Jalapa, Mexico.

No. 2.

CYANOMYIA CYANOCEPHALA Gould.

Ornismyia cyanocephala Lesson.

Trochilus quadricolor Vieillot?

The Black billed Azure-crown, Gould, Monograph, part xi.

This Humming Bird is commonly known by the name of *Chupa-mirto*, comun de pecho blanco, or common white-breasted Myrtle-sucker. It is found very

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abundantly, and at all seasons of the year, in the vicinity of Jalapa, Coatepec, Orizaba, and many other places in Mexico; but Mr. Gould, in his Monograph of Humming Birds, states, that it is also found in Guatemala, and seems disposed to assign that country as its proper locality. It is quite possible it nests there also, but the fact that it remains in Mexico all the year round, and as I have often found its nest in the months of April and May, I believe it is most properly to be considered a bird of the country last mentioned.

This pretty little bird is very familiar and unsuspecting, and allows a person to approach it very near in the woods, and is a constant visitor to the gardens in the towns and cities. Like the fine species mentioned in my first paper, it frequents the *Mazapan* flowers, around which it may be seen at all hours of the day.

The nest of this species is lined on the inside with the *tule* silky floss, which is the case with nearly all the Humming Birds in this part of Mexico. On the outside it is covered with moss from the rocks, in such handsome and ingenious manner that would be very difficult for man to imitate. There are generally two eggs, but on one occasion I found three in one nest. The eggs are white, oblong, rather elongated, and large in proportion to the size of the bird.

The upper part of the head in this species is of a most brilliant metallic azure color, the upper parts of the body and wing coverts are brown, shaded with bronze green; the tail and its coverts are of the same, but not so bright; the wings are as long as the tail, and of an amber purplish color, the throat is satin-like white, with the sides of a bluish green, or rather feathers of both colors mixed together, very lustrous; the under part of the body and the feathers of the leg are dull white; the under surface of the wings is bronzed brownish gray; the under tail coverts are of the same, but less brilliant, and with the edges of each feather lighter, the feet, nails and upper mandible are black, the mandible is about one third black at its point, and flesh color at its base.

Total length, $4\frac{1}{4}$ inches, wing $2\frac{1}{4}$, tail $1\frac{1}{2}$, bill $\frac{3}{4}$ inches. The female is of the same size as the male, and the only difference between the two sexes is that the blue of the head and the white of the breast are of not so decided colors in the female, although this difference only occurs at certain seasons of the year. The cranium of the male can be distinguished also from that of the female, being rather larger.

The Committee to which was referred a communication from Mr. P. B. Du Chaillu, asserting that the Academy is his debtor for a part of the costs of a certain exploration in Africa made by him, reported in substance that Mr. Du Chaillu has no claim whatever on this institution.

Dr. Carson said:

MR. PRESIDENT,—I rise to perform the painful duty of announcing the death of our associate, Dr. Edward Hallowell, which took place on the 21st instant, from consumption; and I feel that in connection with this announcement, it is especially proper from me should come the remarks which will serve to do honor to his memory as a member of the Academy of Natural Sciences. He was not only an intimate friend, but one of long standing, having almost uniformly been educated together, at first in the Collegiate Department of the University of Pennsylvania, then as students of Medicine in the office of the late Dr. Hewson, and in the Medical Department of the University.

In early life Dr. Hallowell was remarkable for his studious habits, and proficiency in the branches of his Collegiate Course. He always had a prominent position, and graduated with the highest honors of his class. To the Science of Medicine, which he subsequently pursued with ardor, and in which for 1860.]

many years he labored zealously as a practitioner, he made important contributions, in the department of pathology. His paper upon the subject of Cholera Infantum is an admirable and original addition to the knowledge of that disease, by which medical literature was enriched, and American medical authorship advanced in estimation abroad. It is looked upon as authoritative, with respect to the true pathology of the affection.

As a member of the Academy he labored industriously, and from the time of his election was devoted to the interests of the Institution. His department was that of Herpetology, and I may appeal to the collection for proof of his usefulness, and to the publications for evidences of his ability to place before the public the large amount of new information derived from the materials at his command. When a few years ago he was stricken down by disease, his loss as a working member of the Academy was severely felt and lamented.

As an associate Dr. Hallowell was a favorite of his fellow members. His manners were always urbane and deferential to the views and feelings of others, his temper was uniformly equable and not readily ruffled; the kindness of his heart was a perennial spring, while his sense of justice led him to acknowledge the merits and the services of all who, like himself, were engaged in scientific occupations.

We have lost in him a worthy and beloved associate, and most sincerely deplore his too early death, although to him it is a gain.

The following resolutions were then offered by Dr. Le Conte and adopted:

Resolved, That the Academy has learned with sincere regret the death of its late member, DR. EDWARD HALLOWELL.

Resolved, That in Dr. Hallowell the Academy has lost one of its most enthusiastic and laborious students and valued associates; one who has endeared himself to his fellow members, as well by his high personal qualities as by his steadfast and successful pursuit of science.

March 6th.

Vice President BRIDGES in the Chair.

Forty members present.

Dr. Joseph Wilson (Surgeon U. S. Navy) related that he had in his possession, during some months, on board of the U. S. ship *Vandalia*, a female whelp of a small Ocelot, (*Felis pardalis minimus*,) commonly called "tiger-cat." It was obtained in Realejo, Nicaragua, in the month of December, 1858. At that time it was too young to eat anything except milk, but gradually came to eat crumbs of bread from her cup, and small scraps of meat. The animal was light gray, beautifully marked with dark elliptical rings and spots, light underneath; ears quite short, rounded, with a lunated white spot on top; the tail about the length of the body and nearly black. She was of the size of an ordinary cat, and weighed five pounds eight ounces when ten months old. She was transferred to the Doctor's protection in March 1859, when her age was conjectured to be four months. She was named Miss Tiger by acclamation, and became reconciled to her change of abode much more readily than I was prepared to expect. The *Vandalia* was miserably infested by rats, and in the course of a few hours she received her first lesson in the valuable accomplishment of catching them. A young rat was caught in a trap and presented to her attention; she hesitated but a moment, when she commenced struggling to get at it, and when permitted she pounced upon it with great fierceness; she walked about growling with her prize, evidently proud of the conquest. She afterwards played with it for about three hours, performing many fantastic tricks in the way of tossing it up and catching it as it came

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down, turning somer-saults and rolling over with it in her paws. After this she seemed quite at home, and required no more lessons in rat-catching, though she eventually became very expert. It occasionally happened that a rat was seen or heard in a store room or corner from which there was no secret escape, and in all such cases Miss Tiger was immediately called upon and carried to the scene of action. She generally pointed out by her actions the locality of the object of pursuit, and stood ready to pounce upon it on the very first opportunity. On these occasions she sometimes made tremendously long bounds, say ten feet. Escapes in these cases were very rare. She eventually came to understand this business so well, that when called she would run out and exhibit an eagerness to be picked up and carried, comparable to that of a child who expects to be lifted into a carriage. In attacking rats she was quite fearless, and so far as known was never hurt by them. She mostly seized them by the back of the neck or head, but was not at all particular if these parts did not happen to be the first in her reach. She soon crushed the skull by forcing her long cuspid teeth through it, generally killing her prey so quickly that it was not even heard to squeal. After playing with it a moderate time, she would eat it, commencing with the head and progressing steadily till she finished with the end of the tail, only stopping a moment to lick her chops, when she came to the heart or other tit bit. Imagining that the hair and hide were not very good food for her, I once partially skinned one that she might learn to tear off the skin and leave it; but this was labor lost, as she immediately began to eat the skin, hair and all, in preference to the other part. Rats were sometimes taken from her and thrown overboard, as she occasionally caught more than she could manage to eat; but she soon began to show her disapprobation of this measure by a very startling, fierce and threatening growl. The first occasion it waked me up at about midnight, and when I went out to inquire what was wrong with Miss Tiger, I found her sitting near a big rat and growling in a very unusual and startling manner at about six men whom she had driven from their beds by her threatening. They were standing around her with various weapons in their hands, but there was very little prospect of moving her without some severe bites and scratches. As I approached a little nearer than the rest she showed a disposition to take her prize in her mouth, and while her teeth were thus employed I caught her by the top of her shoulders and she permitted me, without the least resistance, to carry her off, rat and all, to a place on deck, where her growling could not annoy the sleepers. She was frequently carried off in this manner afterwards both by myself and by others. She would sit by the hour very quietly near her property, till she was disturbed by some movement near her, when she would commence with her threatening growl, which was loud enough and fierce enough to make the firmest stand back, till they had seen and reflected on the state of affairs. She had another gentle, plaintive growl, which she used in calling for her breakfast and in showing dissatisfaction on ordinary slight occasions. She had no cry which could be compared to the mewling of the cat, but she could purr to perfection when in search of a warm bed. Her favorite food was rare beef steak, which she even preferred to rats; but hunger and petting eventually induced her to eat bread and butter for her breakfast, whenever she had a night of unsuccessful hunting.

The gentleness of this pet was really astonishing. She allowed herself to be picked up by any body, without any worse mark of dissatisfaction than a little growling. Even when feeding, and under apprehension that her rat was about to be taken from her, she would not bite or scratch. She would play with a handkerchief much in the same manner as with a rat. She was fond of being handled, and when rubbed with the hand she would roll about on her back and pretend she was going to bite, seizing the fingers between her teeth, growling and biting with such cautious gentleness as not to be in any
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danger of wounding the skin. But one exception to this occurred; one of the officers attempted to play with her in this manner with kid gloves on, and was immediately punished for his foppery by having her long teeth instantly forced through both his glove and his finger. She may have perceived some difference between the texture of the gloves and that of the fingers on which she was accustomed to try her teeth. She knew very well where to find warm sleeping places. She would for this purpose visit the hammocks of the men at night, and waken any sleeper she happened to fancy by patting him gently on the face with her paw. If encouraged and welcomed by a pat on the back or top of the head, she would lie down either against his breast or at his feet; but if refused by one or two very gentle boxes on the ear, she would retire with a discontented growl and seek a more hospitable sleeper. How she learned to distinguish between the taps on the top of the head as marks of approbation, and those on the sides of the opposite signification, is a subject of mystery, but there is no doubt of the fact; perhaps some of the men may have taught her the difference by boxing her more energetically.

She was very fond of licking the men about the face and gently pinching their ears in her teeth; and although she frequently engaged in this disagreeable amusement, she never wounded any one in the least while thus occupied. In cold weather she was very fond of getting between blankets, and required but the very slightest encouragement to crawl into the very middle of a bed and roll herself up in this position for her morning nap.

On one occasion it was noticed that she had a large tumor on the side of her face, and a large abscess formed. It was at first supposed that she had hurt her face in playing with a catfish; some one, however, noticed that it proceeded from an irregularity in shedding one of the milk teeth. One of the officers, of uncommon zeal in such matters, proposed to hold her while the obnoxious tooth was extracted. I determined to gratify him in this matter, and to the astonishment of all he held Miss Tiger on his lap while I extracted the obnoxious tooth with a pair of forceps, and neither of us was scratched during the operation.

She was fond of dark places, and delighted in running about deck and up the rigging early in the mornings and on cloudy days. When the men were called aloft to furl "top gallant sails," she would jump to the shrouds and have a race with them up the rigging, and with very little effort she was "first man in the top."

She generally showed so much excitement in the presence of birds, that doubtless her instinct would lead her to seize them. She killed three or four chickens at different times secretly, and off Cape Horn she seized and killed an albatross of at least double her weight. A common green parrot was at one time on board and she was exceedingly eager to get at it, but she was boxed a little on the ears and her head turned the other way a few times, till she appeared to understand that it was not for her. Subsequently, when she appeared to be watching it too intently, she was boxed a little and driven, till in about a week she seemed to regard it as one of the family.

In the beginning of December we were passing the West India Islands, the ship, in her course, starting flocks of flying fish, in which Miss Tiger became interested, they looked so much like birds. She was observed in the moonlight watching them very intently. Her absence was noticed at breakfast. A search through the ship made it certain she had been lost overboard during the night.

March 13th.

Mr. LEA, President, in the Chair.

Forty members present.

[March,

The following papers were presented for publication :
 "Description of four new species of Unionidæ from Brazil, by Isaac Lea." "Description of fifteen new species of Uruguayan Unionidæ, by Isaac Lea."

And were referred to a Committee.

Mr. Lea stated that when he made some remarks, a few weeks since, on the *Unionidæ* of the United States, he gave the number of them incorrectly by an inadvertence. He now desired to restate them numerically :

Unio,	465 species.
Margaritana,	26 "
Anodonta,	59 "

550

To these may be added, new species in his cabinet not yet described,	30
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580

And to these may be added, for North America, known to inhabit Mexico, Honduras, Central America and one in Canada,	Unio,	29
	Anodonta,	8
	—	37

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It will be observed that we have not in North America either of the genera *Triquetra*, (*Hyria*, Lam.) *Prisodon*, (*Castalia*, Lam.) *Monocondylæa*, *Mycetopus*, *Byssandonta*, or *Plagiodon*. They are all emphatically South American types, while there does not seem to inhabit the southern half of America a single species of *Margaritana*, (*Atasmodonta*, Say.) Ferussac has described a species (*A. incurva*) as coming from South America, but there is reasonable doubt of it. The *Monocondylæa* and *Margaritana* seem mutually to replace each other. The *Uniones* and *Anodontæ* prevail in both parts of the continent over all the other genera, both as to numbers and universality of distribution. The genus *Mulleria*, (*Acostea*, D'Orb.) has only been found in the tributaries of the Magdalena in New Granada.

Dr. Leidy called the attention of the members to a specimen of the singular body, named *Hyalonema mirabilis*, recently presented by Dr. Ruschenberger. It is the second specimen obtained within a short time for the Academy. Both are from Japan. The specimen of *Hyalonema* exhibited, consists of a twisted cord of siliceous spiculæ over a foot in length, and about half an inch in diameter. Twisted around it is a coriaceous membrane with wart-like eminences, belonging to a zoophyte, which Dr. L. regards with M. Valenciennes as parasitic. The cord of siliceous spiculæ, Dr. J. E. Gray supposes to be the axis of the zoophyte, but Dr. L. with M. Valenciennes, views it as belonging to a sponge. This latter view is apparently confirmed by a specimen of a sponge, in the cabinet of the Academy, from Santa Cruz, presented by the late Dr. Griffith. This sponge is an oblong oval mass, about four inches long, surmounted at one extremity with a corona of twisted cords of siliceous spiculæ about two inches in length. These spiculæ are very similar in structure to those of the *Hyalonema*, mainly differing in size.

The Publication Committee laid on the table, part 3, vol. 4, of the Journal of the Academy.
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March 20th.

Mr. LEA, President, in the Chair.

Forty-two members present.

The following papers were presented for publication :

"Descriptions of new species of Cretaceous Fossils from New Jersey, by W. M. Gabb."

"Description of four new species of Melanidæ of the United States, by Isaac Lea."

"Description of five new species of Uniones from Alabama, by Isaac Lea."

And were referred to Committees.

Dr. Leidy announced the presentation by Dr. T. B. Wilson of his entire collection of birds, amounting to 26,000 mounted specimens, and 2,000 skins.

Mr. Cassin said, in relation to the presentation of the collection of birds now in the Museum of this Academy, by Dr. T. B. Wilson :

The collection of birds in the Museum of the Academy has been regarded for some years as the collection of this Academy, and is extensively known and referred to as such by authors and naturalists. The donation this evening, so liberally and characteristically made by Dr. Wilson, involves only a change of ownership, or transfer of title, with the further important consideration that it secures the collection to the Academy, as intended by Dr. Wilson, in perpetuity and without contingency.

Previous to this donation the collection has been the private property of Dr. Wilson, and has been accumulated from various sources, since 1845, with great judgment, and with constant and unremitting exertion on his part and also on the part of his brother, Mr. Edward Wilson, long resident in Europe. The latter named gentleman has most ably and successfully seconded his brother in the greatest enterprises ever entered upon in America, having for their object the promotion of the Zoological Sciences and of general Natural History. The results mainly have been, at this period, the formation of the Library of this Academy and of its collections in all departments, but especially in Mineralogy, Palæontology, Conchology, Crustacea, Ichthyology and Ornithology.

The very extensive and comprehensive series now presented, with the comparatively small collection previously owned by the Academy, comprise one of the most complete Ornithological Museums extant. It is, in fact, one of the four great collections of birds in the world, and, so far as can be ascertained from published catalogues, is fairly entitled to be considered as presenting facilities for study in this favorite branch of Natural History equal to those of any other Institution.

Mainly, the collection of Dr. Wilson was based on that of General Massena, Duke of Rivoli, and his son, M. Victor Massena, Prince D'Essling, which was regarded as the finest private collection in Europe. This was acquired by purchase in 1846, and brought to this country. Various other valuable and more or less extensive collections

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have been added since that period, including Mr. Gould's Australian birds, which are the types of his great work, "The Birds of Australia," and embracing all the species then known, except five only. Another important collection, mainly Parrots, Humming Birds and Tanagers, was that of M. Bourcier, a distinguished French Ornithologist, and quite equally so was a collection made in the interior countries of India by Capt. Boys, of the East India Company's service. Very important, too, are collections from the Leyden Museum, through the influence of the eminent naturalists now or lately attached to that great Institution, particularly the celebrated Temminck, and many others obtained in Europe through the faithful and judicious exertions of Mr. Edward Wilson for the interests of this Academy.

Numerous other smaller additions have been made, whenever opportunity presented, in this country, by Dr. Wilson, and also have been derived from European Naturalists by exchange and purchase to the extent of several thousand specimens. Messrs. Verreaux, the well-known commercial Naturalists and Ornithologists of Paris, have been of exceeding service, and but little less so has been Mr. John G. Bell, of New York, the principal commercial Naturalist in this country, whose high interest in the prosperity of the Academy and scientific knowledge has never failed to be exerted and always has been of great value in the extension of the collection. Mr. John Krider, Mr. William S. Wood and Mr. James Taylor, of this city, have also furnished to Dr. Wilson many valuable specimens, and all of these gentlemen have invariably shown the utmost cheerfulness and liberality in their business with the Museum of the Academy.

The collection now presented by Dr. Wilson has been derived from the following sources, and includes specimens nearly as here enumerated:

Rivoli collection, 1st purchase,	- - -	12,500 specimens.
do. do. 2d do.	- - -	2,500 "
Mr. Gould's Australian collection,	- - -	2,000 "
M. Bourcier's collection,	- - -	1,000 "
Capt. Boys' collection,	- - -	1,000 "
Mr. Edward Wilson's collections in Europe, including collections from the Leyden and British Museums,	- - - - -	4,500 "
Dr. Thos. B. Wilson's collections in Europe,	- - -	1,000 "
do. do. do. in the U. S.,	- - -	1,500 "
Total now presented to the Academy,		26,000 "

It may be of interest to add that the collection previously owned by the Academy comprises about 3000 specimens, including a very superior North American series derived from nearly all ornithologists in the United States, who have invariably shown the greatest interest in the formation of the large collection of this Academy. The aggregate number of specimens exhibited and now belonging to the Academy is therefore about twenty-nine thousand birds.

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Mr. Lea read extracts from letters of Dr. Lewis, of Mohawk, New York, on the subject of the coloring matter of the nacre of the genus *Unio*, and exhibited some fine specimens to illustrate the subject. The following extracts will fully convey Dr. Lewis's ideas on this subject which has much interest with the naturalist.

"I hinted something about *Uniones* being colored with an oxide or salt of gold. My reasons for this are derived from observing some singular phenomena in colors on submitting shells to the action of chloride of gold, and then bringing them in contact with tin. Whether a stannate of gold formed and precipitated on the shells or not, I cannot say, but the colors were very much intensified. It is to be remarked that the colors of such shells as *Unio complanatus* and of *U. ligamentinus*, when colored, are such as result from the presence of gold in a state of atomic division and dissemination in a semi-opaque body. I think nitro-muriatic acid with a minute trace of gold in it, if applied to shells, will produce colors, but I never have satisfactorily demonstrated this. My observations are derived from having once used acid in which was a small quantity of gold, too small to be reclaimed."

"I notice that colors are most brilliant in regions where gold may be suspected. In the Lake regions of the Western States, minerals are abundant, and the conditions are not incompatible with the supposition that gold is sparingly disseminated among them, in quantities too small perhaps to be available, but no doubt it is there."

"As regards colors in the nacre of *Uniones*, you are correct in saying that *Uniones* are colored where there is no gold. But there are some species that are not colored unless you find them in some particular localities. If that is taken into consideration we shall, perhaps, be more ready to accept the gold theory. Modern investigations show that gold exists in soils that, until they were rigidly tested, were not suspected to contain it. In fact I am disposed to believe that gold is more universally disseminated than is generally supposed."

"But, the question is one I take no particular interest in, except that it presents itself incidentally. I know one fact that you also know. That of two streams producing identically the same species, one will give a large proportion of white nacles, and the other will present colored nacles, and usually we also notice another phenomenon—a greater brilliancy of nacre where rich colors abound. In this case I have my private opinion that gold produces its peculiar tonic effect, for tonic it is under certain circumstances by increasing the secretions."

"To have gold in a shell, it is not necessary it should be an oxide. It is only necessary it should have been received into the circulation of the animal, in solution as chloride, or some other possible soluble form that chemistry has not brought to light; and when once in the circulation it may be eliminated by being deprived of its solving principle and excreted or secreted with the other solid matter that enters into the formation of the shell. The stannate of gold, or purple of Cassius, may be wholly deprived of the tin associated with it, yet retain its purple color, and its condition of atomic division, if so you are pleased to call it. But I only offer this as suggestive of something for those interested to follow further. I am not enough of a chemist to develop any facts out of a suspicion of this kind."

Mr. Lea remarked, after reading the above extracts, that the purple, pink and salmon color of many of our American *Unionidæ* had had his attention from the period of his first studying this beautiful and interesting family, more than thirty years since. Without having experimented himself upon them, he was aware that no chemist had been able to detect the presence of a metal or other elementary body. He therefore thought it likely to be caused by the presence of some organic body which had not yet been detected; such is supposed by chemists to be the case with the colored fluates of lime, colored quartz, &c. What Dr. Lewis states as regards the colors being more frequent and more intense in the waters of Michigan and in the streams leading into the northern

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great lakes from the southern side, is very true. The *Unio rectus* is usually white in the Ohio, though sometimes tinted with purple and salmon color, while in the more northern waters it is usually of a fine rich purple or salmon. Two specimens from the upper Mississippi, brought by Dr. Cooper, were exhibited by Mr. Lea, which were of exquisite purple and salmon. The *Unio ligamentinus* has probably never been found pink or purple in the Ohio, while at Grand Rapids, Michigan, those with a fine pink and salmon color are very common. The *Margaritana margaritifera* of Columbia river and its tributaries has a fine purple nacre in almost all the specimens, rarely white, while those in the rivers of Pennsylvania, Connecticut and Massachusetts are almost universally white, as those from the northern part of Europe are also.

Dr. Draper had informed Mr. Lea that he had calcined some of these purple shells, but that they had burned white and he had not detected any metallic substance in their composition. The subject was certainly one well worth the pursuit, as no doubt could remain that the color was derived from some foreign substance entering into the composition of some individuals, while others were free from it. It was not an uncommon case to find the dorsal portion of the nacre to be pink or purple while the other portions were white, and this was also sometimes the case with the cavity of the beaks. Mr. Lea did not believe the color arose, as some persons supposed, from the structure of the surface of the nacre dividing the rays of light by thin laminations. This division of color was exhibited in almost every species, and is what naturalists call the "pearly hue," oftentimes of great beauty, but quite a different matter from the pink, purple and salmon color of the mass of the carbonate of lime composing the substance of the valves.

March 27th.

Mr. LEA, President, in the Chair.

Forty-eight members present.

The following papers on report of the respective committees were ordered to be printed in the Proceedings:

Descriptions of Four New Species of UNIONIDÆ from Brazil and Buenos Ayres.

BY ISAAC LEA.

UNIO TRIFIDUS.—Testâ lævi, obliquo-oblongâ, ad laterè planulatâ, valdè inæquilaterali, posticè acutè angulatâ, anticè rotundâ; valvulis crassiusculis, anticè crassioribus; natibus prominentibus, ad apices rugosè et divaricatè undulatis; epidermide micante, luteo-viridi, eradiatâ; dentibus cardinalibus grandibus, trifidis, sulcatis; lateralibus longis, crenulatis, in valvulo dextro trifidis; margaritâ argenteâ et iridescente.

Hab.—Buenos Ayres, South America. M. D'Orbigny.

UNIO PATELLOIDES.—Testâ lævi, subrotundâ, subcompressâ, subæquilaterali, anticè et posticè rotundatâ; valvulis subcrassis, anticè crassioribus; natibus prominulis, ad apices divaricatè undulatis; epidermide tenebroso-castaneâ, striatâ, eradiatâ; dentibus cardinalibus longis, compressis, obliquis, crenulatis corrugatisque; lateralibus longis, crenulatis curvisque; margaritâ argenteâ et iridescente.

Hab.—Amazon River, Brazil. Captain George Brown. Rio Plata. H. Cum-
ing.

ANODONTA AMAZONENSIS.—Testâ lævi, transversâ, subinflatâ, valdè inæquilaterali, posticè subbiangulatâ, anticè rotundâ; valvulis subcrassis; natibus
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subelevatis, tumidis; epidermide micante, tenebroso-viridi, nigricante, vel radiatâ vel obsolete radiatâ; margaritâ intus subroseâ et valdè iridescente.

Hab.—Upper Amazon, Brazil. C. M. Wheatley.

ANODONTA MORICANDII.—Testâ lævi, obliquè quadratâ, subinflatâ, ad laterè planulatâ, valdè inæquilaterali, posticè obtusè angulatâ et hiantè; anticè obliquè rotundatâ et valdè hiantè; valvulis tenuibus, diaphinis; natibus sub-prominentibus; epidermide luteo-olivâ, politâ, obsolete radiatâ, margaritâ cæruleo-albâ et valdè iridescente.

Hab.—Bahia, Brazil. S. Moricand, Geneva.

Descriptions of Fifteen new Species of Uruguayan UNIONIDÆ.

BY ISAAC LEA.

During the winter of 1858-59, R. B. Forbes, Esq., of Boston, whose name has been identified with so many works of philanthropy and public utility, organized an excursion to the La Plata, the Uruguay and Rio Negro rivers, in South America; his object in part being to afford facilities for studying the natural history of the countries bordering on these waters. Professor J. Wyman, who accompanied him, has most kindly placed at my disposal all the specimens of the *Unionidæ* which he had been enabled to collect in these extensive southern fresh waters. In this very interesting collection I was surprised to find so many species which had not been before observed. These are now herein described, and consist of eleven *Uniones* and four *Anodontæ*. The whole number brought of these fresh water *Molluscs*, was twenty-three species. Those heretofore described are *Prisodon truncatus*, Schum., (*Castalia ambigua*, Lam.,) *Unio Paranensis*, Lea., *U. parallelopedon*, Lea., *Anodonta rotunda*, Spix, *A. trapezalis*, Lam., *A. lato-marginata*, Lea., *A. tenebricosa*, Lea., *A. Blainvilliana*, Lea. In addition there were three small species of *Cyrena*, two of which I have not ascertained, the third is the *variegata* of D'Orbigny. There was also a small species of *Cyclas*.

UNIO WYMANII.—Testâ lævi, anticè subsulcatâ, quadratâ, compressâ, ad laterè planulatâ, inæquilaterali, posticè obtusè angulatâ, anticè rotundatâ; valvulis subcrassis, anticè crassioribus; natibus prominulis, ad apices divaricatè undulatis; epidermide tenebroso-olivâ, vel radiatâ vel obsolete radiatâ; dentibus cardinalibus compressis, erectis, crenulatis, in utroque valvulo duplicibus; lateralibus longis, crenulatis subcurvisque; margaritâ argenteâ et valdè iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO URUGUAYENSIS.—Testâ lævi, anticè subsulcatâ, ellipticâ, inflatâ, subequilaterali, posticè obtusè angulatâ, anticè rotundatâ; valvulis subcrassis, anticè crassioribus; natibus subprominentibus, ad apices divaricatè undulatis; epidermide virido-fuscâ, posticè tenebricosâ, politâ, obsolete radiatâ; dentibus cardinalibus compressis, crenulatis suberectisque; lateralibus longis suberectisque; margaritâ argenteâ et iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO FIGER.—Testâ lævi, ellipticâ, inflatâ, subequilaterali, posticè obtusè angulatâ, anticè obliquè rotundatâ; valvulis crassiusculis, anticè paulisper crassioribus; natibus subprominentibus, inflatis, ad apices divaricatè undulatis; epidermide nigro-fuscâ, striatâ, obsolete radiatâ; dentibus cardinalibus compressis, crenulatis; lateralibus sublongis curvisque; margaritâ argenteâ et iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO PERÆFORMIS.—Testâ lævi, subrotundâ, inflatâ, valdè inæquilaterali, posticè obtusè subangulatâ, anticè obliquè rotundatâ; valvulis subcrassis, anticè paulisper crassioribus; natibus vix prominentibus, inflatis; epidermide

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striatâ, nigro-virente, eradiatâ; dentibus cardinalibus parviusculis, compressis crenulatisque; lateralibus sublongis subrectisque; margaritâ argenteâ et iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO NOCTURNIS.—Testâ lævi, subrotundâ, subcompressâ, inæquilaterali, anticè et posticè rotundatâ; valvulis crassis, anticè crassioribus: natibus prominulis, subinflatis; epidermide nigricante, anticè rugoso-striatâ, eradiatâ; dentibus cardinalibus parviusculis, erectis; subcompressis, in utroque valvulo duplicibus; lateralibus sublongis valdè curvisque; margaritâ vel albâ vel salmonis colore tinctâ.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO FUNEBRALIS.—Testâ lævi, subrotundatâ, compressissimâ, inæquilaterali, anticè et posticè rotundatâ; valvulis crassis, anticè crassioribus; natibus prominulis, compressis; epidermide nigricante, striatâ, ad apices micante, eradiatâ; dentibus cardinalibus parviusculis, subcompressis, tripartitis; lateralibus sublongis valdè curvisque; margaritâ vel albâ vel salmonis colore tinctâ.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO GRATUS.—Testâ lævi, subrotundâ, subinflatâ, inæquilaterali, anticè et posticè rotundatâ; valvulis subcrassis, anticè paulisper crassioribus; natibus subprominentibus, ad apices divaricatè undulatis; epidermide tenebroso-fuscâ, micantè, obsoletè radiatâ; dentibus cardinalibus parviusculis, compressis striatisque; lateralibus sublongis subcurvisque; margaritâ albâ et iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO DISCULUS.—Testâ lævi, subrotundâ, valdè compressâ, valdè inæquilaterali, anticè et posticè rotundatâ; valvulis crassiusculis, anticè paulisper crassioribus; natibus subprominentibus, ad apices paulisper divaricatè undulatis; epidermide tenebroso-castaneâ, minutè striatâ obsoletè radiatâque; dentibus cardinalibus parviusculis, lamellatis crenulatisque; lateralibus sublongis, striatis curvisque; margaritâ albâ et iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO PICEUS.—Testâ lævi, ellipticâ, subinflatâ, valdè inæquilaterali, posticè subrotundatâ, anticè obliquè rotundatâ; valvulis crassiusculis, anticè paulisper crassioribus; natibus prominulis; epidermide micante, nigrâ, striatâ obsoletè radiatâ vel eradiatâ; dentibus cardinalibus parviusculis, compressis, obliquis, in valvulo sinistro singulis; lateralibus sublongis subcurvisque; margaritâ cæruleâ albâ et iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO LEPIDUS.—Testâ lævi, ellipticâ, subinflatâ, valdè inæquilaterali, posticè subrotundatâ, anticè rotundâ; valvulis subtenuibus, anticè paulisper crassioribus; natibus prominulis, ad apices rugosè et divaricatè undulatis; epidermide politâ, fusco-virentè, striatâ, radiatâ; dentibus cardinalibus parviusculis, compressis, obliquis; lateralibus sublongis subcurvisque; margaritâ cæruleo-albâ et valdè iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

UNIO ÆTHIOPS.—Testâ lævi, oblongâ, subinflatâ, ad laterè planulatâ, valdè inæquilaterali, posticè biangulatâ, anticè rotundatâ; valvulis crassiusculis, anticè crassioribus; natibus prominulis, planulatis, ad apices divaricatè undulatis; epidermide micante, nigrâ, striatâ, eradiatâ; dentibus cardinalibus parviusculis, compressis, obliquis, subrectis crenulatisque; lateralibus prælongis, crenulatis rectisque; margaritâ albâ et iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

ANODONTA WYMANII.—Testâ lævi, ellipticâ, subinflatâ, inæquilaterali, posticè subbiangulatâ, anticè regulariter rotundatâ; valvulis crassis, anticè paulisper

crassioribus; natibus prominulis, ad apices æquis; epidermide cinnomomeâ, vel eradiatâ vel obsolete radiatâ; margaritâ roseâ et valdè iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

ANODONTA RUBICUNDA.—Testâ alatâ, lævi, subrotundâ, inflatâ, subequilaterali, anticè et posticè rotundatâ; valvulis subtenuibus; natibus elevatis, tumidis, rosaceis; epidermide tenebroso-rufo-fuscâ, vel obsolete radiatâ vel eradiatâ, margaritâ rufo-salmonis colore tinctâ et valdè iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

ANODONTA FORBESIANA.—Testâ lævi, suboblongâ, ventricosâ, inæquilaterali, valvulis crassiusculis; natibus elevatis, inflatis; epidermide luteo-fuscâ, micante, vel eradiatâ vel obsolete radiatâ; margaritâ albidâ et valdè iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

ANODONTA URUGUAYENSIS.—Testâ lævi, obovatâ, ventricosâ, valdè inæquilaterali; valvulis subcrassis, anticè paulisper crassioribus; natibus subelevatis, tumidis; epidermide tenebroso-olivâ, eradiatâ; margaritâ cæruleo-albâ et valdè iridescente.

Hab.—Uruguay River, S. America. Prof. J. Wyman.

Descriptions of Five New Species of UNIONES from North Alabama.

BY ISAAC LEA.

UNIO PUDICUS.—Testâ lævi, subtrigonâ, compressâ, inæquilaterali, posticè obtusè angulatâ, anticè rotundâ; valvulis subcrassis, anticè crassioribus; natibus prominulis, ad apices rugoso-undulatis; epidermide luteo-fuscâ, micante, virido-radiatâ; dentibus cardinalibus crassiusculis, erectis, compressis crenulatisque; lateralibus subcurtis, crassis subcurvisque; margaritâ albâ et iridescente.

Hab.—North Alabama, Prof. Tuomey; and Florence, Alabama, L. B. Thornton, Esq.

UNIO CAMELOPARDILIS.—Testâ lævi, oblongâ, subinflatâ, inæquilaterali, posticè obtusè biangulatâ, anticè regulariter rotundatâ; valvulis subtenuibus, anticè crassioribus; natibus prominulis, ad apices rugoso-undulatis; epidermide luteâ, politâ, undiquè virido-maculatâ; dentibus cardinalibus parvis, erectis, compresso-pyramidatis crenulatisque; lateralibus longis, lamellatis subrectisque; margaritâ luteo-albâ et valdè iridescente.

Hab.—North Alabama, Prof. Tuomey.

UNIO FUCATUS.—Testâ lævi, ellipticâ, subinflatâ, valdè inæquilaterali, posticè subbiangulatâ, anticè rotundatâ; valvulis tenuibus, anticè paulisper crassioribus; natibus prominulis, ad apices undulatis; epidermide olivo-luteâ, micante, undiquè virido-maculatâ; dentibus cardinalibus parvis, compresso-conicis, crenulatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subcurvisque; margaritâ vel cæruleâ vel luteo-albâ et valdè iridescente.

Hab.—North Alabama, Prof. Tuomey. Tuscumbia, L. B. Thornton, Esq.

UNIO DISCREPANS.—Testâ lævi, ellipticâ, subinflatâ, ad laterè subplanulatâ, valdè inæquilaterali, posticè obtusè biangulatâ, anticè rotundatâ; valvulis subtenuibus, anticè crassioribus; natibus prominulis; epidermide luteo-olivâ, micante, radiatâ; dentibus cardinalibus parvis, compresso-conicis crenulatisque; lateralibus longis, lamellatis subcurvisque; margaritâ vel albâ vel purpureâ et valdè iridescente.

Hab.—North Alabama, Prof. Tuomey.

UNIO PLANICOSTATUS.—Testâ lævi, ellipticâ, compressâ, ad laterè subplanulatâ, valdè inæquilaterali, posticè obtusè biangulatâ; anticè rotundatâ; valvulis tenuibus, diaphanis, anticè paulisper crassioribus; natibus prominulis, ad apices

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undulatis; epidermide olivaceâ, undiquè radiatâ; dentibus cardinalibus parvis, conicis, crenulatis, in utroque valvulo duplicibus; lateralibus longis lamellatis subcurvisque; margaritâ vel cœruleo-albâ vel purpurascete et valdè iridescente.

Hab.—Tuscumbia, Alabama, L. B. Thornton, Esq.

UNIO SCRITULUS.—Testâ lævi, ellipticâ, inflatâ, valdè inæquilaterali, posticè obtusè biangulatâ, anticè rotundatâ; valvulis subtenuibus, anticè crassioribus; natibus prominentibus, ad apices undulatis; epidermide luteâ, undique virido-radiatâ; dentibus cardinalibus parviusculis, erectis, acuminatis, crenulatis, in utroque valvulo duplicibus; lateralibus longis, lamellatis subrectisque; margaritâ albâ et valdè iridescente.

Hab.—Tuscumbia, Alabama, L. B. Thornton, Esq.

Descriptions of Four New Species of MELANIDÆ of the United States.

BY ISAAC LEA.

SCHIZOCHILUS SHOWALTERII.—Testâ transversè costatâ, subcylindraceâ, crassâ, castaneâ, minutè striatâ; spirâ elevatâ; suturis impressis; anfractibus subplanulatis; fissurâ submagnâ, profundâ; aperturâ subparvâ, ellipticâ, intus vittatâ; columellâ subcrassâ; labro paulisper crenulato.

Hab.—Coosa river, Uniontown, Alabama. E. R. Showalter, M. D.

ANGULOSA SHOWALTERII.—Testâ valdè costatâ, suborbiculari, crassâ, tenebroso-fuscâ, nigricante, exilissimè striatâ; spirâ brevissimâ; suturis valdè impressis; anfractibus inflatis, septenis transversis costis indutis; aperturâ magnâ, subrotundâ, supernè subangulatâ, internè tenebroso-vittatâ; columellâ crassâ, planulatâ, tenebroso-fuscâ; labro valdè extenso et valdè crenulato.

Hab.—Coosa river, Uniontown, Alabama. E. R. Showalter, M. D.

MELANIA CRENATELLA.—Testâ transversè striatâ, turrito-subulatâ, subcostatâ, paulisper plicatâ, subtenui, tenebroso-fuscâ, nigricante; spirâ elevatâ, ad apices crebrè plicatâ; suturis valdè impressis; anfractibus septenis, planulatis, transversis costis indutis; aperturâ parvâ, ellipticâ, intus vittatâ; columellâ albidâ, incurvatâ; labro subcontracto et valdè crenulato.

Hab.—Coosa river, Uniontown, Alabama. E. R. Showalter, M. D.

MELANIA NEWBERRYI.—Testâ lævi, ovato-conicâ, subtenui, tenebroso-fuscâ, trivittatâ, internè suturis luteâ; spirâ subelevatâ; suturis valdè impressis; anfractibus senis, inflatis; aperturâ parviusculâ, ovato-rotundatâ, intus albidâ et vittatâ; columellâ albidâ, incurvatâ; labro inflato.

Hab.—Upper des Chutes river, Oregon Territory. J. S. Newberry, M. D.

Descriptions of New Species of Cretaceous Fossils from New Jersey.

BY WM. M. GABB.

ACTÆONINA D'Orb.

A. biplicata, pl. 2, fig. 13.

Actæon biplicata, M. & H.

This fossil I had considered new, but have, since the plate was drawn, seen the type of Meek and Hayden's species, to which it bears such a close resemblance, that I shall refer it to their species. The fact of its having been referred to another genus, and the figure not having been published, misled me. The existence of two folds on the columella, which can be seen in the New Jersey fossil, has not been yet ascertained in the one from Nebraska.

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SOLARIUM Lam.

S. abyssinus, pl. 2, fig. 9. Shell conical; whorls three, rounded; mouth circular, surface markings unknown. A cast.

Locality.—With the above from Burlington Co., N. Jersey.

VOLUTILITHES Swains.

V. Abbotti, pl. 2, fig. 7. Shell fusiform, whorls three or four, spire moderately elevated; mouth, three-fourths the length of the shell; four folds on the columella; surface apparently smooth. A cast.

Locality.—Burlington Co., N. J.

I take pleasure in dedicating this species to Mr. C. C. Abbott of Trenton, N. J., to whom I am indebted for the type of the species, as well as for many other species of cretaceous fossils.

TURBINELLA Lam.

T. subconica, pl. 2, fig. 6. Shell subconical, spire low; body whorl subangular above, two folds on the columella, surface marked by longitudinal ribs, about ten on the body whorl, crossed by numerous smaller revolving lines. A cast.

Locality.—Monmouth Co., N. J.

T. parva, pl. 2, fig. 3. Shell small, subconical, spire very low, whorls two or three, mouth wide, and at the upper part angular, three folds on the columella; surface marked by about twelve large longitudinal ridges or undulations, on the body whorl crossed by three or four revolving lines. A cast.

Locality.—With the preceding.

CANCELLARIA Lam.

C. septemlirata, pl. 2, fig. 10. Shell subglobose, spire low, whorls two, mouth wide, surface, from markings on the cast, apparently ornamented by about seven prominent revolving lines. A cast.

Locality and position.—From the highest bed at Mullica Hill, N. J.

PURPULOIDEA Lycet.

P?dubia, pl. 2, fig. 11. Shell ovate, whorls four or five, spire elevated, surface marked by longitudinal ribs, about fifteen on the body whorl; a few revolving striæ appear to exist near the lower part of the body whorl, but this specimen is so weathered, that this character may be only the result of disintegration of the shell. The lower part of the mouth is broken.

Locality and position.—Mullica Hill, with the preceding.

FUSUS Lam.

F. trivolvus, pl. 2, fig. 5. Shell fusiform, elongate, whorls three, spire moderately elevated, mouth long and angular, surface markings unknown; on the cast there are three prominent revolving lines, dividing the whorls into a corresponding number of flat surfaces, beak elongate; length of shell 2 in., beak $1\frac{1}{2}$ in., width of last whorl 1 in.

Locality and position.—Yellow Limestone, Timber Creek, N. J.; collection of the Academy. The types of all the other species in this paper are in my own collection.

RAPA Klein.

R. pyruloidea, pl. 2, fig. 4. Shell pyriform, whorls three, spire low, surface marked by longitudinal ribs or undulations, about twelve on the body whorl, crossed towards the beak by fine revolving striæ.

Locality and position.—Green marl, Burlington Co., N. J.

[March,

PLEUROTOMA Lam.

P. Mullicaensis, pl. 2, fig. 8. Shell fusiform, robust; spire elevated, whorls four or five, surface marked by numerous longitudinal ribs (crossed by revolving lines?)

Locality and position.—Upper bed, Mullica Hill, N. J.

ARCA Linn.

A. quindecimradiata, pl. 2, fig. 2. Shell gibbous, inequilateral, beaks incurved, umbones small; umbonal ridge subangular, and extends to the margin of the shell, surface marked by about fifteen radiating ribs, crossed by very distinct lines of growth; no appearance of ribs on the cast, posterior to the umbonal ridge.

Locality.—Common in the more northerly portions of the cretaceous deposits of New Jersey.

CIBOTA Brown. (*Byssoarca* Swains.)

C. multiradiata, pl. 2, fig. 1. Shell small, gibbous, beaks incurved, umbones small, rounded; anterior ends rounded gently, basal margin slightly sinuous, posterior rounded below, and inclined anteriorly above; surface marked by numerous fine radiating ribs; margin crenulated.

Locality and position.—Green marl, Mullica Hill, N. J.

LEDA Schum.

L. angulata, pl. 2, fig. 12. Shell twice as wide as long, beaks small, curved anteriorly, umbonal ridge angular and extending to the posterior basal margin; anterior margin rounded, basal very slightly sinuous, posterior, inclined anteriorly to the hinge line.

Locality and position.—Green marl, Burlington Co., N. J.

The following communication from Mr. A. E. Jessup, Mr. E. A. Jessup and Mrs. Clara J. Moore, children of the late Augustus E. Jessup, was read.

Philadelphia, March 6th, 1860.

Isaac Lea, Esq., President of the Academy of Natural Sciences of Philadelphia.

Dear Sir,—The undersigned, children of the late Augustus E. Jessup, believing that it was his intention to leave a sum of money to the "Academy of Natural Sciences," for the purposes stated below, and desiring to carry out what we have cause to think were his intentions, propose to pay to the Academy the sum of one hundred and twenty dollars per annum, to be applied to its Publication Fund, and the further sum of four hundred and eighty dollars per annum, to be used for the support of one or more deserving poor young man or men, who may desire to devote the whole of his or their time and energies to the study of any of the Natural Sciences.

The above sums we propose to pay as long as we feel our circumstances to be such as will warrant our doing so, and we look forward to investing in trust, at some not distant time, the principal of the sums named, for the purpose of creating a perpetual fund for the above named uses.

Signed,

A. E. JESSUP.

E. A. JESSUP.

CLARA J. MOORE.

On motion of Mr. Foulke, the letter was referred to a special committee of five.

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April 3d.

Vice President BRIDGES in the Chair.

Fifty members present.

A paper was presented for publication, entitled, "Conspectus Piscium in expeditione ad Oceanum Pacificum Septentrionalem, C. Ringgold et J. Rodgers ducibus, a Guilelmo Stimpson, M. D., collectore; Sicydianæ: auctore Theo. Gill."

Mr. Lesley read the following extract from a letter received from Mr. T. S. Hunt, Chemist of the Canada Geological Survey, dated Montreal, March 25th, 1860:—

"If we mingle in equivalent proportions the chlorides of calcium and magnesium in concentrated solution, and then having precipitated the bases by a slight excess of carbonate of soda in the cold, and expose the mixture for a few hours in a closed flask to a temperature of 200°—212° F., the pasty mass is entirely transformed into a beautiful granular powder, made up of spherical, translucent, crystalline grains, which are sparingly soluble in cold, dilute, acetic acid and are a double carbonate of lime and magnesia. In my previous and published trials, at temperatures of 300°—400° F., the product was much less beautiful, and was mingled with carbonate of magnesia. It now remains to be seen whether the combination may not be slowly effected at a temperature much below 200° F., and experiments upon this point are in progress."

Mr. Lesley drew the attention of the Academy to the significant direction in which these and similar experiments are carrying the chemical geology of the day. If they result in nothing more than the destruction of those *igneous* prejudices which still shackle observers, especially in metamorphic mineral regions, and set us free to study *ab initio* the phenomena of magnetic iron veins, copper lodes and gold quartz, primary limestones, serpentines and dolomites, the consequences must be practically important.

Mr. Foulke remarked the equally important bearing the low temperature of these experiments must be seen to have, on the theory of non-fossiliferous, primary rocks. If metamorphism has been possible at such low temperatures, the argument in favor of the destruction of organic remains from metamorphic strata by fiery agencies is of force no longer, and we must conclude that these early and apparently non-fossiliferous rocks were really destitute of life.

Dr. Leidy stated that he had just received a short notice from Prof. Leuckart, of Giessen, in which he mentions the results of some experiments with *Trichina spiralis*. Having fed dogs with human flesh containing *Trichinæ*, he found that in a week or less, the worms completed their development, but without assuming the form of a *Tricocephalus* or *Strongylus*. Within the intestine of the dog, the generative apparatus, together with the eggs and embryos, were fully developed in the *Trichinæ*. The embryos rapidly pass away with the excrement of the dog. A pig having been fed with a dog's intestine containing fully developed *Trichinæ*, was killed and dissected on the 3d of March, and exhibited in the muscles millions of *Trichinæ*. From these facts it is rendered probable that embryos of *Trichina* voided by dogs find their way into the human stomach through the food or drink, and subsequently burrow into the tissues of the body.

NOTE.—The date of the meeting of the Academy on page 51, should be Feb. 14th, instead of Feb. 11th.

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April 10th.

MR. LEA, President, in the Chair.

Thirty-eight members present.

Mr. Lea remarked that he had recently received from Prof. J. Wyman specimens in alcohol of two species of *Anodonta* from the Uruguay River, South America, descriptions of the soft parts of which he had made, and intended, at a future time, to publish in the Journal at length; but he wished at present to mention that he had found a form of *Palpi* (mouth lips) different from any of the *Unionidæ* which had come under his notice from any other part of the world. The form of the *Palpi* heretofore described have always been obliquely or transversely elliptical or subtriangular, while these two species, *An. Wymanii*, Lea, and *An. lato-marginata*, Lea, are round, and the pair on either side only joined above, the edges being entirely free. It is greatly to be regretted that more or all the South American *Unionidæ* could not have been examined, as regards their soft parts, to ascertain if this difference of form of the *Palpi* should be persistently different in all the South American *Unionidæ*, or only with this member of the family—the *Anodontæ*.

April 17th.

MR. LEA, President, in the Chair.

Fifty-six members present.

The following papers were presented for publication:

“Monograph of the Genus, *Labrisomus*, of Swainson, by Theo. Gill.”

“Monograph of the Genus *Labrax*, of Cuvier, by Theo. Gill.”

“Monograph of the *Philypni*, by Theo. Gill.”

“Notice of Geological Discoveries, made by Capt. J. H. Simpson, Top. Engineers, U. S. Army, in his recent explorations across the Continent.”

“Catalogue of Birds collected during a survey of a route for a ship canal across the Isthmus of Darien, by order of the Government of the United States, made by Lieut. N. Michler, U. S. Top. Engineers, with notes and descriptions of new species, by John Cassin.”

And were referred to Committees.

Mr. Lesley described a boulder of gneiss, eight feet high, on the summit of one of the Orange Co. highlands, in the State of New York, which was supported by four smaller rocks, so that it was lifted about a foot above the floor of nearly horizontal gneiss, forming the top of the mountain. One of these supports was a hard blue limestone, from the crust of which Mr. Lesley obtained numerous fossils, among which was probably the *Orthis costalis*, (Hall,) of the Chazy Limestone. Another block of limestone, also fossiliferous, lay not far away, and a few small pieces of a reddish sandstone like that of certain bands in the Oneida Conglomerate; but with these exceptions, there was neither drift nor diluvial strata visible, but here and there large blocks of gneiss. The whole surface of the exposures, which were numerous and many hundred feet square, has been weathered down 2 or 3 inches, as is evident from the ridges of refractory quartz veins, which have successfully resisted the atmosphere. On this weathered surface occur what have been called the footmarks of animals; but these are nothing else than weathered-out nodules of rock more ferruginous than the rest. The locality is two miles east of Southfield Station, on the New York and Erie Railroad. Mr. Lesley and his brother were accompanied and guided to the locality by Mr. T. B. Brooks and Mr. Jenkins, two excellent local geologists and mineralogists, living in the village of Munroe.

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Dr. Leidy stated that on last Saturday, in company with Dr. Darrach, he had visited, to them, a new and rich botanical locality, which was worthy of the attention of those members interested in our local flora. This was at Jackson, N. J. about 20 miles from Philadelphia, on the Camden and Atlantic Railway. A cedar swamp, crossed by the latter, not one hundred yards from the station, contains the greatest profusion of *Saracenia purpurea*, and *Helonias bullata*, which is now in flower. Near by, they also found abundantly the *Pyxidantha* and *Cassandra* both in flower. *Oxycoccus*, *Drosera*, etc., were also noticed. The neighboring extensive forest tract is thickly carpeted with *Gaultheria procumbens*.

Prof. W. B. Rogers communicated the result of observations which he had made within the last year on the structural and geological relations of the Albertite or so-called Albert Coal of New Brunswick.

An examination of the mine afforded, as he thought, convincing proof that this remarkable accumulation of asphaltic material could not have formed a part of the regular carbonaceous deposits of the region,—that it is not and never has been a true bed or stratum, but that it should rather be regarded as a mass collected within an irregular fissure of subsequent formation, by the distillation or infiltration of asphaltic matter from the surrounding bituminous shales.

The principal features of the deposit pointing to such an origin are—the very limited extent of the mass longitudinally traced,—its sudden and great irregularities of thickness and trend, and the yet more striking fact of its transverse direction in many parts of its course as compared with the bedding of the adjacent rocks. In the lower level at a depth of about four hundred and sixty feet where the combustible material has been removed almost entirely from end to end, the slaty rocks are seen in many places abutting against the sides of the mine at a steep angle, presenting frequently a jagged surface, such as would result from a transverse fracture and gaping of the strata. The Albertite was seen adhering to these irregular surfaces, as well in the cavities as on the projections, affording even in hand specimens excellent examples of the discordance of the mass as to position with the stratification of the contiguous rocks.

It is worthy of note that the material thus adhering to the walls of the mine has none of that intermixture with earthy sediment which so often marks the contact of regular coal seams with the enclosing strata, but maintains the same remarkable purity as in the midst of the mass. It is, moreover, quite free from the carbonaceous and rocky debris, and other marks of mechanical violence, which it must have presented had it originated in the dislocation and displacement of a coal seam originally conformable with the stratification of the neighborhood.

These evidences of the nature and origin of the deposit are confirmed by the statement that in the progress of the mining, several large fragments of the vertical wall-rock have been found detached and imbedded in the midst of the Albertite, and on one occasion a mass of unusually great dimensions could be traced by correspondence of form to a cavity in the wall at some distance above, from which it would seem to have fallen, while the contents of the fissure were still but imperfectly solidified.

The conclusions of Prof. Rogers, as to the origin and nature of this remarkable deposit are thus completely in harmony with those which Prof. Leidy has maintained on the ground of a microscopic examination of the material.

Prof. W. B. Rogers gave an account of some experiments in binocular vision, which he had devised for the purpose of testing the theory of the successive combination of corresponding points as maintained by Sir David Brewster.

In one class of these experiments two slightly inclined luminous lines were combined into a perspective resultant, either with or without a stereoscope. On looking at this intently for a few seconds, so as to induce the reverse ocular

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spectrum, and then directing the eyes towards a distant wall, a single spectrum was observed, having the attitude and relief of the original binocular resultant. When the luminous lines were regarded in succession, each by the corresponding eye, the other eye being shaded, so that no direct binocular combination could be formed, it was found on looking towards the wall that the subjective images united into a single spectral line, having the same relief as if the lines had been directly combined in the stereoscope.

In these experiments, according to the theory of Brewster, the resultant spectrum, instead of being a single line in a perspective attitude ought to present the form of two lines inclined or crossing, situated in the plane of the wall without projection or relief. The conditions of the experiments are such as exclude all opportunity of a shifting of the image on the retina, and this is essential to the successive combinations of pairs of points required by the theory in the production of perspective effect.

A similar result was still more clearly shown by vibrating a screen between the eyes and the twin pictures of a stereoscope, so as alternately to expose and cover each, completely excluding the simultaneous vision of the two. The stereoscopic relief was as apparent in these conditions as when the vibrating screen was withdrawn.

The perception of the resultant in its proper relief does not therefore require that each pair of corresponding points should be combined by directing the optic axes to them pair by pair in succession, as maintained by Brewster. Nor is it necessary for the singleness of the resultant perception that the images of corresponding points of the objects should fall on what are called corresponding points of the retinae. The condition of single vision in such cases seems to be simply this, that the pictures in the two eyes shall be such and so placed as to be identical with the pictures which the real object would form, if placed at a given distance and in a given attitude before the eyes.

Dr. Ruschenberger asked how it is, under the explanation given by Prof. Rogers, that a man with only one eye is capable of perceiving solidity, and of appreciating the properties of photographs viewed stereoscopically.

Mr. Powell asked at what rate per second the vibrating or revolving screen presented its openings; for if it happened eight or ten times in a second, might it not fail to practically intercept vision? Objects thus seen would appear permanently. Thus, although not appearing to each eye at the identical instant of time, the object would be persistent in both, for an impression upon the eye cannot be discharged oftener than about eight times in a second, some impressions remain much longer. An object illuminated by a flash of lightning for a very instant, may thus appear solid to both eyes, the intense reflection impressed upon the retina endures long enough for the *sensorium* to scan it in detail. A man takes quick aim with a rifle, it may be almost instantaneously, yet by distinct operations and different foci of vision he must see the distant mark—the tip sight, and again the heel sight, no two of which can be in focus at once. We have here successive points in a line, rapidly scanned in determining position. The breadth of field of distinct vision is exceedingly narrow for the same instant of time, and so is the penetration of focus very short. A separate direction and a new adjustment of the eye must be given for parts of even a very small object.

Mr. P. remarked, while upon the subject, that he believed the stereoscopic effect often noticed in viewing large photographic pictures with only one eye, was caused by the aperture of the lens used in taking the picture; for the aperture is often so great that objects have an appreciable parallax from the opposite margins of the aperture, and the picture thus contains more than could be seen from one point. When both eyes, however, view such a picture they decide that it is flat and in one plane, and their evidence denies the stereoscopic effect which one eye cannot so well dispute.

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April 24th.

MR. LEA, President, in the Chair.

Forty-four members present.

The Committee to whom was referred the communication addressed to Isaac Lea, Esq., President of the Academy of Natural Sciences, by A. D. Jessup, E. A. Jessup and Clara J. Moore, under date of March 6th, 1860,

Reported, That the unsolicited efforts of the children of the late Augustus E. Jessup to ascertain any expressed intentions on his part to pecuniarily benefit the cause of science through this Academy, and the filial regard and liberal feeling evinced by them in fulfilling his supposed views, satisfy your Committee that the respect and esteem entertained by the Academy for the father, is also merited by the children of our lamented fellow member, Augustus E. Jessup, Esq.

Your Committee recommend that the President and Curators of this Academy shall, ex-officio, be a perpetual Committee under the direction of the Academy to carry out the intentions of the late Augustus E. Jessup, Esq., as expressed in the above mentioned letter of his children, A. D. Jessup, E. A. Jessup and Clara D. Moore, and that said Committee shall make a quarterly report of their proceedings, your Committee also recommend that a copy of the Publications of this Academy shall be furnished to each of the above named children of the late Augustus E. Jessup during life, commencing with the volumes now in progress.

WM. S. VAUX, Chairman of Committee.

The report was unanimously adopted.

The Committee of the Biological Department to whom was referred the communication "On the Physical and Chemical Characteristics of Corroval and Vao, two recently discovered varieties of Woorara, and on a new alkaloid containing their active principle, by William A. Hammond, M. D., Assistant Surgeon U. S. Army, and S. Weir Mitchell, M. D., Lecturer on Physiology, in the Philadelphia Medical Association," reported in favor of its publication in the Proceedings.

The following papers were, on the report of the Committees to whom they had been referred, ordered to be published in the Proceedings:

Conspectus Piscium in Expeditione ad Oceanum Pacificum Septentrionalem, C. Ringold et J. Rodgers ducibus, a Gulielmo Stimpson collectorum. SICYDIANÆ:

AUCTORE THEO. GILL.

SICYDIANÆ Gill.

Corpus elongatum, antice subcylindricum, squamosum vel nudum; aperturæ branchiales paulo fissæ, verticales; caput elongatum, rostro prominens; maxilla inferior triangularis, crassa; labium inferius plerumque dentibus gracilibus, confertissimis præditum.

Pinnæ dorsales duæ; pinnæ pectorales basi latæ fere verticales; pinnæ ventrales in modo disci conjunctæ, ad basin pectori adhærentes.

Hæc subfamilia bene distinguitur ab subfamiliis "Gobinæ" Gill et "Triden-

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tigerinæ" Gill pectori pinnarum ventralium adhæratione, et forma capitis et osteologia.

Genus I. SICYDIUM Val.

Corpus plerumque squamis ctenoideis obtectum; maxillæ superioris dentes gracillimi, confertissimi, uniseriati; maxillæ inferioris distantes, magni, præcipue prope symphisin; dentes labiales gracillimi.

Subgenus I. SICYDIUM.

Maxilla inferior superne ad symphisin et prope commissuras lateribus appendicibus carnosus prædita.

Typus *S. (Sicydium) Plumieri* Val. Hist. Nat. des Poissons, vol. xii.

Subgenus II. SICYPTERUS Gill.

Maxilla inferior appendicibus carnosus carens.

Typus *S. (Sicypterus) Stimpsoni* Gill nov. sp.

Genus II. SICYOGASTER Gill.

Corpus alepidotum. Dentes in utraque maxilla uniseriati; ei ad maxillæ superioris partem anteriorem crassi, tricuspidati, laterales simplices; maxillæ inferioris dentes anteriores remoti, simplices.

Typus *Sicyogaster concolor* Gill, nov. sp.

Genus SICYDIUM Val.

Sicydium Val. Hist. Nat. des Poissons, vol. xii, p. 18.

Corpus antice subcylindricum, versus pinnam caudalem regulariter attenuatum; squamæ imbricatæ, plerumque marginibus subrotundæ, nec angulatæ, valde pectinatæ, striis concentricis et radiantibus obsoletis; squamæ dorsales et laterales anteriores parvæ, cycloideæ.

Caput oblongum, subquadratum, latitudine altitudinem æquante vel superante; rostrum subverticale, obtuse rotundatum. Oculi cerciter in capitis parte mediana siti.

Os mediocre, fere horizontale, usque ad oculos extendens. Maxilla inferior triangularis, superiore brevior minorque, intus superiorem claudens; labia crassa, præcipue labium superius.

Dentes maxillæ superioris gracillimi, confertissimi, in serie unica dispositi; maxillæ inferioris in serie una, remoti, mediocres, ad utrumque latus symphisis majores.

Pinnæ dorsales omnino disjunctæ; pinna caudalis rotundata vel subrotundata, sub oculis desinens: maxilla inferior superiore brevior, minorque, intus superiorem claudens: labia crassa, maxillas dentesque tegentia.

Subgenus SICYPTERUS Gill.

1. *Sicydium Stimpsoni* Gill.

Caput latitudine antrorsum retrorsumque subæquale, vix quam altitudo majore; rostro subverticali, obtuse rotundato; capitis longitudine corporis longitudinis extremi partem quintam æquante, latitudine capitis longitudinis 2-3 æquante, altitudine fere latitudinem æquante. Labium superius utrinque emarginatum fere sub nare, sub rostro fissum; intus papillarum serie circa marginem superiorem extendente et papilla unica supra sinum labri anteriorem præditum. Pori capitis in linea transversa arcuata pone oculos, et in linea brevi obliqua in operculi parte inferiorique, suboperculo, &c.

Pinna dorsalis prima radio secundo ejus filiforme, ultimo remotiori.

D. vi, 11; A 11; C 8, 13, 7; P 18; V i, 5+5 i.

Color subpurpureus, fasciis obscurioribus septem variegatus; pinna dorsalis analisque basi albo punctulatæ; pinna caudalis albo punctulata.

Habitat in aquæ dulcis rivulis, lapidibus adherens, Hilo Hawaii.

Forsitan *Sicydio laticepti* Val. proximum.

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Genus *SICYOGASTER* Gill.

Corpus alepidotum, antice subcylindricum, inde versus caudam lente attenuatum.

Caput oblongum depressum, altiore latius, antice rotundatum. Oculi in parte subanteriori positi. Os medioce, horizontaliter fissum.

Dentes in maxilla utraque serie regulare unica dispositi; dentes circa maxillæ superioris partem anteriorem approximata, apicibus lateraliter dilatatis, tricuspidatis, cuspa mediana majore, subrotundata; dentes laterales pauciores, remotiores, simplices, subcylindrici et paulo recurvati. Dentes maxillæ inferioris partis anterioris subcylindrici recurvatique, remoti. Dentes labiales tenuissimi adsunt.

Pinnæ dorsales duæ, prima radiis valde flexibilibus; pinnæ caudalis margini rotundata; pinnæ ventrales postice bene conjunctæ, antice funiculo musculari spinas connectente et membranæ marginem formante præditæ.

Hoc genus a *Sicydio* Val., valde differt corpore omnino alepidoto, dentibus trilobatis crassis in maxillæ superioris parte anteriore et dentibus maxillæ inferioris subæqualibus.

Eo referenda est unica species.

Sicyogaster concolor Gill.

Caput longitudinis totius partem quintam formans, altitudine sui longitudinis dimidiam superante. Maxilla superior circiter dentibus tricuspidatis sexdecim et latere utroque circiter dentibus simplicibus quatuor vel quinque armata; maxilla inferior circiter dentibus simplicibus remotis decim prædita.

D vi, 11; A 10; C+15+; P 15 V i, 5 +5 i.

Color subpurpureus; pinnæ analis et ventrales submargaritaceæ, analis pureo marginata.

Habitat cum *Sicydio Stimpsoni* in aquæ dulcis rivulis saxis adhærens.

In specimine unico in collectione, labium inferior dentes graciles paucos habet.

Monograph of the Genus *LABROSOMUS* Sw.

BY THEO. GILL.

In the genus *Clinus* as proposed by Cuvier, and even as revised by Valenciennes, there are dissimilar types which yet remain to be named and elevated to the rank of genera. Among the species of this group, described by the latter naturalist in the eleventh volume of the "Histoire Naturelle des Poissons," there are several species which are distinguished by the presence of superciliary tentacles, and of a transverse pectiniform series of filaments on the nape. Those fishes provided with such appendages, have at the same time a much less inequality between the spinous and soft portions of the dorsal than the typical *Clini*, and the teeth in the outer row are much stronger. They would therefore be correctly referred to a genus which is quite distinct from *Clinus*. For this genus, the name *Labrosomus*, first proposed by Swainson, must be adopted, but the characters given by that author to it are not the proper generic ones, and the greater number of the species referred to it are not congeneric with its type.

The name of *Labrosomus* (or *Labrisomus*) was first published in 1839, in the second volume of the "Natural History of Fishes, Amphibians and Reptiles." At the seventy-fifth page of that volume, Swainson has divided the Cuvieran genus *Clinus* into five genera: *Clinus*, of which the *Clinus acuminatus* Cuv., is taken as the type; *Labrisomus* with *Clinus pectinifer* Val., as type; *Tripterygion* Risso, *Clinitrachus* Reese, which is typified by Blennius

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variabilis of *Rafinesque*, and *Blennophis*,* of which the *Clinus anguillarum* *Val.*, is the only true species. Of these genera, *Clinus* *Sw.*, and *Clinitrachus* *Sw.*, are distinguished by false or illusive characters, and cannot be regarded as distinct. The others are valid, but their characters require revision.

The only claim to distinction of the genus *Labrosomus* given by Swainson, are founded on the strong, conic and pointed row of front teeth, behind which are villiform ones; a thicker body than in *Clinus*, and the "dorsal fin distinctly emarginate towards the caudal." The genus resting on these characters alone is composed of very incongruous elements. To it are referred, at page 277 of the second volume, the following species, all of which are described as species of *Clinus* by Valenciennes: *Labrosomus gobio*, *L. pectinifer*, *L. capillatus*, *L. Delalandii*, *L. linearis*, *L. variolosus*, *L. Peruvianus*, *L. microcirrhis*, *L. ? geniguttatus*, *L. elegans*, *L. ? littoreus* and *L. latipinnis*.

Of these species, not more than three can, with propriety, be regarded as congeners, if the *Labrosomus pectinifer* is taken as the type. These are *Labrosomus pectinifer*, *L. capillatus* and perhaps *L. Delalandii*. The latter is more probably the representative of a distinct genus.

That genus is distinguished from *Labrosomus* by the smaller mouth, the presence of only two rays to the ventral fins, and perhaps by the undulating margin of the spinous portion of the dorsal fin. It may be named *Malacoctenus*, in illusion to the pectiniform row of filaments. This genus is the nearest ally of *Labrosomus*. All the others are very distinct.

Labrisomus gobio Sw., is the type of quite a distinct genus, whose characters consist of a broad, depressed head, with a very short muzzle, large approximated eyes, superciliary and nasal tentacles, two ventral rays and a comparatively short spinous dorsal. The genus may be called *Gobioclinus*. The only species *Gobioclinus gobio* is found in the West Indies, and has but eighteen dorsal spines.

Labrisomus linearis Sw., is synonymous with *Clinus brachycephalus Val.* This also is the type of a distinct genus distinguished by its abbreviated and blenniform head, the profile being very convex; by the villiform teeth, the absence of superciliary tentacles, the spinous portion of the dorsal long, and the presence of only two rays to the ventral fins. The name of *Blennioclinus* is conferred on it; for the species, the specific name of Valenciennes must be retained.

Labrisomus variolosus is distinguished by a large thick head, with lateral eyes, short superciliary tentacles and a small nuchal one. The mouth is large; the teeth of the jaws in an outer row strong and conical, behind which are villiform ones; those of the vomer and palate villiform and in three patches, one on the vomer and one on each palatine bone. The spinous portion of the dorsal is long, and the ventrals have each three rays. The species thus characterized is the type of a new genus which may be named *Anchenionchus*.

Labrisomus microcirrhis, *L. elegans* and *L. Peruvianus* are nearly related to *Anchenionchus*, and are from the same zoological province.

Labrosomus ? geniguttatus is distinguished from *Anchenionchus* by the more approximated eyes, and by the disposition of the vomero-palatine teeth, as well as the small size of the anterior row of maxillary teeth. The dorsal is moderately long, and each of the ventrals have three rays. The mouth is comparatively small, and there are superciliary, nasal and nuchal tentacles. For this species, the generic name of *Calliclinus* is proposed.

* Valenciennes has since given the name of *Blennophis* to a very distinct genus from that to which Swainson applied the name. As Swainson's genus is a natural one, another name must be substituted for that of Valenciennes—*Ophioblennius* is therefore proposed.

Labrisomus littoreus may possibly belong to the genus *Acanthoclinus* of Jenyns, but it is only known from a drawing and description.

Labrisomus latipinnis is related to *Blennioclinus*, but is distinguished from the species of that genus by the presence of superciliary tentacles. The generic name of *Ophthalmolophus* may be retained for it.

If the above views of the limits of the *Labrosomus* are correct, only two of the species assigned by Swainson to the genus truly belong to it. Of the remaining species, nearly each one belongs to a genus distinct from the others. The affinities and characters of the genera above indicated will be more fully exposed at another time.

About three years after the publication of the work of Swainson, the same species that served as the type of the genus of that naturalist, was described by Dr. Dekay, in the ichthyological part of his "Zoology of New York, or the New York Fauna," as the representative of a new genus of Percoids, under the name of *Lepisoma*. That the genus *Lepisoma* is identical with the *Labrisomus* of Swainson, no one can entertain a doubt after a perusal of the generic and specific description of Dekay.

Dr. Dekay has given the characters of his genus *Lepisoma*, as follows:

"Body and fins scaly. Fleshy filaments along the basal line of the head and on the orbits. A single dorsal fin. Branchial rays six. Teeth in the jaws vomer and palatines. Ventrals before the pectorals."

Dekay in his remarks, states "that it is with much hesitation that he places this genus at the end of the jugular section of this family (Percidæ). In its general aspect, it might readily be referred to the families Sciaenidæ or Labridæ; but the presence of vomerine and palatine teeth excludes it from them."

The amiable naturalist was much mistaken in regard to the affinities of the genus, as must be perceptible from his descriptions. Even in his brief generic diagnosis, the ichthyologist is surprised by the peculiarity described by the second sentence; "*fleshy filaments along the base of the head and on the orbits.*" This character is so peculiar, so much at variance with the compact character, if I may so express myself, of the head in the family of Percoids, that it might well cause the naturalist to doubt if a fish with such appendages can really belong to the family of Percoids. On a careful examination of the specific description, the characters are found to disagree more and more with the natural ones of the family to which Dekay has referred it.

The scales are described as being "moderate, rounded, finely striate on their free surfaces, with a smooth membranous margin." The head is "corrugated and destitute of scales. Along the basal line of the head, on each side, are nine or ten fleshy processes, ending in bifid or trifid filaments," &c. "Another fleshy process arises from beneath the upper margin of the orbit, which subdivides into six or eight smaller processes," &c. The anterior nostril has a "fleshy valve, through which is pierced the nasal aperture; its posterior border elongated and terminating in six or eight filaments." The opercle and preopercle are rounded and smooth on their margins."

All of the attributes of the species underlined in the foregoing abstract are more or less at variance with the characters of Percoid fishes, even as the family was accepted by Dr. Dekay; the doubt of the reader is still more increased when he finds it stated that the "*branchial membrane (is) large, extending loosely around the throat, with six rays, and that the ventrals arise near the inferior fold of the branchial membrane, and are composed of two long articulated rays and a short rudimentary one on each side.*"

This condition of the branchial membrane, this number of ventral rays are so different from the characters of the true Percoids, that one can have no hesitation in denying a fish with such attributes a place in the family. As in all those as well as in minor details, it agrees with *Labrosomus*, it is unhesitatingly referred to that genus.

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The genus *Lepisoma* has been adopted by the following authors, but it is necessary to add, entirely on the authority of Dr. Dekay.

Troschel has translated into German the characters of the genus for the "Archiv für Naturgeschichte" of 1844, page 233. He has questioned the presence of three ventral rays.

Dr. Storer, in his "Synopsis of the Fishes of North America," has adopted it without qualification.

Sir John Richardson, in the article "Ichthyology" of the last edition of the "Encyclopædia Britannica," at page 277 of the twelfth volume, has taken the characters of the genus from the "Archiv," and on account of the presence of six branchiostegal rays, places it, together with *Boleosoma* and *Pileoma*, at the end of his family of *Theraponidae*, but adds that he "cannot, without more data, fix their proper place in the system."

No notice has been taken of the genus *Labrosomus*, except in a reference of *Lepisoma cirrhosum* Dekay to it, in a recent number of the Proceedings of the Academy of Natural Sciences. That this is entitled to distinction appears to be evident, and its characters are now given.

LABROSOMUS Sw., emend.

Synonymy.

Labrisomus Sw., Nat. Hist., Fishes, Amphibians and Reptiles, vol. ii. pp. 75, 182, 277, 1839.

Lepisoma Dekay, Zoology of New York, Fishes, p. 11, 1842.

Blennius sp. auct.

Clinus sp. auct.

Body oblong, highest at the pectoral fins, thence attenuated towards the caudal. Scales moderate, covering the body and encroaching upon the vertical fins. Head compressed, naked, declining from the nape with a slight curve. Eyes large, separated by a narrow interval. Superciliary tentacles multifid, and one or two transverse rows of filaments across the nape. Nostrils approximated; the anterior ones with a tufted barbel on the posterior border. Teeth in the anterior row stout, recurved, conic and pointed, behind which is a band of villiform teeth. Vomerine and palatine teeth stout and conic, generally in a single row. Dorsal fin commencing near the nape; the spinous portion long, and with from sixteen to eighteen rays, slowly decreasing in height to the soft portion; the latter oblong, with its rays subequal and higher than the spinous portions. Caudal fin moderate, truncate or rounded, and disconnected from the dorsal and anal fins. Ventral fins jugular, closely approximated, each composed of three rays.

1. *Labrosomus pectinifer* Sw.

Synonymy.

Clinus pectinifer Val., Hist. Nat. des Poissons, vol. xi. p. 374, 1836.

Labrisomus pectinifer Sw., Nat. Hist., Fishes, Amphibians and Reptiles, vol. ii, p. 277, 1839.

Lepisoma cirrhosum Dekay, Zoology of New York, Fishes, p. 41, pl. 30, fig. 94, 1842.

Lepisoma cirrhosum Storer, Synopsis of Fishes of North America, p. 49, ib. in Memoirs American Academy, 1856.

Clinus pectinifer Müll. and Troschel con Schomburgh Annals and Magazine Nat. Hist., 2d ser. vol. ii, p. 16; ib. in Schomburgh's Barbados.

Clinus pectinifer Castlenau, Animaux nouveaux ou rares recueilles &c., dans l'Amerique du sud. Poissons, p. 26, 1855.

Labrosomus pectinifer Gill, Proc. Acad. Nat. Sci. Phila., 1860, p. 21.

There can scarcely remain a doubt of the identity of the *Lepisoma cirrhosum* of Dr. Dekay with the *Labrosomus pectinifer*. The only difference between the description of Dekay and that of Valenciennes, is respecting the 1860.]

orbital and nuchal filaments. The orbital filaments are stated by Dr. Dekay to "subdivide into six or eight smaller processes, each of which terminate in several slender filaments, not thicker than the finest thread;" Valenciennes describes them as divided to their base in ten or twelve slender filaments. Dr. Dekay informs us that the nuchal filaments are nine or ten on each side, each bifid or trifid; Valenciennes describes them as being arranged in two pectiniform rows, each row consisting of thirty or more.

Another variation of *Lepisoma cirrhosum* from *Labrosomus pectinifer* is concerning the vomero-palatine dentition; Dekay mentions that "in the upper jaw, in front, is a series of equal, conical, slightly recurved teeth, somewhat longer than those below, smaller on the sides; behind the outer row, in front, is a patch of minute crowded teeth. Similar teeth in bands on the vomer and palates. On the anterior part of the vomer is a very large solitary tooth." This description of the vomerine and palatine teeth is ambiguous, and may be variously interpreted. If by it is meant that the vomero-palatine teeth are in several rows, or in a villiform band, it widely disagrees with the *Labrosomus pectinifer*. In the latter species there is but one row of stout conic teeth, like those of the outer row of the upper jaw, with "a very large solitary tooth on the anterior part of the vomer." A figure is given of the dentition of the *Lepisoma cirrhosum*, but very little reliance can be placed on it. The vomerine and palatine teeth are certainly represented as pluriserial, but there is no "very large solitary tooth" represented on the vomer. A doubt may therefore arise respecting the propriety of referring *Lepisoma cirrhosum* to *Labrosomus pectinifer*. Considering, however, that the description of the former, in all respects except those above mentioned, agrees with the latter; that the number of rays is almost exactly similar; that in each, a larger tooth is at the front of the vomer, and that the description and figure of the dentition of *Lepisoma cirrhosum* do not agree with each other; it appears almost certain that the two belong to the same species, and that error has entered into the description and illustration of the species as well as in the allocation of the genus.

The *Labrosomus pectinifer* is widely distributed through the Caribbean Sea, and is found at the Islands of Barbados, Trinidad, St. Thomas, Jamaica, Cuba, as well as at the Bahama Islands and on the coast of Florida.

The specimens from which Valenciennes described the species were obtained at Brazil and at Bahia. A specimen from Brazil does not specifically differ from West Indian ones.

Valenciennes even observes that it is one of the small number of species that cross the Atlantic ocean. A specimen is stated by him to have been obtained by Adanson among the rocks of the Island of Gorea, in January, 1750.

2. *Labrosomus fasciatus* Gill.

Clinus fasciatus Castelnau, Animaux nouveaux ou rares recueilles, &c., dans l'Amerique du sud. Poissons, p. 26, pl. xii. fig. 2, 1855.

This species is very closely related to the *Labrosomus pectinifer* Sw., and it was at first believed that it was probably only a variety. My friend, J. C. Brevoort, Esq., has since sent me an outline of the figure of Castelnau and a copy of his description, and I am now disposed to regard it as a true species.

The *Labrosomus pectinifer* is sometimes found with four dark brown vertical bars, between which are smaller and more obscure ones, interrupted at the middle. Such appears to have been the variety mentioned by Drs. Müller and Troschel in their list of the Fishes collected by Sir Robert Schomburgk at the island of Barbados, and published in the "Annals and Magazine of Natural History" and the History of Barbados. This variety, in every other respect, resembles typical individuals of the species, and has, like them, the rays of the caudal and pectoral fins covered with five or six rows of spots.

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In the normal variety of the *Labrosomus pectinifer*, the bands, although present, are faint and confused.

The *Labrosomus fasciatus*, from the figure and description of Castlenau, appears to differ from the *L. pectinifer* or its variety, by the absence of the intermediate, interrupted and fainter bands, and of the rows of spots on the caudal, by the red color of the abdomen and opercula, and of the ventral, pectoral and caudal fins, as well as of the broad marginal band of the soft portion of the dorsal fin. The following is the description given by Castlenau :

“Ressemble pour la forme au *pectinifer*, et a une tache semblable à l'opercule. Le corps est d'un brun clair avec quatre, larges bandes transversales d'un brun très obscur ; l'opercule, la gorge, la partie inférieure de la tête et la moitié antérieure des dessous du corps sont d'un beau rouge vif ; les nageoires anale et ventrale sont de cette même couleur.

“De Rio Janeiro.”

3. *Labrosomus capillatus* Sw.

Synonymy.

Clinus capillatus Val., Hist. Nat. des Poissons, vol. xi. p. 377.

Labrisomus capillatus Sw., Nat. Hist. Fishes, Amphibians and Reptiles, vol. ii. p. 277.

Clinus capillatus Müll and Trosch., con Schomburgh, Annals and Mag. of Nat. Hist. 2d ser. vol. ii. p. 16 ; ib. in Schomburgh's Barbados.

The *Labrosomus capillatus* is recorded as an inhabitant of the same coasts as the *L. pectinifer*. It is very nearly allied to the latter, but differs from it by the immaculate pectoral fins, and the spot on the operculum is bordered with white.

4. *Labrosomus Xanti* Gill.

This species in form and proportions is very nearly allied to *Labrosomus pectinifer*.

It attains a length of about six inches. Of the length, the head, from the front row of teeth to the margin of the operculum forms a fourth part, and the caudal fin about a seventh. The greatest height is rather less than the head's length. The dorsal outline from the nape to the posterior third of the dorsal fin is nearly straight and scarcely convex, and thence gradually declines in a slight curve to the end of the fin, when the height of the caudal peduncle is scarcely more than a fourth of the length of the head.

The profile from the eyes to the snout slopes more gradually than in *Labrosomus pectinifer*, and the suborbital is less broad.

The dorsal commences behind the vertical of the preopercle, and the spines regularly increase in height towards the middle of the spinous portion, and thence slightly decrease towards the soft portion, which is almost twice as high as the last spine.

The pectoral fins are produced at its middle rays, and their length is equal to nearly a fifth of that of the body. The articulated rays of all the fins are simple and unbranched as in its congener.

D xviii.+13 ; A iii. 18 ; C 7+7 ; P 14 ; V 3.

The color of the body is brown, crossed by about ten darker bands. The head is dotted with blackish, and from the posterior and inferior borders of the eye, two bands proceed obliquely to the margin of the preopercle. The opercle is darker than the preopercle, but there is no black spot. The dorsal has the basal portion of the membrane between the first and third spines blackish ; the rest of the membrane is tinged with purple, but immaculate. The basal half of the fin is covered with scales as in *Labrosomus pectinifer*. The anal fin is crossed by six oblique purplish bands. The caudal, pectorals and ventrals are immaculate.

1860.]

This species is very nearly allied to the West Indian *Labrosomus pectinifer* and *L. capillatus* *Sec.*, but differs from them in color and some minor details of form. The median tooth of the front of the vomer, which is so large in the *Labrosomus pectinifer*, is of the same size as the others in the *Labrosomus xanti*.

Old and young specimens were obtained by Mr. J. Xantus under rocks on Cerro Blanco. They are numbered 2334, 2335 and 2478 in the collection of the Smithsonian Institution.

I have dedicated this species to Mr. Xantus as a slight testimony to his worth and abilities: while engaged in his duties on the coast survey, and with many obstacles to contend against, on account of the present condition of affairs in Mexico, he has obtained a collection of terrestrial and marine animals, which is rich in new forms, and all the species of which are in the highest state of preservation.

5. *Labrosomus Herminieri* Gill.

Synonymy.

Blennius Herminieri Lesueur, Journ. Acad. Nat. Sci. Pa., vol. iv. p. 361, 1825.

Clinus Herminieri Val., Hist. Nat. des Poissons, vol. xi. p.

This species appears to be nearly related to the other species of the genus, but is distinguished by the presence of only sixteen spines in the dorsal fin, and by a different pattern of coloration. The dorsal fin anteriorly has an elongate black spot. "The cheeks and head are rufous brown, vermicular with little blackish lines, which form an irregular kind of close net work."

The radial formula is as follows:

D 16, 11; A 20; P 16; V 3; C 14.

Specimens were taken at the West Indian Island of St. Bartholomews, in cavities of madreporic rocks, in the month of June, 1816, by C. A. Lesueur. It has not since been re-discovered.

Monograph of the Genus *LABRAX*, of Cuvier.

BY THEO. GILL.

There is found, in the Mediterranean sea, a fish which has, from the earliest times, attracted the attention of the inhabitants of the neighboring coasts from the abundance in which it is found and the size to which it attains. By the Ancients, as at the present day, it was much esteemed as an article of food, and was called by the Greeks $\Lambda\alpha\beta\rho\alpha\zeta$ and by the Romans, *Lupus*. Of this fish, Cuvier has said that its appearance and almost all the details of its form recall to mind the *perch*, and that a just idea would be given of it by describing it as a "large, elongated and silvery perch."

From the *Perches*, however, it differs in several characters, which induced Cuvier to separate it generically, and for the name of the genus, he adopted the Greek designation of the species. The characters by which Cuvier distinguished it from the *Perches* were the presence of teeth on the tongue and of two spines to the operculum. It differs also from the true *Perches* in the armature of some of its bones, and by the shorter spinous dorsal fin, whose rays, in the European and allied American species, do not exceed the number of nine.

Though Cuvier was the first to properly distinguish the genus, its type had been long previously placed by Klein as the first of two species which he placed in a group, for which he used the same name of *Labrax*.

In the second and third volumes of the great "Histoire Naturelle des Poissons," Cuvier and Valenciennes have referred to the genus *Labrax* seven species, six of which are described in the former volume.

Of these, the *Labrax lupus* is the type of the genus, and is distinguished by

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the spur-like spines of the inferior margin of the preoperculum; the presence of a perfect marginal band of teeth and of an oval basal patch on the tongue; three spines to the anal fin, and other characters which will be noticed in the diagnosis of the genus. To this should the name of *Labrax* be restricted.

The second species (le Bar alongé, or *Perca elongata* of Geoffrey) is distinguished by finer and more numerous teeth on the inferior border of the preoperculum, and the presence of only two anal spines. This is doubtless the type of a distinct genus to which the name of *Dicentrarchus* may be given.

The third species is the *Labrax lineatus* of Cuvier, the common rock fish and striped bass of the United States. This is now taken as the type of a new genus, for which Mitchell's name of *Roccus* is preserved. The characters are given below. To this genus should be also referred the *Labrax multilineatus* described by Cuvier and Valenciennes in the third volume of their "Histoire."

The fourth species, *Labrax Waigiensis*, has been identified by Bleeker with the *Psammoperca datnioides* of Richardson; if this is correct,—and notwithstanding the discrepancies between the descriptions of the "Histoire Naturelle" and Richardson, such appears to be the case—it belongs to a very distinct genus from *Labrax lupus*. The teeth of the jaws, vomer and palatines are described by Richardson as crowded, rounded and granular, while by Cuvier the teeth on both jaws, the chevron of the vomer and the palatines are said to be villiform ("dents en velours"); it is also stated by Cuvier that there is a small oval disc at the base of the tongue. By Richardson, the tongue is said to be smooth. In the latter statement, however, he disagrees not only with Cuvier and Valenciennes, but with Bleeker, who also asserts* that there is an oblong patch at the base of the tongue; "lingua basi thurma denticulorum scabra." Both authors agree as to the presence of a single spine to the operculum (although one of the generic characters assigned to *Labrax* by Cuvier is the presence of two spines on that bone), and of a strong horizontal spine at the angle of the preoperculum, above which the margin is pectinated.

The next species in order,—*Labrax Japonicus* of Cuv. and Val.,—is the type of the genus *LATEOLABRAX* of Bleeker, which is widely separated from *Labrax* by the absence of any teeth on the tongue. In the plectroid armature of the operculum it, however, resembles that genus.

The last species—*Labrax mucronatus*—is now taken as the type of a new genus, for which the name of *MORONE* is accepted. Its generic characters and affinities will be given at length in a subsequent portion of this memoir.

Of the seven species referred by Cuvier and Valenciennes to the genus *Labrax*, six are thus seen to belong to different genera. Nor do any of these genera appear to be unnecessary, but on the contrary, all of them are well distinguished from each other by characters that ichthyologists must admit are of importance; two of the species, indeed, that were referred to the genus by the French naturalists, do not agree with their characters of that genus. It is not in disparagement of those celebrated and able men that these remarks have been made. The progress of scientific discovery and the examination of better materials have enabled their successors to discover the errors of the founders of modern ichthyology. None could have performed the work at that day better than they.

Having long since, from an examination of the descriptions of various authors, been aware of the confusion and uncertainty in which our American species of the Cuvieran *Labrax* were enveloped, I have thought that it might be a useful task to attempt the elucidation of the genus. More than three years ago, I had noticed that the *Labrax rufus* of *Dekay* belonged to a different natural genus from *Labrax*, but not having then had an opportunity of examining the European species, I believed that the *Labrax lineatus* was a true *Labrax*. The name which I had then applied to the *Labrax rufus* having never been published, I have now renounced it for that of Mitchell, not because

* *Natuurkundig Tydschrift voor Nederlandsch Indie*, vol. ii. p. 479.

he was the author of the genus, but because the name had been applied, though from a false idea, to one of its species.

The number of American species admitted by Drs. Dekay and Storer in the genus *Labrax* amounts to seven, and another specific name has been since added by Filippi, an Italian naturalist. It will be attempted to demonstrate, in the following monograph, that all of these nominal species are referable to three true ones. Three of the synonyms apply to one species and four to another.

Besides the species that have been attributed to the genus by Richardson, Dekay and Filippi, several others have been described under that name by modern naturalists. Dr. Charles Girard has noticed two of these in the "Proceedings of the Academy of Natural Sciences of Philadelphia," under the name of *Labrax nebulosus* and *L. clathratus*. He afterwards constructed for them a new genus which he called *Paralabrax*, and placed it in the vicinity of *Serranus*. They appear truly to belong there, or perhaps to the group composed of *Elastoma* Sw., or *Macrops* Dumeril, and *Etelis* Cuv.

Mr. Hill, of Jamaica, in a useful catalogue of the Fishes of that island, has also noticed a fish which he referred to *Labrax*, under the name of *L. pluvialis*, or the rainy weather chub. It is said by that gentleman to be confounded by the fishermen with the *Labrax mucronatus*, but differs from it by the presence of vertical bars, like those of the common perch of Europe and America. Is not this related to the *Perca Plumieri* of Cuvier and Valenciennes? The presence of the vertical bars would militate against its natural association with *Morone*, and it may perhaps be the type of a distinct genus or belong to the genus *Percichthys* of Girard.

For the facilities of investigating into the history of this group I am indebted to the Museum of the Smithsonian Institution.

I. LABRAX (Klein) Cuv. emend.

Synonymy.

Labrax Klein, Miss. V. p. 25, 1749.

Perca sp. Linn. auct.

Sciæna sp. Bloch.

Centropome sp. Lac.

Perseque sp. Lac.

Labrax sp. Cuv. Regne Animal, ed. prima, vol. ii. 1817.

Dentes maxillares, palatini et vomerini velutini; dentes linguales velutini in margine totio et fascia longitudinali mediana dispositi. Squamæ occipitales et interorbitales, et in genis pleurusque cycloideæ vel vix pectinatæ. Preoperculum postice serratum vel pectinatum, ad angulum plerumque subtusque spinis recurvatis antrorsum spectantibus. Operculum biaculeatum. Pinnæ dorsales ad basin haud membrana elevata conjunctæ; pinna dorsalis prima numero radiorum haud decem superante. Pinna analis spinis tribus in magnitudine regulariter increscentibus.

The genus *Labrax*, as above restricted, is chiefly distinguished by the continuous band of villiform teeth around the margin of the tongue, and the oval disc at its base. It is most intimately allied to the genus *Roccus*, from which it is separated by the character of the lingual dentition and the plectroid inferior margin of the preoperculum; the latter character is seen in the less nearly allied genus, *Lateolabrax* of Bleeker.

But a single species of this genus is yet known.

Labrax diacanthus Gill.

Synonymy (partim.)

Perca labrax Linn. Systema Naturæ.

Sciæna diacantha Bloch.

The full synonymy of this species can be ascertained by reference to the

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"Fauna Italica" of the Prince of Canino; as it has been given by Cuvier as well as Canino, it is not necessary to more than refer to it here.

As many names had been given to the species before it was designated *Labrax lupus* by Cuvier, that name cannot be retained if we are to be guided by the rules of priority. A specific name given to it by Bloch is therefore adopted.

In the edition of the "Systema Naturæ" by Gmelin, the European *Labrax* appears under the name of *Perca punctata*. Cuvier and Valenciennes have shown that this name is only a misapplication of one by Linnæus, who had given it to a Sciænoid from North America, which he placed immediately before the *Perca labrax* in his System. Gmelin, in his edition of the same work, has by mistake omitted both the description of the Linnæan *Perca punctata* and the name of *Perca labrax*, so that the name of the former is there applied to the description of the latter. Bloch has also applied the name of *Perca punctata* to the young of *Labrax diacanthus*, but without allusion to the names of Linnæus or Gmelin. As the name thus applied would have at that time conflicted with the one of Linnæus, it should not be retained. The name of *Sciæna diacantha* coming next in order, its specific part must be adopted. Although the name of *Lupus* was bestowed on this species by the ancient Romans, that does not appear to constitute a valid reason for accepting it as a scientific name.

II. DICENTRARCHUS Gill.

Synonymy.

Perca sp. Geoffrey.

Labrax sp. Cuv. et Val.

Genus *Labrici* Cuv. simile, sed preoperculo margine inferiore dentibus non validis, et pinna analis solum spinis duabus.

Dicentrarchus elongatus Gill.

Synonymy.

Le Bar alongé Cuv. and Val., Hist. Nat. des Poissons, vol. ii. p. 79.

This species I have never seen, but it evidently belongs to a distinct genus, and I have been, in a measure, compelled to give it a name in order to present a perfect view of the classification of the *Labraces*.

The species is an inhabitant of the Mediterranean sea.

The synonymy of the species is given in the second volume of the "Histoire Naturelle des Poissons," to which reference is made.

III. ROCCUS (Mitch.) Gill.

Synonymy.

Sciæna sp. Bloch.

Perca sp. Bloch, Schneid., Mitchell, 1818.

Centropome sp. Lac.

Roccus sp. Mitchell, Report in part on the Fishes of New York, p. 25, 1814.

Lepibema Raf. Ichthyologia Ohioensis, p. 23, 1820.

Labrax sp. Cuv., et Val.

Corpus gracile vel oblongo-ovatum, dorso antice curvato. Dentes maxillares, palatini et vomerini velutini; dentes linguales velutini, in fasciis lateralibus et ad basin in seriebus duabus longitudinalibus separatis vel coalescentibus dispositi. Squamæ a nucha ad nares et in genis plerisque cycloideæ. Preoperculum postice subtusque pectinatum, operculum biaculeatum. Pinnæ dorsales ad basin non membrana elevata conjunctæ. Pinna dorsalis prima numero radiorum non decem superante. Pinna analis spinis tribus in magnitudine regulariter increscentibus. Linea lateralis rectilinearis.

1860.]

The genus *Roccus* is very closely allied to both *Labrax*, as here revised, and *Morone*. From *Labrax* it differs chiefly in the character of the armature of the preoperculum, and by the absence of the teeth at the anterior extremity of the tongue; the whole margin of the tongue in the latter genus being provided with a band of villiform teeth, and the spur-formed teeth of the inferior margin of the preoperculum calling to mind the genus *Plectropoma* of Cuvier among the *Serrani*. The difference between the last named genus—or at least of many of its species—and *Serranus* is indeed not of as great value as that between *Labrax* and *Roccus*. The only constant character between *Serranus* and *Plectropoma*, as those genera were established by Cuvier, is the spur-like dentition of the inferior border of the preoperculum, while *Labrax* and *Roccus* are distinguished not only by an equally great and constant difference of the preopercular border, but also by the difference of the lingual dentition. As the former character is of as great value in the Labraces as in the *Serrani*, consistency will require that if *Plectropoma* and *Serranus* are considered as distinct genera, *Roccus* and *Labrax* should also be so regarded.

The difference between *Roccus* and *Morone* is of even more importance than that of *Roccus* and *Labrax*. The distinguishing characters will be referred to under the diagnosis of *Morone*.

The name which has been adopted for this genus is one given by Dr. Mitchell, in the year 1814, to a medley comprising the *Roccus lineatus*, which he called *Roccus striatus*, and the *Otolithus regalis*, which was designated as *Roccus comes*. The name was solely the result of ignorance on the part of the author, of the application of the ordinary terms used by naturalists at that day. The name itself is a barbarous latinization of the popular name, rock fish, by which its chief species is known in many parts of the United States. Notwithstanding these facts, it has been nevertheless deemed more advisable to accept the name than to apply a new one. It is scarcely worse than *Rattus*, *Kangurus*, *Catus*, *Gunnellus*, and many other names of similar derivation.

Rafinesque, in the "*Ichthyologia Ohiensis*," also proposed for his *Perca chrysops*, in case it should be found to be generically distinct from *Perca*, the name of *Lepibema*. He believed it to be distinguished "by the scaly bases of the caudal, anal and second dorsal fins, the last with some spiny rays, and all the three parts of the gill cover more or less serrulate, besides the small teeth." Rafinesque suggested that to this genus the *Perca Mitchelli* of Mitchell might "perhaps be found to belong."

The genus *Roccus* may be divided into two sections.

§ I. Corpus elongatum; dentes ad linguæ basin in seriebus longitudinalibus duabus ordinati.

Roccus lineatus Gill.

Synonymy.

Sciæna lineata Bloch, *Ichthyologie*, pars. ix. p. 53, pl. 305.

Perca ——— Schoepff, *Schrift. der Gesells. Nat. Freund*, vol. viii. p. 160.

Perca saxatilis Bloch, *Systema Ichthyologiæ*, Schneid. ed. p. 89.

Perca septentrionalis Bloch, *Systema Ichthyologiæ*, Schneid. ed. p. 90, pl. 70.

Centropome rayé Lac., *Hist. Nat. des Poissons*, vol. iv. p. 225.

Roccus striatus Mitchell, Report in part on the fishes of New York, p. 25, 1814.

Perca Mitchelli Mitchell, *Trans. Lit. and Phil. Soc., N. Y.*, vol. i. p. 413, pl. 3 fig. 4.

Rock-Fish Mease, *Trans. Lit and Phil. Soc., N. Y.*, vol. i. p. 502.

Perca Mitchelli

Lepibema Mitchelli

} Raf. *Ichthyologia Ohiensis*, p. 23, (passim).

Labrax lineatus Cuv. et Val., *Hist. Nat. des Poissons*, vol. ii. p. 79.

Perca labrax! Smith, *Nat. Hist. Fishes of Mass.*, p. 277.

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- Labrax lineatus* Rich., Fauna Boreali-Americana, vol iii. p. 10.
 " " Storer, Report on the Fishes of Mass., p. 7.
 " " Ayres, Boston Journ. Nat. Hist., vol. iv. p. 757.
 " " Dekay, Zoology of New York, Fishes, p. 7, pl. 1. fig. 3.
 " " Linsley, Catalogue of Fishes of Connecticut.
 " " Storer, Synopsis Fishes of N. America, p. 21, ib. in Memoirs Am. Acad.
 " " Storer, Hist. Fishes of Mass., ib. in Memoirs Am. Acad., vol. v. p. 55, pl. 1, fig. 4., 1853.
 " " Baird, Report on Fishes of New Jersey coast, p. ib. in Ninth Annual Report of Smith. Inst., p. 321.
 " " Holbrook, Ichthyology of South Carolina, p. 17, pl. iv. fig. 2.
 " " Gill, Annual Report Smith. Inst., 1857, p. 255.

This species is so well known and has been so frequently described and figured that no description is here needed. The best that has appeared is that of Holbrook in the Ichthyology of South Carolina; in that, the only correct account of the lingual dentition published by any American author, is given. The best illustration of the species is given by Sonrel in Dr. Storer's "History of the Fishes of Massachusetts," and is superior to that of Dr. Holbrook.

Cuvier and Valenciennes have described the tongue as having asperities only on its sides, while other naturalists have stated that the teeth on the tongue are most obvious on its sides," or more correctly that the "tongue is rough at its base and upon its sides and smooth in the centre." Dr. Holbrook has well said that "there are two bands of minute teeth, at the root of the tongue, separated slightly from each other in the mesial line; the sides of the tongue are also armed with small teeth."

Prof. Filippi, a learned naturalist of Turin, has also correctly described the lingual dentition of *Roccus lineatus* in comparison with a species of the genus which he regarded as new, but which has, in this monograph, been considered as identical with the *Roccus chrysops*.

♁ II. Corpus oblongo-ovatum, compressum; dentes ad linguæ basin in turma ovali aggregati.

Roccus chrysops Gill.

Synonymy.

- Perca chrysops* }
Lepibema chrysops } Raf., Ichthyologia Ohiensis, p. 28.
Labrax multilineatus Cuv. and Val., His. Nat. des Poissons, vol. iii. p. 588.
Perca multilineata Les. *vide* Cuv. and Val.
Labrax notatus Smith, in Rich. Fauna Boreali-Americana, vol. iii. p. 8, 1836.
Labrax multilineatus Kirtland, Boston Journal Nat. Hist., vol. v. p. 21, pl. 7, fig. 1.
 " " Dekay, Nat. Hist. of New York Fishes, p. 14.
Labrax albidus Dekay, Nat. Hist. of New York Fishes, p. 13, pl. 51, fig. 165.
Labrax notatus Dekay, loc. cit., p. 14.
Labrax multilineatus Storer, Synopsis of the Fishes of North America, p. 22, ib. in Memoirs of American Acad.
Labrax notatus Storer, loc. cit., p. 22.
Labrax albidus Storer, loc. cit., p. 23.
Labrax osculatii Filippi, Revue et Magazin de Zoologie, 2d series, vol. v. p. 164.
Labrax chrysops Gill, Proc. Acad. Nat. Sci., Phila., 1860, p. 20.
 Non *Labrax chrysops* Girard.

The *Roccus chrysops* of this monograph is undoubtedly identical with the *Perca* or *Lepibema chrysops* of *Rafinesque*, and the *Labrax multilineatus* of the "Histoire Naturelle des Poissons" and of Kirtland. The descriptions that have been yet given of the species under those names are meagre and unsatisfactory, but the notice of the color given by the above 1860.]

named authors and the possession of specimens from the same hydrographical basins as those from whence the fishes described by them were taken, leave no doubt as to the identity of the species.

Rafinesque's description of his *Perca chrysops* is, like almost all his descriptions, inapplicable to any known fish, but it agrees with the *Morone chrysops* better than any other species. Rafinesque erroneously attributes to his species six branchiostegal rays, a single opercular spine, eight spines to the first dorsal fin, and places it under the genus *Perca*, all the species of which, he informs us, have naked heads. He proposed for it a new genus to which he gave the name *Lepibema*, in allusion to the scaly bases of the unpaired fins.

Lesueur subsequently sent to the Parisian Museum two specimens of a species which he called *Perca multilineata*, which Cuvier and Valenciennes placed in their genus *Labrax*, but adopted for it the specific name of *Lesueur*. Their description is mostly comparative, it being said to differ from the *Labrax lineatus* by its higher body, shorter head, more feeble teeth, the stronger asperities of the tongue, and especially the larger scales of the maxillaries, which resemble those of *Labrax mucronatus*, while in *Labrax lineatus* they were said to be scarcely perceptible.

The description of the lingual dentition is very unsatisfactory, and no correction is made of the statement made in the second volume that the *Labrax lineatus* has only lateral teeth. It is not in the development of the asperities of the tongue that the lingual dentition of the species differs, but that while there are two narrow rows separated by a mesial line in *Roccus lineatus*, the rows are broader at the middle, in proportion, and coalescent in *Roccus chrysops*.

There were said to be in one specimen sixteen, and in another, nineteen longitudinal dark lines. So large a number is rarely seen; the most constant arrangement is five above, including the one through which the lateral line runs, while sometimes there are several below the lateral line, and at other times they are obsolete. These lines are sometimes straight, but often interrupted.

In the "Fauna Boreali-Americana" of Richardson, a *Labrax* is described in the volume on Ichthyology, under the name of *Labrax notatus* (Smith), the Bar-fish or Canadian Basse." This species is said to "differ from Mitchell's Basse (*L. lineatus* Cuv.) in being much more robust, and in being marked with rows of spots, five above and five below the lateral line, so regularly interrupted and transposed as to appear like ancient church music." It has been suggested by Dr. DeKay that it is the same as the *Perca Mitchelli*, var. *interruptus* of Mitchell, but the comparison will apply very well to *Roccus chrysops*, and it is doubtless identical with that species. In the remarks upon the species, it is said—by Dr. Richardson apparently—that "in the more robust form, and in the strong scales of the head, the Canadian Bar-fish resembles the *L. mucronatus* of the United States and the West Indies, and the *L. multilineatus* of the Wabash. The latter has sixteen narrow, black, longitudinal lines on the flanks." It has been attempted to show that the number of lines is not a specific character, and if this is the case, the *Labrax notatus* and *L. multilineatus* are probably identical with each other and with *Roccus chrysops*. The *Labrax notatus*, it is true, is stated by Smith to have but one anal spine and six articulated ventral rays, but this statement is undoubtedly due to a *lapsus calami* or an error of observation. So great a variation, in the number of anal spines, from a nearly allied species, would be in direct opposition to all we know of the peculiarities of the fishes of this tribe, while it is one of the characters of the family to have only five branched rays in the ventral fins. Smith states that he counted fifty-eight scales along the lateral line, a statement which confirms the identity of this species with *Roccus chrysops*.

In the abstracts of Smith's description of *Labrax notatus*, given by DeKay
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and Storer, the species is said to have the "length, one to two feet." If this was so, it might militate against the idea of its identity with *Roccus chryso-*
sops, but an examination of the description of Smith and Richardson reveals no mention whatever of the size of the species.

In the number of Gueria's "Revue et Magazin de Zoologie," for April, 1853, (vol. v. p. 164,) Professor Filippi, of Turin, has described a *Roccus* to which he has given the name of *Labrax Osculatii*, a traveller in America, M. Osculati, having obtained it from Lake Ontario. Filippi has distinguished this species from *Labrax lineatus* very well, alluding to the two longitudinal lines of basal teeth in that species, and attributing to his own a single oval patch. His other characters are the greater height of the body in *L. Osculatii*, which equals a third of the length, while in *L. lineatus* it is a

quarter; and the number of scales, which are formulated as $56 \frac{9}{15}$ for *L.*

Osculatii, and $64 \frac{9}{11}$ for *L. lineatus*. The true teeth are also said to

be more numerous. The distinctive characters of the species are very well stated by Filippi, but his expression of surprise that a fish so common in the United States should not have been noticed by any American naturalist, not even by Dr. Dekay, is uncalled for. Unhappily, the species had been too often noticed, and in Dekay's Ichthyology of New York it appears under no less than three different names. Filippi has mentioned its habitat as the sea and rivers of the United States (*Mare et fluviis confederationis Americanæ*). I know not on what authority it is said to inhabit the sea; it is probably assumed to be found there because the *Roccus lineatus* is. So far as we now know, it is confined to the great fresh water lakes and the Western rivers.

Specimens of the *Roccus chryso-*
sops are in the Museum of the Smithsonian Institution, from southern Illinois, obtained by Mr. Robert Kennicott, and from the Root river at Racine, Wisconsin, Toronto, &c., obtained by Professor Baird.

The specimens from the hydrographical basins of the Ohio river and of the Great Lakes cannot be specifically distinguished from each other. Nor can I perceive the difference signalized by Dr. Kirtland in the caudal fins of Ohio and Lake Erie specimens.

In extreme youth, this species appears to be crossed by obscure vertical bands; at a later epoch these bands are lost, and afterwards the longitudinal lines are assumed.

The best descriptions of this species have been published by Prof. Filippi under the name of *Labrax Osculatii*, and by the late Dr. Dekay under that of *Labrax albidus*. The best figure is that given by Dr. Kirtland in the Journal of the Boston Society of Natural History, but the dorsals are erroneously represented as being connected by a low membrane. In the text they are correctly described as being "distinct."

IV. MORONE. (Mitch.) Gill.

Synonymy.

Perca sp., Bloch, Gmel. Lac.

Morone sp., Mitchell.

Bodianus sp., Mitchell.

Labrax sp., Raf.

Corpus oblongo-ovatum, gibbosum ad pinnae dorsalis initium. Dentes maxillares, palatini et vomerini velutini; dentes linguales in margine totio dispositi, ad basin carentes. Squamæ in capite totio bene pectinatae. Preoperculum postice subtusque pectinatum. Operculum biaculeatum. Pinnae dorsales ad basin membrana paulo elevata conjunctae; pinna dorsalis spinosa radiis numero non decem superantibus. Pinna analis spinis tribus, quarum secunda sæpe major est. Linea lateralis antice convexa vix dorso concurrens.

1860.]

The chief distinctive characters of the genus are the presence of strongly pectinated scales on the cheeks and opercular bones, and the band of villiform teeth on the sides and of more scattered ones at the tip.

In the armature of the preoperculum and operculum, it resembles the genus *Roccus*. In the connection of the dorsal fins at the base, the less allied Pacific genera *Lateolabrax* of Bleeker, and *Psammoperca* of Richardson. The slightly gibbous back in front of the dorsal fin, and the greater development of the second anal spine are secondary features, which support the natural characters of *Morone* as distinguished from the genus *Roccus*.

For the name of the genus, one used by Mitchell for a group founded in error, has been adopted. The name of Mitchell resulted from a misunderstanding of that author regarding the value of the terms made use of by Linnaeus. The genus *Perca* was placed by the Swedish naturalist in his section of *Thoracici*; Mitchell, believing that the *Morone americana*, *Perca flavescens* and *Pomotis maculatus* were rather abdominal fishes, considered them to be generically distinct from *Perca*, and consequently gave to them the generic name of *Morone*. It is scarcely necessary to state that all the species enumerated have the normal position of the ventrals of *Perca*, and that therefore *Morone* of Mitchell was a mere synonyme of *Perca* of Linnaeus. I have nevertheless preferred to take that name rather than to give a new one.

Morone americana. Gill.

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Synonymy.

- Perca* Schoepff, Schrift. der Gesells. Nat. Freund, vol. viii. p. 159.
Perca americana Gmel., Systema Naturæ, vol. i., pars iii., p. 1308.
Perca Schoepff, Naturforscher, vol. xx., p. 17.
Perca americana Bloch, Systemæ Ichthyologiæ, Schneid. ed.
Perca americana Lac., Hist. Nat. des Poissons, vol. iv. p. 412.
Morone rufa Mitchell, Report in part on the Fishes of New York, p. 18.
Bodianus rufus Mitchell, Trans. Lit. and Phil. Soc. of New York, vol. i. p. 420, Jan. 1814.
Centropomus albus Raf. Precis des decouvertes Somilologiques, June, 1814. p. 19.
Perca mucronata Raf., American Monthly Magazine and Critical Review, vol. ii. p. 205.
Labrax mucronatus Cuv. and Val. Le petit Bar d'Amerique, Hist. Nat. des Poissons, vol. ii., p. 81, pl. 121.
Bodianus rufus Smith, Nat. Hist. Fishes of Mass, p. 274.
Labrax mucronatus Storer, Report on Ichthyology of Mass., p. 8.
Perca macronatus (misprint) Sw. Nat. Hist. of Fishes, Amphibians and Reptiles, vol. ii., p. 198. 1839.
Labrax rufus Dekay, Nat. Hist. of New York Fishes, p. 9, pl. 3, fig. 7.
Labrax mucronatus Ayres, Boston Journal Nat. Hist., vol. iv., p. 257.
Labrax mucronatus Linsley, Catalogue of Fishes of Connecticut.
Labrax rufus Storer, Synopsis of the Fishes of North America, p. 22; ib. in Memoirs of American Acad., new series, vol. ii., p. 274. 1846.
Labrax rufus Storer, Hist. of the Fishes of Mass., p. 1, ib. in Memoirs of American Acad., n. s., vol. v., p. 57.
Labrax mucronatus Baird, Report on Fishes of New Jersey Coast, p. 8; ib. in Ninth Annual Report of Smith. Inst. p. 322. 1855.
Labrax americanus Holbrook, Ichthyology of South Carolina, p. 21, pl. 3, fig. 2. 1855.
Labrax rufus Gill, Annual Report of Smith. Inst., p. 256. 1857.
Labrax mucronatus Hill, Catalogue of Fish of Jamaica, p. 1.
β.
Labrax nigricans Dekay, Nat. Hist. of New York Fishes, p. 12, pl. 50, fig. 160. 1842.

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Labrax nigricans Storer, Synopsis of the Fishes of North America; ib. in Memoirs of American Acad., vol. ii. p. 23. 1846.

Morone pallida Mitchell, Report in part on the Fishes of New York, p. 18.

Bodianus pallidus Mitchell, Trans. Lit. and Phil. Soc. of New York, vol. i. p. 420.

Bodianus pallidus Smith, Nat. Hist. of Fishes of Mass. p. 294.

Labrax pallidus Dekay, Nat. Hist. of New York, Fishes, p. 11, pl. 1, fig. 2. 1842.

Labrax pallidus Storer, Synopsis of the Fishes of North America, p. 22; ib. in Memoirs of American Acad., vol. ii., p. 22.

Labrax pallidus Perley, Report upon the Fishes of the Bay of Fundy, p. 121. 1851.

Labrax pallidus Perley, Descriptive Catalogue (in part,) of Fishes of New Brunswick and Nova Scotia, p. 4; ib. in Reports on Sea and River Fisheries of New Brunswick, p. 182. 1852.

In the above synonymy, it will be observed that several species which have been created as distinct, and so retained by succeeding naturalists, have been merged into one. Although there can scarcely be a doubt of the identity of these nominal species, the synonymy, at the same time, has been divided into three portions, each applying to one of the nominal species as previously accepted.

The reference of all the variations of the *Labrax americanus* type to one species has been only done after a careful study of Dekay's descriptions, and after examination of numerous specimens of the genus. The descriptions of Dekay certainly do not afford any means for distinguishing his species, in the case of *Labrax rufus* and *Labrax nigricans*, except a very slight difference in the shade of color. The description of the color of the latter species is given by Dekay, as follows:

"The general hue is deep brownish-black, more intense on the head and upper part of the body. In the older specimens, there is a strong brassy hue throughout; occasionally dark longitudinal parallel streaks on the upper part of the body, pupils black, irides yellow, base of the fins light greenish-yellow, edge of the membrane of the spinous dorsal, black; upper portion of the membrane of the posterior dorsal fin transparent, and separated from the yellow portion at the base by a tolerably well defined dark band; membrane of the anal fin dark toward the tips of the rays."

Let any naturalist take an ordinary specimen of the common white perch, and decide whether the difference of color between that specimen and the *Labrax nigricans* is sufficient to authorize a separation on that ground; in all other respects, the description of Dr. Dekay will exactly apply to his *Labrax rufus*.

The distribution of the darker shades of color on the body and fins, is the same in both species; the proportions are the same, and the difference in the number of rays is not greater than is noticed in the same species. Is it not probable that Dr. Dekay was induced to separate the *Labrax nigricans* from his other species on account of a supposed difference of station? The *Labrax rufus* is described as being "obtained in brackish streams," while the *Labrax nigricans* is said to be found in "deep fresh-water ponds in Queen and Suffolk Counties." But the true *Labrax rufus* (*Morone americana*) is found also in streams of fresh water, and in ponds that are now entirely disconnected from the salt water, although not far from the sea. As there is therefore no difference in the habitation of the supposed two species, and as no specific distinctions appear to exist from the descriptions of Dr. Dekay, no alternative is left but to consider them identical.

Mr. William H. Herbert, a popular writer on our fishes, entertained "great doubts" whether the *Labrax nigricans* was more "than a casual variety of 1860.]

the Black Bass of the Saint Lawrence," the "Grystes nigricans of Agassiz." Such doubts deserve no consideration, as there are none of its being at least the congener of *Morone americana*.

As to the *Labrax pallidus*, there is a greater discrepancy in the description of it as compared with that of the *Labrax rufus*. It is said that in the former, the opercle has "a single flat spine, and a pointed membrane extending beyond it," while the generic characters given by Cuvier to the genus are retained, one of which is founded upon the presence of "two points on the opercle." The statement that *Labrax pallidus* has but one spine is probably due to a misapprehension of Dekay. In the *Morone americana* there is one acute point terminating the opercle, above which is an emargination separating it from a more obtuse or rounded process, which in one case has been regarded as a spine, and in the other has not. It is impossible to believe that two fishes of this genus so nearly resembling each other, should so differ in the development of the opercular spines.

Another distinctive character is said to exist in the first ray of the posterior dorsal, which is "nearly as long as the second." Was not this relative difference in the proportions of the rays the result of injury to the tips of the succeeding soft ones? As a third character, it is mentioned that the body is "much compressed." From the figures of *Labrax rufus* and *Labrax pallidus*, it would appear that any difference in height was rather in favor of the former than of the latter. No mention is made in the description, of the color of the fins of *Labrax pallidus*, but from the figure it would appear that the pattern is nearly the same in that species as in *Labrax rufus*, but the shade is lighter towards the borders of the dorsal and anal. This difference is too trivial to be accepted as specific, and if the above conjectures as to the nature of Dr. Dekay's statements are correct, the *Labrax pallidus* must be regarded as a mere synonyme of *Morone americana*.

Morone interrupta Gill.

Synonymy.

Labrax chrysopterus Girard. General Report upon the Zoology of the several Pacific Railroad routes, Ichthyology, p. 29.

non *Roccus chrysopterus* Gill.

The form of this species scarcely differs from the *Morone americana*, the chief difference existing in the more gradual declination of the dorsal outline to the end of the second dorsal fin, and the greater inequality of the anterior and posterior portions of the caudal peduncle. The greatest height of the body equals three-tenths of the length from the snout to the concave margin of the caudal fin; of that length, the head forms almost three-tenths, being not much less than the height of the body, and the caudal fin, at its middle rays, equals half of the height of the body. The caudal fin, when expanded, is emarginated and its angles rounded; the shortest rays equal three-fifths of the length of the longest.

The dorsal fin commences at a vertical intermediate between the bases of the pectoral and ventral fins, and is of a triangular form, the fourth ray being the largest, and equalling the length of the pectoral fin; the spines have the same form and arrangement as those of *Morone americana*. The second dorsal is connected by a membrane as in *Morone americana*; its spinous or first ray is little more than half the length of the first articulated one, which itself is nearly as long as the fourth dorsal spine; the fin thence decreases in height towards its last ray, which is shorter than its spinous one.

The anal fin commences under the fourth or fifth articulated ray of the second dorsal, and about four of its rays are posterior to the termination of that fin; the first spine is short and robust; the second at least twice as long as the first, compressed, and very strong; the third is as long or longer than the second, but much more slender. The first articulated ray of the anal is

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longer than the spines, and about twice as long as the last; the outline of the fin is slightly emarginated.

The first ray of the pectoral fin is, as usual, articulated but simple; the third is longest and branched, and equals the base of the second dorsal.

The ventrals are about as long as the pectorals; the length of the spine is equal to two-thirds of that of the first or second branched rays.

The radial formula is as follows:

D ix—I, 12; A iii, 10; C 4, I, 8, 7, I, 2; P 3, 14; V i, 5.

The scales are of about the same size as in the *Morone americana*, the lateral line running through about fifty, besides the smaller ones at the base of the caudal fin; at the region of its greatest height, there are about nineteen rows, of which about seven are above the lateral line and eleven beneath. The relative proportions on the different parts of the body are almost nearly the same as in that species, the chief difference existing on the front of the back, where the exposed portions of the disc are higher and narrower than in *M. americana*. On the cheeks from the orbit to the angles, there are about seven oblique rows.

The specimens preserved in spirits have a bright brazen color, tinged on the back with olivaceous. Along the sides are seven very distinct longitudinal black bands, through the fourth of which the lateral line runs for its entire length. The continuity of the bands below the lateral line is interrupted at the posterior half of their length, and they there alternate with their anterior parts.

The dorsal fins are tinged with purple, and the margin of the spinous one is dark. The anal is of a darker purple towards its anterior angle. The caudal, especially posteriorly and at its middle, is purple. The rays of the pectoral and ventral fins are yellowish, while the membrane of the former is hyaline, and of the latter sometimes minutely dotted.

This species, as will be observed by reference to the synonymy, has been described by Dr. Charles Girard, under the name of *Labrax chrysops* Grd. (*Perca* or *Lepibema chrysops* Raf.), to which is also referred as a synonyme, the *Labrax multilineatus* of Cuvier and Valenciennes, Kirtland, DeKay and Storer. From that species, it is very distinct, and even belongs to a different genus. Cuvier described the ground color as a greenish-gray on the back and silvery on the belly. This is not the color of *Morone interrupta*, and that species must be therefore distinct from *Labrax multilineatus*, nor can it be the *Perca chrysops* of Rafinesque, which is said to be "silvery with five longitudinal brownish stripes on each side," and have the "head brown above." This description, though erroneous in most respects, is as accurate as Rafinesque's generally are, and agrees sufficiently well with Kirtland's *Labrax multilineatus*, which is doubtless identical with the Cuvierian species. Even such an observer as Rafinesque would have noticed the deep brazen hue of *Morone interrupta*, and would not have overlooked two of the seven very distinct black bands that run along the sides.

Dr. Girard has stated that there are but six branchiostegal rays in his species, but I am able to say, from an examination of the specimens used by Dr. Girard himself, for description, that it agrees with all allied species, in having the normal number of seven, and which are developed as in *Morone americana*.

There are preserved in the Museum of the Smithsonian Institution, three specimens of the *Morone interrupta*, one of which was obtained by Lieutenant Couch, at New Orleans, and two larger ones were found at St. Louis, Missouri, by Dr. George Engelman. The small specimen from New Orleans differs from the two Missouri specimens by the larger second spine of the anal fin, but in every other respect they are similar.

Monograph of the *Philypni*.

BY THEO. GILL.

I. In the year 1837, M. Valenciennes has for the first time separated from the genus *Eleotris* of Gronovius, a fish which had been previously referred by Schneider, Lacepede and by Cuvier, to genera to which it did not naturally belong.

This species was first named *Platycephalus dormitator*, in Schneider's posthumous edition of the "Systema Ichthyologiæ" of Bloch, from the figure and manuscript description of the Father Plumier.

Shortly after, M. Lacepede, upon the same documents, established his *Gobimorpe dormeur*. The genus to which it was referred was distinguished by M. Lacepede from the genus *Gobius*, by the separation of the ventral fins. The group was thus established on the same characters as those by which Cuvier afterwards separated the species under the Gronovian name of *Eleotris*, but the homogeneity of the group was destroyed by the introduction of species which had no affinity to the *Eleotroids*.

Subsequently, Cuvier, in his "Regne Animal," revised the characters of the genus *Eleotris*, and introduced among true species of the genus, the *Eleotris dormitatrix*, which is the same as the above mentioned species of Bloch and of Lacepede.

No additional information was communicated respecting this species until the year 1837. At that time, M. de Valenciennes, in his monograph of the *Gobioids* contained in the twelfth volume of the "Histoire Naturelle des Poissons," revised the characters of the genus *Eleotris*, and in addition to those by which Cuvier distinguished it, referred to the presence of teeth only on the jaws. From the genus, as thus constituted, he has separated the *Platycephalus dormitator* of Schneider, or the *Eleotris dormitatrix* of Cuvier, on account of the presence of teeth on the front of the vomer. Valenciennes has taken the species as the type of a new genus, which he has called *Philypnus*, and the presence of vomerine teeth is the only character by which he distinguishes it from his *Eleotris*; he has called the species *Philypnus dormitator*, and has given an extended description of it. He had examined specimens from the islands of Martinique and Porto Rico, and has signalized its presence in Saint Domingo. The species thus described is the only one which he has referred to the genus.

But in the same volume as that in which he has introduced the genus *Philypnus*, Valenciennes has placed in the genus *Gobius*, a Chinese fish which Lacepede has described under the name of *Bostryche chinois*. This fish, as will afterwards be shown, is nearly allied to the species of the genus *Philypnus*.

II. The *Bostryche chinois* or *Bostrychus sinensis*, was first introduced into Systematic Nomenclature by Lacepede, who founded the species only on a Chinese drawing. The genus *Bostrychus* was formed for its reception, and was characterized by its "elongated and serpentiform body, two dorsal fins, the second of which is separated from the caudal fin, two barbels at the upper jaw, and the eyes quite large and without a lid." As a second species of the genus so defined, Lacepede has placed a species which was ascertained by Valenciennes to be a species of *Ophicephalus*, a genus belonging to an entirely different family from the *Bostrychus sinensis*, and which possesses a single long continuous dorsal. Notwithstanding this rather important variation from *Bostrychus sinensis*, Lacepede chiefly distinguishes his second species by a difference of color, the former being described as brown, and the latter as spotted with green; from the latter character the name of *B. maculatus* was conferred on it. The *B. maculatus*, like the *B. sinensis*, was only known from a Chinese drawing. As Valenciennes has

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already remarked, it should properly have been referred by Lacepede to his genus *Bostrychoides*, which was distinguished from his *Bostrychus* by the presence of only one dorsal fin.

In 1806, M. Dumeril published his "Zoologie Analytique, ou Methode Naturelle de Classification des Animaux." In the ichthyological portion of the volume, the genera of Lacepede are adopted, but the name of *Bostrychus* is abolished on account of its previous application by Geoffrey to a genus of coleopterous insects, and that of *Bostrichtes* or *Bostrichthys* is substituted in its stead. The characters given to the genus are the same as those of Lacepede.

In 1815, Rafinesque published his "Analyse de la Nature, ou Tableau de l'Univers." In this volume there is first introduced into the seventh family of the system (*Petalomia*,) and into the first sub-family (*Cepolidia*) the *Bostrychus* of Lacepede under the name of *Bostrictis*, and the *Bostrychoides* under the name of *Pterops*, and these are interposed between *Cepola* and *Trachypterus* on the one hand, and on the other *Tasica* Raf., and *Lepodopus*, while *Gymnetrus* and a number of genera founded on more or less perfect specimens of *Trachypterus* are placed in a second family called *Gymnetria*. Again the *Bostrychi* and *Bostrychoides* are introduced under the new name of *Ictiopogon* for *Bostrychus*, and *Pterops* for *Bostrychoides* into a twenty-third family called *Pantopteria*, and into a third sub-family (*Anguillina*). The family and sub-families contain a singular and most unnatural reunion of the most widely distinct types; apodal *Scombroids* and *Xiphoids* are mingled with apodal *Blennoids* and *Comephorus* and *Mastacembelus* Gron, *Ammodytes* L., *Ophidium* L., and *Anguilla* are thrown together in the same family. Rafinesque doubtless derived the idea of placing the last named genera in the family of "*Pantopteria*" or apodal fishes from a remark of Lacepede, who saw no ventrals represented in the figures of his *Bostrychi*, and therefore suggested that none might exist.

Thus, on the authority of the figure of a Chinese painter, unacquainted with Ichthyology, three distinct generic names, besides orthographical modifications of two of them, had been formed for a fish which no naturalist had ever seen. Without criticism and without judgment, it had been referred to the systems of the various authors, and one of them had placed it in two distinct orders in the same work. After the last of these works, the problematical genus was allowed to rest, and no naturalist has since paid attention to it.

The first critical ichthyologist who examined the grounds on which the species was founded, was M. Valenciennes. That excellent naturalist, like his predecessors, only knew the species by the Chinese painting. Judging from this alone, he recognized its affinity to the Gobioids, and expressed the belief, from its form, that it was certainly a *Gobius*, and therefore called it *Gobius sinensis*, but was careful to observe that he could neither see the ventral fins, nor count the rays of the others.

The first ichthyologist by whom the species was seen and described from nature was Sir John Richardson. That gentlemen, in the Ichthyology of the Voyage of H. M. S. the Sulphur, gave a description of it, referring it, as a new species, to the genus *Philypnus*, under the name of *P. ocellicauda*. He afterwards, in the same work, published his belief of its identity with the *Bostrychus sinensis* of Lacepede, and adopting the specific name of that author, called it *Philypnus sinensis*. In the same part, he has given a very good figure of the species.

Subsequently, Dr. Bleeker, in his monograph of the Gobioids and Blennoids of the Sundamulluccan Archipelago, described a fish, which he called *Philypnus ophicephalus*, at the same time doubtfully placing as a synonyme, the *Philypnus ocellicauda* of Richardson. He afterwards appeared to have become satisfied of the identity of the two species, and adopting the older name of Richardson, quoted his own as a synonyme.

Although this species is nearly allied to the true *Philypni*, it differs too much from those species to be a natural member of the same genus. It has therefore

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been now placed in a separate one, for which the name of *Bostrichthys* is retained. The two genera, *Philypnus* and *Bostrichthys*, form a distinct group, characterized chiefly by the presence of vomerine teeth. To this group, the name of *Philypni* may be given: ultimately it may be found to be a separate sub-family.

PHILYPNI Gill.

The form of the body is similar to that of the typical Eleotroids, anteriorly subcylindrical, becoming compressed, and slightly decreasing in height towards the caudal fin.

The head is elongated and depressed above, the mouth ample, the teeth villiform on both the jaws and the front of the vomer.

The branchial apertures are more or less extended forwards, but separated from each other by an isthmus.

There are six branchiostegal rays, the four exterior of which are well developed, curved and compressed, the two internal are small and slender.

The dorsal fins are separated by a considerable interval; the ventrals approximated, but entirely disconnected.

The above characters apply to the only two known genera. Subsequent discoveries may necessitate their revision. The group as thus constituted, differs from the Eleotroids by the presence of vomerine teeth, and the distance of the dorsal fins from each other. If these characters are persistent, it would seem proper to retain the group as a distinct sub-family.

The only known genera are *Philypnus* Val., and *Bostrichthys*. *Philypnus* is an American form, and *Bostrichthys* an Asiatic form. The characters of these will be now given:

PHILYPNUS Val.

Synonymy.

Philypnus Val., Hist. Nat. des Poissons, vol. xii. p. 255, 1837.

Platycephalus sp. Bl. Schneid., Systema Ichthyologiæ, 1801.

Gobiomorus sp. Lac., Hist. Nat. des Poissons.

Eleotris sp. Cuv., Regne Animal, ed. ii.

Head elongated, subconical in profile, depressed above; mouth large, lower jaw projecting beyond the upper; nostrils with raised margins, between the eyes and upper jaw; the distance between each nearly equal to that of the anterior nostrils from the upper jaw, and of the posterior from the eyes. Branchial apertures extending anteriorly nearly to the angles of the mouth and separated from each other by a very narrow isthmus. Scales ctenoid, moderate, extending on the forehead, opercula and cheeks; pectinations of those on the forehead and cheeks frequently obsolete.

All of the scales on the body of the species of *Philypnus* are more or less angulated posteriorly, and have the nucleus near the angle; from this angle radiating grooves and ridges diverge towards the anterior margin of the scales, and are crossed by concentric striæ, which terminate at the posterior borders in pectinations that are often obsolete; in other scales, especially on the forehead, the concentric striæ surround a subcentral nucleus, and give to the scales a pseudocycloid appearance. In young individuals the scales are much more distinctly pectinated than in the adult.

Philypnus dormitator Val.

Synonymy.

Cephalus seu asellus palustris, vulgo le dormeur, Plummer, MSS. fide Val.

Platycephalus dormitator Bloch, Systemæ Ichthyologiæ, ed. Schneid.

Gobiomorus dormeur Lacepede, Hist. Nat. des Poissons, vol. ii. p. 599.

Gobiomorus dormeur Descourtilz, Voyages d'un Naturaliste.

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Electris dormitatrix Cuv., Regne Animal, vol. ii.

Electris dormitatrix Guerin, Iconographie du Regne Animal.

Philypnus dormitator Val., Hist. Nat. des Poissons, vol. xii. p. 255.

Philypnus dormitator Storer, Synopsis Fishes of North America, ib. in Memoirs of American Acad., vol. ii.

Philypnus dormitator Girard, United States and Mexican Boundary Survey, Ichthyology, p. 29, pl. xii. fig. 13.

This species has been very fully described by Valenciennes. He had examined specimens from Porto Rico, St. Domingo and Martinique. It has also been found at Mexico.

Dr. Girard has given a figure of a very small species of this genus under the name of *Philypnus dormitator*. It is very probable the young of that species, but as the only specimen in the Museum is one of fifteen inches in length, obtained by the author at the junction of the Arouca and Caroni rivers, in the island of Trinidad, there is no means of comparison. The specimen described by Dr. Girard has very large eyes, and other characters of an extremely young fish. It was obtained at the mouth of the Rio Grande by Mr. John H. Clarke, the Naturalist of the "United States and Mexican Boundary Survey," and is preserved in the Smithsonian Museum.

Philypnus lateralis Gill.

In general outline of form, this species has considerable resemblance to the *Philypnus dormitator*. The dorsal outline ascends in almost a straight line from the snout to the front of the dorsal fin, the chief variation existing between the eyes, where there is a slight depression. The back under the first dorsal is straight; at the second, it declines very little and in almost a straight line to the base of the caudal fin. The abdominal outline from the ventrals to the caudal fin converges in nearly the same proportion as the dorsal. The greatest height of the body, at the first dorsal ray, is equal to about one-fifth of the total length, inclusive of the head and caudal fin; the least height at the base of the caudal is half of the greatest.

The head, in profile, is conical or elongated triangular; it forms three-tenths of the total length. Its dorsal and inferior surfaces regularly converge towards the tip of the lower jaw, and the declension of the former is about twice as great as the ascension of the latter. The dorsal surface over the operculum is rounded, and the degree of convexity becomes less towards the eyes, between which it is flat. The breadth at the operculum equals about half the length of the head, and under the eyes it is between one-fourth and one-fifth less. The interocular space is somewhat less than half of the breadth at the opercula. The outlines of the jaws are semi-elliptical.

The eyes are longitudinally oval, and are at the third sixth of the head's length.

The preoperculum in its declination recedes considerably backwards, and is thence broadly curved forwards. The distance from the orbit to the preopercular angle, equals the distance from the posterior border of the orbit to its horizon behind the intermaxillaries. The operculum declines obliquely downwards from its membranous point, and its greatest length, in an oblique direction, slightly surpasses the interval between the orbit and the angle of the preoperculum. The oculo-humeral groove is shallow and scarcely ascending.

The mouth is oblique and large, the maxillaries extending backwards to the vertical of the eyes.

The teeth on the jaws do not much differ from those of the *Philypnus dormitator*. The vomerine patch is narrowed towards its ends, and its teeth are much smaller than those of the jaws, especially anteriorly.

The scales on the sides of the body are of an oblong form and hexagonal outline, with the nucleus at the posterior angle and with about eight radiating

ridges, some of which are bifurcate; the ridges are separated into two portions by the median line. The free margin is delicately pectinated. The scales are of moderate size, there being about fifty-four in a row behind the pectoral fins. Before the dorsal fin, and especially on the forehead, the nucleus is subcentral, and with numerous radiating grooves sometimes advancing even to the lateral margins. On the operculum they are often higher than wide, with the nucleus subterminal to subcentral, with the posterior margin angulated and pectiniform; on the preoperculum they are smaller and almost square, with more or less subcentral nuclei, and with the pectinations generally obsolete.

The first dorsal fin commences some distance behind the vertical of the bases of the pectorals, and has the arrangement of the rays normal in the *Gobionæ* and *Eleotrinæ*. The rays in length have the following relation to each other; 2, 3, 1, 4. The second dorsal is oblong and commences behind the vertical of the anus.

The caudal fin is posteriorly rounded, and its longest rays form a fifth of the length of the fish.

The pectorals are rounded and equal in length to the interval between the orbit and the margin of the operculum. The ventrals are also rounded, and the third and fourth branched rays are the longest.

The radial formula is as follows:—

$$D \text{ vi} - I, 8 \frac{1}{1}; A \text{ I}, 1, 8 \frac{1}{1}; C \text{ 5}, 6, 5, 5; P \text{ 2}, 13; V \text{ I}, 5.$$

The color is dark purplish brown, lighter on the abdomen. Along the sides a black band runs from behind the upper part of the pectoral to the base of the caudal fin, dividing about nine vertical light bands, which project a little above and below the band. At the base of the caudal, the lateral band somewhat enlarges, and is sometimes partly surrounded by a light margin. The vertical and ventral fins are sometimes immaculate, but generally spotted with white and black. The pectorals have a black spot at the upper axilla, and a blackish basal band, bordered on each side, by whitish. The head is of the color of the back, with vertical dark bar from the eye to the angle of the jaw, another from the inferior corner of the eye to the extremity of the operculum, and another horizontal one from the orbit to the upper jaw.

This species was obtained in considerable numbers by Mr. John Xantus, of the United States Coast Survey, at Cape St. Lucas, Lower California. It adds another proof of the similarity of the Fauna of the Gulf of California to that of the West Indies.

The specimens collected by Mr. Xantus are in the Museum of the Smithsonian Institution, and are numbered in the catalogue of the Ichthyological collection from number 2435 to 2442.

This species differs from its West Indian congener chiefly in its proportions, the smaller vomerine band of teeth and in color.

BOSTRICHTHYS (Dum.) Gill.

Synonymy.

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| <i>Bostryches</i> | } | Lacepede, Hist. Nat. des Poissons, vol. iii. p. 141. |
| <i>Bostrychus</i> | | |
| <i>Bostrichthes</i> | } | Dum., Zoologie Analytique, &c., p. 120, 1806. |
| <i>Bostrichthys</i> | | |
| <i>Bostrictis</i> | } | Raf., Analyse de la Nature, &c., 1815. |
| <i>Ictiopogon</i> | | |
| <i>Philypnus</i> sp. Rich. | | |

Head elongated subconical in profile, oblong and depressed above. Nostrils distant: the anterior elongated-tubular, and immediately behind the maxil-
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laries; the posterior subtubular and immediately in front of the antero-superior border of the eye. Branchial apertures extending forwards considerably beyond the posterior margins of the preopercles, and separated from each other by a wide isthmus. Scales cycloid, small, especially anteriorly, and extending on the opercula, cheeks and forehead.

The name of *Bostrychus*, which was applied to this genus by Lacepede, had been previously used by Geoffrey, who, in the year 1764, applied the name, incorrectly spelled *Bostrichus*, to a genus of coleopterous insects. The name applied to that group has been universally adopted by Entomologists, and the name of *Bostrychus*, as applied to the piscine genus, must be replaced by another. The name of *Bostrichthys* was proposed as a substitute by Mr. Dumeril, and this is accepted.

It would be questionable to some whether a genus founded on the evidence that *Bostrychus* was by Lacepede, and founded, at the same time, on erroneous ideas, should be adopted. Bleeker has adopted Richardson's first specific name, and on the same principle, the generic name of Lacepede would also have been probably ignored by him. The same objections that exist against Lacepede's name would, of course, militate against the adoption of those of Dumeril and Rafinesque, which were only intended by their authors to supersede his. Believing, however, that the laws of priority are imperative, and require the adoption of the first given name, when the object to which it was given can be identified, and unless entirely founded on false characters, the name of *Bostrichthys* is now accepted. Against the name, however, there exist the objections of an erroneous formation, and of a reference to a false character. The name, in accordance with the composition, should be written *Bostrychichthys*, but the erroneous name is more euphonious than the correct one. The name itself would imply the presence of cirrhi or barbels, but none exist; the objects that were taken for such by Lacepede are the prolonged nasal tubes. These objections do not appear to be of sufficient weight to authorize a change of name.

The zoological characters by which *Bostrichthys* is distinguished from *Philypnus* are found chiefly in the difference of the extent of the branchial apertures, the cycloid structure of the scales, the distant nasal apertures, and the tubular form of the anterior ones. The smaller size of the scales, especially on the anterior portion of the back, where they are imbedded in the skin, perhaps offers another distinguishing character of *Bostrichthys*.

Bostrichthys sinensis Gill.

Synonymy.

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| <i>Bostryche chinensis</i> | } | Lacepede, Hist. Nat. des Poissons, vol. iii. p. 141. |
| <i>Bostrychus sinensis</i> | | |
| <i>Le Gobie chinensis</i> | } | Val., Hist. Nat. des Poissons, vol. xii. p. 94. |
| <i>Gobius sinensis</i> | | |
| <i>Philypnus ocellicauda</i> | | Rich., Voyage of the Sulphur, Zoology, p. 59. |
| <i>Philypnus sinensis</i> | | Rich., loc. cit., p. 149, pl. 56, fig. 15, 16. |
| <i>Philypnus sinensis</i> | | Rich., Fifteenth Annual Report of the British Association A. S., p. 210. |
| <i>Philypnus ophicephalus</i> | | Blkr., Verhandelingen v. Batav. Genootschap, vol. xxii., Blennoiden en Gobioïden, p. 20. |
| <i>Philypnus ocellicauda</i> | | Blkr., Verhandelingen v. Batav. Genootschap, vol. xxvi., Index sp. Piscium, p. 10. |

There can scarcely be a doubt that this is the *Bostrychus sinensis* of Lacepede, as there is no other fish of the Chinese waters known which has any thing like "two barbels at the upper jaw," and an ocellus near the dorsal region of the peduncle. The first specific name, *P. ocellicauda*, which has 1860.]

been proposed by Richardson, and adopted by Bleeker, must therefore be relinquished for the prior one of Lacepede.

As this species has been fully described by Richardson and Bleeker, and also figured by the former, no further description is necessary, this being the only known species of the genus.

Specimens have been obtained by Dr. William Stimpson, the Naturalist of the North Pacific Exploring Expedition, under Commodore Rodgers, at the market of Hong Kong, China.

Notice of Geological Discoveries, made by Capt. J. H. Simpson, Topographical Engineers, U. S. Army, in his recent Explorations across the Continent.

Washington City, April 9th, 1860.

Anticipatory of discoveries of a geological character which might be made and published of date subsequent to those of my Explorations, in 1858 and '59, across the Continent, with the sanction of the Hon. John B. Floyd, Secretary of War, under whose authority the Explorations were made, I present in advance of my final and detailed official report, the following communication from Messrs. F. B. Meek and H. Engelmann, in reference to the fossil remains which they found, and the geological epochs to which they point. As a large portion relates to a region of country, *The Great Basin*,—so called by Fremont—lying between the Wahsatch range of mountains on its east, and the Sierra Nevada on its west, which never before was traversed by a white man, not even by a trapper, so far as is known, the publication of this paper cannot be unacceptable to the scientific world, and I therefore take pleasure in submitting it to be read before the Academy.

J. H. SIMPSON,

Capt. Top. Engineers, U. S. Army.

SMITHSONIAN INSTITUTION, }

Washington, D. C., April 2d, 1860. }

Capt. J. H. Simpson, Topographical Engineers, U. S. Army:

Dear Sir,—In accordance with your instructions we give below a brief statement of some of the conclusions arrived at from a hasty examination of the fossils collected during your late explorations in Utah. Although the time yet devoted to the study of these specimens is not sufficient to enable us to enter into details, enough has been determined to warrant the conclusion that they are of considerable interest, and establish the existence there of geological formations not hitherto known at such remote western localities.

As a more extended sketch of the general geology of the country, including a full account of the igneous and metamorphic rocks, together with figures and descriptions of the new organic remains, are to appear in your final report, it is unnecessary for us to do more here than to give merely some of the leading facts determined from the fossils collected from the various formations exposed along the line of survey. In doing this it will be most convenient to speak of the formations in the order of their succession in point of time, beginning with the most ancient, instead of referring to them in the order in which they were observed in traversing the country.

DEVONIAN ROCKS.

The oldest deposits from which fossils in a condition to be determined were collected, occur in the vicinity of the Humboldt Mountains, at the following points, viz.: Long. 114° 45' west, Lat. 39° 45' north,—Long. 115° 58' west, Lat. 39° 33' north, and Long. 115° 36' west, Lat. 39° 30' north. At the first of these localities fragments of *Trilobites* belonging as near as can be determined to the genera *Calymene*, *Homalonotus* and *Proetus*, were collected from a hard, bluish limestone. The specimens are too imperfect to warrant a posi-

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tive opinion whether they are Upper Silurian or Devonian forms, though they evidently belong to one or the other of these epochs, and closely resemble Hamilton Group forms.

At the other localities mentioned above, a group of fossils of decided Devonian type were found. They consist of *Atrypa reticularis*, *A. aspera*, or a closely allied species, a small *Productus*, and three new species of *Spirifer*. The first of these species has so great a vertical range, that taken alone, it would only indicate that the rock from which it was obtained holds a position somewhere between the Upper Silurian and the middle or higher portions of the Devonian. *A. aspera* is a common Devonian fossil, but is also said to occur in the upper Silurian of the old world while the genus *Productus* is now generally regarded as not dating farther back than the Devonian.* These facts taken in connection with the close analogy of the small *Productus* mentioned above, and the associated *Spirifers*, to forms characterizing the Hamilton Group of the New York Devonian series, leave little room to doubt that the rock in which these fossils were found is of Devonian age, and that it most probably belongs to about the horizon of the Hamilton Group.

The discovery of these fossils at this distant locality cannot fail to be regarded as an interesting addition to our knowledge of the geology of the great West, especially when it is borne in mind that they were obtained near twelve hundred miles farther westward than such forms, so far as is known to us, have hitherto been found *in situ*, within the limits of the territory of the United States.†

CARBONIFEROUS ROCKS.

Following up the sequence of the formations, we pass eastward to the vicinity of Camp Floyd, which is in Long. 112° 8' west, Lat. 40° 13' north. Here on the west side of Lake Utah, extensive deposits of a dark, very hard, silicious limestone of Carboniferous age occur. The fossils collected from these beds here, and for a long distance west of this, are in so bad a state of preservation that the specific characters of most of them are much obscured. It is believed, however, that we have from this rock *Orthis Michelini*, and *O. umbraculum*, though they may be only allied representative species. There are also along with these a species of *Arthyris* or *Terebratula*, one or two of *Spirifer*, and the spiral axis of an *Archimedes*,‡ with fragments of other *Polyzoa* and *Corals*.

As the genus, or subgenus *Archimedes*, has not yet, so far as we know, been found as high in the Carboniferous system as the Coal Measures, and there are apparently no decided Coal Measure forms in the collections from this rock, we are inclined to regard it as belonging to the Lower Carboniferous series.

Carboniferous formations also extend westward from Camp Floyd to the

* Some two or three species were formerly supposed to occur in the Upper Silurian rocks of the Old World, but the correctness of this conclusion is questioned by most of the best English and Continental authorities.

† A few fossils belonging to the genera *Spirifer*, *Conocardium*, &c., collected on a former expedition by one of the writers (H. E.) near Medicine Bow Butte, Long. 106° 30' west, Lat. 41° 38' north, were regarded by Dr. Shumard as probably of Devonian age, though none of the species were positively identified with Devonian forms, and they were obtained from an erratic mass, the exact original position of which is unknown.

‡ It is also stated in Capt. Stansbury's report that at a locality three or four days' march beyond Fort Laramie, an outcrop from which some imperfect specimens of gasteropoda and a shell resembling a *Monotis* were obtained, is probably of Devonian age. The exposure here alluded to, however, is now known to be composed of Jurassic and probably Triassic rocks. The genus *Monotis* is unknown below the upper Coal Measures, in this country, and the Permian in the Old World, though it ranges above on both sides of the Atlantic.

‡ We believe this to be the first specimen of this curious fossil yet found in the region of the Rocky Mountains.

Devonian localities alluded to above, interrupted at places by outbursts of igneous rocks. It is likewise probable there may be in this interval both Devonian and Silurian strata, but the collections yet obtained are not sufficient to enable us to speak with confidence on this point.

Between Long. 115° and $115^{\circ} 30'$, Lat. $40^{\circ} 10'$ and Lat. $39^{\circ} 20'$, there is a series of hills or mountains, trending nearly north and south, to unknown distances beyond the field of these explorations, which seem to be mainly made up of light yellowish gray, more or less argillaceous, and arenaceous subcrystalline limestones, and slates. This formation belongs to the Carboniferous system, but is more recent than the dark colored limestone at Camp Floyd. The fossils collected from it are for the most part new, and consist of three species of *Productus*, one of which resembles *P. Rogersi*, Norwood and Pratten, two new species of *Spirifer*, and another apparently identical with *S. cameratus*, but more robust, and having stronger costæ than is common in that species. Along with these there are also specimens of *Athyris subtilita*, and a new species of *Chonetes*, closely allied to *C. Verneuiliana*, Norwood and Pratten, from the Western Coal Measures. From the affinities of this group of fossils, we have little hesitation in referring this rock to the Upper Carboniferous series, though in its lithological characters it is entirely unlike strata of that age in the Middle and Western States.

There were also seen at a few places near here, some outcrops of dark grayish colored limestones, containing *Productus*, *Spirifer*, &c. These were not observed in contact with the light colored beds mentioned above, but under circumstances indicating that they hold a lower position, from which it is inferred they are probably of lower carboniferous age.

The occurrence here, as far west as Long. 115° , of extensive Carboniferous formations, is another interesting fact in the geology of this distant region not known previous to these explorations,—no rocks of this age being represented on any of the most recent and carefully compiled geological maps, from near Camp Floyd and the Salt Lake to the Pacific Ocean.

Deposits, probably of the age of the Coal Measures and of great thickness, were also observed in the Wahsatch Mountains east of Lake Utah, along Timpanogos Cañon. The strata here, however, consist mainly of dark colored and bluish impure limestones, slates, and argillaceous shales, the latter containing at a few places fragments of carbonaceous matter,—the whole being upheaved and greatly distorted, apparently by violent forces acting from beneath. The fossils collected from these beds all differ specifically from those found in the light colored limestone at the localities near Long. 115° west, and we have no means of determining which of these is the older rock. The specimens from the dark colored beds in the Cañon, consist of one new or undetermined *Spirifer*, two of *Productus*, and two of *Athyris*, together with fragments of a small *Lepidodendron*.

The indications of Coal of true Carboniferous date, seem to be more favorable here than at any other point examined along the route explored, though no beds of it were seen. Good coal has, however, been found in the same mountain range 140 miles south of this, but as yet little is positively known in regard to its age.

Several miles above this on Timpanogos River, and at a higher geological horizon, outcrops of light colored, and yellowish sandstones and silicious limestones, with red shales, were seen. At one place in this formation a few specimens of very hard, light gray, highly silicious rock were obtained, containing great numbers of small bivalves, in a broken condition. As near as could be determined these are very much like *Bakevellias*, while another of these specimens contains a fragment resembling closely a *Phyllipora*. Both these fossils are quite similar to Permian forms, but it would be unsafe without other evidence to refer the rock to that epoch.

[April,

TRIASSIC ROCKS.

At several localities east of Lake Utah, near the tributaries of Uintah River, extensive deposits of fine red, more or less arenaceous material were seen occupying considerable areas, and from the accounts of various explorers, this formation is greatly developed along the Wahsatch Mountains south of Lake Utah. At these latter localities we have accounts of numerous beds of gypsum, and deposits of rock salt. These beds were seen near Uintah River are not known to contain gypsum or salt, but from the occurrence of gypsum in similar formations a little farther south, and their proximity and relations to Jurassic strata to be mentioned hereafter, there is little room for doubting that they are the same red gypsum-bearing deposit seen by Dr. Hayden beneath Jurassic rocks at the Black Hills. (See paper by Meek & Hayden, *Proceed. Acad. Nat. Sci.*, Phil'a, March, 1858, p. 44.)

From the statement of Mr. Marcon, Dr. George Shumard, Mr. Blake, and more recently of Dr. J. S. Newberry, it is evident this formation is developed on a grand scale in New Mexico. The only organic remains yet found in it, so far as we know, were some plants (*Zamites*, *Pterophyllum*, &c.) and Saurian bones, discovered by Dr. Newberry during his important investigations in the South-West, as geologist of the exploring expeditions under the command of Lieut. Ives, in 1858, and Capt. McComb, Top. Engrs., U. S. Army, in 1859. These fossils led Dr. N. to refer this series to the New Red or Triassic epoch,* which view was also maintained by Mr. Marcon, though the latter gentleman seems not to have had a very clear idea of its limits, since he included other rocks in the Trias as defined by him.

This formation is well exposed on the North Platte at Red Butte, above Fort Laramie, where it also contains several beds of gypsum, and again on La-Bonte Creek, nearer Fort Laramie. It likewise occurs on Smoky Hill River, and at other localities in Kansas, where it has been referred (along with some lower Cretaceous rocks, and possibly some Jurassic strata) to the Trias, by Mr. F. Hawn. All the facts that have been accumulating for some time past, seem to render it more than probable that this series really represents the Trias of the Old World.

JURASSIC ROCKS.

At the localities already mentioned where the red beds were seen near Duchesne River, a tributary of Uintah River, heavy deposits were also observed of grayish and whitish calcareous rock, and light, red and whitish sandstones and shales. Some portions of the same formation were also met with further to the north-west on the east branch of Weber River. At both of these places in the calcareous beds, fragments of *Pecten*, *Ostrea* and portions of the columns of *Pentacrinus*, undistinguishable from those of the Jurassic species *P. asteriscus*, Meek and Hayden, were found. From the presence of these fossils, taken together with all the other circumstances, we have scarcely room to doubt that these deposits are of Jurassic age.

Well marked Jurassic strata occur at Red Buttes, on the North Platte,—at the same locality already referred to in speaking of the red gypsum bearing rocks. They were not seen in direct contact with the gypsum formations, but under circumstances showing that they must hold a higher stratigraphical position. Here they consist of sandstones, shales and slates, more or less laminated calcareous sandstones, and gritty limestones of various colors, altogether of considerable thickness. Some of the lower of these beds are quite fossiliferous. The specimens collected consist of *Pentacrinus asteriscus*, Meek and Hayden, a *Gryphæa* probably identical with *G. calceola*, Quenstedt, a plicated oyster,

*See *Am. Journ.*, vol. 28, 2d ser., p. 299:

closely allied to *O. Marshii*,* a *Pecten* scarcely distinguishable from *P. lens* of Sowerby, a small *Dentalium*, and *Belemnites densus*, Meek and Hayden. From the identity of some of these species with forms collected by Dr. Hayden at the Black Hills, from beds overlying the red gypsum bearing strata of that region, and associated with other well marked Jurassic types, as well as from the affinities of the new species discovered at the locality under consideration on the North Platte, we have no hesitation in referring these deposits to the Jurassic system, in accordance with the views of Dr. Hayden and one of the writers (F. B. M.) expressed in regard to the beds alluded to at the Black Hills. (See Proceed. Acad. Nat. Sci., Philad'a, March, 1858.)

CRETACEOUS ROCKS.

Returning south-westward again to Weber river, in order to follow up the succession of the formations, we find that at a point nearly due east of Salt Lake City, on that stream, and but a short distance north of the locality, where it has already been mentioned that Jurassic beds with *Pentacrinus* occur, outcrops of a Whitish Sandstone were seen, containing in an imperfect condition an Oyster, agreeing in all respects, as far as could be determined, with *O. glabra* of Meek and Hayden. This rock, with the same oyster, was also seen some eight or nine miles farther down Weber River; also, on White Clay Creek, a tributary of Weber River, and some fifty miles farther east on Sulphur Creek, a tributary of Bear River. At the latter locality a small *Anomia* was also found with the same Oyster; and in a more yellowish portion of the same formation several specimens of *Inoceramus*, closely allied to the Western species usually referred to *I. problematicus*. Judging from the Oyster occurring in this rock, and from its lithological characters, it would seem to be of the same age as some older Cretaceous strata, at the mouth of Judith River, on the Upper Missouri, which have been referred by Dr. Hayden and one of the writers, provisionally to No. 1, of the Nebraska section.

At several of the localities rather extensive beds of excellent brown coal, with some shale, were seen in immediate contact with this Oyster Sandstone, and apparently dipping at the same angle, so as to give the impression, when examined, that it belongs to the same epoch.

Well marked Cretaceous rocks were seen at a point on the Platte below the Red Buttes, near the Platte Bridge. The beds consist of gray shales and slates. The fossils found here are a large new species of *Inoceramus*, a fragment of a much compressed *Baculite* and *Ostrea congesta* of Conrad. From the presence of the latter fossil, it is more than probable these beds are on a parallel with No. 2 or 3 of the Nebraska Cretaceous series.

TERTIARY ROCKS.

Tertiary formations occur over a large area in the region of Fort Bridger. They seem to belong to two distinct epochs, the older of which was seen on Bear River, near the mouth of Sulphur Creek, about 30 miles west of Fort Bridger, and but a short distance from the locality, already mentioned, where the *Oyster* and *Inoceramus* occur in a yellow sandstone. The outcrop seen here consists of light colored and gray argillaceous shale, with coarse dark and light colored limestones, all of which dip at a high angle. The fossils collected from these beds consist of one new species of *Unio*, three of *Corbula* (*Potamomya*), three species of *Melania*, three or four of *Paludina*, and one of *Melampus*.

This is an exceedingly interesting deposit, which is undoubtedly of brackish-water origin, the fossils belonging to just such a group of genera as we would expect to find in an estuary deposit, without any strictly marine forms. One

*The oyster here alluded to, is distinct from the species referred by Mr. Marcon to *O. Marshii*. The *O. Marshii* of Marcon holds a much higher stratigraphic position than the above mentioned species.

of the species of *Melania* appears to be identical with *Cerithium tenerum* of Hall, (Fremont's Report, pl. 3, fig. 6,) and a small *Paludina* agrees very closely with *Natica? accidentalis*, while a third is equally as near *Turbo paludinaformis*, of the same report. All the other species are new excepting one *Paludina*, which is identical with *P. Conradi* of Meek and Hayden, from the estuary beds at the mouth of Judith River, on the Upper Missouri. All the facts point to the conclusion that this formation holds a low position in the Tertiary System, or, in other words, is probably of Eocene age.

The succeeding more recent Tertiary beds of this region, are extensively developed along the route traversed, from near the last mentioned locality to Fort Bridger, and thence towards the South Pass. They differ materially in their lithological character from the older deposits just described, and are characterized by an entirely different group of fossils. The upper part of this series consists of greenish sandstones and arenaceous shales, interstratified with sandy and calcareous slates altogether estimated at from two to three hundred feet in thickness, and apparently destitute of fossils. Then comes, (descending,) light colored argillaceous and pure limestones, with at places great numbers of fossils, all of which are strictly fresh water forms, belonging to a few species. Those collected consist of two new species of *Melania*, two of *Limnea*, one of *Unio* and two or three of *Planorbis*. There is also at the junction of the lower light colored more calcareous deposits with those above, at many places, a band of dark shaly, more or less carbonaceous material, containing many impressions of fern and other leaves.

As all the fossils found in the foregoing series are distinct from those yet discovered in known horizons, in the other Tertiary basins of the North-West, we have no means of drawing parallels, though they are probably miocene. Whether the extensive lignite beds on Bitter Muddy Creeks, east and north of Fort Bridger, belong to this series or to the horizon of the older Sulphur Creek coal is unknown, these localities being too remote from the route to be examined.

The more modern group described above was never seen in an upheaved or inclined condition, like the estuary beds on Bear River, though it is manifest that the general contour of the country has been considerably modified since its deposition, as this formation was often seen occupying some of the most elevated positions.

Beneath this series heavy deposits were observed at several places, consisting of light and whitish fine grained sandstone in thick layers, interstratified with bright red, aren-argillaceous shales. Although these beds appeared to be conformable with the superimposed Tertiary, as no organic remains were found in them, their age must be regarded as doubtful.

From the foregoing remarks it will be seen that these collections furnish no evidence of the existence of strictly marine Tertiary deposits in the Green River Basin, but like all those yet obtained in Nebraska, point to the conclusion that the Tertiary strata of this central portion of the Continent were deposited in brackish and fresh waters. The oldest of these formations, so far as known, contain a group of mollusca indicating brackish waters, while all the subsequent formations are of strictly fresh water origin.

Another fact worthy of note is, that all the secondary and Tertiary fossils collected during the survey came from localities east of the Wahsatch range of mountains, while all the specimens collected west of that range of mountains, in the Great Basin, came from Palaeozoic rocks.

In the ranges of mountains west of the 116th degree of longitude, to the Sierra Nevada, near lat. 39°, igneous rocks predominate, and only few traces of stratified rock were found in that district, in none of which any organic remains were observed.

F. B. MEEK and H. ENGELMANN.

Catalogue of Birds collected during a survey of a route for a ship Canal across, the Isthmus of Darien, by order of the Government of the United States, made by Lieut. N. Michler, of the U. S. Topographical Engineers, with notes and descriptions of new species.

BY JOHN CASSIN.

The route surveyed by Lieut. Michler, for the purpose of ascertaining the practicability of establishing communication by water, between the Atlantic and Pacific Oceans, was mainly by way of the river Atrato and its tributaries, the Truando and the Nercua. In the performance of this duty, the Atrato was ascended for a distance of about ninety miles, to the mouth of the Truando, and then a southwesterly route pursued along the latter towards the Pacific Ocean. The Nercua is a tributary of the Truando at a distance of thirty-six miles from the union of the latter with the Atrato.

The most interesting localities mentioned in the present catalogue are on those two rivers, especially after the Truando reaches the Cordilleras, in which in a great measure it and the Nercua have their course. These localities have been but very partially explored by naturalists. Another locality frequently mentioned is Turbo, which is a small village on the Atlantic, directly on the eastern side of the Gulf of Uraba or Darien, and nearly opposite to the mouths or delta of the Atrato.

This collection was made by Mr. William S. Wood, Jr. and Mr. Charles J. Wood of Philadelphia, who accompanied the Expedition, and were of course under the immediate direction of the chief officer of the Expedition, Lieut. N. Michler, of the U. S. Topographical Engineers. This accomplished officer and gentleman encouraged in the fullest degree investigations in Natural History throughout the route, whenever consistent with other duties, and as opportunity presented. To his enlightened views and evident appreciation of the interesting character of the zoology of the country traversed by the Expedition, science in America is indebted for the present valuable collection, including several birds never before known, and other valuable additions to the zoology of this continent.

1. *HYPOTRIORCHIS FEMORALIS*, (Temminck).

Falco femoralis, Temm., Pl. Col. i. liv. 21.

Temm. Pl. Col. 121, 343, U. S. Pacific R. R. Reports, x. pl. 1.

From Carthagena.

2. *MORPHENUS GUIANENSIS*, (Daudin)?

Falco guianensis, Daud. Tr. d'Orn. ii. p. 78?

Lesson. Traite d'Orn. ii. pl. 11?

From the river Truando. One specimen only, not adult, and in bad condition, appears to be this or a nearly allied species.

"Observed once only, in the Rio Truando, at the first camp, after leaving the Atrato. I noticed this eagle at first perched in a high tree, but after I had fired at a small bird, he immediately flew very rapidly and fiercely directly towards the spot where I was standing, as though he intended to pounce upon me. He approached within a few feet, when I shot him with small bird shot." (Mr. C. J. Wood.)

3. *ASTURINA MAGNIROSTRIS*, (Gmelin).

Falco magnirostris, Gm. Syst. Nat., i. p. 282, (1788.)

Temm. Pl. Col. 86, Buff. Pl. Enl. 464.

From Turbo.

4. *BUTEOGALLUS NIGRICOLLIS*, (Latham)

Falco nigricollis, Lath., Ind. Orn. i. p. 35, (1790).

[March

Aquila milvoides, Spix?

Spix, Av. Bras. i. pl. 1, d? Le Vaill, Ois. d'Afr. i. pl. 20.

From the river Truando. "Only observed in trees on the Rio Truando, about 40 or 50 miles from the Cordilleras." (Mr. C. J. Wood).

5. *URUBITINGA MEXICANA*, Du Bus.*Morphnus mexicanus*, Du Bus, Bull. Acad. Brussels, 1847, p. 102.

From the delta of the Atrato. Specimens of this little known species are quite identical with others from Mexico in the museum of this Academy. It is accurately described by the Viscount Du Bus as above cited.

6. *IBYCTER AQUILINUS*, (Gmelin).*Falco aquilinus*, Gm. Syst. Nat. i. p. 280, (1788).

Buff. Pl. Enl. 417, Vieill. Gal. i. pl. 6.

From Turbo, on the Atlantic, and the river Truando, near the Cordilleras. "Abundant in the vicinity of the village of Turbo, but less numerous in the interior. Always seen in trees, and utters a very disagreeable note bearing some resemblance to the *gobble* of the male Turkey." (Mr. C. J. Wood).7. *NYCTIDROMUS GUIANENSIS*, (Gmelin).*Caprimulgus guianensis*, Gm. Syst. Nat. ii. p. 1030, (1788).*Caprimulgus albicollis*, Lath. Ind. Orn. ii. p. 585, (1790).

Buff. Pl. Enl. 733.

From Turbo.

Smaller than *N. americanus*, but much resembling that species.8. *PROGNE CHALYBEA*, (Gmelin)?*Hirundo chalybea*, Gm. Syst. Nat. i. p. 1026, (1788)?

Young birds from Carthagera, very difficult to recognize, but much resembling the species I understand to be as here given.

9. *COTYLE FLAVIGASTRA*, (Vieillot).*Hirundo flavigastrea*, Vieill. Nouv. Dict. xiv. p. 534, (1817).*Hirundo jugularis*, De Wied.

Temm. Pl. Col. 161, fig. 2.

From Carthagera and the river Truando.

10. *CERYLE TORQUATA*, (Linnæus).*Alcedo torquata*, Linn. Syst. Nat. i. p. 180, (1766).

Buff. Pl. Enl. 284.

From the rivers Atrato and Truando.

Numerous specimens in the collection of the Expedition, which are exclusively adults, in fine plumage.

"Very abundant in the immense swamps on the Atrato and Truando, alighting on the low trees, and uttering a loud shrill note. Catches small fishes apparently very easily, on account of their abundance, and returns to the tree." (Mr. C. J. Wood).

11. *CERYLE AMAZONA*, (Latham).*Alcedo amazona*, Lath. Ind. Orn. i. p. 257, (1790).*Alcedo vestita*, Dumont.

Du Bois, Orn. Gal. pl. 85.

From the river Nercua.

12. *CERYLE INDA*, (Linnæus).*Alcedo inda*, Linn. Syst. Nat. i. p. 179, (1766).*Alcedo viridirufa*, Bodd. Tab. Pl. Enl. p. 36, (1783).*Alcedo bicolor*, Gm. Syst. Nat. i. p. 451, (1788).

Edwards, Glean. vii. pl. 355. Buff. Pl. Enl. 592.

From Turbo.

Common enough in South American collections, but never quite correctly

1860.]

named in catalogues, nor hardly elsewhere. Naturalists evidently overlook the solemn fact that Linnæus gives the *habitat* of his species as above cited, "in India *occidentali*!" The name *inda* seems to have been understood to mean a far distant country, beyond the Ganges, and evidently misled even Boddært and Gmelin, but is strictly applicable to this bird. It can readily be recognized from the descriptions and Edwards' figure above cited.

"One specimen seen in a salt water marsh, near the village of Turbo, very quiet and easily approached." (Mr. C. J. Wood).

13. *CERYLE SUPERCILIOSA*, (Linnæus).

Alcedo superciliosa, Linn. Syst. Nat. i. p. 179, (1766).

Edwards, Glean. v. pl. 245, Buff. Pl. Enl. 756, fig. 2, 3.

From Turbo.

"In a salt water marsh, almost in the village of Turbo, one specimen only seen perched in a bush, which was obtained without difficulty, being very unsuspecting." (Mr. C. J. Wood).

14. *JACAMEROPS GRANDIS*, (Gmelin).

Alcedo grandis, Gm. Syst. Nat. i. p. 458, (1766.)

Le Vaill. Jacamars, pl. 54.

From the river Truando.

"First camp after leaving the Atrato, and the only time that this bird was noticed. Sits in a tree and darts after insects like a fly-catcher." (Mr. C. J. Wood).

15. *GALBULA RUFICAUDA*, Cuvier.

Galbula ruficauda, Cuv. Reg. An. i. p. 420, (1817).

Le Vaill. Jac. pl. 50, Vieill. Gal. i. pl. 29.

From the river Nercua.

One specimen only, in bad condition, which appears to be this species, but is darker chestnut brown on the abdomen, than other specimens now before me.

16. *BUCCO RUFICOLLIS*, Lichtenstein.

"*Bucco ruficollis*, Licht." Wagler, Isis, 1829, p. 658.

Tamatia bicincta, Gould, Proc. Zool. Soc. London, 1836, p. 80?

Tamatia gularis, D'Orb. et Lafres. Rev. Zool. 1838, p. 166?

From the river Truando.

"Seen once only, at the first camp on the Truando, after leaving the Atrato." (Mr. C. J. Wood).

For all that I can see this is the young of *B. bicincta*, Gould, as above, with which *B. gularis*, D'Orb, appears to be synonymous.

17. *MALACOPTILA PANAMENSIS*, Lafresnaye.

Malacoptila panamensis, Lafres. Rev. Zool. 1847, p. 79.

From the river Truando.

"Very quiet and inactive, starting out occasionally from its perch to capture an insect, and then returning." (Mr. C. J. Wood).

18. *MONASA PALLESCENS*, nobis.

Rather larger than any other known species; wing rather long, fifth quill longest; tail moderate, with the feathers wide. Front and lores white, entire head, quills, upper and under tail coverts black, with a greenish lustre, (no white on the chin nor throat), upper and under wing coverts, back, rump and under parts of body cinereous; very light on upper wing coverts, and darker on the back; bill red, sexes alike.

Total length about 11 inches, wing $5\frac{1}{2}$, tail 5 inches.

Hab. Cordilleras mountains on the river Truando, New Grenada. In National Museum and Mus. Acad. Philadelphia. Discovered by Mr. Chas. J. Wood and Mr. Wm. S. Wood, Jr.

[April,

This is a remarkable and apparently new species of *Monasa*, strictly of the same group, and related to *M. Morphoeus* (= *albifrons* and *personata*) and *M. peruana*. Like those species, the present bird has a conspicuous white frontal band, which reaches very nearly from one eye to the other, but it differs from those species in being without any white whatever on the throat. It is, however, easily distinguished from all known species, by the cinereous color of the body above and below and wing coverts; which color is very light, and in some specimens nearly white on the whole of the upper wing coverts, and but slightly darker on the under wing coverts. Several specimens labelled as both sexes are in the collection from the river Truando.

Stated by Messrs. W. S. and C. J. Wood, to have been seen once only in the Cordilleras on the river Truando, in January, 1858. A party of eight or ten specimens was observed sitting very quietly in a tree at some distance from the ground, and being quite regardless of the gun or the presence of man, several were obtained. Specimens labelled as females are slightly larger than those stated to be males.*

19. TROGON MASSENA, Gould.

Trogon Massena, Gould, Monog. Trogonidæ, (1838).

Gould, Mon. Trog. pl. 16.

From the Truando, and also from the delta of the Atrato.

All the specimens in the collection are of young birds in but indifferent condition, amongst which one specimen may be the young of *T. macrourus*.

*The following species of *Monasa* are in the Museum of this Academy:

1. MONASA ATRA, (Boddart).

Cuculus ater, Bodd. Tab. Pl. Enl. p. 30, (1783).

Cuculus tranquillus, Gm. Syst. Nat. i. p. 417, (1788).

Bucco cinereus, Gm. Syst. Nat. i. p. 409, (1788).

Corvus australis, Gm. Syst. Nat. i. p. 377, (1788).

Bucco calcaratus, Lath. Ind. Orn. i. p. 206, (1790).

Corvus affinis, Shaw, Gen. Zool. vii. p. 381, (1809).

Buff. Pl. Enl. 512, Le Vaill. Barbets, pl. 44, 45.

2. MONASA MORPHOEUS, (Wagler).

Bucco morphoeus, Wagler, Hahn's Voegel, Asien. Africa, &c. pt. xiv. (1822).

"*Bucco leucops*, Ill." Licht. Verz. p. 8, (1823).

Bucco albifrons, Spix, Av. Bras. i. p. 53, (1824).

Monasa personata, Vieill. Gal. i. p. 23, (1825).

Hahn, Voegel, pt. xiv. pl. 2. Spix, Av. Bras. i. pl. 41, fig. 1, Vieill. Gal. i. pl. 36

Swains. B. of Braz. pl. 12.

3. MONASA NIGRIFRONS, (Spix).

Bucco nigrifrons, Spix, Av. Bras. i. p. 53, (1824).

Lypornix unicolor, Wagler, Syst. Av. (1827, not paged).

Spix, Av. Bras. i. pl. 41, fig. 2.

4. MONASA AXILLARIS, (Lafresnaye).

Monasa axillaris, Lafres, Rev. et Mag. Zool. April, 1850, p. 216.

Monasa flavirostris, Strickland, Jard. Contr. April, 1850.

Jard. Contr. 1850, pl. (not numbered).

It would require nice discrimination to determine with certainty the priority of either of the above names. My impression is that *M. Lafresnaye's* name is entitled rather to preference, because it bears an unmistakable date, which the other does not, but requires to be determined by examination or approximation.

5. MONASA PERUANA, Verreaux.

"*Monasa peruana*, Bp. et Verr." label on spec. from *M. Verreaux*.

Monasa peruana, Sclater, Proc. Zool. Soc. London, 1855, p. 194.

This is very closely allied to the now well known *M. morphoeus*, and scarcely distinguishable without specimens of both. A specimen bearing *M. Verreaux's* label is in the Acad. Coll., and is therefore entirely reliable as this species.

6. MONASA PALLESCENS, Cassin.

1860.]

20. **TROGON MELANOPTERUS**, Swainson.
Trogon melanopterus, Sw. Cab. Cy. p. 332, (1838).
Gould, Mon. pl. 10, 11.
From the river Truando.
One specimen only in adult plumage.
21. **TROGON ATRICOLLIS**, Vieillot.
Trogon atricollis, Vieill. Nouv. Diet. viii. p. 318, (1817).
Gould, Mon. pl. 8.
Falls of the Truando.
"In the Cordilleras on the Rio Truando. Seen once only, very unsuspecting and easily shot." (Mr. C. J. Wood).
22. **MOMOTUS MARTII**, (Spix).
Prionites Martii, Spix, Av. Bras. i. p. 64, (1824).
Momotus semirufus, Sclater, Rev. et Mag. Zool. 1853, p. 489?
Spix, Av. Bras. i. pl. 60.
From the river Nercua.
One specimen in adult plumage, labelled as a male bird.
23. **CRYPTICUS PLATYRHYNCHUS**, (Leadbeater).
Momotus platyrhynchus, Leadb. Trans. Linn. Soc. Lond. xvi. p. 92, (1829).
Crypticus Martii, Bonap. Proc. Zool. Soc. London, 1837, p. 119.
Jard. and Selby, Ill. Orn. iii. pl. 106.
From the Cordilleras on the river Nercua.
In adult plumage, and in colors singularly resembling the preceding, but with the bill differently formed, and affording strong generic distinctions. This is probably the first time that these two birds, which have much perplexed naturalists, have ever occurred in the same collection. Both are labelled as from the same locality, and I am informed by Mr. C. J. Wood, that they inhabit the forests on the river Nercua, on the western side of the Cordilleras.
24. **RAMPHASTOS TOCARDUS**, Vieillot.
Ramphastos Tocard. Vieill. Nouv. Dict. xxxiv. p. 280.
Ramphastos Swainsonii, Gould. Proc. Zool. Soc. London, 1833, p. 69.
Gould, Mon. Ramph. pl. 4.
From the River Nercua.
25. **RAMPHASTOS CARINATUS**, Swainson.
Ramphastos carinatus, Sw. Zool. Ill. i. p. (pl. 45, not paged.)
Gould, Monog. pl. 2.
River Nercua. One specimen only, in mature plumage, from the western side of the Cordilleras on the River Nercua.
26. **PTEROGLOSSUS ERYTHROPYGIUS**, Gould.
Pteroglossus erythropygius, Gould, Proc. Zool. Soc. London, 1843, p. 15.
Gould, Monog. pl. 21, Zool. Voy. Sulphur, pl. 28.
From the River Truando. Specimens labelled as both sexes are in the collection. The females are smaller, and in both sexes there is some variation in the color of the bill as noticed by Mr. Gould, the white being in these specimens more extended in the females.
27. **SELENIDERA SPECTABILIS**, Cassin.
Selenidera spectabilis, Cass. Proc. Acad. Philada. 1857, p. 214.
Jour. Acad. Philada. iv. pl. 1.
From the falls of the River Truando.
Both sexes of this species, in excellent plumage and preservation are in the collection from the Cordilleras on the River Truando. They are, however, precisely similar to Mr. Mitchell's specimens described by me as above cited, though the occurrence of this little-known species again, and at another locality, is a point of interest.

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28. *ARA MILITARIS*, (Linnæus).
Psittacus militaris, Linn. Syst. Nat. i. p. 139, (1766).
 Le Vaill. Parrots, pl. 6, Edward's Glean. vii. pl. 313.
 From the River Nercua in the Cordilleras mountains.
29. *ARA ARARAUNA*, (Linnæus).
Psittacus ararauna, Linn. Syst. Nat. i. p. 139, (1766).
 Le Vaill. Parr. pl. 3, Lear, Parr. pl. 8.
 From the mouth of the Atrato, Gulph of Uraba.
30. *ARA SEVERA*, (Linnæus).
Psittacus severus, Linn. Syst. Nat. i. p. 140, (1766).
 Le Vaill. Parr. pl. 8, 9, 16, Edward's Glean. v. pl. 229.
 Mouth of the River Nercua.
31. *CONURUS PERTINAX*, (Linnæus).
Psittacus pertinax, Linn. Syst. Nat. i. p. 142, (1766).
 Le Vaill. Parr. pl. 34, Edw. Glean. v. pl. 234.
 Carthagenæ.
32. *CONURUS TOVI*, (Gmelin).
Psittacus tovi, Gm. Syst. Nat. i. p. 351, (1788).
 Bourj. St. Hil. Parr. pl. 48.
 From the River Atrato.
33. *PSITTACULA CYANOPTERA*, (Boddært).
Psittacus cyanopterus, Bodd. Tab. Pl. Enl. p. 27, (1783).
Psittaculus gregarius, Spix. Av. Bras. i. p. 39, (1824).
 Bourj. St. Hil. Parr. pl. Spix. Av. Bras. i. pl. 34.
 Carthagenæ.
34. *DRYOCOPUS MALHERBII*, (G. R. Gray).
Campephilus Malherbii, G. R. Gray, Gen. Birds, ii. p. 436, pl. 108, (1845).
 Malherbe, Monog. Pictidæ, pl. 6.
 From Turbo. "Occasionally seen in the forest at Turbo, very shy and difficult to approach." (Mr. C. J. Wood).
35. *DRYOCOPUS ALBIROSTRIS*, (Vieillot).
Picus albirostris, Vieill. Nouv. Dict. xxvi. p. 69, (1818).
Megapicus albirostris, (Vieill.) Malherbe.
 Malherbe, Monog. Pictidæ, pl. 4.
36. *CELEUS MENTALIS*, nobis.
 About the size of *C. rufus*, occipital feathers somewhat lengthened, third quill longest, bill rather short. Male, with a large space on the chin and throat, bright scarlet. This space begins nearly on a line with the commissure of the bill on each side, covering the chin and throat, and is not divided in the middle, but is integral.
 Head and upper parts of body dark cinnamon, many feathers having semi-circular and crescent shaped spots of black, rump and upper tail coverts lighter. Quills brownish black, barred with dark cinnamon, tail brownish black, all the feathers of which are barred with dull yellowish cinnamon color. Underparts of body yellowish cinnamon, lighter than the back and with the black spots much more numerous, every feather having nearly complete semicircular and crescent shaped bands of black. Under wing coverts uniform dark cinnamon, not spotted, axillaries dark cinnamon with a few imperfect bands of deep black. Bill bluish horn color, under mandible lighter. Female, much like the male, but having no red patch on the throat and the black spots on the under parts not so numerous.
 Total length about 8 inches, wing $4\frac{1}{2}$, tail $1\frac{3}{4}$ inches.
Hab.—Turbo and Atrato River, New Grenada. Discovered by Messrs. Wm. S. and Chas. J. Wood, Spec. in Nat. Mus. Washington.
 1860.]

Of this Woodpecker, I have found no description nor figure which seemed to approach it, except *Picus undatus* of authors figured by Edwards, pl. 332. It is nearly the size and of the same general colors as that species, but instead of two patches of red on the cheeks as described and figured in *P. undatus*, the present bird has a single large patch completely enclosing a space on the throat around the base of the lower mandible, similar to that in the common *Picus varius* of the United States. This character I cannot trace in any other species of this genus.

This bird belongs to the same subgeneric group as *Celeus rufus*, which seems to have no name, though readily defined.

37. *CROTOPHAGA MAJOR*, Brisson.

Crotophaga major, Brisson, iv. p. 180, (1760).

Buff. Pl. Enl. 102.

From the River Atrato.

38. *CYANOCORAX PILEATUS*, (Temminck).

Corvus pileatus, Temm. Pl. Col. (liv. 10.)

Temm. Pl. Col. 58.

From the rivers Truando and Nercua. "In flocks on the high trees on the Truando before reaching the mountains. Very shy and noisy, calling out loudly whenever an attempt was made to approach them. (Mr. C. J. Wood).

39. *QUISCALUS MACROURUS*, Swainson.

Quiscalus macrourus, Sw. Cab. Cy. p. 299, (1838).

Rept. U. S. and Mex. Bound. Survey, Birds, pl. 20.

From Turbo and Carthagena. "In parties of ten or a dozen feeding on berries along the sea shore. Abundant, especially at Carthagena, and noisy, but not easily shot." (Mr. C. J. Wood).

40. *OCYALUS WAGLERI*, (G. R. Gray).

Cacicus Wagleri, G. R. Gray, Gen. Birds, ii. p. 342, (1845).

Gray's Genera, ii. pl. 85.

From the rivers Truando and Nercua. Specimens of both sexes in mature plumage, the females being much the smaller.

41. *OSTINOPS CRISTATUS*, (Gmelin).

Oriolus cristatus, Gm. Syst. Nat. i. p. 387, (1788).

Sw. B. of Bras. pl. 32, Buff. Pl. Enl. 328.

From Turbo and the Atrato River.

"In company with smaller species along the Atrato, and seemed to be feeding on the fruit of a tree which grew plentifully on the edge of the water. Unsuspecting and easily approached." (Mr. C. J. Wood).

42. *OSTINOPS GUATIMOZINUS*, Bonaparte.

Ostinops guatimozinus, Bonap. Compte Rend., 1853, p. 833.

Large, resembling *O. Montezumae* and *O. bifasciatus*, but larger than either, darker colored, and with the crest feathers much longer and more slender. Male.—Head, under parts of body and tibiae brownish black, under tail coverts chestnut brown, same as the back. Entire upper parts of body, wing coverts and outer webs of quills purplish chestnut brown. Tail graduated, two middle feathers brownish black, all others yellow. Naked space below the eye completely divided by a line of short imbricated feathers nearly on a line with the lower edge of the lower mandible. Crest long and composed of very narrow feathers. Bill wide at base in front, high and compressed, pointed, basal two-thirds black, terminal one-third light colored (red?). Total length about $21\frac{1}{2}$ inches, wing $10\frac{1}{2}$, tail $8\frac{1}{2}$ inches. Crest feathers 3 inches, bill from gape $3\frac{1}{4}$ inches.

Hab.—River Truando, New Granada.

One specimen, labelled as a male, in the collection of the Expedition is dis-

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tinct from any species in Acad. Coll. or that we find described, except as above. It is nearly allied to *O. Montezumae* of Mexico and Central America, and *O. bifasciatus* of Northern Brazil, both of which are in the Acad. Coll. and are distinct from each other.

The present bird differs from both of the above species in being larger, darker colored and having a lengthened almost filiform crest. The bill also is disproportionately longer and wider at base, with a rounded termination in front. It is not without scruples that I apply the name above to this bird; the description by the Prince Bonaparte, as cited, not being sufficient for the recognition of any species nearly related to another.*

"At Camp Abert, on the Truando, before reaching the Cordilleras, one specimen only seen, which was shot; it was very shy and seemed to be a stranger." (Mr. C. J. Wood.)

43. *CASSICUS ICTERONOTUS*, Vieillot.

Cassicus icteronotus, Vieill.

Sw. B. of Braz., pl. 3.

From Turbo and the delta of the Atrato River. "Very abundant at Turbo, builds many nests on the same tree, which are long and hanging, and entered from the top. Always seen in large parties and very noisy, especially in the morning, although their notes are rather agreeable." (Mr. C. J. Wood.)

44. *CASSICUS CHRYSONOTUS*, Lafresnaye?

Cassicus chrysonotus, Lafres.

D'Orb. Voy. Am. Mer. Ois. pl. 52?

From Turbo. A single specimen in young plumage appears to be this species.

45. *CASSICUS UROPYGIALIS*, Lafresnaye?

Cassicus uropygialis, Lafr. Rev. Zool. 1843, p. 290?

Falls of the River Truando.

Specimens not mature nor in good condition appear to be this species.

*The three nearly allied species are as follows:

1. *OSTINOPS BIFASCIATUS*, (Spix).

Cassicus bifasciatus, Spix, Av. Bras., i. p. 65 (1824).

Spix, Av. Bras., i. pl. 61.

Naked space on the cheek, integral (not divided as in the two succeeding species). Crest feathers rather long, not so narrow nor so long as in *O. guatimozinus*, but longer than in *O. Montezumae*. Head and breast brownish black, entire upper parts of body, abdomen, under tail coverts and *tibiæ* light chestnut brown, tail yellow, central two feathers dark brown. Total length, male 18 to 20 inches. Naked space on cheek precisely as figured by Spix as above cited, which figure is sufficiently accurate. Two specimens from Para, in Acad. Coll.

2. *OSTINOPS MONTEZUMÆ*, (Lesson).

Cassicus Montezumae, Less. Cent. Zool. p. 33, (1830).

Less. Cent. Zool. pl. 7, Gervais, Atlas de Zool. pl. 33.

Naked space on the cheek partially divided by a line of short imbricated features above the lower edge of the lower mandible. Crest feathers short and inconspicuous, shorter than in either of the other species here described. Plumage much as in preceding, but with the *tibiæ* brownish black. Total length, male, about 20 inches. Naked space on cheek accurately represented in both plates above cited, which are otherwise very accurate. Nine specimens in Acad. Coll. including Lesson's original which is labelled as from Mexico, others are from Nicaragua.

3. *OSTINOPS GUATIMOZINUS*, Bonaparte.

Ostinops guatimozinus, Bonap. Compt. Rend. 1853, p. 833.

Naked space on cheek completely divided by a line of short, imbricated feathers nearly on a line with the lower edge of lower mandible. Crest feathers long and pendant, longer than in either of the preceding. Plumage generally resembling that of both the preceding, but darker, entire under parts brownish black, *tibiæ* black. Total length 21 to 22 inches. One specimen in National Museum, Washington.

1860.]

46. *ICTERUS MESOMELAS* (Wagler).
Psarocolius mesomelas, Wagl.
 Lesson, Cent. Zool. pl. 22.
 From the River Atrato.
47. *ICTERUS GIRAUDII*, Cassin.
Icterus Giraudii, Cass. Proc. Acad. Philad'a, iii. p. 332 (1847).
 Journ. Acad. Philad'a, i. pl. 17.
 From the Rivers Truando and Nercua and the "Shores of the Pacific."
 Several specimens differing somewhat in size are from the Cordilleras and the western coast, until quite reaching the Pacific Ocean. One specimen obtained by Mr. W. S. Wood, Jr., is labelled "Shores of the Pacific."
 "In bushes and low trees on the Truando, and has very pleasant notes of the same general character as those of the Baltimore Oriole. Solitary and rather wild." (Mr. C. J. Wood).
48. *XANTHORHUS AFFINIS*, Lawrence.
Xanthornus affinis, Lawr. Am. Lyc. New York, 1851, p. 113.
 From the Atrato. A single specimen in adult male plumage.
49. *EUSPIZA AMERICANA* (Gmelin).
Emberiza americana, Gm. Syst. Nat. i. p. 872 (1788).
 Wilson, Am. Orn. i. pl. 3. Aud. B. of Am. pl. 384, Oct. ed. iii. pl. 156.
 From Turbo. "In flocks early in April, about grassy places at Turbo, and seen for one day only." (Mr. C. J. Wood).
50. *PITYLUS GROSSUS* (Linnæus).
Loxia grossa, Linn. Syst. Nat. i. p. 307 (1766).
 Buff. Pl. Enl. 154.
 From the Falls of the River Truando. "In the mountains and seen once only. Has a loud, musical note similar to that of the Cardinal bird of the United States." (Mr. C. J. Wood).
51. *SALTATOR MUTUS*, Sclater?
Saltator mutus, Sclater, Proc. Zool. Soc., London, 1856, p. 72?
Tanagra superciliaris, Spix, Av. Bras. ii. p. 44, pl. 47?
 From Carthage. "On the 'Popa' mountain at Carthage."
 Specimens in young plumage not for us easily identified.
52. *ARREMON SCHLEGELI*, Bonaparte.
Arremon Schlegeli, Bonap. Consp. Av. i. p. 488 (1850).
 From Carthage. Very fine specimens of this beautiful little bird, in adult plumage.
 "In the high grass on the sea shore at Carthage on the seed of which it appeared to feed. Notes and habits generally resembled those of the Sparrows of the United States, not abundant and difficult to obtain." (Mr. C. J. Wood).
53. *PYRANGA AESTIVA* (Gmelin).
Tanagra aestiva, Gm. Syst. Nat. i. p. 889 (1788).
 Wilson, Am. Orn. i. pl. 6, Aud. B. of Am. pl. 44, Oct. ed. iii. pl. 208.
 From Turbo. "In the forest at Turbo, early in April, seen once only."
54. *ORTHOGONYS OLIVACEUS*, nobis.
 Form short and robust, bill rather wide at base, upper mandible with a distinct tooth-like lobe about the middle of its cutting edge, wing moderate, fourth quill slightly longest, tail moderate or rather short. Male.—Front and line extending over and around the eye bright yellow. Throat, middle of abdomen, edge of wing at shoulders and under wing coverts greenish yellow. Upper parts of head and body dark olive green, under parts olive green tinged with yellowish, the latter color more apparent in the middle, under tail coverts

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greenish yellow. Quills brownish black, with their outer webs dark olive, uniform with the back, tail dark olive, inner webs of outer feathers greenish brown. The yellow on the throat somewhat striped or spotted with dark olive. Bill bluish horn color, legs lighter. Sexes similar.

Total length about $6\frac{3}{4}$ inches, wing $3\frac{1}{2}$, tail $2\frac{1}{2}$ inches.

Hab.—Cordilleras Mountains, on the River Truando, New Granada. Discovered by Mr. W. S. Wood, Jr., and Mr. C. J. Wood, attached to U. S. Expedition for surveying the River Atrato, in command of Lieut. N. Michler, U. S. Topog. Engineers. Spec. in Nat. Mus., Washington.

This is a curious bird and has not a little puzzled the present writer. My impression is that it is an undescribed genus related to *Icteria* and more so to *Orthogonys* and not unlike some species of *Pyrranga*. At present I rate it as an *Orthogonys* to which it quite as much belongs as *Pyrranga cyanicteria* of authors at least, of which there are several specimens in the Academy collection.

Mr. C. J. Wood states that this bird inhabits low trees and bushes in the Cordilleras, on the Rio Truando, and could be constantly heard at some localities, though not so easily seen. Its notes are loud and much varied, bearing a general resemblance to those of the Chat of North America (*Icteria viridis*). It appeared to be very active and lively, constantly flying about the bushes and changing its position.

55. TANAGRA CANA, Swainson.

Tanagra cana, Sw. B. of Braz. p. 2, (1841).

Sw. B. of Braz. pl. 37.

From Turbo.

"Abundant in the orange and lime trees at Turbo, and in gardens and other cultivated localities at Carthagena. Note only a single chirp and very unsuspecting and easily shot." (Mr. C. J. Wood).

56. RAMPHOCELUS ICTERONOTUS, Bonaparte.

Ramphocelus icteronotus, Bonap. Proc. Zool. Soc. London, 1836, p. 121.

Du Bus, Esq. Orn. pl. 15.

From Turbo and the rivers Atrato and Truando.

"Always observed frequenting one kind of tree, that grows along streams of water, on the fruit of which it feeds. Abundant on the Rio Truando in the month of March." (Mr. C. J. Wood).

57. RAMPHOCELUS DIMIDIATUS, Lafresnaye.

Ramphocelus dimidiatus, Lafres. Mag. Zool. 1837, p. (not paged).

Guerin's Mag. Zool. 1837, pl. 81.

From Turbo.

"Abundant in April in the bushes and low trees in the drier parts of the forest. Solitary but constantly seen, and heard only to utter a single chirp." (Mr. C. J. Wood).

58. EUCOMETIS CRISTATA, (Du Bus).

Pipilopsis cristata, Du Bus, Bull. Acad. Brussels, 1855, p. 154.

From the river Truando.

"At the first camp on the Truando after leaving the Atrato. In the bushes and low trees, very shy, and seen once only in a party of three together. Sings very pleasantly, and very loud for the size of the bird." (Mr. C. J. Wood).

59. TACHYPHONUS LUCTUOSUS, D'Orb. et Lafres.

Tachyphonus luctuosus, D'Orb. et Lafres. Mag. Zool. 1837, p. 29.

D'Orb. Vey. Am. Mer. Ois. Pl. 20.

From the Truando.

"Obtained during our encampment in the mountains, on the Rio Truando. In the high trees, and rarely seen, and very shy and active. Male black, female brown." (Mr. C. J. Wood).

1860.]

60. TACHYPHONUS DE LATTREI, Lafresnaye.

Tachyphonus De Lattrei, Lafres. Rev. Zool. 1847, p. 72.

Falls of the Truando.

"Seen once only, in the bushes on the bank of the Rio Truando, in the month of March. About twenty specimens which seemed to be in company, were noticed and several obtained, though they were very shy and not easily approached. All chattered together like a flock of blackbirds, and appeared to be feeding on a berry that was abundant." (Mr. C. J. Wood).

61. TACHYPHONUS XANTHOPYGIUS, Selater.

Tachyphonus xanthopygius, Selater, Proc. Zool. Soc. Lond. 1854, p. 158.

Proc. Zool. Soc. London, 1854, pl. 69, 1855, pl. 90.

From the Truando.

The male only, of this handsome and remarkable species, precisely as figured by Mr. Selater.

"The wildest bird I met with in the whole journey. A portion of the surveying party remained fifteen days at a camp in the Cordilleras, on the Rio Truando, where only this bird was obtained, and was so very shy and watchful, that it was with difficulty obtained. Three specimens were together and were observed to always resort to one tree to roost, and constantly frequenting the highest trees. Very active and perpetually on the move from one tree to another, notes loud and musical, somewhat like those of the Baltimore Oriole of the United States." (Mr. C. J. Wood).

62. TACHYPHONUS?

Falls of the Truando.

One specimen labelled as a female, but which is of no species with which I am acquainted, nor find described. Not having the male I do not venture a description.

63. CALLISTE FRANCESCÆ, (Lafresnaye).

Aglaiia Fanny, Lafres. Rev. Zool. 1847, p. 72.

Des Murs. Icon. Orn. pl. 56.

From Turbo.

"In a tree that grows along streams of water, on the fruit of which it feeds. Rather shy and not easily approached, very quick and active." (Mr. C. J. Wood).

64. CALLISTE INORNATA, Gould.

Calliste inornata, Gould, Proc. Zool. Soc. London, 1855, p. 158.

Sclater, Monog. Calliste, pl. 45.

From Turbo.

Probably the female or young, of the preceding, (*C. francescæ*), and given by us as distinct, with some reluctance. The specimens in the collection are very nearly as described and figured as cited above.

"In the same tree, and appeared to be in company with the preceding, and thought by my brother and myself to be the female of that bird." (Mr. C. J. Wood).

65. CALLISTE LAVINIÆ, Cassin.

Calliste Lavinia, Cass. Proc. Acad. Philadelphia, 1858, p. 178.

From the river Truando.

We have much gratification in finding in the present collection, the second specimen that we have ever seen of this interesting little species, though not in mature plumage. It bears, however, the characteristic edging of rufous on the outer webs of the quills, and is easily recognised.

"Shot at camp Toucey, in the mountains on the Rio Truando. In high trees, very active and lively, and not easily obtained, though not often seen, March, 1858." (Mr. C. J. Wood).

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66. *EUPHONIA FULVICRISSA*, Selater.

Euphonia fulvicrissa, Selater, Proc. Zool. Soc. Philada. 1856, p. 276.

Falls of the Truando.

"At our encampment in the mountains on the Rio Truando, in the high trees, and difficult to shoot. Not often seen, and quite shy and watchful." (Mr. C. J. Wood).

67. *NEMOSIA AURICOLLIS*, Selater.

Nemosia auricollis, Selater, Proc. Zool. Soc. London, 1856, p. iii.

From the river Truando.

"At the first camp on the Truando, before reaching the mountains. In the bushes growing abundantly in the extensive marshes and swamps on that river. Appeared to have habits much like those of the Wrens, and constantly repeated its notes, so as easily to be followed. (Mr. C. J. Wood).

68. *LIPAUGUS UNIRUFUS*, Selater.

Lipaugus unirufus, Sclat. Proc. Zool. Soc. London, 1859, p. 385.

Querula fuscocinerea, Lafres. Rev. Zool. 1843, p. 291?

From Turbo and the river Truando.

Entire plumage light rufous, darker on the back, and lighter on the under parts of the body and under wing coverts; quills and tail rufous cinnamon, shafts and inner webs of quills darker. Total length, about 9 inches, wing 5, tail 4½ inches. Sexes alike.

Several specimens labelled as both sexes, are from Turbo and the river Truando, and all have the appearance of being in young or some peculiar seasonal plumage. These specimens are all of an uniform dull rufous, very nearly the color of the immature plumage in some species of black *Tachyphonus* which induces me to suppose that the adult of this bird is quite different in color from the present specimens. Although undoubtedly of the genus *Lipaugus*, this bird corresponds but indifferently with the last description above cited, though it may be that species in the plumage of another season than that described.

"In the dry parts of the forest at Turbo, and in the Cordilleras on the Rio Truando, in the lower trees. Frequently seen, but always solitary and silent. Sits very quietly in a tree and flies after insects, especially the large coleopterous species, abundant on the route everywhere." (Mr. C. J. Wood).

69. *QUERULA CRUENTA*, (Boddært).

Muscicapa cruenta, Bodd. Tab. Pl. Enl. p. 23, (1783).

Buff. Pl. Enl. 381, Vieill. Gal. pl. 115.

From Turbo. "Very abundant and in large parties in the thick and dry parts of the forest at Turbo. Constantly chattering and noisy, frequently seen on the ground, and seemed to prefer low bushes. Female entirely black." (Mr. C. J. Wood).

70. *SAUROPHAGUS LICTOR*, (Lichtenstein).

Lanius lictor, Licht. Verz. p. 49, (1823).

Gray, Genera of B. i. pl. 62.

From the Rivers Atrato and Truando.

71. *TYRANNUS DOMINICENSIS*, Brisson.

Tyrannus dominicensis, Briss. Orn. ii. p. 394, (1760).

Aud. B. of Am. pl. 46, Oct. ed. i. pl. 55.

From Carthagen.

72. *TYRANNUS MELANCHOLICUS*, Vieillot.

Tyrannus melancholicus, Vieill. Nouv. Diet. xxxv. p. 48, (1819).

Spix, Av. Bras. ii. pl. 19.

From Turbo, Carthagen and the River Truando.

73. *MYIARCHUS FEROX*, (Gmelin).

1860.]

- Muscicapa ferox*, Gm. Syst. Nat. i. p. 934, (1788).
Buff. Pl. Enl. 571, fig. 1.
Falls of the Truando.
74. *ELAENIA CAYENNENSIS*, (Linnaeus).
Muscicapa cayennensis, Linn. Syst. Nat. i. p. 327, (1766).
Buff. Pl. Enl. 569, fig. 2.
From Turbo.
75. *SAYORNIS ARDOSIACUS*, (Lafresnaye).
Tyrannula ardosiacus, Lafres. Rev. Zool. 1844, p. 80.
Falls of the Truando. "A pair observed about rocks at the foot of the mountains, on the Truando. Had some very pleasing notes and almost a continued song, very shy." (Mr. C. J. Wood).
76. *MYIOBIUS SULPHUREIPYGUS*, (Sclater).
Tyrannula sulphureipygia, Sclater, Proc. Zool. Soc. London, 1856, p. 296.
From the River Truando.
77. *TYRANNULA ALBICEPS*, (D'Orb. et Lafres).
Muscipeta albiceps, D'Orb. et Lafres. Mag. Zool. 1837, p. 47.
From Carthage.
78. *TYRANNULA ALBICEPS*?
Apparently an accidental variety of the preceding, having the back light yellow or canary color. One specimen from Carthage.
79. *CYCLORHYNCHUS BREVIROSTRIS*, Cabanis.
Cyclorhynchus brevirostris, Cab. Wieg. Arch. 1847, p. 249.
From the River Truando.
80. *PLATYRHYNCHUS CANCROMA*, (Lichtenstein).
Todus caneroma, Licht. Verz. p. 51, (1823).
Temm. Pl. Col. 12, fig. 2, Sw. Zool. Ill. ii. pl. 115.
From the Truando.
"At Camp Toucey, on the Truando, soon after leaving the Atrato. In the high trees and difficult to obtain." (Mr. C. J. Wood).
81. *TODIROSTRUM CINEREUM*, (Linnaeus).
Todus cinereus, Linn. Syst. Nat. i. p. 178 (1766).
Buff. Pl. Enl. 585, fig. 3.
From Carthage.
"Occasionally seen on the 'Popa' Mountain, near Carthage, in the bushes and low trees, flying out after insects, which it caught on the wing with much dexterity, and which were very abundant, mostly small *Diptera*." (C. J. Wood).
82. *TODIROSTRUM NIGRICEPS*, Sclater.
Todirostrum nigriceps, Sclater, Proc. Zool. Soc. London, 1855, p. 66.
Proc. Zool. Soc. London, 1855, pl. 84.
From Turbo.
"In the drier parts of the forest at Turbo, occasionally seen, but not common. Caught insects of the same description as the preceding, and resembled it in general habits." (Mr. C. J. Wood).
83. *TODIROSTRUM EXILE*, Sclater.
Todirostrum exile, Sclater, Proc. Zool. Soc. London, 1857, p. 83.
Proc. Zool. Soc. London, 1857, pl. 125.
From Carthage.
"In the bushes and low trees, constantly flying after insects, and uttering a single chirp, by which it could easily be traced and shot. Frequently seen in the month of April." (Mr. C. J. Wood).

(To be continued.)

[April,

May 1st.

DR. LEIDY in the Chair.

Twenty-four members present.

Dr. Darrach read the following catalogue of Plants collected in flower in the neighborhood of Philadelphia, from February to the 1st of May, amounting to sixty-eight species :

Plants appearing in Flower, in the neighborhood of Philadelphia, from February to May.

- February. *Symplocarpus fœtidus*, N. J. 32. *Cerastium vulgatum*.
 March. *Draba verna*. 33. " *viscosum*.
 April.
- I. RANUNCULACEÆ. 34. *Claytonia Virginica*.
 1. *Anemone nemorosa*. IX. LIMNANTHACEÆ.
 2. *Hepatica triloba*. 35. *Flœrkea proserpinacoides*.
 3. *Thalictrum anemonoides*. X. SAPINDACEÆ.
 4. " *dioicum*. SUBORDER III. ACERINEÆ.
 5. *Ranunculus abortivus*. 36. *Acer dasycarpum*.
 6. " *fasicularis*. 37. " *rubrum*.
 7. *Caltha palustris*. XI. ROSACEÆ.
 8. *Aquilegia Canadensis*. 38. *Potentilla Canadensis*.
 II. ANONACEÆ. 39. *Fragaria Virginiana*.
 9. *Asimina triloba*. 40. *Amelanchier Canadensis*.
 III. PAPAVERACEÆ. XII. SAXIFRAGACEÆ.
 10. *Sanguinaria Canadensis*. 41. *Saxifraga Virginiana*.
 IV. FUMARIACEÆ. 42. *Mitella diphylla*.
 11. *Dicentra cucullaria*. 43. *Chrysosplenium Americanum*.
 12. *Corydalis aurea*. XIII. UMBELLIFERÆ.
 V. CRUCIFERÆ. 44. *Chærophyllum procumbens*.
 13. *Dentaria laciniata*. XIV. ARALIACEÆ.
 14. *Cardamine rhomboidea*. 45. *Aralia trifolia*.
 15. " *pratensis*. XV. RUBIACEÆ.
 16. " *hirsuta*. 46. *Oldenlandea cœrulea*.
 17. " *v. virginica*. XVI. COMPOSITÆ.
 18. *Arabis ludoviciana*. 47. *Erigeron bellidifolium*, in places
 19. " *hirsuta*. exposed to the sun.
 20. *Barbarea vulgaris*. 48. *Antennaria plantaginifolia*.
 21. *Sisymbrium thalianum*. 49. *Taraxacum dens-leonis*.
 22. *Draba Caroliniana*.
 23. *Capsella bursa-pastoris*.
 VI. VIOLACEÆ. XVII. ERICACEÆ.
 24. *Viola cucullata*. 51. *Epigœa repens*.
 25. " *villosa*. 52. *Cassandra calyculata*.
 26. " *pedata*. XVIII. SCROPHULARIACEÆ.
 27. " *sagittata*, v. 53. *Veronica serpyllifolia*.
 28. " *Muhlenbergii*. 54. *Pedicularis Canadensis*.
 29. " *blanda*. XIX. LABIATÆ.
 VII. CARYOPHYLLACEÆ. 55. *Lamium amplexicaule*.
 30. *Stellaria media*. 56. " *purpureum*.
 31. " *pubera*.

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| XX. BORRAGINACEÆ. | XXV. MYRICACEÆ. |
| 57. <i>Lithospermum arvense</i> . | 64. <i>Comptonia asplenifolia</i> . |
| XXI. POLEMONIACEÆ. | XXVI. ARACEÆ. |
| 58. <i>Phlox subulata</i> . | 65. <i>Arisæma triphyllum</i> . |
| 59. <i>Pyxidantha barbulate</i> . | 66. <i>Orontium aquaticum</i> . |
| XXII. GENTIANACEÆ. | XXVII. LILLIACEÆ. |
| 60. <i>Obolaria Virginica</i> . | 67. <i>Erythronium Americanum</i> . |
| XXIII. ARISTOLOCHIACEÆ. | XXVIII. MELANTHACEÆ. |
| 61. <i>Asarum Canadense</i> . | 68. <i>Hellonias bullata</i> . |
| XXIV. LAURACEÆ. | In all—68 species. |
| 62. <i>Sassafras officinale</i> . | <i>In addition,</i> |
| 63. <i>Benzoin odoriferum</i> . | <i>Viola rotundifolia</i> . |
| | <i>Acer saccharinum</i> . |
| | <i>Diospyros Virginiana</i> . |

May 8th.

MR. LEA, President, in the Chair.

Forty-four members present.

The following papers were presented for publication :

"Contributions to American Lepidopterology, No. 4," by Brackenridge Clemens, M. D.

"Notes on American Land Shells, No. 6," and "Descriptions of new species of Pulmonata," by Wm. G. Binney; and

"A list of the fresh-water Shells of Wisconsin," by J. A. Lapham.

And were referred to Committees.

Mr. Aubrey H. Smith read the following extracts from a letter from Mr. Alex. H. Smith, of Solano Co., California, dated March 25th, 1860, on the habits of the Beaver.

"This winter I have had an opportunity of observing somewhat the habits of the Beaver. You know that this cunning little animal is famed for his industry and bold engineering. About the middle of our land there is a large slough seventy feet wide and very deep, running back into the country. In the progress of our work, it became necessary to stop it off and lay a large sluice to drain it, which was done in a complete manner.

At the head of the slough, two miles away, the beavers had their settlement. When the water fell away from their houses and would not return, as usual, they seemed to have sent a delegation down to see what was the matter. For several successive mornings we found a dam built across the race leading to the sluice, quite skilfully made with sticks and *tulés*, and cemented with mud. One of the men agreed to watch for them with the hope of securing their skins, which are of some value. The night was bright moonlight. Four beavers came down examining either bank carefully. One of the party always remained in the water and seemed to be the commander, and would turn from the one to the other to see that each did his duty. At length they reached the dam, still observing the same caution. The three examiners came out and went all over it and into the sluice, chattering the while to their companion in the water. Finally they seemed satisfied that it was past their skill and went off. Since

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then we have had no further trouble with them. When the man was asked why he did not shoot, he said, 'he didn't want to shoot the pretty little creatures, he wanted to see what they were going to do.' I could not help being pleased with his humanity and love of science."

Mr. Lea mentioned that he had recently received a letter from Dr. Showalter of Uniontown, Alabama, in which he mentions that specimens of *Physa (gyrina)* Say, which he sent on, were obtained in an open neglected cistern, and in a trough of water supplied by an Artesian well ten miles from the town. Dr. S. expressed his surprise that these *Physæ* should find their homes so soon at these Artesian wells. There are no streams or pools near to these wells, but in a few years after they are bored and water supplied, these shells may with certainty be found. Mr. Lea went on to mention that he had nearly 30 years ago found an undescribed species of *Lymnæa*, accompanied by *Physa heterostropha* Say, in a small artificial pond on the high grounds near to the Falls of Schuylkill, about four miles north of Market Street, now within the limits of this City. He published an account of it in April 1834, in the Trans. Am. Phil. Soc. under the name of *acuta*. The pond was small and dug out for $1\frac{1}{2}$ to 2 feet deep, simply for the supply of rain water for cattle. Afterwards it dried up and the shells were no longer to be obtained there. He never found this *Lymnæa* in, any other habitat; but many years subsequently, Dr. Ingalls, of Greenwich, N. Y., near to Lake Champlain, sent him several specimens of what he regarded as a new *Lymnæa*, but which was at once recognised as the *acuta*, heretofore found only in the one habitat near the Falls of Schuylkill. In the minds of some zoologists a difficulty exists as to existence of species in such constricted, isolated points as mentioned above, but that difficulty in Mr. Lea's mind was done away with under the belief that very young molluscs may be transported on the feet of birds from distant points, or on those of cattle going to drink from one place to another. The idea of spontaneous generation could not of course be for one moment admitted.

Mr. Lea also read an extract of a letter from Dr. Lewis, of Mohawk, N. Y., giving an account of some meteorological phenomena, and exhibited a diagram of thermal curves traced by the self-registering thermometer of Dr. Lewis.

Prof. R. E. Rogers stated that he had recently received a letter from Western Pennsylvania, communicating the intelligence that some of the *Petroleum* wells had already begun to show a diminished yield of *Oil*, a fact in confirmation of an apprehension which he had expressed at a former meeting of the Academy, that when the Artesian borings became more numerous in the favorite localities, there was a probability of such a result.

He regarded the circumstance of even a small reduction in the supply of the oil, from any of the wells, at this early stage of the enterprise in that region, as very significant, and suggestive of the fear that, remunerative as these wells may at present prove to be, it may not be prudent to base permanent calculations upon them.

In connection with the subject, Prof. Rogers described the approved process by which the illuminating and lubricating Coal Oils are manufactured, and detailed the characteristics which seemed to be requisite to render any oil-making material profitably available for the purpose.

May 15th.

MR. LEA, President, in the Chair.

Fifty-three members present.

The following papers were presented for publication :

"Description of a new species of *Marginella*," by John H. Redfield.

"Descriptions of new organic remains from the Tertiary, Cretaceous and Jurassic rocks of Nebraska," by F. B. Meek and F. V. Hayden.

And were referred to Committees.

Dr. Fisher read the following extract of a letter from Mr. J. H. Redfield :

"Mr. J. R. Willis announces that he has discovered, in deep water off the coast of Nova Scotia, small specimens of the *Waldheimia cranium*, hitherto known only from Northern Europe. He has also found *Littorina litorea* abundant upon the rocky shore near Halifax, the specimens being perfectly undistinguishable from English examples."

Prof. R. E. Rogers exhibited a modification of Mr. Gore's apparatus of the metallic ball revolving in a circle under the influence of a galvanic current.

The apparatus consists of two bands of sheet brass, secured parallel and within an inch and a half of each other, upon the edge of a board, so as to form a miniature railway, on which the ball may rest.

To give automatic action to the ball, causing it to transverse the rails alternately to and fro, the ends of the bands are bent slightly upwards. By this arrangement, the ball, on approaching the end of its course in one direction, is carried by its momentum a little up the inclination, but gravity soon prevailing, its motion is reversed, and continues in its new direction until the same result takes place at the other end.

The death of Bernard Henry, M. D., who died at sea on the 15th April, was announced.

On motion of Mr. Vaux, the following resolution was unanimously adopted :

Resolved, That the thanks of this Society be presented to H. G. Desilver, for the valuable addition to its collection of the fine specimen of the Moose presented this evening.

May 22nd.

Vice President BRIDGES in the Chair.

Forty-four members present.

The following papers were presented for publication.

"Catalogue of Birds collected during a survey of a route for a ship canal across the Isthmus of Darien, by order of the Government of the United States, made by Lieut. N. Michler, U. S. Top. Eng., with notes and descriptions of new species," No. 2, by John Cassin.

"Descriptions of some new species of Cretaceous Fossils from South America, in the collection of the Academy, by Wm. M. Gabb.

"Descriptions of 14 new species of *Schizostoma*, *Anqulosa*, and *Lithasia*," by Isaac Lea.

And were referred to Committees.

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Mr. Aubrey H. Smith remarked, that a few days since, whilst he and another member of the Academy were crossing a sandy bank, partially covered with low bushy pine trees and other undergrowth, near Moorestown, N. J., they came across a black snake of about four feet in length, lying near the edge of the cover formed by the bushes. At the first alarm, the animal, instead of escaping along the ground, into the shelter so close at hand, immediately, with a rapid gliding motion, ascended among the branches of the pines, and reaching their somewhat flattened tops, pressed along from one of them to the other at the height of some six or seven feet from the ground, and finally rested at length among the horizontal upper branches. The ascent was made by him in a direction almost perpendicular, solely by projecting the body upward from the ground to the lower branches of the trees, and from them as from a new point of support, to those next higher, not deriving any aid from the upright trunk of the tree, which he did not seem even to touch. When again disturbed by our approach, he did not descend, but retreated with the same gliding motion along the top of the pines. It was not till actually seized by the hand, that, on his release, he betook himself to flight along the ground.

Mr. Lea called the attention of the members to two very remarkable specimens of *Echinus*, perforating rocks, which he had recently received from Mr. Cailliaud, of Nantes, the Egyptian traveller. He also exhibited a specimen of Sandstone from Payta in Peru, which contained *Petricola*, *Lithophagus*, &c. He reminded the members that he had presented to the Academy a very remarkable specimen, which he had received about two years since from Mr. Cailliaud, being a mass of *gneiss* which had been perforated by *Pholades*. When Mr. Cailliaud, who had advocated, contrary to the opinion of most naturalists, the theory that some of the Molluscs bored the rocks by friction and not by decomposition, found that *gneiss* and *granite* and other *silicious rocks* were penetrated by them, he entirely settled that question, for there are no acids known which will decompose *silex*. Mr. Lea remarked that the two specimens now on the table were still more remarkable. The smaller one consisted of two specimens of *Echinus lividus*, Lam., which had buried themselves in the solid *granite*, one of them having made a circular hole $1\frac{1}{2}$ inch deep, and 2 inches wide. This specimen came from the granite coast of the Loire-Inférieure. The second specimen consisted of quite a congress of individuals of the same species, imbedded in a solid mass of hard *Silurian Sandstone*, from the Bay of Douaraenez, in the Department of Finistère. In this beautiful specimen there are five individuals nestled in their circular holes, worked out in this hard stone by the attrition of their teeth, and there are three holes vacated. The specimen is 5 inches by $6\frac{1}{2}$, and there being eight holes in all, their circumferences nearly impinge on each other. Mr. Cailliaud is entirely satisfied that the boring is purely mechanical, that the five teeth are the instruments of exploitation, and that it is by the percussion of their points on the rocks that these holes are effected. The teeth are in form like the rodents, and constantly increase as worn at the outer extremity. He made a hole five millimetres deep and forty in circumference with a bundle of the teeth in an hour. One of the colonies which he examined was in a bay, and contained about two thousand holes, each one filled, and at low water they were but a short distance below the surface. Some of the specimens were not larger than a pea, and probably only five days old. The holes were not all made by the present occupants, most of them probably being very old and having successive inhabitants. Mr. Cailliaud mentioned in his letter to Mr. Lea that he shortly expected to receive from Guadeloupe an *oval Echinus* which had made its *oval hole* in the mass of *Madreporite*.

Dr. I. I. Hayes stated to the Academy, that his success in New York and Boston, in raising funds for his proposed Arctic Expedition, 1860.]

had been so great, that if he could succeed in raising \$6000 in this city he would be able to sail this year.

May 29th.

Mr. LEA, President in the Chair.

Thirty-eight members present.

The report of the Biological Department was presented.

The following resolution, presented by Dr. Leidy on behalf of the Curators, was adopted,

Resolved, That the Publication Committee and the Committee on Proceedings, be authorized to exchange as much of the Journal and Proceedings of the Academy as can be spared, for the suite of Palæozoic fossils, which have been offered by Mr. J. N. H. Barris.

The following papers were, on the report of the Committees to whom they had been referred, ordered to be published in the Proceedings.

Notes on American Land Shells. No. 6.

BY W. G. BINNEY.

The Catalogue of the Terrestrial Mollusks of North America, commenced in the Proceedings of the Academy for November, 1858, and continued in the number for July, 1859, is here completed. The list is believed to contain all the species described as inhabiting Mexico. I have followed the systematic arrangement of Drs. Gray and Pfeiffer in grouping the genera, and the decisions of the latter in regard to the synonymy.

Many Central American species will undoubtedly be added to the list when their geographical range is better known. The species of the Pacific coast, included in the first section of the Catalogue, are omitted here, viz.: Nos. 3, 7, 8, 11, 23, 25, 35, 37, 39, 40, 41, 42, 43, 45, 46, 47.

For additional species, changes of nomenclature, &c., &c., of the section of the United States, see Boston Journal of Natural History, vol. vii., and the Remarks on North American Helicidæ by Mr. T. Bland, in Annals of New York Lyceum of Natural History, vol. vi.

FAMILIA TESTACELLIDÆ.		252. <i>G. corneola</i> <i>W. G. Binn. vid.</i>
GLANDINA.		202.
248. <i>G. candida</i> (<i>Achatina</i>) <i>Shuttl.,</i>	<i>Pf. (olim.)</i>	252a. <i>G. delicatula</i> (<i>Achatina</i>)
<i>Oleacina candida</i> <i>Gr. et Pf., Pf.</i>		<i>Shuttl., Pf. (olim.)</i>
249. <i>G. Carminensis</i> <i>Mor., Ads.</i>	<i>Gen.</i>	<i>Oleacina delicatula</i> <i>Gr. et Pf., Pf.</i>
<i>Achatina Carminensis</i> <i>Desh. in</i>	<i>Fer., Pf. (olim.)</i>	253. <i>G. Ghiesbreghti</i> (<i>Achatina</i>)
" <i>rosea</i> <i>var. Rve. (46 b.)</i>		<i>Pf. (olim.)</i>
<i>Oleacina Carminensis</i> <i>Gr. et Pf.,</i>	<i>Pf.</i>	<i>Oleacina Ghiesbreghti</i> <i>Pf.</i>
250. <i>G. conularis</i> (<i>Oleacina</i>) <i>Pf.</i>		253a. <i>G. indusiata</i> <i>Pf.</i>
<i>Achatina conularis</i> <i>Pf. (olim.)</i>		254. <i>G. Isabellina</i> (<i>Achatina</i>) <i>Pf.</i>
251. <i>G. Cordovana</i> (<i>Oleacina</i>) <i>Pf.</i>		<i>(olim), Rve.</i>
<i>Achatina Cordovana</i> <i>Pf. (olim.)</i>		<i>Oleacina Isabellina</i> <i>Gr. et Pf., Pf.</i>
		255. <i>G. Liebmanni</i> (<i>Achatina</i>) <i>Pf.</i>
		<i>(olim), Chemn.</i>
		<i>Achatina striata</i> <i>Rve. (19.)</i>
		<i>Oleacina Liebmanni</i> <i>Gr. et Pf., Pf.</i>

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256. *G. margaritacea* (*Achatina*)
Pf. (olim.)
Oleacina margaritacea *Pf.*
- 256a. *G. monilifera* (*Achatina*)
Pf. (olim.), *Rve.*
Oleacina monilifera *Gr. et Pf., Pf.*
257. *G. nana* (*Achatina*) *Shuttl., Pf.*
(olim.)
Oleacina nana *Gr. et Pf., Pf.*
- 257a. *G. Orizabæ* (*Achatina*) *Pf.*
(olim.)
Oleacina Orizabæ *Pf.*
258. *G. pulchella* (*Oleacina*) *Pf.*
259. *G. solidula* (*Achatina*) *Pf.*
(olim.), *Chemn., Rve., Desh. in*
Fer.
Polypheumus solidulus *Pf. (olim.)*
Glandina solidula *Pf., (olim.)*, *Phil.*
" *folliculus* *Gld. (teste Pf.)*
Oleacina solidula *Gr. et Pf., Pf.*
var. Glandina paragramma *Mor.*
260. *G. Sowerbyana* (*Achatina*)
Pf. (olim.), *Rve.*
Oleacina Sowerbyana *Gr. et Pf.,*
Pf.
261. *G. speciosa* (*Achatina*) *Pf.*
(olim.)
Oleacina speciosa *Pf.*
262. *G. stigmatica* (*Achatina*)
Shuttl., Pf. (olim.)
Oleacina stigmatica *Gr. et Pf., Pf.*
263. *G. Vanuxemensis* *Lea, vid.*
206.
- FAMILIA HELICIDÆ.
- VITRINA.
264. *V. Mexicana* *Beck.*
- SIMPULOPSIS.
265. *S. Chiapensis* *Pf.*
266. *S. Cordovana* *Pf.*
267. *S. Salleana* *Pf.*
- SUCCINEA.
268. *S. brevis* *Dunk., Pf., Chemn.*
269. *S. undulata* *Say, Pf., Chemn.*
- HELIX.
270. *H. Ariadnæ* *Pf., vid. 79.*
271. *H. Berlandieriana* *Mor. vid.*
84a.
272. *H. bicincta* *Pf., Chemn., Phil.*
273. *H. bicurris* *Pf.*
274. *H. bilineata* *Pf., Chemn., Rve.*
H. zonites *Rve. 615.*
275. *H. caduca* *Pf., Rve., Chemn.*
=290?
276. *H. Chiapensis* *Pf.*
277. *H. coactiliata* *Fer.*
278. *H. contortuplicata* *Beck.*
279. *H. Cordovana* *Pf.*
280. *H. Couloni* *Shuttl., Pf.*
281. *H. flavescens* *Wieg., Pf.,*
Chemn.
282. *H. fulvoidea* *Mor., Pf.*
283. *H. Ghiesbreghtii* *Nystr., Pf.,*
Rve., Chemn., Desh. in Fer.
284. *H. griseola* *Pf. vid. 113,*
285. *H. Guillardmodi* *Shuttl., Pf.,*
Chemn., Rve.
286. *H. helictomphala* *Pf.*
287. *H. Hindsii* *Pf. vid. 117.*
288. *H. Humboldtiana* *Val., Pf.,*
Chemn., Rve., Desh. in Fer.,
Phil.
H. Buffoniana *Pf., Phil., Chemn.,*
Fer., Rve., Binn.
H. badiocincta *Wieg.*
289. *H. implicata* *Beck.*
290. *H. lucubrata* *Say, Pf., nec*
Binn. vid. 275.
291. *H. Mexicana* *Koch., Chemn.,*
Pf.
292. *H. Oajacensis* *Koch., Chemn.,*
Pf.
293. *H. plagioglossa* *Pf.*
294. *H. Salleana* *Pf., Rve., Chemn.*
295. *H. stolephora* *Val., Pf.,*
Chemn., Desh., Rve.
Helicella bupthalmus *Fer.*
Helix Lamarkiana β . *Pf.*
Nanina stolephora *Pf., Gr. et Pf.*
" *bicolor* *Pf. (olim.)*
296. *H. tenuicostata* *Dunk.,*
Chemn., Rve., Pf.
297. *H. Texasiana* *Mor. vid. 170.*
298. *H. trypanompala* *Pf.*
299. *H. Veraacruzensis* *Pf.*
300. *H. zonites* *Pf., Rve., (excl.*
615.)
Nanina zonites *Gr.*
- BULIMUS.
301. *B. alternatus* *Say, vid. 182.*

302. *B. attenuatus* Pf., Chemn.
 303. *B. aurifluus* Pf.
 304. *B. Cordovanus* Pf.
 305. *B. coriaceus* Pf.
 306. *B. costatostriatus* Pf.
 307. *B. Droueti* Pf.
 308. *B. Dunkeri* Pf., Rve.
 309. *B. emeus* Say, Pf.
 310. *B. fenestratus* Pf., Rve., Phil.
 311. *B. gnomon* Beck.
 312. *B. Gruneri* Pf., Rve., Chemn.
 313. *B. Hegewischi* Pf., Rve.
 314. *B. Humboldti* Pf., Rve.
B. Mexicanus Val., nec Lam.
 var. β .
 var. γ . *Bulimus primularis* Rve., Pf. (olim.)
 var. δ .
 var. ϵ .
 315. *B. livescens* Pf., Rve., Phil.
 316. *B. Mariæ Albers*, =183.
 317. *B. Martensi* Pf.
 318. *B. Mexicanus* Pf., Rve., Deless., Desh. in Lam.
Cochlogena vittata Fer.
Orthalicus? Mexicanus Carp.
 318a. *B. patriarcha* W. G. Binn.
 319. *B. punctatissimus* Less., Rve., Pf., Chemn.
Clausilia punctatissima Less.
 " *exesa* Pot. et Mich.
Auricula fuscagula Lea.
Pupa septemPLICATA Muhlfr.
Bulimus fuscagula Orb.
 " *septemPLICATUS* Pf. (olim.)
 " *dentatus* King?
Cochlodrina exesa Fer.
 320. *B. rudis* Anton. Rve., Pf.
 321. *B. Schiedeanus* Pf. vid.193.
 322. *B. serperastrus* Say., Pf., Chemn.
 var. β . *Bulimus Liebmanni* Pf.
 " *Ziebmanni* Rve.
 " *serperastrus* var. Chemn.
 var. γ . *Bulimus nitelinus* Rve.
 323. *B. sulcosus* Pf., Phil., Rve.,
B. hyematus Rve.
324. *B. sulphureus* Pf.
 325. *B. truncatus* Pf., Rve., Phil.
 326. *B. varicosus* Pf., Chemn.
- SPIRAXIS.
327. *S. acus* Shuttl., Pf.
 328. *S. auriculacea* Pf.
 329. *S. biconica* Pf.
 330. *S. catenata* Pf.
 331. *S. conformis* Shuttl., Pf.
 332. *S. dubia* Pf.
 333. *S. euptycta* Pf.
 334. *S. irrigua* Shuttl., Pf.
 335. *S. lurida* Shuttl., Pf.
 336. *S. mitræformis* Shuttl., Pf.
 337. *S. Nicoleti* Shuttl., Pf.
Achatina Nicoleti Chemn.
 338. *S. nigricans* Pf., Shuttl.
Achatina nigricans Pf. olim, Rve., Desh. in Fer.
Glandina nigricans Pf. olim.
 339. *S. oblonga* Pf.
 340. *S. parvula* Pf.
 341. *S. Shuttleworthi* Pf.
 342. *S. streptostyla* Pf.
Achatina streptostyla Pf. olim, Chemn.
 343. *S. turgidula* Pf.
- ORTHALICUS.
- 343a. *O. Boucardi* Pf.
 344. *O. livens* Pf., Bk., Shuttl.
 345. *O. longus* Pf.
Bulimus zebra β . Pf. (olim.)
 346. *O. undatus* Brug. vid. 196.
- ACHATINA.
347. *A. ambigua* Pf.
 348. *A. Chiapensis* Pf.
 349. *A. Rangiana* Pf., Rve.
 350. *A. trochlea* Pf., Chemn.
 351. *A. trypanodes* Pf.
- CYLINDRELLA.
352. *C. apiostoma* Pf.
 352a. *C. aretispira* Pf.
 353. *C. attenuata* Pf., Chemn.
 354. *C. Boucardi* Pf.
 355. *C. clava* Pf., Chemn.
 355a. *C. cretacea* Pf.

356. *C. decollata* Nyst. (Pupa), Pf., Chemn.
 357. *C. denticulata* Pf., Chemn.
 358. *C. filicosta* Shuttl., Pf., Chemn.
 359. *C. Ghiesbreghti* Pf., Chemn.
 360. *C. goniostoma* Pf., Chemn.
 360a. *C. grandis* Pf.
 361. *C. Liebmanni* Pf., Chemn., Phil.
 361a. *C. Mexicana* Cum.
 362. *C. Pfeifferi* Menke, Chemn., Phil.
 363. *C. Pilocerei* Pf., Chemn., Phil.
 364. *C. polygyra* Pf., Chemn.
 365. *C. teres* Menke, Pf., Chemn., Phil.
 365a. *C. splendida* Pf.
 366. *C. turris* Pf., Chemn.

FAMILIA AURICULIDÆ.

MELAMPUS.

367. *M. coffea* Linn. vid. 229.

FAMILIA TRUNCATELLIDÆ.

TRUNCATELLA.

368. *T. Caribæensis* Sowb. vid. 238.

FAMILIA CYCLOPHORIDÆ.

CYCLOTUS.

369. *C. Dysoni* Pf.
Cyclostoma Dysoni Pf. (olim), Chemn.
Cyclophorus Dysoni Pf. (olim), Gr. et. Pf.

CYCLOPHORUS.

370. *C. Boucardi* Sallé, Pf.
 371. *C. Mexicanus* (*Cyclostoma*) Menke, Vgt., Phil., Sby., Chemn.
Cyclotus Mexicanus Gr. et Pf., Pf. (olim.)

TUDORA.

372. *T. planospira* Pf.
Cyclostoma planospira Pf. (olim.)

CISTULA.

373. *C. trochlearis* Pf., Gr. et Pf.
Cyclostoma trochleare Pf. (olim), Chemn.

- Cyclostoma trochlea* Pf. (olim), nec Bens.

CHONDROPOMA.

374. *C. Cordovanum* Pf.
Cyclostoma Cordovanum Pf. (olim.)
 375. *C. truncatum* (*Cyclostoma*) Wieg., Rossm.
Chondropoma truncatum Pf., Gr. et Pf.

FAMILIA HELICINIDÆ.

HELICINA.

376. *H. brevilabris* Pf.
 377. *H. Chiapensis* Pf.
 378. *H. chrysocheila* Binn. vid. 242.
 379. *H. chrysocheila* Shuttl., Pf. (nomen tr.)
 380. *H. cinctella* Shuttl., Pf.
 381. *H. concentrica* Pf., Gr. et Pf., Chemn.
 382. *H. Cordilleræ* Sallé, Pf.
 383. *H. delicatula* Shuttl., Pf.
 384. *H. elata* Shuttl., Pf.
 385. *H. flavida* Menke, Sowb., Chemn., Pf., Gr. et Pf.
H. Ambieliana Boissy, Pot. et Mich.
H. trossula Mor.
 386. *H. Ghiesbreghti* Pf.
 386a. *H. Heloisæ* Sallé.
 387. *H. Lindeni* Pf., Chemn., Gr. et Pf.
 388. *H. lirata* Pf., Gr. et Pf., Chemn.
 389. *H. meridigera* Sallé, Pf.
 390. *H. notata* Sallé, Pf.
 391. *H. Oweniana* Pf., Chemn., Gr. et Pf.
 392. *H. Sandozi* Shuttl., Pf.
 393. *H. sinuosa* Pf., Chemn., Gr. et Pf.
 394. *H. tenuis* Pf., Chemn., Gr. et Pf.
 395. *H. tropica* Pf. vid. 247.
 396. *H. turbinata* Wieg., Pf., Mke., Chemn., Gr. et Pf.
H. zephyrina var. Sowb.
 397. *H. zephyrina* Ducl., Sowb., Chemn., Orb., Gr. et Pf.
H. Ambeliana Sowb.
Oligyra zephyrina Mrs. Gray.

SCHAZICHEILA.

398. *S. alata* (*Helicina*) Mke., Gr.
et Pf.
Schazicheila alata Shuttl., Pf.,
Ad. Gen.
399. *S. Nicoleti* Shuttl., Pf.
400. *S. pannucea* Mor.
Helicina alata var.? Gr. et Pf.

FAMILIA PROSERPINIDÆ.

CERES.

401. *C. eolina* (*Carocolla*) Duclos.
Helicodonta eolina Fer.
Odontostomus eolinum Pf. (olim.)
Proserpina eolina Pf. (olim.)
Ceres eolina Pf., Gr. et Pf.
402. *C. Salleana* Cum., Pf., Gr. et
Pf.

Descriptions of New Species of Pulmonata in the Collection of the
Smithsonian Institution.

BY W. G. BINNEY.

PEDIPES LIRATA. *T. imperforata*, globoso-conica, solida, liris regularibus spiraliter cincta, nitens, straminea; spira brevis, depressa, apice obtusâ; anfr. 3, superi brevis, ultimus 5-6 longitudinis subæquans; apertura semicircularis; paries aperturalis callo nitente induta, et plicâ elevatâ, crassâ, unâ et intrante armata; labium columellare callosum, dentibus 2 approximatis, crassis, acutis, munitum; perist. acutum, intus callo nitente in medio dentem formante munitum. Diam. maj. $2\frac{1}{2}$, long. $3\frac{1}{3}$; apertura long. $2\frac{1}{2}$, mill.

Ad promont. St. Lucas pœninsulæ Californiæ collegit J. Xantus (cum *Bulimo proteo* Brod., *B. pallidiori* Sowb. et *B. excelso* Gould.)

ONCHIDIUM CARPENTERI. Among the mollusca from the Straits of De Fuca, Mr. Carpenter has detected five specimens of a shellless mollusk, which evidently belong to the genus *Onchidium*. Being preserved in alcohol it is difficult to obtain any more satisfactory specific characters than the following: The body is oblong, with its extremities circularly rounded; the upper surface is regularly arched; below, quite near the edge, the border of the mantle is readily distinguished, most of the under surface is occupied by the broad, distinct, locomotive disk; the body is uniformly smoke-colored; in size the individuals vary considerably, the length of the largest being 5, the extreme breadth 3 millimetres.

A List of the SHELLS of the State of Wisconsin.

BY J. A. LAPHAM.

- VITRINA LIMPIDA, Gould, N. W. Territory, Say.
SUCCINEA AVARA, Say, Milwaukee!
 OBLIQUA, Say, do. !
 OVALIS, Gould, do. !
HELIX ALBOLABRIS, Say, do. !
 ALTERNATA, Say, do. !
 ARBOREA, Say, do. !
 CHERSINA, Say, do. !
 CLAUSA, Say, do. !
 CONCAVA, Say, N. W. Territory, Say.
 ELEVATA, Say, R. Kennicott.
 PRATERNA, Say, Milwaukee!
 HIRSUTA, Say, do. !
 LABYRINTHICA, Say, do. !
 LIGERA, Say, N. W. Territory, Say.
 LINEATA, Say, Milwaukee!

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- MONODON, Rack, Milwaukee!
 MULTILINEATA, Say, do. !
 (PERSPECTIVA, Say, ?)
 PROFUNDA, Say, Milwaukee !
 STRIATELLA, Anthony, do. !
 BULIMUS HARPA, Say, N. W. Territory, Say.
 MARGINATUS, Say, Milwaukee !
 ACHATINA LUBRICA, Müll. do. !
 PUPA ARMIFERA, Say, (?)
 CORTICARIA, Say, (?) Milwaukee !
 VERTIGO OVATA, Say, (?) do. !
 CARYCHIUM EXIGUUM, Say, (?) do. !
 HELICINA OCCULTA, Say, Sheboygan !!

 AMNICOLA LIMOSA, Say, N. W. Territory, Say.
 LUSTRICA, Say, Milwaukee !
 MELANIA DEFYGIS, Say, (?) do. !
 ELONGATA, Say ? (or ELEVATA ?) Milwaukee !
 OCCULTA, Anth., Wisconsin, Anthony.
 LEPTOXIS ISOGONA, Say, Rock River !
 VIVIPARUS DECISUS, Say, Milwaukee !
 SUBGLOBOSUS, Say, N. W. Territory, Say.
 VALVATA SINCERA, Say, Milwaukee !
 TRICARINATA, Say, do. !
 LIMNÆA CAPERATA, Say, (?) do. !
 CATASCOPIUM, Say, N. W. Territory, Say.
 COLUMELLA, Say, (?) Milwaukee !
 EMARGINATA, Say, Madison, Wisconsin !
 FRAGILIS, Say, Milwaukee !
 GRACILIS, Say, do. !
 JUGULARIS, Say, do. !
 MEGASOMA, Say, N. W. Territory, Say.
 UMBROSA, Say, do. do. do.
 PHYSA ELONGATA, Say, Milwaukee !
 HETEROSTROPHA, Say, do. !
 PLANORBIS ARMIGERUS, Say, do. !
 BICARINATUS, Say, do. !
 CAMPANULATUS, Say, Milwaukee.
 CORPULENTUS, Say, N. W. Territory, Say.
 DEFLECTUS, Say, Milwaukee !
 EXACUTUS, Say, do. !
 PARVUS, Say, do. !
 TRIVOLVIS, Say, do. !
 ANCYLUS DIAPHANUS, Hald. (?) do. !
 RIVULARIS, Say, do.
 UNIO ALATUS, Say, do. !
 GRACILIS, Bar. do. !
 PRESSUS, Lea, do. !
 PLICATUS, Lesueur, Rock and Wisconsin Rivers !
 SCHOOLCRAFTENSIS, Lea, Fox River, Lea.
 CORNUTUS, Bar., Fox River, Barnes.
 POSTULOSUS, Lea, Rock and Wisconsin Rivers !
 VERRUCOSUS, Bar., Rock River !
 METANEVRUS, Raf., Wisconsin River !
 TUBERCULATUS, Bar., do. !
 ELEGANS, Lea, do. !
 DONACIFORMIS, Lea, (?)

UNIO	ZIG-ZAG, Lea, Wisconsin River !
	TRIGONUS, Lea, Milwaukee !
	OBLIQUUS, Lam., Wisconsin River !
	MYTILOIDES, Raf., Rock River !
	VENTRICOSUS, Bar., Wisconsin River, Barnes.
	ELLIPSIS, Lea, Wisconsin River !
	CARIOSUS, Say, Silver Lake !
	LIGAMENTINUS, Lam., Milwaukee !
	LUTEOLUS, Lam., do. !
	RADIATUS, Lam., do. !
	PARVUS, Bar., Fox River, Barnes.
	RECTUS, Lam., Wisconsin and Rock Rivers !
	IRIS, Lea, (?)
	TENUISSIMUS, Lea, Milwaukee !
	PHASEOLUS, Hild., Wisconsin River, Barnes.
	GIBBOSUS, Bar., Milwaukee !
MARGARITANA	COMPLANATA, Lea, Milwaukee !
	MARGINATA, Lea, do. !
	RUGOSA, Lea, do. !
	CALCEOLA, Lea, do. !
ANODONTA	EDENTULA, Lea, do. !
	FERUSSACIANA, Lea, do. !
	IMBECILIS, Say, do. !
	PLUVIATILIS, Lea, (?) do. !
	PLANA, Lea, (?) do. !

NOTE.—The localities observed by me are marked with an exclamation point (!) after the manner of botanists.

Contributions to American Lepidopterology.—No. 4.

BY BRACKENRIDGE CLEMENS, M. D.

SATURNIA Schrank.

S. galbina.—Antennæ luteous. Body and head rather dark brown. Fore wings yellowish-brown, with a rather faint whitish, angulated band at the base. On the discal nervure is a round, black ocellus having a central subvitreous streak, containing a yellow circle, and toward the base of the wing a slender blue crescent. A whitish band crosses the middle of the nervules, with a faint wavy one between it and the hind margin. In the apical interspace is a black spot, with a crimson streak to the tip of the wing. The marginal portion of the wing is whitish, and is tinged on the terminal edge with pale yellowish brown. Hind wings similar in color and ornamentation to the fore wings, the ocelli being somewhat smaller. On the *under surface*, which is similar in hue to the upper, the faint wavy bands of the fore and hind wings are very distinct.

Texas. From the Smithsonian Institution. Capt. Pope's collection.

PIMELA.

In the fore wings, the costal and subcostal nervures are placed near each other and the exterior margin. The subcostal sends a single marginal branch from near the posterior-superior angle of the disk, delivered to the margin near the tip, and just behind this angle divides into two branches; the upper one or *the apical* is simple, and the lower one is subdivided into three nervules, *the post apical* arising near the upper third and *the infra post-apical* and *subcosto-inferior* near the middle. The discal nervure arises midway between the origin of the subcosto-marginal branch and that of the apical; it is acutely

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angulated about the middle and sends a false nervule through the disk to the base of the wing, and above this arises the discal nervule.

The median nervure is four-branched. In place of the fold is a slender, simple nervure. The submedian sends *two branches to the inner margin*, one from the upper third and one from the lower third of the nervure. (This may be a malformation. However I can scarcely believe it is one.)

Hind wings without costal nervure. The subcostal forms an imperfect cell at its base, and near the hind end of the disk sends off an apical branch, which gives rise to an oblique but not angulated discal nervure; from this arises a false nervule running to the base, and nearly opposite to it a discal nervule to the hind margin.

Median nervure four-branched. Submedian and internal, simple.

Body stout and very pilose, woolly. Head rather small; eyes rather large and salient. Antennæ, basal joint somewhat tufted, rather longer than the thorax, rather deeply pectinated with the branches decreasing in length to the tip, and both sets directed forward. Labial palpi extremely short, almost rudimentary. Tongue none. Abdomen equal in length to the hind wings. Tibiæ moderately ciliated exteriorly; hind tibiæ with two very short apical spurs.

This genus may, perhaps, be the same as Mr. Walker's *Lagoa*.

P. lanuginosa.—Female? The wings are badly worn and denuded. Antennæ pale brownish-yellow. Face dark brownish: head and body dull yellow. The anterior tibiæ and all the tarsi are dark brownish. The undenuded portion of the fore wings at the base, is woolly and pale brownish yellow.

Male? Antennæ yellowish white. Face and the fore legs blackish-brown, the hairs white and all the tarsi blackish-brown toward the ends. Thorax white, very slightly tinted with yellowish. Abdomen rather deep, dull yellow. Wings white, slightly tinted with yellowish; fore wings woolly toward the base, with a dark brownish discoloration along the upper part of the disk and the costa adjoining it.

The female? of this species was ticketed by the collector *Bombyx lanuginosus*, but I have not been able to find any description under this name, nor any that designates the insect itself.

From the Smithsonian Institution. Capt. Pope's coll. Texas.

LIMACODES Latreille.

L. laticlavata.—Body and fore wings rather dark ochreous-yellow. Fore wings with an oblique silvery band, inclined toward the base of the wing, from the costa to the middle of inner margin, and toothed toward the base on the submedian nervure or fold. A rather faint dark reddish brown line, extends from the costal origin of the silvery band to the hind margin beneath the middle. Hind wings pale ochreous-yellow. Abdomen rather reddish-ochreous.

Larva.—Outline elliptical somewhat pointed behind; body flattened, with the sides curving from a central ridge, flattened above. The ridge has a vertical elevation at its sides above the body, growing less and less before and behind, and terminates in front in a rounded margin and behind in an obtuse, short spine. The body is smooth, with no distinct spined papulæ, but the edges of the ridge and the outline of the body are thrown into folds, subcrenate. The body is thickest in the middle where it curves anteriorly and posteriorly.

The general color of the body is pale green and dotted with numerous yellow points. The central ridge is bordered in front with yellow.

The larva feeds on the underside of the leaf of maple in September, and the imago from it appears in the spring. There is doubtless a spring brood of larvæ.

1860.]

Var. *laticlavata*? Imago, brownish-luteous, sometimes inclining to yellowish. Fore wings with an oblique silvery band from the costa to the middle of the inner margin, toothed on the submedian fold and shaded behind with blackish-brown, with a blackish-brown line from the costal origin of the silvery band to the hind margin beneath the middle. Hind wings dark brown, yellowish at the base.

Three sp. from Robert Kennicott, Illinois.

ADONETA.

The characteristics in wing structure are; that the subcostal nervure is remote from the anterior margin, and gives off two marginal branches from the disk, one near the middle and one near the end, and then subdivides beyond the disk into an apical and post apical branch. The disco-central nervule arises above the middle of the discal nervure at an angle, whence the nervure curves to the first branch of the median. In the hind wings the costal and subcostal intersect at their bases. The latter is bifid beyond the disk; the disco-central is continued to the base of the wing, attenuated within the disk, and the discal nervure is straight on the costal side of it, and very oblique on the median side; with their points of junction separated. Median three branched.

Body rather slender, not pilose. Head small; eyes quite small. Antennæ rather more than one half as long as the body. Labial palpi somewhat exceeding the front, rather slender, nearly cylindrical, squamose above and slightly hirsute beneath; third joint very small, the development being chiefly in the second joint. Tongue none. Abdomen much shorter than the hind wings. Fore legs rather slender, tibiae moderately ciliated; middle and hind tibiae thickly and shortly ciliated, with two rather short apical spurs. Wings very much deflexed in repose, almost enveloping the body. *Male*.—The basal half of the antennæ shortly pectinated. *Female*.—Antennæ simple.

A. voluta.—Reddish-brown, somewhat paler in the ♀ than the ♂. Fore wings with a dingy yellow streak along the base of the inner margin, extended toward the disk above the middle of the wing and on this portion are two or three blackish dots. On the hind portion of the disk is a short black streak. In the ♂ there is another short black streak along the median nervure and its last branch, with a curved row of three, black, submarginal spots. The lower streak and the spots are as distinct in the ♀ as in the ♂. In both sexes there is a subapical dingy yellow patch, lightly bordered behind with whitish. Hind margin spotted with black. Hind wing pale reddish brown.

Larva.—Body semi-cylindrical, tapering posteriorly and rounded obtusely in front. Nearly smooth, but with a subvascular row of small fleshy, minutely spined papulae on each side of the vascular line, three of which placed anteriorly are separated and distinct, and three approximated on the last rings; the intermediate ones are minute. The outline of the body above the ventral surface, is furnished with a row of minute spined papulae.

Bright green, with a broad dorsal yellow band containing a reddish purple one, which is constricted opposite the second and third pairs of anterior papulae and dilated into an elliptical patch in the middle of the body. This is almost separated from a smaller elliptical patch which is constricted opposite the third pair of posterior papulae and ends in a small round patch. The anterior and posterior papulae are crimson and the intermediate ones green. The superventral row of spined papulae are green.

In September, on the leaf of Apricot. Imago in March.

EMPRETIA.

In the anterior wings the subcostal nervure is moderately remote from the external margin, sends off two marginal branches from the disk, and beyond

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it subdivides, first near the disk, into a subcosto-inferior branch, and then into an apical and post apical branch. The discal nervure is very irregular, and sends from its costal portion a disco-central nervule, whilst the middle of the disk contains a bifid false nervule. The internal nervure is bifid at its base. In the hind wings the costal and subcostal nervures intersect at their bases. The subcostal is bifid near the disk. The costal portion of the discal nervure is angulated, and forms likewise an acute angle in the middle of the disk, whence a false nervule proceeds to the base of the wing, and obliquely joins the median system, giving rise on the median side to a disco-central nervule.

Body stout or very stout, thorax covered thickly with flat hairs. Head quite small; eyes small and oval. Labial palpi somewhat exceeding the head, slightly curved, more robust in the ♂ than in the ♀; third joint small and conical, about four times less long than the second and slightly hirsute beneath. Tongue none. Antennæ rather more than one half the length of the body. Abdomen shorter than the hind wings. Fore legs long and rather slender; fore tibiæ and tarsi moderately ciliated; middle and hind tibiæ thickly ciliated, with two moderate apical spurs on hind tibiæ. *Male*.—Antennæ, basal half pectinated. *Female*.—Simple.

E. stimulea.—Body and fore wings uniform dark ferruginous, with two small subapical white spots, and in the ♂ two more near the base of the wing beneath the median nervure. Hind wings pale reddish-brown.

Larva.—Body semicylindrical, truncated obliquely before and behind, with a pair of anterior, long, fleshy, subvascular slenderly spined horns and a pair smaller beneath them, above the head; a posterior similar pair and a smaller anal pair beneath them. The superventral of papulæ are rather large and densely spined. After the last moulting the longer horns become moderate in length.

The portion of the body between the anterior and posterior horns is a fine, bright green color, bordered anteriorly and superventrally by white, with a central, dorsal, oval reddish brown patch bordered with white, which color is again edged by a black line. The horns, papulæ and anterior portion of the body are reddish brown, with a small yellow spot between the anterior horns, while the posterior pair are placed in a yellow patch.

The spines with which the horns are supplied, produce an exceeding painful sensation when they come in contact with the back of the hand, or any portion of the body on which the skin is thin.

On a great variety of plants; fruit trees, the rose, Indian corn, (*Zea mays*) and a number of other plants.

E. paenulata.—Body dark reddish brown. Fore wings dark reddish-brown along all the borders, with a large, central pea-green patch, extending from the base of the wing to the subterminal portion, bordered narrowly on the inner side and behind with white, and deeply indented opposite the middle of the inner margin, where there is a bright brown patch in the reddish brown border. Hind wings yellowish brown.

I do not know the larval state of this species, and have only two specimens, both apparently females. I can perceive no differences in the structural characters of the imago of this and the previous species, and am quite sure that they belong to the same generic group. The discovery of the larval form will, however, determine the question.

From Mr. Robert Kennicott, Illinois.

NOCHELIA.

In the anterior wings, the subcostal nervure is remote from the external margin, and the costal arises from its base; it gives off a marginal branch near the posterior end of the disk, and another exterior to the disk. The subcosto inferior branch arises nearly midway between this latter and the post-

apical, which is given off near the tip of the wing. The discal nervure is doubly angulated, and gives rise to the disco-central nervule at the angle on the costal side; and from the central, a false nervule to the base of the wing. Median four-branched. Internal bifid at the base.

In the hind wings, the costal and subcostal have a common trunk. The subcostal bifid beyond the disk. The subcostal and median portions of the discal nervure are much separated at their points of junction with the disco-central, which is continued as a false nervule to the base of the wing.

Male.—Body stout and very short; thorax covered with flat hairs. Head and eyes moderate, the latter oval. Labial palpi slightly exceeding the front, rather stout, porrect, third joint very minute. No tongue. Antennæ much more than one half as long as the body, with the basal third pectinated. Abdomen shorter than the hind wings. The middle and hind tibiæ rather thickly ciliated; apical spurs of hind tibiæ, if present, inconspicuous.

N. tardigrada.—*Male*.—Body and fore wings rather dark reddish brown, with a small, nearly triangular pea-green patch narrowly bordered with dark brown at the base of the wing beneath the median nervure, slightly excavated behind where it adjoins a bright brown patch. Towards the hind end of the disk, in its middle, is a minute, oval dark brown streak; two small pea-green subapical spots, the one nearest the costa minute.

Larva.—The body is elliptical, much flattened above. There is on each side a row of subvascular, minutely spined papulae, of which the three anterior and two posterior are more conspicuous than the rest. The superventral row of papulae are moderate, equal, and form the outline of the body.

General color very pale green, with dorsal patches of the general hue beautifully margined by crimson lines, and crimson, vascular patches, of which those between the *fourth* and *fifth*, *seventh* and *eighth* pairs of subvascular papulae are most conspicuous, although small. All the papulae pale green.

On the apricot in September. Imago in April.

I have descriptions of other larvæ similar in physical characteristics to the above, but have not succeeded in carrying them through their transformations.

The genera *Pimela*, *Limacodes*, *Adoneta*, *Empretia* and *Nochelia* belong to that most anomalous family *Limacodidae*. Perhaps some of the groups described as new have been heretofore established, but I found the effort to identify them from meagre and unsatisfactory diagnoses of the imago an almost futile task.

ATTACUS Hübner.

The following species have never been described I believe, except by De Beauvois, and as his work is now rather rare and an expensive one, and not accessible to the great body of American entomologists, I insert here descriptions of the following insects:

A. splendida, *Bombix splendida*, *De Beauvois, Ins. en Afrique et en Amer.* p. 133, pl. 22, f. 1, 2.

Dull reddish-brown. Thorax banded with white before and behind. Abdomen with a white stigmatal band edged above and beneath with black and containing reddish brown spots. Fore wings with a basal white streak extending from the costa to the base of medio-posterior nervule and thence to the inner margin at the base of the wing, bordered toward the base with orange-yellowish and externally by black. The breadth of the disk is occupied by a large trigonate vitreous patch, extended behind so as to interrupt a white wavy, narrow band crossing the middle of the nervules and which is bordered internally with black and externally with orange-yellowish. The trigonate patch is edged within by white and externally by black behind and before. Beyond the transnervular band, the wing is brown dusted with blackish and powdered with whitish roseate in the medio-posterior and sub-

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median interspaces behind the band. At the tip is a large whitish roseate patch, three contiguous black spots at the end of post apical interspace, with a wavy black, submarginal line. Hind margin luteo-testaceous. Hind wings, trigonate vitreous patch somewhat larger than in fore wings, with a transnervular band similar to fore wings, continued around the costa to the base of the wing and the medio-posterior interspace and those adjoining it, powdered with whitish roseate behind the band. Hind margin luteo-testaceous with a row of black spots and a dark brown line.

From Smithsonian Institution. Capt. Pope's coll. Texas.

HYPERCOMPA Stephens.

H. interrupto-marginata.—*Bombix interrupto-marginata*, *De Beauvois Ins. Afrig. et Amer.* p. 265, pl. 24, f. 5, 6. Head and labial palpi pale orange yellow, the latter with black tips. Thorax pale yellow, with a broad black stripe on the disk. Abdomen orange yellow, with a dorsal black stripe. Fore wings pale yellow, with a black streak along the costa not reaching the tip of the wing, a broad streak of the same hue along the inner margin, sending from the inner angle toward the hind end of the disk, a hooked demi-band; hind margin black in the middle. Hind wings pale orange-yellow, with a black spot near the inner angle and a larger one in the middle of the medio-posterior interspace and nervule. Legs pale orange-yellow.

Virginia and Wisconsin.

TINEINA.

ANORTHOSIA.

Anterior wings rather narrow, and somewhat lanceolate. The subcostal nervure is nearly straight and gives off from the disk, which is unclosed, three marginal nervules and becomes bifid before the tip. The discal nervule is independent. The median is four-branched, its last nervule is bifid, and arises opposite the middle of the origins of the 2d and 3d subcosto marginals. The submedian is bifid at its base.

Hind wings somewhat emarginate behind the tip on the external margin, and rather deeply emarginate beneath the tip. Disk unclosed. Subcostal nervure bifid from the end of the disk. This discal nervule is transferred to the median side, and the median nervure is three-branched.

Head and face smooth; vertex elongated, with long loose scales overlapping in the middle. Forehead rounded. Ocelli very small. Eyes small, round and salient. Antennæ about one third less long than the anterior wings, basal joint long and slender, the stalk slightly denticulated beneath. Maxillary palpi extremely small. Labial palpi, smooth, long and porrected, their development being almost entirely in the second joint, which is supplied above with long hairs capable of being erected, although usually decumbent, and with the third joint short, very slender, smooth and pointed, arising nearly erectly at the apical third of the second, and is likewise capable of being erected or depressed. Tongue scaled at the base and about as long as the labial palpi.

A. punctipennella.—Labial palpi and head rather dark ochreous, the former dark brownish externally. Antennæ ochreous, annulated with dark brown. Fore wings rather dark ochreous, sometimes dusted with dark brownish, with three pairs of blackish brown dots along the fold, the first near the base of the wing, the second rather above the middle and the third near its end. One dot of each of the latter pairs, is in the fold, the other above it obliquely. The costa at the base, and beyond the middle is touched with blackish, with the hinder portion of the wing dotted and dusted with dark brown, especially along the hinder margin. Cilia ochreous. Hind wings shining, blackish gray, cilia the same. Abdomen blackish.

1860.]

GELECHIA Zeller.

G. cerealella.—*Anacampsis (Butalis) cerealella* Harris, Treat. on Ins. 2d ed. p. 392.—Head and face dull ochreous. Labial palpi pale ochreous, with fuscous ring at the tip and a slight fuscous spot on the middle of the second joint. Fore wings pale, shining ochreous, with a fuscous streak in the fold toward the base and a few fuscous scales toward the tip of the wing on the margin; cilia grayish ochreous. Hind wings grayish ochreous, cilia the same.

This insect has doubtless been introduced into this country from Europe. My own specimens were obtained from the W. D. Porter wheat, distributed by the Patent Office at Washington City. The seed of this wheat was originally procured from Mount Olympus in Asia, and from two heads of this as a beginning was grown in the District of Columbia the grain distributed in the years 1854 and 1855. The insect is probably common in the District.

G. agrimoniella.—Labial palpi yellowish. Eyes crimson. Antennæ yellowish annulated, with black. Head, thorax and fore wings blackish somewhat suffused with a greenish hue, the latter black beyond the middle, with a pale yellow band, somewhat hooked on the costa, at the apical third of the wing. Hind wings blackish-brown, cilia the same.

The larva may be found about the middle of June, nearly full fed, in the leaves of Agrimony, (*Agrimonia Eupatoria*) which it rolls and binds together with silken threads. The body of the full grown larva is colored obscure green, dotted with black dots. Head and shield pale brown. The young larva is flesh-colored and dotted with dark colored dots. The pupa is contained in a slight cocoon, sometimes woven between the leaves of its food plant, but usually it is abandoned to construct it. The pupa-case is not thrust from the cocoon at the maturity of the insect.

The June brood of larva become imagos during the latter part of June or the beginning of July.

Fore wings scarcely pointed. Secondary cell faintly indicated. Subcosto-apical vein forked. The last branch of median bifid. Hind wings emarginate before the tip and slightly beneath it; with an intercostal cell at the base.

G. flavocostella.—Labial palpi wanting. Head dull reddish yellow. Antennæ blackish-brown, yellowish toward the base. Thorax, disk black, front and sides dull yellow. Fore wings black, with a broad, pale yellow costal streak, extending from the base nearly to the tip of the wing, undulating from the base to the middle of the wing and dilated into an angle at the apical third, with a faint, yellowish streak produced from the apex of the angle toward the inner angle of the wing. Hind wings dark brown, cilia the same.

This insect does not, probably, belong to the genus under which it is placed. As the labial palpi are wanting, I include it here from its general structure and appearance, not knowing otherwise where to place it.

One specimen from A. I. Packard Jr., of Brunswick, Maine.

The second joint of labial palpi moderately thickened. Hind wings deeply emarginate beneath the tip, which is produced.

G. roseosuffusella.—Labial palpi, second joint whitish spotted with dark fuscous; the third dark fuscous annulated with two white rings. Head and thorax ochreous, tegulæ with a dark-brown spot in front. Antennæ dark fuscous, annulated with whitish. Fore wings dark brown, ochreous along the inner margin, where it is suffused with roseate. At the base of the wing is a white spot containing a dark brown dot, and near the base an oblique white band. About the middle of the wing is a large white spot or indistinct broad band, irrorated with dark brownish and tinted with roseate on the inner margin. Near the tip is a costal white spot and a roseate spot

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opposite on the inner margin, and a whitish spot at the tip. Cilia brownish gray. Hind wings dark fuscous-gray, cilia fuscous. Feet annulated with white.

Fore wings scarcely pointed. Hind wings slightly emarginate beneath the tip, with an intercostal cell at the base.

G. Rhoifructella.—Head, face and thorax grayish-fuscous. Labial palpi rather dark ochreous. Antennæ ochreous, annulated with black. Fore wings grayish-fuscous dusted with dark brown, and with four dark fuscous dots, one near the base of the fold, two near the middle of the wing, (one on the fold and one above it,) and one on the end of the disk. Near the end of the wing is an indistinct grayish band. Hind wings fuscous, cilia the same.

The larvæ may be found in April or early in May, in the fruit spikes of sumach (*Rhus Typhina*), where they feed on the crimson hairs and exterior envelope of the drupes, without however eating the drupes themselves. The larvæ are concealed in galleries formed in the fruit spikes, and their presence is indicated by strings of "frass" clinging to the exterior. The cocoon is a slight silken web woven amongst the "frass" near the surface. The larva is immaculate, and varies in color, from dark reddish-brown to a pale brown, dotted with rows of darker colored dots, each giving rise to a hair; the head is brown and the shield blackish. The imago appears about the middle of June.

Size small. Fore wings rather lanceolate and pointed. Hind wings deeply emarginate beneath the tip, which is produced. The second joint of labial palpi somewhat thickened.

G. ? rubidella.—Head and face ochreous. Labial palpi yellowish white, with two deep fuscous spots on the middle joint, and two blackish brown rings on the terminal one, a narrow one near its base and a broad one near the tip, while the tip is blackish. Antennæ deep fuscous annulated with white. Thorax fuscous, deep fuscous in front. Fore wings roseate, dusted with deep fuscous, with a brownish ochreous streak along the inner margin from the base to nearly the middle of the wing, and interrupted about its middle by a roseate hue. At the basal third of the wing is an oblique deep fuscous band, extending from the costa to the fold, and beyond the middle of the costa is a spot of the same hue, joined toward the inner margin by a brownish-ochreous spot. The apical portion of the wing much dusted with deep fuscous; cilia ochreous, with a fuscous hinder marginal line. Hind wings blackish gray; cilia somewhat paler. Feet rather pale ochreous, spotted with deep fuscous.

G. flexurella.—Head and face grayish fuscous. Labial palpi, second joint dark fuscous, terminal joint white with a blackish ring at the base and one near the tip. Antennæ whitish annulated with dark fuscous. Fore wings grayish fuscous, with a pale grayish band near the apex margined internally on the costa by a blackish brown spot, with another of the same hue about the middle of costa and another on the costa near the base. Near the base of the fold is a rather faint dark brownish spot, and the wing is sprinkled with dark brown atoms. Hind wings dark fuscous, cilia ochreous gray.

Variety? Fore wings smoky fuscous, with a pale grayish band near the tip, broadest and most distinct on the costa, margined broadly internally across the wing, with dark brown, with a pale grayish spot between it and a dark brown spot on the middle of costa. In the middle of the wing are two dark brown spots, one on the basal part of the fold and a small one on the costa above it of the same hue. Hind wings dark fuscous.

G. mimella.—Head and face tawny brown. Labial palpi, second joint dark fuscous, with a whitish ring at its end; third joint gray with a ring in its middle. Antennæ pale fuscous annulated with white. Fore wings tawny brown, with an ochreous band near the tip, margined internally slightly with
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dark brown. Along the costa are a few dark brown spots and a few in the apical portion behind the ochreous band. Hind wings dark brown.

Size small. Fore wings acutely pointed or lanceolate. Hind wings deeply emarginate beneath the tip, which is produced. Labial palpi rather short; middle joint somewhat thickened with scales, terminal rather short.

G.? *detersella*.—Head and face grayish fuscous. Labial palpi pale yellowish-white, with two fuscous patches on the middle joint, a very narrow fuscous ring at the base of terminal joint, a broad one near the tip, with the extreme apex whitish. Antennæ grayish fuscous, annulated with dark fuscous. Fore wings grayish, very profusely dusted with dark fuscous, with a dark fuscous spot on the disk; cilia ochreous gray. Hind wings pale ochreous-gray; cilia pale ochreous. Feet annulated with whitish.

I have found this genus a very difficult one. It is of great extent and includes individuals of a variety of aspects and more or less marked modifications in the labial palpi. The oral parts in the doubtful species correspond so nearly to those of the genus, that I have concluded after much hesitation not to place them in separate groups, notwithstanding the produced apex of the hind wings in some of them.

STROBISIA.

Fore wings obtuse and rounded behind. The subcostal divides into four branches, with the apical branch simple or forked. The discoidal nerve gives origin to a disco-central branch. The median is four-branched; submedian forked at the base. Hind wings trapezoidal, not broader than fore wings, with the hinder margin slightly emarginate beneath the tip. Subcostal bifid from the discoidal, which gives rise to a disco-central vein. Median three-branched, the two upper branches arising at a common base.

Head smooth with appressed scales. Forehead and face rounded. Ocelli large. Eyes oval and obliquely placed. Labial palpi recurved, moderately long; second joint flattened, smooth with appressed scales; third slender, smooth and pointed. Maxillary palpi short and distinct. Antennæ slender, simple; basal joint subclavate. Tongue scaled, nearly or quite as long as the thorax beneath.

The structure of the insects here included, closely approach that of the genus *Gelechia*, in which I placed them in the first arrangement. I cannot believe, however, that they are members of this group, and have hence removed them. The perfect insects are most commonly found in shaded places, on the surface of leaves. They are active and restless in their motions, and *turn in circles* on their resting places, especially after short flights; withal they are disposed to be quarrelsome and drive away from the leaves on which they may happen to be enjoying themselves, other "little people" of the shaded wood.

Fore wings obtusely rounded behind. Subcosto apical branch simple. Medio posterior vein bifid.

S. iridipennella.—Head and thorax brown, with a greenish hue; face whitish beneath. Labial palpi dull silvery. Antennæ dark brown. Fore wings dark brown, with a greenish-golden hue. Along the costa are three metallic blue or violet-blue oblique streaks scarcely reaching the middle of the wing, the first is longest and is placed about the middle of the costa, the third near the tip, and with three spots of the same hue beneath the second streak, one in the fold and two in the middle of the wing. In the apical portion near the hind margin are three or four parallel similarly hued streaks and at the base of the fold is a violet-blue spot. Hind wings brown, along the base of costa pale yellow.

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Fore wings obtuse, hind margin slightly oblique. Apical branch bifid.

S. emblemella.—Head and thorax dark brownish, with a golden hue; face whitish beneath. Labial palpi silvery gray; third joint fuscous in front. Antennæ dark fuscous. Fore wings dark brown, somewhat golden. The costa at the base and a basal band are dull silvery and rather behind the middle of costa is an oblique silvery costal streak and about the middle is a curved costal streak of the same hue. This unites with an oblique silvery streak, from the middle of inner margin, and which becomes diffuse in the middle of the wing. Near the tip at the beginning of the costal cilia, is a small costal silvery spot and a row of spots or short parallel bluish silvery streaks along the hinder margin. Cilia at the tip ochreous, containing a dark fuscous line; on inner margin dark fuscous. Hind wings dark brown, yellowish along the costa; cilia dark brown.

ENDROSIS? Hübner.

Hind wings with a medio-discal branch, in addition to the discocentral; terminal branch of median bifid. Transparent patch at base, quite distinct.

E. Kennicottella.—Head and thorax white, with a small dark fuscous patch on the front of tegulæ. Labial palpi white, terminal joint with a dark fuscous ring at the base and one near the tip, with the extreme apex white. Antennæ dark fuscous. Fore wings whitish, much dusted with dark fuscous. At the base is a white spot and the adjoining portion of the costa dark fuscous; behind the middle and near the tip is a whitish spot and opposite the latter on the inner margin is a whitish spot nearly joining it, both dusted with fuscous. Apical portion, dark fuscous, with a few whitish spots on the margins; cilia ochreous. Hind wings gray; cilia pale ochreous. Feet with tarsi annulated.

From Mr. Robert Kennicott of North Westfield, Ill. Two specimens.

EVAGORA.

Fore wings rather narrow and obliquely pointed at the tip; inner margin slightly retuse beyond the middle. Discoidal cell closed by a faint, simple, oblique nervure, given off from the subcostal near the third marginal branch; without disco-central nervule. The subcostal runs almost straight from the base to the tip of the wing, giving off from the cell three marginal branches, one near the middle of the wing and two near the end of the disk; beyond the disk it sends another branch to the costa, and before the tip becomes bifid sending one branch above and another below the tip. The median subdivides into four branches, which are aggregated at their origins, and, except the medio-posterior, are long. The submedian is furcate at its base. Hind wings deeply emarginate beneath the tip, which is abruptly produced, although short. The discoidal cell is closed by a slight curved nervure, and is without a disco-central nervule. The subcostal is bifid from the discal nervure, and the median gives rise to a medio-discal nervule which curves much upward; the last branch of the median much removed from the two terminal branches which are approximated.

Size small, forehead rounded; face rather narrow. Ocelli none. Eyes round, moderately prominent. Antennæ rather thick, simple, and about one half as long as the fore wings; basal joint rather slender but short. Labial palpi cylindrical, rather short, middle joint slightly thickened toward its extremity, at least one half longer than the terminal joint, which is somewhat roughened but slender and pointed. Maxillary palpi not perceptible. Tongue scaled at the base, short, not as long as the labial palpi.

This genus shows some resemblance in structure to *Parasia*, but I think it is very distinct.

E. apiciripunctella.—Head, face and thorax ochreous. Labial palpi 1860.]

ochreous internally, externally dark fuscous; terminal joint with a fuscous ring at the base and tip, extreme tip ochreous. Antennæ dark fuscous, indistinctly annulated with ochreous. Fore wings brownish ochreous, with three oblique dark streaks from the costa to the middle of the wing, bordered behind with *very pale ochreous*, the first near the base, the second about the middle of costa, the third near the tip with its pale ochreous margin extended across the wing. Beneath the *third streak* are two dark fuscous spots, sometimes margined with pale ochreous. At the tip are three dark fuscous dots, one nearly on the extreme apex and two others behind it. Cilia of the tip somewhat dusted with fuscous, the inner margin ochreous. Hind wings rather dark ochreous, cilia the same.

TRICHOTAPHE.

Fore wings scarcely pointed, hind margin oblique, costa behind the tip deflexed. The discoidal cell is closed and rounded behind. The subcostal nervure sends four veins to the costa behind the tip, the last of which is furcate, and one to hind margin beneath the tip from the cell. The median sends four branches to the hind margin, the last of which is furcate. Hind wings emarginate in the middle of costa, and somewhat emarginate beneath the tip, with an intercostal cell at the base; subcostal bifid from the discal nervure which sends a central branch to the hind margin. The median is three-branched.

Head smooth, with appressed scales. Without ocelli. Eyes round and moderately prominent. Labial palpi recurved; middle joint slightly curved, rather broad, compressed laterally, squamose on the sides and hairy toward the end; terminal joint slender, smooth, pointed and not so long as the middle joint. Maxillary palpi short and distinct. Antennæ rather more than one half as long as the fore wings, somewhat denticulated and microscopically pubescent beneath in the male? Tongue scaled at the base, nearly as long as the thorax beneath.

Middle joint of labial palpi much flattened; hairy above and below, with diverging hairs.

T. *setosella*.—Head, face and thorax rather dark ochreous. Labial palpi, middle joint blackish-brown externally, with the spreading hairs above and beneath at the end, ochreous; terminal joint ochreous tipped with fuscous, antennæ fuscous, ochreous toward the base. Fore wings dark brown, slightly dusted with pale ochreous. At the base of the costa is a pale ochreous irregularly triangular patch, slightly dusted with fuscous, angulated on the upper portion of the fold; the angle is margined beneath with blackish brown, with a small patch of the same hue between the angle and base of the wing, and a large one behind it extending from the subcostal nervure to the fold. Across the base of the nervules runs a pale ochreous line, on each side of which the wing is nearly uniform dark brown. Hind wings yellowish brown.

Middle joint of labial palpi without spreading hairs.

T. *juncidella*.—Head, face and thorax dark brown. Labial palpi ochreous orange. Antennæ dark brown. Fore wings dark brown almost blackish brown, with an ochreous orange spot on the disk, one on the subcostal nervure nearer the base, one beneath it in the fold, and one on the end of the disk, all of the same hue. On the costa near the tip is a small ochreous orange spot, and the cilia which are somewhat paler than the general hue are varied with shining ochreous. Hind wings dull yellowish brown.

CALLIMA.

Fore wings rather ovate, obtusely pointed. The subcostal nervure sends four nervules to the costa, the last one furcate behind the tip, with both branches above it. From the discal proceeds a disco-central nervule, and the median subdivides into four branches. Submedian furcate at the base.

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The hind wings are much narrower and shorter than the fore wings, emarginate in the middle of the costa, hind margin obtusely pointed and very oblique. The costal ends in the middle of the wing. The subcostal is attenuated towards the base, the discal gives rise to two nervules and the median is three-branched, the superior and central nervules arising in a short common stalk.

Head smooth, with hair-like scales. Face quite narrow. Ocelli none. Eyes round and quite prominent. Labial palpi long and recurved; the middle joint rather slender, smooth with appressed scales, slightly flattened, longer than the third joint, which is slender, smooth and pointed. Maxillary palpi none. Antennæ inserted on the front, basal joint smooth and subclavate, slightly denticulated beneath and microscopically pubescent (in the ♂ alone?). Tongue scaled at the base and somewhat longer than the anterior coxæ.

This insect, I think, must approach very nearly *Cecophora* of Zeller if it is not, indeed, a member of that genus.

C. argenticinctella.—Head, face and thorax deep reddish orange. Labial palpi, middle joint dark brown, terminal white with a broad dark brown ring on its middle. Antennæ silvery white annulated with blackish. Fore wings yellowish orange. Along the *basal margin* of the wing from the fold to the basal angle, is a silvery line black margined on both sides, and one from the basal third of the inner margin, somewhat curved and not extended to the costa, likewise silvery and black margined on both sides; the basal portion of the wing included between these lines is deep reddish orange. Near the apical third of the wing is a silvery costal streak, curved and tapering outwardly, slightly dark margined on the costa behind. Opposite this on the inner margin, is a semicircular silvery line, black margined on both sides at its beginning, which terminates in a dark brown spot, white margined exteriorly, at the commencement of the cilia, before which the line becomes grayish silvery. The portion of the wing included within this line, is deep reddish orange, as well as the apical portion, in which along the hind margin is a row of silvery spots each slightly dark margined. Hind wings fuscous. Feet annulated with white.

NOMIA.

Fore wings rather narrowly ovate-lanceolate, discoidal cell very narrow, long and unclosed, with two independent discal nervules to the hinder margin beneath the tip. The costal nervure is short. The subcostal nearly straight, sending three nervules to the costa from the cell, the first from the middle of the wing, and its last branch bifid, with both branches above the apex. The median is two-branched, the one nearest the base bifid near its end. The submedian is furcate at its base.

Hind wings narrower than the fore wings, costa nearly straight, but slightly curved; apex decidedly produced, with the hind margin deeply and circularly excavated beneath it and the anal angle rounded. The discoidal cell is broad and unclosed, with a short independent discal nervule beneath the middle of the wing. Subcostal nervure simple. Median three-branched, the first delivered to the inner margin rather behind the middle, the last to the rounded anal angle.

Head smooth, with appressed scales. Forehead and face broad and rounded. Ocelli none. Eyes oval, not prominent, flattened. Labial palpi short, somewhat reflexed, smooth, rather slender and pointed; terminal joint extremely short, much slenderer than the middle. Maxillary palpi not perceptible. Antennæ about one half as long as the fore wings, rather thick, but tapering, roughened; basal joint rather slender and short. Tongue slender, scaled at the base, longer than the anterior coxæ.

N. lingulacella.—Head, face, and thorax, dark fuscous. Tegulæ golden. Labial palpi pale yellowish, terminal joint fuscous. Antennæ dark 1860.]

fuscous. Fore wings golden yellow. At the base of the costa is a dark golden brown patch, not extended beyond the fold, and margined behind and beneath with iridescent silvery. On the inner margin near the base and extended to the middle of the margin is a rather long patch of the same hue, with an iridescent silvery internal patch and touched exteriorly with the same hue. A large trapezoidal golden brown patch on the middle of the costa is margined internally by a rather broad iridescent silvery streak, which is slightly dark margined internally, having also an external silvery streak produced in the middle of the wing toward the apex and beneath it, at its anterior angle, a brownish silvery blotch, pointing to the inner margin at the beginning of the cilia. In the apical portion of the wing is a silvery streak, dark margined on both sides behind, pointing into the costal cilia above the apex. The costa from the trapezoidal patch to the tip, is touched with dark brown; cilia dark brown; beneath the apex varied with silvery on the base of the cilia. Hind wings dark brownish.

TRYPANISMA.

Fore wings ovate-lanceolate. The discoidal cell is rather narrow and elongately oval. The subcostal nervure sends three nervures to the costa, the last from the end of the cell, together with the apical branch which curves at its origin to send off a very short and faint di-castal nervure, and at its middle gives rise to a costal branch, becomes furcate behind the tip and delivers a branch above and one below the tip. The median is three-branched, the middle branch being bifid. Submedian furcate at the base. Hind wings narrower than the fore wings, with an intercostal cell at the base; apex produced, deeply emarginate on hind margin and anal angle rounded. The costa is slightly emarginate in the middle. The discoidal cell broad, and closed by a very faint nervure from the middle of the subcostal, which is furcate near the tip. The discal nervure arises near the median, which is three-branched, with branches rather approximated.

Size small. Head smooth, with appressed scales. Forehead and face rounded and rather broad. Ocelli none. Eyes oval, moderately prominent. Labial palpi moderate, arched; middle joint slightly thickened with scales beneath, terminal as long as the second, smooth, pointed and tapering from the middle. Maxillary palpi not perceptible. Antennæ slender and simple; about one half as long as the fore wings; basal joint subclavate. Tongue scarcely so long as the labial palpi.

T. prudens.—Head pale yellowish white dusted with fuscous. Face yellowish white. Labial palpi pale yellowish white, with two dark brown spots on the second joint and two rings on the terminal of the same hue, one at the base and one near the apex. Thorax yellowish, dusted with fuscous. Antennæ fuscous slightly annulated with yellowish. Fore wings fuscous, tinted with yellowish, with a small ochreous yellow patch on base of costa, one of the same hue on the middle of inner margin, extended to the middle of the wing and a band of the same hue near the tip, much angulated or nearly interrupted in the middle of the wing. Hind wings fuscous.

The generic characters of this insect approach those of *Evagora*. The larva lives within a silken web woven on the under surface of the leaves of chestnut oak. It feeds on the cuticles and parenchyma of both sides of the leaf, gaining the upper side by round holes eaten through its substance, and just large enough to admit the body; of these there were three at various points of the eaten surface. If alarmed the larva immediately retreats through the opening last made to the web on the under surface. The pupa is robust, almost ovoid and is contained in a slight cocoon woven on the leaf on which the larvæ feed. I have no description of the larva. It was taken July 22d, became a pupa on the 27th, and an imago on August 8th.

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BUTALIS Treitschke.

B. fuscicomella.—Head, face, labial palpi and thorax, yellowish fuscous, antennæ purplish fuscous. Fore wings purplish fuscous, tinted somewhat with yellowish; cilia purplish fuscous. Hind wings dark fuscous.

Taken on wing in June. The egg is ellipsoidal; dirty white; investing membrane thin and covered with punctures, variolate.

Fore wings with three subcosto marginal-branches, the apical simple; apex pointed.

B. flavifrontella.—Head and face pale brownish ochreous. Labial palpi dark fuscous. Thorax and antennæ purplish fuscous. Fore wings purplish fuscous, with a yellow basal streak from the base to the middle of the wing, sometimes almost wanting, and the tip of the wing of the same hue. Hind wings dark fuscous.

Fore wings with three nervules beneath the apical.

B. matutella.—Head, face, thorax, and antennæ dark brownish with a purple hue. Fore wings reddish fuscous, with a brassy lustre; a pale greenish white spot rather obliquely placed near the middle of the wing and one of the same hue on the inner margin, near the apex. Hind wings dark fuscous, cilia the same.

ANARSIA ? Zeller.

Fore wings ovate-lanceolate; with an *opaque space* on the costa, towards the end of the costal nervure and the first subcosto-marginal branch. Discoidal cell rather narrow, closed by a short nervure. The subcostal sends four branches to the costa, the first from a point rather behind the middle of the wing, much separated from the second, and the last *furcate* on the costa before the tip, and a simple branch beneath the latter to inner margin just beneath the tip of the wing. The median subdivides into four branches, rather approximated at their origins, the medio-posterior branch being nearly opposite to the second marginal. Subcostal furcate at the base. Hind wings trapezoidal, costa retuse, slightly emarginate beneath the tip, hind margin obliquely rounded; broader than the fore wings. Subcostal nervure rather attenuated toward the base, with a faintly formed intercostal cell, furcate. Discoidal cell broad, closed, with a nervule given off to the hind margin. Median three-branched, medio-posterior branch distant from the others.

Head smooth, covered thickly with decumbent scales. Forehead broad, almost spherical; face rather narrow beneath. Ocelli none. Eyes rounded, moderately prominent. Labial palpi, *second joint thick, with a very abundant tuft of hairs beneath prolonged in front*; third joint *smooth, slender and pointed*, as long as the second. Maxillary palpi, *short and distinct*. Antennæ simple, scarcely more than one half so long as the fore wings, slightly denticulated, basal joint smooth. Tongue scaled at the base, about as long as the labial palpi.

I have three specimens of the insect belonging to this genus, but none of them show the peculiar structure of the palpi of the European male. Whether mine are all females or whether the individuals are generically distinct from the European, as the details of some parts of their structure seems to indicate, must be left for future determination.

A. ? pruniella.—Head and face pale gray; thorax dark gray. Labial palpi dark fuscous externally and pale gray at the end; terminal joint gray, dusted with dark fuscous. Antennæ grayish, annulated with dark brown. Fore wings gray, dusted with blackish brown, with a few blackish brown spots along the costa, the largest in the middle, and short blackish-brown streaks on the median nervure, subcostal, in the fold and one or two at the tip of the wing; cilia fuscous gray. Hind wings fuscous gray; cilia gray, tinted with yellowish.

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The larva was taken June 16th, full grown and about to transform on the limbs of the plum. Its head is black, body uniform reddish-brown with indistinct papulæ, each giving rise to a hair, and with pale brown patches on the sides of the 3d and 4th segments; shield and terminal prolegs, black. One specimen had secreted itself under a turned up portion of the old bark of the trunk. The cocoon is exceedingly slight, and the tail of the pupa is attached to a little button of silk. The pupa is ovate, abdomen short and conical, smooth; color, dark reddish-brown. I do not know on what part of the tree the larva feeds.

STILBOSIS.

Fore wings narrow and pointed. Discoidal cell open, elongated and very narrow. Subcostal nervure, with three nervules to the costa from the cell, and an apical branch which sends a *nervule to the costa from its middle, and is bifid at the tip of the wing*; the apical branch is nearly obsolete from the third to the fourth marginal branch. Beneath the apical is a discal nervule, which is obsolete posteriorly from its middle. The median is three-branched; the submedian, simple. Hind wings setaceous; the discoidal cell is open and moderately broad toward the base of the wing. The subcostal is obsolete toward the base and bifid at the tip of the wing; *a discal nervule beneath it is obsolete posteriorly from its middle*. The median subdivides into three separate branches.

Head and face perfectly smooth. Ocelli none. Eyes small, oval and visible in front. Labial palpi moderate, somewhat curved, slender, smooth and pointed; terminal joint as long and as thick as the middle, and very acute at its apex. Antennæ rather thick, simple, somewhat roughened, rather short; basal joint smooth and subclavate. Tongue short.

This genus is nearly related to *Cosmopteryx* of Hübner, but the labial palpi are much less developed, and the tongue much shorter.

S. tesquella.—Head and face grayish-silvery, having a greenish splendid lustre. Labial palpi ochreous. Antennæ dark fuscous. Fore wings fuscous-golden, tinted along the base of costa with reddish-violet; with *three patches of raised scales*, one in the fold near the base, one behind the middle of the wing, and one near the tip on the inner margin, the latter two are large and extended nearly to the costa. In certain lights these raised patches are golden *internally*, while the spaces of the wing between them become dark fuscous and with the light striking the wing from the tip the patches are dark ochreous and the last is extended obliquely into the costa as a streak of the same hue.

The tip of the wing is reddish-violet, in certain lights dark fuscous. The cilia are very long and are extended along the hind margin beyond the middle of the wing; fuscous tinged with reddish. Hind wings dark fuscous, cilia the same.

LAVERNA Curtis.

Fore wings pointed, oblique along the hinder margin, with five veins beneath the furcate apical vein. Discoidal cell narrow. Submedian *furcate at each end*; basal fork long, the apical fork shorter. Hind wings rather retuse on the costa before the tip; hind margin rounded or cimeter-shaped from base to apex. The subcostal is obsolete toward the base, simple, and runs into the costa before the tip. Discoidal cell closed, with a discal vein furcate at the tip. Median three-branched, the last two arising on a common base.

Head smooth; backhead or vertex elongated. Forehead obtuse, advanced; face retreating. Eyes oval, visible in front. Labial palpi moderately long, curved, smooth but rather loosely scaled; second joint flattened toward its end, subclavate; the third short, smooth and pointed. Antennæ rather more than one half as long as the fore wings, simple, setaceous, basal joint subclavate. Tongue sparingly scaled, extremely short, not one-half as long as the labial palpi.

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L. luciferella.—Head and face silvery, tinged with yellowish. Back-head dark fuscous. Labial palpi silvery; middle joint dark fuscous from the base to the middle, the terminal joint with a minute fuscous dot at its base. Antennæ dark fuscous. Fore wings dark reddish fuscous, with a large, rather faint bluish silvery patch at the base, one on the middle of the costa, and a curved band near the tip of the wing, of the same hue. On the fold beneath the costal patch, is a patch of raised scales, and another on the inner margin joining the band behind. Exterior to the band the wing is touched with ochreous, containing in the middle a short dark fuscous streak, sometimes a pale yellowish white streak margined with dark fuscous, and on the costa just behind it, is a short pale yellowish-white streak, margined exteriorly with dark fuscous. Apical portion of the wing is dark fuscous; cilia of inner margin fuscous. Hind wings fuscous, cilia the same.

Fore wings slenderly and shortly caudate at the tip. Apical vein with a long fork, with an independent discal nervure beneath it. Median four-branched. Submedian with a long basal fork, no apical fork, but with the end of the fold thickened. Labial palpi recurved, thickened at the end of second joint with loose scales; the third rather long, smooth and pointed. Tongue nearly as long as the anterior coxæ.

L. Eloisella.—Head, face and thorax silvery white, the latter spotted with blackish. Labial palpi white, with a dark brown spot on the middle of second joint, and two dark brown rings on the third, one at the base and one at the tip. Antennæ tawny yellow, white at base. Fore wings silvery white, with a small tuft of tawny scales at the basal third of the fold, and a larger patch of the same hue on the inner margin at the end of and above the fold. Between the tufts, is an oblique dark brownish costal streak, nearly joined at an angle by another of the same hue in the middle of the wing and exterior to the first tuft; the fold is tinted with golden yellow. Exterior to the second tuft is a blackish-brown streak, which becomes diffuse behind and above, while the apical portion of the costa to the slender apex of the wing is golden yellow. At the base, beneath the fold, is a blackish-brown spot, and another of the same hue beneath the fold equidistant from the first and the first tuft of scales, and on the costa midway between these latter is a rather faint dark brownish spot. Cilia yellowish gray. Hind wings tawny-grayish, cilia ochreous.

CHRYSOCORYS Curtis.

C. Erythriella.—Head, face and thorax fuscous, with a greenish-brassy hue. Labial palpi ochreous, terminal joint fuscous. Antennæ bronzy-yellowish fuscous. Fore wings reddish-fuscous, with a greenish-brassy hue; cilia fuscous. Hind wings reddish fuscous, cilia the same.

Specimens of this insect reared by myself were much smaller than those taken on the wing, had less of the brassy hue and were nearly uniform *grayish fuscous*, but I have no doubt it is the same insect.

The larva feeds on the fruit racemes of Sumach. It tapers anteriorly and posteriorly, incisures deep, segments elevated in the middle, with a single row of transversely arranged epidermic points on each ring, each one giving rise to one or two rather stiff hairs; abdominal legs very slender and short, terminal placed posteriorly. Head with a few hairs, ellipsoidal, pointed rather small, and pale brown. The body is uniform dark green. "Frass" scarlet.

The cocoon was woven on the outside of the raceme. It was ovoid, and appeared to consist of coarse silk and but a single thread, being woven so as to leave large meshes, enabling one to see the pupa through it distinctly. At maturity the pupa case is thrust forth. The pupa is pale green, with the head-case distinctly separated from the case of the thorax. The length of the larva is about two lines, of the pupa about one and a half.

The larva may be taken in July; the imago appears early in August and 1860.]

may be taken on wing at this time in the neighborhood of the food plant of the larva.

ELACHISTA Treitschke.

I would beg here to call the student's attention to the fact, that the genus described in Paper No. 3, January, 1860, under the name *Cosmiotes*, is the same as the present one. I much regret the existence of this error; it is not, however, necessary to state how I came to be misled.

Median vein of hind wings two-branched. Apical vein of fore wings with a branch from its middle to the costa, bifid at the tip; median vein two-branched.

E. præmaturella.—Head, face and labial palpi grayish fuscous. Antennæ rather dark fuscous. Fore wings fuscous with a purplish hue. Rather behind the middle of the wing is a white band, silvery-hued, and near the tip a costal and opposite dorsal spot of the same hue. Extreme apex of the wing white, with a row of dark brown atoms in the cilia, which are fuscous. Hind wings bluish-gray, cilia fuscous with a reddish hue.

The imago may be taken on wing early in April.

BRENTHIA.

Fore wings almost *cuneiform*, rounded behind. The subcostal nervure sends a vein to the costa from the middle of the cell, and subdivides into two branches at the point of junction with the discoidal nervure; arising from this are *five veins* to the hinder margin, and the median nervure subdivides into two branches at its tip. The subcostal is furcate at its base. The hind wings are broad, irregularly oval. The subcostal is simple. The discoidal does not join it, gives rise to *three veins* to the hind margin, and is deflected towards the base. The median is two-branched, the upper one being bifid about its middle.

Head smooth. Forehead and face rounded. Ocelli large. Eyes oval, and rather prominent. Labial palpi moderately long, rather slender, pointed and somewhat squamose; the terminal joint shorter than the second. Antennæ slender, simple in the ♀, rather densely ciliated in the ♂. Tongue slightly scaled and very short.

The insect belonging to this genus, which is nearly allied to *Glyphipteryx* of Hübner, has the curious habit of strutting about broad leaves in shaded places, with its fore wings somewhat spread and the hind wings turned forward at right angles to the costa of the fore wings, so as to display the surface of the under pair. It is easily recognized by this characteristic alone.

B. pavonacella.—Head and thorax fuscous; face whitish beneath. Labial palpi white, with three fuscous rings, one at the end of the second joint, one at the base of the terminal and one near its tip. Antennæ fuscous, annulated with white. Fore wings fuscous, mottled with whitish, especially on the middle of the wing, with a fuscous spot on the middle of the disk, ringed with whitish. Near the hinder margin is a black band, not extended to the costa nor the inner margin, with two sharp indentations of the general hue internally, and containing on its middle a streak of brilliant scarlet-blue metallic scales. Along the costa are one or two faint spots of the same hue. Hind wings fuscous, whitish at the base and along the costa, with a short white line near the hind margin, above the inner angle of the wing, and a rather faint scarlet-blue metallic hued band on the hind margin, from near the tip to beyond the middle. The under surface of both wings show a metallic hued subterminal band.

Imago on wing in July and August.

PIGRITIA.

Fore wings narrow, elongated, pointed and very slightly retuse on the costa before the tip. The subcostal sends to the costa, beyond the apical third of

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the wing, a long, thick vein which arises behind the middle, and subdivides into three branches at its tip, the apical being forked, with one of its branches delivered to the tip, and the other to the costa before it. The discoidal cell is much elongated and narrow, and sends to the hinder margin a disco-central branch. The median is three-branched at its tip, all of which are short, and the two upper veins arise on a common stalk. Submedian is forked at the base, with the lower branch nearly obsolete. Hind wings narrowly lanceolate, broad at base, with interior basal angle rounded. The subcostal vein is simple, and extended to the tip. Discoidal cell closed by a very faint nervule, giving rise to a *simple nervule*. Median nervule is three-branched, the last two branches from a common base.

Head smooth, with decumbent scales, slightly retracted. Forehead broad and rounded; face, with the scales spreading out at the base of the tongue, so as to make it nearly equally broad. Eyes oval, vertically placed. Ocelli small. Labial palpi very short, smooth; first and second joints rather thick; terminal joint pointed, slender, and as long as the second. No maxillary palpi. Antennæ setaceous, simple in the ♀, microscopically pubescent in the ♂, rather more than one-half as long as the fore wings; basal joint flattened and expanded into a small eye-cap, with cilia in front. Tongue scaled, rather longer than the thorax beneath.

I have but one male, which is *without labial palpi*. With the aid of good lenses, I cannot make out whether they have been broken off, or whether they are naturally obsolete. Otherwise, the head is in most perfect condition.

The genera *Zelleria* and *Ocnerostoma* are congeneric with this in the neuration of the wings, especially the hinder pair in the latter genus.

P. laticapitella.—Head, face and thorax shining tawny fuscous. Labial palpi dark fuscous. Antennæ fuscous, basal joint tawny fuscous. Fore wings dark fuscous, with a rufous tinge, sprinkled with white, especially toward the tip, with an indistinct whitish band behind the middle of the wing; cilia pale rufo-fuscous. Hind wings greyish-fuscous; cilia the same.

PARASIA? Duponchel.

Fore wings lanceolate. The subcostal nervule sends three veins to the costa, the first from the middle of the cell, and an apical branch which delivers from its middle a branch to the costa, and is forked before the tip, with one of the branches above and the other beneath it. The discoidal cell is closed, but gives rise to no nervule. The median fan-branched, more separated than in *Evagora*, and all the branches long. Submedian is forked at the base. Hind wings with the apex produced. The submedian is forked *beyond the discal nervule*, which gives rise to a disco-central branch. The median is three-branched.

Head smooth, with loose, decumbent scales. Forehead advanced; globose, face retreating. Ocelli small. Eyes oval, vertically placed, but little visible from the front. Labial palpi rather short, recurved, smooth, with appressed scales; second joint thick, subclavate; third joint short, very acuminate. Maxillary palpi short, distinct. Antennæ simple, setaceous, one-third less long than the fore wings. Tongue clothed with scales, scarcely as long as the anterior coxæ.

This insect and *Evagora apictripunctella* certainly approach each other closely in structure; nevertheless, they are very different in appearance. The hind wings differ from those of *Parasia* in the produced apex being straight, and slightly in neuration.

P. ? subsimella.—Head, face and thorax ochreous-fuscous. Labial palpi, second joint dark brownish, ringed with whitish at its tip; third joint white, terminal half black. Antennæ dark fuscous, basal joint striped with yellowish in front. Fore wings dark ochreous-fuscous; along the costa from its middle, 1860.]

and toward the tip, brown; and in the latter part much sprinkled with whitish. On the middle of the costa is a short, yellowish white streak, and in the apical third of the wing is an oblique line of the same hue, meeting in the middle of the wing another of the same hue from the inner margin. At and beneath the tip is a blackish brown spot, and in the cilia a dark fuscous line. Hind wings dark ochreous, cilia the same.

DEPRESSARIA Haworth.

D. *Lecontella*.—Head and face ochreous. Labial palpi ochreous; second joint varied externally with fuscous; third joint with a slight fuscous ring at the base, and one near the tip. Antennæ fuscous. Thorax ochreous, with two blackish brown dots before. Fore wings dark ochreous, with dispersed blackish brown dots throughout the wing, two of which, about the middle of the median nervure, are more conspicuous than the others; cilia rather pale ochreous. Hind wings pale grayish-ochreous, cilia the same.

This is the only true *Depressaria* I have found thus far; but we have other nearly allied species, which differ from it in the structure of the labial palpi. In this respect they resemble somewhat *Gelechia rufescens* of Europe, but differ from the genus to which it belongs in several particulars. I think they must form a group intermediate between *Depressaria* and *Gelechia*.

I have now nearly worked up my collection of *Tineina*, and would beg those who feel interested in the continuation of these studies, to aid me in extending my knowledge of species, by contributing collections from their various neighborhoods.

Description of a new species of *Marginella*.

BY JOHN H. REDFIELD.

MARGINELLA ROSCIDA Redf.

T. rhombico-ovatâ, politâ, cinereo-lutescente, albido guttulatâ, versus apicem albido-lineatâ; labis albo, crasso, reflexo, extûs fulvo trimaculato, intûs subdenticulato; spirâ modicâ; anfractus quatuor exhibente; anfractu ultimo angulato, juxta aperturam calloso; columellâ quadriplicatâ.

Shell rhombic-ovate, polished, light grayish brown, minutely flecked with white; towards and upon the spire the white spots tend to be confluent in longitudinal lines. Lip white, well thickened, obtusely reflected, extending a little upon the penultimate whorl, slightly denticulate within, and bearing three brown spots, one at its junction with the spire, a second about midway, and the third near the base. Spire moderate, apex slightly colored, with about four whorls visible; the last whorl is distinctly shouldered, a little beneath the suture and near the aperture shows a vitreous deposit. Columella with four plaits; upper ones somewhat oblique, lower ones more so. Aperture yellowish brown within. Length 0.57 in. (14 millim.); breadth 0.32 in. (8 millim.)

Habitat. Coast of South Carolina.

Remarks. The general form of this shell is nearly that of *M. apicina* Menke, and the spots upon the outer lip give it a further likeness to some varieties of that species, but the spire is more developed, and the last whorl more distinctly angular than is usual in *M. apicina*, while the latter never displays the minute white flecking of the species under consideration. This last feature is common also to *M. guttata*, *M. nivosa* and *M. pruinosa*, but all these are quite different in form and in development of spire.

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Descriptions of new Organic Remains from the Tertiary, Cretaceous and Jurassic Rocks of Nebraska.

BY F. B. MEEK AND F. V. HAYDEN.

The following new species of fossil mollusca, belong mainly to the collections brought from Nebraska by the expeditions under the command of Lieut. G. K. Warren, of the U. S. Top. Engrs. in 1856-7 and 8. More extended descriptions of these and the other species already described by us from that region, together with remarks, comparisons, and full illustrations, will appear in Lieut. Warren's final report.

TERTIARY SPECIES.

GASTEROPODA.

HELIX EVANSI, A. & H.—Shell small, suborbicular, spire depressed; volutions four and a half to five, obliquely compressed, or a little convex above, rounded on the outer side, and very convex below, the most prominent part being near the umbilicus, concave within, and each embracing on the upper side about half, and below nearly the whole breadth of every succeeding inner turn; surface unknown; umbilicus rather small, or about equalling the breadth of the widest part of the outer volution; aperture nearly obovate, its longer diameter being directed outward and upward. Height, 0.10 inch; breadth, 0.17 inch.

Named in honor of Dr. John Evans, Geologist, of Oregon.

Locality and position. Estuary beds at the mouth of Judith River.

PLANORBIS VETULUS, M. & H.—Shell discoidal, much compressed, spire slightly concave, umbilicus shallow, very little broader than the concavity on the upper side, and rather more than one-third wider than the outer whorl, showing about half of each inner turn; volutions three and a half to four, compressed convex above and below, the upper side being a little more convex than the other, and sloping slightly outward from near the inner margin, rather distinctly angular around the outer side, a little below the middle, and deeply concave within for the reception of each succeeding inner whorl; sutures well defined, though not very deep; aperture sub-cordate, approaching an irregular hastate outline, very slightly oblique, having its longer axis in the direction of the greatest breadth of the shell; surface apparently nearly smooth, or only showing obscure marks of growth. Greatest breadth 0.23 inch; height 0.05 inch.

Locality and position. Upper part of the Tertiary forming the Bad Lands of White River.

PLANORBIS LEIDYI, M. & H.—Shell small, subdiscoidal; spire flat, or a little concave; volutions scarcely three, increasing rather rapidly in size, not embracing on the upper side, inner ones almost entirely hidden by the last turn below, all convex above, rather narrowly rounded on the upper outer side, ventricose and rounded below; suture well defined; umbilicus small, or less than half the breadth of the outer whorl, deep and scarcely permitting the inner volutions to be counted; surface marked by fine delicate lines of growth; aperture sub-circular, or obliquely a little oval, flattened or somewhat concave on the inner side. Greatest breadth, 0.22 inch; height, 0.09 inch.

Named in honor of Prof. Jos. Leidy of Philadelphia.

Locality and position, same as last.

CONCHIFERA.

SPHERIUM PLANUM, M. & H.—Shell rather small, broad oval or subcircular, much compressed; extremities more or less regularly rounded, the posterior margin being sometimes faintly subtruncate; base semi-oval in outline; cardinal margin rounding gradually from near the middle; beaks very small, compressed, and scarcely extending beyond the hinge margin, nearly central; surface marked
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by fine irregular, obscure, concentric striæ. Length, 0.38 inch; height, 0.32 inch; convexity 0.08 inch.

Locality and position. Near the mouth of Grand River on the Upper Missouri.

SPHÆRIUM RECTICARDINALE, M. & H.—Shell of medium size, transversely subelliptical, rather compressed, very thin; anterior side rounded; base forming a regular semielliptic curve; posterior extremity obliquely subtruncate above, and rather narrowly rounded below; cardinal margin long and straight; beaks very small, compressed, and projecting but slightly above the hinge, located nearly half way between the middle and the anterior end; surface marked by moderately distinct, irregular lines of growth. Length, 0.55 inch; height, 0.36 inch; breadth, 0.24 inch.

Locality and position, same as last.

CYRENA (CORBICULA?) CYTHERIFORMIS, M. & H.—Shell broad trigonal ovate, varying to subcircular, rather thick and strong; extremities more or less rounded; base semiovate, usually more prominent before than behind the middle; dorsal outline sloping from the beaks, the anterior slope being more abrupt than the other, and slightly concave, while the posterior is convex; beaks rather elevated, moderately gibbous, located in advance of the middle; surface marked by fine lines of growth, which sometimes show a very slight tendency to gather into small irregular concentric wrinkles. Length, inches; height, inch; thickness, inch.

Locality and position. Estuary beds, near mouth of Judith River.

CRETACEOUS SPECIES.

CEPHALOPODA.

Genus PHYLLOTEUTHIS, M. & H.

PHYLLOTEUTHIS SUBOVATUS, M. & H.—The specimens on which we propose to found this genus and species consist of the expanded portion of the pen or gladius. This organ seems to have been corneous, and is thin, very wide or subovate in form, a little concave on the under side, and convex above. From behind the middle it narrows towards the front, the outline of the lateral margins being convex, while the posterior end is more or less obtusely angular. The shaft is broken away in our specimens, but that portion of it extending backward and forming the midrib of the expanded part, is narrow, prominent, and rather sharply carinate above, while on the under side it is merely represented by a narrow groove. The lateral expansions are crossed a little obliquely backward and outward, at an angle of about 65° from the midrib, by numerous slender, ridged parallel striæ, which are very nearly straight, or very slightly curved backward near the outer margins. Length of expanded part, exclusive of the shaft, 1.55 inch; breadth of do., 0.82 inch.

Apparently near the Liassic genera *Beloteuthis* and *Teudopsis*, or at any rate to species that have been, with doubtful propriety, ranged in these groups.

Locality and position. Moreau River, in formation No. 5.

HELIOCERAS ANGULATUM—Of this shell we have seen but a single nonseptate fragment, 2.78 inches in length, with a diameter of 1.50 inches at the larger end, and 1.37 inches at the smaller. It is rounded, or subcylindrical, and makes a broad (sinistral?) spiral curve, in such a manner that if continued around, the volutions would be disconnected, and encircle an umbilical cavity apparently more than three times their own breadth. The surface is ornamented by distinct angular costæ, which pass around the whorls obliquely and support two rows of nodes on the lower outer side, where they sometimes bifurcate. Septa unknown.

Locality and position. Head of south branch of Shyenne River, in the upper part of formation No. 4, of the Nebraska series.

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AMMONITES PLACENTA, var. INTERCALARIS.—It is possible this shell may be specifically distinct from *A. placenta* of Dekay, but it agrees with that species so nearly that we are in doubt about the propriety of considering it entitled to rank as a species. It differs externally from the typical forms of Dekay's species, in being rather less compressed, and in having a slightly larger umbilicus, while instead of a single series of scarcely perceptible transversely elongated prominences on each side, it has a row of small, but distinct nodes a little less than one-third of the way across from the dorsum, and another more prominent series near the umbilicus. It also differs in having a row of small, pinched, alternating nodes on each of the two dorsal angles.

With these external differences, however, the septa of the shell under consideration, are so very similar in all their details to those of *A. placenta*, that we are at present inclined to regard it as a variety of that species.

It is also worthy of note, that the form before us is closely related to *A. syrtalis* of Morton, being in fact almost exactly intermediate between that shell and *A. placenta*, as well in form and external ornaments, as in the characters of its septa. Its exact relations to these species can perhaps only be settled by a careful comparison of a more extensive series of specimens than has yet been obtained; in the mean time it may be made known as a subspecies, under the name *A. placenta, var. intercalaris*, and should it prove distinct, it may take the latter as a specific name. It seems to attain a large size. Our specimen, which consists of inner septate whorls, is 5·70 inches in its greatest diameter, with a thickness or convexity of 1·62 inches.

Locality and position. Sheyenne River, in the upper part of Formation No. 4 of the Nebraska Cretaceous series.

AMMONITES VERMILIONENSIS, M. & H.—Shell compressed discoidal; umbilicus large, very shallow, and showing about four-fifths of each inner whorl; volutions five or more, rather sharply carinated around the middle of the dorsum, and ornamented on each side by nearly straight, simple, moderately strong, obtuse costæ, which show a tendency to develop nodes at each extremity. Greatest diameter 1·05 inches; convexity about 0·29 inch.

Locality and position. Mouth Vermilion River, in Formation No. 2, of the Nebraska section.

SCAPHITES WARRENI, M. & H.—Shell small, transversely subovate, moderately compressed, rounded on the dorsum; umbilicus rather small; volutions sub-cylindrical, height and breadth nearly equal, increasing gradually in size; non-septate portion of last turn slightly compressed laterally, and deflected from the regular curve of the others, so as to become nearly or quite disconnected at the aperture. Surface of the inner whorls ornamented by numerous small costæ, which increase chiefly by implantation, and all cross the dorsum very regularly without arching; on the sides of the non-septate outer chamber, about every fourth or fifth one of the costæ is much more prominent and sharper than the others, and extends quite across to the umbilical side, while those between die out, or coalesce with the others at various distances.

Length 1·45 inches; height about 1·22 inches; breadth 0·57 inch.

Locality and position. Near the Black Hills, in formation No. 2 of the Nebraska Section.

SCAPHITES NODOSUS, var. PLENUS.—We suspect the noble specimen we here propose to notice provisionally, as a variety of Dr. Owen's *Scaphites nodosus*, may prove to belong to a distinct species, but as we are not yet fully satisfied on this point, it is perhaps better to regard it, for the present, as a marked variety of Dr. Owen's species; and should further comparison demonstrate that it is entitled to rank as a species, it can take as a specific name that by which we have designated it as a variety. It differs externally from Dr. Owen's figure of *S. nodosus*, in being greatly more ventricose, and shorter in proportion to its height, while its inner rows of nodes are much smaller and nearer the umbili-

cus. There are also some differences in the details of the septa, which cannot, however, be readily explained without figures. It is likewise much larger than the specimen represented by Dr. Owen, or any individuals of that form we have seen, its length being 4.57 inches; height 3.87 inches, and its breadth 2.53 inches.

Locality and position. On Yellow Stone River, 150 miles above the mouth, in the upper part of formation No. 4 of the Nebraska Cretaceous Series.

GASTEROPODA.

APORRHAI PARVA, M. & H.—Shell small, conical, subfusiform; spire moderately elevated, and acute at the apex; volutions six or seven, separated by a small but rather distinct suture, and having around the middle a single series of very oblique, flexuous folds, or node-like costæ, which do not extend to the suture either above or below; last whorl having just below the row of nodes, a small but well defined revolving angle; surface marked by very obscure lines of growth, and fine, closely set, revolving striæ. Length about 0.28 inch; breadth of body whorl, 0.15 inch; apical angle a little convex, divergence 33°.

Locality and position, same as last.

APORRHAI SUBLEVIS, M. & H.—Shell conical, or subfusiform; spire elevated; volutions seven or more, convex, and separated by a rather distinct, though not deep suture; last one convex above, and abruptly contracted below, having a (single?) small, revolving angle, which passes around to the suture, but is not seen on the succeeding turn above. Surface polished, and marked by moderately distinct, arcuate lines of growth, which are crossed by rather obscure revolving lines, nearly equalling the spaces between, on the spire, but more distant, with sometimes a few indistinct, irregular, very fine, parallel striæ between on the body whorl; aperture and lip unknown. Length about 0.54 inch; breadth of body whorl, 0.26 inch; apical angle slightly convex, divergence 37°.

Locality and position. Yellow Stone River, Upper part of No. 4, Nebraska section.

DENTALIUM PAUPERCULUM, M. & H.—Shell small, arcuate, slender and tapering gradually; section circular; substance comparatively thick; surface smooth, but showing under a magnifier extremely fine, obscure lines of growth, which pass around somewhat obliquely. Length (of an incomplete specimen, measuring from the apex,) 0.36 inch; diameter of same at apex 0.03 inch, do. at larger extremity 0.06 inch.

Locality and position. Moreau River, formation No. 5 of the Nebraska section.

CYLICHA SCITULA, M. & H.—Shell small, rather thick, narrow, subelliptical, or subcylindrical; spire entirely hidden; summit truncate, and occupied by a comparatively large umbilicoid depression; aperture very narrow, moderately arched, and equalling the greatest length of the shell; umbilical region slightly impressed; inner lip reflexed upon the columella, which seems to be slightly twisted, so as to form a small indistinct fold at its base; surface marked by fine, obscure lines of growth, which are crossed by impressed, revolving striæ, separated by spaces about twice or three times their own breadth, near the middle of the outer whorl, but becoming much more closely crowded towards the extremities. Length 0.24 inch; breadth 0.14 inch; widest part of aperture 0.07 inch, breadth of same near upper extremity, only 0.02 inch.

Locality and position. Moreau River, No. 5 of the Nebraska section.

CONCHIFERA.

TEREDO SELLIFORMIS, M. & H.—Shell small, subglobose; posterior side narrowly rounded above, gaping, and having a broad, more or less angular notch

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below; antero-ventral side provided with a large hiatus, formed by a similar, but deeper rectangular notch, which extends from the base nearly half way up to the beaks, and back almost to the middle of the valves; base, between the anterior and posterior notches, extended downward in the form of a narrow prolongation, which curves under, and is the only part of the ventral borders of the two valves that come in contact; beaks elevated, gibbous, incurved, and located between the middle and the anterior margin; surface ornamented by small concentric lines, which are curved, and deflected parallel to the great irregularities of the free borders, and crossed by two distinct radiating grooves, one of which passes from the back part of the beaks obliquely downward and backward to the corner of the posterior notch, and the other nearly directly downward to the extremity of the ventral prolongation. Length, of a medium sized specimen, 0.16 inch; height 0.14 inch; gibbosity 0.13 inch.

Locality and position. Fort Clark, on the Missouri, in formation No. 5.

MACTRA SIOUXENSIS, M. & H.—Internal cast oval-subtrigonal, moderately gibbous; anterior border narrowly rounded; posterior margin subangular at the extremity; base forming a nearly semioval curve, the most prominent part of which is in front of the middle; dorsal outline declining with a slightly convex outline behind the beaks, and distinctly concave in front of them; beaks prominent, rather gibbous, very nearly central; pallial impression provided with an oval sinus, which appears to be a little narrower behind than in the middle, rounded at the anterior extremity, and extending nearly in a horizontal direction, about three-fourths of the way towards the middle of the valves. Length 1.55 inches; height, 1.22 inches; convexity 0.76 inch.

Locality and position. Near mouth of Big Sioux River, in formation No. 1, of the Nebraska Cretaceous series.

MACTRA GRACILIS, M. & H.—Shell small, rather thin, ovate-subtrigonal, moderately gibbous, anterior end rounded, a little broader than the other; base forming a broad semioval curve, being usually more prominent towards the front than behind; posterior margin rather narrowly rounded, or subtruncate; beaks moderately prominent, and located slightly in advance of the middle; escutcheon comparatively large, lance-ovate in form; surface marked by distinct, regular lines of growth; hinge unknown. Length 0.49 inch; height 0.38 inch; convexity about 0.24 inch.

Locality and position. On Yellowstone River, 150 miles above the mouth, in beds containing a mingling of the fossils of No. 4 and 5.

TELLINA? FORMOSA, M. & H.—Shell subelliptical, very thin, moderately convex; anterior extremity a little wider than the other, but very narrowly rounded; posterior side subangular at the extremity; base forming a semi-elliptical curve; dorsum sloping gradually, with a slightly convex outline in front and rear; beaks small, and located almost exactly in the middle; surface marked by rather obscure, irregular lines of growth, and extremely fine radiating striæ, only visible by the aid of a magnifier; hinge unknown. Length 0.67 inch; height 0.40 inch; convexity (of a right valve) about 0.13 inch.

Locality and position. Twenty miles below mouth of Cannon Ball River, formation No. 5.

CYPRINA HUMILIS, M. & H.—Shell ovate, gibbous, thick, very oblique; anterior margin scarcely extending beyond the beaks, abruptly rounded below; base semioval in outline, most prominent towards the front, sometimes a little contracted behind; posterior extremity rounding obliquely, with a broad curve from the dorsum to the postero-basal extremity, which is narrowly rounded; beaks very oblique, almost overhanging the anterior border, declining and turned a little inwards at the extremities; umbonal slopes prominent from near the beaks obliquely backward to the lower part of the anal margin; surface marked by distinct, subimbricating lines of growth. Length 1.70 inches; height 1.34 inches; breadth 1.30 inches.

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Locality and position. North branch of Cheyenne River, near Black Hills, formation No. 5.

AVICULA SUBGIBBOSA, M. & H.—Shell (left valve) obliquely rhombic-oval, or ovate, moderately gibbous; anterior margin contracted, or a little concave in outline just below the wing, from which point it descends obliquely backward, with a broad, gently convex sweep, into the base; posterior border rather broadly rounded below, distinctly sinuous under the wing above; hinge line straight, a little less than the height of the shell. Anterior wing forming an equilateral triangle, compressed, and rather distinct from the umbo; posterior wing having the form of a very inequilateral triangle, the posterior side of which is much the shortest, compressed, moderately distinct from the more gibbous part of the valve, forming an angle of about 50° at the extremity; beak small, slightly elevated above the hinge, gibbous, located a little less than one-third the length of the hinge, behind the anterior extremity; posterior muscular scar large, oval or ovate, and located a little above the middle. Height 1.40 inches; length, measuring from the postero-basal extremity obliquely forward and upward to the point of the beak, 1.72 inches; length of hinge 1.32 inches.

This species resembles *A. linguiformis*, Evans & Shumard, but is much broader and less oblique, while its postero-basal margin is more broadly rounded. Our specimen is a cast, and does not show the surface-markings, excepting on the anterior wing, where the marks of growth are rather distinct and subimbricating.

Locality and position. Long Lake, above Fort Pierre, formation No. 5.

INOCERAMUS CUNEATUS, M. & H.—Shell oblong-ovate, moderately gibbous in the umbonal and anterior regions, very nearly or quite equivalve, rather thin; buccal side descending from the beaks at first, almost at right angles to the hinge, after which it gradually curves obliquely backward and downward, so as to pass by a graceful sweep into the base; posterior side long, compressed, broader than the other extremity, and regularly rounded; ventral border forming a semioval curve, the most prominent part of which is behind the middle; hinge very long, and nearly straight. Beaks very nearly terminal, or located almost directly over the anterior border, oblique, rising little above the hinge, equal, and but slightly incurved. Surface marked by rather distinct, more or less regular undulations. Length 3.90 inches; height 2.75 inches; convexity 2 inches.

Locality and position. Yellow Stone River, 150 miles above the mouth, in beds containing a blending of the fossils of formations Nos. 4 and 5.

INOCERAMUS VANUXEMI, M. & H.—Shell large, subcircular or broad oval, equivalve, and much compressed; anterior margin rounded; base forming a nearly semicircular curve, being a little more prominent behind than in front; posterior side longer and wider than the other, broadly rounded or subtruncate; hinge (of moderate length?) straight, and forming an angle of about 70° with the axis of the umbones. Beaks small, compressed, scarcely rising above the hinge, not distinctly incurved, located a little in advance of the middle. Surface ornamented by regular, distinct, angular, but not very prominent concentric undulations, which are separated by rather shallow depressions. Length of the largest specimen we have seen, 10 inches; height of do. 9 inches.

Locality and position. White River above the Bad Lands, in upper part of formation No. 4.

INOCERAMUS BALCHII, M. & H.—Shell large, subquadrate, or broad oblong-oval, much compressed; anterior side truncate obliquely forward above, at an angle of about 115° with the hinge, rounding into the base below; ventral margin forming a broad curve, the most prominent part of which is a little behind the middle; posterior side longer and wider than the other, broadly rounded, (sometimes subtruncate above?); hinge line rather long, forming an

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angle of about 60° with the umbonal axis. Beaks narrow, rising somewhat above the hinge, scarcely incurved, located about half way between the middle and the most prominent part of the anterior border. Surface ornamented by very slightly elevated, broadly rounded, rather irregular undulations, which become entirely obsolete on large specimens below the middle, and on the posterior as well as the lower anterior regions. Attains a diameter of $3\frac{1}{2}$ to 4 inches.

Named after Lieut. G. T. Balch, of U. S. Ordinance—who discovered the only specimens of the species we have seen.

Locality and position. White River above the *Mauvaises Terres*.

INOCERAMUS SUBCOMPRESSUS, M. & H.—Shell rhombic-oval, compressed, very thin; anterior side rounded below the beaks; base forming a long semiovate curve, the most prominent part of which is behind the middle; posterior side long, very narrowly rounded and prominent below the middle, subtruncate obliquely forward above; hinge of moderate length, forming an angle of about 40° with the umbonal axis. Beaks small, scarcely rising above the hinge, located nearly over the anterior extremity. Surface ornamented by somewhat regular concentric undulations. Length 2.55 inches; height 1.70 inches.

Locality and position. Mouth of Judith River, formation No. 1? of Nebraska section.

INOCERAMUS AVICULOIDS, M. & H.—Shell compressed, often broad ovate or subcircular when young, but becoming obliquely oval or subrhomboidal in outline as it advanced in age; substance thin and fragile. Anterior and basal margins forming a broad gentle curve; posterior extremity narrowly rounded below, ascending obliquely forward, with a slightly convex outline above, and meeting the hinge at an angle of about 120° . Hinge margin long, straight and compressed, so as to form an alate expansion behind. Beaks nearly terminal, scarcely rising above the hinge, not gibbous or distinctly incurved. Surface ornamented by more or less regular concentric undulations and obscure lines of growth. Length from the beaks obliquely backward and downward to the postero-basal edge, about 3 inches; height from base to hinge, 2.30 inches.

Locality and position. Little Blue River, formation No. 3.

ANOMIA OBLIQUA, M. & H.—Shell thin, broad oval, subcircular, or somewhat irregular, and more or less oblique; upper valve rather convex, beak nearly or quite marginal, and placed nearer the anterior side, moderately gibbous; surface marked concentrically by fine obscure lines, and small wrinkles of growth. Length about 1.32 inches; breadth 1.16 inches.

Locality and position. Near mouth of Niobrara River, in formation No. 3 of the Nebraska section.

ANOMIA SUBTRIGONALIS, M. & H.—Shell subtrigonal, approaching subcircular, extremely thin and fragile; upper valve moderately convex; anterior side subtruncate, with a slightly convex outline, rounding abruptly at its junction with the ventral margin; posterior side obliquely truncate from the beak, and very narrowly rounded at its connection with the ventral border, provided with a broad, oblique, rounded fold; pallial margin nearly straight, or but slightly convex; umbo marginal and rather prominent. Lower valve nearly flat, or compressed, and more irregular than the other. Surface marked by small, irregular, concentric wrinkles, and very obscure lines of growth. Length 1.57 inch; breadth 1.14 inch.

Locality and position. Bijou Hill, on the Missouri, formation No. 4.

OSTREA INORNATA, M. & H.—Shell small, narrow subovate, rather thin, attached by the whole under surface of the lower valve; beaks pointed and curved usually to the left side; under valve conforming to the contour of the surface to which it adhered, moderately concave, area small and narrow; upper valve rather convex, having its beak less pointed than that of the other valve;

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surface smooth, or only marked by very obscure lines of growth, with sometimes a few very small, irregular, nearly obsolete radiating wrinkles near the lower border. Length about 1.40 inches; breadth 0.87 inch.

Locality and position. Great Bend of the Missouri, below Fort Pierre—lower part of No. 4, Nebraska section.

JURASSIC SPECIES.

CONCHIFERA.

PHOLADOMYA HUMILIS, M. & H.—Shell transversely oblong-oval, ventricose; posterior end rounded, and more or less gaping; base nearly straight along the middle; anterior end very short, narrowly rounded below the beaks; dorsum nearly parallel with the base, slightly concave in outline; escutcheon lanceolate, and bounded by an obscure angle on each side; beaks depressed, gibbous, incurved, and located in advance of the middle; surface ornamented by small, regular, concentric wrinkles, crossed by a few raised lines, or obscure, distant, radiating costæ, extending from the back part of the beaks, to the posterior, and postero-basal margins. Length about 1.06 inch; height 0.52 inch; breadth 0.52 inch.

Locality and position. Lower Jurassic series, at the south-west base of the Black Hills.

MYACITES NEBRASCENSIS, M. & H.—Shell elongate, subelliptical, rather convex; extremities narrowly rounded, the posterior end being sometimes apparently obliquely subtruncate, and more or less gaping above; base nearly straight, or very slightly sinuous along the middle, rounding up gradually towards the ends; dorsum behind the beaks concave in outline; posterior umbonal slopes gibbous, or prominently rounded; antero-ventral region a little compressed, or contracted from near the middle of the base obliquely forward and upward; beaks moderately elevated, gibbous, incurved, and located near the anterior end; surface ornamented by concentric striæ, and small, very obscure, irregular parallel wrinkles. Length about 1.43 inch; height 0.69 inch; breadth 0.59 inch.

Locality and position. South-west base Black Hills. Jurassic.

THRACIA? SUBLEVIS, M. & H.—Shell narrow oblong-oval, rather compressed; anterior end narrowly rounded; base nearly straight along the middle, rounding up toward the ends; posterior side longer than the other, rounded or slightly truncate, and apparently gaping a little at the extremity; dorsal border concave in outline, and nearly horizontal behind the beaks, declining more abruptly in front; beaks moderately elevated, the right one being usually a little higher than the other, located in advance of the middle; posterior umbonal slopes prominently rounded; surface concentrically striate; hinge and interior unknown. Length 1.17 inch; height 0.60 inch; breadth about 0.32 inch.

Locality and position. Near the middle of the Jurassic deposits at the south-west base of the Black Hills.

THRACIA? ARCUATA, M. & H.—Shell small, transversely subovate, more or less arcuate, moderately convex; extremities rather narrowly rounded, and a little gaping; cardinal margin sloping from the beaks, anterior slope more abrupt than the other; beaks rather elevated and unequal, that of the right valve being higher than the other, located in advance of the middle; posterior and anterior umbonal slopes prominent; sides of the valves flattened or slightly concave in the central region near the base; surface of cast retaining small concentric marks of growth; hinge and interior unknown. Length, 0.62 inch; height, 0.37 inch; thickness or convexity, 0.23 inch.

Locality and position. Same as last.

CARDIUM SHUMARDI, M. & H.—Shell small, subcircular, rather gibbous; an-

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terior side rounded; base more broadly rounded; posterior side obliquely subtruncate above and passing with an abrupt curve into the base below; hinge margin rather short, and sloping slightly from the beaks, which are moderately elevated, gibbous and nearly central; posterior umbonal slopes angular; surface of cast retaining only traces of small radiating costæ or lines on the prominent posterior umbonal slopes, and flattened postero-dorsal region; hinge and interior unknown. Length 0.44 inch; height 0.37 inch; thickness 0.32 inch.

Named in honor of Dr. George G. Shumard, of the Texas Geological Survey.
Locality and position. Jurassic, beds south-west base of Black Hills.

TANCREEDIA? ÆQUILATERALIS, M. & H.—Shell very nearly equilateral, moderately convex; anterior end rather narrowly rounded; base forming a broad, regular, semielliptical curve; posterior end slightly truncate on the upper oblique slope, narrowly rounded below, apparently not gaping; beaks depressed, located a little in advance of the middle; surface of cast retaining traces of concentric striæ; hinge and interior unknown. Length 1 inch; height 0.64 inch; breadth about 0.16 inch.

Locality and position. South-west base Black Hills—Jurassic.

TANCREEDIA WARRENANA, M. & H.—Shell small, trigonal ovate, moderately convex, anterior half a little narrower and more compressed than the other, narrowly rounded at the extremity; base forming a broad gentle curve; posterior side subtruncate, angular, or abruptly rounded below; dorsum sloping from the beaks, the anterior slope being slightly concave in outline, and the other nearly straight, or a little convex; beaks elevated, but not extending much above the cardinal edge; posterior umbonal slopes prominent, or subangular; surface and hinge unknown.

Named in honor of Lieut. G. K. Warren, U. S. Top. Engineers.

Length 0.50 inch; height 0.33 inch; breadth about 0.14 inch.

Locality and position. Same as last.

ASTARTE FRAGILIS, M. & H.—Shell small, rather broad oval, thin, moderately compressed; anterior end rounded; base nearly straight along the middle, rounding up regularly in front, and more abruptly behind; posterior extremity obscurely subtruncate; dorsum straight and slightly declining behind the beaks, which are small, obtuse, rather depressed, and located a little in advance of the middle; posterior umbonal slopes prominent; surface ornamented by distinct, irregular concentric wrinkles and fine parallel striæ; hinge and interior unknown; pallial margin crenulate within. Length 0.45 inch; height 0.32 inch; breadth or convexity 0.18 inch.

Locality and position. South-west base of the Black Hills—Jurassic.

ASTARTE INORNATA, M. & H.—Shell subelliptical, compressed; extremities rounded, the posterior margin forming a broader curve than the other; base semielliptical in outline; dorsum declining from the beaks, the anterior slope being a little concave, and the other nearly straight or slightly convex; beaks moderately elevated, compressed, angular in front, located just in advance of the middle; lunule rather deep, lance-oval, bounded on each side by a more or less distinct angle; surface marked by concentric striæ, with a tendency to develop small, very obscure concentric wrinkles. Length 1.15 inches; height 0.79 inch; breadth or convexity 0.44 inch.

Locality and position. Same as last.

TRIGONIA CONRADI, M. & H.—Shell rather small, subtrigonal, moderately convex; anterior side truncate; base rounded; posterior side sloping obliquely from the beaks above, and apparently vertically truncate at the extremity; beaks elevated, narrow, incurved, and located in advance of the middle; posterior umbonal slopes distinctly angular; surface ornamented by rather small, obscure concentric costæ, which on the posterior side of the valves, descend

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at first perpendicularly, after which they are deflected forward parallel to the basal and anterior borders. Length and height, each about 0.97 inch; convexity 0.58 inch.

Locality and position. South-west base Black Hills, Jurassic.

Named in honor of Mr. T. A. Conrad, the well known palæontologist, of Philadelphia.

PECIEN EXTENUATUS, M. & H.—Shell broad ovate, or sub-circular, thin, compressed; basal margin rounded; beaks small; hinge line rather short; ears unknown; surface apparently having only concentric striæ of growth. Height 0.98 inch, length 0.90 inch; convexity 0.28 inch.

Locality and position. South-west base of Black Hills, in a sandstone of lower Jurassic age.

PALÆOZOIC.

MYALINA AVICULOIDES, M. & H.—Shell subtrigonal, higher than long, very convex, or sometimes subangular down the umbonal slopes; anterior margin distinctly sinuous above the middle, thence descending with a slightly convex curve, nearly at right angles with the hinge, to the basal extremity, which is narrowly rounded; posterior side compressed, its margin curving a little forward above, or intersecting the hinge at right angles, slightly convex, and nearly perpendicular along the middle, below which it curves obliquely forward to the abruptly rounded basal extremity; hinge straight, nearly equalling the length of the shell; beaks very convex, subangular, and curving rather abruptly forward, so as to become nearly, or quite terminal; surface having moderately distinct marks of growth. Length, 1.48 inch; height, 1.66 inch; convexity, (of left valve), 0.32 inch.

This will be readily distinguished from all the other species of the genus known to us, by its more accurate front, and the extension of its anterior margin under the beaks, above its most sinuous part.

Locality and position. From the upper beds, containing Permian types of fossils, on Cottonwood creek, Kansas Territory.

NOTE. In going carefully over these extensive collections, we have in addition to finding the new species here described, succeeded in working from the matrix, better specimens of many of those already published by us, than had been previously obtained. The additional information derived from these, and a more careful review of the subject has enabled us to make several corrections in the synonymy, as well as in the generic references, a list of which is given below.

It will also be observed, that we have made quite a number of other changes, in order to range the species under the oldest generic names proposed after the introduction by Linnæus, of the binomial system. We must confess, however, that we have some doubts whether science is to be much benefited by a strict observance of the law of priority, in such cases as those where it becomes necessary to change long established names. We nevertheless make some such changes in conformity with usages rapidly gaining ground, and probably destined soon to become universal amongst conchologists and laborers in other departments of Natural History.

The transfer of several species formerly published under the names *Hamites*, *Ancylloceras*? and *Turrilites*, to the genus *Helicoceras*, has been made in accordance with the views of Mr. Daniel Sharpe, (Fossil Mol. Chalk, England, part 3d, Cephalopoda, p. 59, Paleont. Soc.) who refers all the so called *Turrilites* having rounded whorls, with the siphuncle placed on the dorsal or outer side, to the genus *Helicoceras*, whether the whorls are in contact or not. The genus *Turrilites*, he restricts to those forms having more or less angular contiguous whorls, with the siphuncle located near the suture. The fact of the whorls of those forms with rounded volutions being in contact or not, can scarcely be

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regarded in all cases, of even specific importance, since it is now well known that in some instances the same species presents both these peculiarities, and sometimes the whorls of one part of the spire are in contact, and in others disconnected, even in the same individual.

Our specimens confirm Mr. Sharp's views, for although they are but mere fragments, it is evident they are parts of spiral shells, presenting intermediate gradations between forms with whorls barely in contact, and others in which they are clearly disconnected.

Mr. D'Orbigny describes the septa of the genus *Helicoceras* as being unsymmetrical, like those of *Turrilites*, this, however, is not always the case in species, the whorls of which make a very broad curve around a large umbilical cavity, for in some of our specimens of this kind, the corresponding lobes on opposite sides of the siphuncle, present scarcely the slightest inequality, and in other instances seem to be as nearly symmetrical as in *Hamites*, or any of the allied genera.

Names formerly used.

- HAMITES* MORTONI, Hall & Meek. }
Helicoceras tenuicostatum, Meek & Hayden. }
TURRILITES (*HELICOCERAS*) COCHLEATUS, M. & H. }
ANCYLOCERAS? *NEBRASCENSIS*, Meek & Hayden. }
Turrilites Nebrascensis, Meek & Hayden. }
ANCYLOCERAS? *CHEYENNENSIS*, Meek & Hayden. }
Turrilites Cheyennensis, Meek & Hayden. }
TURRILITES UMBILICATUS, Meek & Hayden.
AMMONITES PERCARINATUS, Hall & Meek,
 presents extremely different characters, at
 various stages of its growth; probably not
 distinct from *A. WOOLGART*, of Mantell.
AMMONITES CORDIFORMIS, Meek & Hayden,
 probably identical with *A. CORDATUS*, Sowerby.
PLANORBIS FRAGILIS,* M. & H. (non Dunker.)
PLANORBIS SUBUMBILICATUS, Meek & Hayden.
PLANORBIS AMPLEXUS, Meek & Hayden.
PALUDINA CONRADI, Meek & Hayden.
PALUDINA MULTILINEATA, Meek & Hayden.
PALUDINA LEAI, Meek & Hayden.
PALUDINA RETUSA, Meek & Hayden.
PALUDINA TROCHIFORMIS, Meek & Hayden.
TURRITELLA MOREAUSIS, Meek & Hayden.
SCALARIA CERITHIFORMIS, Meek & Hayden.
TURBO NEBRASCENSIS, Meek & Hayden.
ROSTELLARIA BIANGULATA, Meek & Hayden.
FUSUS CONTORTUS, Meek & Hayden.
BUCCINUM? *VINCULUM*, Hall & Meek.
ACTEON ATTENUATUS, Meek & Hayden.
ACTEON CONCINNUS, Hall & Meek, }
Avellana subglobosa, Meek & Hayden. }
ACTEON SUBELLIPTICUS, Meek & Hayden.
NATICA PALUDINIFORMIS,* Hall & Meek.
 (non *N. paludiniiformis*, D'Orbigny.)
BULLA SUBCYLINDRICA,* Meek & Hayden.
CORBULA VENTRICOSA, Meek & Hayden.
CORBULA MOREAUSIS, Meek & Hayden.
CYTHAREA TENUIS, Hall & Meek.
CYTHAREA PELLUCIDA, Meek & Hayden.
CYTHAREA DEWEYI, Meek & Hayden.
CYTHAREA OWENANA, Meek & Hayden.
CYTHAREA ORBICULATA, Meek & Hayden.
CYCLAS FORMOSA, Meek & Hayden.
CYCLAS FRAGILIS, Meek & Hayden.
CYCLAS SUBELLIPTICA, Meek & Hayden.
HETTANGIA AMERICANA, Meek & Hayden.
NUCULA EVANSI, Meek & Hayden.
NUCULA SCITULA, Meek & Hayden.
CUCULLEA SHUMARDI, Meek & Hayden.
PECTUNCULUS SIOUXENSIS, Hall & Meek.
PECTUNCULUS SUBIMBRICATUS, Meek & Hayden.

Names here adopted.

- HELICOCERAS* MORTONI.
HELICOCERAS COCHLEATUM.
HELICOCERAS NEBRASCENSE.
HELICOCERAS CHEYENNENSE.
HELICOCERAS UMBILICATUM.
PLANORRIS PLANOCONVEXUS.
VALVATA SUBUMBILICATA.
HELIX (*POLYGYRA*) AMPLEXUS.
VIVIPARA CONRADI.
VIVIPARA MULTILINEATA.
VIVIPARA LEAI.
VIVIPARA RETUSA.
VIVIPARA TROCHIFORMIS.
CERITHIOPSIS MOREAUSIS.
TERBONILLA (*CHEMNITZIA*) CERITHIFORMIS.
MARGARITA NEBRASCENSIS.
APORRHAI BIANGULATUS.
PLEUROTOMA CONTORTA.
FUSUS *VINCULUM*.
SOLIDULUS ATTENUATUS.
AVELLANA CONCINNA.
SOLIDULUS (*ACTEONINA*?) SUBELLIPTICUS.
AMAUROPSIS PALUDINIFORMIS.
BULLA SPECIOSA.
NEERA VENTRICOSA.
NEERA MOREAUSIS.
MERETRIX TENUIS.
MERETRIX PELLUCIDA.
MERETRIX DEWEYI.
MERETRIX OWENANA.
MERETRIX ORBICULATA.
SPHERIUM FORMOSUM.
SPHERIUM FRAGILE.
SPHERIUM SUBELLIPTICUM.
TANCREDIA AMERICANA.
LEDA EVANSI.
LEDA SCITULA.
CUCULLEA FIBROSA, Sowerby.
AXINÆA SIOUXENSIS.
AXINÆA SUBIMBRICATA.

*The names followed by an asterisk, were pre-occupied.

Descriptions of Fourteen new species of Schizostomæ, Anculosæ and Lithasiæ.

BY ISAAC LEA.

It will be observed that I have in this paper adopted my first name (*Schizostoma*) for the division of those *Melanidæ* which have a cut or fissure in the upper portion of the last whorl. This name I proposed in December, 1842. Subsequently finding that it was used by Bronn in 1835 I abandoned it, and proposed the name of *Schizochilus* as a substitute, (Obs. on the Genus Unio, v. 5, p. 51, 1852.) I am now satisfied that Bronn's name was applied to the same genus—*Euomphalus*—which Sowerby established in 1814, (Min. Conch. tab. 45.) This evidently liberates my original name, and Herrmannsen, in the Appendix to his "Generum Malacozorum," very properly restores it. It was supposed that this was the *Melatoma* of Swainson, and Mr. Anthony adopted this name. But it is evident that Mr. Swainson's *Melatoma* is not my *Schizostoma*. By reference to his figure (Malacology, p. 342, f. 104) it will be observed at once that there has never been observed in the United States any of the group of which that figure is the type, while it is known that they exist in the islands of the Indian Ocean. Mr. Swainson says (p. 202) that his *Melatoma* was "founded upon a remarkable Ohio shell" sent by Rafinesque. Now, as no member of the family *Melanidæ* with a cut in the lip has ever been found in the Ohio, where such hosts of active collectors have since pursued their investigations, it is perhaps beyond the bounds of possibility that the specimen sent by Rafinesque, so eminently careless and reckless as he always was, should ever have been found there. Indeed, if the specimen figured was sent by Mr. Rafinesque to Mr. Swainson, then the question would arise whether it had not been obtained by Mr. R. from some dealer or collector, who may have obtained it from Asia. I have no doubt of the *Melatoma costata*, which Mr. Swainson has figured, being exotic, and belonging to a group probably from the Philippine Islands. Mr. Anthony says, page 64, Proc. A. N. S. 1860, that "it may be doubted whether Mr. Lea's first name will not eventually prevail, since, before he published *Schizostoma*, Bronn's genus of the same name had been called a synonym of *Bifrontia*, Desh." And that "H. and A. Adams (Gen. Rec. Moll. 1, 105) do not appear correct in giving preference to *Gyrotoma* over *Schizostoma*, Lea," &c. Notwithstanding this, Mr. Anthony in this paper, where he describes nine supposed new species of this genus, adopts the generic name of *Gyrotoma*. It may be added here that Dr. Gray, in his *Genera of Recent Mollusca*, gives *Melatoma* to Mr. Anthony, not to Swainson, while he does not notice the name of *Schizostoma*. Mr. A. does not pretend to claim it, of course, but adopts *Gyrotoma*, Mr. Shuttleworth's name, proposed in 1845, which being three years later cannot have precedence.

The genus *Schizostoma* seems to be capable of being divided into two natural groups in the form of the *fissura*, the cut in the lip. In one group this fissura is deep and direct, that is parallel with the suture or upper edge of the whorl; in the other it is not deep and is oblique to the suture.

In Mr. Anthony's paper (Proc. Acad. Nat. Sci. Feb., 1860) I recognize several of my old species. His *Gyrotoma demissa* I believe to be my *Schizostoma constricta*. His *G. quadrata* to be my *S. incisa*.

SCHIZOSTOMA CASTANEA.—Testâ carinatâ, conicâ, subcrassâ, tenebroso-fuscâ, imperforatâ; spirâ elevatâ; suturis valdè impressis; anfractibus senis, planulatis, unicarinatis, quadrivittatis; fissurâ rectâ, angustâ profundâque; aperturâ parviusculâ, ellipticâ, intus vittatâ, ad basim subrotundatâ; columellâ albâ, incrassatâ; labrò acuto, vix sinuato.

Hab.—Coosa River, Alab. E. R. Showalter, M. D.

SCHIZOSTOMA GLANS.—Testâ lævi, ovato-conicâ, inflatâ, subcrassâ, luteo-corneâ, striatâ, imperforatâ; spirâ obtusè elevatâ; suturis regulariter impressis; anfractibus senis, obsolete vittatis, ultimo subgrandi; fissurâ rectâ, angustâ

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profundâque; aperturâ parviusculâ, ellipticâ, intus albidâ, ad basim obtusè angulatâ; columellâ albidâ, supernè incrassatâ; labro-acuto, subsinuato.

Hab.—Coosa River, Alab. E. R. Showalter, M. D.

SCHIZOSTOMA GLOBOSA.—Testâ transversè striatâ, globosâ, subtenui, luteola, imperforatâ; spirâ curtâ, obtusè conoideâ; suturis impressis; anfractibus quaternis, trivittatis, ultimo grandi; fissurâ rectâ, angustâ brevique; aperturâ subgrandi, ellipticâ, intus vittatâ, ad basim angulatâ; columellâ albâ, incurvatâ; labro acuto, expanso.

Hab.—Alabama. E. R. Showalter, M. D.

SCHIZOSTOMA VIRENS.—Testâ subnodulosâ, curtâ, inflatâ, subcrassâ, tenebroso-viridi, exilissimè striatâ, imperforatâ; spirâ obtusâ; suturis impressis; anfractibus subplanulatis et trivittatis; fissurâ obliquâ brevique; aperturâ elongatâ, subpyriformi, intus tenebroso-vittatâ; columellâ supernè purpuratâ et incrassatâ; labro acuto, sinuato.

Hab.—Coosa River, Alab. E. R. Showalter, M. D.

SCHIZOSTOMA GLANDULA.—Testâ lævi, curtâ, inflatâ, subcrassâ, luteo-corneâ, exilissimè striatâ, imperforatâ; spirâ obtusâ; suturis valdè impressis; anfractibus senis, vittatis, ultimo magno et tumido; fissurâ obliquâ brevique; aperturâ subgrandi, ellipticâ, intus albidâ; columellâ albidâ, supernè incrassatâ; labro acuto, subsinuato.

Hab.—Coosa River, Alab. E. R. Showalter, M. D.

SCHIZOSTOMA WETUMPKAENSIS.—Testâ striatâ, ovato-cylindraceâ, crassâ, pallido-fuscâ, perforatâ; spirâ obtusâ, conoideâ; suturis valdè impressis; anfractibus senis, vittatis, planulatis, ultimo grandi; fissurâ obliquâ brevique; aperturâ grandi, ovatâ, intus vittatâ, ad basim obtusè angulatâ; columellâ albâ, supernè incrassatâ; labro acuto, sinuato.

Hab.—Coosa River, at Wetumpka, Alabama. E. R. Showalter, M. D.

SCHIZOSTOMA ALABAMENSIS.—Testâ striatâ, ellipticâ, robustâ, luteo-olivaceâ, imperforatâ; spirâ obtuso-conoideâ; suturis valdè impressis; anfractibus senis, vittatis, subinflatis, ultimo pergrandi; fissurâ obliquâ subbrevique; aperturâ subgrandi, ovatâ, intus vittatâ, ad basim rotundatâ; columellâ albâ, infernè et supernè paulisper incrassatâ; labro acuto, sinuato.

Hab.—Alabama. B. W. Budd, M. D., and E. R. Showalter, M. D.

SCHIZOSTOMA HARTMANI.—Testâ lævi, subcylindraceâ, crassâ, luteo-corneâ, imperforatâ; spirâ elevatâ; suturis valdè impressis; anfractibus planulatis, ultimo subgrandi; fissurâ rectâ subbrevique; aperturâ parviusculâ, ovatâ, intus albâ, ad basim obtusè angulatâ; columellâ albâ, incurvâ, infernè paulisper incrassatâ; labro acuto, sinuato.

Hab.—Coosa River, Alab. W. D. Hartman, M. D.

SCHIZOSTOMA PUMILA.—Testâ striatâ, turbonatâ, subtenui, pallido-corneâ, imperforatâ; spirâ valdè obtusâ; suturis valdè impressis; anfractibus senis, ventricosis, ultimo permagno; fissurâ rectâ subbrevique; aperturâ parviusculâ, ovatâ, intus albâ, ad basim angulatâ et subcanaliculatâ; columellâ albâ, contortâ, infernè incrassatâ; labro acuto, sinuato.

Hab.—Alabama. B. W. Budd, M. D.

ANCULOSA FORMOSA.—Testâ lævi, globosâ, subtenui, diaphanâ, vel luteolâ vel crocatâ, valdè vittatâ et maculatâ; spirâ depressâ vix conspicuâ; suturis impressis; anfractibus ternis, ultimo magno et valdè ventricoso; aperturâ grandi, subrotundâ, intus pallido-crocatâ et tenebroso-vittatâ; columellâ infernè et supernè incrassatâ et pallido-purpuratâ; labro acuto et valdè expanso.

Hab.—Coosa River, Shelby Co., Alabama. E. R. Showalter, M. D.

ANCULOSA CONTORTA.—Testâ lævi, globoso-ovoideâ, crassâ, luteo-corneâ; spirâ elevatâ; suturis valdè impressis; anfractibus inflatis, obsoletè transversè
1860.]

striatis; aperturâ parvâ, subrotundâ, contractâ, intus luteo-albâ; columellâ incrassatâ; labro acuto, expanso.

Hab.—Coosa River, at Watumpka, Alab. E. R. Showalter, M. D.

ANCULOSA VITTATA.—Testâ lævi, subglobosâ, crassâ, luteolâ, valdè vittatâ; spirâ obtusâ; suturis impressis; anfractibus quarternis, inflatis, ultimo magno et ventricoso; aperturâ rotundâ, in faucibus valdè constrictâ, intus vittatâ; columellâ valdè incrassatâ, planulatâ, purpuratâ; labro acuto, expanso.

Hab.—Coosa River, at Watumpka, Alabama. E. R. Showalter, M. D.

LITHASIA SHOWALTERII.—Testâ lævi, ovato-cylindraceâ, subcrassâ, luteo-corneâ, vittatâ; spirâ obtusè conoideâ; suturis valdè impressis, anfractibus senis, ultimo magno et planulato: aperturâ grandî, subovatâ, elongatâ, intus albidâ, tenebroso-vittatâ, ad basim obtusè angulatâ; columellâ infernè et supernè incrassatâ, incurvâ; labro acuto et subconstricto.

Hab.—Coosa River, at Watumpka, Alabama. E. R. Showalter, M. D.

LITHASIA NUCLEA.—Testâ lævi, ellipticâ, luteo-olivâ, crassâ, solidâ, trivittatâ; spirâ obtusè conoideâ; suturis impressis; anfractibus quinis, ultimo magno et paulisper inflato; aperturâ parviusculâ, ovato-rotundâ, intus albidâ, trivittatâ, ad basim recurvatâ; columellâ infernè et supernè incrassatâ, incurvâ; labro acuto.

Hab.—Coosa River, Alabama. E. R. Showalter, M. D.

Catalogue of Birds collected during a survey of a route for a ship Canal across the Isthmus of Darien, by order of the Government of the United States, made by Lieut. N. Michler, of the U. S. Topographical Engineers, with notes and descriptions of new species.

BY JOHN CASSIN.

(Continued from page 144.)

84. *THAMNOPHILUS ATRICAPILLUS*, (Gmelin).

Lanius atricapillus, Gm. Syst. Nat. i. p. 303, (1788).

Lanius pileatus, Lath. Ind. Orn. i. p. 76, (1790).

Vieill. Ois. D'Am. Sept. pl. 48, 49. Buff. Pl. Enl. 479, fig. 2.

From Carthagera.

"On the Popa mountain at Carthagera, constantly flying across the pathway, and was evidently catching small *Lepidoptera* and *Diptera*. Has a prolonged note somewhat like one note of the Cat bird of the United States. Very shy, and not easily obtained, though abundant." (Mr. W. S. Wood, Jr.)

85. *THAMNOPHILUS NÆVIUS*, (Gmelin).

Lanius naevius, Gm. Syst. Nat. i. p. 308, (1788).

Leach, Zool. Misc. i. pl. 17. Sw. B. of Braz. pl. 59.

From the River Truando.

"Frequently seen, and generally on the ground, in patches of a plant called "Spanish Bayonet," by the people of the country, on which it seemed to be catching insects. At Camp Toucey, in January, 1858." (Mr. W. S. Wood, Jr.)

86. *THAMNOPHILUS TRANSANDEUS*, Slater.

Thamnophilus transandus, Sclat. Proc. Zool. Soc. Lond. 1855. p. 18.

From Turbo.

Appears to be this species, having the under tail coverts tipped with white, and is rather larger than specimens of *T. melanurus*, in the Acad. Coll. Very nearly allied, though, to that species.

"In very thick bushes on the banks of a creek near Turbo, seen only once,

[May,

and very shy. Has a harsh loud note, and appeared to be pursuing large insects, occasionally alighting on the ground." (Mr. W. S. Wood, Jr.)

87. THAMNOPHILUS.

From Turbo.

Two specimens labelled as females, nearly allied to *T. caesius*, (Cuv.) and *T. aethiops*, Sclater.

88. THAMNOPHILUS,

From the River Truando.

Several specimens, all in young plumage, probably of a species allied to *T. atricapillus*.

"All of the preceding five species live in the bushes, and are often to be seen on the ground, and appear to subsist by capturing insects in various stages, which are exceedingly abundant. All of them are more or less noisy, having harsh, though not always disagreeable notes, which can constantly be heard where they frequent. When alarmed, they take long flights very precipitately, and are not easily collected." (Mr. W. S. Wood, Jr.)

89. PACHYRHAMPHUS RUFESCENS, (Spix) ?

From Turbo. A single specimen in young plumage.

"On the Cremantina, a high tree with very abundant foliage. Has much the habits of a Fly-catcher, darting out in pursuit of insects, and returning to its perch, and moving his tail in the same manner." (Mr. W. S. Wood, Jr.)

Genus PITTASOMA, nobis.

General aspect of *Conopophaga*, Vieillot, but larger, and bearing about the same relation to that genus as *Grallaria*, Vieillot, does to *Grallaricula*, Sclater. Also resembling *Pitta*, Vieillot, but differing from all the genera here mentioned, except *Conopophaga*, in having the bill wide and depressed, not compressed.

Form robust, wings short, concave, rounded, fifth, sixth and seventh quills longest; tail very short; bill strong, wide at base and narrowing gradually, depressed, upper mandible notched near the tip, and with the culmen distinct, a few rudimentary bristles at base; nostrils oval, inserted in a large membrane; legs long, very strong, tarsus with about five large scales in front, which become nearly integral on the outside, and quite so behind; toes moderate; claws curved, sharp.

90. PITTASOMA MICHLERI, nobis.

♂ Head above black, the shafts of the feathers lustrous, large space on the cheek, extending completely around the neck behind, bright chestnut, throat black, many of the feathers tipped with white, and with chestnut, lores white; back reddish olive, many feathers edged with black on each side; rump, upper tail coverts and wing coverts greenish rufous, the last (wing coverts) with small terminal spots of white, which spots are edged and nearly enclosed with black; under parts white, every feather having two or three rather wide, transverse, waved or crescent-shaped bands of deep black; abdomen and under tail coverts, tinged with ferruginous, but transversely striped with black, same as other under parts of body; under wing coverts, dull greenish brown, striped and spotted with white and black; quills greenish rufous, some of the shorter quills having sub-terminal spots of light rufous, edged with black; tail greenish rufous; upper mandible dark bluish horn color, lighter towards the tip; under mandible yellow, legs light horn color.

Total length from tip of bill to end of tail, about 7 inches, wing $3\frac{3}{4}$, tail $1\frac{1}{2}$, bill from gape $1\frac{3}{8}$, tarsus $1\frac{7}{8}$ inches.

Hab. River Truando, New Grenada. Discovered by Mr. William S. Wood, Jr. and Mr. Charles J. Wood. (Panama, Mr. J. McLeannan). Spec. in Nat. Mus. Washington.

This is the most remarkable bird in the collection of the expedition, and is one of the most handsome of the Ant Thrushes, if indeed to that group it and the 1860.]

genus *Conopophaga* belong. Though with the general form and appearance of *Pitta* and *Grallaria*, this bird differs from them in having a very strong *depressed* and rather wide bill, not *compressed* as in those genera. In this respect, and other structural characters, it approximates to *Conopophaga*, and also in having more variegated and agreeable colors than in *Grallaria*. This bird is in fact, the most handsome bird of its group yet discovered in America. The only specimen in the collection of the expedition is labelled as a male.

Another and very fine specimen of this bird, kindly loaned to me by Mr. Lawrence, of New York, belongs to the collection of J. McLeannan, Esq., of that city, and was obtained by him on the Isthmus of Panama.

"On the river Truando. January 22d, 1858, above its junction with the Atrato, but before reaching the Cordilleras. In the woody places running on the ground very swiftly, and scratching among the leaves, not common." (Mr. C. J. Wood).

This handsome bird I have named in honor of the commanding officer of the expedition, Lieut. N. Michler, of the U. S. Topographical Engineers, under whose direction, and with whose judicious advice and assistance, the present interesting collection was made, as stated in the preliminary note to this paper.

91. FORMICIVORA GRISEA, (Boddært).

Turdus griseus, Bodd. Tab. Pl. Enl. p. 39, (1783).

Formicivora nigricollis, Swains. Zool. Jour. ii. p. 147.

Spix. Av. Bras. ii. pl. 41. Buff. Pl. Enl. 643.

From Carthagera.

"On the 'Popa' mountain, at Carthagera. Very abundant in the bushes, but very quick in motion, and shy, flying off on slight noise or alarm. November, 1857." (Mr. W. S. Wood, Jr.)

92. FORMICIVORA QUIXENSIS, (Cornalia).

"*Thamnophilus quixensis*, et *rufiventris*, Corn. Scater."

"*Myiothera perlata*." Label in Mus. Acad. Philadelphia.

From the river Truando.

Both sexes, much as given in the descriptions above cited and labelled by the collectors as male and female of the same species.

"Abundant at the camp in the Cordilleras, on the Rio Truando. In the high trees, actively capturing insects, and never observed descending to the bushes. The two plumages labelled as male and female, were constantly seen together, and were thought by my brother and myself to be the same bird." (Mr. W. S. Wood, Jr.)

93. HYPOCNEMIS NÆVIODES, (Lafresnaye).

Conopophaga nævioides, Lafr. Rev. Zool. 1847, p. 69.

From the falls of the Truando.

"At camp Floyd, on the south side of the river Truando, before reaching the first range of the Cordilleras. Running on the ground amongst bushes, and always in damp or marshy places, much resembling in its actions the Water Thrush of the United States, (*Seiurus noveboracensis*). Frequently seen in January and February, 1858." (Mr. W. S. Wood, Jr.)

94. MYRMOTHERULA PYGMÆA, (Gmelin).

Muscicapa pygmæa, Gm. Syst. Nat. i. p. 983, (1788).

Buff. Pl. Enl. 831.

From the river Truando.

"Abundant on the 'Cremantina' trees, especially at Camp Toucey, in January, 1853. Frequently seen also in the Plaintains or Bananas, constantly searching for insects amongst the fruit and leaves." (Mr. W. S. Wood, Jr.)

95. MYRMOTHERULA SURINAMENSIS, (Gmelin).

Sitta surinamensis, Gm. Syst. Nat. i. p. 442, (1788).

Lath. Gen. Hist. iv. pl. 62. Proc. Zool. Soc. London, 1853, pl. 141.

From Turbo.

"Frequently seen in the trees at Turbo, and the male was at first supposed

[May,

by my brother and myself, to be the black and white creeper of the United States, (*Mniotilta varia*). It has habits exactly like those of that bird, running along the upper or lower sides of the branches frequently with its head downwards. In April, 1858." (Mr. W. S. Wood, Jr.)

96. MYRMOTHERULA MELAENA, (Sclater).

Formicivora melaena, Sclat. Proc. Zool. Soc. London, 1857, p. 130.

From the river Truando.

"At Camp Toucey on the Truando, before reaching the Cordilleras. In the bushes, and very active in pursuit of insects. Has a short, rather loud note, often repeated, rendering pursuit very easy; solitary, but frequently seen." (Mr. W. S. Wood, Jr.)

97. MYRMOTHERULA ORNATA, (Sclater)?

Formicivora ornata, Sclat. Rev. et Mag. Zool. 1853, p. 480?

From the river Truando.

Several specimens, apparently immature, and not easily to be referred to either *M. gularis* or its allies, but unmistakably of that ilk.

"At Camp Toucey, on the Truando, and previously at Turbo. Seen in the high trees and also occasionally in the bushes, very active, and constantly in motion." (Mr. W. S. Wood, Jr.)

98. MYRMECIZA EXSUL, Sclater.

Myrmeciza exsul, Sclat. Proc. Zool. Soc. London, 1858, p. 540.

From Turbo.

One specimen only, labelled as a male and very nearly as described by Mr. Sclater as above cited.

99. MYRMECIZA EXSUL, Sclater?

Very similar to the preceding, and probably the same species, but with the entire under parts reddish chestnut brown, nearly uniform with the upper parts, throat only ashy black.

From Turbo.

"These two birds were considered to be the same species by my brother and myself, notwithstanding the difference in the color of the under parts. We met with this species in the thick and dry parts of the forest at Turbo, rather plenty, but not easily shot on account of their running on the ground very swiftly, and concealing themselves amongst the leaves. It utters loud, rather musical notes, somewhat similar to those of the Golden-crowned Thrush, (*Seiurus*) of the United States." (Mr. W. S. Wood, Jr.)

100. PIPRA AURICAPILLA, (Brisson).

Manacus auricapillus, Briss. Orn. iv. p. 448, (1760).

Desm. Manak. pl. 60. Hahn & Küster, Orn. Atlas, pl. 92.

From Turbo.

101. PtiloCHLORIS RUFO-OLIVACEUS, Lafresnaye.

Ptilochloris rufo-olivaceus, Lafres. Rev. Zool. 1838, p. 238.

From the Truando.

"At camp Toucey. On the ground, seen once only." (Mr. W. S. Wood, Jr.)

102. SEIURUS NOVEBORACENSIS, (Gmelin).

Motacilla noveboracensis, Gm. Syst. Nat. i. p. 958, (1788).

Aud. B. of Am. pl. 433. Oct. ed. iii. pl. 149.

From Carthagena.

"Seen once only, in a small stream of water on the 'Popa' mountain, in November, 1857." (Mr. W. S. Wood, Jr.)

103. DENDROICA ÆSTIVA, (Gmelin).

Motacilla æstiva, Gm. Syst. Nat. i. p. 996, (1788).

Sylvia citrinella, Wilson, Am. Orn. ii. p. 111, (1810).

Wilson, Am. Orn. ii. pl. 15. Aud. B. of Am. pl. 95. Oct. ed. ii. pl. 88.

From Turbo.

"Seen for a few days at Turbo, early in April, 1858." (Mr. W. S. Wood, Jr.)

1860.]

104. DENDROICA VIEILLOTI, nobis.

Sylvia ruficapilla, Vieill. Nouv. Dict. xi. p. 228, (but not of same vol. p. 179, and not *Sylvia ruficapilla*, Lath. Ind. Orn. ii. p. 540, which is *Motacilla petechia*, Linnæus, a distinct species).

"*Chloris erithrachorides*, Feuille," Baird, Rept. Pac. R. R. Surv. ix. p. 283, hence *Dendroica erithrachorides*, Baird, same vol. p. 283, (but not *Chloris erithrachorides*, Feuille, Jour. Obs. Phys. iii. p. 413, (1725), which is *Motacilla petechia*, Linnæus).

Entire head and neck in front light reddish chestnut. Plumage of all other parts much resembling that of *D. æstiva*, of the United States, but darker on the back, wings and tail, size rather larger, and with the bill slightly longer and more gradually pointed. Total length, $4\frac{1}{2}$ to $4\frac{3}{4}$ inches.

Hab.—South America, Central America. (Panama, Mr. J. G. Bell).
From Carthagena.

I have been quite unsuccessful in attempting to find a name really applicable to this well marked and not uncommon species. It is usually, I believe, regarded as *Sylvia ruficapilla* of authors, and is unmistakably described by Vieillot, as above cited, but erroneously so far as relates to the name, which is applied by all other authors to *Motacilla petechia*, Linnæus, a species not uncommon from the West Indies, and accurately figured by Vieillot, Ois d'Am. Sept. pl. 91. Under these circumstances I propose the name above given.*

*There are at least five species of *Dendroica*, resembling each other, and all having the general appearance of *D. æstiva* of the United States. The first four of these have been much confused and mistaken for each other:

1. DENDROICA ÆSTIVA, (Gmelin.)

Motacilla æstiva, Gm. Syst. Nat. ii. p. 996, (1788).

Hab. United States, Mexico, Central America, New Grenada, West Indies?

2. DENDROICA ALBICOLLIS, (Gmelin.)

Motacilla albicollis, Gm. Syst. Nat. ii. p. 983, (1788).

Hab. Cuba, (Gundlach), St. Domingo, (Brisson).

This is the bird usually regarded as *D. æstiva*, by the Cuban ornithologists, but is a distinct species as I suspected long before examining authentic specimens. The habits of this bird, as given by those very accurate naturalists, are different from those of the common bird of the United States. Brisson (Orn. iii. p. 494) carefully describes the present species, though his specimens do not appear to have been mature. The young bird only has the throat and neck in front nearly pure white.

2. DENDROICA PETECHIA, (Linnæus).

Motacilla petechia, Linn. Syst. Nat. i. p. 334, (1776).

Motacilla ruficapilla, Gm. Syst. Nat. ii. p. 971, (1788).

Hab. West Indies, Central America? Jamaica? Martinique (Brisson).

I have frequently seen specimens precisely in the plumage as figured by Vieillot, as above cited, and by Edwards, Birds v. pl. 256, fig. 2, but I am not confident of the exact locality. This is very probably the *Sylvicola æstiva*, of Gosse, B. of Jamaica, p. 157, and probably of Messrs. Newton, B. of St. Croix, in Selater's Ibis, 1859, p. 153. This bird is also very carefully described by Brisson, (Orn. iii. p. 490), in mature plumage, with the top of head, clear, well defined rufous.

4. DENDROICA VIEILLOTI, Cassin, *ut supra*.

Sylvia ruficapilla, Vieill. Nouv. Dict. xi. p. 228.

Hab. South America and Central America, New Grenada, (W. S. Wood, Jr.) Panama, (J. G. Bell).

5. DENDROICA AUREOLA, (Gould).

Sylvicola aureola, Gould, Voy. Beagle, Birds, p. 86, (1841).

Hab. Galapagos Islands, (Gould).

Very similar to *D. petechia*, as above. This species, or at least specimens from the Galapagos Islands, I have not seen. Of all the others several specimens of each are now before me, and I have not the smallest doubt of their specific distinctness, which I hope to fully demonstrate in a subsequent paper. Having called the attention of my friend Mr. Lawrence, of New York, to the distinctness of the Cuban species, his views will probably appear in his notes on Birds of Cuba, about to be published in the Annals of the Lyceum, New York.

[May,

"Frequently seen on the 'Popa' mountain at Carthagena, in November, 1857 Very active and constantly moving in the lower trees and bushes." (Mr. W. S. Wood, Jr.)

105. *DENDROICA CASTANEA*, (Wilson).

Sylvia castanea, Wilson, Am. Orn. ii. p. 97, (1810).

Wilson, Am. Orn. ii. pl. 14. Aud. B. of Am. pl. 69, Oct. ed. ii. pl. 80.

From Turbo and the River Truando.

"On the Truando, in January, and at Turbo early in April, 1858. In small flocks of ten or twelve, in the high trees, very much as in autumn in the United States." (Mr. W. S. Wood, Jr.)

106. *THRYOTHORUS NIGRICAPILLUS*, Sclater.

Thryothorus nigricapillus, Sclater, Proc. Zool. Soc. London, 1860, p. 84.

From the River Truando.

Two specimens appear to be this species, or at least very closely allied. They differ only in having the throat transversely banded with black lines, same as on other parts.

"In low bushes and on the ground, on the banks of the Rio Truando, in the Cordilleras. Frequently seen, and runs on the ground, more than usual in the larger Wrens of the United States, but has similar general habits." (Mr. W. S. Wood, Jr.)

107. *THRYOTHORUS*.

A large plain colored species, for which I have found no name, but am not sufficiently acquainted with the group of *Troglodytinæ* to feel warranted in proposing a species. Several specimens from Turbo and Carthagena.

108. *SCLERURUS BRUNNEUS*, Sclater.

Sclerurus brunneus, Sclat. Proc. Zool. Soc. London, 1857, p. 17.

From the river Ingador.

One specimen only in the collection of the Expedition appears to be this species. "On the banks of a small stream called the Ingador, near the coast of the Pacific Ocean. In the Palm trees, clinging to the leaves and searching for insects. March, 1858." (Mr. W. S. Wood, Jr.)

109. *SYNALLAXIS CANDEI*, D'Orb. et Lafres.

Synallaxis Candei, D'Orb. et Lafres. Rev. Zool. 1838, p. 165.

From Carthagena.

110. *XENOPS RUFICAUDA*, (Vieillot).

Synallaxis ruficauda, Vieil. Nouv. Dict. xxxii. p. 310, (1818).

Temm. Pl. Col. 150.

From Turbo.

111. *DENDROORNIS TRIANGULARIS*, (Lafresnaye).

Dendrocalaptes triangularis, Lafr. Mag. Zool. 1843.

Guerin, Mag. Zool. 1843, pl. 32.

From the river Truando.

"These kinds of birds were very abundant on the trees in the Cordilleras, and a few were seen at camp Toucey, on the Rio Truando, within 20 or 30 miles of the mountains. They run on the trunks and branches very rapidly, and appear to be very greedy and rapacious. Not shy, and easily approached, but not easily shot, on account of their quick movements. When they have ascended a tree, they fly down to the base of another, like the Brown Creeper of the United States, (*Certhia*)." (Mr. W. S. Wood, Jr.)

112. *DENDROORNIS GUTTATUS*, (Lichtenstein).

Dendrocalaptes guttatus, Licht. Verz. p. 16, (1823).

Le Vaill. Prom. pl. 30.

From the river Truando.

113. DENDROENIS.

One specimen from the river Truando, with large elongated spots for which I have not succeeded in finding a name.

114. MALACOPTILA ?

From the river Truando.

A single specimen in immature plumage, referable to no species with which I am acquainted.

115. CERTHIOLA LUTEOLA, Cabanis.

Certhiola luteola, Cab.

From Turbo and Carthagena.

116. JULIAMYIA JULIÆ, (Bourcier).

Juliamyia typica, Bonap. Rev. Zool. 1854, p. 255.

Ornismyia Juliae, Bourc. Ann. Soc. Lyons, 1842, p. 345.

Gould, Monog. pt. xviii. pl. (not numbered).

From Turbo.

"Seen occasionally in April, 1858, but not very common. Flies very swiftly, and is shy, darting away on the least alarm." (Mr. W. S. Wood, Jr.)

117. CHRYSOLAMPIS MOSCHITUS, (Linnaeus.)

Trochilus moschitus, Linn. Syst. Nat. i. p. 192, (1766).

Gould, Monog. pt. xii. pl.

From Carthagena.

"About an old fort in the 'Popa' mountain, which was completely overgrown with vines and flowering plants, this humming bird and others were exceedingly abundant. Constantly flying and fighting with each other, and nowhere seen so abundant as here, in the month of November, 1857." (Mr. W. S. Wood, Jr.)

118. LAMPORNIS MANGO, (Linnaeus.)

Trochilus mango, Linn. Syst. Nat. i. p. 191, (1766).

Gould, Monog. pt. xii. pl.

From Carthagena.

Appears to be the true *mango* of authors.

119. EUCEPHALA CÆRULEA, (Vieillot).

Trochilus cæruleus, Vieill. Nouv. Dict. vii. p. 361. (1817).

Gould, Monog. pt. xiv. pl.

From Carthagena.

120. IONOLAIMA.

From Turbo.

One specimen only, in bad condition and immature plumage, appears to be of this genus.

121. PHAETHORNIS YARUQUI, (Bourcier).

Trochilus yaruqui, Bourc. Compt. Rend. xxxii. p. 187.

Gould, Monog. pt. iv. pl.

From the River Truando.

"Plain plumaged humming birds were frequently seen in the Cordilleras, but never very abundant. We rarely saw the brighter colored in the mountains. Generally about the vines and shrubbery." (Mr. W. S. Wood, Jr.)

122. PHAETHORNIS.

From Turbo.

A single specimen, in immature plumage, of a small species.

123. CHLORAENAS RUFINA, (Temminck).

Columba rufina, Temm. Fig. et Gall. i. p. 467, (1813).

Knip, Pigeons i. pl. 24.

From Turbo and the Delta of the River Atrato.

"Seen once only at Turbo in a small flock, sitting in a high tree, and once only at the mouth of the Atrato; seemed to be a stranger. Early in January, 1858." (Mr. W. S. Wood, Jr.)

124. *LEPTOPTILA VERREAUXII*, (Bonaparte).

Leptoptila Verreauxi, Bonap. Consp. Av. ii. p. 73, (1854).

From Turbo and the River Truando.

"In a secluded part of the forest at Turbo, in the trees, and afterwards on the Truando." (Mr. W. S. Wood, Jr.)

125. *CHAMAEPHELIA GRANATINA*, Bonaparte.

Chamaepelia granatina, Bonap. Consp. Av. ii. p. 77, (1854).

From Carthage.

"Abundant and in large flocks among the bushes on the shores of the sea at Carthage, in November, 1857. Seemed to be searching for food in the sand and short grass, and not very easily approached, flying away very rapidly, and frequently alighting on trees." (Mr. W. S. Wood, Jr.)

126. *TINAMUS MAJOR*, (Gmelin).

Tetrao major, Gm., Syst. Nat. i. p. 767, (1788).

Pezus serratus, Spix, Av. Bras. ii. p. 61, (1825).

Buff. Pl. Enl. 476. Spix. Av. Bras. ii. pl. 76.

From the River Truando.

One specimen only, labelled as a female, which appears to be identical with specimens from Brazil.

"Frequently heard on the Truando, near the first range of the Cordilleras. It has a very loud, continued note, not inappropriately compared by the members of our party to the whistle of a locomotive engine. Not easily seen, being exceedingly shy and running very rapidly." (Mr. W. S. Wood, Jr.)

127. *SQUATAROLA HELVETICA*, (Linnæus).

Tringa helvetica, Linn. Syst. Nat. i. p. 250, (1766).

Charadrius apricarius, Wilson, Am. Orn. vii. p. 41, (1813).

Wilson, Am. Orn. vii. pl. 57. Aud. B. of Am. pl. 334. Oct. Ed. v. pl. 315.

From Carthage.

128. *SYMPHEMIA SEMIPALMATA*, (Gmelin).

Scolopax semipalmatus, Gm. Syst. Nat. i. p. 659, (1788).

Wilson, Am. Orn. vii. pl. 56. Aud. B. of Am. pl. 274. Oct. Ed. v. pl. 347.

From Carthage.

129. *GAMBETTA MELANOLEUCA*, (Gmelin).

Scolopax melanoleucus, Gm. Syst. Nat. i. p. 659, (1788).

Scolopax vociferus, Wilson.

Wilson, Am. Orn. vii. pl. 58. Aud. B. of Am. pl. 308. Oct. ed. v. pl. 345.

From Carthage.

130. *GAMBETTA FLAVIPES*, (Gmelin).

Scolopax flavipes, Gm. Syst. Nat. i. p. 659, (1788).

Wilson, Am. Orn. vii. pl. 58. Aud. B. of Am. pl. 228. Oct. ed. v. pl. 344.

From Carthage.

131. *CALIDRIS ARENARIA*, (Linnæus).

Tringa arenaria, Linn. Syst. Nat. i. p. 251, (1766).

Calidris americana, Brehm.

Wilson Am. Orn. vii. pl. 59, 63. Aud. B. of Am. pl. 230. Oct. ed. v. pl. 338.

From Carthage.

132. *EREUNETES PUSILLA*, (Linnæus).

Tringa pusilla, Linn. Syst. Nat. i. p. 252, (1766).

Tringa semipalmata, Wilson.

Ereunetes petrifactus, Illiger.

1860.]

- Wilson Am. Orn. vii. pl. 63. Aud. B. of Am. pl. 408. Oct. ed. v. pl. 336.
From Carthagea.
This is, I have no doubt, the true *Tringa pusilla* of Linnæus.
133. *TRINGA WILSONII*, Nuttall.
Tringa Wilsonii, Nutt. Man. ii. p. 121, (1834).
Tringa pusilla, Wilson.
Wilson, Am. Orn. v. pl. 37. Aud. B. of Am. pl. 320. Oct. ed. v. pl. 337.
From Carthagea.
"The preceding seven species, and in fact nearly all the small wading birds that we had been accustomed to seeing on the coast of New Jersey, were very abundant on the sea coast at Carthagea, in November, 1857. The most abundant were perhaps the two small Sandpipers (*E. pusilla* and *T. Wilsonii*), and the yellow Shanks (*G. flavipes*). Though easily shot, they were not so easily obtained, on account of the marshy or boggy character of many localities which they particularly frequented. All of these species were in flocks, as seen on the coast of the United States in Autumn." (Mr. W. S. Wood, Jr.)
134. *PARRA HYPOMELAENA*, G. R. Gray.
Parra hypomelaena, Gray, Gen. iii. p. 589, (1846).
Gray. Gen. iii. pl. 159.
Atrato River.
"In open places which are very marshy on the River Atrato, late in December, 1857. Two or three together, generally on the ground, frequently stretching out their wings, and often wading in the water. Quite shy and watchful." (Mr. W. S. Wood, Jr.)
135. *ARAMIDES CATENNENSIS*, (Gmelin).
Fulica cayennensis, Gm. Syst. Nat. i. p. 700, (1788).
Buff. Pl. Enl. 352.
From Turbo.
"In a salt water marsh at Turbo; seen once only." (Mr. Wm. S. Wood, Jr.)
136. *ARDEA HERODIAS*, Linnæus.
Ardea Herodias, Linn. Syst. Nat. i. p. 237, (1766).
Wilson, Am. Orn. viii. pl. 65. Aud. B. of Am. pl. 211. Oct. ed. vi. pl. 369.
From the delta of the Atrato.
"Frequently seen about the mouth of the Atrato, in December." (Mr. W. S. Wood, Jr.)
137. *BUTORIDES GRISEA*, (Boddært).
Cancroma grisea, Bodd. Tab. Pl. Enl. p. 54, (1783).
Ardea scapularis, Illiger.
Buff. Pl. Enl. 908.
From Carthagea.
138. *GARZETTA CANDIDISSIMA*, (Gmelin).
Ardea candidissima, Gm. Syst. Nat. i. p. 633, (1788).
Wilson, Am. Orn. vii. pl. 62. Aud. B. of Am. pl. 242. Oct. ed. vi. pl. 374.
From Carthagea and the River Atrato.
"Abundant on the Rio Atrato, in February, 1858. Generally seen sitting on the low trees on the edge of the river." (Mr. W. S. Wood, Jr.)
139. *TIGRISOMA BRASILIENSE*, (Linnæus).
Ardea brasiliensis, Linn. Syst. Nat. i. p. 239, (1766).
Buff. Pl. Enl. 860.
From the delta of the Atrato.
140. *TIGRISOMA TIGRINUM*, (Gmelin)?
Ardea tigrina, Gm. Syst. Nat. ii. p. 638, (1788).
From the delta of the Atrato.

141. *HARPIPRION CAYENNENSIS*, (Gmelin).
Tantalus cayennensis, Gm. Syst. Nat. i. p. 652, (1788).
 Buffon. Pl. Enl. 820.
 From the River Nercua.
 "In the mountains, before reaching the main ridge on the Rio Nercua."
 (Mr. W. S. Wood, Jr.)
142. *DENDROCYGNA AUTUMNALIS*, (Linnæus.)
Anas autumnalis, Linn. Syst. Nat. i. p. 205, (1766).
 Baird, B. of N. Am. pl. 63. Rept. Mex. Bound. Surv. Birds, pl. 25.
 From the River Truando.
143. *CARBO BRASILIANUS*, (Gmelin)?
Procellaria brasiliiana, Gm. Syst. Nat. i. p. 564?
 Gillis, Astr. Exp. Birds, pl. 28?
 From the River Truando.
 "On the Truando and Atrato, frequently seen in the water and also on trees. When perched, drop very suddenly into the water on being alarmed, and disappear by diving." (Mr. W. S. Wood, Jr.)
144. *PLOTUS ANHINGA*, Linnæus.
Plotus anbinga, Linn. Syst. Nat. i. p. 580, (1766).
Plotus melanogaster, Wilson.
 Wilson, Am. Orn. ix. pl. 74. Aud. B. of Am. pl. 316, Oct. ed. vi. pl. 420.
 From the Rivers Atrato and Truando.
 Several specimens in immature plumage, but all apparently of this species.
 "Abundant in the months of January, February and March, on all the rivers from the Gulf of Darien, on the Atlantic, to the coast of the Pacific." (Mr. W. S. Wood, Jr.)

Descriptions of some new species of Cretaceous Fossils from South America,
 in the Collection of the Academy.

BY W. M. GABB.

Eulima seminosa, pl. 3, fig. 6. Shell fusiform, spire elevated, whorls five, mouth small, shell thick and marked by irregular lines of growth.

From a greyish brown limestone from Chili, in connection with *Trigonia Hanetiana D'Orb.*, and many of the other species described by that author in the "Voyage de l'Astrolabe et Zélée."

Scalaria (Clathrus) Chiliense, pl. 3, fig. 4. Shell [scalariform, spire very elevated, whorls six or seven, rounded and marked by about fourteen prominent, longitudinal, rounded ribs. Mouth small, subcircular; a reflection of the inner lip covers the base of the body whorl so as to hide the lower part of some of the ribs.

Pugnellus tumidus, pl. 3, fig. 13 and 14. Shell heavy, scalariform, spire elevated, five whorls, which are angular at the upper part, and marked by a series of small nodes on the angle; body whorl large, mouth expanded, superior sinus very deep, outer lip very much thickened, especially the extreme outer portion or callosity, which is nearly as thick as long. The thickening of the superior and lateral edges of the outer lip, produces a deep fosset on the posterior portion of the body whorl, immediately behind the expansion of the lip; the inner lip is reflected over a portion of the spire; canal long and curved anteriorly.

This species is the one to which Mr. Conrad, in his note on the genus, refers 1860.]

as occurring in South America. There is another species, (P.) *Strombus semicostatus* D'Orb., that occurs in the same deposit.

Pleurotoma D'Orbignyana, pl. 3, fig. 7. Shell scalariform, spire elevated, whorls five, body whorl angular above; shell marked by a series of small nodes on the shoulder of the whorls and by fine lines of growth.

P. arata, pl. 3, fig. 9. Shell scalariform, spire elevated, whorls three or four, subangular above and marked by a shallow, revolving groove immediately below the angle; surface marked by numerous revolving striae, crossed by faint lines.

Patella Auca, pl. 3, fig. 11. Shell small, thin, circular; apex small, acuminate and very excentric; surface marked by irregular concentric undulations.

Cultellus Australis, pl. 3, fig. 8. Shell elongate, narrow, beaks very small, incurved, near the anterior end; posterior end gaping, and a little narrowed; anterior end rounded; surface marked by concentric striae.

Mactra Chiliensis, pl. 3, fig. 5. Shell thin, equilateral, slightly convex; beaks small, incurved; umbones large, prominent; hinge teeth small; anterior end slightly subangular, posterior rounded; surface marked by distinct concentric lines.

M. Araucana, D'Orb. sp. var. pl. 3, fig. 12. This specimen differs a little from the one figured by D'Orbigny, in the Voyage de l'Astrolabe et Zélée, in being less angular anteriorly, and in having the umbonal ridge less strongly developed.

Thracia corbulopsis, pl. 3, fig. 1. Shell nearly equilateral, beaks small, slightly curved anteriorly, umbones prominent and rounded, umbonal ridge angular, and extends to the margin of the shell; anterior end rounded, posterior acutely angular; surface marked by numerous fine concentric lines.

Venus D'Orbignyanus, pl. 3, fig. 2. Shell inequilateral, somewhat convex, beaks small and inclined anteriorly, umbones large and rounded; cardinal margin curved; anterior end rounded, posterior subangular; surface marked by strong concentric lines. This species resembles, in its outline, the common *V. mercenaria*, (*M. violacea*) of our coast. It differs from *V. Auca* d'Orb. in having the cardinal margin more strongly curved, in being more angular posteriorly, and in not being so regularly marked on the surface.

Pinna minuta, pl. 3, fig. 10. Shell small, robust, narrow; umbonal ridge subangular and nearly parallel with the cardinal line; cardinal and basal margins straight; posterior end sub-biangular; surface marked by strong lines of growth.

Modiola cretacea, pl. 3, fig. 3. Shell small; beaks small, anterior; umbonal ridge rounded, continued to the posterior basal margin, gradually losing itself in the general curve of the shell, cardinal line arcuate, basal edge sinuous; surface concentrically striate.

Anomia parva, pl. 3, fig. 15. Shell thin, orbicular, very slightly convex, pearly; beak small but acute; surface marked by concentric undulations, crossed by delicate radiating lines.

June 5th.

Vice President BRIDGES in the Chair.

Thirty-seven members present.

The following papers were presented for publication :

"The Cutting Ant of Texas," by S. B. Buckley.

"Synonymy of the Cyclades, a family of Acephalous Mollusca, part 1st," by Temple Prime.

"Catalogue of the Colubridæ in the museum of the Academy of Natural Sciences of Philadelphia, with notes and descriptions of new species," by E. D. Cope.

"Notes on Shells," by T. A. Conrad.

"Contributions to the Carboniferous Flora of the United States," by Horatio C. Wood, Jr.

And were referred to Committees.

Dr. Darrach presented the following Catalogue of Plants appearing in flower, in the neighborhood of Philadelphia, during the month of May.

- | | |
|--------------------------|----------------------------|
| 1. RANUNCULACEÆ. | 10. CISTACEÆ. |
| Ranunculus aquatilis. | Helianthemum corymbosum. |
| " sceleratus. | Hudsonia tomentosa. |
| " recurvatus. | 11. CARYOPHYLLACEÆ. |
| " bulbosus. | Silene Pennsylvanica. |
| 2. MAGNOLIACEÆ. | " antirrhina. |
| Magnolia glauca. | Arenaria serpyllifolia. |
| Liriodendron tulipifera. | Stellaria longifolia. |
| 3. BERBERIDACEÆ. | " uliginosa. |
| Podophyllum peltatum. | Cerastium arvense. |
| 4. NYMPHÆACEÆ. | *Spergula saginoides. |
| Nymphæa odorata. | Scleranthus annuus. |
| Nuphar advena. | Sagina procumbens. |
| 5. SARRACENIACEÆ. | 12. OXALIDACEÆ. |
| Sarracenia purpurea. | Oxalis violacea. |
| 6. PAPAVERACEÆ. | " stricta. |
| Chelidonium majus. | 13. GERANIACEÆ. |
| 7. FUMARIACEÆ. | Geranium maculatum. |
| Fumaria officinalis. | " Carolinianum. |
| 8. CRUCIFERÆ. | " Robertianum. |
| Arabis lyrata. | 14. SUCARDIACEÆ. |
| " lævigata. | Rhus toxicodendron. |
| Sisymbrium officinalis. | 15. SAPINDACEÆ. |
| Sinapis Nigra. | Staphylea trifolia. |
| 9. VIOLACEÆ. | 16. LEGUMINOSÆ. |
| Solea concolor. | Lupinus perennis. |
| Viola lanceolata. | Trifolium arvense. |
| " primulæfolia. | " pratense. |
| " striata. | " repens. |
| " pubescens: | " procumbens. |
| | Vicia hirsuta. |
| | Circis Canadensis. |

* Barton.

17. ROSACEÆ.
Prunus serotina.
Cratægus coccinea.
Pyrus arbutifolia.
Rubus villosus.
 " *Canadensis.*
18. ONAGRACEÆ.
Oenothera sinuata.
19. SAXIFRAGEACEÆ.
Saxifraga Pennsylvanica.
Heuchera Americana.
20. UMBELLIFERÆ.
Heracleum lanatum.
Thaspium barbinode.
 " *trifolium.*
 " *v. atropurpureum.*
Osmorrhiza longistylis.
 " *brevistylis.*
21. ARALIACEÆ.
Aralia nudicaulis.
22. CORNACEÆ.
Cornus Florida.
23. CAPRIFOLIACEÆ.
Triosteum angustifolium.
Viburnum lentago.
 " *acerifolium.*
24. VALERIANACEÆ.
Fedia radiata.
 " *olitoria.*
25. COMPOSITÆ.
Lucanthemum vulgare.
Senecio aureus.
Krigia Virginica.
Cynthia Virginica.
Hieracium venosum.
26. ERICACEÆ.
Gaylussacia resinosa.
Vaccinium stamineum.
 " *Pennsylvanicum.*
 " *vaccillans.*
 " *corymbosum.*
 " *v. glabrum.*
Leucothe racemosa.
Andromeda Mariana.
Kalmia latifolia.
 " *angustifolia.*
Azalea nudiflora.
Leiophyllum buxifolium.
Pyrola chlorantha.
27. PLANTAGINACEÆ.
Plantago lanceolata.
 " *Virginica.*
28. LENTIBULACEÆ.
Utricularia subulata.
29. OROBANCHACEÆ.
Aphyllon uniflora.
Conopholis Americana.
30. SCROPHULARIACEÆ.
Linaria Canadensis.
Veronica Americana.
 " *officinalis.*
 " *perigrina.*
 " *arvensis.*
Castillæa coccinea.
31. LABIATÆ.
Salvia lyrata.
32. BORRAGINACEÆ.
Symphytum officinalis.
Mertensia Virginica.
Myosotis palustris.
 " *arvensis.*
33. HYDROPHYLLACEÆ.
Hydrophyllum Virginicum.
34. POLEMONIACEÆ.
Polemonium reptans.
35. POLYGONACEÆ.
Rumex crispus.
 " *acetosella.*
36. SANTALACEÆ.
Comandra umbellata.
37. EUPHORBIACEÆ.
Euphorbia ipecacuanhæ.
38. MYRICACEÆ.
Myrica cerifera.
39. ARACEÆ.
Arisæma dracontium.
40. ORCHIDACEÆ.
Arethusa bulbosa.
Cypripedium acaule.
41. AMARYLLIDACEÆ.
Hypoxis erecta.
42. IRIDACEÆ.
Iris versicolor.

43. SMILACEÆ.

Smilax rotundifolia.
 “ *herbacea*.
Trillium cernuum.
Mediola Virginica.

44. LILLIACEÆ.

Asparagus officinalis.
Polygonatum biflorum.
Smilacena racemosa.
 “ *trifolia*.
 “ *bifolia*.
Ornithogalum umbellatum.
Allium Canadense.

45. MELANTHACEÆ.

Uvularia perfoliata.
 “ *sessilifolia*.
Veratrum viride.

46. COMMELYNACEÆ.

Tradescantia Virginica.

47. ERIOCAULONACEÆ.

Eriocaulon gnaphalodes.

Orders 47.

Species 130.

June 9th.

SPECIAL MEETING.

Vice President BRIDGES in the Chair.

The Vice President announced the object of the meeting to be to express the sense of the Academy at its loss in the death of Mr. GEORGE W. CARPENTER, its late Treasurer, which occurred on the 7th inst. On motion of Mr. Cassin, a committee consisting of Messrs. Cassin, Vaux, Rand, Bridges and Jeanes, was appointed, who, after a recess, presented the following resolutions, which were unanimously adopted:

Resolved, That the Academy has learned with the deepest regret of the decease of our late esteemed fellow member, George W. Carpenter, who has been associated with this Institution for a period of thirty five years, and who, on account of his able and active exertions as a member, and faithful discharge of the responsible duties of Treasurer, during the long official term of thirty-three years, has been strictly identified with, and efficiently co-operative in its progress.

Resolved, That the members of this Academy do cordially sympathize with the bereaved family of Mr. Carpenter, and do hereby tender to them their sincere condolence.

Resolved, That the Recording Secretary be instructed to send to the family of our deceased member a copy of these resolutions, and that they be published in the daily journals of this city.

June 12th.

Mr. WM. S. VAUX in the Chair.

Forty members present.

The following papers were presented for publication:

“Contributions to American Lepidopterology, No. 5,” by Brackenridge Clemens, M. D.

“Hemiptera of the North Pacific Exploring Expedition, under Commanders Rodgers and Ringgold,” by P. R. Uhler.

And were referred to Committees.

Prof. Robert E. Rogers made some remarks on the fallacies that arose from the ordinary use of language, when applied to the description of phenomena in a scientific manner. He adverted to the subject of combustion to illustrate his views, and showed that our ordinary explanation of what is called by this name, where one of the substances is styled a *combustible*, and the other a *supporter of combustion*, as for example, in the burning of an ordinary gas light, was fallacious, because we only looked at it from one point of view. The gas to be burned was comparatively small in quantity, and the oxygen surrounding it was in large amount; hence the gas alone appeared to burn—the oxygen of the air to support it. When, however, we surround the oxygen with a large quantity of gas, or, so to speak, with an *atmosphere of gas*, thus reversing entirely the conditions, then the oxygen burns, and the gas becomes a supporter of combustion. We have then no right to call the gas a combustible any more than the oxygen; or the oxygen a supporter of combustion, any more than the gas. The action between the two bodies is mutual, and the various phenomena witnessed are the result of that mutual action. The Professor then exhibited a beautiful experiment, in which, after first burning the common illuminating gas in the ordinary way, he reversed the conditions, and burned a jet of *common air* in an *atmosphere of gas*.

June 19th.

Mr. LEA, President, in the Chair.

Twenty-one members present.

The following papers were presented for publication:

“On the identity of *Ammonites Texanus*, Roemer, and *A. vespertinus Morton*,” by Wm. M. Gabb.

“Descriptions of three new species of Gorgonidæ in the Collection of the Academy of Natural Sciences of Philadelphia,” by George W. Horn.

And were referred to Committees.

June 26th.

Mr. LEA, President, in the Chair.

Thirty-one members present.

The following papers were, on the report of the Committees to which they had been referred, ordered to be published in the Proceedings:

On the Identity of *Ammonites Texanus*, Roemer, and *A. vespertinus*, Morton.

BY W. M. GABB.

In 1834, Dr. Morton described an ammonite from Arkansas, in his synopsis, under the name of *A. vespertinus*. The type, consisting of two fragments of an individual, apparently about fifteen inches in diameter, is in the collection of the Academy.

As long ago as September of last year, I was struck with the resemblance of these specimens to the species described by Roemer, in “*Kreidebildungen von Texas*,” 1852, under the name of *A. Texanus*. The originals of Dr. Morton's species were so weathered that I was unable to make out the septum.

More recently, however, through the kindness of Dr. Moore, I have been enabled to procure an undoubted specimen of *A. Texanus*, consisting of nearly the whole outer whorl of an individual, about a foot in diameter. On comparing this with Morton's specimens, I became convinced of their identity. The names will therefore have to be *A. vespertinus*, Morton; *A. Texanus*, Roemer, being a synonyme.

[June,

Contributions to American Lepidopterology.—No. 5.

BY BRACKENRIDGE CLEMENS, M. D.

PYRALIDÆ.—CRAMBITES.

CRAMBUS Fabricius.

C. agitatellus.—Head and thorax pale luteous; labial palpi somewhat fuscous, white beneath. Fore wings ochreous, tinted with orange, beneath the fold and toward the tip, with a broad silvery white median streak divided longitudinally by a chrome yellow line. The costa is dark fuscous from the base, and beyond the middle are two oblique fusco-luteous lines, the first of which is joined at an angle by another in the middle of the wing. On the middle of the apical third is a silvery white patch, another in the costa above it, a small one in the middle of hind margin, and one at the tip, margined internally by a small fuscous patch. Along the nervules, above and beneath the middle of the wing, are fuscous lines containing dull silvery scales, with a subterminal angulated silvery line, and a few marginal dots beneath the middle of the wing. Cilia silvery-hued. Hind wings whitish.

C. laqueatellus.—Head luteous. Thorax and labial palpi fuscous, the latter whitish beneath. Fore wings with two silvery white streaks, separated by a fuscous streak; the upper silvery streak is margined on the costa with fuscous, and the lower one, which extends beyond the apical third, is edged on the fold by the same hue. Beneath the fold, the wing is pale yellowish with a fuscous streak along submedian nervure. The apical portion of the wing is tinted with ochreous-yellow, in which the nervules are streaked with silvery; on the costa, near the tip, is an oblique silvery streak, dark margined on both sides. The subterminal silvery line is much angulated, and beneath the middle of the wing, is a large marginal whitish patch, containing black lines on the nervules. The tip of the wing is silvery, with an ochreous-yellow patch. Cilia silvery-hued. Hind wings pale fuscous, cilia white.

C. involutellus.—Labial palpi dark fuscous, whitish at the base beneath. Head and thorax dark yellowish with a brassy hue. Fore wings fusco-ochreous, with a brassy lustre, with a median silvery white streak pointed behind and extended nearly to the hind margin. The subterminal line is silvery, with a short white streak on each side of it on the costa. At the tip is a small white spot, and on the hinder margin beneath the middle is a whitish patch, containing marginal black dots. Cilia silvery-hued. Hind wings pale bluish white.

In some specimens the general hue of the fore wings is paler than the above.

C. camurellus. Labial palpi fuscous, whitish above. Head whitish. Fore wings rather pale, dull reddish fuscous or pale ochreous, dusted with fuscous, with an irregular patch of fuscous scales on the middle of the wing, where it is crossed by an angulated, rather ferruginous line, and one of the same hue near the hinder margin, edged externally by dull silvery. The nervules are faintly marked by silvery lines, and on the hind margin is a row of black dots. Cilia dark but silvery-hued. Hind wings grayish.

C. luteolellus.—Labial palpi pale yellowish, dusted externally with fuscous. Head, thorax and fore wings yellowish white, sometimes dusted with fuscous, with a patch of fuscous scales on the end of the disc, and an irregular line of the same hue near hinder margin. The hind margin marked by a slender dark brown line; cilia yellowish white. Hind wings fuscous, cilia whitish.

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C. caliginosellus.—Head, thorax and labial palpi dark fuscous. Fore wings dark fuscous, with two angulated umber brown lines, one about the middle of the wing, and rather indistinct, and one near the hind margin; on the hinder margin is a blackish brown line; cilia fuscous. Hind wings rather dark fuscous; cilia whitish.

C. mutabilis.—Grayish fuscous, varied beneath the fold with luteous. Labial palpi dark fuscous. Fore wings with a grayish median stripe, not extending beyond the disk, more or less tinted with luteous beneath the fold, and with fuscous along the base of the costa. On the end of the median nervure is a dark brown dot, and sometimes streaked with dark fuscous beneath the nervure. The subterminal line is faint and bluish, usually containing a row of faint brownish dots. Hind wings yellowish, gray or pale fuscous.

This species appears to be highly variable, the general hue being sometimes pale ochreous, and in specimens somewhat worn, scarcely to be identified.

C. vulgivagellus.—Labial palpi luteous, dark fuscous externally. Head and thorax luteous; tegulae with a fuscous stripe. Fore wings luteous, with numerous fuscous streaks in atoms, along the veins and two in the disk. Hind margin with a row of terminal black dots; cilia golden hued. Hind wings yellowish; cilia whitish.

C. albellus.—Pure white, with a row of black dots on the hind margin of the fore wings, with an oblique pale yellow acutely angulated line from near the middle of costa, and an angulated silvery subterminal line margined on both sides with pale yellowish. Above the marginal dots at the base of the cilia is a short blackish marginal line. Hind wings pale brownish-gray or whitish.

C. elegans.—Whitish. Fore wings at the base of costa rather broadly streaked with brown, having a brassy lustre, with a patch of brown scales on the inner margin near the base, and a short, curved streak of the same hue about its middle, which forms with its opposite when the wings are closed a semi-circular dorsal line, behind which the wing is dusted with brown. On the apical third of the wing is a broad, brown band, broadest on the costa, where it encloses a small white spot, and with a straight brown subterminal line exterior to it, on a silvery white ground. The hinder margin is dotted with black points; cilia silvery. Hind wings pale brownish white.

Variety. Costa slightly touched at the base with dark fuscous. No distinct broad band on the apical third, but the costa from nearly the middle, dark fuscous, containing two small, white costal spots. The subterminal line whitish, margined on each side with fuscous. The spot on middle of inner margin rather diffuse, not linear, and the wing behind it but little dusted. Hind wings whitish.

C. Girardellus.—Labial palpi pale fuscous externally, above and beneath silvery white. Fore wings silvery white, with an orange yellow stripe beneath the median nervure, somewhat turned upwards at its tip toward the apex of the wing, and extended on the sides of the thorax to the head; it is slightly margined toward the costa of the wing with dark reddish fuscous. The hind margin is dotted with blackish dots, and at the base of the cilia is a dark brown marginal line; cilia silvery. Head wings white.

Mass. From Dr. Chas. Girard.

C. auratellus.—Labial palpi and antennae orange yellow, the former silvery white above. Fore wings silvery white, with an orange yellow band, from the apical third of the costa to the middle of inner margin, where it is broadest, and somewhat produced along the costa toward the tip, and the inner margin to the anal angle. Cilia orange yellow, with a dark reddish fuscous, somewhat crenated basal line. Head wings white.

Mass. From Mr. S. H. Scudder, Jr.

CHILO Zincken.

C. longirostrallus.—Labial palpi, head and thorax ochreous white. Fore wings pale yellowish-white, with a fuscous line from the tip to the inner margin. Hind wings pale ochreous white. Abdomen tufted at the tip.

C. melinellus.—Ochreous yellow. Fore wings with a pale fuscous streak along the middle of the fold, extended nearly to the tip, and a faint oblique line of the same hue, from the tip, not extended to the hind margin. Hind wings pale yellowish-white. Abdomen tufted.

C. aquilellus.—Dark fuscous. Fore wings with an ochreous streak along the submedian nervure and its nervules, and those beneath likewise touched with the same hue. Hind wings yellowish fuscous.

PHYCITES.

NEPHOPTERYX Hübner.

N. undulatella.—Labial palpi, head and thorax grayish fuscous. Fore wings grayish fuscous, with an angulated white line crossing the disk, sometimes obsolete above the fold, margined with dark brownish, and a subterminal line of the same hue dark margined on both sides. At the end of the disk is a short blackish transverse line, slightly margined exteriorly with whitish. Hinder margin tipped with blackish; cilia grayish fuscous. Hind wings grayish testaceous; cilia paler.

Penna., Canada and Mass. From Dr. Chas. Girard, Washington, D. C.

Early in October, I found pupæ of this insect at Niagara Falls, on the Canada side, under shelter of loosened portions of the bark of the American Elm. They were enclosed in a cocoon of silk, mixed with particles of bark. On the same tree I took a number of larvæ which were descending the trunk to undergo pupation. I did not, however, obtain imagos from any of the specimens. The body was nearly uniform in diameter, with the ordinary number of feet. Head as broad as the body and dark green. Body dark green, between the segments yellowish and dotted with yellow; first rings with two black dots on the sides.

N. ulmi-arrosorella.—*Female*. Grayish-fuscous. Fore wings with a slender, dark fuscous angulated line, edged on the costa internally by a pale grayish spot, and on the inner margin externally by another of the same hue. The subterminal line pale gray, dark margined internally. Hind wings pale brownish, darker on the margin.

The larva is found on the American elm in August. The head is pale brown, dotted with dark brown. The body dark green, with a dorsal, double line of pale green patches, and a slight subdorsal and stigmatal line of the same hue. On the 1st, 2d, 4th, 5th and 10th rings, are brown subdorsal points. It weaves a web on the surface of the leaves, feeding beneath it. The pupa is contained in a web between united leaves, in the vivarium. It becomes a pupa about the middle of August, and an imago about twelve or fourteen days after transformation.

PEMPELIA? Hübner.

Male. Labial palpi moderately long, scarcely exceeding the vertex; first and second joints thick, third extremely short and slender. Maxillary palpi with a short pencil of hairs. Tongue nearly as long as the thorax beneath: scaled at base.

P. virgatella.—Brownish luteous. Fore wings varied with pale grayish toward the base and tip, with dull pale reddish at the base and middle of inner margin; on the middle of the costa is a blackish blotch, containing a short line of the same hue, and opposite, an angulated whitish line, with few black spots exterior to the costal line; a blotch of the same hue towards the

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base of submedian nervure, and a pale grayish subterminal line margined internally by a blackish line, and externally by black streaks on the nervules. The internal black margin is edged on the costa and middle of the wing with pale grayish. Hinder margin spotted with black; cilia grayish fuscous. Hind wings pale brownish.

P. subcaesiella.—*Male*. Pale bluish gray, dusted with fuscous. Fore wings with a reddish luteous band at the base, broadest on the inner margin, and a rather broad, dark fuscous band on the basal third. The subterminal line is pale grayish, edged behind by dark fuscous. Hind wings pale brownish.

EPHESTIA ———?

E. ostrinella.—Reddish-purple varied with blackish. Fore wings with the basal third and the apical portion reddish purple, with a broad blackish band in the middle edged internally by a straight whitish line, and an exterior costal patch of the same hue containing two blackish dots on a short streak. The subterminal line is pale grayish. Hind wings pale brownish gray.

The larvæ lives in the fruit heads of Sumack, passing the winter in the larval state. It is dark reddish-brown, head brown; cervical and terminal shields blackish brown. The body is supplied with a few isolated hairs, and one or two rows of obscure dark brown subdorsal dots.

The larvæ make galleries through the fruit heads, and desert them in the spring, to form their cocoons, which are slight silken webs, and appear as imagos about the middle of April.

E. Zeae.—*Tinea Zeae*, Fitch, Rept. 2d, 321. Fore wings with the basal third pale ochreous-yellow or yellowish-white, and the remainder fuscous, with a reddish-luteous spot on the end of the disk, or dark grayish-fuscous varied with reddish luteous.

The larvæ is a frequent inhabitant of houses, and feeds on a variety of dry goods, rye, corn, clover seed, on garlic heads, preserves, especially those contained in jars. The seeds are bound together with a silken web in which galleries are left. It would be well if Dr. Fitch changed the specific name of this insect as corn is by no means its favorite or usual food.

The labial palpi of the imago are more decidedly porrected than in the foregoing species, but I do not think the difference between them is generic. I have no males of *Zeae* in my collection and do not know whether they have the tuft beneath the fore wing.

LANTHAPHE.

Male. The discoidal cell of the fore wings is narrow and appears to be unclosed. The costal and subcostal nervures run very close to each other, if not united, in the basal third of the wing; the former, from union with the first subcosto-marginal branch much thickened, or indistinctly furcate. The subcostal subdivides into two branches near the basal third of the wing, the upper one subdividing again in the middle of the wing, sending a branch with a *long fork* to the costa near the tip and a simple branch to the apex. The lower branch is thickened towards its origin, simple, and is the post-apical nervule. The median is thickened towards its end, and is four-branched. Hind wings neuration pyraliform.

Head with ocelli. Eyes large and salient. Labial palpi ascending, applied closely to the front and with the tips much elevated above the vertex; first and second joints very short, first almost rudimental; the third very long, *folded longitudinally like a sheath*. Maxillary palpi rather short, with a pencil of very long, silky hairs, capable of being expanded, and *carried concealed in the sheath formed by the third joint of labial palpi*. Antennæ ciliated beneath; basal joint thick, with a short horn-like appendage behind having a tuft of hairs. Fore wings with a *small discal vitreous spot*, and the under surface from

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the base of the costa to the middle, *thickly covered with long scales placed transversely.*

Female. Fore wings without discal vitreous spot. Discoidal cell closed by an arcuate nervure; with costal and subcostal nervures distinct, the latter with a single marginal branch from the cell, and at the apical third of the wing subdividing into an apical and marginal branch, which is furcate; the subcosto post-apical from the superior angle of the cell. Submedian four branched.

With ocelli. Labial palpi ascending, with tips but little elevated above the vertex; nearly cylindrical; second joint somewhat thickened and long, extending above the eyes; the third short, slender and pointed. Maxillary short, without pencil of hairs. Antennæ simple and setaceous: basal joint thick, without appendage behind.

The tongue in both sexes is scaled at the base, and moderately long; and the fore wings with distinct strigæ and tufts of scales.

This genus appears to be congeneric with *Acrobasis* of Zeller.

L. platanella.—Labial palpi pale brownish-red, touched in front with pale gray. Head and thorax brownish-red, the latter varied with grayish and dark fuscous. Fore wings grayish fuscous, with the costa touched with brownish red, and a patch of the same hue in the female, near the base of the inner margin containing a tuft of raised scales; in the male, blackish brown, touched with brownish red. The base of the wing is whitish. In the middle of the wing is a broad white band, obsolete toward the costa, with two straight blackish-brown lines internally, and in the male shaded internally with the same hue. The subterminal line is irregular and whitish, dark margined internally. The hinder margin of the wing is touched with blackish-brown. Hind wings pale brown, somewhat darker toward the hinder margin.

The larvæ is tortriciform in appearance. Head pale brown, mottled with whitish. Body with isolated hairs, pale green, with a dark brown dorsal line and a fainter stigmatal line of the same hue, or pale reddish, with a brown dorsal line on each side of the vascular.

It makes a web on the under surface of the leaf of Sycamore, (*Platanus occidentalis*), drawing it together and living within a silken tube.

The cocoon is woven on the surface of the ground, in form of a flattened oval, consisting of brown silk covered exteriorly with grains of earth. The larvæ remain in it unchanged during the winter. It may be taken in July, and enters the pupa state during the latter part of August, to appear as an imago in May or June.

L. asperatella.—Labial palpi blackish brown, varied with whitish. Thorax pale grayish, varied with grayish or dark gray. Fore wings dark brownish-gray, with a blackish brown tuft of scales in the basal part of the fold, and a smaller one of the same hue on the disk above it, a whitish median band, sometimes almost obsolete, containing on the disk a small blackish-brown tuft in the female, with an internal crenated blackish line, and shaded toward the base with blackish; on its external margin is a line of raised scales. The subterminal line is pale grayish, angulated and margined internally by a blackish line, and externally by a fainter one produced into points on the nervules. The hinder marginal line is black. Sometimes in the female the base of the wing is whitish, slightly touched with luteous.

Penn. and Mass. From Dr. Chas. Girard.

TINEINA.

LITHOCOLLETIS. (See Paper No. 2.)

L. Fitchella.—*Argyromiges quercifoliella*, Fitch, Report v., Section 327. Head, face and thorax silvery white. Labial palpi tipped with pale ochreous. Antennæ pale saffron; basal joint silvery white. Fore wings pale 1860.]

reddish-saffron, with a slight brassy hue. Along the costa are *five silvery white costal streaks*, all black margined internally except the first, which is very oblique and continued along the costa to the base of the wing. All the costal streaks are short, except the first. On the inner margin are *two conspicuous silvery dorsal streaks*, dark margined internally, *the first, very large*, and placed near the middle of the inner margin, the second opposite the third costal streak. At the tip is a small, round black spot, placed above the middle of the wing; cilia silvery gray, tinted with saffron. Hind wings grayish-fuscous, cilia paler.

The specific name used by Dr. Fitch being already in use to designate a European species of this genus, it was necessary to change it. I feel pleasure, therefore, in dedicating it to the industrious observer who first described it, and who is adding so much to our knowledge of entomological Natural History.

L. tubiferella.—Head silvery white. Antennæ fuscous, slightly annulated with white; basal joint pale saffron. Fore wings pale saffron, with two silvery white, moderately broad bands, black margined externally, one near the base and the other on the middle of the wing, and both somewhat oblique; cilia of the general hue. Hind wings dark grayish, cilia the same.

The larva belongs to the second larval group of this genus, but the body much more contracted than that of any other larva I have seen. Its form is almost that of a flattened ovoid, the rings separated by deep incisions, and each forming in the sides a projecting mammilla.

The larva mines the upper surface of the leaves of oaks in September, and doubtless also in the summer months. The mine is a linear tract, sometimes curved or wavy, gradually increasing in breadth from the beginning to the end, or as the larva increases in length, with the "frass" deposited on each side of the tract and marking its outlines by two black lines. The position of the larva within the mine is likewise a peculiar one, as it is always placed transversely to its course, and hence the deposition of the "frass" on the sides, and the gradual increase in breadth as the larva grows in length. Its head is blackish brown; the body pale greenish, with pale brown dorsal macule, darker on their edges. It undergoes transformation in the end of the mine, preparing a circular cell or slightly silk-lined cavity, and leaves the last larval cast outside of it. The fall brood of larva become imago about the middle of May.

L. cratægella.—This insect is found on the apple and wild cherry, (*P. serotina*), without undergoing any variation, which I can detect. I thought beyond doubt, that that in the leaf of wild cherry, must be a distinct species, for the larva has a habit unusual to larvæ of this group, and which I have not noticed in those on the thorn and apple, although, doubtless, they correspond. The habit I refer to in wild cherry miners, *consists in deserting an old mine to form a new one*, reminding one strongly of the early habits of the *Ornix* larvæ. The larva enters along the midrib to form a new mine, which I have found in various stages of advancement, besides the old and tenantless mine in another portion of the leaf.

TISCHERIA. (See Paper No. 2.)

T. malifoliella.—Head and antennæ shining dark brown; face ochreous. Fore wings uniform, shining dark brown with a purplish tinge, slightly dusted with pale ochreous; cilia of the general hue. Hind wings dark gray; cilia with a rufous tinge.

The larva mines the upper surface of the apple leaf. The mine is flat, at least until the larva enters the pupa state, and begins as a slender *white line*, dilating as it increases, and is ultimately formed into an irregular brownish colored patch, which is sometimes extended over the beginning. This is then shown on the separated epidermis as a white line or streak. The head of the

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larva is brown; the body uniform pale green; first segment brownish, with a short, vascular greenish streak. When the pupation begins the leaf is thrown into a fold, which is carpeted with silk, and the pupa lies within it. This state begins about the latter part of September, and the imago appears early in May.

ANTISPILA. (See Paper No. 3.)

A. Isabella.—Head golden. Antennæ purplish brown. Fore wings purplish brown, without violet and greenish reflections, with a pale golden band near the base, inclined toward the base, not constricted on the fold, but broadest on the inner margin. Near the tip of the wing is a small pale golden costal spot, and one of the same hue nearly opposite on the inner margin. The hind wings have a greenish reflection; in *Nyssæfoliella*, they are rather deep purple.

The larva mines the leaf of *Isabella* grape in September. Its head is brown; the body yellowish white, with a few black dorsal spots on a dark green ground, on the middle segments and beneath a spot on the fourth and fifth segments: first segment dark green. It cuts out a very large, nearly round disk, during the latter part of September, and appears as an imago in the latter part of May.

A. viticordifoliella.—The larva mines the leaves of wild grapes. Its head is brown; the body yellowish green, without dorsal or ventral spots; the first ring brown. It may be taken in August, and in the beginning of September it cuts out a small oval disk and enters the pupa state. I have not succeeded in breeding the imago, but have no doubt it is specifically distinct from any heretofore described.

ASPIDISCA.

(See Proceedings, Jan'y., 1860, p. 11.)

The diagnosis of this genus was made from two specimens of *A. splendorella*. In insects so extremely small and fragile, even when relaxed by moisture, it is no simple task to make a correct diagnosis from a single examination. The reader will therefore please correct in the January number of the Proceedings as follows: *Labial palpi extremely short and slender, much separated. Tongue naked and scarcely as long as the anterior coxæ.*

A. lucifluella.—Head silvery. Antennæ rather dark fuscous. Fore wings silvery from the base to the middle, and thence to the tip dark fuscous varied with golden. Near the tip are three short, costal silvery streaks adjacent to each other; the first is longer than the others, with converging dark margins, and a golden patch on its internal side; the second with straight dark margins, and a golden patch beneath and adjoining it; the third is unmarginated except by the external margin of the second streak which separates them. Opposite the first costal streak is a dorsal, tapering streak of the same hue, and placed in the dark fuscous portion of the wing. From the second golden spot to the middle of the hinder margin is an oblique silvery streak, sometimes separated into two spots. At the extreme apex is a deep black triangular spot; the cilia grayish, tinged with pale brownish.

The larva may be found in September and October mining the leaves of hickories. The head, first and second segments are brownish, with a reddish tinge; body brownish-green, with a dark green vascular line and three blackish dorsal spots on the middle segments. Early in October the larva cuts out an oval disk and enters the pupa state, to appear as an imago early in June. The perfect insect is larger than *splendorella*.

PARECTOPA.

The fore wings are lanceolate. The disk is acutely closed behind, at the apical third of the wing and narrow. *No costal nervure.* The subcostal sends
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off quite near the base of the wing a long marginal branch, and near its end, two other branches to the costa. From the acute apex of the disk arises the apical branch, which, near its origin sends a branch to the costa, and about its middle becomes bifid, sending one branch to the costa near the tip, and the other to the inner margin beneath it. The median is *three-branched*, the posterior vein arising somewhat anteriorly to the costal origin of the second marginal, and is most distinct on the inner margin, being faintly indicated from its middle to its origin.

Hind wings very narrow, almost setiform. The disk unclosed. The costal nervure is well indicated and long, reaching almost to the tip of the wing. The subcostal is furcate beyond the middle of the wing and is attenuated toward the base almost from its bifurcation; it runs close to the costal trunk. The median nervure is furcate within the middle of the wing, on the inner margin.

Head with long, loose scales above, forming a slight tuft between the antennæ. Forehead rounded. Face narrow and short, somewhat retreating and smooth. No ocelli. Eyes small, round, salient and naked. Labial palpi moderately long, slender, smooth, pointed and drooping, (in the living insect most probably ascending); second joint slightly thickened at its end. Maxillary palpi not perceptible. Antennæ inserted on the front; filiform and simple; basal joint scarcely thicker than the stalk and short; nearly as long as the fore wings. Tongue naked, slender, nearly as long as the thorax beneath.

P. lespedezaefoliella.—Head and face white. Labial palpi, second joint dark fuscous, the third white. Antennæ dark grayish fuscous. Thorax blackish brown. Fore wings blackish brown, with three silvery white spots along the inner margin, one almost at the base of the wing, one at the apical third, and the other intermediate between them. On the costa are two silvery white spots, the first a little exterior to the second dorsal; the second costal opposite the third dorsal. Along the hinder margin is a black hinder marginal line, or two decided converging black streaks, one from the costa and the other from the inner margin, meeting at the tip where there is a small silvery white spot. The cilia along the *hinder margin are silvery white tipped with blackish*, and along the inner margin dark gray. Hind wings dark fuscous, cilia the same.

The larva mines the leaves of bush-clover, (*Lespedeza violacea*) early in September. It makes a whitish blotch mine, with a number of narrow, lateral mines, or rather wide galleries running out from it, on the upper surface of the leaf. The blotch is chiefly in the middle of the leaf, the larva mining along the midrib in the first instance, and when disturbed it conceals itself by retreating to the midrib, and applies itself along the course of it. Hence tenanted mines may easily be mistaken for deserted ones. The mine never contains "frass," and the larva seems to leave one capriciously, whilst it is yet small in extent, to form a new one; this it does by penetrating the under cuticle of the leaf. In the course of larval life, many new mines are formed and the insect is a troublesome one to breed. The larva is cylindrical, slightly tapering from the first segment, and the body bright, concolorous green. It deserts its food-plant about the middle of September to form its cocoonet; this is woven upon some substance on the ground, in the vivarium, in a pucker on a leaf, or under a turned-down portion of the edge, and is white. It appears as an imago early in May.

I have no good description of this larva in my notes, but have of another having precisely similar habits, and in appearance very like it. It mines a species of *Desmodium* plants, nearly related to *Lespedeza*, and is probably the same insect, or at least of the same genus as the above. The body of this larva tapers posteriorly; it is submoniliform and slightly flattened, with the segments roundly mammillated on the sides. The feet are three, the abdominal three and the terminal one pair. The head is pale brown; the body

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bright green, tinged with yellowish. The larvæ desert their mines to form new ones, hence they are never extensive, sometimes blotches, and again irregular galleries along the midrib, with lateral branches. The "frass" is voided at the entrance opening beneath. I was not successful in breeding the larvæ on *Desmodium*.

BUCCULATRIX Zeller.

(See Paper No. 3, Proceedings, Jan., 1860. The authority there given is a mistake.)

B. pomifoliella.—Head and face very pale ochreous, with the tuft tipped with brownish. Antennæ pale ochreous, dotted above with dark fuscous. Fore wings whitish, tinged with pale yellowish, freely dusted with brown. On the middle of inner margin is a large dark brown, oval patch, forming, with its opposite when the wings are closed, a conspicuous, nearly round dorsal patch; a streak of the same hue, from the costa opposite it, running to the inner angle of the wing and tapering from the costa where it is broadest. At the tip is a round, dark brown apical spot, and in the cilia a dark brown hinder marginal line. Hind wings pale brownish ochreous, cilia the same.

The larva feeds externally on the leaf of apple, at least at the time it was taken, in the latter part of September. It is cylindrical and submoniliform; tapers anteriorly and posteriorly; with punctiform points and isolated hairs, first segment with rather abundant dorsal hairs; thoracic feet three, abdominal four and very short, terminal one pair. Head small, ellipsoidal, brown; body dark yellowish green, tinged with reddish anteriorly; hairs blackish and short.

Early in October the larva enters the pupa state, weaving an elongated, dirty white, ribbed cocoon, and appears as in imago during the latter part of the following April or early in May.

B. agnella.—Head and face sordid white, the latter touched with fuscous. Antennæ dark fuscous. Fore wings whitish, washed with pale luteous-brown, which prevails especially towards the tip and along the fold. About the middle of inner margin, on the fold, is a small dark fuscous mark, consisting of a few scales. *The costa is dark fuscous from the base*, and about the middle of the wing gives off a short oblique streak of the same hue, and another near the apical third, which is fuscous near the costa and pale luteous-brown beyond it, and margined exteriorly with white, especially on the costa. The long scales in the cilia are tipped with dark brown. Hind wings brownish, cilia brownish with a rufous tinge.

Taken on wing about the middle of May.

MACHIMIA.

Fore wings with the hind margin obliquely pointed. The subcostal nervure gives off a marginal branch near the basal third, and at the end of the disk subdivides into four nervules, of which the apical is furcate near the tip. The median is four-branched, the medio-posterior remote from the penultimate. The submedian is furcate at the base. In the disk is a long, faintly indicated secondary cell. The neuriation of the hind wings like that of *Depressaria*. The discal nervure is oblique. The interior basal angle rounded, and the margin slightly excised behind it.

Head and forehead between the antennæ, *shaggy*. Face rather smooth, depressed and retreating. No ocelli. Eyes small, oval and salient. Labial palpi rather long, remote from the face, slender, curved and ascending; *second joint roughened with scales*; the third smooth, aciculate, and about one-third less long than the second. Maxillary palpi very short. Antennæ about one-half as long as the fore wing, simple and filiform; basal joint short. Tongue scaled, about as long as the anterior coxæ.

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M. tentoriferella.—Labial palpi pale yellowish; basal half of the second joint blackish or dark fuscous. Fore wings reddish ochreous, with dispersed dark fuscous atoms. The extreme base of the costa is blackish, from a small black spot on its edge; with three blackish brown spots arranged in a triangle in the middle of the wing, one about the middle of the disk, another on its end, and one in the fold beneath them; cilia rather long and russet colored. Hind wings rufo-fuscous, along the discal portion of costa, pale ochreous.

The larva tapers posteriorly from the head; terminal legs short, placed posteriorly, projecting beyond the shield; abdominal legs short; with papilliform points in squares, each bearing a hair; body cylindric and sub-monilliform. The head is large, carried horizontally; somewhat flattened above, but rounded; cervical shield doubtfully indicated, its color dark green. Body dark green, at first uniform, but after the last moult, a double yellowish-green dorsal line is added.

It may be found during the latter part of July, on the leaves of wild cherry, oaks and hickories. On the underside of the leaf it throws a closely woven sheet or web from the midrib to the side of the leaf, and draws it into a shallow fold. This sheet or tent is not much longer than the larva itself, open at both ends, transparent, shining and vitreous. Beneath this it rests during the day, and in the night leaves it to feed on the edges of the leaf, retreating to its cover if alarmed. To this it clings most tenaciously if disturbed, thrusting its head from beneath it, shaking it from side to side, or if disturbed in front, retreats, without leaving it, and defends itself stoutly with its mandibles. Its length is about half an inch. When it leaves a leaf to form a new tent on another, it always devours the silk of the one it deserts.

During the latter part of August or first of September it enters the pupa state and forms its cocoon, by turning down a portion of a leaf, carpeting it with silk and binding its edges closely. The opening left at the ends, corresponding to the tail of the pupa, is closed densely, and the other with loose silken threads. The pupa case is very dark reddish brown, and it remains in situ when the imago escapes. The antennæ-cases as long as the wing-cases; abdomen rather short and blunt; cylindrico-conical. The imago appears during the latter part of September.

PSILOCORISIS.

The neuration of the wings differs in scarcely any respect from the foregoing genus, except that the medio-posterior vein is not remote from the penultimate. The posterior veins of the median are very much curved. The structure of the fore wings in both these groups is much like that in the *Tortrices*.

Head smooth. Face rounded. Ocelli none. Eyes large, round and salient.

Labial palpi long, remote from the face, recurved, rather slender; second joint rather flattened, smooth, with appressed scales; third smooth, slender and pointed, nearly as long as the second joint. Maxillary palpi short, distinct. Antennæ about one half as long as the fore wings, simple and filiform; basal joint rather long and subclavate. Tongue one-half as long as thorax beneath, scaled.

P. quercicella.—Head and thorax dark yellowish-brown. Labial palpi, second joint ochreous, with a black line on the edge beneath; third black, with two yellowish white stripes in front. Antennæ ochreous, with a black line above, terminating in black spots; basal joint with two black stripes in front. Fore wings yellowish brown, varied with blackish irregular striæ, chiefly from the costa, with a black dot on the end of the disk. The posterior margin is tipped with blackish; the cilia are yellowish brown, containing two dark fuscous hinder marginal lines. Posterior wings pale ochreous, cilia the same.

The larva tapers from the third segment anteriorly and posteriorly; flattened

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above and beneath, submoniliform; no dorsal papilliform points, but two rows on the sides; abdominal and terminal feet very short, the latter placed posteriorly. Head small, cordate, horizontal. The body is yellowish or pale greenish, the head, 1st, 2d, and 3d segments black.

It binds the leaves of oaks together, in August and September, and picks out the parenchyma between the network of veins. In the latter part of September it weaves a slight cocoon between two leaves, (in nature it is probably made elsewhere than between the leaves of its food plant), and becomes a rather short, thick pupa, with the antennæ cases moniliform and longer than the wing-cases, beyond the end of which they project as an obtuse spine. It appears as an imago in March or April.

Labial palpi very long and recurved, the tips extending back as far as prothorax, but remote from the face and head.

P. reflexella.—Head brownish, tinged with ferruginous. Labial palpi dark ochreous, with a black line on the edge of second joint beneath, and three black lines on the third, one in front and one on each side. Antennæ dark ochreous, annulated with dark fuscous; basal joint with two black stripes in front. Fore wings dull ochreous, profusely dusted with reddish fuscous; cilia short and dark colored. Hind wings fuscous.

This species very closely resembles, physically, *M. tentoriferella*. The labial palpi are longer, however, more recurved, and the second joint perfectly smooth, whilst in *tentoriferella* it is roughened with scales.

Both these genera likewise closely approach the European genus *Phibolocera*, and it is not impossible that one of them may be really identical with it, notwithstanding the longer antennæ and shorter third joint of the labial palpi in the European species.

MENESTA.

Fore wings obtusely pointed above the middle, elongate-ovate. Disk closed by a very faint nervure. The subcostal subdivides into five nervules, the first of which is from the middle of the disk, the fourth being the apical, and the fifth the post apical from the middle of the disk behind. The median is three-branched, the medio-posterior being opposite the third subcostal vein. The fold is thickened at its end and runs into the basal third of the median. The submedian curved, and shortly furcate at the base.

Hind wings somewhat trapezoidal, slightly emarginate on the hind margin beneath the tip. The discoidal cell unclosed. The costal nervure is long and extended nearly to the tip. The subcostal somewhat attenuated at its base, distinct from the costal, and furcate at the apical third of the wing. The median three-branched, the superior and central veins on a common stalk.

Size small. Head and face smooth, minutely scaled. Forehead and face rounded and very broad. Ocelli none. Eyes vertically placed, minute, oval, salient. Labial palpi smooth, slender, curved and ascending equal to the vertex; second joint slightly thickened towards its end; third very slender, pointed, and not more than one-half as long as the second. Maxillary palpi very short, distinct. Antennæ much separated at their base, about one-half as long as the fore wings, filiform and ciliated beneath microscopically, *with one hair to each article*; basal joint very short, scarcely thicker than the stalk. Tongue scaled at the base, slender, and about as long as the anterior coxæ.

M. tortriciformella.—Labial palpi fuscous, towards the base whitish. Head, antennæ, and face dark luteo-fuscous, the latter whitish beneath. Fore wings dark brownish with a purplish hue, with a small lunate white spot on the end of the disk. Hind wings dark fuscous, cilia the same. Feet pale yellowish, the ends of middle and posterior tibiæ touched with fuscous; the middle tarsi fuscous externally, and the hind tarsi banded with fuscous at the base.

NEPTICULA Zeller.

N. rubifoliella.—Head dark luteous. Palpi somewhat paler luteous. Antennæ luteous, basal joint silvery white. Fore wings blackish-brown, with a rather narrow, curved silvery band about the middle of the wing. The band is concave toward the base of the wing, and shows a tendency to be interrupted in the middle. Cilia whitish. Hind wings grayish, cilia the same.

I have very carefully compared this insect with the description and delineation of *N. angulifasciella*, of Stainton, in the first volume of the Nat. Hist. of the Tineina, and though unwilling to believe the fact, I cannot resist the conclusion, that it is the same species. I have not named the species in accordance with this conviction, because as yet I have secured but a single specimen.

The larva mines the leaf of blackberry in September. It makes a blotch mine on the upper surface of the leaf, beginning as a slender gallery, extending quite a distance, usually along a vein of the leaf, before being enlarged into a blotch. The body of the larva tapers posteriorly, the terminal rings being attenuated; color pale green, with a bright dark green vascular line; head greenish-brown and small. The larva was not taken from the mine for description. It leaves the mine very early in October to spin an oval, very dark reddish brown cocoon, and appears as an imago during the latter part of May or early in June. There is, therefore, in all probability, a summer brood, which may be found in July and August, if the conjecture is correct.

I have no doubt that subsequent observation will prove this insect to be the same as *angulifasciella*, and I am no little astonished to find so minute a creature common to the continents of Europe and America. During the coming season I will endeavor to record minutely the history of the preparatory states of the American species.

PHALENITES.

DORYODES Guenée.

I would notice this genus here merely to express my ideas respecting its classification. M. Guenée says of it, that the insects belonging to it have so doubtful an aspect that he is uncertain not only in what family, but in what division to place it. He notices its superficial resemblance to *Crambus*, or *Chilo*, and to the genera *Senta* and *Meliana* of his division *Noctuelites*, but says that from the form of antennæ and labial palpi, the absence of ocelli, (herein, however, M. Guenée is in error, for they are *not* absent), and from some other characters, not designated, it cannot be mistaken for one of the *Noctuelites*. While acknowledging the very notable differences between this genus and those with which it is associated, he does not inform us what ruling considerations induced him to prefer for it a place in his division *Phalenites*, (*Geometrina*) and the family *Ligida*.

In my own view, this genus has few or no structural characteristics of the *Geometrina*, and its neurulation just as undoubtedly places it in Guenée's group *Noctuelites*, (*Noctuina*); this, too, is a position justified by its general structure. If the subpectinated antennæ of the ♂, and the comparatively slender body, are considerations sufficient to overrule the position of the wings in repose, the partial folding of the hinder pair, the structure of the legs, *the presence of ocelli*, and the purely noctuiform neurulation, then indeed does the lesser amount of evidence overbalance the greater. Had M. Guenée not overlooked the presence of ocelli, his decision might have been different, for these organs are always absent in the *Phalenites*, and the possession of geometriform antennæ is not enough to neutralize their presence or to determine the place of the genus.

In the hope that some of the entomological students of New England, where one of the species of this genus certainly is found, may be able to make out

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its larval history, I will describe the species in my collection, and extract M. Guenée's description of the other. The first species may be easily recognised by means of Guenée's very good figure, and as a generic diagnosis would not facilitate recognition, particularly without the means of reducing it from a general to a special group, I will omit any generic description.

D. acutaria.—Herr. Sch. Sup., p. 74, f. 447. *Guenée Uranides and Phalénites, Suites à Buffon*, x. 233, pl. 17, f. 6.

The appearance of the imago is somewhat crambiform. The fore wings pale ochreous, tinted with dark luteous (with clear grayish violet, *Gn.*) along subcostal nervure and its marginal branches, and with a rather broad blackish streak beneath the median nervure, extended from the base and curving behind upwards toward the tip, bordered on the costal side by a silvery line, and one of the same hue behind, along the curved portion. In the disk are two blackish dots, one on the discal nervure and the other about the middle of the disk. Hind wings ochreous white. Guenée's sp. from Ga.; mine from Mass. Col. of Dr. Chas. Girard.

D. spadaria.—*Gn.* x. p. 234. "Very near the preceding, but larger, with the wings more oblong. The superior wings are more acute, and the terminal border perfectly straight. Their color is darker, grayer, with the designs finer and less distinct. The inferior are more developed and more oblong; they have the internal angle and part of the side tinted with blackish gray. The abdomen is perceptibly longer, and the antennæ also proportionally longer and slenderer."

In his generic diagnosis, M. Guenée says of the abdomen, "*dépassant beaucoup les ailes inférieures*," whereas in my specimens of *acutaria*, the abdomen exactly equals the length of the hind wings, when the wings are folded. He refers, doubtless, to the expanded wings.

PYRALIDÆ.

DESMIA Westwood.

This is one of the few genera in M. Guenée's family Asopidæ, of his division Pyralites, the males in which are characterized by nodosities or curvatures of the antennæ. As Guenée, at the time of writing his volume on *Deltoides* and *Pyralites*, had not seen the males of this genus, and his description, in the general remarks on the genus, does not accurately represent their structure, I will describe these organs in the male, of which I have several specimens. In noticing the singular conformation of the male antennæ, he says: "*sont d'abord renflées en massue, puis étranglées et munies d'un gros article ovoïde. puis enfin grêles et ciliées jusqu' au sommet.*"

About the middle of the antennal stalk, is placed a transverse, nearly vertical plate, which on the external side has a triangular elevation, and adjoining this, toward the base, is a narrow tuft of obliquely placed scales, running along the upper surface of the stalk. Toward the apex of the organ, immediately following this protuberance, one-half of the stalk is excised from above and slightly tufted internally. There is no thickening of the stalk except at the protuberance, and beneath it is microscopically pubescent from the base to the tip.

D. maculalis.—West. Mag. Zool., 1831, pl. 2, Guenée, vol. viii. 189. Blackish brown. Labial palpi blackish brown, while beneath. Fore wings with an irregularly oval white spot placed partly on the middle of the disk, the median nervure and the fold; another of the same hue and nearly round, on the base of the nervules behind the disk. Hind wings with a single, discal white spot. Abdomen with a white band at the base, a dorsal spot on the middle, and a short white dorsal streak at the tip.

Mass. and Ill. Col. of Messrs. Scudder and Kennicott.

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EUSTALES.

Fore wings with two subcosto-marginal nervules, given off very near the posterior-superior angle of the disk, the stalk of the second almost in contact with that of the apical branch near their origins. The apical and post-apical arise together at the angle of the disk, the former being furcate near the tip, sending a nervulet to near the costa. The disco-central is given off from the middle of the discal. Median four-branched, the medio-superior on an extremely short, vertical peduncle; the posterior arising at a point somewhat behind the costal origin of the first marginal branch.

In the hind wings the costal nervure is furcate at the tip of the wing; the oblique intercostal branch is long and exterior to the cell, and the subcostal simple and attenuated at the base. The median four-branched, the superior which continues the curved discal nervure, almost in actual contact with the following branch. The hind wings are broader than the fore wings, and about one-fourth less long.

Head with ocelli, rather remote from the eyes; face rounded, smooth, and rather narrow. Eyes large, round and prominent. Labial palpi rather thick, curved and ascending to about the middle of the face; second joint thickened beneath with scales; the third rather smooth, elongate ovoid, and about one-half as long as the second. Maxillary palpi rather long, curved and ascending, their tips nearly equal to those of the labial palpi, roughened with scales, distinctly three-jointed. Antennæ about as long as the body, with triangular patches of shining scales along the stalk above; inserted above the middle of the eyes, with bases contiguous and microscopically pubescent beneath. Tongue scaled at base and when unrolled, does not extend beyond the tips of the labial palpi. No abdominal apron (*tablier*) perceptible. The posterior coxæ rather short; the length of the tibiæ and tarsus, of the hind pair of legs, equal to that of the entire body.

E. *Tedyus congalis*.—Fore wings ochreous yellow, paler along the costa, dusted somewhat with reddish fuscous, with a moderately broad white band from the costa near the tip, curving toward the base of the wing in the *submedian interspace*, where it becomes rather broader, to the middle of the inner margin. Behind this, near and parallel to the hind border, is a narrow white band, not extended to the costa nor inner margin, and bordered exteriorly with a blackish-brown line. The exterior border of the wing is paler yellow than the general hue. Hind wings white, with an oblique fuscous band above the middle, tapering to the external margin; a broad one of the same hue near the hinder margin, having a pale ochreous-yellow spot at each end, and margined behind with a white streak having an external delicate black line. The terminal margin pale ochreous-yellow, with four black points having ochreous-yellow pupils, arranged along the margin from the middle of the wing toward the exterior angle.

Lake Teedyuscong, Pike county, Penna., in the latter part of June or early in July.

The ornamentation of this insect resembles in a remarkable degree that of *Oligostigma juncealis* Gu.; it cannot, however, be a member of the same genus.

HYDROCAMPA? Latreille.

Guenée, vol. viii. 273.

Fore wings with one subcosto-marginal from near the superior angle of the disk; the apical branch, at its basal third, gives off a branch to the costa, and somewhat behind its apical third becomes furcate; the post-apical arises at the angle, and the discal nervule on the costal side of the cell. Median four-branched; the superior on a very noticeable peduncle; the posterior remote from the penultimate, which together with the other branches are aggregated at their bases.

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In the hind wings the costal nervure has a rather long fork. The intercostal branch exterior to the cell and extremely short, and from this point posteriorly the stalks of the two nervures are almost in contact. The median nervure four-branched, the superior on a moderate peduncle.

The structural differences between this and the foregoing genus are: the labial palpi slenderer; third joint very short, about one-third as long as the second, which is squamous beneath. Maxillary palpi slender, smooth, porrected; with tips equal to the end of the second joint. Tongue scaled at the base, *at least one-half as long as the body*. The length of the middle tibiæ and tarsus equal to that of the body; the hind tibiæ and tarsus exceeding the length of the body.

H. ? formosalis.—Fore wings pale yellow, with three white patches on the disk, the two nearest the base small and slightly margined with fuscous, the one on the end of the disk margined internally by an oblique fuscous line; a white patch on the nervules behind the disk, margined externally by a fuscous line convex toward the base of the wing and hooked at each end, with a white patch at the tip and one beneath it at the inner angle, both margined externally by a submarginal curved fuscous line. In the middle of the *submedian interspace* is a nearly oval white patch encircled with fuscous. Hind wings white, pale yellowish beyond the middle, with a fuscous line near the base from the inner margin, not extended to the costa; a wavy double line of the same hue rather external to the middle, and a white spot near the tip and one about the middle of the hinder margin, both margined externally with a fuscous line. On the disk is a pale yellowish spot.

Lake Teedyuscong. Imago, July.

CATACLYSTA Herrich-Schaffer.

Fore wings with the first subcosto-marginal vein and medio-posterior opposite at their origins. The apical vein runs into the costa before the tip, and gives rise to a marginal branch at its basal and apical third. The post-apical runs into the produced tip of the wing and gives origin to the discal nervure. Hind wings, the costal is shortly forked near the tip. The subcostal arises from the costal within the disk and *is not produced toward the base*. *The median is three-branched*. Head without ocelli. Antennæ of the ♂ densely pubescent. Tongue as long as the thorax beneath.

The structure of the posterior wings in the species described below forms very nearly a parallel case to *C. dilucidalis* described by M. Guenée. The costal nervure of *dilucidalis* is not, however, represented bifid, and the branch which corresponds to the costal nervure does not arise within the cell and give origin to the discal, but exterior to the disk and the discal nervure arises behind it from the costal. They both concur in the absence of the discal, or independent nervure, and in the median being three-branched. May not *dilucidalis* be an American species? I cannot determine the question, as M. Guenée's description is imperfect, from the fact that it was drawn from badly preserved specimens.

C. fulicalis.—Fore wings white, fuscous at the costal portion of the base, with a broad band near the base and a narrow wavy fuscous line crossing the middle of the disk, sending from the median nervure a curved line to the inner margin, convex exteriorly. The space between these lines is frequently dusted with fuscous. From an elongated fuscous patch limited below by the subcostal nervure, on the middle of the costa, departs an oblique ochreous band, inclined to the inner angle and margined along the discal nervure on both sides, with fuscous; and from the posterior end of the costal patch, a curved line joins the external dark margin of the band enclosing an oval spot of the general hue. A subterminal band tapers to the inner angle, leaving on each side of it two converging tapering bands of the general hue. Hinder margin ochreous, margined internally with fuscous. Hind wings white, with

a broad fuscous band near the base, corresponding to that on the anterior, and touched with ochreous in its middle; with a median yellowish brown curved line, not reaching the costa, and exterior to this, the apical half of the wing is dusted slightly with dark brownish. Along the terminal margin, is a row of five black lunules, connected by *intermediate metallic violet-blue spots*, and on the extreme margin behind these latter spots, *a row of orange yellow dots*; while the band is tinted interiorly with the same hue, limited by an interrupted slender dark brown line near the band.

Pennsylvania, Easton.

In ornamentation the following species is very like the foregoing. It differs from it structurally in the following respects: Fore wings with the first subcosto-marginal and medio-posterior opposite at their origins; the second marginal arises at the angle of the disk; the apical vein forked at about its middle, the lower branch entering the costa before the tip. In the hind wings the costal has a long fork; the intercostal joins the subcostal at the point of departure of the discal and seems to be a continuation of it, and the subcostal is continued to the base of the wing. *Head with ocelli*. Tongue as long as the thorax beneath. The first joint of labial palpi thickened with scales.

C. ? helopalisis.—Fore wings white, dusted with pale fuscous toward the base, and on the fold behind; with a narrow fuscous band crossing the base of the disk. Near the end of the disk is a yellowish brown line, crossing the wing, deeply and acutely angulated on the fold; and near the tip are two narrow oblique streaks of the same hue converging to the inner margin above the angle, the first of which is recurved toward the disk, encircling an obliquely placed oval spot of the general hue on the nervules behind the disk. Along the hinder margin, near the inner angle, are a few indistinct, iridescent spots; the margin and cilia yellowish brown. Hind wings white, with a short narrow fuscous band near the base, corresponding to that on the fore wings; a median line of the same hue, not attaining the exterior margin and the apical portion of the wing exterior to it sprinkled thickly with fuscous. Hinder margin with a row of black spots, having violet-blue metallic pupils and tinted with pale orange between the spots.

Lake Teedyuscong.

SIRONIA.

In the fore wings two distinct subcosto-marginal nervules leave the disk, the first and the medio-posterior opposite; the second marginal arising at a point nearly intermediate between the two hinder branches of the median; the apical vein is forked a little beyond its middle; the post apical and disco-central arise near each other on the costal side of the wing. The median is four-branched. In the hind wings the intercostal is short, remote from and exterior to the upper angle of the disk. There is nothing characteristic in the shape of the wings; the posterior are broader than the anterior.

Head with ocelli. Antennæ pubescent beneath. Labial palpi, *when undenuded*, moderately thick and squamose beneath, ascending to the middle of the front; third joint short and rather smooth; *denuded*, tapering to the tip from the base, slender and cylindrical; the basal joint long, equal to the front; the second and third short and equal in length. Maxillary palpi two-jointed, with tips nearly equal to those of the labial, ascending and somewhat tufted at the end. Tongue scaled at base, exceeding the labial palpi *by one half its length*. No abdominal apron perceptible; the length of the posterior tarsus and the tibia equal to that of the body.

S. maculalis.—Fore wings white, dusted with fuscous along the base of submedian nervure; with a fuscous spot at the base of the fold and one of the same hue in the middle of submedian interspace, and a broad, irregular band adjoining the disk behind, extended from the costa to the inner angle, with the exterior half nearly square, and the interior somewhat paler, curved

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and tapering. The apex of the wing is touched with fuscous, and the ends of the nervules slightly dotted with the same hue. Hind wings concolorous, pure white.

Lake Teedyuscong. July.

Before concluding this paper, I desire to record my views respecting the unnecessary amount of labor, loss of time and uninviting study, which the details of M. Guenée's mode of systemization imposes on the American student. MM. Boisduval and Guenée, in the important and comprehensive works which engage their labors at the present time, are not writing treatises on local faunæ, but on that of the entire world, in so far at least as lepidopterous insects are known; and students everywhere have a right to expect that the difficulties of classification will be diminished, rather than complicated, by their treatment of the various groups which may be included in their works. The author who would be cosmopolitan in his representation of this subject, at the present day, cannot neglect, in justice to those who may follow his footsteps through nature, to endeavor to lighten their burden of study and to economize their time, by leading them with all the lights of his knowledge, through the complicated mazes of doubt, engendered by the numerous and perplexing affinities existing in beings of the animated world. The chief object of classification is simply to communicate our own systematic conceptions to others, and to mark the graduations in the arrangement in such a manner, as will enable them easily and quickly to recognize its groups. How has M. Guenée facilitated the recognition of genera, whilst he has greatly increased the number of them, or lightened in any respect the systematic labor of the foreign student? Is it enough that he should content himself with carefully written diagnoses, and compel the student to examine critically and minutely every one in any of his family groups, before being able to decide whether the insect he may wish to classify belongs to any of them, or is not edited? A system which both reason and convenience approves, is that which enables the student easily to find what he seeks, and not that which compels him to master the genera peculiar to every other portion of the globe, in order to assure himself whether a group has been established into which his specimens can be admitted.

The omission of synopses of genera, when the number of them in his family groups calls for such tables, as it does so frequently, is a most serious, not to say unpardonable, defect in the six volumes published by M. Guenée. There is no student of American lepidopterology, compelled to study his works, who will not regret that he has so extensively described our fauna; and the fact that so much time and patience and labor are necessary to determine whether a generic description is given by the author, of one of our moths, of which everything is unknown, perhaps, except the division to which it belongs in his system, is an actual and real impediment to the development of the study in our country. In the examination and comparison of lepidopterous insects, M. Guenée recognizes beyond doubt, each genus under a family by some distinctive structural trait, and why cannot all these be presented to the student in synopses, as well as they are apparent to his own perceptive faculties? Without these conveniences of comparative study, the student is compelled to do the work of the author anew, and, at an immense disadvantage and loss of time, to search for what is distinctive, in by no means sharply, though diffusely characterized groups, which include very frequently ornamentation as one of their chief characteristics. In the cabinet of specimens, all this is almost apparent at a glance, and it is the result of this educated sense that seizes quickly what is distinctive in a variety of forms, that the student has a right to look for in synopses.

M. Guenée expressly declares in one of his early works in the "Suites à Buffon," that in giving the meagre synopses of tribes and families, contained in the series, he is merely following the custom of M. Boisduval, and that he
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does not consider them of any value in a natural system. It seems strange that any one, especially M. Guenée, could entertain such an opinion, when a slight amount of study is sufficient to convince any naturalist, that there is no severer test to be applied to a system than the construction of synopses containing exclusive categories founded on structure. Groups agreeing most closely are brought into direct contrast, and if the most trivial and unimportant structural peculiarities, except in the case of genera, are called into requisition to distinguish them, whatever may be their comprehensiveness, is not the fact very strongly suggestive of want of naturalness, nay, of purely artificial, arbitrary distinctions, produced by the desire to create differences where there are none actually in nature? But even admitting they are formed on a purely artificial basis, and that all synopses are essentially artificial, need the fact in the character of a simple index to systematic conceptions, in any manner affect the most natural arrangement of the group in the text? And could there be any better system than that which unites the convenience of the one to the truthfulness of the other?

One of the chief objects in systematic and descriptive works certainly ought to be, a ready and certain recognition of groups and individuals; and to facilitate this, no care or labor bestowed on synopses intended to promote this object and prevent loss of time to the inquirer, can be regarded as superfluous or as a tax on authorship. The world is thus the gainer in economy of time, and science is more rapidly advanced. And surely, when one reflects how few there are who devote themselves to scientific study, the additional labor thus expended by the author carries into the future the most fruitful results. It is the neglect of the synoptical system that has converted, even at the present day, the great majority of entomologists everywhere into a class of mere collectors and picture-recognizers, and which calls for a profuseness of illustration to be met with in no other department of Natural History. And on the other hand, its tendency is to institute, if indeed it has not already done so, an Egyptian priesthood over nature, in that body of European "authorities" skilled in the interpretation of its hieroglyphics, and who furnish students with a complicated, skeleton method, all of whose details they must painfully acquire, before they can in the humblest degree, aspire to question systematic nature for themselves. How laborious, time consuming and discouraging this is to the American student, who has "no authority" to consult, save the ambiguous phrases of diagnoses, no classified collections to study, and by the comparison of forms to educate his perceptive powers in generic and family differences, cannot be appreciated by those who have all these aids, and who are the heirs to almost hereditary entomological lore and collections, handed down from one generation to another.

The times, however, demand of MM. Guenée and Boisduval a system of convenient study. The former, it is true, attempts to meet this demand by separating the portion of the order of which he treats, first, into divisions, and these into tribes, and these again into families; but scattered as they are through the body of the work, or through several volumes, this complication of arrangement is far from fulfilling the needs of the student. It is not *natural*, and is therefore perplexing, and has caused the author to mistake well marked groups within families, for families themselves, or even higher divisions. When the individual structure of two beings placed in different, sometimes widely separated families, approach so intimately that they can be distinguished only by resort to trivial characters, what more conclusive proof of artificiality, and mere brain and paper-created distinctions, can the naturalist desire?

The elaborate description of groups is a highly commendable trait in a systematic work. They should be, however, merely a confirmation of the results attainable by the study of synopses of characters, all the categories of which are rigidly exclusive and markedly characteristic of the groups they desig-

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nate. By this means, the question of groups having been reduced to a few which are most closely coincident, doubts which cannot be dispelled by the best synopses, are either confirmed or dissipated at once. This subject I think eminently worthy M. Guenée's consideration, and that of all systematists who may succeed him. I would beg him to think upon it in connection with his subsequent works, and at least tell students why he values less a solid and self-satisfying reputation, built on essential and successful impetus given to his favorite branch of study in all parts of the civilized world, than that ephemeral position of being the temporary authority for the little entomological world; and if in addition to synopses of all his groups, under the next most general in value, he would add to his works delineations of the distinctive parts of structure in every genus, instead of colored representations of a few moths, his works would possess an enduring and permanent value, so long as entomology as a study engages the attention of the student of nature.

Hemiptera of the North Pacific Exploring Expedition under Com'rs Rodgers and Ringgold.

BY P. R. UHLER.

The Hemipterous insects, brought home by the Expedition, furnish several new and remarkable species, and much praise is due the indefatigable botanist of this Expedition, Mr. Charles Wright, for displaying such zeal in bringing together so many interesting objects. The insect fauna of many of the countries touched at, particularly that of Japan, being almost entirely unknown, renders every addition of species from those localities exceedingly desirable, and it would be matter of deep interest to have an opportunity of examining full series of them.

Considering the importance of the species procured, it is much to be regretted that extensive facilities were not afforded for bringing together a general collection; but, under the existence of contingent circumstances, this was not possible.

The absence of any extensive collection of exotic *Hemiptera* in this country renders it impossible to decide with precision upon a few of the species here included; but should they hereafter be found to have been previously characterized, the proper acknowledgments will be made. As there seems to be no settled opinion in the minds of Entomologists respecting certain groups, particularly with such families as *Halydæ*, *Pentatomidæ*, *Rhaphigastridæ*, &c., and still further on, with *Mictidæ*, *Nematopidæ*, *Acanthocoridæ*, &c., and having met with a genus (*Pachycephalus*) which violates the characters of the families given, I thought it better to place the included species in two large groups (*Pentatomoidea*, *Coreoidea*), corresponding with the genera *Pentatoma* and *Coreus*, of Fabricius.

SCUTELLERIDÆ.

CALLIDEA, Burm.

C. Stollii, Wolff, Icones Cimicum, 48, tab. 5, fig 45. Hong Kong.

EUCORYSSES, Amyot et Serv.

E. superbus ♀.—Deep orange; head bluish-black, lateral lobes and the middle one at tip sanguineous, transversely wrinkled, rostrum and antennæ black, pubescent, eyes and ocelli brownish; thorax deep orange, obsolete punctured, a lunulate, black depression just behind the head densely, coarsely punctured, exterior and anterior edges black, spot upon the disk, one upon each humerus, and a connecting band upon the basal margin also black; behind each anterior angle is an oblong, rounded, shallow impression, blackish; corium black, punctured; wings dark-fuliginous; scutellum finely punctured, with a band at base, an irregular one dilated and projecting medially forward, 1860.]

upon the middle, one interrupted each side, with an anterior acute point behind the middle and a transverse, roundish spot before the apex black; venter violaceous, the middle with a large sanguineous spot, common to the antepenultimate and preceding segments; caudal segment, except the anus, red, segments 1 to 4 with a transverse, lateral carmine spot, the two posterior of which are obsolete connected with the discal spot, penultimate one at sides broadly carmine through their marginal length, with an impression each side against the stigmata; pectus punctured, violaceous and black, a rounded spot upon the sides of the anterior and posterior segments; legs black, yellowish pubescent.

Length 10—11 lines. Humeral breadth 5—5½. Simoda, Japan.

One specimen differs in having the anterior band of the scutellum interrupted each side of the middle, so as to form three spots.

PELTOPHORA, Burm.

P. picta, Leach, Zool. Misc. Hong Kong.

GRAPHOSOMA, Lap.

G. rubro-lineatum, Hope, Cat. Hemipt., p. 12. Hakodadi and Takanosima, Japan.

PENTATOMOIDEA.

BRACHYPELTA, Amyot et Serv.

B. elevata.—Black, shining, broad, ovate; head roughly punctured, finely emarginate, rounded, margins reflexed, lateral lobes meeting in front of the middle one; thorax short, transverse, finely but roughly punctured, sides subparallel, margins trenchant, ciliate, anterior angles rather abruptly rounded, behind the head a deep lunulate depression, bounded posteriorly by a very much elevated prominence, which is rather smoother than the surrounding surface, posterior margin truncate; scutellum finely, rather sparsely punctured, depressed behind the middle to the tip, against the basal corners more elevated and polished; hemelytra finely, closely punctured, corium sinuated, ciliated at the basal margins, membranes testaceo-hyaline; abdomen slightly dilated, convex beneath, margins trenchant, projecting a little beyond the breadth of the corium posteriorly; venter polished; legs black, polished, femoræ ciliate, each with a line of impressed punctures upon the anterior surface, tibiæ very spinous, exterior, spiniform teeth of the anterior ones, subequal.

Length 10—12 millim. Abdominal breadth 5—7. Cape of Good Hope.

This species is very closely related to and possesses many of the characters of *B. tristis*, Fab.; it may be distinguished at a single glance, however, from that common species, by the proportionately shorter and less, laterally, oblique thorax, and by the abdomen being much broader than the thorax.

ACATALECTUS, Dallas.

A. magnus ♀.—Black, shining, punctured; head rounded, emarginate, with the anterior margin narrowly recurved, lateral lobes meeting by a point of their surface, in front of the middle one, coarsely and deeply rugose-punctate, eyes testaceous, ocelli reddish, antennæ piceous pubescent, terminal joints paler, rostrum pitchy black, second joint thickened; thorax subquadrate, anterior angles a little oblique and rounded, behind the head a slightly elevated, irregularly crescent-formed surface, smooth and impunctate, remaining surface very deeply, coarsely and confluent punctured, a series of very fine punctures against the lateral margins, basal margin subtruncate, smooth, with a very few coarse punctures; scutellum polished, rugosely punctured, impunctured at the apex; corium subopaque, very finely and closely punctured, membrane fuliginous, subopaque, freckled with spots of yellow, beneath scabrescently punctured, venter densely so, its disk polished, impunctured, margins trenchant; legs deep black, polished, anterior and middle femoræ ciliated beneath with a row

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of long slender spines, those upon the posteriors very short, tibiæ densely spinous.

Length 9 lines. Abdominal breadth 5. Hong Kong.

This species must be closely allied to *A. rugosus*, Dallas; but in that species the middle lobe is represented to form the anterior margin of the head, and nothing is said of spots upon the membrane.

ERTHESINA, Spin.

E. fullo, Thunb. Nov. Ins. Sp. 42, tab. 2, fig. 57, (1783.) *E. mucoreus* Fab. Ent. Syst. iv. 117, 147, (1794.)

AGONOSCELIS, Spin.

A. nubilus, Fab. Ent. Syst. iv. 112, 124. Loo-Choo Islands.

POECILOMETIS, Dallas.

P. mistus ♀.—Brownish-cinereous; head rounded in front, middle lobe slightly longer than the lateral ones, surface densely punctured with black, antennæ yellow, punctured with black, penultimate joint black in the middle, almost to each end, eyes brownish-glaucous, with a posterior, narrow yellow lobe, prominent, subtruncate posteriorly, rostrum reaching to the abdomen, a longitudinal line, tips of the articulations and apical segment black; thorax densely punctured, a few impunctured yellow spots scattered over the surface, four of which are placed in a transverse row behind the head, anterior angles armed with a very minute denticle, lateral margins smooth, slightly sinuated, humeral angles prominent, triangularly rounded; scutellum confluent punctured, an impunctured yellow spot against each basal corner; sinuated before the tip, tip rounded; hemelytra flecked with brown, densely punctured, slightly tinged with reddish upon the apex of the corium, membrane yellowish-hyaline, the nervures having interrupted brown lines upon them; beneath less closely punctured, upon the pectus several spots of dense green punctures, under surface of the head also punctured in green spots; disk of the venter, with a broad, smooth, impunctured line, surface tinged with reddish, stigmata, and obsolete spots upon the incisural middles of the segments black; legs reddish-yellow, sparsely pubescent, punctured with black, unguiculi with black tips.

Length to tip of wings $7\frac{1}{2}$ lines. Simoda, Japan, and Hong Kong, China.

PENTATOMA, Lat.

1. *P. fimbriata*, H. Schf. Wanz. Ins. v. 63, tab. 164, fig. 505. Loo-Choo Islands.

2. *P. cruciata*, Fab. Ent. Syst. iv. 119, 153. Hong Kong, China.

3. *P. dissimilis*, Fab. Ent. Syst. iv. 109, 112. Hong Kong, China.

4. *P. humerigera*.—Olivaceous-brown, shining, tinged with æneous; head emarginate, with the central lobe slightly projecting from the emargination, surface closely punctured, eyes prominent, scarcely as wide as the anterior breadth of the thorax, and closely applied against it, ocelli bronzed, antennæ fulvous, second and third joints equal, rostrum reaching the posterior coxæ, testaceous, having a black line above; thorax brassy punctured, humeral projections blackish, salient, subconic, slightly flattened, curved; anterior margin deeply rounded out, behind the head a shallow, transverse, interrupted impression, lateral margins deeply arcuated, with an elongated-oval, impunctured, yellow mark, beginning at the anterior subacute angle; scutellum closely punctured with black, slightly sinuated before the tip, which is bluntly rounded; hemelytra closely punctured, nervures well defined, membrane brownish-fulvous; wings testaceous; tergum black, impunctate, with the lateral margins olivaceous, punctured; beneath polished, olivaceo-testaceous, finely punctured, more deeply and closely so upon the pectus and beneath the humeral projections, a common black spot upon the fourth and fifth segments, and a minute black point against the lateral margin upon the incisures of the segments, stigmata black; legs yellowish-testaceous, pointed with black.

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Length $3\frac{1}{2}$ lines. Humeral breadth 3. Takanosima, Japan.

This species bears some resemblance in form to *P. scabricorne*, H. Schf.; but differs in the form of the humeral angles.

STRACHIA, Hahn.

S. ornata, Linn. Fauna Suecica, 251, 937. Loo-Choo Islands.

A remarkably small variety of this species was obtained at Petropaulovsk, Kamtschatka; it differs from the type in marking, chiefly, in wanting the medial lateral black spot; the specimens are males, being six millims. in length.

EYSARCORIS, Spin.

E. perlatus, Fab. Ent. Syst. iv. 125, 177. Simoda and Loo-Choo.

One specimen has the spots of the base of the scutellum very minute, and in another they are entirely wanting.

NEZARA, Amyot et Serv.

N. torquata, Fab. Ent. Syst. iv. 108, 107. Loo-Choo.

RHAPHIGASTER, Lap.

R. disjectus.—Grayish-æneous, shining; head bluntly rounded, middle lobe about as long as the lateral ones; surface confluent punctured, tinged with purplish green anteriorly, eyes brownish, ocelli reddish, antennæ piceous pubescent, base of the apical joint yellow, rostrum yellowish, a line above and tip piceous; thorax brassy-greenish, tinged with purplish, confluent punctured, lateral margins regularly oblique, smooth, yellow, humeral angles slightly rounded, a little prominent, margin against the head yellowish; scutellum same color as the thorax, confluent punctured, a little sinuated before the tip, tip and a geminate spot each side at base yellow; corium grayish-yellow, punctured with black, punctures very dense upon the clavus and lateral margins; membrane and wings yellowish-testaceous; tergum black with a violet reflection, segments each with a yellow spot upon the lateral margin; beneath grayish-yellow, coarsely pointed with black, points absent from the disk, which is smooth, yellow, points becoming confluent in spots posteriorly and upon the external edges of the segmental incisures; sternum black, finely carinate in the middle; ventral spine reaching to the medio-coxæ, yellow; legs yellowish, pointed with black, a black band upon the knees, and another at the tips of the tibiæ, tarsi blackish, middle joint paler.

Length 5 lines. Humeral breadth 2 lines. Hong-Kong.

ACANTHOSOMA, Curtis.

A. haematogaster, Burm. Handb. ii. 360, 4. Hong-Kong.

TESSERATOMA, Lep. et Serv.

T. chinensis, Thunb. Nov. Ins. Spec. 45, tab. 2, f. 59. Hong-Kong.

DICHELOPS, H. Schf.

D. affinis.—Elongated-oval, testaceous-yellow, punctured with black, head elongated-triangular, deeply cleft in the middle, points applied, hardly divaricating at the tip, middle lobe about half the length of the external ones, punctured, antennæ reddish, incisures and apical half of the tip joint black, rostrum yellowish, with the extreme tip black; thorax transverse, gradually elevated to the middle, upon which a slightly elevated, arcuated transverse carina, continued to the subacute humeral angles, exists, surface finely wrinkled and punctured, lateral margins lightly arcuated, minutely denticulated; scutellum transversely wrinkled, punctured, and having five longitudinal rows of obsolete granulations; before the tip sinuated, much narrowed; hemelytra very finely punctured with black, membrane testaceous; wings milk-white; venter finely punctured with black, extreme lateral margin a line just outside of the

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stigmata each side, one each side between the stigmata and the disk, and one upon the disk, almost impunctured; legs yellow, finely pubescent, and pointed with black.

Length 7 lines. Humeral breadth $3\frac{1}{2}$ lines. Simoda, Japan.

COREOIDEA.

DISCOGASTER, Amyot et Serv.

D. fuliginosus.—Dark brown, without lustre; head square, rugous, pubescent; antenniferous tubercles robust, blunt; rostrum thick, reaching between the anterior coxæ, tapering towards the extremity; antennæ densely pubescent, basal joint thickest, constricted at its origin, slightly curved, second a little longer than the third, fourth almost equal to the first, all the joints cylindrical, with the tip of the apical one acute; eyes globular, salient, stemmata about as far from each other as from the eyes; thorax subcrescentiform, triangular in front to the base of the head, humeral angles produced into flat, plate-like appendages, angular at the tips, posterior margin obtusely rounded, surface densely covered with short pubescence, coarsely transversely wrinkled, before the posterior margin a transverse, slightly elevated line, which does not reach either margin, edges of the crescent irregularly serrate, antero-lateral margins denticulate; scutellum smooth at base, coarsely wrinkled behind the base to the tip; hemelytra a little paler than the other surface, finely clothed with yellowish pubescence, nervures well defined, membrane subopaque; tergum smooth in the middle, pubescent at the sides; beneath sparsely clothed with golden pubescence, stigmata of the postpectus, bright yellow; legs covered with yellowish pubescence, tip of each femur beneath armed with a stout tooth, between which and the tip are a few smaller ones, posterior femora thickest, slightly curved, all the femoræ subcylindrical.

Length 23 millim. Humeral breadth 9 millim. ♀

This insect, owing to the length of the last joint of the antennæ and the absence of the sternal groove, does not completely agree with the genus as characterized by Amyot; but its general affinities seem to cause it to recur to this genus, where we have accordingly placed it.

CAMPTOPUS, Amyot et Serv.

C. annulatus.—Fuscous, minutely pubescent; head finely shagrinéd, blackish against the eyes and behind the stemmata, stemmata and eyes reddish-brown, antennæ yellowish, apical two-thirds of the last joint and tips of the others blackish; rostrum with the sides beyond the middle to the tip fulvous; thorax subcampanuliform, posterior angles armed with an acute spine, a minute denticle behind the spine, posterior margin irregularly crenated; surface pubescent, sprinkled with small, black, elevated points; tip of the scutellum yellowish; hemelytra pubescent, nervures very distinct, surface punctured, membrane immaculate, shining; tergum blackish, with a large, rounded, white spot behind the middle, against each incisure a white spot, exteriorly; venter yellowish, sprinkled with irregular dusky marks, a large black discal spot and an interrupted black line upon the middle of the three posterior segments; legs pubescent, spotted and marbled with fuscous and yellow, posterior femoræ particularly dark, armed with five teeth, between the two posterior teeth a few smaller ones, posterior tibiæ slender, curved, yellowish upon the middle, slender, acute spine at tip.

Length 7 lines. ♀. Simoda, Japan.

PACHYCEPHALUS, Uhler.

Body robust, elongate-oval; head filled up between the antenniferous tubercles, base of rostrum projecting bluntly; antennæ cylindrical, basal joint thickened, slightly curved, about equal in length to the third, second longest, apical one shortest, fusiform; eyes globular, situated upon a robust promi-
1860.]

nence; stemmata placed on the line of the eyes, a little nearer them than each other; rostrum reaching the posterior coxæ, first joint thickest, about equal in length to the second, third and fourth subequal, slender; thorax trapezoid; hemelytra about one-third shorter than the abdomen, a little shorter in the female, membrane with the nervures very irregularly ramose; abdomen thick, margins not recurved, superior caudal segment longest in the male; legs unarmed; posterior thighs not thickened, slightly curved.

P. opacus.—Dark brown, without lustre, punctured, pubescent; head with the space between the antenniferous tubercle filled up, antennæ pubescent, brown, with the apical two-thirds of the tip joint yellow, upper surface of the head covered with yellowish pubescence; thorax roughly punctured, a transverse, slightly elevated lobe near each anterior angle, posterior margin with a fine, transverse, impressed line, anterior angles acute, posterior ones rounded, lateral margins sinuated, edge slightly recurved, posterior margin truncate; scutellum and corium of the hemelytra punctured and uniform with the thorax; membrane pale brown, nervules very irregular, tip reaching the end of the fifth segment; tergum and beneath uniformly roughly punctured, pubescent, incisures of the tergum yellowish at the lateral margins; legs dark brown, pubescent, tarsi honey-yellow.

Length 10 millim. Humeral breadth $2\frac{1}{2}$ millim. ♂ ♀. Takanosima, Japan.

This genus presents an entire anomaly amongst the Coreoid Hemiptera with simple legs; it seems to have most affinity with the Gonoceridæ, but it differs from them in the length of the hemelytra and the irregularity of its nervules; its position in the series, as the system now stands, is very difficult to define.

GONOCERUS, H. Schf.

1. *G. bipunctatus*, H. Schf. Wanz. Ins., vi., 9, tab. 183, fig. 566. Takanosima and Loo-Choo.

2. *G. punctipennis*.—Body ovate, tawny-yellow; head punctured with black, space almost filled up between the antenniferous tubercles; tubercles but slightly prominent, middle of the head sulcate; antennæ reddish, pubescent, tips of the first three joints blackish, middle of the apical joint dusky, second joint longest, third a little shorter than the basal one, apical joint about half the length of the second, subfusiform, thickest; two basal joints of the rostrum about equal, apical ones subequal, apex minutely black; a slender black line behind the eyes to the base of the head, eyes brownish, globular, stemmata reddish; thorax trapezoid, gradually narrowed anteriorly to the breadth of the head, sides a little arcuated, margins recurved, paler than the surface, humeral angles bluntly triangular, hardly acute; surface closely punctured with black, behind the head slightly depressed, before the posterior margin a fine, transverse, elevated line interrupted at each end; scutellum and hemelytra minutely and densely punctured, the latter with pale, smooth, elevated costal margins, and upon the disk a small round black dot, membrane pale, semitransparent, nervures longitudinal, numerous, wings same color as membrane, nervures black; abdominal margins lightly recurved, tergum with two small black spots before the tip, and a number of irregular blackish marks near the sides; venter and beneath pale-yellowish, covered with minute, scattered punctures, a double irregular row of black points each side of the venter, within the stigmatal orifices, a few others against the sutures of the discoidal segments, and a single one upon the side of the medio and postpectus; legs minutely pointed with black, finely pubescent.

Length 14 millim. Abdominal breadth ♀ 7 millim. Simoda, Japan.

The female has the antepenultimate segment posteriorly deeply emarginate; at the base of this segment is also an elevated biemarginate process, at which the vulvar opening commences.

HOMŒOCERIDÆ.

ANACANTHUS, Uhler.

Body elongated, sides parallel; head square, lightly emarginated between the antennæ, and furnished with a feeble carina; behind the emargination, longitudinally impressed; eyes globular; stemmata situated on the posterior line of the eyes, a little nearer them than each other, a slight transverse impression before each; rostrum reaching half way between the anterior pairs of legs, first and second joints nearly equal in length, second thickened, next and the apical one cylindrical, subequal; antennæ cylindrical, slender, as long as the body, basal joint a little more robust than the others, slightly arcuated, second longest, third and apical ones subequal, the latter cylindrical, acute; thorax trapezoid, humeral angles not armed; membrane with the nervures numerous, chiefly longitudinal, tip not extending beyond the abdomen; legs simple, posterior femoræ not thickened, two pairs of hind-femoræ arcuated; abdomen not dilated, sides parallel.

A. concoloratus.—Cinnamon-yellow, legs and antennæ deeper, beneath paler, above uniformly, finely punctured, last joint of the antennæ dusky, with a minute black tip; eyes brownish; stemmata reddish; humeral angles simply angulated, an irregular, transverse elevated line before the hind-margin; membrane pale-yellowish, with a brassy tint, a thick nervule running nearly half the length of its posterior margin black; wings whitish, slightly tinged with brassy lustre; origin and basal half of the costal nervure red, remaining part yellow, some of the discal nervures margined with red, the rest brownish or yellow; beneath pale, polished, pectus finely punctured, unguiculi blackish.

Length 16 millim. Humeral breadth $4\frac{1}{2}$ millim. ♂. Hong-Kong, China.

LYGÆIDÆ.

LYGÆUS, Fab.

1. *L. equestris*, Linn. Fauna Suecica, 946. Hakodadi, Japan.

2. *L. mundus*, Dallas, Brit. Mus. Cat. Hemip. 542, 32. Cape Good Hope.

3. *L. ornatus*.—Head sanguineous-red, base, under side and slender longitudinal line black, rostrum also black, in the midst of the basal black spot is a minute whitish dot; eyes brownish, stemmata yellowish; antennæ ———; thorax red, margins not elevated, a black, each side interrupted, line behind the head, two triangular spots behind near the posterior angles, and two round dots of a deeper black, almost connecting the anterior band with the posterior spots; scutellum black, with a red tip and posterior margin; corium red, whitish against the membrane, a black oval spot running from near the internal angle to the humeral one, where it is reduced almost to a point, another subtriangular one behind the former against the external margin; membrane black, exterior margin and point at the basal angle white; disk of the venter blackish, margins red, stigmata black; each pectoral segment with a large black spot, pulverulent with whitish; a series of four round blacker points each side of the pectus; legs piceous, powdered with whitish.

Length $9\frac{1}{2}$ millim. ♀. Hong-Kong, China.

PACHYMERIDÆ. †

PACHYMERUS, H. Schf.

P. albo-marginatus.—Elongated, black; head black, pubescent, impunctured; rostrum piceous, paler in the middle; thorax trapezoidal, lateral margins broadly elevated, pale testaceous; basal breadth less than the length, surface densely punctured upon the basal half, behind the head and against the lateral margins, middle transverse, impressed line distinct, a slightly elevated, longitudinal line reaching from it to the base, humeral angles obtusely rounded; scutellum black, sparsely punctured, tip and a slightly elevated line against it testaceous; hemelytra coarsely punctured, testaceous, a large black

spot, covering the clavus, reaching to the subcostal nervure and extending two-thirds of its length, when it becomes blacker, and ramifies broadly against the lateral margin, a much narrower branch also continues against the posterior margin; membrane fuliginous, some of the nervures tinged with testaceous, towards the base; wings pale fuliginous, nervures darker; tergum with two pale spots upon the lateral margin; femoræ black, their basal third and trochanters testaceous, tibiæ light-piceous, black at tip, tarsi dusky at tip.

Length 11 millim. ♀. Takanosima, Japan.

Nothing is said of the antennæ, as they are unfortunately broken off from the only specimen obtained.

A specimen, which I take to be a variety of this species, was captured at the Cape of Good Hope.

It differs from the type in having the posterior thoracic lobe marmorated with testaceous, the hemelytral spot is not so black, spreading more irregularly over the surface, the testaceous color is faintly spread over the margins of the tergum, the femoræ are testaceous for two-thirds of their basal length, the tibia and tarsi are almost entirely testaceous, and the rostrum is tinged with piceous, more or less deep, throughout its entire length. Its length is $10\frac{1}{2}$ millim. ♀.

It corresponds with what is considered as a not full colored state of many insects of this and other families of Hemiptera, wherein the insect has not lived long enough to attain its complete depth of coloring, or where certain physical contingencies have retarded its attainment to full perfection of color.

APHANUS, Dallas.

A. boniniensis.—Pitchy-black, finely pubescent; head black, antennæ testaceous, tips of joints black, rostrum testaceous, piceous in front and at the tip, eyes dark brown, stemmata yellowish; thorax subcampanuliform, pubescent, anterior lobe rounded at sides, dark brownish, posterior lobe reddish, with a testaceous line upon the humerus bounded by a black line; corium yellowish-testaceous, margins paler, a spot at the apex, another a little in advance of it, punctulation and a few minute spots black; membrane fuliginous, nervules white; wings white; beneath black, margins of the abdomen and antepectus pale piceous; legs testaceous, a band upon the anterior femora, one upon the middle and posterior femora, and tips of tibiæ blackish.

Length 5 millim. ♀. Bonin Islands.

ORTHÆA, Dallas.

Elongated, black, opaque; head clothed with long hairs, first joint of the antennæ with a pale base, remaining joints —; rostrum reaching to the posterior coxæ, slender, curved, its color piceous, paler towards the tip, with a black longitudinal line; eyes brownish, darker upon the middle, stemmata amber-yellow; thorax clothed with long hairs, deep black, opaque, posterior lobe strongly punctured, a pale piceous spot upon the broad, transverse impression, including a slightly elevated, short, longitudinal line; anterior lobe strongly convex; scutellum black, coarsely but sparsely punctured; hemelytra testaceous, clavus, excepting the exterior nervure, vestiges upon the corium, large transverse spot, extending from the apex of the scutellum to the lateral margin and posterior margin, gradually dilating to the tip, black; membrane fuliginous, a number of small spots near the tip, nervules measurably, and small round spot near the apex of the corium, testaceous; disk of the tergum rufescent, lateral margin and two posterior segments blackish, fourth segment with a large, marginal, yellow spot each side; beneath dull black, antepectus punctured, postpectus yellow at its superior angles, minutely corrugated, mediopectus punctured and wrinkled; venter without lustre, a large yellowish spot upon the margin of the fourth segment, and a smaller one upon the fifth; trochanters and coxæ testaceous, anterior femora black, testaceous at base,

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armed with a number of minute teeth, tibiæ all pale piceous, middle femora piceous, paler toward the base.

Length 12 millim. ♀. Hong-Kong, China.

PELIOSOMA, Uhler.

Body elongated; head long, triangular, each side, between the antennæ, with a small, curved lamellæ, concave on the exterior side, interrupted at the origin of the rostrum, and not extending back much beyond the antennæ; rostrum reaching but little behind the anterior coxæ, basal and second joints subequal in length, third and fourth also subequal; antennæ ♂ as long as the body, ♀ not quite two-thirds of that length, basal joint longest, clavate at tip, second somewhat longer than the third, fourth shortest, subfusiform; thorax elongated subtrapezoidal, base elevated, lateral margins obtusely and feebly carinated; hemelytra as long as the abdomen, membrane with five longitudinal nervules; legs normal, anterior tibiæ curved.

P. antennata.—Tawney, lustrous, punctured with black; head and thorax densely punctured, the latter with a longitudinal, raised, polished, yellow line, but little punctured, lateral obsolete, carina yellow, posterior angles tubercular; anterior lobe convex, a broad transverse depression behind it; antennæ honey-yellow, paler upon the third joint, apices of the first and second joints dusky, last joint entirely so; eyes and ocelli brown; rostrum fulvous, dusky behind the middle to the tip; scutellum with a yellow line at tip and a yellow, short, tubercle-like line each side of base; corium dusky near the internal angle, apex with a small blackish dot, membrane honey-yellow, with white nervules; field of the tergum black, sides yellow, with black dots at the incisural margins; beneath varied with piceous and testaceous, pectus more uniformly pitchy, densely punctured, margins of the venter tawney yellow; legs honey-yellow, pointed with black; tips of tibiæ and tarsal joints blackish.

Length 8 millim. Simoda, Japan.

OPHTHALMICUS, Schill.

O. varius.—Black; head and legs orange-yellow; antennæ piceous, basal joint and apex of the third, yellowish; eyes light-brown, rostrum honey-yellow; thorax square, broader than long, surface polished, black, coarsely punctured; posterior angles with a subquadrate, small, yellow spot; scutellum black punctured; corium and membrane honey-yellow, the former punctured with black, most thickly so upon the exterior and interior margins; tergum and beneath polished black; pectus punctured.

Length 5 millim. ♂. Simoda, Japan.

It belongs to Fieber's second subdivision (a**) and seems to approach his *O. s iculus*, more nearly than any other species.

PYRRHOCORIDÆ.

PYRRHOCORIS, Fallen.

P. Forsteri, Fab. Ent. Syst. iv. 164. H. Schf. W. I. viii. tab. 283, f. 372. Cape Good Hope.

DYSDERCUS, Serv.

D. carnifex, Fab. Ent. Syst. iv. 160. H. Schf. W. I. ii. tab. 66, f. 199. Cape Good Hope.

D. Schlambuschii, Fab. Ent. Syst. iv. 155. Donovan, Ins. China, tab. 20, f. 2. Hong Kong.

LEPTOCORIS, Hahn.

L. haematideus, Hahn., W. I. tab. i, fig. 3, vol. i. Hong Kong, China. 1860.]

LARGIDÆ.

LARGUS, Hahn.

L. cinctus, H. Schf. W. I. vii. tab. 218, f. 683. California.

ECTRYCHODIDÆ.

PHYSORHYNCHUS, Serv.

P. crux, Thunb. Dissert. Acad. 156. Hahn. W. I. i. tab. 5, f. 20. Cape Good Hope.

HARPACTORIDÆ.

ARILUS, Burm.

A. bifidus, Fab. Ent. Syst. 4, 204. Donovan, Ins. China, pl. 21, f. 5. Hong Kong.

HARPACTOR, Lap.

H. nodipes.—Black, polished; head black, pubescent, bilobed, grooved between the ocelli; ocelli whitish; eyes large, black; antennæ black, apical joints piceous, pubescent, basal joint with two whitish rings upon the middle; rostrum robust, black; thorax pubescent, longitudinal impressed line, interrupted upon the middle of the posterior lobe, prothorax each side of the head produced into a subacute tubercle; scutellum without spinous processes; corium pitchy-black, membrane fuliginous, nervures darker; tergum blackish, lateral margins much dilated, crenulated, the incisures and a large postero-lateral spot upon the two last segments, whitish; beneath, black polished, venter sprinkled with numerous round, yellow points, the two posterior segments tinged with pale piceous; the spots of the upper marginal surface obvious beneath; legs black, three knot-like pilose prominences upon, and near the tips of the femora, two yellow bands upon the femora, and one upon the tibiæ; nodulæ much less obvious in the ♂ than in the ♀; yellow femoral bands, also more numerous in the male.

Length 12 millim. Simoda, Japan.

STENOPODIDÆ.

CANTHESANCUS.

C. trimaculatus, Amyot et Serv. Hemipt. 389, pl. 7, fig. 20. Hong Kong.

GERRIDÆ.

HALOBATES, Esch.

H. sericeus, Esch. Entomograp., 164, 79, tab. 2, f. 4. Atlantic Ocean near the Equator.

PTILOMERA, Amyot et Serv.

P. tigrina.—♂ Fulvous, polished, beneath silvery sericeous; rostrum with the apical joint and tip of the preceding one black, nasus and spot at the origin of the antenna black, head impressed at the origin of the rostrum, eyes brownish-black; prothorax subquadrate, largely impressed posteriorly, sides of the thorax with a silvery undulating line bounded each side by a black line, and extending from the base of the prothorax to the origin of the posterior legs, sutures black, behind the head three minute spots, behind the prothorax, included in a rounded impression, two larger ones and upon the posterior transverse suture, silvery sericeous; metathorax impressed each side against the anterior transverse suture, and having a slender impressed middle line; abdomen much narrower than the thorax, about equal to it in length, sutures black, particularly at the sides of the segments, sides of the segments slightly sericeous, anal and caudal appendages filiform, acute; two lamellar

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anal processes, emarginate above, each projecting into a subtruncate point inferiorly; legs long, slender, fulvous, posterior pair longest, anterior pair with two slender black lines superiorly; a black spot each side upon the pectus, before the anterior and middle legs; anterior tibia and tarsi pubescent, middle tibia armed with long cilia, posterior tibia ———.

Length to tip of abdomen 15 millim., prothorax 2, mesothorax 4 millim. Hong Kong, China.

GERRIS, Fab.

G. rufo-scutellatus, Latr. H. Schf. W. I. ix. 69. tab. ccc. fig. 924. Simoda.

PEDIRAPTI.

DIPLONYCHUS, Lap.

D. rusticus, Fab.; Donovan, Ins. China, p. 46, pl. 19, fig. 1. Loo Choo.

NEPA, Fab.

N. rubra, Linn.; Donovan, Ins. China, p. 47, pl. 19, fig. 2. Hong Kong.

NOTONECTIDÆ.

BOTHRONOTUS, Fieb.

B. bimpressus.—Robust, shining, dusky-yellowish testaceous; head narrower than the thorax, with a punctured impression each side upon the front, from both of which a punctured, impressed line extends to a shallower impression, each side, near the base, apical joint of the rostrum piceous; thorax transversely wrinkled, transparent, a transverse brownish band upon the anterior submargin; each side, behind the fossa, depressed; scutellum black; corium with a pitchy stripe upon the interior suture, a spot at base and against the apex, exterior submargin and membrane dusky; basal areole and veins of the latter piceous; embolium and connected edge yellow; wings fuliginous, veins darker; tergum piceous, posterior margins of the segments paler, lateral margins and caudal extremity yellowish, the last clothed with long golden hairs; venter pale piceous, middle carina and margins yellowish; legs testaceous, clothed with golden hairs.

Length 11 millim, breadth of thorax 5 millim. Hong Kong.

Var. a. Pale, luteo testaceous, ventral disk and basal areole of the membrane dusky.

Notes on Shells.

BY T. A. CONRAD.

In "Tertiary Fossil Shells of the United States," I characterized a genus of *Carditida*, published in 1838, under the name of *CARDITAMERA*, which has generally been referred to the genus *MYTILICARDIA* of Blainville. The two genera differ so much in external form, that they can easily be recognized without reference to the hinge. The former has the general form of an elongated *ARCA*, Lam., whilst the latter has an outline somewhat like that of *Modiola*. The genus *CARDITAMERA*, Dr. Gray has since named *LAZARIA*, the reason for the change of name being unknown to me.

In this country the genus *CARDITAMERA*, originated in the Miocene period, which contains three known species, and there is one living, which inhabits the coast of Florida. One is said to inhabit Madagascar, and all the others are American. It does not appear that any species of *MYTILICARDIA*, is American, either recent or fossil. The type of *CARDITAMERA* is *Cardita pectunculus*, Brug. 1860.]

Synopsis of the Genus Rangia.

RANGIA, Desmoulin, (1832, Hermannsen).

CLATHRODON, Gray, MSS. Conrad, 1831.

GNATHODON, Gray, 1837.

1. *Rangia cyrenoides*, Desmoulin. (1831, Bronn.)
G. cuneatus, Gray.
2. *R. flexuosa*, Conrad, (Gnathodon,) 1840.
G. rostratum, Petit de la Saussaye, 1853.
3. *R. parvum*, ib. (Gnathodon.)
4. *R. mendica*, Gould, (Gnathodon,) 1851.
G. trigonum, Petit de la Sauss., 1853.

Fossil Species.

1. *Rangia clathrodonta*, Conrad, (Mactra.)
Gnathodon, Grayi, ib.
2. *R. Lecontei*, Conrad, (Gnathodon.)
3. *R. minor*, Conrad, (ib.)

PLEIODON, Conrad.

The discovery of a new species of this African genus in Lake Tanganyika suggests the probability that Pleiodon will prove the predominant form of Unionidæ in tropical Africa, and we may anticipate the discovery of many species by future explorers. It occupies in geographical distribution as important a position as CASTALIA and TRIQUETRA do in tropical South America. I presume from the peculiar and distinct character of the hinge of PLEIODON, that the animal will be found somewhat different in organization from those of other genera of Unionidæ. It will be interesting to learn whether this form is accompanied or not by species of the nearest allied genus MUTEA, at present known only to exist in the Nile.

PARAMYA, Conrad.

I propose the above name as a substitute for MYALINA, Conrad, figured and described in "Foss. of Medial Tert. of the U. S." p. 65, pl. 36, fig. 4. A very different genus was designated MYALINA, by De Koninck, and has priority.

Geographical distribution of the Genus Lemopsis Sassi.

Recent species. Red Sea, 1. Cape of Good Hope, 1, 120 fathoms. Singapore, 1. Norway, 1.

Fossil species. Eocene of Claiborne, Alab. 7. Texas, 1. English crag. 2. D'Orbigny, in his Prodomus, names 7 Jurassic species, 3 Cretaceous sp., 17 Miocene, and 1 Subappennine sp. of European formations. In North America I believe no species has been found older than those of the Eocene, and no recent one.

ADEORBIS, Wood.

This genus occurring recent in England, California and the West Indies, and fossil in the English Miocene, is represented in the Miocene of the United States by 1 species.

A. lyra, (*Delphinula lyra*, Con.,) see Proceed. Acad. Nat. Sci. vol. 3, p. 20.

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Descriptions of three new species of Gorgonidæ, in the collection of the Academy.

BY GEO. H. HORN.

LOPHOGORGIA.

L. clavata.—Polypary bipinnate. Trunk and branches very much flattened. Branchlets thick, and but slightly compressed, clavate at their extremities. Calices numerous and projecting. Coenenchyme thick. Color reddish-pink.

This species differs from the *L. flammæa*, in its more numerous and projecting calices. The branchlets of the latter are much flattened and acuminate, and have an intense red color.

Locality unknown.

L. aurantiaca.—Polypary very much subdivided. Trunk but slightly flattened. Branchlets numerous and rounded, arising in pairs from opposite sides of the branches. Calices numerous and slightly elevated. Coenenchyme thin. Color orange, striped with red.

This species is much more subdivided than either of the others, and has its trunk and branches much less flattened. The color of the trunk, deprived of the cortex, is red.

Locality unknown.

RHIPIDIGORGIA.

R. Engelmanni.—Flabellate, coarsely reticulate. Branches much flattened, from one to two and a half lines wide. Interspaces rounded, occasionally elongated to the extent of one inch. Color ochreous externally, purple or reddish within.

The fronds of this species are higher than wide, (height 9 inches, width 6 inches,) bearing no free branchlets. Calices large and crowded, quadrangular in outline, with no elevation of their edges. Coenenchyme thick, easily crushed.

Locality. Mazatlan. Dr. Engelmann.

The Cutting Ant of Texas.

BY S. B. BUCKLEY.

MYRMICA (ATTA) TEXANA—"Cutting Ant."

Description.

Neuter. Color reddish-brown; head disproportionately large, mandibles large, triangular falcate, serrate, bent downwards in adult, two small, short spines at the back of each lobe of the head; sinus between lobes large; antennæ two, two-jointed, last joint clavate; thorax small, compressed, upper surface armed with six spines, front pair inclining forwards, middle pair erect, smallest, and near front pair, back pair inclining backwards; connecticum nodose, two-jointed; abdomen about half as large as head, oblong, ovate, obtuse; legs two-clawed, a claw or spine near the base of the tibia of the two front legs. Adult $4\frac{1}{2}$ lines long.

Female. Color reddish-brown; head disproportionately small; sinus small between its lobes, rudiments of spines at back of each lobe; antennæ and mandibles as in neuter; thorax large, upper front protruding over the head, compressed, upper surface covered with thick downy hairs; abdomen larger than thorax,

1860.]

ovate, obtuse. Length without wings, $8\frac{1}{2}$ lines. Largest wings 1 inch 1 line in length. Entire length, 1 inch 4 lines.

Male. Resembles female, but is a little smaller, with its head and abdomen more acute.

These ants have homes in the ground. A few of their underground dwellings have lately been brought to view, by digging, in order to kill the ants, because they destroy what belongs to the farmer and horticulturist. The extent of these ant galleries and cells, is so great as almost to exceed belief; but several of the excavations made to slay ants are within the incorporated limits of the city of Austin, and have been seen by hundreds of its citizens. The underground rooms of these cutting ants are rounded or oblong cavities, all connected by cylindrical passages, of a diameter varying from one to three or even more inches. Some cells are six inches wide, by nearly as many in height, and others twelve inches high, with a shorter diameter of some six to eighteen inches and the longer diameter three feet, and sometimes even more. These chambers are often one above the other, and again side by side; but on the whole, they do not seem to be placed with any apparent order, being scattered underground at various distances apart, from two inches to as many feet. In a clay soil they appear to be coated or varnished with a very thin, dirty brown, waxlike secretion. In sandy ground, to keep the walls firm, they are plastered with a black limestone earth, abounding in portions of the prairies and river bottoms. This often has to be carried a distance of many rods; and then the amount of their labor and its results are truly wonderful, showing their knowledge to be equal to that of any race of ants known. Their lowest chambers are generally ten and twelve feet deep, while the upper cells are rarely nearer the surface than eighteen inches. I extended a tape line down to the bottom of one, and found it seventeen feet deep; at one of their largest dens, a room was found sixteen feet beneath the surface, and several others were at near the same depth. At that place, the ground is dug out from twelve to sixteen feet deep, extending over an area having an average diameter of twenty-five feet, all of which was filled with ant cells. Several large avenues (4—5 in. diam.) entered the bottom of this large den. On striking an avenue, some ants were seen to enter it followed by others, loaded with barley, all coming from that underground passage. Where they got the barley was the question, which was finally solved by going to a stable more than three hundred feet distant; from which ants were seen to descend, each with his barley grain, and enter a hole in the ground near the base of the stable, which was the only place in the vicinity where there was any barley. Another avenue on the other side, is said to come out at the bank of a stream, between two and three hundred feet distant, where are some elm trees, from which the ants obtained bits of leaves, and carried them through said avenue into the base of the den. That they have extensive underground passages, there is not the least doubt. A gentleman recently told me of an instance where they dug under or tunneled a stream to get into a garden. There was a large ant den across the stream, and for a long time the garden was safe from their depredations, but finally the cutting ants were seen there, carrying bits of leaves into a small hole in the ground. There was no ant den in the vicinity, except the one across the creek, and as there were no dirt heaps on the surface of the ground in the garden, as there always are above an ant den, the inference was, that those cutting ants seen in the garden belonged to the tribe across the river; if so, it is probable that some of their wise ones, when on the trees in the vicinity of their abode, beheld the fine things in the garden, to obtain which they advised tunneling the stream.

The question will naturally arise, how is it possible for them to direct their course in digging those long underground passages so as to reach the surface at the wished for spot? Let those who ask, also answer; I only know that such long avenues exist, having thrust a long stick into one at the bottom of one of their dens, and I have also seen the outer openings of many of them on

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the banks of rivers and streams, whose water gives the ants drink, and where food can easily be had from the trees and bushes usually found growing on the banks of streams in all prairie lands.

At the large ant den in Austin, before spoken of, millions of working ants, and bushels of eggs and larvæ, with great numbers of males and females, were destroyed. As soon as a large apartment containing the eggs, larvæ and winged ants was found, a fire was kindled forthwith among them, for which purpose, light, combustible stuff was kept near. The eggs were of different sizes, belonging to opposite sexes, also showing, probably, that they grow, and were in a greater or less advanced stage of development. The workers at first are very small, scarcely a line in length. The eggs mixed with minute young ants, were in a soft, grey spongy substance, apparently leaves, finely triturated and mixed with an animal secretion.

It is said they sometimes abandon their caves, when from long residence the chambers become filthy, or perhaps they are injured by heavy rains, or it may be that the ants desire a better situation for provender. Whatever may be the cause, they have been known to emigrate en masse, and after making new excavations, and dwelling in them a few years, to return again to their old first residence. It is probable that they have a division of labor, some nurse the young, and others provide food. In one instance I saw one cut off a segment of an elm leaf, and another seized it as soon as cut, and carried it away, but generally I have noticed that he who cuts also carries. When cutting, one mandible is inserted, and carried slowly along; the head swaying to and fro, and the other mandible moving its sharp point, apparently breaking the surface to lessen the thickness to be cut by the other. The ant often stands on the part of the leaf which he is cutting off, but he is careful to remove to a firm place before it is finally severed, which done, he seizes one edge of it with his mandibles, and with a rapid movement throws it on his head and thorax, so that its lower edge rests between the lobes of the head and the spines of the thorax, and the upper edge is aloft. Away he goes, and joins the busy throng in the main path, which looks as if the ants had a gala day, and were marching with banners flying. Lately, on the banks of the Colorado river, near Austin, I saw multitudes of ants in their path, going up hill with fragments of leaves, and hack berries, (celtis,) some entire, and others with a small portion cut off, to render them lighter and suitable to be carried by the smaller ants. The place at which they entered the ground was about six feet from the top of the bank. This pathway was steep, and even perpendicular, for a distance of five or six inches, at a place about one foot below their doorway. The labor was severe to carry the berries up this path, but the struggle was great to get them to the top of the perpendicular spot. In performing this feat the berry carriers met with many falls, often rolling one and two feet down the hill but always sticking fast to their burdens, and trying again until they finally triumphed. One fell when near the top, and as he came up again, and was about to succeed, I touched his load with the point of a knife, and down it and ant went. His third attempt was put to the same test, but even then, he did not get angry, or show the least impatience, but cheerfully took his berry, and went up and in at the door of the long avenue.

A lady lately showed me a safe where she kept sugar and sweetmeats, which drew swarms of small ants. The legs of the safe were then placed in vessels of water, and the ants did not succeed in reaching the sweets during several days, but finally many of them were found in the sugar. After some little study to discover how they got there, they were seen to drop on the safe from the roof at the distance of about two feet above. These, however, were not the cutting ants, and I only mention their feats because they are similar to those related of ants by an East India officer. A gentleman told me that he suspended sugar by a string from a rafter in his house, to keep it from ants, but they went up and came down the string. They also were not the cutting ants, which rarely, if ever, enter houses.

1860.]

The cutting ants often assist each other. I saw one which fell with a hack berry, at the vertical place before named. The berry got loose from him, and instead of shouldering it again, he tried to drag it along, but was unable to pull it up the perpendicular. Many passed him and gave the cold shoulder; finally a kind ant came and pushed. By shoving and pulling the two succeeded in getting the berry to the top, when the assister immediately left, and started down the hill. They live on both animal and vegetable food. I have seen them carrying both worms and bugs. Whole beetles and numerous elytra have been found in their cells, but nothing indicating that they lay up large stores of food, like some of the East India ants, which have been seen to fetch their stores of corn to the surface to dry after heavy rains. The common tumble bug, (*Canthon lavis*.) in rolling his ball, sometimes heedlessly backs up over a nest of the cutting ants, and falls a victim, being overcome by numbers. Once I saw a very large one roll his ball into their midst, when he was fiercely attacked by the multitude. At first he stuck his nose in the sand, or rather between his forelegs, but the bites behind were so severe that he roused and flew in circles, finally alighting near me, which was no sooner done than an ant who had accompanied the flight, jumped to the ground, for a moment looked bewildered, then ran for home, it may be, to tell of his wonderful ride on the big bug.

The damage which these ants do, is great, by destroying trees and vegetables. I know of one family who are about to leave a beautiful situation near a fine spring, because the cutting ants have nearly killed their fruit trees and ornamental shrubbery, especially roses, for which they have a peculiar fondness. They have been known to strip a fruit tree of its leaves in a single night. In some sections these ants prevent the cultivation of fruit. Thousands of dollars have been uselessly spent in attempts to kill them by blowing noxious gasses into their dens, or by placing poisons at the doorways of their dwellings. A knowledge of the habits and abodes of these insects show the futility of such attempts; the fact is, but few of these can be reached by gas, let the bellows blow ever so hard, nor can many be killed by poison, even if the most deadly be placed within their doorways, for as soon as they discover harm, they form a new entrance. The only effectual method of destroying them is to dig, and kill the females and young, when the neuters will soon perish. This is so expensive that it will only be resorted to near a garden or dwelling, and as the cutting ants are scattered through western and central Texas, they probably never will be exterminated by man.

Contributions to the Carboniferous Flora of the United States.

BY HORATIO C. WOOD, JR.

CALAMITES Suckow.

C. bicostatus nobis.—Stem slender, bicostate, with distant articulations; ribs undulate, double, a very narrow, alternating with a broader one; tubercles obsolete. The distant articulations and the double, undulate ribs characterize this as a very distinct species.

ANNULARIA Sternb.

A. dubia nobis.

Syn. *Bechera dubia* Stern. Vers. vol. i. p. 30, t. 51 fig. 3, 1821. *Annularia minuta* Brongt. Prod. p. 155.

A. stellata nobis.

Syn. *Casuarinites stellatus* Schloth. Flora der Vorwelt, t. i. fig. 4, 1804, ejudem, Nacht. Petref. 1822. *Bornia stellata* Sternb. Vers. i. p. 28. *Annularia longifolia* Brongt. Prod. 1828. *Asterophyllites equisetiformis* Lind. et Hutton, Foss. Flora, vol. ii. t. 124.

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ASTEROPHYLLITES.

A. reflexa nobis.

Syn. *Annularia reflexa* Sternb. Vers. i. p. 31, t. 19, fig. 5. *Asterophyllites Brardii*, Brongt. Prod.

If this is a distinct species (which is doubtful) it must retain the specific name of the first author.

SIGILLARIA Brongt.

Stem not articulate, corticate, costate, smooth or striate; ribs of various widths, having furrows interposed between them; cicatrices discoid, disposed spirally upon the ribs, their longitudinal diameter exceeding the transverse; vascular scars varying in number, mostly linear.

The great fossil botanist, Brongniart, united the three genera of Sternberg, (*Rhytidolepis*, *Favularia* and *Syringodendron*.) with the title of *Sigillaria*. More modern authors have, however, re-separated them, retaining Brongniart's name for the first division of Sternb.

Among recent writers, Messrs. Lindley and Hutton, have acknowledged the genus *Favularia*, but Unger, Lesquereux and others do not. We have not seen sufficient specimens of this genus to justify us in offering an opinion.

Rhytidolepis, has, we believe, the right of priority over *Sigillaria*, but as the latter is now universally employed, it would cause too much confusion to revert to the original title.

M. Brongniart says, (see top of page 393, Veg. Foss.) "this genus is characterized by the longitudinal diameter of scars at least equalling the transverse, and that ordinarily it is much greater." A very few of the species which we would recognise as true *Sigillaria*, depart slightly from this rule, but it is impossible to characterize a genus in fossil botany, some of whose forms will not approach those of another division, for the simple reason, that any classification, however ingenious, must necessarily be purely artificial.

According to the oldest classification, all fossil plants were referred to the two genera, *Filicites* and *Phytolithus*. The present system has arisen by splitting off, as it were, section after section from these.

The classification of vegetable reliquæ may thus continue to advance, and it is with the hope it may prove a step in the right direction, that we propose a partial revision of the genus *Sigillaria*.

S. perplexa, n. sp.—Stem costate, costa varying in their width; bark thin; cicatrices quadrangular, conjoined by their raised confluent borders; vascular scars obsolete.

We place this very remarkable fossil in this group until better specimens can be obtained for further study. Though the vascular scars are not preserved, yet we cannot say they have never existed. When the bark is stript from the stem, a raised border is seen to underlie the margin of external scar. Locality and position unknown. Cabinet of the Academy.

S. solanus, n. sp.—Stem costate; ribs strongly convex, striate, and with a striate groove in the middle; cicatrices placed in this groove, small, distant subdiscoidal, often elongated with their base rounded and apex somewhat truncate; vascular scars three, those on the sides linear, arcuate.

In our specimen the distance between the scars is about five times their length. The depression or channel is slightly widened at their position, and between them a band, equalling them in width, is finely chased by very numerous minute striæ. Locality, Shæver's Drift, East Norwegia. Position unknown. Collection of the Academy.

ASOLANUS nobis.

Stem not costate, striate; striæ straight or curved, regularly or irregularly disposed; cicatrices discoid, single, their transverse exceeding the longitudinal diameter; vascular scars varying in number, mostly linear.

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We think the absence of ribs is sufficient to found a generic distinction on, but this genus is also separated from *Sigillaria*, by the excess of the transverse over the longitudinal diameter of the leaf-scar.

A. camp totaenia, n. sp.—Stem striate; striæ disposed in two series; in the one, contiguous, numerous, descending towards the right; in the other, few, and *ascending* towards the right; cicatrices sub-triangular rounded at apex, acuminate at the base; vascular scars almost obsolete. Locality and position unknown. Cabinet of the Academy.

A. ornithicoides, n. sp.—Stem longitudinally striate, vascular cicatrices three, linear, the middle much the longest.

This is undoubtedly decorticated and the markings are often obscured by adherent flakes of coal; but the peculiar disposition of the scars render this species very distinct. The middle impression projecting in front and behind gives the scars an appearance resembling that of bird tracks, which is often heightened by short curved striæ projecting from the side marks. Near the top and bottom of the specimen are two large oval scars, which, perhaps, mark the former position of branches; if so, this further separates this genus from *Sigillaria*, which Brongt. says do not branch. Locality, Milnes Mine, St. Clair. Position unknown. Collection of the Academy.

SYRINGODENDRON Sternb.

Stem tree-like furrowed, costate; cicatrices either single or double; vascular scars for the most part wanting, but sometimes represented by a single dot.

This is a very poorly defined genus, and we think that at some future date it will be broken up into several. We have seen no vascular scar in any specimen, and think that species possessing such will be found to have other characters in common sufficient to warrant their erection into a distinct genus.

For the present we follow Sternberg in dividing into two sub-genera—*a*, those with a single scar; *b*, those with a double scar.

S. magnifica, n. sp.—Stem not costate; striate (when decorticated), bark very seldom preserved; cicatrices double, oval, arranged in spiral, undulating rows ten to fifteen lines apart.

The distance between the pairs of scars is very variable, but never, in our specimens, exceeding twice their length. The two scars are often fused into one, with a broad disk of coal adherent. This species is seldom found with the bark remaining, we have seen but a single very poor specimen of it in that state. Owing to the absence of ribs, we think that it should not be classed in this genus. But desiring to avoid creating genera unnecessarily, we place it provisionally here. If other similar species should be found, constituting a distinct group, we would propose the name of *Diplotaxis*.

SOLENOULA nobis.

Stem ribbed, costæ narrow, convex; furrows equalling in width the ribs; cicatrices round, situated in the *furrows* between the ribs; vascular scars unknown.

We have created this genus to receive a very curious fossil from Schuylkill Co., Pa. Although the specimen is large and very handsome, yet the cortex is not sufficiently preserved, for us to note the form or even existence of vascular scars.

S. psilophloeus, n. sp.—Stem costate, costa convex, furrows and ribs striate, bark thin, cicatrices convex, situate in middle of the furrows. Locality, Milnes Mine, St. Clair. Position, body of Mammoth Vein. Collection of the Academy.

LEPIDODENDRON Sternb.

L. dubium n. sp.—Cicatrices lanceolate, approximate, strongly convex, [June,

with apex and base acuminate; margin sunken, flexuous, very narrow; vascular scars lanceolate.

In our specimen the vascular scars are almost obsolete and have a slight bulbous enlargement in the centre. Where the bark remains, the crest of the scar alone reaches the surface. We place this plant, with some hesitation, among the *Lepidodendra*. It is, however, allied to *L. rimosum* and *L. undulatum*, and with them ought perhaps to be erected into a separate genus. If this should be found advisable, we would propose the name *Acrostigma*. Locality and position unknown. Collection of the Academy.

L. ingens n. sp.—Cicatrices sub-rhomboidal, with apex and base acuminate, and base curved; margin distinct, furrowed, regularly flexuous; vascular scar sub-triangular, rounded at its apex, with the angles acute; tubercles distinct obovate; middle line almost obsolete, its situation marked by a shallow groove.

This large species, somewhat resembles *L. giganteum* Lesq. from which, however, the outline and disposition of leaf-scars separate it.

L. mekiston, n. sp.—Cicatrices, elongate with both apex and base acuminate and the base curved; margin raised, regularly flexuous; vascular scars sub-rhomboidal, with acute angles and marked with two or three dots; appendices distinct, very long, tubercles obovate; medial line deeply furrowed, transversely rugose.

The internal markings, of cicatriculi as well as the tubercles, are very often badly preserved. The general form of main scar resembles *L. Lindleyanum* Ung., whilst the raised border and form of vascular scars ally the plant to *L. aculeatum* Sternb. The more elongated cicatrix and the acute angles of the cicatriculi, separate it from the latter species. It also differs in the situation of tubercles and length of appendices. Locality and position unknown. Cabinet of the Academy.

L. Oweni, n. sp.—Cicatrices rhomboidal with somewhat curved base and apex; margin distinct, flexuous; vascular scars rhomboidal, placed near the apex of the cicatrix; appendices parallel to the margin; medial line well marked, flexuous.

Syn. *L. aculeatum* Sternb. n. sp.—Owen Geological Survey of Wisconsin, Iowa, &c., vol. ii. pl. vi. figs. 1, 3. That the impressions there figured are not *L. aculeatum* Sternb. we think is shown by the following considerations: 1st. The shape and relative position of the leaf-scars in the two are quite different. 2d. The vascular scars differ in outline and in Sternb.'s species they are marked with three dots which are wanting in Owen's. 3d. Tubercles are present in *L. aculeatum* Sternb. but not in Owen's figures. Finally the margins of the cicatrices differ.

The outline of our specimens differ somewhat from those figured in the Report, but we think that the species are identical. Locality, unknown. Position, Sandstone below the coal? Cabinet of the Academy.

L. dikrocheilus, n. sp.—Cicatrices sub-elliptical with apex and base acuminate and the base curved; margin raised, broad, regularly flexuous, vascular scars sub-rhomboidal, with apex and base rounded and angles at the sides very acute, marked with three dots; medial line almost obsolete, slightly rugose.

The margin of this species so bifurcates, that on the right side it receives an offset from the same side of the neighboring scar; thus making it nearly twice as wide on the right hand side below, and on the left, above. Locality, Broad Top Coal Region. Position, Roof of Cook's (upper) Seam. Private collection.

L. venustum, n. sp.—Cicatrices rhomboidal, with their base truncate; margin narrow, flexuous; vascular scar rhomboidal, placed above the middle
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of leaf-scar; tubercles obovate; appendices well marked, flexuous; middle line distinct, transversely rugose.

The left tubercle is obsolete, and when present is placed lower than the right; the middle line is sometimes flexuous. Locality and position unknown. Cabinet of the Academy.

L. drepanaspis, n. sp.—Cicatrices rhomboidal with rounded angles; margin flexuous; vascular scar triangular, raised, placed in apex of leaf-scar, bounded below by a crescentic slope, on which are the tubercles; appendices parallel to the margin; medial line transversely rugose.

This species somewhat resembles *L. clypeatum* Lesq., but is very different when more closely examined. Locality and position unknown. Cabinet of the Academy.

L. Lesquereuxi, n. sp.—Cicatrices sub-rhomboidal, elongated, with the apex and base acuminate, vascular scars curved, sub-rhomboidal, their apex rounded and other angles acute, marked with two or three (sometimes obsolete, sometimes confluent) dots; appendices distinct; medial line very strongly marked, transversely rugose.

It is with great pleasure that we dedicate this handsome species to Prof. Lesquereux, to whom every American Geologist is indebted for time and toil spent in elucidating the ancient Flora of this continent. This plant, besides the above characters, has also a crescentic scar, situated in the apex of leaf-scar and marked with two, often obsolete, dots. Locality unknown. Position, Sandstone below the Coal? Cabinet of the Academy.

L. Bordaë, n. sp.—Cicatrices rhomboidal, elongate, with apex and base acuminate and curved; margin distinct; vascular scars placed near the apex of cicatrix, trapezoidal, marked with two (often obsolete) dots; appendices well marked; tubercles obsolete; medial line distinct, transversely rugose.

This species is allied to *L. elegans* Brongt., but is separated from it by the scars being more elongated and the consecutive ones communicating, as well as by the difference in the proportion of the length to the breadth of the cicatriculi and the much greater rugosity of medial line. Two magnificent specimens were presented to the Academy by Mr. Borda, the largest measuring 3 feet 7 inches by 13 inches. Locality and position, Top slates of Back Vein, south side of Mine Hill, in the Black Heath Colliery.

LEPIDOPHLOGOS Sternb.

M. Unger (Gen. et Spec. Plan. Fossil) marks this as a doubtful genus, but we think it is quite a distinct one.

L. ichthyolepis, n. sp.—Stem large; cortex thin; cicatrices approximate, raised, triangular, furnished with an appendix on each side and one in the middle; vascular scars not preserved. Locality, Roof of Perseverance Tunnel, Dauphin Co., Pa. Cabinet of the Academy.

Mr. Lesquereux, in his "Catalogue of American Coal Plants," gives *L. crassicaule*, as a species of Brongt.; we are unable to find it in the works of that author, neither is it in Unger (op. cit.) As Prof. Lesquereux does not describe it we are at a loss as to its nature.

LEPIDOSTROBUS Brongt.

L. stachyoides, n. sp.—Catkin small, about two and a half lines in breadth and an inch in length; sporanges rhomboidal with flexuous margins, arranged in a single row on each side of the slender axis.

In the specimen a leaf of *Lepidodendron* has such relations to the fruit as to appear at first sight to have been connected with it, but closer examination shows this not to have been the case.

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Catalogue of the Colubridæ in the Museum of the Academy of Natural Sciences of Philadelphia, with notes and descriptions of new species. Part 2.

BY E. D. COPE.

CORONELLINÆ.

TOLUCA Kennicott. Type *T. lineata*.

U. S. and Mex. Boundary Survey, ii. pt. 2, Reptiles, p. 23, 1859.

Toluca differs from *Amblymetopon Gthr.* in possessing two pairs of frontal plates instead of one, and the nasal and first upper labial are not confluent. *Gyalopion nobis* has two pairs of frontals, but the rostral is recurved and acute, and the first labial is confluent with the nasal. The contact of the post-frontals, the want of anterior prolongation of the vertical, the concavity of the rostral, and presence of anterior frontals, distinguish the latter from *Amblymetopon*. In these genera the teeth are smooth, of equal lengths and a little stouter posteriorly. In *Arrhyton* Gthr.* (Cat. Brit. Mus. p. 244) the posterior upper maxillary is longer, and separated from the anterior by an interspace, (diacranterian.) These genera possess a strong resemblance to the Calamarian type of form—where some of them have been placed by authors—but we believe them to be more nearly allied to the *Stenorhina*, *Rhinostoma* and *Cemophora*, which are not to be separated from the Coronelliform genera *Simotes*, *Lampropeltis*, etc. Indeed, comparison with such typical Calamarian forms as *Calamaria*, *Aspidura*, *Rhabdosoma*, *Carphophiops*, etc., shows a less complete want of distinction of head and body, a less degree of rigidity of the latter, and a greater resemblance to the higher types in the forms of the superciliary and labial plates. We do not think their small size at all conclusive as to their pertinence to the Calamarina, though an opposite opinion might be held by such herpetologists as would place the Old World "Ablabes," the *Diadophis* and *Tæniophis* of the New in that group.

Allied to Toluca and *Cemophora nobis*, is a genus inhabiting the southwestern regions of the United States, called *Lamprosoma* by Dr. Hallowell, (Proceed. Acad. N. S. viii. p. 311.) As this name was previously employed by Kirby for a genus of Coleoptera, we propose replacing it here by *CHIONACTIS*, given in allusion to the refulgent whiteness of the scales. The typical and only well-ascertained species is *Rhinostoma occipitale Hallow.*, (Proc. Acad. vii. 1854, p. 95.) This serpent has been erroneously stated by Dr. Günther, P. Z. S. 1858, p. 387, to be a native of West Africa. The muzzle is more depressed than in Toluca, and there is a loreal plate. The equal teeth, single nasal and more depressed head and snout, separate it from *Cemophora*.

83. *T. lineata*, Kenn. l. c. U. S. Pac. R. R. Rept. ix. Reptiles, fig. 35, pl. 8.
One sp. Toluca Valley, Mexico. Smithsonian Inst.

PARIASPIS nobis. Type *P. plumbeatra*.

Body cylindrical; tail one-eighth of total length. Head scarcely distinct, broad and swollen at the temples, in front very short and depressed. Superior maxillary bone short, its teeth gradually increasing in length posteriorly, none grooved. Pupil round. Top of head covered with the ordinary nine plates, the frontals relatively small, occipitals large. Two nasals, the nostril in the

* *Arryton tæniatum Gthr.* l. c.

The adult of this species measures 16 in. 10 l. in length; the tail 3 in. 7 lines. The color of the lower surface is brownish yellow, and extends upon the third row of scales. Above dark brown, with three indistinct longitudinal lines, as in Günther's description. These notes are taken from a specimen belonging to the Museum at Cambridge, Mass.

anterior, which is very small. No loral. Preocular one, post-oculars two. Sixth upper labial touching the occipital, which latter is separated from the posterior labials by a single plate. Anal and urosteges entire. Scales smooth.

84. *P. plumbeatra nobis*.—Seven superior labials, eye over third and fourth; the first as large as the postnasal, the last three very large. Preocular small. Rostral small, rather prominent. Vertical presenting an obtuse angle in front, its lateral borders parallel and equal in length to the latero-posterior. Occipitals elongate acute, their divaricating tips separated by a small plate. Exteriorly they are bordered by one temporal and the sixth upper labial. Inferior labials seven. Genieals two pair, the anterior broader in front, and one-third longer than the posterior. Scales in fifteen longitudinal rows, very smooth. Gastrosteges 140, an anal, urosteges 44. Total length 16 in. 8 lines; tail 2 in. 9 l.

Color above a uniform blackish lead color, paler on the head. Chin and belly yellowish, the inferior labials and gastrosteges tipped with the color of the back, the latter posteriorly spotted with the same. Under surface of tail grey.

One specimen of this interesting serpent is in the Museum of the Academy, presented by Mr. E. T. Cresson, a gentleman to whom we are also indebted for fine specimens of *Boödon virgatum*, *Dryiophis Kirtlandii*, *Boiga pulverulenta*, etc. The *Pariaspis* is a native of Liberia, in the same zoological district with the *Holoropholis*, *Dipsadoboa*, *Brachycranion*, etc., which it represents in this group.

STENORHINA Dum. & Bibr. Type *S. ventralis*.

Erpetologie Generale, vii. p. 865, 1853.

85. *S. Kennicottiana nobis*.—Form stout, thick, the head not distinct. Muzzle acute. Number of rows of scales and head shields as in *S. ventralis*, except that there are eight inferior labials instead of seven, the fourth being the largest instead of the third. The anterior genieal plates are more elongate, the length being twice the breadth, and the posterior are more produced, and are separated by a narrow intercalary shield. The postnasal is very large, and is joined to the preocular by a suture half the length of the latter. Tail one-fifth of the total length. Gastrosteges 155; one divided anal; urosteges 39 pair. Total length 22 in. 3 l.; tail 4 in. 5 l.

Coloration. Above brown, the body crossed by thirty-six deep brown or black bands. These are irregular and very narrow, not wholly involving any scale which they cross. On the flanks they are interrupted and irregular. Chin, belly and under surface of the tail yellow, with an irregular medial line formed by adjacent spots near their extremities. Superior labials yellow, the sixth and seventh bordered above with black. Top of the head uniform brown. One sp. Isthmus of Panama. Drs. Gallaer and LeConte.

This species is dedicated to Mr. Robert Kennicott of Washington, a gentleman possessing a knowledge of North American Serpents not excelled by any other naturalist.

86. *S.* ?

We have before us two specimens of the young of what is probably an undescribed species of *Stenorhina*. Their immature age is indicated by the division of several of the gastrosteges upon the umbilical region. In both specimens the tail is only one-eighth of the total length, in the *ventralis* a little more than one-fifth. The scales in the latter are relatively larger, and the vertical plate a little broader. In a specimen of the former, from Veragua, the gastrosteges number 165, urosteges 35; in the second, collected by Dr. Sartorius in the hills west of Vera Cruz, and in the possession of the Smithsonian Institute, they are 155×32. In the *ventralis* the *Erp. Gen.* gives 149×44. The

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color of our specimens is light brown, crossed by numerous bands or elongated spots of deep brown bordered with paler. Sides and belly spotted with the same.

The specimen of *S. ventralis* sent to the Smithsonian Institution by Dr. Sartorius corresponds with the description in the *Erpetologie Generale* in nearly every respect. The color is, however, a very deep slate above, so that the transverse spots are scarcely visible. The gastrosteges are much clouded with slate, and the longitudinal markings are also indistinct. Chin and lower labial plates tinged with bright yellow. There is no specimen of this species in the Academy Museum.

87. *S. quinquelineata nobis. Microphis quinquelineatus*, Hallow. Proc. Acad. Nat. Sci. 1854, p. 97.

Two specimens.

Honduras.

Dr. S. W. Woodhouse.

This is the species figured in the *Erp. Generale*, plate 70, as *Stenorhina Fremivillei*. In that figure the loreal plate is distinctly and correctly represented, though the description of that species and diagnosis of the genus would lead one to infer its absence. Is it not possible that the specimen figured by the learned herpetologists may belong to a different species from that which they regard as typical of the *Fremivillei*?

RHINOSTOMA* Fitz. Type *R. nasuum*.

Neue Classification, 1826, p. 56. Dum. & Bibr. vii. p. 992.

88. *R. nasuum Wagl.*

One sp.

Surinam.

Dr. Hering

89. *R. Guntheri nobis*. Head depressed, rather wider than the neck. Posterior angle of the rostral plate a right-angle. Anterior frontals forming a short suture with each other; posterior frontals forming no suture, their tips only in contact, so that their posterior borders are diagonally continuous with the posterior borders of the anterior frontals. Vertical plate presenting a right angle anteriorly; its superciliary border shortest of all. Occipitals shorter than vertical, each bounded by one large and five small temporals.

**GYALOPION nobis*. Form stout; tail one-eighth of total length. Head slightly distinct, large, depressed. Rostral plate acute; its anterior border elevated; its upper surface concave. It is produced backwards, separating the prefrontals, not reaching the vertical. Frontals, two pair. Nasal confounded with the first labial, a groove from the nostril to the suture of the second labial. No loreal, its place supplied by the post frontal. One pre-two postoculars. Scales smooth; anal and subcaudal scutellæ divided. Teeth small, of equal lengths. Pupil round.

P. canum nobis. Prefrontals triangular, not larger than preoculars. Postoculars of equal size. Anterior border of vertical not angulated. Occipitals as broad as long, truncate posteriorly. Superior labials seven, eye over third and fourth. Inferior labials seven, fourth largest. Genials one pair, very short. Scales in seventeen longitudinal rows, nearly square. Gastroteges 130; one anal; urosteges 28. Total length 7 in. 6 lin.; tail 11 lin.

Coloration. Above brownish grey, crossed by thirty-one irregular transverse brown bands. These are from one to three scales wide on the back, and extend to the gastroteges. Anteriorly they exhibit a tendency to divide into a dorsal and two lateral series of spots. Eight transverse spots on the tail. First spot on the neck large, produced medially to the occipitals. A brown band extends from one angle of the mouth to the other across the occipitals, involving the tip of the vertical. Another brown band commences upon the upper borders of the lower labial shields, passes through the eye, and crosses the anterior parts of superciliaries and vertical, and posterior parts of postfrontals and rostral. Dirty yellowish beneath, and upon the first row of scales. One specimen (No. 4675,) in the National Museum, Washington, discovered near Ft. Buchanan, Arizona, by Dr. Irwin. It is an extraordinary serpent, resembling, at first sight, a diminutive *Heterodon*.

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Loreal acute posteriorly; preoculars two, the inferior very small. Postoculars three, nearly equal in size. Upper labials eight, fourth and fifth entering the orbit; last as small as the second. Inferior labials eight; one pair of genaeals. Scales in nineteen rows. Gastroteges 182. One entire anal, 67 urosteges. Total length 21 inches, 2 lines. Tail 5 inches.

The upper surface of the head and body are of a dark brown. The upper labials, chin, belly, two inferior rows of scales and the tips of many of the others, dirty white.

One specimen brought from the interior of Venezuela by Capt. Jas. Wilson. It is called by the natives "Coralilla."

We have named this species in honor of Dr. Albert Günther, the celebrated Herpetologist of London, who has done so much toward effecting a natural arrangement of the Colubridæ.

CEMOPHORA nobis. Type *C. coccinea*.

Form rather slender; tail one-seventh of total length. Head scarcely distinct, very convex, elongate, acute. Plates of the head broad, normal as to number. Rostril very prominent, obtusely trihedral, produced slightly between the prefrontals. Nasals two—sometimes united,—a loreal, one pre-two postoculars. Scales smooth; anal scutella entire, urosteges divided. Pupil round. One or two posterior maxillary teeth longer than the others, smooth, and not separated by an interspace, (syncranterian).

The form of the rostral plate is the most prominent peculiarity which separates this species from *Simotes D. & B.*

90. *C. coccinea nobis*. *Coluber coccineus* Blumenb. in Licht. & Voigt. Magaz. v. 1788, pl. 5. *Heterodon coccineus* Schl. Essai, ii. p. 102. *Rhinostoma coccinea* Holbr. N. Am. Herp. 1842, p. 125, pl. 30. Baird et Girard, Catal. p. 118. *Simotes coccineus* Dum. et Bibr. vii. p. 637. Günther, Cat. Brit. Mus. p. 26.

Two sp.	South Carolina.	Dr. Holbrook.
One sp.	Georgia.	Dr. Jones.
One sp.	South Carolina.	Dr. Blanding.
One sp.	"	Philada. Mus. in Ex.
One sp.	?	Dr. Wilson.

RHINOCEILUS Bd. et Grd. Type *R. Lecontei*.

Catal. Serp. Smiths. Inst. 1852, p. 120.

In dentition this genus is isodont. The entire urosteges distinguish it from *Rhinechis*. The general form is rather that of *Cemophora*.

91. *R. Lecontei* Bd. et Grd. l. c.

One sp. Ft. Chadbourne, Texas. Smithsonian Institution.

SIMOTES Dum. & Bibr. Type *S. Russellii*.

Erpetologie Generale, vii. p. 624, 1853.

A. Form stout, calamarian; anal shield entire.

92. *S. phænochalinus nobis*. This is a small serpent, and resembles an *Oligodon* in form. The arrangement and number of cephalic plates are the same as in the *Russellii*, except that the rostral plate is higher, and not produced so far back upon the muzzle, and that the vertical is not so broad, and with lateral borders less convergent posteriorly. Superior labials seven, the third and fourth entering the orbit; inferior labials eight. Scales in seventeen rows small, rounded. Gastroteges 172, an anal, urosteges 41 pairs. Total length 7 inches 9 lines. Tail 1 inch.

The ground color is a light brown, and is crossed above by short black transverse bands, about fifteen in number, from the head to the end of the tail. These bands are wider on the back, and taper on the flanks. A transverse black band crosses the head from eye to eye on each side of the posterior

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suture of the postfrontals, and is continued beneath the eye on the suture of the fourth and fifth labials. A longitudinal black band proceeds from the transverse, passes through the middle of the vertical and along the suture of the occipitals, then widens and bifurcates on the neck. A crescentic black mark begins near the exterior border of the occipital plate, and extends a little beyond the commissure of the mouth, crossing the seventh upper labial.

One sp. Manilla. Dr. Barnwell.
One sp. Philippine Islands. Mr. Cuming, in ex.

The second of these specimens has, alternating with the cross bands, a transverse series of four separate spots; two dorsal, rounded, and one on each side, narrow.

93. *S. aphanospilus nobis*.—In this species the head and investing plates are shorter and broader than those of the last species; the sides of the vertical shields are more convergent posteriorly. As in other Simotes there are one pre- and two postoculars. Loreal a little longer than high; upper labials seven, third and fourth entering the orbit; inferior labials eight, the posterior one very small. Scales large, obtuse, imbricate, in seventeen rows. Genaials two pair, the posterior half the length of the anterior. Gastrosteges 173, anal one, urosteges 37 pairs. Length of body and tail 23 in. 5 l.; tail alone 3 in. 4 l.

The color of the upper surface of this serpent is a dull olive brown. From the neck to the base of the tail we count thirteen nearly equidistant scutcheon-shaped figures, brown bordered with black. These extend a short distance on the flanks, and are sometimes confluent with another series of smaller, similar figures on each side. In the middle of the interval between each dorsal figure is a small black spot. On the head the arrangement of markings is similar to that of the last species. They are, however, only indicated by narrow black borders enclosing the ground color. Lips and beneath dirty yellowish.

One specimen. Philippines. Mr. Cuming, in ex.

The two species preceding are nearly allied to the *S. purpurascens* Gthr., but comparison with the figures of Schlegel and Dum. et Bibr. at once reveals the differences in the markings of the head. The number of labials is also different.

B. Form slender; anal divided.

94. *S. Russellii* Dum. & Bibr. Erp. Gen. vii. p. 628. Russell, Ind. Serp. i. pl. 35.

One spec. ? ?

CORONELLA Laurenti. Type C. AUSTRIACA.

Specimen Synopsis Reptilium 1768, p. 84. *Zacholus* Wagler, Natur. Syst. 1830, p. 190.

95. *C. Austriaca* Laurenti. *Zacholus Austriacus* Wagler. *Coronella laevis* Schlegel, Essai 1837, ii. 65.

Fourteen spec.	Italy.	Dr. Wilson (Bp. Coll.)
Five "	Sicily.	" "
Two "	Europe	Gard. Plants (in ex.)

96. *C. Giron dica* Dum. & Bibr. *Coluber Giron dicus* Daudin, 1804. *Col. Riccioli* Metaxa, Monograf. p. 40, 1823. Bp. Fauna Italica.

Ten spec. Italy. Dr. Wilson (Bp. Coll.)

MACROPROTODON Guichenot. Type M. cucullatus.

Expédition d'Algérie, Rept. p. 22, No. 2.

97. *M. cucullatus nobis*. *Coluber cucullatus* Is. Geoff. St. Hilaire, 1827. *Macroprotodon mauritanicus* Guichen. loc. cit. 1846. *Lycognathus cucullatus* Dum. & Bibr. 1853. *Coronella cucullata* Gthr. 1858. ? *Zacholus bitorquatus* Bonap.

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The long anterior and isolated grooved posterior maxillary teeth appear to us to separate this species from *Coronella*.

One spec. Algiers. Gard. Plants, (in ex.)
Two " " Dr. Wilson, (Bp. Coll.)

PSAMMOPHYLAX Fitz. Type *P. rhombeatus*.

Systema Reptilium 1843, p. 26. *Trimerorhinus* Smith, Zoöl. S. Africa, p. 1849.

98. *P. rhombeatus* Fitz. *Coluber rhombeatus* Linn. *Coronella rhombeata* Boie, Schlegel. *Coelopeltis rhombeata* Wagl. *Trimerorhinus rhombeatus* Smith. *Dipsas rhombeata* D. & B.

One spec. Cape of Good Hope. Gard. Plants, (in ex.)

TARBOPHIS Fleischmann. Type *T. vivax*.

Dalmat. Nov. Serp. Genera p. 18, 1831. *Trigonophis* Eichwald, 1831. *Ailurophus* "Fitz." Bp. 1832.

99. *T. vivax* Dum. & Bibr. *Coluber vivax* Fitz., 1826. *Tarbophis fallax* Fleisch. 1831. *Trigonophis Iberus* Eich. 1831. *Dipsas fallax* Schleg. Essai ii. 295. *Tachymenis vivax* Gthr. 1858. *Ailurophus vivax* Bp. Fauna Italica.

One spec. Italy. Dr. Wilson.

HYPSIGLENA nobis. Type *H. ochrorhynchus*.

Dentition diacranterian; i. e. a long, smooth, posterior superior maxillary tooth, separated from the anterior by an edentulous space. Pupil elliptic, erect, body cylindrical. Head distinct, broad posteriorly, shortly conic anteriorly, much depressed. Cephalic shields normal. Two nasals, nostril between; one loreal; two pre- and two postoculars. Scales smooth. Gastrosteges not angulated. Anal and subcaudal scutellæ divided. Tail less than one fourth the total length.

This curious genus has points of resemblance to *Sibon Fitz.*, *Hemidipsas Gthr.*, *Tachymenis Wieg.*; while the general appearance is not unlike that of *Coronella Laur.* A perusal of the above diagnosis, cannot fail to convince the herpetologist that it possesses characters strongly distinguishing it from all, uniting as it does, in its general aspect, peculiarities of certain tropical and northern forms.

100. *H. ochrorhynchus nobis*.—Muzzle shortly conic; rostral plate prominent, encroaching a little on the pre-frontals. Nasal plates indistinctly separated, equal, their upper and lower borders parallel. Loreal longer than high. Lower preocular small, bounded anteriorly by the third upper labial. Eight upper labials, fourth and fifth entering the orbit; sixth and seventh very large. Vertical plate twice as long as broad; lateral borders slightly convergent. Superciliaries narrow; occipitals as long or longer than vertical, rounded posteriorly. Inferior labials eleven, sixth largest. Genaeals two pair, the posterior acute. Scales in twenty-one rows. Gastrosteges 168, urosteges 48 pair. Total length, 12 in. 4 lines, tail 2 in. 3 lines.

Coloration. The upper surface light grey, with a series of large brown spots, separated by intervals of one scale wide. These spots are about forty-eight in number, upon the body; they extend transversely from the seventh to the fifteenth rows of scales, and are three or four scales in length. On the posterior part of the body they sometimes divide longitudinally, their moieties alternating or becoming confluent into a zig-zag band.

Alternating with these on each side, is a series of small spots formed by the brown borders of scales of the fifth and sixth rows. Another series of small spots opposite to the dorsal row, is formed by the shading of the adjacent borders of the fourth and fifth rows with the same color. Many of the scales of

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the second row are also tipped with brown. There is a large brown spot on each side of the neck, sometimes confluent with an elongate central one, which extends to the occipital plates. A brown stripe passes from the eye to the neck spot, entirely covering the last upper labial. Top of the head brownish grey, indistinctly spotted with pale brown. Labial plate paler; frontals and rostral ochreous. Beneath yellowish-white, immaculate.

One specimen in the Academy, and numerous others in the National Museum, Washington, received from Mr. John Xantus, from Cape St. Lucas, California.

101. *H. chlorophaea nobis*.—Number of labials and rows of scales the same as in the last species. The scales of the body are, however, more elongate, and partly on this account are arranged in rows more oblique in an antero-posterior direction. The vertical plate is a little broader, and the head is narrower in proportion to its length. The body is rather more slender.

The color is a greenish ash, much darker than in the preceding species. The dorsal spots, instead of being brown, are black, and separated by intervals of two scales in width. They are much smaller, occupying only the space from the ninth to the thirteenth longitudinal rows, and are one scale and a half long. They frequently divide and alternate, and their number on the body amounts to from fifty-eight to sixty-six. Two rows of smaller alternating spots appear on the sides, one upon the sixth and seventh rows of scales, the other on the fourth. The distribution of colors on the head and neck is much as in the last species, except that the neck spots are a little longer. The brown is, however, replaced by black, and the ochreous by olivaceous. The crown and muzzle are thickly punctulated with black. Beneath pale olivaceous. Gastrosteges 167, urosteges 55. Total length, 15 in. 6 l., of tail 2 in. 3 l.

Two specimens from the National Museum, there received with others from Fort Buchanan, Arizona, where they were collected by Mr. Irwin.

TACHYMNIS Wiegmann. Type *T. Peruviana*.

Nova Acta, Acad. Caes. Leopold. Carol. xvii. 1834, p. 251.

102. *T. Chilensis Girard*, U. S. Naval and Astronomical Exp. 1855, ii. p. 213, Günther, Cat. Brit. Mus. 1858, p. 34, *Coronella Chilensis* Schlegel. Guichenot, Hist. Chili, ii. p. 79. *Dipsas Chilensis* Dum. & Bibr. vii. p. 1159.

Var. near the third of Dum. & Bibr.

Belly as in the ordinary variety, but the upper surface of the body of a light rufous brown, more deeply shaded on the fourth and ninth rows of scales.

One specimen.

Quinquina Id.

Dr. Ruschenberger.

Variety fourth, nobis.

Coloration of the upper surface as usual, but upon each gastrostegite there is a single central, oblong, spot. These form a medial, unbroken, black band, from near the chin to the anus.

One specimen.

Talcahuano, Chili.

Dr. Ruschenberger.

103. *T. hypoconia nobis*.—The head of our single specimen is mutilated, hence a detailed description of the plating cannot be given. The shields seem, however, to differ but little from those of the preceding species; the pre-frontals are relatively smaller, and the superciliaries larger. There are eight superior labial shields, the eye resting on the fourth and fifth; the sixth and seventh are disproportionately large. Nine inferior labials. Scales large, in nineteen rows, the exposed part of those of the first row higher than long. Body stout; gastrosteges 140, one divided anal; urosteges 52, relatively more numerous than in *T. Chilensis*.

Coloration.—The upper surface of the head, body and tail, is of a wood brown, many of the scales black at their bases. The first, second, third and

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fourth rows of scales are densely punctulated with black, thus forming an indistinct band upon each side. The punctulations are more numerous upon the fourth row, hence the band is better defined upon its dorsal margin. A pair of dark bands commence upon the occipital plates, and extend a short distance upon the back, enclosing a light vitta. The dark bands send off upon each side two branches, one to the middle of the superciliary plate, and one to the superior suture of the upper postocular. From the inferior suture of the same plate, a deep brown vitta extends to the angle of the of the mouth; this continued in front of the orbit as far as the nostril. The superior labial shields are paler than the crown, are punctulated, and have upon their postero-superior angle a triangular brown mark. Belly yellowish-grey, densely punctulated with black, (whence the name.) On each side, the gastrosteges are crossed near their extremities by a narrow black band, which is continuous from the throat to the end of the tail. Anteriorly the punctulations arrange themselves in two series of indistinct V-shaped marks within the bands but they are quite ill defined, and in some specimens will probably be absent.

One specimen.

Buenos Ayres.

Dr. A. Kennedy.

CONIOPHANES Hallowell, MSS. Type *C. fissidens*.*

This genus consists of coronelliform serpents with grooved teeth, of rather a slender habit, having a distinct, depressed head, conic muzzle, one preocular and a divided anal plate. Perhaps the *Coronella bipunctata* of Günther belongs to it.

It differs from *Dromicus* in the grooved maxillary tooth, and the less lanceolate head. *Philodryas* has a much more elongate body and tail. A peculiarity in the coloration of the species consists in the numerous punctulations of the upper and under surface, whence probably the name (*xerops pulverulentus*.)

104. *C. punctigularis* nobis.—Scales thin, lanceolate, in twenty-one longitudinal rows. Head broad posteriorly, muzzle rather shortly conic. Prefrontals equal in size to the fourth superior labial; post-nasal larger than prenasal; loreal as high as long; preocular not reaching the vertical. Vertical elongate, its sides parallel; occipitals moderate, each bounded by two large, and two small temporals. Postoculars two; superior labials eight; eye over the fourth and fifth. Symphyseal unusually broad; inferior labials nine. Gastrosteges 121, one divided anal, urosteges 44, (tail mutilated.) Total length 14 in. 6 l. Tail 3 in. 4 l. (was probably nearly two inches longer.)

Coloration.—Above, dark chestnut-brown, shaded with grey on the top of the head. On each side of the neck, three scales behind the terminal superior labial, a whitish line commences. These widen, assume a pale ferruginous hue, and extend to the tip of the tail. They cover the sixth, seventh and half of the fifth and eighth rows of scales on each side, and enclose a brown dorsal band five scales wide. Upon the neck the brown of the sides is very deep, and extends forward as a band to the orbit. It is bordered beneath with white. Lips and throat yellowish-white, densely punctulated with brown. Gastrosteges also yellowish-white, punctulated irregularly at their tips.

One specimen.

Honduras.

Mr. J. S. Hawkins & Dr. J. L. Le Conte.

C. fissidens *Hallow.* differs from the present species in several points. The body is more elongate, there being 140 gastrosteges instead of 121. The head is more depressed, and the muzzle more prominent, since the prefrontal plates are in the plane of the occipitals. This form, together with the dark

**Coronella fissidens* Gthr. Cat. Brit. Mus. p. 36.

color, and the narrow light band on the upper borders of the labials, is suggestive of certain genera of venomous snakes, as *Hypnale*. The lateral borders of the vertical plate in *fissidens* are not so long nor so nearly parallel as in *punctigularis*. The whole head is relatively narrower. The colors of the former are deeper, the longitudinal bands being very indistinct. The throat is not so thickly punctulated.*

TÆNIOPHIS Girard. Type *T. tantillus*.

U. S. Astronomical Expedition, ii. p. 215. 1855.

105. *T. vermiculaticeps nobis*. Size small; form slender; tail one-third the total length. Head distinct, elongate ovoid; the muzzle short and the eye large and far forward. The last superior maxillary tooth is longer than those preceding it, and smooth. As in the other species of the genus, there are two postoculars, one preocular, and a divided postabdominal scutella. Scales in seventeen longitudinal rows. Frontal plates small, superciliaries and vertical elongate, the latter with its anterior border nearly straight, the lateral slightly convergent. Nostril principally in the prenasal; postnasal higher. Loreal as high as long; preocular narrow and high, not reaching the vertical. Superior postocular twice as long as the inferior. Superior labials eight, fourth and fifth entering the orbit. Inferior labials ten. Genials two pair, the posterior one-third longer than the anterior, divaricating. Gastrosteges 117, one anal, urosteges 79. Total length of the largest specimen 13 in. 8 lin. Tail 4 in. 7 lin.

Coloration. The ground color of the upper surface of the body is a rich yellowish brown—where the epidermis is lost, of a brownish straw color. A pair of deep brown bands begin, one at the externo-posterior angle of each superciliary shield, and converge upon the neck. There each narrows to a width of one scale, and enclosing a vitta of the ground color one scale in width, extends to the origin of the tail. Here they unite, and extend to the extremity of that member as a median band. A second pair of brown bands commences one at each nostril. It passes through the eye to beyond the angle of the mouth, where its inferior border becomes ill defined, and continues so throughout its whole length. The upper border is clearly defined to the end of the tail. The medial light dorsal vitta bifurcates on the neck, and extends as far as the superciliary plates. The intermediate space is irregularly vermiculated with delicate marks of the same color. Upper and lower labials whitish, nar-

* The following is the description of a third species of this genus, a single specimen of which is in possession of the National Museum, Washington. It was discovered by Sr. R. M. De Oca in the vicinity of Jalapa, Mexico.

C. proterops nobis.—Size rather small. Scales in nineteen longitudinal rows, thin, elongate, obtuse. Head scarcely distinct, short profile of muzzle not elevated. Anterior plates of the head small; loreal a little longer than high. One pre- two postoculars. Superior labials seven, third and fourth entering the orbit. Vertical plate elongate, lateral borders convergent, posterior angle acute. Occipitals long. Inferior labials nine; genials two pairs, nearly equal. Gastrosteges 130, anal one, divided, urosteges? (tail badly mutilated.) Head and body 9 in. 7 lin. in length. The stump of the tail appears tetragonal in section.

Coloration. Above light brown, every scale densely punctulated with darker, especially near the margins. From the first to the fourth row of scales this is deeper, giving the sides a darker shade. The vertebral row of scales, from the occipitals to the end of the tail is also darker. Top of the head densely and obscurely vermiculated and punctulated. The dark shade on the fourth row of scales becomes a band anteriorly, and is bordered above and below with white on the neck. The lower white border is continued to the eye, and is bordered above on the labials with black. The upper white border is discontinued on the neck, but reappears as a spot, three scales back of the occipitals. Inferior half of rostral, upper and lower labials, chin, throat and belly, light brownish yellow, densely punctulated with brown. Each labial with a darker spot in the centre. Fewer punctulations on the urosteges.

rowly edged with brown. Chin and belly yellowish white, each gastrostege with a deep brown dot at each end near the posterior border.

This very elegant species was discovered in Veragua, New Grenada, by Mr. R. W. Mitchell, who presented two specimens to the Academy. We also possess a third specimen, native country unknown. It is nearly allied to *T. tantillus Girard*, l. c., but in that the vertical plate is narrower, the sides subconcave, and in contact anteriorly with the preocular. The coloration is also quite different.

DIADOPHIS Baird & Girard. Type *D. punctatus*.

Catalogue North Amer. Rept. in Smiths. Inst. 1852, p. 112. *Spilotes* (i. e. *Spilotes*) "Wagler." Swainson, not Wagler.

106. *D. decoratus nobis*. *Coronella decorata* Gthr. Cat. Brit. Mus. p. 35.

One of our specimens has two preocular plates, another three. In neither do we find the upper maxillary teeth materially longer behind. Nevertheless, our placing this serpent in *Diadophis* is altogether provisional; in the unusual length of tail, as well as in distribution of colors, it differs from this genus. We will not give a detailed description at present, as the color of our specimens has been altered by the loss of the epidermis. The four bright yellow spots on the occiput and nape render this a very distinct as well as beautiful species.

One spec.	Veragua, N. Grenada.	Mr. R. W. Mitchell.
One "	?	?

107. *D. occipitalis nobis*. *Ablabes occipitalis* Günther, Cat. Brit. Mus. p. 29.

We have strong doubts of the validity of this species. Seven upper labial shields are occasionally found in the *punctatus*, and the nuchal interruption of the yellow collar occurs in the *pulchellus* *B. & G.* We have, however, never seen a *Diadophis* with eight upper labials and an interrupted collar.

We have two specimens corresponding with the *occipitalis* *Gthr.*, one the locality unknown, the other believed to have been obtained in central Kansas. Presented by Mr. Henry Yarrow.

108. *D. punctatus* *Bd. & Gird*. *Coluber punctatus* Linn., Holbrook, etc. *Homalosoma punctatum* Wagl. *Spilotes punctatus* Swains. *Calamaria punctata* Schleg. *Ablabes punctatus* Dum., Bibr., Günther, Hallowell.

Three spec.	S. Carolina.	Dr. Holbrook.
One "	Morris Co., N. Jersey,	Dr. J. C. Fisher.
One "	Bucks Co., Penn.	?
Two "	?	Dr. Bache.
One*	New Jersey.	Mr. Tiffany.
Four "	?	Dr. Hallowell & Smiths. Inst.
One†	(young) Allegheny Co., Pa.	Mr. D. C. Trout.
Two "	?	Dr. T. B. Wilson.
Five	(young) ?	?

Var. pallidus nobis. In the number of rows of scales and labial plates and collar, similar to *punctatus*; but the color is a light olive brown, shaded with bluish towards the gastrosteges, which it borders. There is no central series of spots on the belly.

One spec.	California.	Dr. Heermann.
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Var. stictogenys nobis. This may possibly be specifically distinct from the *punctatus*, but it is more probable that in a large suite of specimens

* This specimen has but seven upper labials, eye resting on third and fourth.
 † The vertical shield is as broad as long in this specimen.

the distinctions would not be borne out. The number of rows of scales is fifteen; the superior labials are seven, eye resting on third and fourth, as is sometimes the case in *punctatus*. Color above light brownish olive, a broad yellow collar, bordered with black as in *punctatus*. Each gastros-tege has a brown dot at its extremity, and the central part of the margin the same color, forming a series of transversely elongated spots. Fifth and sixth upper labials each with a brown dot. Symphyseal and lower labials with a brown dot in the centre of each, two on each anterior genaeal, one at the posterior end of postgenaeals and of all the throat scales.

One specimen, locality and donor unknown.

109. *D. dysops nobis*. Scales in 15 rows; superior labials eight, eye resting on the fourth and fifth; inferior labials eight. Color above olivaceous slate blue, beneath light yellowish brown, with three longitudinal rows of spots. A very narrow yellow collar involving a part only of each scale that it crosses, and bordered with blackish. Upper borders of superior labials (not temporals) black. It is in the form of the head that it differs from the *punctatus* most strikingly. The muzzle is very short, rounded and depressed; hence the rostral, frontals and anterior labials are very small. The loreal is a little smaller than the upper postocular. The vertical is small, the lateral borders convergent. Superciliaries short and broad, occipitals long, bordered by five temporal plates on each side. Breadth of the head at the angle of the mouth but little less than the length anterior to the same point.

One specimen, locality and donor unknown.

Size equal to that of an adult *punctatus*. Though small, this serpent has a malignant expression, hence the name.

CONTIA Bd. & Grd. Type *C. mitis*.

Catalogue Rept. Smiths. Inst. Serpents, p. 110, 1862.

This genus is allied to *Tæniophis Girard*, but is of a stouter and more depressed form, and has but one nasal plate. The teeth are minute and equal.

110. *C. mitis* Bd. & Grd. l. c.

One specimen,

Petaluma, Cal.

Smiths. Institution.

111. *C. episcopa nobis*. *Lamprosoma episcopum* Kennicott, U. S. and Mex. Bound. Survey, ii. pt. ii. p. 22, 1859, pl. xxi. fig. 1.

It is now the opinion of Mr. Kennicott that this small serpent does not belong to the *Lamprosoma* of Hallowell. We concur with him in this, and believe that it cannot be generically distinguished from the species just preceding. It resembles certain Calamarian genera, but were its size quadrupled the similarity would probably disappear.

One sp.

Rio Seco, Texas,

Smiths. Inst.

LIOPHIS Wagler. Type *L. reginae*.

Natur. Syst. Amphib. p. 187, 1830. Dum. et Bibr. vii. 697, 1854. Günther, Cat. Colubr. Brit. Mus. 42, 1858. *Dromicus* (Bibron) Dum. Bibr. vii. 646 et Gthr. l. c. 126, pars. *Lygophis* (Fitz.) Tschudi pars.

We have included in this genus the *Dromicus melanonotus* and *D. lineatus* of modern authors. It appears to us impossible to establish any generic distinction between these species and the *L. reginae*, while their comparatively short tails will separate them from the slender *Dromicus fugitivus* and congeners. It is here that the coronelline form seems to pass into the true colubrine.

112. *L. cobella* Wagl. Dum. et Bibr. Gthr. locis citatis.

Seven specimens

Surinam.

Mr. C. Hering.

Three " "

" "

Dr. Hering.

One " "

" "

Dr. Colhoun.

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One specimen	?	Dr. Wilson.
One "	Para.	Col. Abert.
Two " (young)	Surinam.	Mr. Wood.
Two " (young)	"	Dr. Colhoun.

Three of the young specimens have a pair of white dots on the occipital plates, as in the *Tropidonotes*. The transverse, band-like disposition of the small white C-like marks, apparent in specimens of this age, remains during adult age in some, thus affording a transition to the

Var. A. *Gthr.* With distinct transverse light bands.
One sp. Para. Col. Abert.

113. *L. breviceps nobis*. Head short, not very distinct from the body. Plates of the head similar to those of *L. cobbella* except that the occipital plates are shorter; the vertical is broader, its lateral borders measuring less than the anterior; the rostral is broader; and there are but seven superior labials, the third and fourth entering the orbit. The sixth superior labial widens upwards, and supports nearly the whole length of the temporal. In *L. cobbella* the upper margin of this plate is shorter than the lower. Two postoculars, both in contact with the first temporal. Second temporal large, one or two other small ones. One preocular; loreal small. Eight inferior labials, fifth largest, anterior part in contact with posterior genaeals (sixth and seventh in *cobbella*). Scales in seventeen rows. Gastrosteges 154, a bifid anal, urosteges 54 pair. Total length 17 in. 5 lines. Tail 3 in. 2 lin.

Color above, a deep brown without a trace of the small white marks of the *cobbella*, becoming darker posteriorly, and reaching to the gastrosteges. It is crossed by very indistinct darker bands, formed by a single dark scale in every other longitudinal row. These bands are two or three scales apart, and unite on the flanks, into the black transverse bands of the belly, which are irregular and broad, almost excluding the yellow ground in some places.

One spec. Surinam. Dr. Hering.
Obs.—Comparison with our specimens of *L. cobbella* has induced us to consider this distinct on account of: First, the comparative smallness of the head; second, the shortness of the head shields; third, the less number of labials; fourth, the form of the sixth superior labial; lastly, the color; which, however, is of but little importance considered alone. It recalls the genus *Helicops*.

114. *L. Merremii Dum. and Bibr. L. miliaris, poecilogyrus et doliatus* Wagler. *Coluber Merremii, poecilogyrus et doliatus* Neuwied, Beitr. und Abbild. Bras. Lief. 8.

Var. A. *Gthr.* Cat. Brit. Mus. 44.
Three spec. S. America. ?
Var. *poecilogyrus* *Neuw. l. c.*
One sp. S. America. Capt. J. Jameson.
Our specimen is evidently an adult.

Var. *sublineatus nobis*. Olive brown, irregularly varied with black, which forms posteriorly an irregular band on each side, as in *L. reginae*, with a bright one above it.

One spec. (half grown) Bueno's Ayres. Mr. Kennedy.
Young, *Col. doliatus* *Neuw. l. c.*
One spec. " "
One spec. Brazil. " Garden of Plants.

115. *L. reginae* *Wagl. l. c. Coluber reginae* Linn. *Col. graphicus* Shaw. *Natrix reginae* Merr. *Coronella reginae* Schl. Essai, ii. p. 61. *Lygophis reginae* Tschudi, Reise in Peru.

Two sp. Surinam. Dr. Hering.
One sp. Para. Col. Abert.

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- Var. without temporal spot.
 One sp. Para. Col. Abert.
 Var. without temporal spot or tail streak.
 One sp. Buenos Ayres. Mr. Kennedy.
 Young, muzzle short, neck with transverse blotches.
 One sp. Surinam. Dr. Colhoun.
 One sp. Panama. Dr. Ruschenberger.
116. *L. conirostris* Gthr. Cat. Brit. Mus. p. 46.
 The longitudinal dorsal bands are indistinct anteriorly.
 One sp. ? Dr. Wilson.
 One sp. Buenos Ayres. Mr. Kennedy.
117. *L. melanotus nobis*. *Coluber melanotus* Shaw, Zool. p. 534, 1802.
Coronella melanotus Boie, Isis, 1827, 532, and *C. bilineata* ditto. p. 525. ? Col.
vaninus Bonnat. *Col. vittatus* Hall. Proc. Acad. Nat. Sci. ii. 242, 1845. *Lio-*
phis vittatus Cope, l. c. 1859, p. 297.
 Ten sp. Near Caraccas. Dr. S. Ashmead.
 One sp. West Indies. Mr. Engstrom.
118. *L. lineatus nobis*. *Coluber lineatus* Linn. *Coronella lineata* Boie.
Lygophis lineatus Fitz. *Herpetodryas lineatus* Schl. Ess. ii. 191. *Dromicus*
lineatus D. & B. vii. p. 655. Gthr. Cat. Brit. Mus. 134.
 Two sp. Surinam. Dr. Hering.
 Two sp. " Dr. Calhoun.

PLIOCERCUS nobis. Type *P. elapoides*.

Body cylindrical; head scarcely distinct; tail two-fifths of the total length. Cephalic plates normal: two pre-, two postoculars, one loreal, two nasals. Anal scute bifid. Scales smooth. Dentition as in *Lampropeltis*; i. e. the posterior superior maxillaries not isolated, longer, much recurved and smooth.

The great length of the tail separates this genus from *Lampropeltis* and *Erythrolamprus*: it unites the dentition of the former with the preanal scute of the latter. *Coronella* and *Phimothyrus nobis* have comparatively short tails. In *Coniophanes* the head is more distinct, the body more slender and not so firmly cylindrical.

119. *P. elapoides nobis*.

Rostral plated just visible from above: prefrontals one third the size of the postfrontals. Length and breadth of the vertical plate equal to the suture of the occipitals. The latter are oval, and rounded behind. Five marginal temporals on each side. Upper preocular large, not reaching the vertical; inferior one very small, partially between the third and fourth superior labials. Height and length of loreal equal. Eight superior labials, fourth and fifth entering the orbit. Inferior labials eight, the last three times as long as the seventh, sixth largest; these three plates border within a large shield which diverges from the outer posterior extremity of the posterior genaeal. Two equal pairs of elongated genaeals. Scales in seventeen longitudinal rows. Gastrosteges 131; urosteges 89 pair. Total length of adult, 19 in. 9 l., tail 7 in. 6 l.

Coloration.—The ground color is brilliant red, which encircles the body above and below in bands of from four to six scales in width. These are separated by triads of black rings including yellow intervals,—ten or eleven on the body, one at the anus, and six or seven on the tail. The outer ring of each triad is one and a half scales wide, and is not continued on the belly; the yellow interval is of the same width, and the central black ring is three and a half or four scales wide. The first triad is upon the head and neck; the central black ring is seven or eight scales wide and does not extend upon the neck, but involves the ends of the occipitals and the last upperlabial. The anterior yellow ring crosses the occipitals, and involves one and a half tempo-
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rals, the sixth, seventh and half the eight upper labials. All the head anterior to this is lustrous black, except a narrow oral border of yellow. Chin immaculate. Many of the scales of the body are tipped with brown, many with black.

This beautiful species resembles in the distribution of its colors certain Elapses—particularly *decoratus* and *Dumerilii*. It is a beautiful example of analogy of coloring. We have four specimens, one adult, one half grown, and two young, which were obtained through the liberality of John Cassin, Esq., from Sr. R. M. De Oca who collected them near Jalapa, Mexico.

LAMPROPELTIS Fitzinger. Type *L. Sayi*.

Systema Reptilium, 1843, p. 25, et *Sphenophis* ead. loc. *Ophibolus* Baird and Girard, Catal. Serp. Smiths. Inst. 1852, p. 82. *Coluber*, *Pseudoëryx*, *Coronella* et *Ablabes* sp. auctorum.

This group was first defined, and its species enumerated by Profs. Baird and Girard, in their "Catalogue." In structural peculiarities it fulfils all the requisites of a strictly natural group. It represents in America the *Coronella* of the Old World, from which it differs in possessing an undivided postabdominal scutella, and a peculiar form of posterior upper maxillary teeth. These are closely set, stout, much compressed and trenchant, with their anterior borders rather abruptly curved backwards. It also approaches *Erythrolamprus*, which may be distinguished by the grooved superior maxillaries, and divided postabdominal scutella. In geographical range it extends from Maine (*L. triangularis*) to Panama (*L. micropholis*.)

In the Neue Classification der Reptilien of Fitzinger, (1826) p. 55, we find that the seventh genus of the nineteenth family of that author, Colubroidea, is *Pseudoëryx* Fitz. There are seven species enumerated, and the *Coluber doliatus* of Linné is the first. Where there is no possibility of ascertaining what species an author assigns as the type of his genus, it is the practice of naturalists to regard as such that which stands first in his enumeration. Adopting that rule in the present instance, we should have to employ *Pseudoëryx* in place of *Lampropeltis* of later date—a substitution by no means to be desired. Fortunately, however, we believe that Fitzinger did indicate with sufficient clearness what type of form he intended to characterize. On page 29 of the same work he thus characterizes *Pseudoëryx*: "Abdomen scutum. Cauda non compressa. *Oculi verticales*. Rostrum rotundatum." This diagnosis at once shows that he considered the third* species on the list—*P. Daudinii* (*Dimades plicatilis* Gray,)—as the true representative of the genus; and for it, the name *Pseudoëryx* is not inappropriate. This supposition is confirmed by the fact that in his *Systema Reptilium*, published in 1843, he retains the genus, and distinctly assigns *P. plicatilis* as the type.

120. *L. Sayi nobis*. *Herpetodryas getulus* Schlegel, Essai, ii. p. 198, 1837, (not *Col. getulus* Linn). *Lampropeltis getulus* Fitz. l. c. *Coluber Sayi* DeKay, New York Fauna, Reptiles, 41, 1842.

Coronella Sayi Holbr. N. Amer. Herp. iii. p. 99, 1842. Dum. Bibr. vii. p. 619, 1853. Günther Cat. Brit. Mus. p. 41, 1858. *Ophibolus Sayi* Bd. & Grd. Catal. p. 71, 1852.

Two spec.	?	?
One "	Louisiana,	Dr. Hallowell.
One "	?	Dr. Bache.
One "	(half grown) Missouri,	Gard. of Plants in ex. (as <i>Herpetodryas getulus</i>).
Two "(young)	?	Dr. Hammond.

* The diagnosis is equally applicable to the second species *P. pyrrographmus*, if that be the *Col. erythrogrammus* of Daudin. The fifth species is *P. schistosus*, a la homalopsides.

121. *L. splendida nobis*. *Ophibolus splendidus* Bd. & Girard. Catal. p. 83, 1852. Mex. Boundary Survey, Vol. ii. pt. ii. pl. 14.
 One sp. Ft. Buchanan, Arizona, Smithsonian Institution.

122. *L. getula nobis*. *Coluber getulus* Linn., Harlan, Peale, Günther, l. c. p. 249. *Pseudoelaps getulus* Fitz., Neue Class. 1826, p. 56 (not the type.) *Coronella getula* Holbr. Herp. iii. 75. 1842, Dum. Bibr. vii. p. 616. *Ophibolus getulus*, Bd. & Grd. l. c. 72.
 One sp. S. Carolina, Dr. Holbrook.
 Three " New Jersey, Messrs. Benj. Badger and Peter Doyle.
 Two " (young) ?

The posterior supermaxillary teeth are but little longer than the anterior, but are much stouter, and strongly compressed, as in other species of the genus. The young may be distinguished from the young of *P. Sayi* by the less number of the transverse bands. In *getula* they number from 30 to 45, in *Sayi* from 70 to 80, they are also more irregular in the latter.

123. *L. Boylii nobis*. *Ophibolus Boylii* Bd. & Girard, Catal. p. 69, 1852. *Coronella balteata* Hallow. Proc. Acad. Nat. Sci. 1853, p. 236, U. S. Pac. R. R. Exped. Williamson's Expl. p. 14, pl. 5.

A fine species, representing the *getula* in California.

Three sp. California, Dr. Heermann.
 One " Cape St. Lucas, Cal. Smithsonian Institution.

In this specimen the vertical plate is more elongate than usual, and almost trigonal in outline. Many of the scales in the light transverse bands are black at their bases.

124. *L. calligaster nobis*. *Coluber calligaster* "Say," Harlan, Med. and Phys. Res. 122, 1835. *Ablabes triangulum* var. *calligaster* Hallowell, Proc. Acad. Nat. Sci. 1856, p. 244. *Ophibolus Evansii* Kenn. Proc. Acad. 1859, p. 99.

This species is attributed to Say by Harlan and others, but after a most careful examination of Long's Expedition to the Rocky Mountains, we have failed to discover any allusion to it by that author.

In the second volume of that work, p. 330, it is stated that such of the specimens collected by the expedition as arrived in Philadelphia, were deposited in the Philadelphia museum. It was from specimens of the present species in that collection that Harlan drew up his description; and the same are alluded to by Dr. Holbrook, N. Amer. Herp. iii. p. 72, where he asserts their identity with the *Coluber eximius*. One of these, a stuffed skin, presented to the Academy by Dr. Holbrook, and labelled by Dr. Hallowell "original specimen," is now before us. We can assert its identity with the *Ophibolus Evansii* of Kennicott both from his description and from comparison with specimens collected by Dr. Hammond in Kansas, and described by Hallowell l. c. They all have twenty-five rows of smooth scales.

As to the *Scotophis calligaster* of Kennicott, l. c., which belongs to a genus different from the present, we believe it is a serpent distinct from the *Coluber calligaster* of Harlan, although in the description of the former author we read "there can be no hesitation in referring this species to the *Coluber calligaster* of Say." In order to avoid the confusion which must result from the possession of the same specific name by two serpents closely resembling each other, and inhabiting the same section of country, we propose for the species of Mr. Kennicott the appellation *rhinomegas*.

Three sp. Kansas, Dr. Hammond.
 One " Missouri, Dr. Holbrook.

125. *L. rhombomaculata nobis*. *Coronella rhombomaculata* Holbrook, N. Amer. Herp. iii. p. 103. 1842. *Ophibolus rhombomaculatus* Bd. & Grd. l. c. p. 73, 1852.

One sp. Georgia, Dr. Holbrook.

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126. *L. triangula nobis*. Le Triangle, Lacep. Hist. Serp. ii. 331, 1789, *Coluber triangulum* Boie, Isis, 1827, p. 537. *Col. eximius* Dekay, New York Fauna, pl. 12, fig. 25, 1842. Harlan, Storer, Holbrook, Günther. *Pseudoelaps* Y. Berthold, 1843. *Ophibolus eximius* Baird et Girard, Catalogue, p. 87, 1852. *Ablabes triangulum* Dum. Bibr. Erp. Gen. vii. 315, 1853. Do. vars. *clericus* et *eximius* Hallowell, Proc. Acad. Nat. Sci. 1856, 245-6.

The dentition of this species is not different from that characteristic of the genus. The posterior upper maxillary teeth are longer and stronger than the anterior, though not so much so as in *L. Sayi*. They are thickly set, so compressed as to give them a great antero-posterior diameter, and have a rather abrupt posterior curvature. This species cannot be arranged in the same genus as *Lycodonomorphus rufulus* Fitz. (type of *Ablabes* Dum. & Bibr.) which, according to Schlegel and Smith, has the anterior maxillary teeth a little longer than the posterior. The tail is one fourth or fifth of the total length, while in all the species of *Lampropeltis* before us, that member is very short, being never more than one seventh or one eighth of the total length. The arrangement of this species with the *Coluber guttatus* is simply the result of a mistaking of analogy for affinity.

We have seen no second specimen which corresponds with the type of Profs. Baird and Girard's *Ophibolus clericus* in the form of the head and position and size of the eye. The specimen alluded to by Dr. Hallowell, l. c., from New Jersey, approximates remotely in these respects, though resembling it much in the number and size of the dorsal spots. We incline to think that no characters of specific value can be deduced from these; there are specimens intermediate, as respects their size and number, between the highest in *eximius* to the lowest in *clericus*, as defined in Baird and Girard's catalogue. And there are indifferently one or two rows of spots on the sides. What the true *clericus* is, more specimens alone can show.

	A. Spots as in "eximius."	
One spec.	?	Dr. Bache.
" "	Berks Co., Penna.	?
Two "	?	?
One "	"S. Carolina."	"Mr. Jas. Reade."
	B. Spots as in "clericus."	
One spec.	Near Trenton, N. J.	Mr. C. C. Abbott.
One "	Near Haddonfield, N. J.	Dr. G. Watson.
One "	New Jersey.	Mr. S. Ashmead.
Three spec.	Near Philadelphia.	Dr. E. Hallowell.
One "	S. Carolina.	?
Three "	?	Dr. Wilson.
One "	?	Dr. Blanding.
Two "	?	?

127. *L. doliata nobis*. *Coluber doliatus* Linn. *Coronella doliata* Holbr., N. Am. Herp. iii. 105, 1842, pl. 24. Do. var. B, Günther, Cat. Brit. Mus. p. 42. *Ophibolus gentilis* Bd. et Girard, Catal. p. 77. Marcy, Expl. Red Riv. p. 229 pl. 8.

In the true *Coronella doliata* of the Eastern States the black rings forming each pair, separate on the flanks, and become more or less confluent with the adjacent ring of the next pair. The belly is also irregularly varied with black. These peculiarities are well represented in Holbrook's figure. The only constant difference observable between eastern specimens and those from Kansas, which agree closely* with the descriptions and figure of *Oph. gen-*

* Dr. Hallowell (Proc. Acad. 1856, p. 248) speaks of the difference between these specimens and Baird & Girard's descriptions as considerable; to us they appear very slight.

tilis *Bd. & Grd.*, is, that in the former the whole of the occipital shields are included in the black of the crown, in the latter the tips of those shields are crossed by the first yellow band. We do not feel satisfied that this is of specific value.

One sp.	Delaware.	J. Green.
" "	" "	Mr. Drexler.
" "	Washington, D. C.	Dr. Burt, U. S. N.
" "	?	?
Four sp.	Kansas.	Dr. Hammond.
One "	Creek Boundary.	Dr. S. W. Woodhouse.

128. *L. coccinea nobis*. *Coronella coccinea* Schleg., Ess. ii. p. 57, 1837. *Sphenophis coccinea* Fitz. Syst. Rept. 1843, p. 25. *Ophibolus doliatus* Bd. et Grd. l. c. p. 76, 1852. *Calamaria elapsoidea* Holbr. N. Am. Herp. iii. p. 119, 1842, et *Osceola elapsoidea* Bd. & Grd. col. p. 133, (founded upon specimens in which the loreal plate is abnormally absent.)

This species is closely allied to the preceding, but may be distinguished by the following peculiarities: The scales are in seventeen and nineteen rows instead of twenty-one. The pairs of rings are fewer in number, (thirteen to seventeen on the body,) and do not become confluent on the flanks. The belly is not varied with black. From the anterior part of the occipital plates to the muzzle the color is red, not white or yellow, and without black punctulations. The muzzle is depressed, and the superciliary plates are very small, giving the eyes a greater vertical field than in the *doliata*. The tips of the occipitals are crossed by the first yellow ring.

Many of these peculiarities are alluded to in the very accurate description of Herr Schlegel, and to us it is perfectly plain that he had the present species before him when writing it. The species is probably southern in its distribution.

One sp.	Mobile.	Dr. Nott.
" "	Georgia.	Maj. Le Conte.
" "	?	?

129. *L. annulata* Kennicott, MSS. This, perhaps the most beautiful species of the genus, resembles *doliata*, but the scales are very broad, and the gastrosteges opposite to the red interval of the back are totally black. The confluence of the black rings bordering the red does not take place on the scales of the sides. For a more detailed description we refer to Kennicott's forthcoming article.

One sp.	Texas.	Capt. J. P. McCown.
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130. *L. micropholis nobis*. Scales in twenty-one longitudinal rows, small, short and obtuse. Temporal region swollen, giving the depressed head an appearance of distinctness. Plates of the head much as in *doliata*; the superciliaries and vertical are however larger, and the longitudinal line of suture of the occipitals is only three-fourths the length of the latter plate. The outer borders of the occipitals present two posterior divaricating angles, and one on each side at the end of the first temporal. Upper labials seven, third and fourth entering the orbit. Inferior labials nine, the seventh twice as large as the last two together. Other particulars as in *doliata*. Gastrosteges 219; one entire anal; urosteges 43 pair. Total length 16 in. 11 l.; tail 2 in.

The color is a delicate red with a black tip upon each scale. The body is completely encircled by ten pairs of jet black rings, which are anteriorly ten scales apart, posteriorly seven. The space included in each pair is three or four scales wide, and is red—not yellow—each scale having a black tip. The tail is ornamented with two pair of black rings and a black tip. Eighteen scales anterior to the first pair of rings, a black collar four scales wide encircles the neck, scarcely touching the tips of the occipitals. The superciliary

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vertical, except its anterior border, and the occipitals within a line drawn diagonally from the posterior termination of their suture to the lower post-ocular, are black. A spot below the eye, one on the chin, and the posterior borders of most of the other plates of the head are black.

One sp.

Panama.

Dr. John L. Le Conte.

131. *L. polyzona nobis*. Size larger than the three preceding species, body firmly cylindrical; scales large, lanceolate, in twenty-one or twenty-three rows. Head scarcely distinct. Greatest length of vertical plate a little greater than breadth, which latter is a little greater than length of occipital suture. Rostral large, full, postfrontals large, occipitals more elongate than in *micropholis*. One pre-two postoculars, loreal longer than high; upper labials seven, eye over the third and fourth, first in contact with loreal.* Inferior labials nine.

Gastrosteges (1) 214, (2) 215; an anal; urosteges (1) 49, (2) 41. Total length (1) 3 ft. 5 in., (2) 3 ft. 3 in. 6 l.; tail (1) 6 in. (2) 5 in. 9 l.

The ground color above and below is bright red; the scales are largely tipped with black. In specimen No. 1 there are twenty-seven pairs of black rings on the body and tail. In a few instances the double rings become confluent, forming an elongate annular spot. The gastrosteges are irregularly spotted with black, and are almost entirely of that color where the rings cross the belly. Specimen No. 2, which we take to be more typical, is ornamented with twenty-eight pairs of rings only three or four scales apart, and perfect on the belly. In both the pairs include a space but one and a half scales wide, of a pale reddish above, more yellow below. A black collar involves the tips of the occipitals and the last superior labial. In front of this a yellow band crosses the occipitals. The rest of the head is black, a few scales with pale borders, which hue predominates on the chin.†

(2) one sp.

Quatupe, near Jalapa, Mex.

Mr. Pease.

(1) “

Jalapa.

Jno. Cassin, (De Oca coll.)

Var. A. Scales in the rings of the ground color without black tips. Nineteen pairs of rings on the body.

One sp.

Mexico.

Mr. Keating.

The var. C of *Coronella doliata*, in Brit. Mus. Catalogue, p. 42, may belong to this species.

ERYTHROLAMPRUS Boie. Type *E. venustissimus*,

Isis von Oken 1826, p. 981.

* This may not be a constant character; in *doliata* it occurs occasionally, but not at all in our specimens of *coccinea*.

† In another specimen of this species, taken in the hills west of Vera Cruz by Dr. Sartorius, and sent to the Smithsonian Institution, Washington, there are 13 rows of scales, and twenty pairs of black rings not separated the width of one scale.

Another specimen in the Museum Smiths. Inst. resembles our var. A.—having the scales in twenty-one rows without black tips, and twenty-one pairs of black rings on the body. It differs from it in having no yellow marking whatever upon it, and in the black rings being but one scale and a half wide instead of three, and in the smaller size. The first black ring does not touch the occipital plates, in this resembling the *coccinea*, which differs in having nineteen rows of scales, and yellow rings. The head and plates are broad and short, the scales as in *doliata*, and more lanceolate than in *annulata Kenn*. Though loth to add another to the already difficult series of red *Lamprepetes*, the more we have thought of it the more are we impressed with the belief that this is deserving of recognition as a species. Unite it with any species with which we are acquainted, and the characters which distinguish all the species in the series from *triangula* to *micropholis* are invalidated. We propose that it be called *L. amaura*. Locality unknown.

For the opportunity of examining and describing these and other specimens noticed in this paper, in the National Museum of the Smithsonian Institute, Washington, we are indebted to the liberality of its distinguished officers Profs. Henry and Baird.

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132. *E. intricatus* Dum. and Bibr. vii. p. 855.

Var. scales of the white (red or yellow) spaces without black tips.

One sp. S. America, Dr. Neill.

133. *E. venustissimus* Boie, l. c. *Coronella venustissima* Schl. Essai ii. p. 53. *Erythr. venustissimus* Dum. Bibr. vii. 851. Günther Cat. Brit. Mus. 47.

Var. B. Dum. Bibr.

Two sp. S. America, Mr. Cuming in ex.

Var. ? Head black from a single collar forward, except anterior halves of upper labials, which are red. The vertical plate appears to be broader anteriorly than ordinarily, but the specimen is not in sufficiently good state of preservation to offer distinct characters.

One sp. S. America, Dr. Strain.

134. *E. Aesculapii* Wagler, Nat. Syst. Amphib. 187. Dum. et Bibr. vii. p. 845. *Coronella venusta* Schleg. Essai, i. p. 135.

Var. D. Dum. Bibr. l. c. p. 849.

One sp. Surinam, Dr. Hering.

In this specimen twenty-two pairs of reddish brown rings encircle the body from head to tail. These bands are three and a half scales wide and are separated by equal light spaces of one scale in width. It is only on the belly that the former appear in pairs. Head as in the true *Aesculapii*. A species ?

Var. *E. nobis*.

The distribution of colors on the head as usual. Twelve pairs of black rings, those of each pair becoming confluent on the middle of the back. The broad interspaces are shaded with brown, which is deeper on the tip of each scale.

This variety (a species ?) resembles the C of Dumeril & Bibron, where the rings composing the pairs are separated by a very narrow interval, and the spaces between the pairs are very dark.

One spec. Surinam, Dr. Colhoun.

135. *E. albostolatus nobis*.

Number of the plates of the head the same as in the *venustissimus*. In form, the fifth and sixth upper labials are narrower and higher; and the formulas, vertical, and superciliaries, are broader. The eye is larger, the temporal region more swollen, and the whole head deeper and more obtuse. Rows of scales fifteen. Gastrosteges, 167; one divided anal; urosteges, 48.

The ground color of the upper and under surface of this serpent is white, as a note made by Mr. Samuel Ashmead, its discoverer, at the time of its capture, informs us. This is crossed on the body, by ten or thirteen black single rings four or five scales wide, and from seven to twelve scales apart. Another ring crosses at the anus, and there are two *double* rings on the tail. The scales in the white intervals are broadly tipped with black. The distribution of color on the head, much as in *E. venustissimus*. There is a broad black collar which crosses the tips of the occipitals and does not encircle the throat. The fifth and sixth upper labials, the first temporal, the tips of the plates adjoining them posteriorly, and a spot on the occipitals, are white. The rostral, first two labials, nasals and loreal are bordered with the same, the rest of the head is black. Chin immaculate.

One specimen. Jijuca, near Rio Janeiro, Mr. S. A. Ashmead.
One " ? ?

SCOLECOPHIS Fitz. Type *S. atrocinctus*.

Systema Reptilium, 1842, p. 25. *Homalocranion* Dum. & Bibr. viii. 855. Günther, Cat. Brit. Mus. 18.

136. *S. zonatus nobis*. *Elaps zonatus* Hallowell, Journ. Acad. Nat. Sci. New Series, vol iii. p. 35.

This species is very similar to the *S. atrocinctus* of Chili. It differs [1860.]

in having the seventh superior labial larger than the sixth, and in having four large temporals on each side, of equal size, one smaller above the last labial, and two still smaller at the end of each occipital. The breadth of the head at the temples is equal to the length from the muzzle to the extremity of the occipital suture. There are forty-five black rings on the body and tail, which leave white interspaces, wider upon the back than the flanks. Only the white scales on the latter region are tipped with black. The anal scute is divided.

One specimen. Honduras, Dr. S. W. Woodhouse.

PSEUDOBOLA Schneider. Type *P. coronata*.

Hist. Amphib. Fasc. ii. p. 286, 1801. *Scytale* Boie, Isis, 1826, 981, (not of Merrem.) Wagler, Natur. Syst. 187. Dum. & Bibr. vii. p. 996. Günther, Cat. Brit. Mus. 187. *Olisthenes*, Cope, Proc. Acad. Nat. Sci. 1859, p. 296.

Schneider's name for this genus possesses the right of priority over that of Merrem. The almost universal acceptance of the latter by herpetologists, is also the more to be regretted as the type is not known. The relative number of the gastro- and urosteges in the *Scytale anguiformis* of Merrem renders its identity with *Erythrolamprus venustissimus* very improbable.

137. *P. coronata* Schneider. *Scytale coronatum* Boie, Wagler, Dum. & Bibr. Günther, etc. *Lycodon cloelia*, var. Schl.

One specimen. Caraccas, Mr. W. G. Bolton.
One " Panama, Drs. Gallaer and LeConte.

138. *P. Neuwiedii nobis*. Dum. & Bibr., vii. p. 1001, *Olisthenes enphaeus* Cope, l. c.

One specimen. S. America, Ed. D. Cope.

OXYROPUS Wagler. Type *O. petolaris*.

Natur. Syst. Amphib., 1830, p. 185. *Hydroscopus* et *Deiropeda* Fitz. Syst. Rept. 1843, p. 26. *Brachyruton* Dum. & Bibr. vii. p. 1004, 1854.

139. *O. plumbeus* Gthr. *Coluber plumbeus* Wied. Abbild. xii. pl. 6. *Duberria* (1824) et *Hydroscopus* (1843) *plumbeus* Fitz. *Brachyruton plumbeum*, D. et B.

One specimen. Cayenne, Gard. plants in ex.
One " Surinam, Dr. Hering.
One " ? Dr. Wilson.
One " Trinidad, Dr. Watson.

140. *O. melanocrotaphus nobis* This serpent resembles the *O. cloelia*, but may be distinguished from it, first, by the form of the head and the distribution of colors on it (second), and third, by the relative length of the tail.

The profile of the muzzle is very rounding and obtuse, and its sides nearly plane; the head is deep. Eight upper labial plates, third, fourth and fifth, entering the orbit. Loreal large, as high as long. Anterior border of the vertical plate not greater than the length of the lateral borders. The latter are slightly concave, and scarcely or not at all convergent. Three temporals on the exterior border, the first twice as large as the second, and bounding the sixth and seventh upper labials. Preocular large; one narrow postocular, which will probably be found to be divided in other specimens. Inferior labials eight. Genaeals two pair, broad. Scales in nineteen longitudinal rows. Gastrosteges 161, one entire anal, urosteges 45. Total length 25 in. 9 lines. Tail 4 in. 1 l., less than one sixth of total length; in *cloelia* it is a little more than one fifth.

Coloration. The whole upper surface of the body and tail is of a pale yellowish or brownish gray, many scales with one or two borders pure white.

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The plates of the head and chin are of a deeper tint, possibly red in life. Parts of the post-ocular and sixth and seventh superior labials, the whole of the eighth labial and the temporals, are covered by a black spot on each side, which unites upon the nape of the neck with that of the opposite side. One specimen, locality and donor unknown.

141. *O. cloelia* Gthr. *Coluber cloelia* Daudin. *Clelia Daudinii* Fitz. 1826. *Cloelia occipitalis* Wagl. 1830. *Deiropeda cloelia* Fitz. 1843. *Bra-chyru-ton cloelia* Dum. & Bibr. 1853.

One sp.	Surinam.	Dr. Hering.
One "	Cocuyas de Veraguas N. Grenada.	Mr. R. W. Mitchell.
One "	Isth. of Panama.	Drs. Gallaer and LeConte.
One "	Caraccas.	Dr. Morris.

142. *O. immaculatus* Dum. & Bibr. vii. 1029.
Two sp. S. America. Capt. Jameson.

143. *O. petolarius* Wagler. Dum. & Bibr. vii. 1033.
One sp. Surinam. Dr. Hering.
One " (young) ? ?

Var. The black bands occasionally dividing, alternating and becoming confluent on the back. The loreal plate entering the orbit.

One half grown spec. Is. of Panama. Drs. Gallaer and LeConte.

144. *O. trigeminus* Dum. & Bibr. vii. 1013. *Lycodon formosus* Schl.
One sp. Bahia. Gard. Plants in ex.
One " S. America. Dr. Wilson, (Bp. Coll. pres. by Dr. DeKay.)

LYCODONTINÆ.

Boödon Dum. & Bibr. Type *B. unicolor*.

Erpetologie Generale, vii. p. 357, 1854.

145. *B. virgatus nobis*. *Coelopeltis virgata* Hallowell, Proc. Acad. Nat. Sci. vii. p. 98, 1854. *Boödon nigrum* Fischer, Abhandl. aus dem Gebiete der Naturwissensch. Hamburg, iii. 91, 1856. ? *Boödon capense* A. Duméril, Rev. et Mag. de Zoologie 1856, 464. *Boödon quadrivirgatum* Hallow. Proc. Phila. Acad. 1857, p. 56.

Four sp.	Gaboon.	Dr. Ford.
One "	Liberia.	Mr. E. T. Cresson.

Our specimens correspond exactly with the description of Dr. J. G. Fischer, so that we have no doubt as to their belonging to the same species. Prof. Duméril loc. sup. cit. identifies the *Coelopeltis virgata* of Hallowell with the *Boödon capensis* D. & B., and there is a possibility that the specimen received by him from the Acad. Mus. belongs to the latter species. Our specimens, however, presented by Dr. Ford, and subsequently described by Dr. Hallowell as *B. quadrivirgatum*, and stated by him to be identical with his *C. virgata*, cannot be identified with the *B. capense*. The former has twenty one and twenty-three longitudinal rows of scales, the later twenty-nine or thirty-one.

146. *B. quadrivittatus* Hallowell, Proc. Acad. Phila. 1857, p. 54.
One sp. Isles de Los (off Sierra Leon.) Dr. Burt, U. S. N.
A fine species, resembling probably the *Capense*, but with twenty seven rows of scales and a different disposition of the bands on the muzzle.

Lycophidion Fitz. Type *L. Horstokii*.

Syst. der. Rept. p. 27.

147. *L. laterale* Hallowell, Proc. Acad. Nat. Sci. 1857, p. 58.
A *Lycophidion* with the coloration of a *Boödon*. The pupil is round; the anterior nasal plate almost reaches the edge of the lip, and wants but little of meeting its fellow over the rostral.

One sp.	Gaboon.	Dr. H. A. Ford.
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1860.]

HORMONOTUS Hallowell. Type *H. audax*.

Proc. Acad. Nat. Sci. Phila. 1857, p. 56.

A genus agreeing with *Lamprophis Fitz.*, in having a larger series of vertebral scales, but differing in the elongated compressed body, and angular gastrosteges.

148. *H. audax Hallow.* l. c.
One sp. Gaboon. Dr. H. A. Ford.

The form of the body, and color of this species, bear some analogy to those of the *Boiga pulverulenta*, just as the *Boödon*s and *Lycophidion*s resemble the *Brachyranion* and *Atractaspis*. The subject of the prevalence of peculiar shades and arrangement of colors, throughout certain geographical districts, is one of much interest to the zoologist. The smoky and fuscous colors of the serpents just alluded to are repeated among birds in the *Nectarinia fuliginosa*, the genera *Andropadus*, *Drymoeca*, *Artemyias*, etc. The *Euprotodon* (*Lycodon*) of the East Indies in the distribution and often in the shade of its colors, resembles very much the venomous *Bungarus* and *Elaps* (*Calliophis*) of the same countries.

The *Elaps* of South America is represented in the same region by the black and red-ringed *Oxyrhopes*, the *Erythrolamprus*, *Pliocercus*, *Lampropeltis* etc.

? *Lycodon* Boie. Type *L. aulicus*.

Isis, 1827, p. 551, num p. 521? Schlegel (pars) *Ess.* ii. p. 106. Fitzinger, *Neue Class.* p. 29. *Dum.* et *Bibr.* vii. p. 367. *Günther* l. c. p. 201.

We have strong doubts of the propriety of retaining the name *Lycodon* for this genus, inasmuch as Boie first proposed it for the *Colubar audax Linn.* a species of widely different affinities. Fitzinger in the "Neue Classification" removed this species to the genus *Dipsas*, rightly estimating the differences between it and those for which he retained the name *Lycodon*. He afterwards ("Systema Reptilium," p. 29,) made the same species the type of his genus *Siphlophis*. *Duméril* l. c. p. 354, follows Fitzinger in the application of the name *Lycodon*, and quotes Boie's original diagnosis as more particularly appropriate to the *C. aulicus* and congeners. As however Boie says "dentes colubrini" of the *Psammophis* and *Dipsas*, it must be equally appropriate to the *C. audax*. This latter species is the type of *Lycognathus Dum.*, fam. *Anisodontiens*, *Opisthoglyphes*.

In deference to authority we propose no change; but if herpetologists should ever see fit to apply the name *Lycodon* to the *Lycognathus scolopax* (= *audax*) of *Duméril*, the present genus might be appropriately called *Euprotodon*, and the subfamily *Euprotodontinæ*.

149. *L. aulicus Boie* l. c. *Dum.* & *Bibr.* vii. p. 369. *L. hebe* Schleg.
Var. A., *Dum.* & *Bibr.*
One sp. ? Mr. R. Oakford.
Var. B., *Dum.* & *Bibr.*
One sp. India. Dr. Burroughs.
One " " Gard. of Plants in ex.
Var. F., *Dum.* & *Bibr.*
One sp. Java. Dr. Ruschenberger.
Seven sp. Philippine Is. Mr. Cuming in ex.

EUMESODON nobis. Type *E. semicarinatus*.

Palatine teeth of equal length. Mandibular teeth in a continuous series, much longer and stronger anteriorly. Superior maxillary teeth in two slightly separated series, those of the anterior long, but increasing regularly in length posteriorly; the posterior small in front, but terminating in one or two very long, trenchant, smooth teeth.

Form elongate, stout; tail short; gastrosteges bent on the flanks. Head

[June,

distinct, the shields broad; muzzle prominent. Two nasals, two postoculars, one preocular, the loreal sometimes reaching the orbit beneath it. Scales either smooth or partially carinate. Pupil elliptical.

The serpents for which we propose this name are colubrine in form, but possess a peculiar dentition, most resembling that of *Dinodon* and *Odontomus Dum. & Bibr.* From both these forms they differ in having the anterior palatines no longer than the posterior (*i. e.* pterygoids), and the posterior superior maxillaries abruptly longer than the three or four which precede them.

150. *E. semicarinatus nobis.* Head depressed, conic, the width at the eighth labial plate less than half the length. Muzzle rounded conic, prominent, acute in profile. Pupil? Body cylindrical, tail one-fourth of total length. Scales short, obtuse, in seventeen longitudinal rows; anteriorly smooth, near the middle of the body three or four rows, and finally seven or eight, having distinct keels on the anterior half of each scale. Those of the tail smooth. No larger vertebral series. Rostral plate exhibiting a large crescentic inferior surface; superior surface large, presenting an obtuse angle between the prefrontals. Postfrontals three times the size of the prefrontals. Vertical broad, short, pentagonal, the anterior border greater than the lateral, and equal to the greatest length of the plate. Superciliaries not acute in front. Occipitals elongate, not bifurcate, bordered by two large temporals on each side. The anterior of these is narrow, and separated from the sixth and seventh labials by a broader and shorter plate, both in contact with the postoculars. The posterior is broad, and bordered by two others on its postero-inferior border.

Superior labials eight, third, fourth and fifth entering the orbit. Two post-ocular preocular. Loreal low, elongate, acute behind, not reaching the orbit. Nasal plates two, nostril large. Inferior labials ten, genaeals two pair.

Coloration. Above yellowish brown, crossed by forty-two large black spots. The scales which fall in the border of each spot are absolutely black, but those enclosed have a large central spot of the ground-color. The latter appears above as light transverse bands one scale wide. There are seventeen spots on the tail, darker than those of the body. Head above brownish black, continuous with the first dorsal spot. From the posterior extremity of each occipital plate a yellowish band proceeds outwards and backwards, uniting with an area of the same color which extends from the throat upon the sides of the neck. In the centre of this area is a brownish black spot. Spottings of yellowish on the temporal plates form an irregular postocular band, and another equally indefinite and irregular extends from the eye round the muzzle. Superior labials (except their edges) chin, throat, belly and under surface of tail brownish yellow. The ends of the gastrosteges on the flanks, partly included in a series of spots which alternate with the larger ones of the back. Urosteges spotted with blackish. Gastrosteges 221; one entire post-abdominal; urosteges 92 pair. Total length, 37 inches; the tail 9 in. 3 lines. One specimen, captured by Mr. Heine of the U. S. Japan expedition at Loo Choo, presented by the Smithsonian Inst.

151. *E. striatus nobis.* *Coronella striata* Hallowell, Proc. Acad. Nat. Sci. 1856, p. 152.

This serpent resembles the preceding in many points—remarkably in the dentition—yet presents differences which may at some time be regarded as generic. The entrance of the loreal plate into the orbit, the smooth scales, with the vertebral series slightly larger, and the elliptic pupil, approximate it to the *Dinodon cancellatum* Dum. & Bibr. In the palatine and superior maxillary teeth the differences are of a kind which would be considered generic by the authors of the *Erpetologie Generale*. In specific characters there is much resemblance, but our serpent has fewer urosteges, there being 70 to 193 gastrosteges; in the *Dinodon* 168 to 194. The spots above are reddish brown, not black; and the belly is not punctulated posteriorly.

We at one time thought that our specimen belonged to the *Lycodon rufum* 1860.]

zonatus Cantor, Ann. et Magaz. Nat. Hist. 1842, p. 483, and that long immersion in spirits had destroyed the lighter colors. We now believe the animals to be distinct, but nearly allied.

Two specimens and head.

Ningpo.

Dr. McCartee.

DIPSADINÆ.

Boiga Fitzinger. Type *B. irregularis*.

Neue Class. der Reptilien, pp. 29, 60, 1826. *Triglyphodon* Duméril, Prodrome de la Class. Ophid. p. 111, 1852. Erp. Gen. vii. p. 1069, 1854. *Dipsas* Schleg. Essai, ii. p. 257, 1837. Fischer, Abhdl. aus Gebiete Wissensch. Hamb. iii. p. 81, 1856. Günther, Cat. Brit. Mus. p. 169, 1858, (not of Laurenti, 1768.) *Gonyodipsas*, *Cephalophis* et *Macrocephalus* Fitz. Syst. Rept. 27, 1843. *Toxicodryas* Hallow. Proc. Acad. Nat. Sci. Phil. 1857, p. 60.

This is the genus *Dipsas* as understood by Günther l. c. We have, however, not followed this author in the application of a name, since that employed by him was given to another and allied form, long previously. Some time subsequent to the first use of *Dipsas*, the present genus received the barbarous appellation of *Boiga* (!). This we would gladly resign in favor of *Triglyphodon* Duméril, but dates are inexorable. *Vae senioribus*.

152. *B. dendrophila nobis*. Dum. Bibr. l. c. p. 1086. *Dipsas dendrophila* Reinw. et auctorum.

One sp.

Java.

Garden of Plants.

153. *B. Blandingii nobis*. *Dipsas Blandingii* Hallowell, Proc. Acad. Nat. Sci. Phila. ii. p. 170, 1844. *Triglyphodon fuscum* Dum. Bibr. vii. p. 1101, 1854, (not *B. fusca*. = *Dendrophis fusca* Gray, Zool. Misc. 1842, p. 54). *Dipsas valida* Fischer, loc. cit. 1856. Gthr. loc. cit. p. 172, 1858. *Toxicodryas Blandingii* Hallow. loc. cit. p. 60, 1857. Our specimens of this fine and interesting *dipsadien* agree very nearly with the description and figures of Fischer. The two preoculars and divided anal shield are striking characters,* and it exhibits a relationship to *Ophiodon* Dum. and Bibr. in its elongate anterior maxillaries, On these peculiarities, but especially from the fact that our specimens have but a single grooved tooth on each side, Dr. Hallowell proposed his genus *Toxicodryas*. The latter character is, however, inconstant, for Fischer states that his specimen had two such teeth on each side, and Duméril, that his had three. The elongation of the anterior maxillary and palatine teeth does not appear to us sufficiently distinctive to afford generic characters, nor are the other peculiarities of sufficient importance.

154. *B. pulverulenta nobis*. *Dipsas pulverulenta* Fischer, Abhandl. der Naturwissensch. in Hamburg, ii. p. 81. Taf. iii. f. 1. Günther, Cat. Brit. Mus. p. 173.

One sp.

Liberia.

Mr. E. T. Cresson.

A beautiful specimen, having the lateral spots obsolete anteriorly. There is in this species, also, but one grooved superior maxillary.

155. *B. multimaclata nobis*. *Dipsas multimaclata* Reinw. et Auctorum. Erp. Gen. vii. p. 1139.

One sp.

Java.

?

HIMANTODES Dum. & Bib. Type *H. cenchoa*.

Erp. Gen. vii. p. 1064. *Dipsas* Boie, Isis, 1827, p. 521. Fitzinger, Syst. Rept. 27, 1843.

This genus unites the short, flat head of the true *Dipsas*, (*Leptognathus* D. & B. Gthr.) with the dentition of the preceding genus. The tail is very long and slender.

156. *H. cenchoa* Dum. & Bibr. vii. p. 1065. *Coluber cenchoa* Linn. *Dipsas*

* Also possessed by *Boiga globiceps* = *Dipsas globiceps* Fisch. l. c.

cenchoa Wied. Boie, Wagler, Günther l. c. p. 174. *Dipsas Weigeli* Schleg. ii. p. 278. Fitz. Syst. Rept., p. 27.

One sp. Near Isalco, San Salvador. Capt. J. M. Dow.

Our specimen has the preoculars united, which peculiarity appears to be not uncommon. The dorsal spots connected by a narrow, often irregular brown vitta.

TRIPANURGUS Fitz. Type *T. leucocephalus*.

Systema Reptilium. 1843, p. 27.

157. *T. leucocephalus* Fitz. *Coluber leucocephalus* Mikán. *Col. compressus* Oppel. *Dipsadomorphus compressus* Fitz. *Dipsas leucocephalus* Schleg. *Lycognathus leucocephalus* Dum. & Bibr. *Eudipsas leucocephalus* Gthr.

One sp.

?

?

DIPSAS Laurenti. Type *D. Indica*.

Specimen Synopsis Reptilium, p. 89, 1768. *Dipsadomorus*, *Petalognathus* et *Leptognathus* Dum. & Bibr. vii. pp. 463, 477, 1854. *Leptognathus* Günther, Cat. Brit. Mus., p. 177, 1858. *Pholidotamus Sibynomorphus* et *Sibynon* Fitz. Syst. Rept., 27, 1843.

The genus *Dipsas* has been variously understood and defined by herpetological authors. As four distinct groups have been designated by this name, in order to avoid further confusion we have employed it for that to which it was first applied. In the Synopsis Reptilium of Laurenti, which bears date 1768, the name was first proposed, with an appropriate "character," and *D. Indica Laur.* was indicated as the typical and only species. In 1852 Duméril made the same species the type of his genus *Dipsadomorus*, and in 1858 Günther placed it in *Leptognathus Dum.* We next find the genus *Dipsas* characterized at length by Boie in his invaluable contribution to herpetology, in the *Isis von Oken* for 1827, and *D. cenchoa* assigned as the type. This species is the *Himantodes* of Duméril, 1852. In the *Regne Animal*, 1829, we find the genus as proposed by Laurenti retained, and of all modern authors Cuvier is the only one who does so. In 1830 the *Natürlich System der Amphibien* of Wagler appeared. Here *Dipsas dendrophila Rein.* is considered typical of the genus; and in this he is followed by the great ophidiologist Schlegel, in the "Essai," in 1837. The group of which this species is a typical example was named *Triglyphodon* by Duméril in 1852, but is the *Boiga* of Fitzinger, 1826.

Fitzinger, in the *Systema Reptilium*, 1843, cites *Dipsas cenchoa* ("Weigeli") as the type of the genus, following Boie. Phillippo de Phillippi, in the *Catalogue of Serpents* in the Museum of the University of Pavia, 1849, follows Wagler and Schlegel.

In the *Prodrome de la Classification des Reptiles Ophidiens*, vol. xxiii. of the memoirs of the French Academy, 1852, and afterward in the *Erp. Generale*, Duméril considers *Dipsas trigonata* the type of the genus. In 1843, Fitzinger proposed *Dipsadomorphus* for the same species. Finally, in 1858, in the *Catalogue of Colubrine Snakes* in the British Museum, Dr. Günther places *D. multimaclata* first among the species, and so characterizes the genus as to be nearly coextensive with *Triglyphodon*, Duméril, including also *Himantodes* of the latter.

Believing the genera of *Dipsadinæ* as defined by Günther, to be, on the whole, more natural than those of other authors, we have adopted them here, simply employing the name *Dipsas* for that called by him *Leptognathus*, and *Boiga* for his *Dipsas*.

158. *D. nebulata* Boie, l. c. *Coluber nebulatus* Linn. 1754, *Col. variegatus* Hallow. Proc. Acad. Nat. Sci. Phila. ii. p. 244, 1845. *Dipsas nebulata* Schleg. Essai, ii. p. 275. *Sibynon nebulata* Fitz. l. c. *Petalognathus nebulatus* Dum. & Bibr., l. c. *Leptognathus nebulatus* Günther, l. c.

One specimen.

Surinam,

Dr. Hering.

One "

"

Dr. Colhoun.

Two "

Near Caraccas,

Mr. Ashmead.

1860.]

17

159. *D. pavonina* Cuvier, MSS., Schlegel, Essai, ii. p. 280. *Leptognathus pavoninus* Dum. & Bibr. vii. p. 474, Günther, l. c. 179.

One specimen, S. America. ?

160. *D. brevis nobis*. *Leptognathus brevis* Dum. & Bibr. vii. p. 476. One specimen. Cocuyas de Veraguas, New Grenada, R. W. Mitchell.

Our specimen of this rare species has but one preocular plate; its form too, is no less slender than that of our *D. pavonina*, which, however, may not be fully grown. Otherwise it coincides with the description cited. The dark brown of the upper surface of the head is marked with small, irregular spots of white.

SIBON Fitzinger. Type *S. annulata*.

Neue Classification der Reptilien, 1826, p. 60. *Leptodeira* Fitz., Systema Reptilium, 27, 1843. Günther, Cat. Brit. Mus. p. 165.

161. *S. annulata* Fitz. l. c. *Coluber annulatus* Linn. *Dipsas annulata* Schleg. Essai, ii. p. 294, Dum. & Bibr., vii. 1141. *Leptodeira annulata* Fitz. et Gthr. l. c.

Scales in nineteen or twenty-one rows.

a. With an undulating dorsal band. Var. A. Dum. & Bibr. Six specimens. Surinam, Dr. Hering.

b. With isolated, sometimes geminate spots. Var. B. Dum. & Bibr. Five specimens. Caraccas, Mr. Ashmead.
One " " W. G. Bolton.
One " Isth. Panama. Dr. LeConte.
Four " S. America, Mr. H. Cuming, in ex.

Scales in twenty-three rows.

Two specimens. Honduras, J. S. Hawkins & Dr. LeConte.
One " Near Volcano Isalco, San Salvador, Capt. John M. Dow.
One " Xalapa, John Cassin, Esq. (De Oca coll.)
Two " ? ?

There is much difference in the appearance of the specimens of this species which come from the extreme points of distribution represented in our collection, viz. Surinam and Xalapa. As has been observed by authors, those from the more southern localities, have more slender bodies and tails, and hence, fewer longitudinal rows of scales, and the head is more distinct. The whole "physiognomy" is more that of the arborial *Dipsadiens*. This is more striking in a specimen where the vertebral rows of scales in places is slightly, but distinctly larger than the others. From the Stomach of a Surinam specimen we took an adult *Hyla*; from one from Caraccas, a *Thecadachylus rapicaudus*.

Specimens from Mexico exhibit a stouter, heavier form of body, a greater number of longitudinal rows of scales, and a shorter tail. They seldom, if ever, have the dorsal spots confluent into a *band*, strictly speaking, as in the var. A. Dum. & Bibr. Their aspect is that of a terrestrial species.

That these forms are really distinct species, is possible, but it could only be demonstrated with large series of specimens from carefully ascertained localities, if at all. Some of the specimens from Caraccas and Panama, are very intermediate as respects the peculiarities mentioned.

Dipsas septentrionalis Kennicott, (Mexican Boundary Survey, ii. Reptiles, p. 16, pl. viii. fig. 1.) belongs to this genus. The grooving of the posterior upper maxillaries is not represented in the fig. 2, pl. 22, l. c. It seems to resemble northern forms of *S. annulata*; but has the nasals and prefrontals differently proportioned, etc. It has three preoculars but we not unfrequently find one or more supplementary preoculars in the *annulata*.

Synonymy of the Cyclades, a family of Acephalous Mollusca. Part 1.

BY TEMPLE PRIME.

Family CYCLAS, Fer.

Genera.

GALATEA, Brug.

Pectunculus, Lister. *Venus*, Chemn. *Donax*, Perry. *Tellina*, Dillwyn. *Chama*, Favanne. *Egeria*, De Roissy. *Megadesma*, Bowditch. *Potamophila*, Sowerby. *Galateola*, Fleming. *Trigona*, Schum.

GLAUCOME, Gray.

Solen, Linn. *Glaucomya*, Bronn.

CYPRINA, Lamk.

Pectunculus, Lister. *Cardia*, Olafsen. *Venus*, Linn. *Arctica*, Schum.

VELORITA, Gray. 1834.

Cyrena, Valenc. 1838.

CORBICULA, Megerle. 1811.

Tellina, Müller, 1774. *Venus*, Chemn. 1782. *Cyclas*, Brug. 1792. *Cyrena*, Lamk., 1818. *Venulites*, Schl., 1820.

CYRENA, Lamk. 1818.

Venus, Chemn., 1769. *Cyclas*, Brug., 1792. *Cyanocyclus*, Fer., 1818. *Poly-mesoda*, Rafin., 1820. *Maetra*, Brongt., 1823. *Geloina*, Gray, 1844.

BATISSA, Gray. 1854.

Cyprina, *Cyclas*, Brug., 1792. *Cyrena*, Lamk. 1818.

SPHÆRIUM, Scopoli.

Pectunculus, Lister, 1685. *Musculus*, Gualt. 1742. *Tellina*, Linn., 1758. *Sphærium*, Scop., 1777. *Cardium*, Da Costa, 1778. *Cyclas*, Brug., 1792. *Nux*, Humphr. 1797. *Musculium*, Link. 1807. *Cornea*, *Pisum*, Megerle. 1811. *Corneocyclus*, Fer., 1818. *Amesoda*, Rafin., 1820. *Pisidium*, Verany, 1846. *Cycladites*, Krug, 1848.

PISIDIUM, Pf. 1821.

Pectunculus, List., 1685. *Musculus*, Gualt., 1742. *Tellina*, Müller, 1774. *Sphærium*, Scop. 1777. *Cardium*, Poli. 1791. *Cyclas*, Lamk. 1818. *Pera*, *Euglesia*, *Cordula*, Leach, 1820. *Physemoda*, Raf., 1820. *Gallileja*, Da Costa, 1839. *Pisum*, Gray, (non Megerle), 1847. *Musculium*, Gray, (non Link), 1851.

*Species.**

VELORITA, Gray.

1. *V. Cyprinoides*, Gray. Grif. Cuvier, pl. 31, f. v. 1834.*Cyrena Cyprinoides*, Gray. Ann. Phy. n. ser. ix. 136. 1825.*C. recurvata*, Valenc. Mag. Zool. pl. 119, f. 2. 1838.*C. Gaudichaudii*, Valenc. Loc. sub. cit. pl. 119, f. 2. 1838.

Hab. Philippines.

CORBICULA, Megerle.

1. *C. acutangularis*, Desh.*Cyrena acutangularis*, Desh. Inv. Par. 517, pl. 38, f. 17, 18. 1857.

Hab. France, (fossil.)

*The synonymy of the species of *Galatea*, *Glaucome* and *Cyprina*, will be given at some future period; that of the species of *Batissa* and *Pisidium* will be found in the Annals of the Lyceum of N. H., of New York, vol. vii.

2. *C. Africana*, Adams. Ad. Rec. Gen. 2, 447. 1858.
Cyrena Africana, Kr. Moll. S. Afr. 8, pl. i. f. 9. 1848.
C. Gauritziana, Kr. In litt. 1848.
 Hab. Africa.
3. *C. Agrensis*, Prime.
Cyrena Agrensis, Kurr. in litt.
 Hab. India.
4. *C. Alpina*, Prime.
Cyrena Alpina, Bgt. Sph. fr. 49. 1854.
Cyclas Alpina, d'Orb. Prod. 2, 381. 1851.
 Hab. France, (fossil)
5. *C. ambigua*, Desh. Proc. Zool. xxii. 345. 1854.
 Hab. Euphrates.
6. *C. amygdalina*, Desh.
Cyrena amygdalina, Desh. Inv. Par. 500, pl. 37, f. 22, 23. 1857.
 Hab. France, (fossil.)
7. *C. angusta*, Desh.
Cyrena angusta, Desh. Inv. Par. 508, pl. 37, f. 9-12. 1857.
 Hab. France, (fossil.)
8. *C. antiqua*, Prime.
Cyrena antiqua, Fer. Moll. terr. et fluv. f. 5.
Cyclas antiqua, d'Orb. Prod. 2, 304. 1854.
 Hab. France, (fossil.)
9. *C. Arnoudii*, Prime.
Cyrena Arnoudii, Pot et Mich. Gal. Moll. 2, 192, pl. 61, f. 15, 16. 1838-44.
 Hab. France, (fossil.)
10. *C. Arveniensis*, Desh.
Cyrena Arveniensis, Desh. Trait. Elem. Conch. 2, 698. 1843-50.
C. pisum, Desh. Bouillet, Cat. 157. 1836.
 Hab. France, (fossil.)
11. *C. Australis*, Desh.
Cyclas Australis, Lam. Lam. v. 560. 1818.
Cyrena Australis, Desh. Encycl. Méth. 2, 50. 1830.
 Hab. Asia.
12. *C. Bengalensis*, Desh. Proc. Zool. xxii. 344. 1854.
 Hab. Bengal.
13. *C. Bensoni*, Desh. Proc. Zool. xxii. 345. 1854.
 Hab. Bengal.
14. *C. Bouilletii*, Desh.
Cyrena Bouilletii, Desh. Trait. Elem. Conch. 2, 698. 1843-50.
C. depressa, Desh. Bouillet, Cat. 156. 1836.
 Hab. France, (fossil.)
15. *C. Brasiliana*, Adams. Ad. Rec. Gen. 2, 447. 1858.
 Hab. Brazil.
16. *C. breviscula*, Desh.
Cyrena breviscula, Desh. Inv. Par. 503, pl. 36, f. 9-11. 1857.
 Hab. France, (fossil.)
17. *C. Britannica*, Desh.
Cycles deperdita, Lam. Park. Org. Rem. 3, 189, pl. 13, f. 8. 1811.
Cyrena subdeperdita, Morris. Cat. Brit. fossils 86. 1843.
Cyclas subdeperdita, d'Orb. Prod. 2. 305. 1850.

- Cyrena Britannica*, Desh. Inv. Par. 501. 1857.
Hab. Engl. (fossil.)
18. *C. brunea*, Prime. In litt. 1860.
Hab. Scamander River.
19. *C. Cashmiriensis*, Desh. Proc. Zool. xxii. 344. 1854.
Hab. Cashmyr.
20. *C. Chilensis*, Prime.
Cyclas Chilensis, d'Orb. Voy. Amer. 568, pl. 83, f. 11-13. 1846.
Musculium Chilense, d'Orb. Ads. Rec. Gen. 2, 451. 1858.
Pisum Chilense, d'Orb. Loc. sub. cit. 2, 460. 1858.
Hab. Chili.
21. *C. compressa*, Mousson. Ads. Rec. Gen. 2, 447. 1858.
Hab?
—*C. consobrina*, Adams. Rec. Gen. 2, 447. 1858. Is *Corbicula cor* Adams.
22. *C. convexa*, Desh. Proc. Zool. xxii. 342. 1854.
Hab. Central America.
23. *C. cor*, Adams. Rec. Gen. 2, 447. 1858.
Cyrena cor, Lam. Lam. v. 552. 1818. Delessert pl. vii. f. 7. 1841.
C. consobrina, Caillaud. Voy. Meroé iv. 263, t. 2, pl. 61, f. 10-11. 1826.
Cyclas consobrina, Caillaud, Caltow and Reeve, 29. 1845.
Corbicula consobrina, Adams. Rec. Gen. 2, 447. 1858.
Hab. Asia.
24. *C. crassa*, Desh.
Cyrena crassa, Desh. Coq. Foss. Par. 1, 119, pl. 18, f. 14, 15. 1824.
C. spissa, Desh. Loc. sup. cit. p. 9, pl. 18, f. 14, 15. 1824.
Cycles crassa, d'Orb. Prod. 2, 422. 1850.
Hab. France, (fossil.)
25. *C. crassula*, Prime.
Cyrena crassula, Mousson. Mous. Cat. Bellardi. p. 54. f. 12. 1854.
Hab. Tigris River.
26. *C. Cumingii*, Desh.
Hab. Philippines.
27. *C. cuneata*, Adams. Rec. Gen. 2, 447. 1858.
Cyrena cuneata, Jonas. Zeit. Malak. 186. 1844. Phil. Abb. 2, 77. pl. i. f. 6. 1846.
C. globulus, Jonas. In litt.
Hab. Orinoco.
28. *C. cuneiformis*, Prime.
Cyrena cuneiformis, Ferussac. Moll. Terr. Fluv.
Cyclas cuneiformis, Sowb. M. Conch. 2, 140, pl. 162, f. 2, 3. 1818.
Cyrena donacialis, Desh. Dict. class h. n. v. 290. 1824.
C. donaciformis, Anton. Verz. 1839.
Hab. Europe, (fossil.)
29. *C. cycladiformis*, Desh.
Erycina lævis, Lam. Ann. Mus. v. 413. 1805.
Cyrena cycladiformis, Desh. Coq. Foss. Par. 1, 121, pl. 19, f. 7-9. 1824.
Cycles cycladiformis, d'Orb. Prod. 2, 381. 1850.
Hab. Europe, (fossil.)
30. *C. debilis*, Prime.
Cyrena debilis, Gould. Bost. Proc. 3, 293. 1850.
Hab. N. Guinea.
- 1860.]

31. *C. deperdita*, Desh.
Cyclas deperdita, Lam. Ann. Mus. vii. 421. 1806.
Cyrena deperdita, Desh. Cog. Foss. Par. 1, 118, pl. 19, f. 14, 15. 1824.
 Hab. France, (fossil.)
32. *C. Deshayesii*, Prime.
Cyrena Deshayesii, Hébert. Bull. Soc. Géol. Fr. 2d. n. v. 401. f. a. b. 1848.
 Hab. France, (fossil.)
33. *C. Duchasteli*, Nyst. Bull. Brux. xv. 114, f. 1-4. 1838.
Cyrena trigonula, Wood. Ann. Mag. n. h. vii. 275, f. 45. 1841.
 Hab. Europe, (fossil.)
34. *C. Ferrussaci*, Prime.
Cyrena Ferrussaci, Math. Cat. Méth. 149, pl. xiv. f. 14, 15. 1842.
Cyclas Ferrussaci, d'Orb. Prod. 3, 19. 1852.
 Hab. France, (fossil.)
35. *C. fluminalis*, Adams. Rec. Gen. 2, 447. 1858.
Tellina fluminalis, Müller. Verm. 2, 205. 1774.
T. fluviatilis, Müller. Loc. sup. cit. 2, 206. 1774.
Venus fluminalis, Chemn. vi. pl. 30, f. 320. 1782.
V. fluviatilis, Chemn. Loc. sup. cit. pl. 30, f. 321. 1782.
Cyclas Euphratica, Lam. Ann. Mus. vii. 420. 1806. Encycl. pl. 301, f. 2, pl. 302, f. 1, 2.
C. fluviatilis, Bosc. 3, 38. 1802.
C. lævigata, Schum. 170, pl. xii, f. 1. 1817.
Cyrena fuscata, Lam. Lam. v. 552. 1818.
C. Euphratica, Bronn. Syst. Urwelt. pl. iv. f. 10.
C. orientalis, Lam. Phil. Abb. 2, 75, pl. 1, f. 2. 1846. Mousson, Moll. Java 86, pl. xv. f. 2. 1849.
Corbicula fuscata, Cantor. Proc. Zool. x. 124. 1852.
Cyrena fluminalis, Bgt. Cat. Sauley 79. 1853.
Corbicula fluviatilis, Adams. Rec. Gen. 2, 447. 1858.
 Hab. Asia.
36. *C. fluminea*, Adams. Rec. Gen. 2, 447. 1858.
Tellina fluminea, Gml. 3243. 1788. Müller, Verm. 2, 205. 1774.
Venus fluminea, Chemn. vi. 321, pl. 30, f. 322-23. 1782.
Cyclas Chinensis, Lam. Ann. Mus. vii. 421. 1806.
C. fluminea, Bosc. 3, 38. 1802.
Cyrena fluminea, Lam. Lam. v. 553. 1818. Phil. Abb. 2, 76, pl. 1. f. 3. 1846.
 Hab. China.
 —*C. fluviatilis*, Adams. Rec. Gen. 2, 447. 1858, is *Corbicula fluminalis*, Adams.
37. *C. Forbesii*, Desh.
Cyrena Forbesii, Desh. Inv. Par. 510, pl. 37, f. 24-27. 1857.
 Hab. France, (fossil.)
 —*C. fuscata*, Cantor. Proc. Zool. x. 124. 1852. Is *Corbicula fluminalis*, Adams.
38. *C. gracilis*, Prime.
Cyrena fluminea, Mousson. Moll. Java, 87, pl. xv. f. 3. 1849.
Corbicula Moussonii, Desh. Litt. Adams, Rec. Gen. 2, 447. 1853.
 Hab. Java.
 —*C. grandis*, Desh. Proc. Zool. xxii. 344. 1854, is *Corbicula Woodiana*, Adams.
39. *C. Gravesii*, Desh.
Cyrena Gravesii, Desh. Coq. Foss. Par. 2, 810. 1824.

- C. Gravii*, Desh. Loc. sup. cit. 1, 120, pl. 19, f. 3-4. 1824.
Cyclas Gravesii, d'Orb. Prod. 2, 323. 1850.
 Hab. France, (fossil.)
 —*C. hammalis*, Ferussac. Mag. Zool. v. 59-60. 1835.
Cyclas hammalis, Fer. Rafin. Bory St. Vt. Ann. Gen. Sci. Phy. v. 319.
 1820. (Not described.)
40. *C. inæquilateralis*, Prime. In litt. 1860.
 Hab. Africa.
41. *C. incrassata*, Desh. Proc. Zool. xxii. 342, 1854.
 Hab. ?
42. *C. Largillierti*, Adams. Rec. Gen. 2, 447. 1858.
Cyrena Largillierti. Phil. Zeit. Malac. 163. 1844. Abb. 2, 75, pl. 1,
 f. 1. 1846.
 Hab. China.
43. *C. limosa*, Adams. Rec. Gen. 2, 447. 1858.
Tellina limosa, Maton. Trans. Linn. Soc. London x. 325, pl. 24, f. 8-10.
 1809.
Cyrena limosa, Gray. Ann. Ph. n. ser. ix. 137. 1825.
 Hab. South America.
44. *C. Malacensis*, Desh. Proc. Zool. xxii. 343. 1854.
 Hab. Malacca.
45. *C. Manillensis*, Prime.
Cyrena Manillensis. Phil. Zeit. Malac. 163. 1844.
C. fluvialilis. Phil. (non *Venus fluminea*, Chemn.) Phil. Abb. 2, 77,
 pl. 1, f. 5. 1846.
 Hab. Manilla.
46. *C. maxima*, Prime. Proc. Zool. xxviii. 1860.
 Hab. ?
47. *C. media*, Prime.
Cyrena media, Fitton. Ann. Ph. and n. ser. vii. 376. 1824.
Cyclas media, Sowb. M. Conch. vi. 51, pl. 527, f. 2. 1829.
 Hab. Engl. (fossil.)
48. *C. minor*, Prime. In litt. 1860.
 Hab. ?
49. *C. mixta*, Desh.
Cyrena mixta, Desh. Inv. Par. 1058.
 Hab. France, (fossil.)
 —*C. Moussonii*, Desh. Adams, Rec Gen. 2, 447. 1858. Is *Corbicula*
gracilis, Prime.
50. *C. Nepeansis*, Prime.
Cyclas Nepeansis, Less. Voy. Coq. ii, 428, pl. xiii. f. 14. 1820.
 Hab. N. South Wales.
51. *C. nitens*, Adams. Rec. Gen. 2, 447. 1858.
Cyrena nitens. Phil. Zeit. Malac. 163. 1844. Abb. 2, 76, pl. 1, f. 4,
 1846.
 Hab. China.
52. *C. notata*, Prime. In litt. 1860.
 Hab. Phillipines.
53. *C. obovata*, Prime.
Cyclas obovata, Sowb. Min. Conch. 2, 140, pl. 162, f. 4-6. 1818.
Cyrena obovata, Desh. Encycl. Méth. 2, 52. 1830.
 Hab. Engl. (fossil.)
- 1860.]

54. *C. obscura*, Desh. Proc. Zool. xxii. 342. 1854.
Hab. ?
55. *C. obsoleta*, Desh. Proc. Zool. xxii. 345. 1854.
Hab. Uruguay.
56. *C. occidens*, Bens. Adams, Rec. Gen. 2, 447. 1858.
Hab. India.
57. *C. orbicularis*, Prime.
Cyrena orbicularis, Desh. Mellev. Mem. Terr. Tert. Par. 35, pl. 2, f. 3, 4. 1843.
Cyclas suborbicularis, d'Orb. Prod. 2, 304. 1850.
Cyrena suborbicularis, Desh. Inv. Par. 497. pl. 38, f. 11, 12. 1857.
Hab. France, (fossil.)
58. *C. orientalis*, Adams. Rec. Gen. 2, 447. 1858.
Cyrena orientalis, Lam. Lam. v. 552. 1818. Delessert, pl. vii. f. 8. 1841.
Hab. Asia.
59. *C. ovalina*, Desh. Proc. Zool. xxii. 343. 1854.
Hab. Port. Essington, Australia.
60. *C. ovalis*, Prime. Proc. Zool. xxviii. 1860.
Hab. ?
61. *C. Panormitana*, Adams. Rec. Gen. 2, 447. 1858.
Cyrena Panormitana, Bivon.
Hab. Europe, (fossil.)
62. *C. Paranaensis*, Adams. Rec. Gen. 2, 448. 1858.
Cyrena Paranaensis, d'Orb. Guer. Mag. v. 44. 1835.
Cyclas Paranaensis, d'Orb. Voy. Amer. 567, pl. 83, f. 23-25. 1846.
Hab. S. America.
63. *C. parva*, Prime.
Cyrena ovalina, Desh. Inv. Par. 505, pl. 36, f. 16-18. 1857.
Hab. France, (fossil.)
64. *C. parvula*, Prime. In litt. 1860.
Hab. India.
65. *C. pisum*, Desh.
Cyrena pisum, Desh. Coq. Foss. Par. 1, 117, pl. 19, f. 10-13. 1824.
Cyclas pisum, d'Orb. (non Math.) Prod. 2, 322. 1850.
Hab. France, (fossil.)
66. *C. prolongata*, Prime. In litt. 1860.
Hab. E. Australia.
67. *C. pulchella*, Adams. Rec. Gen. 2, 448. 1858.
Cyrena pulchella, Mouss. Moll. Java, 88, pl. 15, f. 4. 1849.
Hab. Java.
68. *C. pullata*, Adams. Rec. Gen. 2, 448. 1858.
Cyrena pullata, Phil. Phil. Abb. 3, 110. 1849.
Hab. Sumatra.
69. *C. pusilla*, Adams. Rec. Gen. 2, 448. 1858.
Cyrena pusilla, Parr. Phil. Abb. 3, 78, pl. 1, f. 7. 1846.
Hab. River Nile.
70. *C. radiata*, Adams. Rec. Gen. 2, 447. 1858.
Cyrena radiata, Parr. Phil. Abb. 2, 78, pl. 1, f. 8. 1846.
Hab. River Nile.

71. *C. recurvata*, Eydoux. Adams, Rec. Gen. 2, 448. 1858.
Hab. ?
72. *C. regularis*, Pr. MSS. 1859. Collect. Cuming.
Hab. Deacan River, Australia.
73. *C. rhomboidea*, Pr. MSS. 1859. Collect. Auctoris.
Hab. Malacca.
74. *C. rivalis*, Adams. Rec. Gen. 2, 448. 1858.
Cyrena rivalis, v. d. Busch. Phil. Abb. 3, 110, pl. 3, f. 5. 1849.
Corbicula striatella, Desh. Proc. Zool. xxii. 344. 1854.
Hab. Java.
75. *C. rotunda*, Prime. Proc. Ac. N. S. Phil. 1860.
Hab. Surinam.
76. *C. Rouyana*, Prime.
Cyclas Rouyana, d'Orb. Prod. 2, 381. 1850.
Cyrena Rouyana, Bgt. Sph. p. 51. 1854.
Hab. France, (fossil.)
77. *C. semistriata*, Desh.
Venulites subaratus, Schloth. Petr. 200. 1820.
Cyrena semistriata, Desh. Encycl. 2, 52. 1830.
C. trigona, Desh. } Goldf. Petr. Germ. 2. 1834-40.
C. cuneiformis, Fer. }
C. subovata, Bronn. Leth. Geog. 2, 958, pl. 38, f. 2. 1835-8.
Cyclas semistriata, d'Orb. Prod. 3, 19. 1852.
Cyrena convexa, Heb. et Renev. Foss. Num. Sup. 59. 1854.
Hab. Europe, (fossil.)
78. *C. semisulcata*, Desh. Proc. Zool. xxii. 343. 1854.
Hab. Victoria River, Australia.
—*C. similis*, Adams. Rec. Gen. 2, 448. 1858, is *Corbicula Woodiana*, Adams.
79. *C. solidula*, Prime. In litt. 1860.
Hab. ?
80. *C. squalida*; Desh. Proc. Zool. xxii. 342. 1854.
Hab. ?
—*C. striatella*, Desh. Proc. Zool. xxii. 344. 1854. Is *Corbicula rivalis*, Adams.
81. *C. subradiata*, Prime.
Cyrena subradiata, Kurr.
Hab. India.
82. *C. sulcatina*, Desh. Proc. Zool. xxii. 348. 1854.
Hab. ?
83. *C. tellinella*, Prime.
Cyrena tellinella, Ferussac. Hist. Moll. f. 1.
Cyclas tellinella, d'Orb. Prod. 2, 304. 1850.
Hab. Europe, (fossil.)
84. *C. tellinoidea*, Prime.
Cyrena tellinoidea, Bouillet. Cat. Foss. 156. 1836.
Hab. France, (fossil.)
85. *C. tenuistriata*, Prime. Proc. Zool. xxviii. 1860.
Hab. ?
86. *C. triangula*, Prime.
Cyrena trigona, Desh. Coq. Foss. Par. 1, 118, pl. 19, f. 16, 17. 1824.
1860.]

- Cyclas trigona*, d'Orb. Prod. 2, 304. 1850.
Hab. France, (fossil.)
87. *C. triangularis*, Desh. Proc. Zool. xxii. 345. 1854.
Hab. ?
88. *C. trigona*, Desh. Proc. Zool. xxii. 344. 1854.
Hab. Pondicherry, India.
89. *C. trigonella*, Prime.
Cyrena trigonella, Lam. Lam. v. 552. 1818.
Hab. East Indies.
90. *C. truncata*, Prime.
Cyrena truncata, Lam. Lam. v. 553. 1818.
Hab. N. America, (fossil.)
91. *C. tumida*, Desh. Proc. Zool. xxii. 343. 1854.
Hab. Borneo.
92. *C. Vapincana*, Prime.
Cyclas Vapincana, d'Orb. Prod 2, 381. 1850.
Cyrena Vapincana, Bgt. Sph. fr. 51. 1854.
Hab. France, (fossil.)
93. *C. variegata*, Adams. Rec. Gen. 2, 448. 1858.
Cyrena variegata, d'Orb. Guer. Mag. v. 44. 1835.
Cyclas variegata, d'Orb. Voy. Amer. 567, pl. 82, f. 14-16. 1846.
Cyclas limosa, d'Orb. Loc. sup. cit. pl. 82, f. 14-16. 1846.
Hab. S. America.
94. *C. veneriformis*, Desh.
Cyrena veneriformis, Desh. Inv. Par. 499, pl. 38, f. 1, 2. 1857.
Hab. France, (fossil.)
95. *C. ventricosa*, Prime. In litt. 1860.
Hab. Mazatlan.
96. *C. violacea*, Prime. In litt. 1860.
Hab. ?
97. *C. Woodiana*, Adams. Rec. Gen. 2, 448. 1858.
Cyrena Woodiana, Lea. Trans. Amer. Phil. Soc. v. 110, pl. 18, f. 55.
1832.
Cyrena similis, Gray. Grif. Cuv. pl. 20, f. 2. 1834.
Corbicula grandis, Desh. Proc. Zool. xxii. 344. 1854.
Corbicula similis, Adams. Rec. Gen. 2, 448. 1858.
Hab. China.

CYRENA, Lamarck.

1. *C. abbreviata*, Desh. Invt. Par. 491, pl. 38, f. 13, 14. 1857.
Hab. France, (fossil.)
—*C. acutangularis*, Desh. Loc. sub. cit. 517, pl. 38, f. 17, 18. 1857.
Is *Corbicula acutangularis*, Desh.
2. *C. æqualis*, Glf. Petr. germ. 2, 224, pl. 146, f. 5, 1834-40.
Hab. Germany, (fossil.)
3. *C. æquilatera*, Desh. Proc. Zool. xxii. 20. 1854.
Hab. Guiana.
4. *C. affinis*, Desh. Loc. sub. cit. xxii. 16. 1854.
Hab. Australia.
—*C. Africana*, Kr. Moll. S. Afr. 8, pl. 1, f. 9. 1848. Is *Corbicula Africana*, Adams.

- C. Alpina*, Bgt. Sph. fr. 49. 1854. Is *Corbicula Alpina*, Prime.
 —*C. agreensis*, Kurr. In litt. Is *Corbicula agreensis*, Prime.
5. *C. alta*, Dkr. Wäld. 153. 1854.
 Hab. Germany, (fossil.)
 —*C. altilis*, Gld. Bost. Il. vi. 400, pl. xvi. f. 5. 1852. Is *Cyrena Mexicana*, Sowb.
6. *C. ambigua*, Br. Geol. Il. x. 275. 1854.
 Hab. Germany, (fossil.)
 —*C. amygdalina*, Desh. Inv. Par. 500, pl. 37, f. 22, 23. 1857. Is *Corbicula amygdalina*, Desh.
7. *C. Anglica*, Prime.
Cyrena obtusa, Forbes, (preoc.) Rec. Sci. 2, pl. 3, f. 4.
 Hab. England, (fossil.)
8. *C. angulata*, Rømer. Oolitt. i. 117, pl. 9, f. 12. 1835.
 Hab. Germany, (fossil.)
 —*C. angulata*, Desh. Proc. Zool. xxii. 22. 1854. Is *Cyrena tumida*, Prime.
 —*C. angusta*, Desh. Inv. Par. 508, pl. 37, f. 9–12. 1857. Is *Corbicula angusta*, Desh.
9. *C. angustidens*, Desh. Mellev. Terr. Tert. Par. 35, pl. 2, f. 1, 2. 1843.
Cyclas angustidens, d'Orb. Prod. 2, 304. 1850.
 Hab. France, (fossil.)
10. *C. anomala*, Desh. Proc. Zool. xxii. 21. 1854.
Cyrena Peruviana, Desh. In litt.
 Hab. Peru.
 —*C. antiqua*, Fer. Moll. Terr. Fluv. f. 5. Is *Corbicula antiqua*, Prime.
11. *C. apicina*, Dkr. Wäld. 149. 1834.
 Hab. Germany, (fossil.)
12. *C. arata*, Forbes. Geol. Il. vii. pl. 5, f. 6. 1851.
 Hab. England, (fossil.)
13. *C. aretata*, Desh. Proc. Zool. xxii. 20. 1854.
 Hab. Maracaibo.
14. *C. arenaria*, Forbes. Rec. Sci.
 Hab. England, (fossil.)
 —*C. Arnoudii*, Pot. & Mich. Gal. Moll. 2, 192, pl. 61, f. 15, 16. 1838–'44. Is *Corbicula Arnoudii*, Prime.
 —*C. arveniensis*, Desh. Trait. Conch. 2, 698. 1843–'50. Is *Corbicula Arveniensis*, Desh.
15. *C. astarte*, Dkr. Wäld. 153. 1831.
 Hab. Germany, (fossil.)
 —*C. Australis*, Desh. Encycl. 2, 50. 1830. Is *Corbicula Australis*, Desh.
16. *C. Bengalensis*, Lam. Lam. v. 554. 1818.
Venus Bengalensis, Lister, pl. 345, f. 182.
Cyclas Bengalensis, Fer.
 Hab. Asia.
17. *C. Boliviana*, Phil. Zeit. Malac. 70. 1851.
 Hab. Bolivia.
 —*C. Bouilleti*, Desh. Trait. Conch. 2, 698. 1843–50. Is *Corbicula Bouilleti*, Desh.
 —*C. breviscula*, Desh. Inv. Par. 503, pl. 36, f. 9–11. 1857. Is *Corbicula breviscula*, Desh.

1860.]

18. *C. Bronnii*, Dkr. Wäld. 160. 1834.
Hab. Germany, (fossil.)
—*C. Britannica*, Desh. Inv. Par. 501. 1857. Is *Corbicula Britannica*, Desh.
19. *C. brunea*, Pr. Proc. Zool. xxviii. 1860.
Hab. ?
20. *C. Buschii*, Phil. Abb. 3, 78, pl. 2, f. 2. 1849.
Hab. ?
21. *C. Caledonica*, Gas. Il. Conch. vi. 277. 1857.
Hab. N. Caledonia.
22. *C. Californiensis*, Prime.
Cyrena subquadrata, Desh. (preoc.) Proc. Zool. xxii. 21, 1854.
Hab. California.
23. *C. cardioides*, Desh. Inv. Par. 498, pl. 36, f. 1-3. 1857.
Hab. France, (fossil.)
24. *C. Caroliniensis*, Lam. Lam. v. 1818.
Cyclas Caroliniensis, Bosc. Fer. Cat. Méth. 84. 1807.
C. Caroliniana, Bosc. 3, 37, pl. xviii. f. 4.
Hab. N. America.
25. *C. caudata*, Roemer. Oolit. 1, 117, pl. 8, f. 13. 1835.
Cyrena excavata, Roemer. Loc. sub. cit. 1, 117, pl. 9, f. 6. 1835.
Hab. Germany, (fossil.)
—*C. Charpentierianus*, Bgt. (err.) Il. Conch. iv. 173. 1853. Is *Ancylus Charpentierianus*, Bgt.
26. *C. Charpentieri*, Desh. P. & M. Gal. Moll. 2, 191, pl. 61, f. 18, 19. 1838-44.
Hab. Europe, (fossil.)
—*C. Childrenæ*, Gray. Ann. Phy. n. ser. ix. 137. 1825. Is *Battisa Childrenæ*, Gray.
27. *C. compressa*, Desh. Lam. (ed. Desh.) vi. 279. 1835.
Cyrena depressa, Desh. (non Lam.) Dict. class. h. n. v. 290. 1824.
Cyclas subdepressa, d'Orb. Prod. 2, 381. 1850.
Hab. France, (fossil.)
28. *C. compta*, Desh. Proc. Zool. xxii. 18. 1854.
Hab. ?
—*C. compta*, Desh. Inv. Par. 491, pl. 35, f. 1-3, pl. 36, f. 19, 20. 1857. Is *Cyrena Galliana*, Prime.
29. *C. conjuncta*, Desh. Proc. Zool. xxii. 15. 1854.
Hab. ?
—*C. consobrina*, Cail. Voy. Mer. iv. 263, t. 2, pl. 61, f. 10, 11. 1826.
Is *Corbicula cor*, Adams.
—*C. convexa*, H. & Renev. Foss. num. sup. 59. 1854. Is *Corbicula semistriata*, Desh.
—*C. cor*, Lam. Lam. v. 552. 1818. Is *Corbicula cor*, Adams.
30. *C. corbiculæformis*, Prime. Ac. N. S. Phil. Proc. 1860.
Hab. Malabar.
31. *C. cordata*, Morris. Geol. Il. x. 158, pl. 2, f. 8, 9. 1854.
Hab. England, (fossil.)
32. *C. cordiformis*, Desh. Dict. class. h. n. 290. 1824.
Hab. France, (fossil.)
—*C. cordiformis*, Recluz, (preoc.) Il. Conch. 251, pl. 7, f. 9. 1853.
Is *Cyrena Recluzii*, Prime.

- C. crassa*, Desh. Coq. foss. Par. i. 119, pl. 18, f. 14, 15. 1824. Is *Corbicula crassa*, Desh.
- C. crassula*, Mouss. Malak. Blät. 57. 1855. Is *Corbicula crassula*, Prime.
33. *C. Credueri*, Dkr. Weald. 152. 1846.
Hab. Germany, (fossil.)
34. *C. crenulata*, Desh. Inv. Par. 518, pl. 34, f. 10-12. 1857.
Hab. France, (fossil.)
35. *C. Cubensis*, Prime.
Cyclas maritima, d'Orb. D'Orb. Cuba 2, 280, pl. xxi. f. 47-50. 1853.
Hab. Cuba.
36. *C. Cumingii*, Desh. Proc. Zool. xxii. 22. 1854.
Hab. Central America.
—*C. cuneata*, Jonas. Zeit. Malak. 186. 1844. Is *Corbicula cuneata*, Adams.
C. cuneiformis, Fer. Moll. terr. fluv. Is *Corbicula cuneiformis*, Prime.
37. *C. Cunninghamii*, Forbes. Geol. II. vii. 112, pl. v. f. 9. 1851.
Hab. England, (fossil.)
—*C. cycladiformis*, Desh. Coq. foss. Par. 1, 121, pl. 19, f. 7-9. 1824. Is *Corbicula cycladiformis*, Desh.
—*C. cyclostoma*, Bgt. (err.) Il. Conch. iv. 193. 1853. Is *Ancylus cyclostoma*, Bgt.
—*C. Cyprinoides*, Gray. Ann. Ph. n. ser. ix. 136. 1825. Is *Velocita Cyprinoides*, Gray.
38. *C. Cyprinoides*, Quoy. Voy. Astrol. 3, 513, pl. 82, f. 1-3. 1834.
Hab. N. Guinea.
—*C. debilis*, Gld. Bost. Proc. 3, 293. 1850. Is *Corbicula debilis*, Prime.
39. *C. decipiens*, Desh. Proc. Zool. xxii. 17. 1854.
Hab. ?
40. *C. densata*, Conrad. Ac. N. S. Phil. Proc. i. 324. 1845.
Cyclas densata, d'Orb. Prod. 3, 109. 1852.
Hab. North America, (fossil.)
—*C. deperdita*, Desh. Coq. foss. Par. 1, 118, pl. 19, f. 14, 15. 1824. Is *Corbicula deperdita*, Desh.
—*C. deperdita*, Morris, Cat. Brit. foss. 86. 1843. Is *Corbicula Britannica*, Desh.
—*C. depressa*, Lam. Lam. v. 553. 1818. Encycl. pl. 302, f. 3. Is *Asparta borealis*, Gray.
—*C. depressa*, Desh. Dict. class. h. n. v. 290. 1824. Is *Cyrena compressa*, Desh.
—*C. Deshayesii*, Hebert. Bull. Soc. Géol. Fr. 2d ser. v. 401, f. a'. b'. 1848. Is *Corbicula Deshayesii*, Prime.
—*C. Deshayesianus*, Bgt. (err.) Il. Conch. iv. 183. 1853. Is *Ancylus Deshayesianus*, Bgt.
41. *C. difficilis*, Desh. Inv. basin. Par. 513, pl. 37, f. 3-5. 1857.
Hab. France, (fossil.)
42. *C. dispar*, Koch & Dkr. Oolit. 60, pl. vii. f. 6, a. b. 1837.
Hab. Germany, (fossil.)
43. *C. distincta*, Desh. Inv. Par. 492, pl. 35, f. 7-9. 1857.
Hab. France, (fossil.)
- 1860.]

44. *C. divaricata*, Desh. Proc. Zool. xxii. 17, 1854.
 Hab. N. Guinea.
 —*C. douacialis*, Desh. Dict. class h. n. v. 290. 1824. Is *Corbicula cuneiformis*, Prime.
 —*C. douaciformis*, Anton. Verz. 1839. Is *Corbicula cuneiformis*, Prime.
45. *C. douacina*, Dkr. Wäld. 162. 1854.
 Hab. Germany, (fossil.)
46. *C. dorsata*, Dkr. Wäld. 155. 1834.
 Hab. Germany, (fossil.)
- 46a *C. Dulchurchiensis*?
 Hab. England, (fossil.)
47. *C. Dumasii*, de Serres. Bull. Sci. 328. 1827.
 Hab. France, (fossil.)
48. *C. Duteplii*, Desh. Inv. Par. 493, pl. 34, f. 43, 44. 1857.
 Hab. France, (fossil.)
49. *C. dura*, Desh. Proc. Zool. xxii. 20. 1854.
 Hab. ?
50. *C. elegans*, Dkr. Wäld. 166. 1834.
 Hab. Germany, (fossil.)
51. *C. elliptica*, Dkr. Wäld. 148. 1834.
 Hab. Germany, (fossil.)
 —*C. elongata*, Rœm. Oolit. i. 117, t. ix. f. 11. 1826. Is *Cyrena Mantelli*, Dkr.
52. *C. elongata*, Dkr. Weald. 155. 1846.
Cyclas elongata, Sowb. Trans. Geol. Soc. 2d ser. iv. 346, pl. 21, f. 9. 1836.
 Hab. Europe, (fossil.)
53. *C. erebea*, Pr.
Mactra erebea, Brongt. Mem. Vicent. 81, pl. v. f. 8. 1823.
Cyclas erebea, d'Orb. Prod. 2, 323. 1850.
 Hab. Europe, (fossil.)
54. *C. Essingtonensis*, Desh. Proc. Zool. xxii. 19.
 Hab. Port Essington.
 —*C. Euphratica*, Bronn. Syst. Urwelt. pl. 4, f. 10. Is *Corbicula fluminalis*, Adams.
 —*C. excavata*, Rœm. i. 117, pl. ix. f. 6. 1835. Is *Cyrena caudata*, Rœmer.
55. *C. eximia*, Dkr. Zeit. Malak. 51. 1852. Pf. Nov. Conch. 8 livr. 88. pl. xxiv. 1857.
Cyrena impressa, Desh. Proc. Zool. xxii. 18. 1854.
Batissa impressa, Adams. Rec. gen. 2, 448. 1858.
 Hab. Java.
56. *C. expansa*, Mouss. Moll. Java, 89, pl. 14. 1849.
 Hab. Java.
57. *C. fabacea*, Rœm. Oolit. 2, 40, pl. 19, f. 16.
 Hab. Germany, (fossil.)
58. *C. fabulina*, Desh. Inv. Par. 506, pl. 37, f. 13-15. 1857.
 Hab. France, (fossil.)
59. *C. fallax*, Desh. Proc. Zool. xxii. 15. 1854.
 Hab. Australia.

60. *C. fasciata*, Rœm. Oolit. 1, 116, pl. ix. f. 10. 1835.
Cyclas fasciata, Gldf. Petr. Germ. 2, 232, pl. 147, f. 10. 1834-40.
 Hab. Germany, (fossil.)
61. *C. Faujasii*, Desh. Encycl. 2, 51. 1830.
Venus de mayeuce, Faujas. Ann. Mus. 8, 379, pl. 58, f. 9, 10. 1806.
Cyrena lævigata, Gldf. Petr. Germ. 2, 224, pl. 149, f. 1. 1834-40.
Cyrena polita, Gldf. Loc. sub. cit. 2, 224, pl. 149, f. 2. 1834-40.
Cyclas Faujasii, d'Orb. Prod. 3, 109. 1852.
 Hab. Europe, (fossil.)
 —C. Ferrussaci, Math. Math. Cat. Méth 149, pl. xiv. f. 14, 15. 1852.
 Is *Corbicula Ferrussaci*, Prime.
62. *C. flavata*, Prime. Proc. Zool. xxviii. 1860.
 Hab. ?
63. *C. Floridana*, Conrad. Ac. N. S. Phil. Proc. 3, 23, pl. i. f. 1. 1846.
 Hab. Florida.
 —C. *fluminalis*, Bgt. Cat. Sauley 79. 1853. Is *Corbicula fluminalis*, Adams.
 —C. *fluminea*, Lam. Lam. v. 553. 1818. Is *Corbicula fluminea*, Adams.
 —C. *fluviatilis*, Phil. Abb. 3, 77, pl. i. f. 5. 1846. Is *Corbicula Manillensis*, Prime.
64. *C. Fontaineii*, Phil. Zeit. Malak. 8, 70. 1851.
Cyclas Fontaineii, d'Orb. Voy. Amer. 569, pl. 83, f. 14, 15. 1844.
 Hab. S. America.
 —C. *Forbesii*, Desh. Inv. Par. 510, pl. 37, f. 24-27. 1857. Is *Corbicula Forbesii*, Deshayes.
65. *C. fortis*, Prime. Proc. Zool. xxviii. 1860.
 Hab. Equador.
66. *C. fossulata*, Cornuel. Mem. Soc. Geol. Fr. iv. 286, pl. 15, f. 1, a-d, 1840.
Cyclas fossulata, d'Orb. Prod. 2, 60. 1850.
 Hab. France, (fossil.)
67. *C. fragilis*, Desh. Proc. Zool. xxviii. 1860.
 Hab. ?
 —C. *fuscatâ*, Lam. Lam. v. 552. 1818. Is *Corbicula fluminalis*, Adams.
68. *C. Galathea*, Rhdt. Morch's Kierulf 32, pl. 2. 1850.
Cyrena Zeylanica var. *major*, Mous. Java 89, pl. 13. 1849.
 Hab. Nicobar Islands.
69. *C. Gallicana*, Pr.
Cyrena compta, Desh. (preoc.) Invt. Par. 491, pl. 35, f. 1-3, pl. 36, f. 19, 20. 1857.
 Hab. France, (fossil.)
 —C. *Gaudichaudi*, Val. (err.) Mag. Zool. pl. 119, f. 2. 1838. Is *Volorita Cyprinoides*, Gray.
 —C. *Gauritziana*, Kr. In litt. 1848. Is *Corbicula Africana*, Adams.
70. *C. Gemmellari*, Phil. Sicil. 1, 39, pl. iv. f. 3. 1836.
 Hab. Europe, (fossil.)
71. *C. Geslini*, Desh. Encycl. 2, 52. 1830.
Cyclas Geslini, d'Orb. Prod. 3, 109. 1852.
 Hab. Europe, (fossil.)
72. *C. gibbosa*, DuKr. Wäld. 157. 1834.
 Hab. Germany, (fossil.)
- 1860.]

73. *C. globosa*, Math. Cat. Méth. 148, pl. xiv. f. 12, 13. 1842.
Cyclas globosa, d'Orb. Prod. 3, 19. 1852.
 Hab. France, (fossil.)
 —*C. globulus*, Jonas. MSS. Is Corbicula cuneata, Adams.
 —*C. Gravesii*, Desh. Coq. foss. Par. 2, 810. 1824. Is Corbicula
Gravesii, Desh.
 —*C. Gravi*, Desh. Coq. foss. Par. 1, 120, pl. 19, f. 3, 4. Is Corbicula
Gravesii, Desh.
74. *C. Hebertii*, Desh. Invt. Par. 516, pl. 36, f. 4-6. 1857.
 Hab. France, (fossil.)
75. *C. heterodonta*, Desh. Invt. Par. 518, pl. 34, f. 13-15. 1857.
 Hab. France, (fossil.)
76. *C. Heysii*, Dkr. Wäld. 147. 1834.
 Hab. Germany, (fossil.)
 —*C. impressa*, Desh. Proc. Zool. xxii. 18. 1854. Is *Cyrena excinia*,
 Dkr.
77. *C. incerta*, Desh. Proc. Zool. xxii. 19. 1854.
 Hab. ?
- 77a *C. incompta*, Desh. Invt. Par. 1857.
 Hab. France, (fossil.)
78. *C. inflata*, Phil. Zeit. Malak. 71. 1851.
 Hab. S. America.
 —*C. inflata*, Desh. (preoc.) Proc. Zool. xxii. 23. 1854. Is *Cyrena Panama-*
ensis, Pr.
79. *C. inquinata*, Desh. Proc. Zool. xxii. 15. 1854.
 Hab. China.
80. *C. insignis*, Desh. Proc. Zool. xxii. 20. 1854.
 Hab. California.
81. *C. intermedia*, Desh. Mellev. Terr. Tert. Par. 35, pl. 2, f. 5, 6. 1843.
Cyclas intermedia, d'Orb. Prod. 2, 304. 1850.
 Hab. France, (fossil.)
 —*C. intermedia*, Meek & Hayden. Ac. N. S. Phil. Proc. 8, 116. 1856.
 Is *Cyrena Nebrascensis*, M. & H.
82. *C. isocardia*, Dkr. Wäld. 151. 1854.
 Hab. Germany, (fossil.)
83. *C. isocardioides*, Desh. Proc. Zool. xxii. 22. 1854.
 Hab. S. America.
84. *C. Jamesonii*, Forbes. Geol. II. vii. 111, pl. v. f. 7, 8. 1851.
 Hab. England, (fossil.)
 —*C. Jayensis*, Lea. Trans. Amer. Phil. Soc. v. 108, pl. 17, f. 52. 1832.
 Is *Batissa Jayensis*, Adams.
85. *C. Jukesii*, Desh. Proc. Zool. xxii. 19. 1854.
 Hab. Australia.
 —*C. Keraudrenii*, Lesson. Voy. Coq. 2, 429, pl. xi. f. 3. 1829. Is *Ba-*
tissa Keraudrenii.
86. *C. Kochii*, Dkr. Wäld. 159. 1834.
 Hab. Germany, (fossil.)
 —*C. lævigata*, Gldf. Petr. Germ. 2, 224, pl. 149, f. 1, a, b. 1834-40. Is
Cyrena Faujasii, Desh.
87. *C. lævis*, Pr.
 Hab. Borneo.

88. *C. Lamberti*, Desh. Invt. Par. 495, pl. 38, f. 9, 10. 1857.
 Hab. France, (fossil.)
 —*C. Largillierti*, Phil. Zeit. Malak. 163. 1844. Is *Corbicula Largillierti*, Pr.
89. *C. lato-ovata*, Rømer. Oolit. i. 116, pl. 9, f. 4. 1835.
Venulites similimus, Schl. Petr. 200. 1820.
Venulites douacilialis, Schl. In Collect.
 Hab. Germany, (fossil.)
90. *C. lauta*, Desh. Proc. Zool. xxii. 15, 1854.
 Hab. ?
91. *C. lentiformis*, Rømer. Oolit. 2, 41, pl. 19, f. 9.
 Hab. Germany, (fossil.)
 —*C. limosa*, Gray. Ann. Phy. n. ser. ix. 137. 1835. Is *Corbicula limosa*, Pr.
92. *C. lunulata*, Desh. Invt. Par. 495, pl. 34, f. 16-19. 1857.
 Hab. France, (fossil.)
93. *C. MacCullochii*, Forbes. Geol. II. vii. 112, pl. v. f. 10, a, b. 1851.
 Hab. England, (fossil.)
94. *C. mactræformis*, Pr.
Cyrena macroides, Desh. (preoc.) Proc. Zool. xxii. 17. 1854.
 Hab. ?
95. *C. macroides*, Rømer. Oolit. i. 116, pl. ix. f. 2. 1835.
 Hab. Germany, (fossil.)
 —*C. macroides*, Desh. Proc. Zool. xxii. 17. 1854. Is *Cyrena mactræformis*, Pr.
96. *C. major*, Morris. Cat. Brit. Foss. 200. 1854.
Cyclas major, Sowb. Trans. Geol. 2d ser. iv. 176, 346, pl. xxi. f. 13. 1836.
 Hab. England, (fossil.)
97. *C. majuscula*, Rømer. Oolit. i. 117, pl. ix. f. 1-3. 1835.
Cyclas majuscula, Glf. Petr. Germ. 2, 232, pl. 147, f. 6, a-c. 1834-40.
 Hab. Europe, (fossil.)
 —*C. Manillensis*, Phil. Zeit. Malak. 163. 1844. Is *Corbicula Manillensis*, Pr.
98. *C. Mantelli*, Dkr. Weald, 42, pl. 13, f. 2. 1846.
Cyrena elongata, Rømer. Oolit. i. 117, pl. ix. f. 11. 1835.
Cyclas angulata, Sowb. Trans. Geol. 2d ser. iv. 176, 346, pl. xxi. f. 12. 1836.
Cyclas carinata, Glf. Petr. Germ. 2, 232, pl. 147, f. 9, a-c. 1834-40.
Cyrena angulata, Morris. Brit. Foss. 199. 1854.
 Hab. Europe, (fossil.)
99. *C. maritima*, C. B. Adams. Ann. N. Y. Lyc. v. 499. 1852.
 Hab. Panama.
 —*C. media*, Fitton. Ann. Phy. n. ser. viii. 376. 1824. Is *Corbicula media*, Pr.
100. *C. membranacea*, Fitton. Ann. Phy. n. ser. 8, 176. 1824.
Cyclas membranacea, Sowb. Min. Conch. vi. 52, pl. 527, f. 3. 1829.
Cyrena membranacea, Sowb. Morris. Brit. Foss. 200. 1854.
 Hab. England, (fossil.)
101. *C. Menkeii*, Dkr. D. et M. Paleont. 1, 40, pl. vi. f. 23-25. 1846.
Venus Menkeii, Dkr. In litt.
 Hab. Germany, (fossil.)

102. *C. Mexicana*, Sowb. Zool. II. (Sowb. et Brod.) 364. 1829.
Cyrena altilis, Gld. Bost. II. vi. 400, pl. xvi. f. 5. 1852.
 Hab. N. America.
103. *C. minuta*, Desh. Invt. Par. 507, pl. 35, f. 10-12. 1857.
 Hab. France, (fossil.)
 —*C. mixta*, Desh. Invt. Par. 1857. Is *Corbicula mixta*, Desh.
 —*C. Moquinianus*, Bgt. (err.) II. Conch. iv. 1853. Is *Ancylus Moquinianus*, Bgt.
104. *C. Moreauensis*, Meek & Hayden. Ac. N. S. Phil. Proc. viii. 115. 1856.
 Hab. N. America, (fossil.)
105. *C. multidentata*, Auton. Conch. 13. 1839.
 Hab. Europe, (fossil.)
 —*C. Murchisonii*, Dkr. Weald. 30, pl. x. f. 2-5. 1846. Is *Cyrena rotunda*, Dkr.
106. *C. Nebrascensis*, M. & H.
Cyrena intermedia, Meek & Hayden, (preoc.) Ac. N. S. Phil. Proc. viii. 116. 1856.
 Hab. N. America, (fossil.)
 —*C. nitens*, Phil. Zeit. Malak. 163. 1844. Is *Corbicula nitens*, Adams.
107. *C. nitida*, Desh. Proc. Zool. xxii. 23. 1854.
 Hab. ?
108. *C. nitidula*, Desh. Proc. Zool. xxii. 23. 1854.
 Hab. ?
109. *C. nobilis*, Desh. Invt. Par. 490, pl. 36, f. 14, 15. 1857.
 Hab. France, (fossil.)
110. *C. notabilis*, Desh. Proc. Zool. xxii. 21. 1854.
 Hab. Peru.
111. *C. nuculaeformis*, Rømer. Oolit. 1, 118, pl. ix. f. 13. 1835.
 Hab. Germany, (fossil.)
 —*C. obesa*, Hinds. Ann. Mag. n. h. n. ser. x. 81. 1842. Is *Batissa obesa*, Adams.
112. *C. obliqua*, Desh. Dict. Class. h. n. v. 290. 1824.
 Hab. France, (fossil.)
113. *C. oblonga*, Quoy. Voy. Astrol. 3, 517, pl. 82, f. 6-8. 1834.
 Hab. Vanikoro.
 —*C. obovata*, Desh. Encycl. 2, 52. 1830. Is *Corbicula obovata*, Desh.
114. *C. obscura*, Pr. Proc. Zool. xxviii. 1860.
 Hab. S. America.
115. *C. obtusa*, Rømer. Oolit. 1, 115, pl. ix. f. 76. 1835.
 Hab. Germany, (fossil.)
 —*C. obtusa*, Forbes. Rec. Scie. 2, pl. 3, f. 4. Is *Cyrena Anglicana*, Pr.
116. *C. occidentalis*, Meek & Hayden. Ac. N. S. Phil. Proc. viii. 118. 1856.
 Hab. N. America, (fossil.)
117. *C. olivacea*, Carp. In litt.
 Hab. N. America.

118. *C. orbicularis*, Roemer. Oolit. 1, 115, pl. ix. f. 8. 1835.
Cyclas orbicularis, Glf. Petr. Germ. 2, 231, pl. 147. f. 5. 1834-40.
 Hab. Germany, (fossil.)
 —*C. orbicularis*, Desh. Mellev. Terr. Tert. 35, pl. 2, f. 3, 4. 1843.
 is *Corbicula orbicularis*, Prime.
 —*C. orientalis*, Lam. Lam. v. 552. 1818. Is *Corbicula orientalis*, Adams.
 —*C. ovalina*, Desh. Invt. Par. 505. pl. 36, f. 16-18. 1867. Is *Corbicula parva*, Prime.
119. *C. ovalis*, Dkr. Wäld. 158. 1834.
 Hab. Germany, (fossil.)
120. *C. oviformis*, Desh. Proc. Zool. xxii. 16. 1854.
 Hab. Philippines.
121. *C. pallida*, Desh. Proc. Zool. xxii. 17. 1854.
 Hab. ?
122. *C. Panamensis*, Pr.
Cyrena inflata, Desh. (preoc.) Proc. Zool. xxii. 23. 1854.
 Hab. Panama.
 —*C. Panormitana*, Bivon. Is *Corbicula Panormitana*, Adams.
123. *C. Papua*, Lesson. Mag. Zool. pl. xi. 1832.
 Hab. Waigou.
 —*C. Paranacensis*, d'Orb. Mag. Zool. 44. 1835. Is *Corbicula Paranacensis*, Adams.
124. *C. parva*, Morris. Brit. Foss. 200. 1854.
Cyclas parva, Sowb. Geol. Trans. 2d ser. iv. 345, pl. 21, f. 7. 1836.
 Hab. England, (fossil.)
125. *C. Panormitana*, Roemer. Oolit. 1, 115, pl. ix. f. 9. 1835.
 Hab. Germany, (fossil.)
126. *C. parvula*, Desh. Invt. Par. 509, pl. 37, f. 6-8. 1857.
 Hab. France, (fossil.)
 —*C. Peruviana*, Desh. Is *Cyrena anomala*, Desh.
 —*C. Petitianus*, Bgt. Il. Conch. iv. 1853. Is *Ancylus Petitianus*, Bgt.
127. *C. Philippinarum*, Hanley. Proc. Zool. xii. 159. 1844. Wood's Suppl. Cat. pl. xiv. f. 60.
 Hab. Philippines.
 —*C. pisum*, Desh. Coq. Foss. Par. 1, 117, pl. 19, f. 10-13. 1824. Is *Corbicula pisum*, Desh.
128. *C. placens*, Hanley. Proc. Zool. xii. 160. 1844. Wood's Suppl. Cat. pl. xiv. f. 52.
 Hab. N. America.
129. *C. placida*, Desh. Proc. Zool. xxii. 19. 1854.
 Hab. ?
130. *C. planulata*, Desh. Invt. Par. 501, pl. 35, f. 16-18. 1857.
 Hab. France, (fossil.)
 —*C. polita*, Glf. Petr. Germ. 2, 224, pl. 149, f. 2. 1834-40. Is *Cyrena Faujasii*, Desh.
131. *C. ponderosa*, Pr. Ac. N. S. Phil. Proc. 1860.
 Hab. Philippines.
132. *C. prona*, Dkr. Wäld. 166. 1834.
 Hab. Germany, (fossil.)
- 1860.]

133. *C. Proserpina*, Pr.
Venus Proserpina, Brongt. Mem. Vicent. 81, pl. v. f. 7. 1823.
Cyclus Proserpina, d'Orb. Prod. 2, 323. 1850.
 Hab. Europe, (fossil.)
134. *C. psmacola*, Desh. Invt. Par. 505, pl. 35, f. 4-6. 1857.
 Hab. France, (fossil.)
 —*C. pulchella*, Mous. Moll. Java, 88, pl. xv. f. 4. 1849. Is *Corbicula pulchella*, Adams.
135. *C. pulchra*, Morris. Brit. Foss. 86. 1843.
Cyclus pulcher, Sowb. Min. Conch. vi. 51, pl. 527. f. 1. 1829.
 Hab. England, (fossil.)
 —*C. pulchra*, Wright. Ann. n. h. Is *Cyrena Wrightii*, Forbes.
 —*C. pullata*, Phil. Abb. 2, 110. 1849. Is *Corbicula pullata*, Adams.
 —*C. purpurea*, Lea. Amer. Il. xlii. 106, pl. 1, f. 1. 1842. Is *Venus gemma*, Totten.
 —*C. pusilla*, Parr. Phil. Abb. 2, 78, pl. 1. f. 7. 1846. Is *Corbicula pusilla*, Adams.
136. *C. radiata*, Hanley. Proc. Zool. xii. 159. 1844.
Cyrena solida, Phil. Abb. 5, 78, pl. 1, f. 9. 1846.
 Hab. Central America.
 —*C. radiata*, Parr. Phil. Abb. 2, 78, pl. 1, f. 8. 1846. Is *Corbicula radiata*, Adams.
 —*C. Raymondi*, Bgt. (err.) Il. Conch. iv. 1853. Is *Ancylus Raymondi*, Bgt.
137. *C. Recluzi*, Prime.
Cyrena cordiformis, Recluz. Il. Conch. iv. 251, pl. vii. f. 9. 1853.
 Hab. ?
 —*C. recurvata*, Val. Mag. Zool. pl. 117, f. 2. 1838. Is *Velorita Cyprinoides*, Gray.
138. *C. regulata*, Gassies. Il. Conch. vii. 372. 1858.
 Hab. N. California.
139. *C. Rigaultii*, Desh. Invt. Par. 494, pl. 36, f. 12, 13. 1857.
 Hab. France, (fossil.)
 —*C. rivalis*, v. d. Busch. Phil. Abb. 3, 110, pl. 3, f. 5. 1849. Is *Corbicula rivalis*, Adams.
140. *C. roborata*, Desh. Invt. Par. 499, pl. 38, f. 15, 16. 1857.
 Hab. France, (fossil.)
 —*C. Roemerii*, Dkr. Wäld. 41. 1834. Is *Cyrena trigona*, Roemer.
141. *C. rotunda*, Dkr. Wäld. 145. 1834.
Cyrena Murchisoni, Dkr. Weald. 30, pl. x. f. 25. 1846.
 Hab. Germany, (fossil.)
 —*C. rotundata*, Lea. Trans. Amer. Phil. Soc. v. pl. 17, f. 51, 107. 1832. Is *Batissa rotundata*, Adams.
 —*C. Rouyana*, Bgt. Sph. Fr. 51. 1854. Is *Corbicula Rouyana*, Prime.
142. *C. Saincenyensis*, Desh. Invt. Par. 496. pl. 38, f. 7, 8. 1857.
 Hab. France, (fossil.)
143. *C. salmacida*, Morelet. Test. Cub. pt. 2d, 26. 1851.
 Hab. Central America.
 —*C. semistriata*, Desh. Encycl. 2, 52. 1830. Is *Corbicula semistriata*, Desh.
 —*C. similis*, Gray. Griff. Cuv. pl. 20, f. 2. 1834. Is *Corbicula Woodiana*, Adams.

144. *C. similis*, Desh. Proc. Zool. xxii. 16. 1854.
Hab. Manilla.
145. *C. singularis*, Desh. Invt. Par. 508, pl. 35, f. 13—15. 1857.
Hab. France, (fossil.)
146. *C. sinuosa*, Desh. Proc. Zool. xxii. 18. 1854.
Cyrena Zeilanica, Mouss. Java, 89, pl. xii. 1849.
Hab. Java.
147. *C. Sirena*, Pr.
Mactra Sirena, Brongt. Mem. Vicent. 81, pl. v. f. 10. 1823.
Cyrena Brongniartii, Bast. Mem. S. N. Par. 2, 84. 1825.
C. Sowerbyi, Bast. Loc. sub. cit. 2, 84, pl. vi. f. 6. 1825.
Cyclas Sirena, d'Orb. Prod. 2, 320. 1850.
C. Brongniartii, d'Orb. Loc. sub. cit. 3, 109. 1852.
Hab. France, (fossil.)
—*C. spissa*, Desh. Coq. Foss. Par. 1, p. 9, pl. 18, f. 14, 15. 1824. Is
Corbicula crassa, Desh.
148. *C. solida*, Dkr. Wäld. 145. 1834.
Hab. Germany, (fossil.)
—*C. solida*, Phil. Abb. 2, 78, pl. 1, f. 9. 1846. Is *Cyrena radiata*
Hanley.
149. *C. sordida*, Hanley. Proc. Zool. xii. 1844. Wood's Suppl. pl. xiv.
f. 51.
Hab. N. America.
150. *C. striata*, Galleoti. Index Paleont. 1, 391. 1848—9.
Hab. Europe, (fossil.)
151. *C. striatula*, Munster. Glf. Petr. Germ. 2, 225, pl. 149, f. 3. 1834
—40.
Hab. Germany, (fossil.)
152. *C. subangulata*, Les. Grat. Moll. Fr. 52. 1855.
Hab. France, (fossil.)
—*C. subarata*, Br. Leth. Geog. 2, 958, pl. 38, f. 2. 1835—8. Is *Corbi-*
cula semistriata, Desh.
153. *C. subcordata*, Dkr. Wäld. 154. 1834.
Hab. Germany, (fossil.)
154. *C. sublævis*, Rømer. Oolit. 1, 116, pl. xi. f. 5. 1835.
Cyclas sublævis, Glf. Petr. 2, 232, pl. 147, f. 7. 1834—40.
Hab. Germany, (fossil.)
155. *C. sublobata*, Desh. Proc. Zool. xxii. 18. 1854.
Hab. ?
156. *C. suborbicularis*, v. d. Busch. Phil. Abb. 3, 77, pl. 2, f. 1. 1849.
Hab. Manilla.
—*C. suborbicularis*, Desh. Invt. Par. 497, pl. 38, f. 11, 12. 1857.
Is *Corbicula orbicularis*, Pr.
157. *C. subquadrata*, Morris. Brit. Foss. 200. 1854.
Cyclas subquadrata, Sowb. Geol. Trans. 2d ser. iv. 177, 345, pl. xxi. f. 8.
1836.
Hab. England, (fossil.)
—*C. subquadrata*, Desh. Proc. Zool. xxii. 21. 1854. Is *Cyrena*
Californiensis, Pr.
—*C. subradiata*, Kurr. Is *Corbicula subradiata*, Pr.
158. *C. sulcata*, Hoenighaus. Irb. 456. 1850.
Hab. Europe, (fossil.)

159. *C. Sumatraensis*, Sowb. Gen. of Shells, 1. Phil. Abb. 3, 109, pl. 3, f. 4. 1849.
 Hab. Sumatra.
 —*C. tellinella*, Fer. Hist. Moll. f. 1. Is *Corbicula tellinella*, Pr.
 —*C. tellinoidea*, Bouillet. Cat. Cuv. 156. 1836. Is *Corbicula tellinoidea*, Pr.
160. *C. tellinoides*, DeFr. Cuv. Foss. 2, 263. 1821—3.
 Hab. Europe, (fossil.)
 —*C. tenebrosa*, Hinds. Ann. n. h. n. ser. x. 21. 1842. Is *Batissa tenebrosa*, Adams.
161. *C. tenuis*, Dkr. Wäld. 158. 1834.
 Hab. Germany, (fossil.)
162. *C. tetragona*, Desh. Invt. Par. 502, pl. 34, f. 20—22. 1857.
 Hab. France, (fossil.)
163. *C. transversa*, Forbes. Rec. Scie. 2, pl. 3, f. 6.
 Hab. England, (fossil.)
164. *C. triangulara*, v. d. Busch. Phil. Abb. 3, 78, pl. 2. f. 3. 1849.
Cyrena triangularis, Metcalf. Proc. Zool. 19, 74. 1851.
 Hab. Borneo.
 —*C. triangularis*, Metcalf. Proc. Zool. xix. 74. 1851. Is *Cyrena triangulara*, v. d. Busch.
 —*C. trigona*, Desh. Coq. Foss. Par. 1, 118. pl. 19, f. 16, 17. 1824. Is *Corbicula triangulara*, Pr.
165. *C. trigona*, Roemer. Oolit. 1, 116, pl. ix. f. 7. 1835.
Cyclas trigona, Glf. Petr. 2, 233, pl. 147, f. 11. 1836—40.
Cyrena Roemeri, Dkr. Wäld. 41. 1834.
 Hab. Germany, (fossil.)
 —*C. trigonella*, Lam. Lam. v. 552. 1818. Is *Corbicula trigonella*, Pr.
 —*C. trigonula*, Wood. Ann. Mag. n. h. vii. 275, f. 45. 1841. Is *Corbicula Duchastelli*, Syst.
 —*C. truncata*, Lam. Lam. v. 553. 1818. Is *Corbicula truncata*, Pr.
166. *C. tumida*, Pr.
Cyrena angulata, Desh. Proc. Zool. xxii. 22. 1854.
 Hab. ?
167. *C. turgida*, Lea. Amer. Phil. Soc. v. 109, pl. 18, f. 53. 1832.
 Hab. ?
168. *C. umbonata*, Auton. Conch. 13. 1839.
 Hab. Europe, (fossil.)
169. *C. unionides*, Dkr. Wäld. 150. 1834.
 Hab. Germany, (fossil.)
170. *C. unioniformis*, Desh. Invt. Par. 503, pl. 38, f. 5, 6. 1857.
 Hab. France, (fossil.)
171. *C. Vanikorensis*, Quoy. Voy. Astrol. 3, 515, pl. 82, f. 4, 5. 1834.
 Hab. Vanikoro.
 —*C. Vapincana*, Bgt. Sph. Fr. 51. 1854. Is *Corbicula Vapincana*, Prime.
 —*C. variegata*, d'Orb. Mag. Zool. 44. 1835. Is *Corbicula variegata*, Adams.
 —*C. veneriformis*, Desh. Invt. Par. 499, pl. 38, f. 1, 1. 1857. Is *Corbicula veneriformis*, Desh.

172. *C. ventricosa*, Desh. Proc. Zool. xxii. 16. 1854.
Hab. Philippines.
173. *C. venulina*, Dkr. Wäld. 155. 1834.
Hab. Germany, (fossil.)
—*C. violacea*, Lam. Lam. v. 553. 1818. Is *Batissa violacea*, Adams.
—*C. Woodiana*, Lea. Trans. Amer. Phil. Soc. v. 110, pl. 18, f. 55. 1832. Is *Corbicula Woodiana*, Adams.
174. *C. Wrightii*, Forbes. Rec. Sci. 2, pl. iv. f. 4.
Cyrena pulchra, Wright. Ann. n. h.
Hab. England, (fossil.)
175. *C. Zeylanica*, Lam. Lam. v. 1818. Delessert, pl. vii. 1841.
Venus Ceylonica, Chemn. vi. 333, pl. 32, f. 336. 1769.
V. coaxans, Gml. 3278, f. 336. 1788.
Cyclas Zeylanica, Lam. Ann. Mus. vii. 420. 1806.
Hab. Ceylon.
176. *C. Zimmermannii*, Dkr. Wäld. 151. 1834.
Hab. Germany, (fossil.)

SPHÆRIUM, Scopoli.

1. *Sph. acuminatum*, Pr. Ads. rec. gen. ii. 450. 1858.
Cycl. acuminata, Pr. Bost. Proc. iv. 155. 1851. Loc. sup. cit. iv. 283. 1852. Jay, Cat. iv. ed. 466. 1852. Bgt. Amen. 1, p. 7. 1853.
Cycl. albula, Pr. Bost. Proc. iv. 155. 1851. Jay, Cat. iv. ed. 466. 1852. Bgt. Amen. 1, p. 7. 1853.
Cycl. inornata, Pr. Bost. Proc. iv. 159. 1851. Loc. sup. cit. iv. 284. 1852. Bgt. Amen. 1, p. 8. 1853.
Cycl. simplex, Pr. Bost. Proc. iv. 159. 1851. Loc. sup. cit. iv. 284. 1852.
Sph. albulum, Pr. Ads. rec. gen. ii. 450. 1858.
Sph. inornatum, Pr. Loc. sup. cit. ii. 450. 1858.
Sph. simplex, Pr. Loc. sup. cit. ii. 450. 1858.
Hab. N. Amer.
—*Cycl. acuta*, Pf. Moll. Germ. 230. 1821. Is *Pisid. Henslowianum*, Jen.
—*Cycl. (Physemoda) æqualis*, Rafin. Bory St. Vt. An. gen. sci. phy. v. 319. 1820. Is *Pisid. Virginicum*, Bgt.
—*Cycl. æquata*, Sheph. Mss. 1840. Is *Sph. rivicola*, Lam.
—*Cycl. alata*, Leach. Moll. Gt. Brit. 291. 1852. Is *Sph. corneum*, Scop.
—*Sph. albulum*, Pr. Ads. rec. gen. ii. 450. 1858. Is *Sph. acuminatum*, Pr.
—*Cycl. alpina*, d'Orb. Prod. 2, 381. 1850. Is *Cyrena alpina*, Bgt.
—*Cycl. altilis*, Anth. C. B. Adams, Cat. 29. 1847. Is *Pisid. compressum*, Pr.
2. *Sph. altum*, Dumt. & Mort.
Cyclas alta, D. & M. Moll. Sav. 1852.
Hab. Italy, (fossil.)
—*Cycl. anmica*, Turt. Conch. 250, pl. 2, f. 15. 1822. Is *Pisidium anmicum*, Jen.
—*Cycl. angulata*, Sowb. Geol. Trans. 2d ser. iv. 176, 346, pl. xxi. f. 12. 1836. Is *Cyrena Mantelli*, Dkr.
—*Cycl. angustidens*, d'Orb. Prod. 2, 304. 1850. Is *Cyrena angustidens*, Desh.
—*Cycl. antiqua*, d'Orb. Prod. 2, 304. 1850. Is *Cyrena antiqua*, Fer.
—*Cycl. appendiculata*, Turt. Man. 15, pl. 1, f. 6. 1831. Is *Pisidium Henslowianum*, Jen.

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3. *Sph. Aquæ Sextiæ*, Sowb. Bgt. Sph. 45. 1854.
Cycl. aquæ-Sextiæ, Sowb. Edin. New Phil. II. vii, 296. 1829.
Cycl. Gargasensis, Math. Cat. Méth. 147, pl. xiv. f. 6. 1842.
 Hab. France, (fossil.)
 —*Cycl. Aquensis*, Math. Cat. Méth. 148, pl. xiv. f. 8-9. 1842. Is *Sph. gibbosum*, Sowb.
4. *Sph. argentinum*, d'Orb. Ads. rec. gen. ii. 450. 1858.
Cycl. argentina, d'Orb. Mag. Zool. 1835. d'Orb. Voy. Amer. 568, pl. 83, f. 5, 7. 1844.
 Hab. S. Amer.
5. *Sph. aureum*, Pr. Ads. rec. gen. ii. 450. 1858.
Cycl. aurea, Pr. Bost. Proc. iv. 159, 1851. Loc. sup. cit. iv. 288. 1852. Jay. Cat. iv. ed. 465. 1852. Bgt. Amen. 1, p. 7. 1853.
 Hab. N. Amer.
Cycl. Australis, Lam. Lam. v. 560. 1818. Is *Corbicula Australis*, Desh.
6. *Sph. Bahiense*, Spix.
Cycl. Bahiensis, Spix. Test. Braz. 32, pl. xxv. f. 5, 6. 1827. Moricand mem. coq. terr. fluv. Br. 31, Bgt. Amen. 1, p. 7, 53. 1853.
C. maculata, Anton. Wieg. Archiv. 284. 1837. Anton. Verz. 14. 1839.
Musculium Bahiense, Spix. Ads. rec. gen. ii. 451. 1858.
M. maculatum, Anton. Loc. sup. cit. ii. 451. 1858.
Pisum Bahiense, Spix. Loc. sup. cit. ii. 560. 1858.
P. maculatum, Anton. Loc. sup. cit. ii. 560. 1858.
 Hab. S. Amer.
7. *Sph. Boissyii*, Desh. Inv. Paris, 521, pl. 34, f. 37, 39. 1857.
 Hab. France, (fossil.)
 —*Cycl. borealis*, Lam. Ann. Mus. vii. 421. 1806. Is a *Venus*.
8. *Sph. Bristovi*, Forbes.
Cycl. Bristovi, Forbes, Rec. Scie. 2, pl. 2, f. 3. Morris, Cat. Brit. Fos. 198. 1854.
 Hab. England, (fossil.)
9. *Sph. Bronchonianum*, Bgt. Sph. 20, pl. 3, f. 1, 5. 1854.
Cycl. Corsa, Charp. Mss.
 Hab. France.
10. *Sph. Brongniarti*, Koch et Dkr.
Cycl. Brongniarti, K. et D. Oolit. 59, pl. vii. f. 4, a, b. 1837.
 Hab. Europe, (fossil.)
 —*Cycl. Brongniarti*, d'Orb. Prod. 3, 109. 1852. Is *Cyrena Sirena*, Pr.
 —*Cycl. Brongniartina*, Math. Cat. Méth. 145, pl. xiv. f. 2. 1842. Is *Pisid. cuneatum*, Petit.
11. *Sph. Buchi*, Dkr.
Cycl. Buchi, Dkr. Wäld. 167. 1834.
 Hab. Germ. (fossil.)
12. *Sph. bulbosum*, Anth. Ads. rec. gen. ii. 450. 1858.
Cycl. bulbosa, Anth. Pr. Bost. Proc. iv. 283. 1852.
 Hab. N. Amer.
 —*Sph. cæruleum*, Pr. Ads. rec. gen. ii., 450. 1858. Is *Sph. partumeium*, Say.
 —*Cycl. calyculata*, Drap. Hist. Moll. 130, pl. x. f. 13, 14. 1805. Is *Sph. lacustre*, Fer.

13. *Sph. capense*, Krauss. Ads. rec. gen. ii. 450. 1858.
Cycl. capensis, Kr. Moll. S. Afr. 7, pl. 1, f. 6. 1848.
 Hab. Africa.
14. *Sph. cardissum*, Pr. Ads. rec. gen. ii. 450. 1858.
Cycl. cardissa, Pr. Bost. Proc. iv. 160. 1851. Loc. sup. cit. iv. 277.
 1852. Bgt. Amen. 1, p. 7. 1853. Lewis, Bost. Proc. v. 122. 1855.
 Hab. N. Amer.
 —*Cycl. carinata*, Goldf. Petr. Germ. 2, 232, pl. 147, f. 9, a, c. 1834–40. Is *Cyrena Mantelli*, Dkr.
 —*Cycl. Caroliniana*, Bosc. Hist. Coq. 3, 37, pl. 18, f. 4. 1802. Is *Cyrena Caroliniensis*, Lam.
 —*Cycl. Caroliniensis*, Bosc. Fer. Cat. Méth. 84. 1807. Is *Cyrena Caroliniensis*, Lam.
 —*Sph. castaneum*, Pr. Ads. rec. gen. ii. 450. 1858. Is *Sph. fabalis*, Pr.
15. *Sph. castrense*, Noulet. Coq. fos. etc., 16. 1857.
 Hab. France, (fossil.)
 —*Cycl. Chilensis*, d'Orb. Voy. Amer. Sept. 568, pl. 83, f. 11, 13. 1844. Is *Corbicula Chilensis*, Pr.
 —*Cycl. Chinensis*, Lam. Amer. Mus. vii. 421. 1806. Is *Corbicula fluminea*, Adams.
 —*Cycl. cinerea*, Hanl. Rec. spec. 1, 91. 1843. Is *Pisid. casertanum*, Bgt.
 —*Cycl. citrina*, Brown. Conch. Gt. Brit. 132, pl. 39, f. 37. 1849. Is *Sph. corneum*, Scop.
 —*Sph. citrinum*, Normd. Cycl. Dépt. Nord. 1. 1854. Is *Sph. Scaldianum*, Norm.
16. *Sph. clandestinum*, da Costa?
Cycl. clandestina, da Costa. Jay, Cat. iv. ed. 32. 1850. (Undescribed.)
 Hab. S. Amer.
17. *Sph. concentricum*, Bronn.
Cycl. concentrica, Br. Ital. tert. gebild. 96. 1831.
 Hab. Italy, (fossil.)
18. *Sph. concinnum*, Sowb. Bgt. Sph. 43. 1854.
Cycl. concinna, Sowb. Edin. N. Phil. II. vii. 297. 1829.
C. Galloprovincialis, Math. Cat. Méth. 146, pl. xiv. f. 34. 1842.
 Hab. France, (fossil.)
 —*Sph. consobrinum*, Fer. Ads. Rec. Gen. ii. 450. 1858. Is *Sph. ovale*, Fer.
 —*Cycl. consobrina*, Cail. Reeve, Conch. Nomencl. 29, 1845. Is *Corbicula orientalis*, Adams.
 —*Sph. constrictum*, Anth. Ads. Rec. Gen. ii. 450. 1858. Is *Sph. transversum*, Say.
19. *Sph. Coquandianum*, Math. Bgt. Sph. 46. 1854.
Cycl. Coquandiana, Math. Cat. Méth. 147, pl. xiv. f. 7. 1842.
 Hab. France, (fossil.)
20. *Sph. corneum*, Scop. Intr. ad Hist. Nat. 397. 1777.
Clama cinerea, d'Arg. Conch. 2d pt. 368, 374, pl. 31. 1742.
Tellina cornea, Linn. Syst. Nat. (10th ed.) 1, 678. 1758.
T. rivalis, Müll. Hist. Verm. 2, 202. 1774.
Cycl. cornea, (pars.) Drap. tabl. Moll. 105, No. 1, var. b. 1801.
Cardium corneum, Mont. Test. Brit. 86. 1803.
C. amnicum, Pult. Cat. 31. 1803.
Cycl. rivalis, Drap. Hist. Moll. 129, pl. x. f. 45. 1805.

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- Tellina communis*, Megerle. Berl. Mag. 1811.
Cycl. nucleus, Stud. Mem. Soc. Helv. Sci. Nat. 1, p. 25, pl. 2, f. 23. 1837.
C. lutea, Ziegler. Anton. Verg. 14. 1839.
C. stagnicola, Leach. Mss. Brit. Mus. 1840.
C. Leachii, Ziegler. Villa. Cat. 44. 1841.
C. tumida, Ziegler. Loc. Sup. Cit. 44. 1841.
C. globosa, Megerle. Loc. Sup. Cit. 44. 1841.
C. plumbeus, ?. Loc. Sup. Cit. 44. 1841.
C. flavescens, McGillvi. Moll. Scot. 208, 246. 1844.
Pisidium cornea, Verany. Cat. Jur. 13. 1846.
Cycladites corneus, Krüg. Urwelt. 2, 469. Bronn. Paleont. 1, 372. 1846.
Cycl. citrina, Brown. Conch. Grt. Brit. 132. pl. 39, f. 37. 1849.
C. isocardoides, Norm. Dup. Moll. 668. 1852.
C. alata, Leach. Moll. Gt. Brit. 291. 1852.
C. fossarum, Kryn. Bgt. Amen. 1, p. 8. 1853.
- Hab. Europe.
 —*Cycl. Corsa*, Charp. Mss. Is Sph. Brochonianum, Bgt.
 —*Cycl. crassa*, d'Orb. Prod. 2, 422. 1850. Is *Cyrena crassa* Desh.
21. Sph. Creplini, Dukr. Norm. Cycl. 3. 1854.
Cycl. Creplini, Dukr. Zeit. Malak. 20. 1845. *Muscul*, (do.) Dkr. Ads. Rec. Gen. ii. 451. 1858. *Pisum*, (do.) Dkr. Loc. Sup. Cit. ii. 560. 1858.
- Hab. Europe.
 —*Cycl. crocea*, Lewis, Bost. Proc. v. 25. 1854. Is *Sph. securis*, Pr.
 —*Cycl. cuneata*, Sowb. Edin. n. Phil. II. vii. 297. 1829. Is *Pisid. cuneatum*, Petit.
 —*Cycl. cuneiformis*, Sowb. Min. Conch. 2, 140, pl. 162, f. 2, 3. 1818. Is *Cyrena cuneiformis*, Fér.
 —*Cycl. cycladiformis*, d'Orb. Prod. 2, 381. 1850. Is *Cyrena cycladiformis*, Desh.
 —*Cycl. cyraenopsis*, Val. Encycl. pl. 301, f. 3. Is ?
22. Sph. Ddingoli, Bivona. Ann. N. Y. Lyc. vii. 97. 1859.
Cycl. Ddingoli, Bivon. Coq. Palerm. 3. 1839.
Pisid. Ddingoli, Bivon. Villa. Cat. 44. 1841.
- Hab. Sicily.
 —*Cycl. Denainvilliersi*, Boissy. Bull. Soc. Geol. Fr. 2d ser. iv. 178. 1846. Is *Pisid. Denainvilliersi*, Desh.
 —*Cycl. densata*, d'Orb. Prod. 3, 109. 1852. Is *Cyrena densata*, Conrad.
23. Sph. dentatum, Hald. Ads. Rec. Gen. ii. 450. 1858.
Cycl. dentata, Hald. Ac. N. S. Phil. Proc. 1, 100. 1841. Pr. Bost. Proc. iv. 250. 1852.
- Hab. N. Amer.
 —*Cycl. deperdita*, Lam. An. Mus. vii. 421. 1806. Is *Corbicula deperdita*, Desh.
 —*Cycl. depressa*, Nyst. Coq. fos. Anv. 36, pl. v. f. 5, 6. Is *Erycina depressa*, Nyst.
 —*Sph. Deshayesianum*, Bgt. Amen. i. p. 6. 1853. Is *Sph. ovale*, Fér.
 —*Sph. detruncatum*, Pr. Ads. rec. gen. ii. 450. 1858. Is *Sph. transversum*, Say.
 —*Cycl. diaphana*, Pr. Bost. II. vi. 367. 1852. Is *Sph. maculatum*, Morlt.

- Sph. distortum*, Pr. Ads. rec. gen. ii. 450. 1858. Is *Sph. solidulum*, Pr.
- Sph. dubium*, Say. Ads. rec. gen. ii. 450. 1858. Is *Pisid. Virginicum*, Bgt.
- Cycl. dubiosa*, Say. Reeve's Conch. Nomen. 29. 1845. Is *Pisid. Virginicum*, Bgt.
- Cycl. duplicata*, Pf. Moll. Germ. 230. 1821. Is *Pisid. duplicatum*, Pf.
- Cycl. Dupontia*, Fer. Cat. 20. 1837. Is *Cyrenella Dupontia*, Joan.
24. *Sph. eburneum*, Anth. Ads. rec. gen. ii. 450. 1858.
Cycl. eburnea, Anth. in Pr. Bost. Proc. iv. 279. 1852.
 Hab. N. Amer.
- Cycl. edentula*, Say. New Harm. Dissem. 2, 356. 1829. Is *Sph. striatinum*, Lam.
25. *Sph. egregium*, Gould. (non Say.) Ads. rec. gen. ii. 450. 1858.
Cycl. egregia, Gl. Bost. Proc. 3, 292. 1850.
 Hab. Oceanica.
- Sph. elegans*, C. B., Ads. Ads. rec. gen. ii. 450. 1868. Is *Sph. rhonoboideum*, Say.
26. *Sph. elevatum*, Hald. Ads. rec. gen. ii. 450. 1853.
Cycl. elevata, Hald. Ac. N. S. Phil. Proc. i. 53. 1841. DeKay, 224. 1842. Pr. Bost. Proc. iv. 280. 1852. Bgt. Amen. i. p. 8. 1853.
Cycl. pallida, Charp. Mss. 1851.
 Hab. N. Amer.
- Cycl. elongata*, Sowb. Gosl. trans. n. ser. iv. 345, pl. 21, f. 9. 1836. Is *Cyrena elongata*, Dkr.
27. *Sph. emarginatum*, Pr. Ads. rec. gen. ii. 450. 1858.
Cycl. emarginata, Pr. Bost. Proc. iv. 156. 1851. loc. sup. cit. iv. 283. 1852. Jay. Cat. iv. ed. 466. 1852. Bgt. Amen. i. p. 8. 1853.
 Hab. N. Amer.
- Cycl. erebea*, d'Orb. Prod. 2, 223. 1850. Is *Cyrena erebea*, Pr.
- Cycl. Euphratica*, Lamk. An. Mus. vii. 420. 1806. Encycl. pl. 302, f. 2, pl. 302, f. 2. Is *Corbicula fluminalis*, Adams.
28. *Sph. faba*, Münster.
Cycl. faba, Münst. Goldf. Petr. 2, 232, pl. 147, f. 8, a, c. 1834-40.
 Hab. Germ. (fossil.)
29. *Sph. fabalis*, Pr. Ads. rec. gen. ii. 450. 1858.
Cycl. fabalis, Pr. Bost. Proc. iv. 159. 1851. Jay. Cat. iv. ed. 465. 1852. Bost. Proc. iv. 273. 1852. Bgt. Amen. i. p. 8. 1853.
Cycl. castanea, Pr. Bost. Proc. iv. 160. 1851. loc. sup. cit. iv. 273. 1852. Bgt. Amen. i. p. 8. 1853.
Cycl. salculosa, Charp. MSS. 1851.
Sph. castaneum, Pr. Ads. rec. gen. ii. 450. 1858.
 Hab. N. Amer.
- Cycl. fasciata*, Gldf. Petr. 2, 232, pl. 147, f. 10, a, b. 1834-40. Is *Cyrena fasciata*, Römer.
- Cycl. Faujasii*, d'Orb. Prod. 3, 109. 1852. Is *Cyrena Faujasii*, Desh.
30. *Sph. ferrugineum*, Kr.
Cycl. ferruginea, Kr. Moll. S. Afr. 7, pl. i. f. 7. 1848.
Pisid. parasiticum, Parr. MSS.
Musculium parasiticum, Ads. rec. gen. ii. 452. 1858.
 " *ferrugineum*, Kr. loc. sup. cit. ii. 451. 1858.
Pisum parasiticum, Parr. loc. sup. cit. ii. 500. 1858.

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- Masculium ferrugineum*, Kr. loc. sup. cit. ii. 560. 1858.
 Hab. Africa.
 —Cycl. Ferrusaci, d'Orb. Prod. 3, 19. 1852. Is Cyrena Ferrusaci, Math.
 —Cycl. flavescens, McGil. Moll. Scot. 208, 246. 1844. Is Sph. corneum, Scop.
31. Sph. flavum, Pr. Ads. rec. gen. ii. 450. 1858.
Cycl. flava, Pr. Bost. Proc. iv. 155. 1851. Jay, Cat. iv. ed. 465. 1852. Bost. Proc. iv. 284. 1852. Bgt. Amen. i. p. 8. 1853.
 Hab. N. Amer.
 —Cycl. fluminea, Bosc. H. n. coq. 3, 38. 1802. Is Corbicula fluminea, Adams.
 —Cycl. fluviatilis, Bosc. H. n. coq. 3, 38. 1802. Is Corbicula fluminalis, Adams.
 —Cycl. Fontaineii, d'Orb. Voy. Amer. 569, pl. 83, f. 14, 15. 1844. Is Cyrena Fontaineii, Phil.
 —Cycl. fontinalis, Drap. Hist. Moll. 130, pl. x. f. 11, 12. 1805. Is Psid. pusillum, Jen.
32. Sph. formosum, Meek & Hayden.
Cycl. formosa, M. & H. Ac. N. S. Phil. Proc. viii, 115. 1856.
 Hab. N. Amer. (fossil.)
 —Cycl. fossarum, Kryn. Mss. (Bgt. Sph. 25. 1854.) Is Sph. corneum, Scop.
 —Cycl. fossulata, d'Orb. Prod. 2, 60. 1850. Is Cyrena fossulata, Cornnel.
33. Sph. fragile, Meek & Hayden.
Cycl. fragilis, M. & H. Ac. N. S. Phil. Proc. viii. 115. 1856.
 Hab. N. Amer. (fossil.)
34. Sph. fuscatum, Rafin. Ads. Rec. Gen. ii. 450. 1858.
Cycl. fuscata, Rafin. Mss. Pr. Bost. Proc. iv. 281. 1852. Lewis, Bost. Proc. v. 122. 1855.
 Hab. N. Amer.
 —Cycl. Galloprovincialis, Math. Cat. Méth. 146, pl. xiv. f. 34. 1842. Is Sph. concinnum, Sowb.
35. Sph. Gardanense, Math. Bgt. Sph. 44. 1854.
Cycl. Gardanensis, Math. Math. Cat. Méth. 145, pl. xiv. f. i. 1842.
 Hab. France, (fossil.)
 —Cycl. Gargasensis, Math. Cat. Méth. 147. pl. xiv. f. 6. 1842. Is Aquæ Sextiæ, Sowb.
 —Cycl. Geslini, d'Orb. Prod. 3, 109. 1852. Is Cyrena Geslini, Desh.
 —Cycl. gibba, Ald. Trans. Nat. Hist. Soc. Northumb. 1, pt. 1, p. 41, 1830. Is Psid. obtusale, Pf.
36. Sph. gibbosum, Sowb. Bgt. Sph. 45. 1854.
Cycl. gibbosa, Sowb. Edin. N. Phil. II. vii. 297. 1829.
Cycl. Aquensis, Math. Cat. Méth. 148, pl. xiv. f. 8, 9. 1842.
 Hab. France, (fossil.)
 —Sph. giganteum, Pr. Ads. Rec. Gen. ii. 458. 1858. Is Sph. sulcatum, Lam.
 —Cycl. globosa, Megerle. Ville, Cat. 44, 1841. Is Sph. corneum, Scop.
 —Cycl. globosa, d'Orb. Prod. 3, 19, 1852. Is Cyrena globosa, Math.
 —Cycl. globus, Dubois. Fos. Wohln. 59, pl. vi. f. 18, 19, 1831. Is Erycina globus, d'Orb.

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37. *Sph. gracile*, Pr. Ads. Rec. Gen. ii. 450. 1858.
Cycl. gracilis, Pr. Bost. Proc. iv. 156. 1851. loc. sup. cit. iv. 274. 1852.
 Bgt. Amen. 1, p. 8. 1853.
 Hab. N. America.
 —*Cycl. Gravesi*, d'Orb. Prod. 2, 323. 1850. Is *Cyrena Gravesi*, Desh.
 —*Cycl. hammalis*, Rafin. Bory. It. Vt. Amen. gen. scie. phy. v. 319.
 1820. Is *Corbicula hammalis*, Fer.
 —*Cycl. hermaphrodita*, Mart. Mag. Nat. Hist. 1, 402, pl. 1, f. 1, 2.
 Is *Galathea radiata*.
 —*Sph. Herminii*, Wüld. In Collect. Cuming. 1859. Is *Pisid. casestantum*, Bgt.
38. *Sph. inconspicuum*, Pr. Proc. Zool. xxviii. 1860.
 Hab. Asia Minor.
39. *Sph. Indicum*, Desh. Proc. Zool. xxii. 342. 1854.
 Hab. E. Indies.
 —*Sph. inornatum*, Pr. Ads. Rec. Gen. ii. 450. 1858. Is *Sph. acuminatum*, Pr.
 —*Cycl. intermedia*, d'Orb. Prod. 2, 304. 1850. Is *Cyrena intermedia*, Desh.
 —*Cycl. Islandica*, Lam. An. Mus. vii. 420. 1806. Is *Cyprina Islandica*.
 —*Cycl. isocardioides*, Norm. Drap. Moll. Fr. 668. 1852. Is *Sph. corneum*, Scop.
40. *Sph. Jayanum*, Pr. Ads. Rec. Gen. ii. 450. 1858.
Cycl. Jayensis, Pr. Bost. Proc. iv. 157. 1851. Loc. sup. cit. iv. 279.
 1852. Jay, Cat. iv. ed. 465. 1852. Bgt. Amen. 1, p. 8. 1853.
 Hab. N. America.
41. *Sph. Jeannoti*, Norm. Cycl. 2. 1854.
 Hab. France.
42. *Sph. Jugleri*, Dkr.
Cycl. Jugleri, Dkr. Wüld. 168. 1834.
 Hab. Germ. (fossils.)
 —*Cycl. lacustris*, Drap. Hist. Moll. 130, pl. x. f. 6, 7. 1805. Is *Sph. ovale*, Fer.
43. *Sph. lacustre*, Fer. Bgt. Amen. 1, p. 6. 1853.
Tellina lacustris, Muller. Verm. 2, 204. 1774.
Cardium lacustre, Mont. Test. Brit. 89. 1803.
Cycl. calyculata, Drap. Hist. Moll. 130, pl. x. f. 14, 15. 1805.
Musculium lacustre, Link. Besch. Coll. Univ. Rostock, 152. 1807.
Cycl. lacustris, Fer. Meth. Conch. 128. 1807.
Tellina tuberculata, Alten. Syst. Abh. 4, pl. 1, f. 1. 1812.
T. tenera, Schrot. An. Wett. x. 316. 1814.
Cycl. tuberculata, Klees. Dissert. Tub. 45. 1818.
Tellina stagnicola, Sheph. Trans. Linn. Soc. xiv. 150. 1823.
Cycl. Perceii, Villa. Mss. 1858.
 Hab. Europe.
 —*Cycl. laevigata*, Schum. 170, pl. xii. f. 1. 1817. Is *Corbicula fluminalis*, Adams.
 —*Cycl. laevigata*, Desh. Dict. class. Hist. Nat. v. 220. 1824. Is *Pisid. laevigatum*, Bgt.
 —*Cycl. lasmampsis*, Rafin. Bory, St. Vt. An. gen. scie. phy. v. 319, pl. 82, f. 19, 21. 1820. Is *Sph. sulcatum*, Lam.
 —*Cycl. Leachii*, Ziegl. Villa. Cat. 44. 1841. Is *Sph. corneum*, Scop.
 —*Cycl. lenticularis*, Norm. Cycl. 8. 1844. Is *Pisid. casertanum*, Bgt.

1860.]

- Cycl. lenticularis*, Boissy. Bull. Soc. Geol. Fr. 2nd ser. iv. 173. 1846. Is. *Sph. Verneulli*, Boissy.
- Cycl. limosa*, d'Orb. Voy. Amer. (err.) pl. 82, f. 14, 16. 1844. Is *Corbicula variegata*, Adams.
- Cycl. littoralis*, Fer. Fer. in collect. Michaud. Is *Sph. maculatum*, Morelet.
- Cycl. lutea*, Ziegl. Anton. Verz. 14. 1839. Is *Sph. cornutum*, Scop.
- Cycl. maculata*, Anton. Wieg. Archiv. 284. 1837. Is *Sph. Bahiense*, Spix.
44. *Sph. maculatum*, Morelet. Ads. Rec. Gen. ii. 450. 1858.
Cycl. maculata, Mt. Test. nov. etc. pt. 2, 25. 1851. Bgt. Amen. 1, p. 8. 1853.
Cycl. striatella, Fer. Cat. 20. 1837. Collect. Mus. Paris.
Cycl. littoralis, Fer. Fer. in Collect. Michaud.—Beau. Cat. Moll. Guadeloupe, 24. 1858.
Pisid diaphanum, Hald. Ac. N. S. Phil. Proc. 1, 53. 1841.
Cycl. diaphana, Pr. Bost. Il. vi. 267. 1852.
Pisid. Moquinianum, Bgt. Amen. 1, p. 61, pl. 3, f. 13, 17. 1855.
Cycl. Moquiniana, Gas. Pisid. q. 1855.
Cycl. Venezuelensis, Pr. Pr. in Collect. Mus. Leiden. 1857.
- Cycl. major*, Sowb. Geol. Trans. n. ser. iv. 176, 346. pl. 21. f. 13. 1836. Is. *Cyrena major*, Morris.
- Cycl. majuscula*, Gldf. Pr. Gere. 2, 232. pl. 147, f. 6, a, c. 1834-40. Is *Cyrena majuscula*, Römer.
45. *Sph. Mansianum*, Noulet. Coq. fos. 16. 1857.
 Hab. France, (fossil.)
- Cycl. maritima*, d'Orb. Cuba, 2, p. 350, pl. 21, f. 47, 50. 1853. Is *Cyrena Cubensis*, Prime.
- Cycl. Matheroni*, d'Orb. Prod. 2, 304. 1850. Is *Pisid cuneatum*, Petit.
- Cycl. medius*, Sowb. Min. Conch. vi. 51, pl. 527, f. 2, 1829. Is *Cyrena media*, Fitton.
- Cycl. membranaceus*, Sowb. Min. Conch. vi. 51, pl. 527, f. 3. 1829. Is *Cyrena membranacea*, Fitton.
- Cycl. minima*, Stud. Verz. 93. 1820. Is *Pisid. obtusale*, Pf.
- Cycl. minor*, C. B. Ads. Bost. Proc. 1, 48. 1841. Is *Pisid. abditum*, Hald.
- Sph. mirabile*, Pr. Ads. Rec. Gen. ii. 450. 1858. Is *Sph. partumeium*, Say.
- Sph. modestum*, Pr. Ads. Rec. Gen. ii. 450. 1858. Is *Sph. striatinum*, Lam.
46. *Sph. modioliforme*, Anton.
Cycl. modioliformis, Anton. Wieg. Archiv. 284. 1837. Anton. Verz. 14. 1839.
Musculum modioliformis, Anton. Ads. Rec. Gen. ii. 451. 1858.
Pisum modioliforme, Anton. Ads. loc. sup. cit. ii. 560. 1858.
 Hab. S. America.
- Cycl. Moquiniana*, Gas. Pisid. g, 1855. Is *Sph. maculatum*, Morelet.
- Cycl. Nepeansis*, Les. Voy. Coq. ii. 4, 28. pl. 13, f. 14, 1830. Ads. Is *Corbicula Nepeansis*, Adams.
- Sph. nitidum*, C. B. Ads. & Mighl. Ads. Rec. Gen. ii. 450. 1858. Is *Pisid. Adamsi*, Pr.
- Cycl. nitida*, Hanley. Rec. spec. etc. 1. go. pl. 14. f. 46. 1843. Is *Pisid nitidum*, Jen.

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47. *Sph. nobile*, Gld.
Cycl. nobilis, Gld. Bost. Proc. v. 229. 1855.
 Hab. Oceanica.
48. *Sph. Normandi*, Michaud.
Cycl. Normandi, Mich. Coq. fos. Hauterive, 27 pl. v. f. 22, 24. 1854.
 (extra. Bull. Linn. Soc. Lyons.)
 Hab. France, (fossil.)
49. *Sph. Nova-Zelandiae*, Desh. Proc. Zool. 22, p. 342. 1854.
 Hab. N. Zealand & N. Holland.
 —*Cycl. nucleus*, Stud. Mem. Soc. Helv. Sci. Nat. 1, p. 25, pl. 2. f. 23.
 1837. Is *Sph. corneum*, Scop.
 —*Cycl. nuclea*, Boissy. Bull. Soc. Geol. Fr. 2nd ser. iv. 175, 1846. Is
Pisid. nucleum, Bgt.
50. *Sph. numismale*, Math. Bgt. Sph. 46. 1854.
Cycl. numismalis, Math. Cat. Méth. 146, pl. 14, f. 5. 1842.
 Hab. France, (fossil.)
 —*Cycl. obliqua*, Lam. Lam. v. 559. 1818. Is *Pisid. amnicum*, Jen.
 —*Cycl. obovata*, Sowb. Min. Conch. 2, 140, pl. 165, f. 4, 6. 1818.
 Is *Cyrena obovata*, Desh.
 —*Cycl. obtusalis*, Lam. Lam. v. 559. 1818. Is *Pisid. obtusale*, Pf.
51. *Sph. occidentale*, Pr.
Cycl. ovalis, Pr. (non Fer.) Bost. Proc. iv. 276. 1852.
Cycl. occidentalis, Pr. Lewis, in loc. sup. cit. v. 122. 1855. Lewis,
 loc. sup. cit. vi. 2. 1856.
Sph. ovale, Stimps. Ads. Rec. Gen. ii. 450. 1858.
 Hab. N. America.
52. *Sph. oepfingense*, Kl.
Cycl. oepfingensis, Kl. Würt. Jhrb. 2, p. 95, pl. 2, f. 19. 1846.
 Hab. Germany, (fossil.)
 —*Sph. orbicularium*, Barrat. Ads. Rec. Gen. ii. 450. 1858. Is *Sph.*
partumeium, Say.
 —*Cycl. orbicularis*, Gldf. Petr. Germr. 5, 231, pl. 147, f. 5, a. b.
 1834-40. Is *Cyrena orbicularis*, Römer.
53. *Sph. ovale*, Fer. Bgt. Sph. 31, pl. iv. f. 10. 1854.
Cycl. lacustris,* Dep. Hist. Moll. 130. pl. x. p. 6, 7. 1805.
Cycl. ovalis, Fer. Méth. Conch. 2d ed. 128, 136. 1807.
Cycl. consobrina, Fer. Dict. Scie. Nat. xii. 279. 1818.
Sph. Deshayesianum, Bgt. Amen. 1, p. 6. 1853.
Sph. consobrinum, Fer. Ads. Rec. Gen. ii. 450. 1858.
 Hab. Europe.
 —*Cycl. ovalis*, Nels. Il. Conch. 2, p. 408. 1851. Is *Pisid. obtusale*,
 Pf.
Sph. ovale, Pr. (non Stimps.) Ads. Rec. Gen. ii. 450, 1858. Is *Sph. oc-*
cidentale, Pr.
54. *Sph. ovatum*, Lewis.
Cycl. ovata, Lewis. Bost. Proc. vi. 2. 1856.
 Hab. N. America.
 —*Cycl. pallida*, Charp. Mss. 1851. Is *Sph. elevatum*, Hald.
 —*Sph. pallidum*, Gray. Ads. Rec. Gen. ii. 450. 1858. Is *Sph. corneum*,
 Scop.
 —*Cycl. palustris*, Drap. Tabl. Moll. 106. 1801. Is *Pisid. amnicum*,
 Jen.

*Non *Tellina lacustris*, Muller, which is *Sph. lacustre*.

—Cycl. *Paranensis*, d'Orb. Voy. Amer. Sept. 567. pl. 83. f. 23, 25. 1844. Is *Corbicula Paranacensis*, Pr.

55. Sph. *Parisiense*, Pr.

Cycl. transversa, Lev. Grateloup. Moll. Fr. Cont. 49 1855.

Hab. France, (fossil.)

56. Sph. *partumeium*, Say. Bgt. Sph. 12. 1854.

Cycl. partumeia, Say. Ac. N. S. Phil. II. 2, 380. 1822. Fer. Mag. Zool. 1835. Jay, Cat. 3d ed. 16. 1839. Gould, Rept. 73, f. 54. 1841. DeKay, 223, pl. 25, f. 262. 1842. C. B. Ads. Vt. 18. 1842. Mighles. Bost. II. iv. 318. 1843. Linsl. Amer. II. 48, 276. 1845. C. B. Ads. Cat. 30. 1847. Jay, Cat. iv. ed. 32. 1850. Pr. Bost. Proc. iv. 165. 1851. Stimps. N. E. Moll. 16. 1851. Pr. Bost. Proc. iv. 278. 1852. Hartm. Cat. 1853. Bgt. Amen. 1, p. g. 1853. Lew. Bost. Proc. v. 122. 1855. Lew. loc. sup. cit. vi. 2. 1856.

C. cornea, Lam. (Var. 2.) Lam. vi. 558, 1818. Lam. (Desh ed. vi.) 268. 1835.

C. orbicularia, Barrat. Linsl. Amer. II. 48, p. 276. 1845. Bgt. Amen. 1, p. g. 1853.

C. mirabilis, Pr. Bost. Proc. iv. 167. 1851. Bgt. Amen. 1, p. 8. 1853.

C. cærulea, Pr. Bost. Proc. iv. 161. 1851. Jay, Cat. iv. ed. 465. 1852. Bgt. Amen. 1, p. 7. 1855.

Sph. orbicularium, Barrat. Ads. Rec. Gen. ii. 450. 1858.

Sph. mirabile, Pr. Loc. sup. cit. ii. 450. 1858.

Sph. cæruleum, Pr. Loc. sup. cit. ii. 450. 1858.

Hab. N. America.

—Cycl. *parva*, Sowb. Trans. Geol. Soc. 2d ser. iv. 345. pl. xxi. f. 7. 1836. Is *Cyrena parva*, Morris.

57. Sph. *patella*, Gould. Ads. Rec. Gen. ii. 450. 1858.

Cyclas patella, Gld. Bost. Proc. iii. 292. 1850. Pr. loc. sup. cit. iv. 285. 1852.

Hab. N. America.

—Sph. *pellucidum*, Pr. Ads. Rec. Gen. ii. 450. 1858. Is *Sph. truncatum*, Linsl.

—Cycl. *Perezeii*, Villa. Mss. 1858. Is *Sph. lacustre*, Fer.

58. Sph. *perpusillum*, Gärtn.

Cyclas perpusilla, Gärtn. Ann. der Wetter. 316.

Hab. Europe.

—Cycl. *Pfeifferi*, Ziegl. Porro. Malac. 121. 1838. Is *Pisid. amnicum*, Jen.

59. Sph. *pisidioides*, Gray? Ads. Rec. Gen. ii. 450. 1858.

Hab. England. (Not described.)

60. Sph. *pisum*, Math. Bgt. sph. 43. 1854.

Cyclas pisum, Math. Cat. Méth. 148, pl. xiv. f. 10, 11. 1842.

C. subpisum, d'Orb. Prod. 3, 19. 1852.

Hab. France, (fossil.)

—Cycl. *pisum*, d'Orb. Prod. 2, 322. 1850. Is *Cyrena pisum*, Desh.

—Cycl. *plumbeus*, Villa. Cat. 44. 1841. Is *Sph. corneum*, Scop.

—Sph. *ponderosum*, Pr. Ads. Rec. Gen. ii. 450. 1858. Is *Sph. sulcatum*, Lam.

—Cycl. *prisca*, Eichw. Nat. Hist. Skizze. 207. Is *Pisid. priscum*, Eichw.

61. Sph. *prominulum*, Reüss. Bgt. Sph. 47. 1854.

Cyclas prominula, Reüss. Dkr. et Meyer Paleont. 2, 242, pl. iv. f. 14. 1852.

Hab. Germany, (fossil.)

- Cycl. proserpina*, d'Orb. Prod. 2, 323. 1850. Is *Cyrena proserpina*, Pr.
62. *Sph. proximum*, Alder? Ads. Rec. Gen. ii. 450. 1858.
Hab? (Not described.)
—*Cycl. pulchella*, Hanl. Proc. Spec. 1, 91. 1843. Is *Pisid. casertanum*, Bgt.
63. *Sph. pulchellum*, d'Orb.
Cyclas pulchella, d'Orb. Guer. Mag. Zool. 1835. Voy. Amer. Sept. 568, pl. 83, f. 8-10. 1844.
Musculium pulchellum, d'Orb. Ads. Rec. Gen. ii. 452. 1858.
Pisum pulchellum, d'Orb. Loc. sup. cit. ii. 560. 1858.
Hab. South America.
—*Cycl. pulcher*, Sowb. Min. Conch. vi. 51, pl. 527, f. 1. 1829. Is *Cyrena pulchra*, Morris.
—*Cycl. pusilla*, Turton. Man. 16, pl. 1, f. 7. 1831. Is *Pisid. pusillum*, Jen.
64. *Sph. pygmeum*, C. B. Adams.
Cyclas pygmea, C. B. Adams. Contr. Conch. 44, 1849. Jay, Cat. iv. ed. 465, 1852. Bgt. Amen. 1, p. 9, 53, 1853.
Musculium pygmeum, C. B. Ads. Ads. Rec. Gen. ii. 452, 1858.
Pisum pygmeum, C. B. Ads. Loc. sup. cit. ii. 660, 1858.
Hab. W. Indies.
—*Cycl. radiata*, Blainv. 2232. 1828. Is *Galatea radiata*, Lam.
65. *Sph. rhomboideum*, Say. Ads. Rec. Gen. ii. 450. 1858.
Cyclas rhomboidea, Say. Ac. N. S. Phil. II. ii. 380, 1822. Fer. Mag. Zool. 1835. Dekay, 224, pl. 25, f. 263, 1842. C. B. Ads. Vt. 18, 1842. Linsl. Amer. II. 48, 276, 1845. C. B. Ads. Cat. 30, 1847. Jay, Cat. iv. ed. 32, 1850. Stimps. N. C. Moll. 16, 1851. Pr. Bost. Proc. iv. 272, 1852. Pr. An. N. Y. Lyc. vi. 66, pl. 1, f. 4—a, b, 1853. Bgt. Amen. 1, p. 9. 1853.
Cyclas cornea, Lam. var. 3. Lam. v. 558, 1818. Lam. (Desh. ed.) vi. 268, 1835.
Cyclas elegans, Ads. Bost. II. 3, 330, pl. 3, f. 11, 1840. Gould. Rept. 74, f. 55, 1841. Dekay, 224, 1842. C. B. Ads. Vt. 18, 1842. Linsl. Amer. II. 48, 276, 1845. C. B. Ads. Cat. 30, 1847. Jay, Cat. iv. ed. 32, 1850. Pr. Bost. Proc. iv. 165, 1851. Stimps. N. E. Moll. 16, 1851. Bgt. Amen. 1, p. 8. 1853. Lewis Bost. Proc. v. 122, 1855.
Sph. elegans, C. B. Adams. Ads. Rec. Gen. ii. 450, 1858.
Hab. N. America.
—*Cycl. rivalis*, Drap. Hist. Moll. 129, pl. x. f. 4, 5. 1805. Is *Sph. corneum*, Scop.
66. *Sph. rivicola*, Lam. Bgt. Amen. 1, p. 6, 1853.
Chama albida, d'Arg. Conch. 2d pt. pl. 31, p. 368, 374, 1742.
Tellina cornea, (pars.) Schröt. 189, pl. iv. f. 4, 1779.
Cyclas cornea, (pars.) Draps. Tabl. Moll. 105, var. a, 1801.
C. rivicola, Lam. Lam. v. 558, 1818.
C. æquata, Sheph. Mss. 1840.
Sph. riviculum, Leach. Morch. Cat. Conch. etc. fasc. 2, p. 30, 1853.
Cycl. sabulicola, Kryn. Mss. (Bgt. Sph. 13, 1854.)
Hab. Europe.
67. *Sph. rosaceum*, Pr. Ads. Rec. Gen. ii. 450. 1858.
Cyclas rosacea, Pr. Bost. Proc. iv. 155, 1851. Loc. sup. cit. iv. 277. 1852.
Hab. N. America.
—*Cycl. Rouyana*, d'Orb. Prod. 2, 381. 1850. Is *Cyrena Rouyana*, Bgt. 1860.]

68. *Sph. rugosum*, Dkr.
Cyclas rugosa, Dkr. Dkr. & Meyer, Paleont. 1, 38, pl. 6, f. 15, 16, a-b, 1846.
 Hab. Germany, (fossil.)
69. *Sph. Ryckholtii*, Normd. Bgt. Amen. 1, p. 6. 1853. Normd. Cycl. 3. 1854.
Cyclas Ryckholtii, Normd. Cycl. 7, f. 5, 6, 1844.
Sph. strictum, Normd. Cycl. 3, 1854.
 Hab. France.
70. *Sph. Rylliense*, Boissy.
Cyclas Rylliense, Boissy. Bull. Soc. Géol. Fr. 2d ser. iv. 178, 1846.
 Mem. Soc. Géol. Fr. 2d ser. 3, 270, pl. v. f. 5, a-c, 1848.
Pisid. Rylliense, Bgt. Sph. 52, 1854.
 Hab. France, (fossil.)
 —*Cycl. sabulicola*, Kryn. Mss. (Bgt. Lph. 13. 1854. Is *Sph. rivicola*, Lam.
 —*Cycl. Sarratogea*, Lam. Lam. v. 560. 1818. Is *Sph. sulcatum*, Lam.
71. *Sph. Scaldianum*, Normd. Cycl. 1. 1854.
Cyclus Scaldiana, Normd. Cycl. 5, f. 1, 2, 1844.
Sph. corneum, Scop. Bgt. Amen. 1, p. 6, 1854.
S. citrinum, Normd. Cycl. 1, 1854.
 Hab. France.
 —*Cycl. Sebetia*, DaCosta. Cat. Syst. Tert. Sicil. pl. 2, f. 6. 1829. Is *Bornia corbuloides*, Phil.
72. *Sph. securis*, Pr. Ads. Rec. Gen. ii. 450. 1858.
Cyclas securis, Pr. Bost. Proc. iv. 160, 1851. Stimp. N. E. Moll. 16, 1851. An. N. Y. Lyc. v. 218, pl. vi., 1852. Bost. Proc. iv. 276, 1852. Jay, Cat. iv. ed. 466, 1852. Hartman, Cat. 1853. Bgt. Amen. 1, p. 9, 1853. Lewis, Bost. Proc. v. 122, 1855.
C. crocea, Lewis. Loc. sup. cit. v. 25, 1854; vi. 2, 1856.
 Hab. N. America.
73. *Sph. seminulum*, Reuss. Bgt. Sph. 47. 1854.
Cycl. seminulla, Reuss. Dkr. & Meyer Paleont. 2, 42, pl. iv. f. 15, 1852.
 Hab. Europe (fossil.)
 —*Cycl. semistriata*, d'Orb. Prod. 3, 19. 1852. Is *Cyrena semistriata*, Desh.
 —*Sph. simile*, Say. Ads. Rec. Gen. ii. 450. 1818. Is *Sph. sulcatum*, Lam.
 —*Sph. simplex*, Pr. Ads. Rec. Gen. ii. 450. 1858. Is *Sph. acuminatum*, Pr.
 —*Cycl. sirena*, d'Orb. Prod. 2, 323. 1850. Is *Cyrena sirena*, Pr.
 —*Cycl. solida*, DeKay. 220, pl. 25, f. 265. 1842. Is *Sph. sulcatum*, Lam.
74. *Sph. solidum*, Normd. Bgt. Amen. 1, p. 6, 1853. Normd. Cycl. 2, 1854.
Cycl. solida, Normd. Cycl. 6, f. 3-4. 1844.
 Hab. France.
75. *Sph. solidulum*, Pr.
Cycl. solidula, Pr. Bost. Proc. iv. 158, 1851. Loc. sup. cit. iv. 282, 1852. Jay, Cat. iv. ed. 466, 1852. Bgt. Amen. 1, p. 9, 1853. Lewis, Bost. Proc. v. 122, 1855.
C. distorta, Pr. loc. sup. cit. iv. 158, 1851. Loc. sup. cit. iv. 285, 1852. Bgt. Amen. 1, p. 7, 1853. Lewis, Bost. Proc. v. 122, 1855.
Sph. distortum, Pr. Ads. Rec. Gen. ii. 450. 1858.
 Hab. N. America.

76. *Sph. sphaericum*, Anthony. Ads. Rec. gen. ii. 450, 1858.
Cycl. sphaerica, Anth. Pr. Bost. Proc. iv. 275. 1852.
 Hab. N. America.
 —*Cycl. stagnicola*, Leach. Mss. Brit. Mus. 1840. Is *Sph. corneum*, Scop.
77. *Sph. stamineum*, Conrad. Ads. Rec. Gen. ii. 450. 1858.
Cycl. staminea, Conrad. Amer. Il. xxv. 342, pl. 1, f. 5, 1834. Fer. Mag. Zool. 1833. Dekay, 224, 1842. Jay, Cat. iv. ed. 32, 1850. Pr. Bost. Proc. iv. 281, 1852. Bgt. Amen. 1, p. 9, 1853.
 Hab. N. America.
 —*Sph. Steenbuchii*, Möller. Ads. Rec. Gen. ii. 450, 1858. Is *Pisid. Steenbuchii*, Morch.
78. *Sph. Steenii*, Schmidt. Ads. Rec. Gen. ii. 450. 1858.
Cycl. Steenii, Schmidt. Zeit. Malac. 118. 1850.
 Hab. Germany.
 —*Cycl. striatella*, Fer. Cat. 20. 1837. Collect. Mus. Paris. Is *Sph. maculatum*, Morelet.
79. *Sph. striatinum*, Lam.
Cycl. striatina, Lam. Lam. v. 560, 1818. Lam. (Desh. edit.) vi. 271, 1835. Delessert pl. vii. f. 4, 1841. Bgt. Amen. 1, p. 9, 1853. Pr. notes on *Cycl.* 1857.
C. edentula, Say N. Harm. Dissem. 2, 1829. Fer. Mag. Zool. 1835. N. Harm. Dissem. (reprint) 10, 1840. DeKay 225, 1842. Bgt. Amen. 1, p. 8, 1853.
C. modesta, Pr. Bost. Proc. iv. 159, 1851. Loc. sup. cit. iv. 284, 1852. Bgt. Amen. 1, p. 8, 1853. Lewis, Bost. Proc. vi. 2, 1856.
Sph. modestum, Pr. Ads. Rec. Gen. ii. 450. 1858.
Musculium edentulum, Say. Loc. sup. cit. ii. 451. 1858.
Pisum edentulum, Say. Loc. sup. cit. ii. 560. 1858.
 —*Sph. strictum*, Normd. *Cycl.* 3. 1854. Is *Sph. Ryeckholtii*, Normd.
 —*Cycl. subdeperdita*, d'Orb. Prod. 2, 305. 1850. Is *Cyrena deperdita*, Desh.
 —*Cycl. subdepressa*, d'Orb. Prod. 2, 381. 1850. Is *Cyrena compressa*, Desh.
80. *Sph. subellipticum*, Meek & Hayden.
Cycl. subelliptica, M. & H. Ac. N. S. Phil. Proc. viii. 115. 1856.
 Hab. N. Amer. (fossil.)
 —*Cycl. sublævigata*, d'Orb. Prod. 2, 304. 1850. Is *Pisid. lævigatum*, Bgt.
 —*Cycl. sublævis*, Gldf. Petr. Germ. 2, 232, pl. 147, f. 7, a-b. 1834-40. Is *Cyrena sublævis*, Rømer.
 —*Cycl. suborbicularis*, d'Orb. Prod. 2, 304. 1850. Is *Corbicula orbicularis*, Pr.
 —*Cycl. subpisum*, d'Orb. Prod. 3, 19. 1852. Is *Sph. pisum*, Math.
 —*Cycl. subquadrata*, Sowb. Geol. Trans. 2d ser. iv. 177, 345, pl. xxi. f. 8. 1836. Is *Cyrena subquadrata*, Morris.
81. *Sph. subtransversum*, Pr. Proc. Zool. xxviii. 1860.
 Hab. Mexico.
82. *Sph. subtrigonum*, Dkr.
Cycl. subtrigona, Dkr. Wäld. 168, 1834.
 Hab. Germ. (fossil.)
83. *Sph. sulcatum*, Lam.
Cycl. sulcata, Lam. Lam. v. 560, 1818. Lam. (Desh. ed.) vi. 271, 1835. Fer. Mag. Zool. 1835. Fer. Cat. 20, 1837. Delessert, pl. vii. f. 3, 1841. Jay, Cat. iv. ed. 32, 1850. Stimp. N. E. Moll. 16, 1851. Bgt. Amen. i. p. 9, 1853. Pr. Notes *Cycl.* 1857.

- Cycl. Saratogea*, Lam. Lam. v. 560, 1818. Lam. (Desh. ed.) vi. 271, 1835. Fer. Mag. Zool. 1835. Delessert, pl. 7, f. 9, 1841. Bgt. Amen. i. p. 9, 1853.
- Cycl. similis*, Say. Rafin. in Bory. St. Vt. An. Gen. Sci. Phy. v. 319, 1820. Fer. Mag. Zool. 1835. Fer. Cat. 20, 1837. Jay. Cat. 3, ed. 16, 1839. Gould. Rept. 72, f. 53, 1841. DeKay, 222, pl. 25, f. 264, 1842. Ads. Vt. 18, 1842. Linsl. Amer. Il. 48, 276, 1845. Ads. Cat. 30, 1847. Jay. Cat. iv. ed. 32, 1850. Pr. Bost. Proc. iv. 165, 1851. Hartman, Cat. 1853. Bgt. Amen. i. p. 9, 1853. Lewis, Bost. Proc. v. 122, 1855. Lewis, loc. sup. cit. vi. 2, 1856.
- Cycl. lasmampsis*, Rafin. Bory, St. Vt. An. Gen. Sci. Phy. v. 319, pl. 82, f. 19, 20, 1820. Fer. Mag. Zool. 1835. Bgt. Amen. i. p. 8, 1853.
- Cycl. gigantea*, Pr. Bost. Proc. iv. 157, 1851. Loc. sup. cit. iv. 282, 1852. Bgt. Amen. i. p. 8, 1853.
- Cycl. ponderosa*, Pr. Bost. Proc. iv. 157, 1851. Loc. sup. cit. iv. 282, 1852. Bgt. Amen. i. p. 9, 1853.
- Cycl. striatina*, Lam. Fr. Mag. Zool. 1835.
- Sph. giganteum*, Pr. Ads. Rec. Gen. ii. 450, 1858.
- Sph. ponderosum*, Pr. Loc. sup. cit. ii. 450, 1858.
- Hab. N. Amer.
- Cycl. sulculosa*, Charp. Mss. 1851. Is *Sph. fabale*, Pr.
- Cycl. tellinella*, d'Orb. Prod. 2, 304. 1850. Is *Cyrena tellinella*, Fer.
84. *Sph. tenue*, Pr. Ads. Rec. Gen. ii. 450. 1858.
- Cycl. tenuis*, Pr. Bost. Proc. iv. 161, 1861. Loc. sup. cit. iv. 825, 1852.
- Hab. N. Amer.
85. *Sph. tenuistriatum*, Pr. Bgt. Sph. 12. 1854.
- Cycl. tenuistriata*, Pr. Bost. Proc. iv. 156, 1851. Loc. sup. cit. iv. 272, 1852. Bgt. Amen. i. p. 9, 1853.
- Cycl. cornea*, Drap. C. B. Adams, Cat. 29. 1847.
- Hab. N. Amer.
86. *Sph. Terverianum*, Dup. Bgt. Amen. i. p. 6, 1853. Bgt. Sph. 19, pl. 2, f. 11, 15, 1854.
- Cycl. Terveriana*, Dup. Cat. Extram. Gall. Tert. Vt. 87, 1849.
- Hab. France.
87. *Sph. transversum*, Say. Ads. Rec. Gen. ii. 450. 1858.
- Cycl. transversa*, Say. New Harm. Diss. ii. 356, 1829. Fer. Mag. Zool. 1835. New Harm. Diss. Rept. 10, 1840. DeKay, 224, 1842. Jay. Cat. iv. ed. 466, 1852. Pr. Bost. Proc. iv. 274, 1852. Bgt. Amen. i. p. 9, 1853. Lewis, Bost. Proc. v. 122, 1855. Lewis, loc. sup. cit. vi. 2, 1856.
- Cycl. detruncata*, Pr. Loc. sup. cit. iv. 155, 1851, iv. 273, 1852. Bgt. Amen. i. p. 8, 1858.
- Cycl. constricta*, Anthony. Pr. Bost. Proc. iv. 274. 1852.
- Sph. detruncatum*, Pr. Ads. Rec. Gen. ii. 450. 1858.
- Sph. constrictum*, Anth. Loc. sup. cit. ii. 450. 1858.
- Hab. N. America.
- Cycl. transversa*, Lev. Grateloup, Moll. Fr. Cont. 49. 1855. Is *Sph. Parisiense*, Pr.
88. *Sph. triangulare*, Say.
- Cyclas triangularis*, Say. New Harm. Dissem. 2. 356, 1829. Fer. Mag. Zool. 1835. New Harm. Dissem. (rept.) 10, 1860. Bgt. Amen. i. p. 9, 1853.
- Hab. N. America.

- Cycl. triangularis*, Dub. Fos. Wohl. 59, pl. vi. f. 20, 21, 1831.
Is *Ericina triangularis*, d'Orb.
- Cycl. trigona*, Gldf. Petr. Germ. 2, 233, pl. 147, f. 11, a-b. 1834-40
Is *Cyrena Rœmeri*, Dkr.
- Cycl. trigona*, d'Orb. Prod. 2, 304. 1850. Is *Cyrena trigona*, Desh.
89. *Sph. truncatum*, Linsley. Ads. Rec. Gen. ii. 451. 1858.
Cyclas calyculata, Drap. C. B. Ads. Amer. II. xl. 277, 1841. Ads.
Vermt. 18, 1842. Ads. Cat. 29, 1847.
Cyclas truncata, Linsl. Gould. Amer. II. n. ser. vi. 234, f. 3, 1848.
Pr. Bost. Proc. iv. 165, 1751. Jay, Cat. iv. ed. 466, 1852. Bgt.
Amen. i. p. 9, 1853.
Cyclas pellucida, Pr. Stimps. N. E. Moll. 16, 1851. Jay, Cat. iv. ed.
465, 1852. Bost. Proc. iv. 277, 1852. Bgt. Amen. i. p. 9, 1853.
Sph. pellucidum, Pr. Ads. Rec. Gen. ii. 450. 1858.
Hab. N. America.
—*Cycl. tuberculata*, Klees. Tubing 45. 1818. Is *Sph. lacustre*, Fer.
—*Cycl. tumida*, Ziegl. Villa Cat. 44. 1841. Is *Sph. corneum*, Scop.
90. *Sph. unguiforme*, Boissy. Bgt. Sph. 42. 1854.
Cycl. unguiformis, Boissy. Bull. Soc. Géol. Tr. 2d ser. iv. 178, 1846.
Mem. Soc. Géol. Tr. 2d ser. 3, 269, pl. v. f. 2, 1848.
Hab. France, (fossil.)
—*Cycl. Ustuertensis*, Eichw. Faun. Casp. 263. 1841. Is *Arthemis*
Ustuertensis, Eichw.
—*Cycl. Vapincana*, d'Orb. Prod. 2. 381. 1850. Is *Cyrena Vapincana*, Bgt.
91. *Sph. Veatleyi*, C. B. Adams.
Cycl. Veatleyi, C. B. Ads. Contrib. Conch. 44. 1869. Jay, Cat. iv. ed.
32. 1850. Bgt. Amen. 1, p. g. 1853.
Pisid. Veatleyi, Petit. II Conch. 2, 421. 1851. Bgt. Amen. 1, p. 53.
1853.
Musculium Veatleyi, C. B. Ads. Ads. Rec. Gen. ii. 452. 1858.
Pisum Veatleyi, C. B. Ads. Ads. loc. sup. cit. ii. 560. 1858.
Hab. Jamaica.
—*Cycl. Venezuelensis*, Pr. In Collect. Mus. Leyden, 1857. Is *Sph.*
maculatum, Morelet.
92. *Sph. Verneuli*, Boissy. Bgt. Sph. 42. 1854.
Cycl. lenticularis, Boissy. Bull. Soc. Geol. Fr. 2d ser. iv. 178. 1846.
Cycl. Verneuli, Boissy. Mem. Soc. Geol. Fr. 2d ser. 4, 569, pl. v. f. 3.
1848.
Hab. France, (fossil.)
—*Cycl. violacea*, Lam. Ann. Mus. vii. 421. 1806. Is *Battissa violacea*, Adams.
—*Cycl. vitrea*, Risso. Risso, iv. 338. 1826. Is *Pisid. casertanum*,
Bgt.
—*Cycl. Zeylanica*, Lam. Ann. Mus. vii. 420. 1806. Is *Cyrena Zeylanica*, Lam.
93. *Sph. zonatum*, Pr. MSS. 1859, in Collect. Cumming.
Hab. N. Zealand.

On motion, an election was held, and Mr. Wm. C. Henszey was chosen Treasurer in place of George W. Carpenter deceased.

July 3d.

Vice-President BRIDGES in the Chair.

Twenty-nine members present.

The following papers were presented for publication :

“ Descriptions of two new species of Uniones from Georgia.” By Isaac Lea.

“ Descriptions of three new species of Uniones from Mexico.” By Isaac Lea.

“ Descriptions of six new species of Unionidæ from Alabama.” By Isaac Lea.

“ Descriptions of seven new species of Unionidæ from the United States.” By Isaac Lea.

“ Descriptions of three new species of Exotic Unionidæ.” By Isaac Lea.

“ Descriptions of new fossil remains collected in Nebraska and Utah, by the Exploring Expeditions under the command of Capt. J. H. Simpson, of U. S. Topographical Engineers,” [extracted from that officer's forthcoming report.] By F. B. Meek.

And were referred to Committees.

Dr. Darrach presented the following list of plants seen in flower in the neighborhood of Philadelphia during the month of June.

<p>RANUNCULACEÆ.</p> <p>Thalictrum cornuti. Ranunculus alismæfolius. Actæa spicata, v. alba. Cimicifuga racemosa.</p> <p>MENISPERMACEÆ.</p> <p>Menispermum canadense.</p> <p>CABOMBACEÆ.</p> <p>Brasenia peltata.</p> <p>PAPAVERACEÆ.</p> <p>Papaver dubium.</p> <p>CRUCIFERÆ.</p> <p>Nasturtium sylvestre. “ palustre. Arabis Canadensis. Camelina sativa. Lepidium Virginicum.</p> <p>VIOLACEÆ.</p> <p>Viola Canadensis.</p> <p>HYPERICACEÆ.</p> <p>Hypericum perforatum. “ corymbosum.</p> <p>CARYOPHYLLACEÆ.</p> <p>Agrostemma githago. Spergularia rubra. Anychia dichotoma. Mollugo verticillata.</p>	<p>PORTULACACEÆ.</p> <p>Portulaca oleracea.</p> <p>MALVACEÆ.</p> <p>Malva rotundifolia.</p> <p>TILIACEÆ.</p> <p>Tilia Americana.</p> <p>LINACEÆ.</p> <p>Linum usitatissimum.</p> <p>ANACARDIACEÆ.</p> <p>Rhus venenata.</p> <p>VITACEÆ.</p> <p>Vitis cordifolia.</p> <p>RHAMNACEÆ.</p> <p>Ceanothus Americanus.</p> <p>CELASTRACEÆ.</p> <p>Euonymus atropurpureus.</p> <p>POLYGALACEÆ.</p> <p>Polygala lutea.</p> <p>LEGUMINOSÆ.</p> <p>Robinia pseudacacia. Tephrosia Virginiana. Lathyrus palustris.</p> <p>ROSACEÆ.</p> <p>Spiræa opulifolia. Gillenia trifoliata.</p>
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Geum album.
Potentilla Norvegica.
Rubus odoratus.
 " *occidentalis.*
 " *hispidus.*
 " *cuneifolius.*
Rosa Carolina.
 " *lucida.*
 " *rubiginosa.*
Cratægus crus galli.
 ONAGRACEÆ.
Oenothera fruticosa.
Circæa lutetiana.
 CACTACEÆ.
Opuntia vulgaris.
 SAXIFRAGACEÆ.
Itea Virginica.
Hydrangea arborescens.
 UMBELLIFERÆ.
Hydrocôtyle umbellata.
 " *Americana.*
Sanicula Canadensis.
Pastinaca sativa.
Thaspium aureum.
Cicuta maculata.
Cryptotaenia Canadensis.
 CORNACEÆ.
Cornus sericea.
 " *paniculata.*
 CAPRIFOLIACEÆ.
Triosteum perfoliatum.
Sambucus Canadensis.
Viburnum nudum.
 " *prunifolium.*
 " *dentatum.*
 RUBIACEÆ.
Galium aparine.
 " *asprellum.*
 " *trifidum.*
 " *pilosum.*
 " *circæzans.*
Mitchella repens.
 COMPOSITÆ.
Erigeron Philadelphicum.
 " *annuum.*
 " *strigosum.*
Rudbeckia hirta.
Maruta cotula.
Achillea millefolium.
Gnaphalium purpureum.
Cirsium horridulum.
 " *arvense.*

Cichorium intybus.
Hieracium Gronovii.
 " *paniculatum.*
Lactuca elongata.
 LOBELIACEÆ.
Lobelia inflata.
 " *spicata.*
 CAMPANULACEÆ.
Specularia perfoliata.
 ERICACEÆ.
Gaylussacia dumosa.
Vaccinium macrocarpon.
Andromeda ligustrina.
Azalea viscosa.
Pyrola rotundifolia.
 " *eliptica.*
 " *secunda.*
Chimaphila maculata.
Monotropa uniflora.
 AQUIFOLIACEÆ.
Ilex opaca.
 " *verticillata.*
 " *lævigata.*
 " *glabra.*
 PLANTAGINACEÆ.
Plantago major.
 PRIMULACEÆ.
Lysimachia stricta.
 " *quadrifolia.*
 " *ciliata.*
 LENTIBULACEÆ.
Utricularia striata.
 BIGNONIACEÆ.
Catalpa bignonioides.
 SCROPHULARIACEÆ.
Verbascum thapsus.
 " *blattaria.*
 " *lychnitis.*
Linaria vulgaris.
Scrophularia nodosa.
Pentstemon pubescens.
Gratiola Virginiana.
Veronica anagallis.
 " *scutellata.*
Melampyrum Americanum.
 VERBENACEÆ.
Verbena urticifolia.
 LABIATÆ.
Nepeta glechoma.
Scutellaria lateriflora.
Leonurus cardiaca.

<p style="text-align: center;">BORRAGINACEÆ.</p> <p>Onosmodium Virginianum. Cynoglossum officinale. " Virginicum.</p> <p style="text-align: center;">POLEMONIACEÆ.</p> <p>Phlox maculata.</p> <p style="text-align: center;">CONVOLVULACEÆ.</p> <p>Ipomæa pandurata. Convolvulus arvensis. Calystegia sepium.</p> <p style="text-align: center;">SOLANACEÆ.</p> <p>Solanum dulcamara. " Carolinense. " nigrum. Physalis angulata. Datura stramonium.</p> <p style="text-align: center;">APOCYNACEÆ.</p> <p>Apocynum androsamifolium. " cannibinum.</p> <p style="text-align: center;">ASCLEPIADACEÆ.</p> <p>Asclepias cornuti. " quadrifolia. " phytolaccoides. " variegata. " obtusifolia. " tuberosa.</p> <p style="text-align: center;">OLEACEÆ.</p> <p>Ligustrum vulgare.</p> <p style="text-align: center;">POLYGONACEÆ.</p> <p>Polygonum aviculare. " convolvulus.</p>	<p style="text-align: center;">ARACEÆ.</p> <p>Peltandra Virginica. Acorus calamus.</p> <p style="text-align: center;">NAIADACEÆ.</p> <p>Potamogeton natans.</p> <p style="text-align: center;">ALISMACEÆ.</p> <p>Sagittaria variabilis.</p> <p style="text-align: center;">HYDROCHARIDACEÆ.</p> <p>Anacharis Canadensis.</p> <p style="text-align: center;">ORCHIDACEÆ.</p> <p>Platanthera lacera. " fimbriata. Spiranthes latifolia. Pogonia ophioglossoides. Calopogon pulchellus. Liparis liliifolia. Corallorhiza odontorrhiza. Cypripedium pubescens.</p> <p style="text-align: center;">HÆMODOREACEÆ.</p> <p>Aletris farinosa.</p> <p style="text-align: center;">IRIDACEÆ.</p> <p>Iris Virginica. Sisyrinchium Bermudiana.</p> <p style="text-align: center;">DIOSCOREACEÆ.</p> <p>Dioscorea villosa.</p> <p style="text-align: center;">SMILACEÆ.</p> <p>Smilax pseudochina.</p> <p style="text-align: center;">MELANTHACEÆ.</p> <p>Amianthium muscætoxicum. Xerophyllum asphodeloides. Chamælorium luteum. Species 160.</p>
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July 17th.

DR. ISAAC HAYS in the Chair.

Twenty-three members present.

The following papers were presented for publication :

"Notes on Coleoptera found at Fort Simpson, Mackenzie River, with remarks on other northern species." By John L. Le Conte, M. D.

"Synopsis of the Scaphidiidæ of the United States." By John L. Le Conte, M. D.

And were referred to Committees.

Mr. Gabb presented a Catalogue of the Museum of the Academy for the use of visitors, which was referred to the Committee on Proceedings with power to publish.

The number of the Proceedings for June was laid on the table by the Committee.

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July 24th.

DR. B. H. COATES in the Chair.

Nineteen members present.

A paper was presented for publication entitled
 "Description of a new species of Cephalopod from the Eocene of Texas." By Wm. M. Gabb.

And was referred to a Committee.

Dr. Leidy mentioned that he had recently found near Jackson, New Jersey, a specimen of *Hyla viridis* or *lateralis*, a species not previously found north of Baltimore.

July 31st.

DR. EMERSON in the Chair.

Seventeen members present.

On report of the respective Committees, the following papers were ordered to be published in the proceedings.

Descriptions of Two New Species of UNIONES from Georgia.

BY ISAAC LEA.

UNIO LINGUÆFORMIS.—Testâ lævi, ellipticâ, compressâ, ad laterè planulatâ, inæquilaterali, posticè obtusè biangulatâ, anticè rotundatâ; valvulis subtenuibus, anticè crassioribus; natibus prominulis; epidermide pallido-luteâ, subnitidâ, virido-radiatâ, dentibus cardinalibus parviusculis, obtuso-conicis. crenulatis, in utroque valvulo duplicibus; lateralibus sublongis, lamellatis subcurvisque, margaritâ albâ et valdè iridescente.

Hab.—Columbus, Georgia.

UNIO DISPAR.—Testa lævi, ellipticâ, subinflatâ, ad laterè paulisper planulatâ, valdè inæquilaterali, posticè obtusè angulatâ, anticè rotundatâ; valvulis subcrassis; natibus prominulis, ad apices undulatis; epidermide vel luteâ vel olivâ et valdè radiatâ; dentibus cardinalibus parviusculis, compressis, in utroque valvulo duplicibus, erectis, crenulatis; lateralibus longis, lamellatis curvisque, margaritâ albâ et iridescente.

Hab.—Columbus, Georgia, Bishop Elliott and G. Hallenbeck.

Descriptions of Three New Species of UNIONES from Mexico.

BY ISAAC LEA.

UNIO COUCHIANUS.—Testâ lævi, quadratâ, inflatâ, biemarginatâ, ad laterè sulcatâ, inæquilaterali, posticè biangulatâ, anticè rotundâ; valvulis crassis, anticè crassioribus; natibus prominentibus; epidermide olivo-fuscâ, striatâ, eradiatâ; dentibus cardinalibus subgrandibus, erectis, rugoso-striatis, crenulatis; lateralibus sublongis, crassis curvisque; margaritâ argenteâ et valdè iridescente.

Hab.—Rio Salado, New Leon, Mexico, L. Berlandier, M. D.

UNIO SALADOENSIS.—Testâ lævi, obovatâ, inflatâ, inæquilaterali, posticè et anticè rotundatâ; valvulis subtenuibus, anticè paulisper crassioribus; natibus prominulis, lævibus; epidermide luteo-olivâ, politâ radiatâque; dentibus cardinalibus parvis, lamellatis, obliquis; lateralibus sublongis, lamellatis subcurvisque; margaritâ cæruleo-albâ et iridescente.

Hab.—Rio Salado, New Leon, Mexico, L. Berlandier, M. D.

1860.]

UNIO COGNATUS.—Testâ lævi, ellipticâ, crassâ, subinflatâ, valdè inæquilaterali, posticè obtusè angulatâ, anticè rotundatâ; valvulis crassis, anticè crassioribus; natibus subprominentibus; epidermide luteolâ radiatâque; dentibus cardinalibus grandibus, crassis, pyramidatis, rugoso-striatis; lateralibus subcurtis, subcurvis crassisque; margaritâ albâ et valdè iridescente.

Hab.—Rio Salado, New Leon, Mexico, L. Berlandier, M. D.

Descriptions of Seven New Species of UNIONIDÆ from the United States.

BY ISAAC LEA.

UNIO LESLEYI.—Testâ lævi, obliquâ, subcompressâ, ad laterè planulatâ, valdè inæquilaterali, posticè angulatâ, anticè rotundâ; valvulis crassis, anticè crassioribus; natibus subelevatis; epidermide luteolâ, radiis interruptis; dentibus cardinalibus crassis, compresso-conicis, obliquis; lateralibus longis, crassis subcurvisque; margaritâ albâ et iridescente.

Hab.—Kentucky, Mr. Joseph Lesley. Tennessee, Mr. J. G. Anthony.

UNIO CASTUS.—Testâ lævi, inflatâ, inæquilaterali, posticè angulatâ, anticè rotundâ, valvulis crassiusculis, anticè crassioribus; natibus subprominentibus; epidermide micante, luteo-viridi, radiatâ; dentibus cardinalibus subgrandibus, compresso-conicis, striatis crenulatisque; lateralibus subbrevibus, rectis, lamellatis striatisque; margaritâ albâ et iridescente.

Hab.—South Carolina, Prof. Tuomey.

UNIO LINDSLEYI.—Testâ lævi, ellipticâ, compressâ, ad laterè planulatâ, valdè inæquilaterali, posticè subbiangulatâ, anticè obliquè rotundatâ; valvulis subcrassis, anticè crassioribus; natibus prominulis; epidermide vel luteâ vel luteo-olivâ, micante, undiquè virido-maculatâ; dentibus cardinalibus parviusculis, compresso-conicis crenulatisque; lateralibus longis, crassis curvisque; margaritâ albâ et iridescente.

Hab.—Tennessee, President J. B. Lindsley.

UNIO PERPICTUS.—Testâ lævi, ellipticâ, subinflatâ, valdè inæquilaterali, posticè obtusè biangulatâ, anticè rotundatâ; valvulis tenuibus, diaphanis, anticè crassioribus; natibus prominulis, ad apices undulatis; epidermide luteo-olivâ subnitidâ, undiquè virido-radiatâ; dentibus cardinalibus parvis, erectis, conicis, crenulatis, in utroque valvulo duplicibus; lateralibus longis lamellatis rectisque; margaritâ cæruleo-albâ et valdè iridescente.

Hab.—Bull River, Tennessee, President Estabrook, and Holston River, Prof. Troost.

UNIO EIGHTSII.—Testâ plicatâ, quadratâ, subcompressâ, maximè undulatâ, usque ad natium apices, valdè inæquilaterali; valvulis crassissimis, anticè crassioribus; natibus elevatis, compressis, ad apices rugoso-undulatis; epidermide tenebroso-fuscâ, eradiatâ, striatâ; dentibus cardinalibus magnis, crassis et valdè striatis; lateralibus longis, crassis, lamellatis subcurvisque; margaritâ albâ et valdè iridescente.

Hab.—Texas and Sabinas River, New Leon, Mexico, James Eights, M. D.

UNIO QUADRANS.—Testâ lævi, quadratâ, valdè ventricosâ, subæquilaterali, posticè obtusè angulatâ, anticè subtruncatâ, valvulis crassis, anticè paulisper crassioribus; natibus elevatis, tumidis; epidermide tenebroso-fuscâ, eradiatâ, transversè striatâ; dentibus cardinalibus magnis, valdè compressis, striatis crenulatisque; lateralibus longis, crassis curvisque; margaritâ albâ et iridescente.

Hab.—Texas, Mr. C. M. Wheatley.

ANODONTA KENNERLYI.—Testâ lævi, ellipticâ, subcylindraceâ, subventricosâ, valdè inæquilaterali, anticè, subtruncatâ, posticè biangulatâ; valvulis tenuissimis, diaphanis; natibus vix prominentibus, ad apices exilissimè undulatis;

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epidermide luteo-olivâ, micante, ad margine striatâ, eradiatâ: margaritâ cæruleo-albâ et valdè iridescente.

Hab.—Chiloweyuch Depot, near Puget's Sound, Washington Territory, C. B. Kennerly, M. D.

Descriptions of Six New Species of UNIONIDÆ from Alabama.

BY ISAAC LEA.

UNIO SHOWALTERII.—Testâ lævi, subrotundâ, crassâ, sublenticulari, æquilaterali; valvulis crassis, anticè crassioribus; natibus elevatis, tumidis; epidermide tenebroso-fuscâ, eradiatâ; dentibus cardinalibus crassis, erectis, compressis, in utroque valvulo duplicibus; lateralibus brevibus, percrassis corrugatisque; margaritâ argenteâ et valdè iridescente.

Hab.—Coosa River, Watumpka, Alab., E. R. Showalter, M. D.

UNIO HARTMANIANUS.—Testâ lævi, obliquè triangulari, crassâ, tumidâ, posticè subbiangulari, inæquilaterali; valvulis percrassis, anticè crassioribus; natibus valdè elevatis, crassis; epidermidè tenebroso-fuscâ, posticè luteolâ, eradiatâ; dentibus cardinalibus subgrandibus, erectis, compressis, corrugatis, in utroque valvulo duplicibus; lateralibus brevibus, percrassis, obliquis corrugatisque; margaritâ argenteâ et iridescente.

Hab.—Coosa River, Watumpka, Alab., E. R. Showalter, M. D.

UNIO DOLOSUS.—Testâ lævi, obovatâ, subalatâ, subcompressâ, ad laterè planulatâ, posticè et anticè rotundatâ, valdè inæquilaterali; valvulis subtenuibus; natibus prominulis, ad apices minutè undulatis; epidermide virido-olivâ et obsoletè radiatâ; dentibus cardinalibus parvis, compressis crenulatisque; lateralibus longis, lamellatis subcurvisque; margaritâ albidâ et purpurâ, paulisper tinctâ et valdè iridescente.

Hab.—Alabama River, Claiborne, Alab., Judge Tait. Coosa River, E. R. Showalter, M. D.

UNIO PARVULUS.—Testâ plicatâ, transversâ, subinflatâ, ad laterè compressâ, posticè obtusè angulatâ, valdè inæquilaterali; valvulis tenuibus, anticè paulisper crassioribus; natibus prominulis; epidermidè olivaceâ, subvirido-maculatâ; dentibus cardinalibus parvis, compressis, crenulatis, in utroque valvulo duplicibus; lateralibus longis subrectisque; margaritâ cæruleâ et iridescente.

Hab.—Coosa River, Alab., E. R. Showalter, M. D.

UNIO PLANCUS.—Testâ lævi, obliquo-ovatâ, subcompressâ, posticè biangulatâ, anticè rotundatâ, valdè inæquilaterali; valvulis crassiusculis, anticè paulisper crassioribus; natibus prominulis; epidermide luteo-fuscâ, radiatâ; dentibus cardinalibus parvis, erectis, crenulatis, in utroque valvulo duplicibus; lateralibus sublongis subrectisque; margaritâ cæruleo-albâ et valdè iridescente.

Hab.—Coosa River, at Watumpka, Alab., E. R. Showalter, M. D.

ANODONTA SHOWALTERII.—Testâ lævi, ellipticâ, ventricosâ, posticè obtusè angulatâ, anticè rotundatâ, subæquilaterali; valvulis crassiusculis, anticè paulisper crassioribus; natibus subprominentibus, ad apices minutè undulatis; epidermide tenebroso-fuscâ, obsoletè radiatâ; margaritâ vel albâ vel paulisper salmonis colore tinctâ et iridescente.

Hab.—Coosa River, Watumpka, Alab., E. R. Showalter, M. D.

Descriptions of Three New Species of Exotic UNIONIDÆ.

BY ISAAC LEA.

UNIO OCCATUS.—Testa plicatâ, ellipticâ, rugoso-occatâ, compressâ, valdè inæquilaterali, posticè biangulatâ, anticè, regulariter rotundatâ; natibus prominulis, valdè compressis, ad apices plicis, pulchris divaricatis; epidermide luteo-1860.]

olivá et valdè rugosá; dentibus cardinalibus parvis, compressis, obliquis; lateralibus sublongis subcurvisque; margaritá albá et valdè iridescente.

Hab.—Bengal, W. A. Haines.

ANODONTA CAILLIAUDII.—Testá lævi, rotundá, ventricosá, inæquilaterali, anticè supernè angulatá; valvulis crassis, anticè paulisper crassioribus; natibus elevatis, tumidis, incurvis; epidermide nigro-fuscá, obsoletè radiatá, supernè micante, infernè exilissimè striatá; margaritá argenteá et valdè iridescente.

Hab.—Brazil, Monr. F. Cailliaud.

MYCETOPUS EMARGINATUS.—Testá lævi, transversissimè, compressá, emarginatá, ad latere planulatá, anticè inflatá, posticè ampliátá et compressá; valvulis pertenuibus, diaphinis, natibus parvis, prominulis; epidermide luteo-cornea, valdè striatá, nitidá, eraditá; margaritá cæruleo-albá et valdè iridescente.

Hab.—Siam, S. R. House, M. D.

Descriptions of new Fossil Remains collected in Nebraska and Utah, by the Exploring Expeditions under the command of Capt. J. H. Simpson, of U. S. Topographical Engineers, [extracted from that officer's forthcoming report.]*

BY F. B. MEEK.

DEVONIAN SPECIES.

BRACHIOPODA.

SPINIFERA NORWOODI, Meek.—Shell rather small, semicircular, wider than long, having its greatest breadth on the hinge line. Ventral valve very convex at the umbo, sloping abruptly to the front and sides; beak elevated, rather pointed, and more or less arched over the area, sometimes a little twisted to one side; mesial sinus rather shallow, rounded, and extending to the point of the beak, from which it widens and deepens very gradually to the front; area triangular, but wider than high, rather distinctly arched; foramen very narrow, and apparently entirely open, having a depressed line along each lateral margin. Dorsal valve convex, but much more depressed than the other; mesial fold obscure in the umbonal region, slightly elevated, and rounded at the front. Surface of each valve ornamented by about forty small depressed, radiating costæ, some six or seven of which occupy the mesial sinus of the ventral valve, and seven or eight the fold of the dorsal valve. Length 0.50 inch; breadth (along hinge line) about 0.75 inch; convexity 0.42 inch.

Named in honor of Dr. J. G. Norwood of the Geological Survey of Missouri.

Locality and position. West side of Buell Valley, lat. 39° 30' north, long. 115° 36' west.

SPINIFERA ENGELMANNI, Meek.—Shell rather small, semicircular, about twice as wide as long; hinge equalling the greatest breadth, angular at the extremities. Dorsal valve depressed convex; mesial fold rather narrow, slightly elevated, flattened along the middle, and apparently without plications. Ventral valve very convex in the umbonal region, sloping abruptly to the sides and front; beak pointed, more or less arched; area high, triangular, the hinge side being longer than the lateral slopes, which are usually somewhat angular, generally rather strongly arcuate and inclined a little backwards over the hinge; foramen very narrow, apparently open to the point of the beak; mesial sinus narrow, shallow, extending to the beak, flattened

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in the middle, and without plications. Surface ornamented by from seven to nine depressed, rounded, simple, plications on each side of the fold and sinus. Length of hinge about 0.66 inch; diameter from hinge to front 0.39 inch; height of area 0.26 inch.

Named in honor of Mr. Henry Engelmann, Geologist of Capt. Simpson's Expedition.

Locality and position. Neill's Valley, lat. $39^{\circ} 32'$, long. $115^{\circ} 36'$.

SPIRIFERA MACRA, Meek.—Shell rather under medium size, subtrigonal, or sub-semicircular, considerably wider than long; hinge line equalling the greatest width, and terminating in rather salient angles. Dorsal valve convex in the middle, compressed towards the lateral extremities; mesial fold narrow, prominent and angular, especially near the front. Ventral valve more convex than the other, sloping somewhat abruptly from the umbo to the sides and front; mesial sinus narrow, rather deep, with sloping sides, continued to the beak, which is pointed and incurved; area of moderate breadth, with well defined sloping lateral margins, apparently not continued quite to the extremities of the hinge, arched and inclined back over the cardinal margin; foramen triangular, higher than wide. Surface of each valve ornamented by about eighteen to twenty-four moderately distinct, more or less bifurcating plications, about six or seven of which usually occupy the mesial fold, and five or six the mesial sinus. Length of hinge, about 1.19 inches; diameter from hinge to front 0.63 inch; height of area 0.16 inch.

Locality and position. Same as last.

CARBONIFEROUS SPECIES.

BRACHIOPODA.

PRODUCTUS SEMISTRATUS, Meek.—Shell of medium size, greatest breadth on the hinge line, which is nearly twice the length, measuring from the hinge to the anterior curve. (Dorsal valve unknown.) Ventral valve very gibbous, extremely arched, and greatly produced in front; sometimes provided with an obscure, very shallow mesial sinus, which never extends to the beak; ears triangular, strongly vaulted, extended nearly at right angles to the vertical sides of the elevated visceral arch, from which they are each separated by an oblique, undefined sulcus; beak very convex, distinctly incurved, and extended a little beyond the hinge; surface of the visceral region marked by small, obscure concentric wrinkles, which are crossed by numerous, more or less bifurcating striae; anterior half, smooth or only marked by fine lines of growth; spines rather long, erect and scattering. Length of hinge, 1.19 inches; diameter from hinge to anterior curve, 0.72 inch; length from the beak to the anterior margin of the ventral valve, measuring around its curve, 2.14 inches.

Locality and position. Timpanogos Canon, lat. $40^{\circ} 22'$, long. $111^{\circ} 38'$, in dark argillaceous rock. Probably of the age of the Coal measures.

PRODUCTUS MULTISTRATUS, Meek.—Shell above medium size, breadth nearly double the length, from the hinge to the anterior slope; hingeline longer than the breadth of the shell in front of it; ears moderately large, triangular, distinctly vaulted, and standing nearly at right angles to the swell of the larger valve. Ventral valve extremely ventricose, strongly arched, and provided with a broad, deep, mesial sinus, extending from the beak to the front; beak rather small, compressed, and projecting little beyond the hinge. Dorsal valve deeply concave, provided with three broad, obscure, radiating prominences, one of which corresponds to the mesial sinus of the other valve, and the other two radiate to the lateral margins in front of the ears. Surface of both valves marked by numerous fine, obscure radiating striae, destitute of spines excepting about three near the extremity of each ear, and some three or four on the anterior slope of the ventral valve. Length of hinge near 1.77 1860.]

inches; length from hinge to anterior slope 1 inch; greatest breadth in front of the hinge 1.48 inches.

Locality and position. Yellowish limestone series, east side of Long Valley, lat. $39^{\circ} 57'$ north, long. $115^{\circ} 10'$ west. Probably of upper carboniferous age.

SPIRIFERA SCOBINA, Meek.—Shell rather large, subcircular, approaching sub-pentagonal, moderately gibbous, length and breadth nearly equal, hinge line scarcely equalling the greatest breadth; lateral margin rounding anteriorly and intersecting the hinge almost at right angles. Valves nearly equally convex, each provided with from about seventeen to twenty-two, rather broad, depressed, occasionally bifurcating plications. Ventral valve a little more gibbous than the other, and having a shallow mesial sinus, which is very small near the beak, but widens gradually towards the front; beak moderately prominent, incurved; area of medium breadth, with nearly parallel margins, extending to the lateral extremities of the hinge, distinctly arched near the beak; foramen having nearly the form of an equilateral triangle. Dorsal valve moderately convex in the umbonal region; beak rather prominent and incurved; mesial fold depressed, not distinctly defined excepting at the front, where it is generally flattened. Surface of both valves apparently without striae, but beautifully ornamented by numerous minute regularly disposed granules. Breadth 2 inches; length 1.88 inches; convexity 1.34 inches.

Locality and position. Divide between Long and Ruby Valleys, lat. 40° north; long. $115^{\circ} 20'$ west, from the yellowish limestone series. Probably upper carboniferous.

SPIRIFERA PULCHRA, Meek.—Shell of medium size, more or less compressed, length from one half to to one third the breadth; hinge line equalling the greatest width; lateral extremities often much extended, compressed and acutely pointed. Ventral valve more convex than the other in the umbonal region; beak rather small and not very strongly incurved; area somewhat narrow, very slightly arched, or inclined back over the hinge, its margins being sub-parallel; foramen triangular, a little higher than wide; mesial sinus narrow, well defined and rather deep, smoothly rounded within, extending to the point of the beak, from which it widens very gradually towards the front. On each side of the mesial sinus of the ventral valve, and its corresponding elevation on the dorsal valve, there are from seven to nine, simple, elevated, rather sharply rounded plications. Entire surface ornamented by fine regularly disposed punctæ and moderately distinct marks of growth, which latter arch in crossing the plications and mesial fold. Length of largest specimen 1.13 inches; breadth 3.10 inches; convexity 0.76 inch.

Locality and position. East and west side of Long Valley, and Pass east of Ruby Valley, lat. 40° north, long. $115^{\circ} 20'$ west. Geological position same as last.

CONCHIFERA.

PECTEN UTAHENSIS, Meek.—Shell of medium size, thin sub-circular, much compressed, apparently nearly equivalve, the left valve being slightly more convex than the other; ears small, subequal, triangular, and distinctly flattened; posterior ear truncate nearly at right angles to the hinge, sometimes a little rounded on the truncate edge; anterior ear separated from the margin by a very shallow sinus; surface of the left valve ornamented by rather obscure, unequal, depressed, radiating costæ, and numerous, extremely fine, equidistant, thread-like, concentric lines, scarcely visible without the aid of a lens; right valve smooth, or only marked by fine concentric striae. Length about 1.10 inches; breadth 1.20 inches; length of hinge 0.57 inch.

Locality and position. Summit Spring Pass, divided between Long and Ruby Valleys, lat. $39^{\circ} 33'$, long. $115^{\circ} 12'$ west. Probably upper carboniferous.

CEPHALOPODA.

ORTAOCERAS BACULUM, Meek.—Shell rather small, elongate conical; section
[July,

very nearly circular near the smaller end, and slightly oval towards the aperture; sides diverging from the apex at an angle of 8° ; septa distinctly concave on the anterior sides, separated by spaces equal to one-fifth their own greater diameter; siphuncle rounded, nearly, but not quite central, a little less than one sixth the diameter of the shell; surface apparently smooth.

Locality and position. East side Ruby Valley, lat. $40'$ north, long. $115^{\circ} 20'$ west. Probably lower carboniferous.

JURASSIC SPECIES.

CONCHIFERA.

OSTREA ENGELMANNI, Meek.—The collection contains only upper valves of this species, all of which are much compressed, rather thin, and subovate, more or less irregular in form. Beak distinctly truncate and provided with a broad but short area. Surface ornamented by from seven or eight, to about fifteen irregular, moderately distinct, rather rounded, radiating plications, that do not usually extend upon the umbo, but become quite distinct at the border, which is usually thin. Lines of growth regular, and moderately well defined, but not imbricating. Muscular scar rather large, ovate and distinct. Length (of the largest specimen) 3.50 inches; breadth 3 inches.

Locality and position. Jurassic beds at Red Buttes, on the North Platte, lat. $42^{\circ} 50'$, long. $106^{\circ} 40'$ west.

PECTEN BELLISTRIATA, Meek.—Shell of medium size, subcircular, sometimes wider than long, thin, compressed, nearly or quite equivalve; hinge straight and very short; posterior wing small or nearly obsolete, obliquely truncate; anterior wing small, vertically truncate at the extremity, and in the right valve separated from the margin below, by a distinct more or less angular sinus, from which a shallow flat groove, extends obliquely to the beak; beaks of both valves small, and rather compressed; surface ornamented by numerous fine, arched, bifurcating, striæ, crossed by extremely small, closely arranged concentric lines, which are often nearly obsolete on the radiating striæ over the more convex portions of the valves, but quite distinct in the slender depressions between, to which they impart a punctate appearance. Length (broad variety) 2.26 inches; breadth, 2.65 inches; convexity 0.64 inch.

Locality and position. Same as last.

GASTEROPODA.

DENTALIUM? SUBQUADRATUM, Meek.—Shell small, thin, slender, regularly and slightly arcuate, very gradually tapering, flattened or a little concave on four sides so as to present a subquadrangular section, the angles being a little rounded; section of internal cavity, circular; surface apparently without longitudinal striæ or marks of growth. Length about one inch; diameter at larger end 0.05 inch; do. at the smaller extremity 0.02 .

Locality and position. Jurassic beds on the North Platte, at Red Buttes, lat. $42^{\circ} 50'$ north, long. $106^{\circ} 40'$ west.

CRETACEOUS SPECIES.

CONCHIFERA.

ANOMIA CONCENTRICA, Meek.—Shell small, thin, subcircular or transversely a little oval; lateral extremities nearly equally rounded; cardinal margin rather straight or but slightly arched; beak very small, central, compressed, marginal, not projecting beyond the cardinal border; surface of upper valve, ornamented by moderately distinct regular, concentric, undulations, and much smaller obscure lines of growth. Transverse diameter 0.64 inch; length from hinge to the opposite margin 0.50 inch.

Locality and position. Near Bear River, on Sulphur Creek, lat. $41^{\circ} 12'$, long. $110^{\circ} 50'$, in whitish sandstone, with an oyster very similar to *O. glabra*, 1860.]

Meek & Hayden, and a small *Inoceramus*. Probably of lower Cretaceous age, but may be older.

INOCERAMUS SIMPSONI, Meek.—Shell attaining a large size, transversely elongate, or narrow, oval, gibbous in the umbonal and anterior regions, cuneate posteriorly; buccal side rounded; anal side very long, usually broader than the other, and subtruncate at the extremity; base in young shells semiovate, being more convex behind than in front, in large specimens rounding up very gradually towards the front, and apparently a little contracted, or slightly sinuous behind; hinge straight, very long; beaks rising little above the cardinal border, rather convex, located very near the anterior extremity; surface ornamented by moderately distinct, rather regular, concentric undulations, which sometimes bifurcate on the flanks; lines of growth small, regular, and equidistant. Length 8·10 inches; height, 4·35 inches; convexity about 3·72 inches.

The specific name of this fine *Inoceramus* is given in honor of Capt. J. H. Simpson, of the U. S. Top. Engrs., commander of the explorations for the location of wagon routes in Utah, &c.

Locality and position. North Platte above the bridge, from the horizon of No. 2 or 3, of the Nebraska cretaceous series.

TERTIARY SPECIES.

CONCHIFERA.

UNIO VETUSTA, Meek.—Shell rather thin, of medium size, narrow, much elongated transversely, moderately convex; anterior side rounded; basal and dorsal margins nearly straight and parallel; posterior side very long, more compressed and rather narrower than the other obliquely truncate above, and angular below in young shells, but becoming more rounded with age; beaks small, much depressed; located near the anterior end; surface of young specimens ornamented by fine, regular, concentric wrinkles, crossed on the umbonal slopes of each valve, by two sharply defined angles, which radiate from the beaks nearly or quite to the posterior extremity. On old and medium sized specimens, these markings become nearly or quite obsolete, excepting sometimes near the beak. Length of a large specimen 3·22 inches; height 1·30 inches; convexity about 0·60 inch.

Locality and position. Brackish-water deposits on Bear River near the mouth of Sulphur Creek, lat 41° 12' north, long. 110° 52' west.

UNIO HAYDENI, Meek.—Shell small, subelliptical, rather thin, moderately convex; extremities more or less regularly rounded, the posterior margin being sometimes obliquely subtruncate above, and more narrowly rounded below than the other; basal border semi-elliptical in outline; dorsal side nearly straight along the middle; beaks very small, depressed nearly to a level with the dorsal margin, not eroded, and apparently without wrinkles, located about half way between the middle and the anterior end; posterior umbonal slopes rather prominently rounded; surface smooth, or only showing obscure marks of growth. Length 1·65 inches; height 1 inch; convexity 0·60 inches.

Locality and position. Freshwater Tertiary beds, near Fort Bridger, and south of there, at the base Uintah Mountains, lat. 41° 40' north, long. 110° 10' west.

COBULA (POTAMOMYA ?) PYRIFORMIS, Meek.—Shell transversely pyriform, moderately thick, very gibbous in the anterior and umbonal regions, more compressed and subrostrate behind; buccal side truncate above from the beaks obliquely forward, rounding rather abruptly into the base below; posterior side much narrower, and longer than the other, and very sharply rounded or slightly truncate at the extremity; base semiovate, being much more prominent in the central and anterior regions than behind; dorsal outline declining

[July,

from the beaks at an angle of about 100° , the posterior slope being distinctly concave. Beaks prominent, incurved, and located half way between the middle and the anterior end; lunule deeply excavated, but not defined by a distinct marginal angle; escutcheon lanceolate, rather deep and circumscribed by a marginal ridge; surface marked by fine lines of growth, with sometimes near the free borders a few concentric wrinkles. Length 1.30 inches; height 0.85 inch; convexity (of a right valve) 0.39 inch.

Locality and position. Brackish-water deposits, Bear River, lat. $40^{\circ} 12'$ north, long. $110^{\circ} 52'$ west.

CORBULA (POTAMOMYA?) CONCENTRICA, Meek.—Shell ovate subtrigonal, gibbous in the umbonal region, narrow and compressed, or subrostrate behind, not very distinctly inequivalve; anterior side obliquely subtruncate above, and narrowly rounded below; ventral border semiovate in outline, being more prominent in the central and anterior regions than posteriorly; anal extremity very narrowly rounded or subangular; beaks elevated, incurved, and placed in advance of the middle; lunule oval and rather deep, though not distinctly circumscribed, escutcheon narrow, impressed and well defined; surface ornamented by fine lines of growth, and small regular, equidistant concentric wrinkles; (hinge and interior unknown). Length about 1.40 inches; height 0.90 inch; convexity about 0.65 inch.

Locality and position, same as last.

CORBULA (POTAMOMYA?) ENGELMANNI, Meek.—Shell rather small, transversely subovate, gibbous in the umbonal region; anterior side rather narrowly rounded; base semiovate, being more prominent towards the front than behind; posterior side narrow, and truncate at the immediate extremity, having a moderately distinct angle extending from the back part of the beaks obliquely backwards to the lower part of the slightly truncate posterior end, beaks depressed, located in advance of the middle; surface ornamented by small very regular concentric wrinkles. (Hinge and interior unknown.) Length (of a right valve) 0.39 inch; height 0.21 inch; convexity, 0.11 inch.

Locality and position, same as last.

GASTEROPODA.

MELANIA HUMEROSA, Meek.—Shell rather thick, sub-ovate; spire conical, not very much elevated; volutions about five and a half, distinctly shouldered; and more or less angular,—last one comparatively large, rounded and contracted below; suture distinct; surface ornamented by about fourteen rather strong, regular vertical folds or costæ to each turn; folds obsolete on the lower part of the body whorl, but becoming more strongly defined at the shoulder, where they often terminate in spine-like nodes, so as to give the whorls a distinctly coronate character; crossing these folds or costæ, there are on each volution of the spire about four, and on the last whorl some seven or eight, regular, equidistant revolving lines, or small ridges.

Locality and position, same as foregoing.

MELANIA SIMPSONI, Meek.—Shell elongate conical; spire attenuate and pointed; volutions about ten, flattened or more or less convex, increasing gradually in size, last one rounded below, suture sometimes linear, in other instances more strongly defined in consequence of the greater convexity of the whorls; surface marked by fine lines of growth, and small slightly arched vertical folds, which vary in size and regularity on different specimens, and are crossed by small obscure thread-like revolving lines; aperture ovate; columella moderately sinuous below; lip somewhat retreating above, and prominent below the middle. Length 0.78 inch; breadth 0.30 inch; apical angle nearly or quite regular, divergence about 26° .

The specific name is given in honor of Capt. J. H. Simpson, Top. Engr's U. S. Army, commander of the Utah Exploring Expeditions, &c.

1860.]

Locality and position. Higher Tertiary beds at Ham's Fork, north-east of Fort Bridger, lat. $41^{\circ} 40'$ north, long. $110^{\circ} 10'$ west. Probably miocene.

MELANIA ARCTA, Meek.—Shell rather small, very slender, terete; volutions about twelve, flattened convex, increasing very gradually from the apex; suture distinctly defined; surface showing an exceedingly slight tendency to develop moderately broad, rather distant vertical folds, with faint traces of small revolving striae; aperture ovate. Length 0.56 inch; breadth 0.17 inch; apical angle regular, divergence 15° .

Locality and position, same as last.

MELANIA? NITIDULA, Meek.—Shell subovate; spire conical, moderately elevated; volutions about six and a half, rounded convex, increasing rather gradually from the apex; suture well defined; aperture subovate, narrowly rounded below and angular above, scarcely equalling half the entire length of the shell; surface marked by fine obscure lines of growth. Length 0.40 inch; breadth; 0.20 inch; apical angle convex, divergence about 40° .

Locality and position. Ham's Fork, freshwater tertiary, probable miocene. Lat. $41^{\circ} 40'$ north, long. $110^{\circ} 10'$ west.

PLANORBIS SPECTABILIS, Meek.—Shell large, moderately compressed; upper side slightly convex, sometimes a little concave in the middle; periphery narrowly rounded below the middle; volutions five and a half, increasing gradually in size, wider than high, depressed convex and sloping a little outwards above, distinctly convex below; about one half of each inner whorl on the under side, and less than one fourth above, embraced by each succeeding turn; umbilicus rather deep; and one third wider than the outer whorl; (surface and aperture unknown.) Greatest breadth 1.19 inch; height 0.25 inch.

Locality and position, same as last.

PLANORBIS UTAHENSIS, Meek.—Shell large, compressed discoidal, nearly flat above, (sometimes slightly concave in the middle) and having a wide moderately deep umbilical cavity below; volutions five to five and a half, wider than high, depressed and sloping outwards on the upper side, very narrowly rounded or subangular around the periphery, and convex, but not ventricose beneath; suture rather shallow above, and deeper on the umbilical side; about one half of each inner turn on the under side, and one fourth on the upper, embraced by each succeeding whorl; surface marked by fine, regular, very oblique lines of growth; aperture rather narrow, oval, and oblique. Greatest breadth 1.20 inches; smaller do., 1.07 inches; height above 0.26 inch.

Locality and position. Ham's Fork, same position as foregoing.

LIMNÆA VETUSTA, Meek.—Shell elongate sub-ovate; spire rather slender and pointed; volutions five and a half to six, compressed or moderately convex; suture well defined; surface nearly smooth, with traces of fine lines of growth scarcely visible without the aid of a lens; aperture narrow ovate, rather narrowly rounded below, and acutely angular above, equalling about half the entire length of the shell; columella with a small comparatively straight fold. Length 0.56 inch; breadth 0.26 inch.

Locality and position, same as last.

LIMNÆA SIMILIS, Meek.—Shell small, narrow subovate, or subfusiform; spire moderately elevated; volutions five and a half to six, convex; suture rather deep, and oblique; surface nearly smooth or only marked by fine obscure lines of growth; aperture narrow ovate, rounded below and angular above, equalling about half the length of the shell; columella not much twisted, and having a rather small fold. Length 0.39 inch; breadth 0.19 inch; apical angle slightly convex, divergence about 38° .

Locality and position, same as preceding.

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MELAMPUS PRISCUS, Meek.—Shell oval, moderately thick; spire depressed conical; whorls about five, convex or subangular, last one comparatively large, shouldered above, and tapering below the middle; suture well defined; surface marked by rather obscure lines of growth, and small regular, vertical or slightly oblique folds, which are distinct on the spire and the upper part of the body, but obsolete below; aperture narrow, angular above, and narrowly rounded below; outer lip apparently sharp and without teeth or crenulations within; columella provided with one rather strong oblique fold below, and a much smaller less oblique one about half way up the aperture. Length near 0.77 inch; breadth 0.50 inch; apical angle nearly regular, divergence about 80°.

Locality and position. Estuary beds on Bear River near mouth of Sulphur Creek, lat. 41° 12' north, long. 110° 52' west.

Notes on Coleoptera found at Fort Simpson, Mackenzie River, with remarks on Northern Species.

BY JOHN L. LE CONTE, M. D.

A small collection made at Fort Simpson, by Mr. Robert Kennicott, although containing but few species, has seemed to me a convenient nucleus, about which I could place certain notes derived from the study of other collections received from Russian America, through Prof. F. W. Maklin, and some interesting specimens from Fort Jasper in the northern part of the Rocky Mountains, kindly sent me by my learned friend, A. Murray, Esq., of Edinburgh.

Species from Fort Simpson.

Carabus Chamissonis Fischer.

Opisthius Richardsonii Kirby.

Platynus marginellus, capite thoraceque nigro-piceis, hoc quadrato, postice paulo angustato, et lateribus paulo sinuato, margine testaceo reflexo, basi utrinque late impresso et subrugoso, angulis posticis obtusis rotundatis, elytris thorace duplo latioribus, piceis, subanescentibus, basi emarginatis, striis haud punctatis, interstitio 3io punctis 5 vel 6 impressis, antennis piceis, pedibus dilutioribus. Long. .25—.28.

Several specimens sent. The elytra are sometimes pale, sometimes dark piceous; the intervals between the striæ are rarely flat, usually moderately convex; the impressed punctures are tolerably large; the under surface is piceous, the base of the antennæ and feet paler. This species resembles *P. anchomenoides* more nearly than any other species in my collection, but the thorax is more narrowed behind, with the margin narrowly reflexed, and the sides somewhat sinuate towards the posterior angles. The posterior transverse impression of the thorax is well marked, and the dorsal line distinct.

Pterostichus mandibularis; specimens in no wise differing from others found by me at Lake Superior, were sent me by Mr. Kennicott. The species is very closely allied to *Cryobius fastidiosus* Mann. from Russian America, but differs by the thorax being broader, with the sides more suddenly and more distinctly sinuate at the posterior angles.

Pterostichus Luczotii Lec. (*Feronia* Lucz. Dej.; *F. oblongonotata* Say). One specimen not differing from those found at Lake Superior.

Pterostichus 6-punctatus Mann. Two specimens quite similar to those from Russian America.
1860.]

Amara (Leirus) lacustris? Specimens almost precisely similar to the specimen from Lake Superior, were found at Fort Simpson and also on the Saskatchewan. The thorax is, however, somewhat less narrowed behind, and the apex is sparsely punctured.

Amara (Leirus) obtusa Lec., Proc. Acad. Nat. Sci. 7, 348. *Amara Eschscholtzii* Mann. Bull. Mosc. 1852, 297. The specimens sent by Mr. Kennicott are larger than the one sent me by Mr. Motschulsky from Russian America, but do not otherwise differ. It is perhaps *Curtonotus latior Kirby*, Fauna Bor. Am. 36, but the descriptions of the species of this genus by Kirby are so indefinite that reference must be had to the original specimens to determine the synonymy.

Amara (Celia) interstitialis Dej.

Bembidium nitens Lec.; *Peryphus picipes* †Mann. Precisely similar to the specimens from Lake Superior, and Kadjak.

Bembidium nigripes; *Notaphus nigripes* Kirby, Fauna Bor. Am. 57. This species is similar in size and form to *B. variegatum* and *B. patrule*, but differs by the feet and antennæ being black, with the first joint of the latter testaceous beneath. The striæ of the elytra are also less deep, and more finely punctured. The size is smaller than required by the description of Kirby, but the color of the feet is so characteristic, that I can scarcely avoid considering it as his species. *Notaphus quadraticollis Mann.* Bull. Mosc. 1853, 148, is probably the same. The Russian American one described as *B. nigripes* by Mannerheim, is totally different, being much larger, with the pale bands of the elytra very badly defined, and the epipleuræ pale, resembling these characters *B. indistinctum Dej.*, from California; it differs, however, from that species by the thorax being more strongly margined, with the posterior angles more rectangular and prominent, and the basal carinæ very distinct; the dorsal line and impressions are likewise deeper. In all these respects it agrees with *B. approximatum Lec.*, but differs by the punctures of the elytral striæ being larger and less closely placed. The femora are dark: in *B. approximatum* the legs are usually pale, though sometimes dark, in *B. indistinctum* they are always pale. The species will hereafter be known as *B. incrementum*; it differs from all the allied species by the 7th elytral stria being obliterated and represented only by punctures.

Bembidium nitidum Lec.; *Eudromus nitidus* Kirby; a specimen precisely similar to one found by me in the Platte River valley. *Bembidium breve Mann.*, Bull. Mosc. 1852, 301, is closely allied to this species, and on comparison may be found to be identical.

Silphalaponica Linn.

Catops brunnipennis Mann. Bull. Mosc. 1853, 176.

Tachyporus jocosus Say.

Dicerca tenebrosa Lec., *Buprestis (Stenuris) tenebrosa* Kirby.

Ancylochira maculiventris Lec., *Buprestis mac.* Say.

Upis ceramboides Fabr.; *Upis reticulata* Say.

Rhagium lineatum Oliv. One specimen precisely similar to those from Oregon and the Atlantic States. I am therefore strongly inclined to doubt the specific value of the Russian American, *R. investigator Mann.* (Bull. Mosc. 1852, 337); the characters given by him as distinguishing it are partly individual and partly sexual.

Chrysomela Adonidis Pallas; *Phædon Adonidis* Kirby, Fauna Bor. Am. 214.

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Haltica bimarigata Say. The difference between this and *Graptodera plicipennis* Mann. is not obvious on comparison. The species is abundant in Kansas, California, Oregon, and at Fort Simpson.

Haltica inarata, oblongo-ovata, convexa, ænea, nitida, thorace latitudine duplo brevior, antrosum subangustato, lateribus parum rotundatis, convexo, parce punctulato, linea transversa postica profunda, elytris parce subtiliter punctatis, thorace paulo latioribus pone basin oblique impressis. Long 18.

One specimen. Resembles a nondescript but common species of the Atlantic States, known in many collections as *H. splendida*, but differs by the thorax being more transverse and somewhat narrowed in front.

Hippodamia 12-punctata Dej.

Hippodamia 5-signata Muls.

Coccinella transverso-guttata Fald.

Notes on Russian American Species.

Calathus lenis. *Anchomenus lenis* Mann. I referred this species formerly to *Pristodactyla*, but think that there is not sufficient reason for retaining the latter genus. The present species is closely allied to *C. advena* Schaum, Ins. Deutschl. 1, 389, (*Pristodactyla advena* Lec.) from Lake Superior, and Maine, but in the latter the sides of the thorax are slightly sinuate behind, whereby the posterior angles become less rounded; among the specimens found by me at Lake Superior is, however, one which does not differ in this respect, and which appears entirely similar to the specimens from Kadjak.

Schaum's statement from Chaudoir (l. c.) that *Pristodactyla* differs from *Calathus* by the absence of furrows on the outer surface of the four posterior tarsi is not correct. Of the specimens of *P. impunctata* in my collection one has the groove very strongly marked; three have it distinct, though not deep, while in the two others it is wanting; of the two specimens referred by me to *P. corvina* Lec., the groove is obsolete in one, and wanting in the other. From these facts I draw two inferences:

1. The genus *Pristodactyla* is to be suppressed.
2. Many of the species of *Calathus* as at present recognized, are too indistinct for systematic purposes, and are to be considered as races clustering around a few principal forms. The species of North America may be arranged as follows:

A. Thorax postice haud angustatus, foveis basalibus obsolete.

1. Corpus elongatum, thorace latitudine haud brevoire, lateribus modice reflexis. *C. gregarius* Dej.

2. Corpus elongatum, thorace latitudine haud brevior, lateribus anguste marginatis. *C. ingratus* Dej.; *C. incommodus* Mann, (Russ. Am.) and *C. confusus* Lec. (Lake Superior), are almost imperceptible races of this species.

3. Corpus elongatum, elytris subopacis, thorace latitudine haud brevior, lateribus modice explanatis. *C. opaculus* Lec.

4. Corpus elongatum, elytris subopacis thorace latitudine haud brevior, antrosum vix angustato, lateribus parum rotundatis vix explanatis. *C. quadricollis* Lec.

5. Corpus minus elongatum, elytris subopacis, thorace latitudine brevior, lateribus valde rotundatis explanatis. *C. Behrensii* Mann.

6. Corpus minus elongatum, elytris subopacis, thorace latitudine brevior, antrosum sensim angustato, lateribus parum rotundatis, explanatis. *C. obscurus* Lec.

7. Corpus minus elongatum, elytris subopacis, thorace latitudine brevior, lateribus valde rotundatis vix explanatis. *L. ruficollis* Dej.

B. Thorax postice angustatus, foveis basalibus latis; (unguiculi subtilius serrati.)

8. Thorace margine latiusculo reflexo: α . lateribus postice subsinuatis, C. a d v e n a *Schaum*; β . lateribus obliquis haud sinuatis, C. l e n i s *Mann*.

9. Thorace tenuiter marginato, angulis posticis rotundatis, postice haud transversim impresso. C. m o l l i s *Schaum*.

10. Thorace tenuiter marginato, postice magis angustato, angulis posticis rotundatis, postice transversim impresso; (major unguiculis vix obsolete serratis). C. d u b i a *Lec*.

Anchomenus dulcis Mann., belongs to this division, and is most probably a race of *C. mollis*, though this is merely a conjecture on my part, as I have never seen a specimen of it.

C. Thorax fere rotundatus, vel ovalis, foveis basalibus latis; (unguiculi fortiter serrati).

11. α . Thorace latitudine subbreiore, postice perparum angustato, C. i m p u n c t a t a *Lec*. (*Feronia imp. Say*; *Pristodactyla americana Dej.*) β . Thorace longiore postice vix angustato, margine paulo angustiore. P. c o r v i n a *Lec*.

Trechus spectabilis Mann. and *T. oblongulus Mann.*, are by no means *Trechus*, but belong to *Bembidium*, forming a group between VIII. and IX. (*Proc. Acad.* 1857. 4), characterized by the thorax subcordate, with the basal foveæ somewhat double, the elytral striæ deep, the outer ones scarcely abbreviated, the base of the antennæ and the feet pale; the last joint of the palpi is longer than in the neighboring groups, but acicular and not at all conical.

Euplectus parviceps Mäklin, belongs to *Faronus Aubé*.

Corymbites caricinus Esch. = *C. telum Lec*.

Cryptohypnus fallax Mann. From this species *C. picescens Lec.*, found at Lake Superior, seems scarcely to differ; in the latter, however, the punctures are a little stronger, and the size somewhat larger, but hardly sufficient to establish a specific difference. The names were both published in 1853, but that of *Mannerheim* has priority by a few months.

Rhagonycha binodula Mann. does not differ from *Telephorus fraxini Lec.* (*Cantharis fraxini Say*, *Telephorus nigrita Lec.*), which is very abundant at Lake Superior, and is found also in Pennsylvania.

Notes and descriptions of other Northern Species.

Calosoma laqueatum, robustum, apterum, nigro-æneum, capite thoraceque punctulatis et rugosis, thorace latitudine duplo brevior postice angustiore, angulis posticis productis subacutis, margine anguste reflexo, elytris ovatis punctatis obsolete striatis costis tribus catenatis lævibus parum elevatis. Long. '67.

Saskatchewan. In sculpture resembles *C. moniliatum Lec.* and *C. cancellatum Esch.*; the former has the thorax much more strongly punctured and the elytra oblong oval, and much narrower; the latter is winged, and has the posterior angles of the thorax less prolonged and broadly rounded, and the elytra more convex, with the sides less rounded.

Nebria moesta Lec. I have received from Russian America two species under the name *N. Mannerheimii Fischer*. The one, received from *Baron Chaudoir* and *Count Mnizech*, has the sides of the thorax moderately rounded, with the posterior angles rectangular and not very prominent; the striæ of the elytra appear smooth, and the outer ones are less impressed at the tip. This

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I take to be the true species. The other, received from Mr. Motschulsky, has the thorax broader, more rounded on the sides, with the posterior angles very prominent, precisely as in *N. metallica*; the striæ of the elytra are scarcely less deep at the tip than at the base; this specimen agrees perfectly with those of *N. moesta*, found by me on the north shore of Lake Superior. I have also a specimen from Oregon, and several were collected by Mr. Barnston at Carlton House, Saskatchewan River.

Platynus corvus, niger, nitidus, thorace latitudine brevior, lateribus cum basi rotundatis, margine laterali anguste reflexo, postice paulo latiore, foveis basalibus latis haud profundis, tuberculo valde obsoleto notatis, elytris oblongis thorace latioribus, planiusculis, basi emarginatis, striis profundis impunctatis, interstitiis paulo convexis, 3io tripunctato. Long. '39.

Black Hills, Dr. Hammond; Saskatchewan. By the form of the thorax this species exactly resembles *P. atratus* Lec., except that it is a little broader. The elytra are, however, broader, less convex, and more emarginate at the base. The size is one half larger.

Platynus crassicollis, elongatus, nigro-æneus virescens, thorace rotundato, margine anguste reflexo, foveis basalibus punctulatis, postice transversim impresso, elytris thorace haud latioribus, striis profundis impunctatis, interstitiis parum convexis, 3io punctis 4 vel 5 impressis. Long. '32.

Jasper House, Rocky Mountains, Mr. A. Murray. Of the same form as *P. protractus* Lec., but smaller, with the thorax more convex, punctured behind, and transversely impressed, and with the striæ of the elytra deeper.

Platynus picicornis, æneo-niger, nitidus, thorace ovali, latitudine paulo longiore, margine tenui reflexo postice vix latiore, foveis basalibus latis, angulis posticis valde rotundatis, elytris basi emarginatis, oblongis, striis impunctatis, interstitiis parum convexis, 3io 6-punctato, antennis palpisque piceis, pedibus piceo-testaceis. Long. '24.

Jasper House. Related to *P. retractus* Lec., but is much smaller, and differs from that and all the others of that division by the characters given above.

Pterostichus validus Mann. Jasper House; precisely similar to specimens from Sitka.

Pterostichus protractus, angustus, thorace latitudine fere longiore postice angustato, margine distincto reflexo, lateribus late rotundatis, postice sub-sinuatis, basi recte truncato, linea marginali profunda medio interrupta, utrinque bistriato, stria externa brevissima, elytris thorace vix latioribus planiusculis fortiter striatis, humeris denticulatis. Long. '52.

Jasper House. Resembles by its form *P. contractus* Lec., but belongs to a different group having the base of the thorax margined, with the marginal line interrupted at the middle, as in *P. validus*, *californicus*, *algidus*, &c., than which this species is much more slender, with the thorax more narrowed behind.

Amara farcta Lec. Saskatchewan.

Harpalus amputatus Say. Saskatchewan, Mr. Barnston.

Harpalus carbonatus, elongato-oblongus, capite obtuso, oculis modice prominulis, thorace capite latiore, latitudine brevior, postice subangustato, lateribus late rotundatis, postice obsolete explanatis, angulis posticis rectis, apice rotundatis, foveis basalibus parvis haud profundis parce punctatis: elytris (femine) opacis, apice haud sinuatis, striis impunctatis, interstitiis parum convexis, antennis palpisque piceo-rufis. Long. '40.

Saskatchewan. Similar in form to *H. advena* Lec., but the thorax has the posterior angles less rounded.

1860.]

Bradycellus longiusculus Lec.; *Acupalpus longiusculus* Mann. A specimen quite similar to one from Sitka, but captured at York Factory, was sent me by Mr. Murray.

Bembidium funereum, longiusculum, nigrum, piceo-æneo tinctum, thorace latitudine paulo brevior, planiusculo, postice modice angustato, lateribus antice rotundatis, postice subsinuatis, foveis basalibus bistriatis, angulis posticis rectis, carinatis, elytris ovalibus, paulo convexis, striis subtilibus, 7ma vix oblitterata, 3ia punctis duobus notata, pedibus piceis. Long. '19.

Saskatchewan River; this species belongs to div. VIII. (Lec. Proc. Acad. Nat. Sc. 1857, 4), but differs from all the other species of that group known to me by the thorax more narrowed behind, and the regularly oval elytra, as well as by the piceous legs.

Dicera prolongata Lec. Trans. Am. Phil. Soc. ii. 194. Saskatchewan River.

Asaphes carbonatus, ater subopacus, fronte concava, capite thoraceque confertim punctatis, hoc latitudine paulo longiore, antrorsum subangustato, lateribus late rotundatis, angulis posticis prolongatis subdivaricatis, carinatis, fissuris basalibus brevibus, basi breviter canaliculato, elytris striis profundis, interstitiis paulo convexis confertim punctatis, antennis articulo 3io 4to vix minore. Long. '68.

Oregon or Rocky Mountains, one male. This species in size, form and color, resembles the Oregon *A. morio* Lec., but the thorax is densely punctured, and the elytra are also more densely punctured.

Agriotes macer Lec. A specimen of this species, precisely similar to the one from Oregon, was received from Jasper House.

Podabrus gradatus, capite thoraceque testaceo-luteis, illo pone antennas punctato, thorace latitudine sesqui brevior lateribus ante medium rotundatis, late depressis, apice late concavo, postice convexo et canaliculato, basi marginato, angulis minutis dentiformibus; elytris dense rugose punctulatis, sordide luteis, postice sensim infuscatis, subtus antennis pedibusque nigris, abdominis margine, femoribus basi, coxis, antennarum articulo 1mo palpisque basi rufotestaceis. Long. '48.

Oregon or Rocky Mountains. The ungues are cleft, with the lower portion but little shorter than the upper. The 2nd and 3rd joints of the antennæ are equal, and together are one-half longer than the 4th; the first joint is reddish yellow, with the tip black. The thighs are yellow at the base, gradually becoming dark at the tip.

TRICRANIA Lec.

Under this generic name I would separate the North American species allied to *Horia*. The genus has been indicated, but not named by Lacordaire, (Gen. Col. 5, 664, note), and differs from *Horia* by the triangular head; by the obconical, scarcely compressed joints of the antennæ; by the mandibles not being toothed; by the last joint of the palpi being somewhat longer than the penultimate, (in *Horia* the last joint is much shorter); and by the posterior tarsi one-half shorter than the tibiæ. The body is also somewhat hairy, while in *Horia* it is glabrous. Three species are known to me, forming two divisions.

A. Body without wings. *T. sanguinipennis*; *Horia sanguinipennis* Say. Middle States.

B. Body winged. *T. Stansburii*; *Horia Stansburii* Hald., Utah: and *T. Murrayi*, niger opacus, alatus, capite thoraceque dense granulato-punctatis, elytris elongato-oblongis, thorace haud latioribus, minus subtiliter

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rugose punctatis, macula utrinque basali rotundata, lateribusque pone quadrantem rufis. Long. '48.

Rocky Mountains or Oregon. Of the size and shape of *T. Stansburii*, but differs by the head and thorax being more finely and densely punctured; the latter is also more transverse, and the sides converge slightly behind, while in the other they are parallel. I take great pleasure in dedicating this fine species to my learned friend, Andrew Murray, to whose liberality I owe this and many other valuable additions to my collection.

Acmaeops mollipilosa, robusta nigra, pube longa cinerea haud dense vestita, capite dense thorace modice punctato, hoc convexo, apice constricto, lateribus ante medium subito rotundatis, postice parallelis, obsolete canaliculato, elytris dorso subdepressis, lateribus oblique impressis, apice suboblique attenuatis dein obtuse rotundatis, violaceo-tinctis, minus dense punctatis, punctis postice subtilioribus, pedibus dense fusco-pubescentibus, antennis fuscis basi nigris. Long. '57.

Oregon or Rocky Mountains. Resembles more nearly the Californian *A. lugens* Lec. than any other in my collection, but is sufficiently distinct from that species by the more flattened elytra, with the sides strongly impressed behind the humeri, and more broadly rounded, or even subtruncate at the tips.

Acmaeops viola, robusta, nigra, pube brevi nigra parce vestita, capite dense, thorace modice punctato, hoc convexo, apice constricto, lateribus praecipue antice rotundatis, elytris dorso subdepressis, apice obtuse rotundatis, minus dense antice fortius postice subtilius punctatis, cyaneo-violaceis, antennis nigris. Long. '43.

Oregon or Rocky Mountains. Smaller than the preceding, and differs by the shorter black pubescence, the elytra more strongly punctured, less impressed at the sides, and more regularly rounded at the tip.

Acmaeops lupina, nigro-picea, pube longa fusca dense vestita, capite dense subtilius, thorace minus subtiliter confertim punctatis, hoc convexo apice constricto, lateribus subangulatis postice paulo concavis, elytris subcylindricis, thorace sesqui latioribus, antice modice postice subtilius et densius punctatis, apice rotundatis subtruncatis. Long. '48.

Rocky Mountains.

Chrysomela multipunctata, Say; var. *verrucosa* Suffrian, Ent. Zeitung. 1858, 266. Carlton House, Mr. Barnston.

Chrysomela subseriata, nigra, vix aenescens, oblonga, alata, thorace lateribus incrassatis rotundatis, sulco vago grosse punctato a disco separatis, hoc subtiliter punctato, elytris thorace haud latioribus, disperse punctatis, punctisque paulo majoribus seriatis, seriebus per paria minus distantibus. Long. '32.

Oregon or Rocky Mountains. The punctures of the rows are small and closely placed, the rows are 9 in number and a short scutellar one.

Oedionychis scripticollis Lec.; *Altica scripticollis* Say. Saskatchewan River.

Synopsis of the Scaphidiidæ of the United States.

BY JOHN L. LE CONTE. M. D.

Several years ago I wrote a synopsis of our species of the family of Coleopterous insects here treated of, but the manuscript having been lost by the printer, was not published. I have recently had occasion to study again this group, and therefore now make known the species in my collection. The native genera may be arranged in the following manner:—

1860.]

I. Scutellum distinctum ; antennæ clavatæ :

Tibiæ haud spinulosæ.

Tarsi postici articulo primo elongato ; oculi emarginati, SCAPHIDIUM.

Tarsi postici articulo primo vix longiore ; oculi integri, SCAPHIUM.

Tibiæ spinulosæ ; oculi integri, tarsi postici articulo

Imo elongato,

CYPARIUM.

II. Scutellum thoracis basi obtectum ; antennæ capillares :

Coxæ posticæ late distantes :

Antennæ articulis tribus ultimis latioribus, BÆOCERA.

Antennæ articulis 5 ultimis latioribus, SCAPHISOMA.

Coxæ post. approximatæ ; (corpus angustum, compressum) TOXIDIUM.

SCAPHIDIUM Oliv.

1. *S. oblitteratum*, nigrum, nitidum, elytris gutta utrinque antica externa, alteraque subapicali transversa lunata, parvis testaceis, stria suturali profunde punctata basi arcuata, striis dorsalibus nullis. Long. .21.

One specimen found near Evansville, Indiana. Larger than the other species, and readily distinguished by the absence of the short rows of punctures on the elytra, and by the small size of the elytral spots, which are yellowish.

2. *S. 4-guttatum*, nigrum, nitidum, elytris macula magna pone basin, alteraque ante apicali lunata rubris, stria suturali profunde punctata basi arcuata, seriebus parce punctatis internis ante medium notatis. Long. .16—.18.

Say, Journ. Acad. Nat. Sci. Philada., 3, 198.

Middle and Southern States and Kansas. I am very much inclined to consider this and the next two species as varieties ; there is no difference in form or sculpture, but only in the spots of the elytra.

3. *S. 4-pustulatum*, nigrum nitidum, elytris macula lunata mediocri pone basin, alteraque ante apicali rubris, elytris stria suturali profunde punctata basi arcuata, seriebus tribus parce punctatis internis ante medium notatis. Long. .18.

Say, Journ. Acad. Nat. Sci. Philad. 3, 198.

One specimen, New York. The elytral spots are much smaller than the preceding, and both are transverse and lunate.

4. *S. piceum*, nigrum, nitidum, elytris immaculatis, stria suturali profunde punctata basi arcuata seriebus tribus parce punctatis internis ante medium notatis. Long. .18.

Melsheimer, Proc. Acad. Nat. Sci. 2, 103.

Scaphidium 4-guttatum var. Say, Journ. Acad. Nat. Sci. 3, 198.

Middle and Southern States. In all these species the posterior tibiæ of the males are pubescent internally.

SCAPHIUM Kirby.

1. *S. castanipes* Kirby, Fauna Bor. Am. 4, 108, tab. 5, f. 1.

Canada. Unknown to me.

CYPARIUM Er.

1. *C. flavipes*, (sub-ovale, convexum, nigro-piceum) nitidum, elytris stria suturali punctata, basi breviter arcuata, seriebus utrinque 5 punctatis, interna fere integra, externis antice valde abbreviatis, humeris testaceo-tinctis, antennis piceis, basi ore pedibusque testaceis. Long. .10.

Southern States. Of the form of a large *Scaphisoma* : the last five joints of the antennæ form an elongate club, and the tibiæ, especially the middle ones, have a few spines, small but distinct. The thorax has no basal punctures, the sides are oblique and broadly rounded.

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BÆOCERA Er.

1. *B. concolor* Er. Ins. Deutschl. 3, 4: *Scaphidium concolor* Fabr. Syst. El. 2, 576.

Unknown to me: described as being black, with piceous legs; half the size of the European *Scaphium immaculatum*, which is $\frac{1}{4}$ inch long.

2. *B. apicalis*, rotundato-ovalis, convexa, nigro-picea nitida lævissima, thorace basi media prolongato, rotundato submarginato, elytris stria suturali haud punctata, basi longe arcuata, margine apicali testaceo, ano piceo, pedibus rufo testaceis. Long. .06.

Middle and Southern States. The side pieces of the mesosternum are distinctly divided by an oblique line. The insect exactly resembles a small *Scaphisoma*, but is at once distinguished by the shorter antennæ having only three enlarged terminal joints.

SCAPHISOMA Leach.

1. *S. castaneum*, castaneo-piceum, ovale convexum nitidum, thorace subtiliter parce, elytris fortius parce punctatis, stria suturali antice longe arcuata, postice, ano pedibusque dilutioribus. Long. .13.

Lec. Pac. R. R. Expl. and Surveys, xi. insects, 14.

Scaphidium castaneum Motsch. Bull. Mosc. 1845, 2, 361, tab. 6, f. 4.

San Jose, California. Larger and narrower than the next species, with the thorax more distinctly punctured, and the antennæ more thickened externally, the 6th joint being not thicker than the 5th, and the 8th not narrower than the adjoining ones.

2. *S. convexum*, rotundato-ovale, convexum, piceo-nigrum, nitidum, thorace subtiliter parce punctulato, elytris parce punctatis, stria suturali antice longe arcuata, margine postico, ano antennis basi pedibusque testaceis. Long. .11.

Say, Journ. Acad. Nat. Sci. Philad. 5, 183.

Middle and Southern States, not rare.

3. *S. punctulatum*, ovale, convexum, nigrum nitidum, thorace subtilissime punctulato, elytris subtiliter punctatis, stria suturali longe arcuata, ore, abdomine, antennis basi pedibusque rufo-testaceis. Long. .08.

One specimen, Georgia. Narrower and smaller than *S. convexum*, with the fine punctures of the thorax more numerous, and the elytra entirely black and more finely punctured.

4. *S. suturale*, ovale, convexum, piceo-nigrum nitidum, thorace subtilissime parce punctulato, elytris parce fortius punctatis, stria suturali profunda arcuata, postice, ano antennis basi pedibusque testaceis. Long. .08.

Middle and Southern States, smaller and narrower than *S. convexum*, with the sutural stria deeper.

5. *S. terminatum*, rotundato-ovale, convexum, piceo-nigrum nitidum, elytris parce subtiliter punctulatis, stria suturali arcuata, margine apicali flavo, ano testaceo, antennis pedibusque flavis. Long. .06.

Melsheimer, Proc. Acad. Nat. Sci. 2, 104.

Middle States, not rare.

6. *S. rufulum*, ovale, convexum, rufo-castaneum nitidum, elytris subtilissime parce punctulatis, stria suturali subtili arcuata, apice ano antennis pedibusque dilutioribus. Long. .06.

One specimen found at the junction of the Colorado and Gila, California.

7. *S. pusillum*, rotundato-ovale, convexum, nigro-piceum nitidum, elytris obsolete parce punctulatis, stria suturali profunda arcuata, postice testaceis, abdomine antennis pedibusque rufo-testaceis. Long. .03.

1860.]

South Carolina and Georgia, Dr. Zimmermann. Very much smaller than the other species. I have not considered it necessary to give detailed descriptions of the species of this genus, as they only differ from each other by the characters above mentioned.

TOXIDIUM Lec.

Antennæ capillares, elongatæ, articulis 7-11 crassioribus, 8vo contiguis angustiore; thorax basi lobatus, scutellum obtogens. Coxæ intermediæ distantes, posticæ parum distantes. Pedes tenues, tibiis haud spinosis, tarsis posterioribus tibiis haud brevioribus, articulo 1mo longiore. Corpus elongatum compressum arcuatum; mesothoracis pleuræ quadratæ, linea obliqua haud insculptæ.

1. *T. gammaroides*, elongato-ovale, valde convexum, nigrum nitidum, thorace latitudine sublongiore, lateribus obliquis, elytris obsolete parce punctulatis, stria suturali tenui antice oblitterata, margine apicali obscure testaceo, ano, antennis pedibusque saturate testaceis. Long. .08.

Southern and Western States, not rare. A singular looking insect, having much the outline of the small Crustacea known as Gammarus.

Description of a New Species of CEPHALOPOD, from the Eocene of Texas.

BY WM. M. GABB.

Sepia (*Belosepia*) *ungula*.—Shell laterally compressed, especially posteriorly; beak robust, acute, arcuate, and with a very faint ridge on the dorsal surface; ventral plate smaller in proportion than in the other species of this subgenus, slightly undulate and radiate, edge smooth and sharp; dorsal callus straight, deeply rugose, marked by about three irregular rugæ, and covered on the face and sides with pits or cavities, which extend on the sides almost to the base of the ventral plate, becoming gradually fainter until they disappear; cavity shallow, ventral edge sharp, interior marked by numerous compound concentric ribs crossed by very faint longitudinal lines.

Length $1\frac{1}{2}$ in.; length of rostrum $\frac{3}{4}$ in.; width of ventral plate $\frac{3}{4}$ in., just above the base of the cavity.

Locality and position, Wheelock, Texas; from a deposit containing many species found at Claiborne, Ala.

This species resembles more nearly *Sepia Cuvieri* *Desh.*, of the Paris basin than any other, but it can readily be distinguished from it by the dorsal callosity, which, in our species, is not so prominent, and is comparatively sharp, especially towards the extremity nearest the rostrum. The roughening of the surface of the same portion is, in the Paris species, transverse, while in ours it is longitudinal. The ventral plate is one-third smaller in the present species than in *S. Cuvieri*.

The type of this species belongs to the Smithsonian Institution.

A letter from Dr. W. S. W. Ruschenberger, dated Philadelphia, July 26th, resigning his position on the Committees of Proceedings, Publication and Conchology, on account of prolonged absence on official duty, was read, and on motion the resignation was accepted.

[July,

August 7th.

DR. HAYS in the Chair.

Thirteen members present.

The following papers were presented for publication: "Descriptions of new species of American Fresh-water Fishes, by Charles C. Abbott."

"Description of new species of North America Reptiles in the Museum of the Smithsonian Institution, Washington, D. C., by Robert Kennicott."

"Notes and Descriptions of new and little known American Reptiles by E. D. Cope."

And were referred to Committees.

The number of the Proceedings for July was laid on the table by the Committee.

August 14th.

DR. HAYS in the Chair.

Thirteen members present.

The following paper was presented for publication: "Contributions to American Lepidopterology, No. 6, by Brackenridge Clemens, M. D.,"

And was referred to a Committee.

August 28th.

Vice President BRIDGES in the Chair.

Twenty-two members present.

Dr. Fisher announced the death at New York, on the 17th inst. of Victor G. Audubon, a Correspondent of the Academy.

On report of the respective Committees, the following papers were ordered to be published in the Proceedings:

Descriptions of new species of American Fresh-water Fishes.

BY CHARLES C. ABBOTT,

1. *Plargyrus melanocephalus* Abbott.—Head large, broad; snout very blunt. Body broad anterior to dorsal fin, rapidly narrowing posteriorly; dorsal outline greatly curved, making the depth of the body anterior to dorsal fin equal to one-fourth of total length. The eye large, circular; diameter equal to one-third the width of head. The distance from the posterior margin of opercular apparatus to edge of the orbit, is double that from extremity of the snout to opposite edge of orbit. The nostrils, which have a double opening, are situated on a line with the upper edge of the orbits. The mouth is of medium size, terminal, the lower jaw the shorter. Small conical, acute cornua arranged on the snout, generally in parallel rows; a few on the lower jaw, irregularly placed. The lateral line, commencing at angle of operculum, is greatly decurved, approaching nearer the ventral than dorsal outline, posteriorly. The anterior ray of the ventral fin directly opposite that of the ventral fin, each ray being equidistant from the snout and base of caudal fin. The tips of the rays of the ventral somewhat overlap the anus. The dorsal fin is higher than broad, quadrangular; caudal fin is slightly bifurcated;

pectorals long, narrow and subquadrangular, the ventrals long, narrow and tapering; anal twice as long as broad, quadrangular.

The fin-rays are—D, 9. C, 20 — P, 14. V, 8. A, 7.

Color. In alcoholic specimens, the whole head, posteriorly to the nape of the neck, inky black. The opercle occasionally with a metallic reflection. A black narrow band extends from opercle to caudal fin, above lateral line anterior and below, posterior to dorsal fin. Body of a general gray hue, darker on the back, and yellowish on the belly. A narrow black line on peduncle of tail.

Total length $2\frac{3}{8}$ inches.

The specimens from which the description is taken, were procured by Dr. J. H. Slack, of Philadelphia, in June, 1860, at Lake Whittlesey, Minnesota. From the number of specimens obtained, it is natural to suppose that it is, in that district at least, a very numerous species.

2. *Cottus Copei Abbott.*—Body subcylindrical; its greatest depth is contained six times in the entire length from snout to tip of caudal fin; and the least depth, at insertion of caudal fin, is contained thirteen times in the entire length. Head twice as broad as deep, with its frontal length equal to its width. The snout is obtuse. A vertical line drawn upwards, from the angle of the mouth would pass anterior to the pupil. The eyes are circular, medium sized, and the diameter is contained little more than four times in the length of the head. The preopercular spine is strongly developed, curving slightly upwards. A small acute spine on the subopercle. The gill openings are oblique, large and separated under the throat by an isthmus of three-eighths of an inch. The lateral line is distinct throughout its course; it is concurrent with the dorsal outline. The first ray of the dorsal is inserted fifteen-sixteenths of an inch from the extremity of the snout, and extends on a basis of one-third of an inch; the origin of second dorsal is posterior to the vent, the first and last rays shorter than the middle ones. The commencement of anal fin is opposite the third ray of dorsal. The caudal fin is rounded posteriorly, and is contained six times in the entire length; the middle rays are bifurcated. The ventrals are inserted in a line with the centre of the insertion of pectorals; the tips of rays do not reach the anus, if bent backward. The bases of the pectorals are crescent shaped, and the tips of the rays, if bended backward, will reach the first ray of second dorsal, but not the anal fin.

The number of fin rays are D, 7—15. P, 12. V, 8. C, 14. A, 10.

Color. Head and back of a varied blackish-gray, with minute yellow spots; sides yellowish-gray, fading to pearly white on the belly; sides marked with very irregular dark gray lines. The fins partaking the color of the region to which they belong, are sparingly dotted with deep black. Iris bronze.—Total length $3\frac{3}{8}$ inches.

Habitat. A small trout stream, a tributary of a tributary of Brandywine creek, Chester Co., Pennsylvania. But one adult and one young specimen captured.

I dedicate, with much pleasure, this beautiful *Cottus*, to Mr. E. D. Cope, of Philadelphia, by whom it was found, and kindly loaned me for description.

POECILOSONA, Agass.

Gen. Char.—Head short and strong, rounded. Mouth little opened, proportionately broad; it is not protractile, though the maxillary bone be moveable; opercular apparatus scaly; cheeks bare.

3. *P. transversum Abbott.*—Head and body compressed; nose acute. Operculum terminating in a spine posteriorly. Jaws equal; mouth broad. Margin of jaws armed with very numerous, small, inwardly curved, sharp teeth. The origin of the first dorsal fin is posterior to the insertion of pectoral

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fin; the ventral is also posterior to the pectoral, and is slightly anterior to the first ray of dorsal. The origin of the second dorsal is situated slightly posteriorly to the vent, and directly opposite the origin of the anal; the terminal ray of the anal is anterior to the terminal ray of second dorsal. The caudal fin is slightly rounded.

The numbers of the fin rays, are D; 11—12. C, 16 — A, 9. V, 6. P, 11.

Total length.—2 inches.

Color. In alcoholic specimens, the general tint of the body is sienna, fading into pale straw color upon the belly; throat orange; pectoral and ventral fins orange; the other fins partake of the color of the region to which they belong. Fourteen bands of dark rufous, joined upon the back, cross the sides transversely, and become obliterated upon the belly; the intervening spaces are double the width of the bands.

Habitat.—Cabinet of Academy? Lake Superior.

A few specimens of this fish, with specimens also of a new species of *Pileoma DeKay*, were presented by W. A. Hammond, M. D., to the Academy; but the locality and date of presentation have been lost, and no mention of the fish being presented is made in the "Proceedings." The only other described representative of this genus is the *P. zebra Agassiz*, described in his work on Lake Superior, as a fish of those waters. This new species may be from the same locality, but at present there is no means of positively ascertaining.

4. *Pileoma cymatogramma Abbott.*—Body cylindrical, slightly depressed. Head small, facial outline oblique; mouth rather large. The eye is situated near the top of the head, with the diameter of the orbit equal to one-third of the length of the head. The operculum terminates posteriorly in a broad flat point; the preopercle terminates posteriorly in a small, very acute and conical spine. The lateral line is nearly straight throughout its course. The insertion of the pectoral fin is anterior to that of the ventral, and that of the ventral anterior to the origin of dorsal. The origin of the second dorsal is opposite the primary ray of the anal fin. The caudal is slightly bifurcated.

The numbers of the fin rays are D, 13—12. C. 16 — P, 13. V, 7. A, 8.

Color. In alcohol specimens, the general color of the upper surface, light rufous, fading on the belly. A broad, wavy band, mostly below the lateral line, of dark rufous-brown. Numerous quadrangular, dark rufous spots on the back and sides above the lateral line.

Habitat.—Cabinet of the Academy.

This genus differs principally from *Pocilosoma*, in having the cheeks and opercular apparatus, both scaly.

5. *Ammocetes aepyptera Abbott.*—Body posterior to second branchial aperture, compressed and tapering rapidly towards the tail; belly, anterior to the vent, flattened. The first dorsal fin arises somewhat posteriorly to the centre of the entire length of the body, and is pyramidal in figure. The second dorsal fin, joining with the caudal, is smaller than the first dorsal and more acutely pyramidal in its figure. The caudal, whose origin is situated opposite the vent, is higher than either dorsal fin, and decreases rapidly towards the tail. Nape of the neck much elevated, and the facial outline obliquely descending. Snout exceedingly prolonged; mouth circular; on the inside of the upper lip there are three or four very small granules on each side; and at the opening of the throat small ramified papillae. The eyes are very small and situated near the top of the head, equidistant between the first branchial aperture and the angle of the mouth. The branchial apertures 1860.]

are situated in a longitudinal depression, oblique and slightly curved; the first aperture is situated in a line with the pupil, and is one-fifth of an inch distant posteriorly.

Total length, $5\frac{1}{2}$ inches.

Color. In the alcoholic specimen, the head, back and sides are dark brown; the belly, clay color. Fins yellow.

Habitat. Ohio River.

A single specimen of this new species of *Ammocetes*, is in the cabinet of the Academy, marked as procured in the Ohio River, and presented by Dr. Hildreth. The peculiarities of the species are to be noticed in the remarkable length of the head, and distance from the orbit to the first branchial aperture, and also in the unusual size of the dorsal and caudal fins; from which last peculiarity the specific name is derived.

Descriptions of New Species of North American Serpents in the Museum of the Smithsonian Institution, Washington.

BY ROBERT KENNICOTT.

TANTILLA Baird & Girard.

T. NIGRICEPS Kennicott.

Specific character. Form more slender and head narrower than in *T. gracilis*. Vertical plate more elongate posteriorly, occipitals narrower. One anteorbital, two postorbitals. Seven upper labials. Color (in alcohol) uniform brownish white above, lighter beneath. Crown as far as behind the occipitals deep black; no indication of a post-occipital black ring as in *T. coronata*.

4491, Fort Bliss, New Mexico. Dr. Crawford.

2046, Indianola to Nueces, Texas. Capt. Pope.

DIADOPHIS Baird & Girard.

D. TEXENSIS Kennicott.

Spec. char. Dorsal scales in fifteen longitudinal rows. Color above uniform leaden or bluish black; beneath light yellow, irregularly spotted with black. Under jaws spotted. A yellowish occipital ring one and a half or two scales wide.

Descr. Form moderately slender. Head rather narrow, with the crown slightly arched; snout narrow and depressed. Vertical plate small, tapering posteriorly; superior labials seven. Eye proportionally large. Outer row of dorsal scales slightly the largest. Color above leaden or bluish black, the crown darker. As in *D. punctatus*, the edges of the upper labial shields are yellow, like the lower, but the latter are thickly spotted with black. The abdomen is usually irregularly spotted with black over its whole surface, though in some specimens there is a tendency to form a medial row as in *D. punctatus*. The under surface of the tail is tinged with reddish.

1897, East of Galveston, Texas. Prof. Andrews.

2076, Head of Trinity River, Texas. Capt. Pope.

2079, Llano Estacado. Capt. Pope.

2155, Monticello, Mississippi. Miss H. Tennon.

This will be distinguished from *D. punctatus* by its more slender form, arched crown and narrow snout, by the numerous and irregular spots on the abdomen, and especially those on the mandibular and mental plates.

LAMPROPELTIS Fitzinger.

L. MULTISTRIATA Kennicott.

Sp. char. Dorsal scales in twenty-three rows. Form similar to that of *L.*

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gentilis, but the head and eye larger. Color above brownish red, with thirty-one pairs of narrow black half-rings enclosing white spaces, from head to anus. The black rings not extending across the abdomen, which is uniform yellowish white. Head black above.

Descr. Snout broader and more depressed than in *L. gentilis*. It is also more elongate, and hence, also, the loreal and nasal plates; in the only specimen examined the second superior labial plate is replaced by two smaller ones, thus increasing the number to eight, a peculiarity probably abnormal, as all the other species of the genus have seven. The body above is brownish red in spirits, crossed by thirty-one pairs of black rings from head to anus. The enclosed white spaces are one and a half scales wide on the central fifteen dorsal rows, and begin to widen abruptly on the fourth lateral row on each side, extending over three or four scales longitudinally on the first row. On the sides they are punctulated with black as in *L. gentilis*. The occipital white ring is much broader. The black rings are each two scales wide on the vertebral region, narrowing to less than one scale laterally. On the fourth lateral row the two rings of each pair begin to diverge, the anterior uniting on the edge of the abdomen with the posterior ring of the pair in advance, the posterior becoming confluent with the anterior of the succeeding pair. Thus the ground color is enclosed in the form of a transverse elliptical spot. Upon the middle of the body these spots are two or three scales wide on the vertebral region, four or five on the sides, and but one on the first row of scales. Anteriorly the red intervals are greater; posteriorly they narrow slightly, but toward the tip of the tail they are entirely lost, as in *L. doliatus* and *gentilis*, by the confluence of the black rings. The black rings extend but a short distance upon the abdominal scuta, leaving the abdomen destitute of blotches, though it is faintly and sparsely punctulated. The chin and inferior labials are tinged with brown. The top of the head is black as in *L. gentilis*.

No. 1842, Fort Lookout, Nebraska. Lieut. Warren and Dr. Hayden.

The number of rows of scales and the more numerous rings will distinguish this species from *L. annulatus*, and those above compared with it.

L. ANNULATA Kennicott.

Spec. char. Form stout, head broad, eye small. Scales short and broad. Color bright red, with eighteen to twenty-two pairs of black rings from head to anus, each pair enclosing an immaculate yellow ring which completely encircles the body, widening but little upon the flanks. Abdomen between the yellow rings black. Top of head entirely black, this color extending posteriorly upon the occipitals in an acute angle. A broad occipital yellow ring.

Descr. General appearance similar to *L. gentilis*. The form is stouter, the head shorter, broader and more depressed, and the eye smaller. The dorsal scales are very different, being much broader; the lateral rows in *L. annulatus*, are higher than long, and those of the central are nearly as wide as long. In *L. gentilis*, those of the lateral rows are considerably longer than high, and those of the central nearly twice as long as wide. There are twenty pairs of black rings from head to vent, which do not diverge on the sides; each ring covering two to two and a half scales longitudinally on the vertebral region and narrowing but little laterally. The enclosed yellow rings are one and a half scales wide on the vertebral region. The first three pairs of black rings behind the head are, with those enclosed, a little wider. The intervals of red ground-color occupy four or five scales on the middle of the body, and one or two more anteriorly and posteriorly. The yellow rings are of nearly uniform width, and completely surround the body. The spaces between them on the abdomen are black. There are no black spots upon the body.

Type No. 4293, Matamoros, Mexico. Lieut. Couch.

425, Mexico. Paris Museum.

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A small specimen from Brownsville, Texas, (No. 1855), with twenty-one pairs of black rings from head to anus, has the yellow rings rather wider on the abdomen, though not two scales wide on the first dorsal row,—and the black rings distinct; the enclosed abdominal intervals are only black along the middle. Otherwise similar to the above.

SCOTOPHIS Baird & Girard.

S. OBSOLETUS Kennicott. *Coluber obsoletus* Say, in Long's Exped. Rocky Mountains, i. p. 140, 1823; not *Coluber obsoletus* "Say," Holbrook, Am. Herp. iii. 1842, p. 61.

Spec. char. Head broad behind, tapering anteriorly, snout more pointed than in *S. Allegheniensis*. Head much more elevated anteriorly. Nasals, loral, anteorbital, and anterior upper labials elevated. Vertical large anteriorly, nearly as broad as long. Superciliaries and occipitals large. Scales in twenty-five or seven rows, the central ones moderately carinated. Color above entirely black, with a slight bluish olive tinge. Upon stretching the skin, the spaces between the scales seem to be red. Abdomen light bluish slate posteriorly; anteriorly, yellowish, clouded with bluish slate, lighter than in *S. Allegheniensis*.

Descr. This species resembles *S. Allegheniensis* very closely, rendering a comparative description necessary. Head broad behind, more elongate and elevated in front than in *S. Allegheniensis*, hence the occipitals are larger, and the nasals, loral, preocular, and anterior upper labials are more elevated. The anterior frontals are smaller, though the external posterior angles are more elongated; the anteorbital is narrower. Posterior orbitals rather larger; vertical large, anterior breadth nearly equal to the length. Four or five external rows of scales smooth, the first largest, with the scales less obtuse than in *S. Allegheniensis*. The head and entire upper parts are uniform black, not pitchy as in *S. Allegheniensis*, but with a slight tinge of olivaceous or brown. Upon stretching the skin the spaces between the scales and sometimes the covered bases of the latter are seen to be of a bright reddish brown on the sides, and in bars across the back, enclosing a vertebral series of pure black spaces which are analogous to the dorsal spots sometimes seen in *S. Allegheniensis*. No trace of these markings is to be seen in our specimens of the present species without stretching the skin, though one of them is but about three feet in length.

The abdomen is much lighter than in *S. Allegheniensis*; the posterior space occupied by the light bluish slate color is less. Along the middle third it is yellowish, heavily clouded with bluish slate, and anteriorly it is yellow, with irregular clouded spots of bluish slate along the sides. These anterior markings are much smaller than in *Allegheniensis*, and never in large square blotches as in that species.

Though so closely allied to *Allegheniensis* as not to be readily distinguished by absolute characters, except in the red spaces between the scales, the differences in the form of the head, and generally lighter colors, will be apparent at once upon comparison.

Independence, Mo. Dr. J. G. Cooper.

EUTÆNIA Baird & Girard.

E. MEGALOPS Kennicott.

Spec. char. Form shorter and stouter, with proportionally shorter tail than in *E. proxima*, which this species resembles. Tail one-fourth of the total length. Eye very large, greater than in *E. proxima*. First dorsal row of scales broader, each scale as high as long, and less strongly carinate. Dorsal stripe narrow, covering one and less than two half rows of scales. Color uniform brownish ash, with the three longitudinal stripes whitish yellow. Head olive ash.

Descr. Color uniform dull brownish ash or clay color, with the dorsal and

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lateral stripes whitish yellow. A few of the scales have narrow black spots on their edges, but these are not prominent, and never extend over a scale, appearing as indistinct mottlings of black on the ground color, always on the rows next the stripes. The head above is light olive ash. The lateral stripe is on the third and fourth rows, and is narrower than in *E. proxima*, covering rather less than two half scales. The color below the lateral stripe is a little lighter than that of the back. The exterior dorsal row is much wider than in any of the allied species, each scale being as high as long. The second row is much narrower, though a little wider than the third. The eye is strikingly large, and the superciliaries are raised, rendering the fore part of the crown an inclined plane, yet the muzzle is higher than in *E. proxima*.

No. 965, Tucson and St. Magdalena, 160, 86, 21, 24, 6. Major Emory. A. Schott.

E. MACROSTEMMA Kennicott.

Spec. char. Twenty-one rows of scales. Body rather stout. Head small, narrow posteriorly. Vertical plate much elongated, twice as long as wide. Eight upper labials, sixth largest, seventh sometimes equal. All the dorsal scales broad and short, first row largest, its scales as high as long and slightly carinate; second smaller, but much broader than the third. Ground color above very dull yellowish brown. Dorsal stripe broad, light brownish, but little lighter than the ground color, and with an indistinct black border. Lateral stripe on the fourth and part of the third row, indistinct, dull yellowish green. Two series of indistinct broken spots along the second and sixth rows.

Descr. The dorsal stripe is broad and regular, covering nearly three rows, but is dull and indistinct. On each side of it for one and a half scales there is a rather indistinct black border, somewhat as in *E. ordinoides*. Below this to the fourth row the color is dull greenish brown. On the fifth and sixth rows there is a series of indistinct black spots, each covering three scales, whose keels are of the ground color. This is also the case with the scales in the black border of the dorsal stripe. The lateral spots are one and a half scales wide, and separated by spaces of the same width. The third and fourth rows, particularly the fourth, are lighter, and of a yellowish green or olive color; the first and second and lower edge of third being a little darker, sufficiently define the lateral stripe. On about every other scale of the second row is a series of broken and irregular black spots, formed by the black margin of each side of the scales; extremely slight as to the contiguous scales. Each abdominal scutum is distinctly edged with black anteriorly, (of course concealed by the incumbent scutum), and some are tipped with black at their extremities, otherwise the abdomen is immaculate. In one specimen it is uniform dark green; in another, uniform yellowish green. The head is dark brown above, the superior labials but little lighter, and narrowly bordered with black posteriorly.

One specimen, upon the removal of the epidermis, appears entirely of a pale creamy yellow throughout, but with the black markings, including the border of the dorsal stripe, very distinct. Another specimen is green instead of whitish yellow.

City of Mexico. Maj. W. Rich.

This is a very well marked species, and readily distinguished. In color it bears some resemblance to some varieties of *E. ordinoides* and *dorsalis*, but it belongs to a different section of the genus, as indicated by the position of the lateral stripe. It is otherwise different from *E. ordinoides*, in having a very much smaller head and larger vertical plate, the dorsal scales wider, and the stripe more indistinct. From *E. Marciana* it differs in its very much smaller head and longer vertical plate, in its broader dorsal band, bordered by a stripe instead of a row of spots, and in the absence of the post oral crescentic patch, and broad black borders of upper labials.

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E. HAMMONDII Kennicott.

Spec. char. Twenty-one rows of scales. Form rather slender; head long, narrow posteriorly; snout elongate and narrow, but rather obtuse. Postorbitals three, the upper much the largest. Eight upper labials, sixth largest; its postero-inferior angle much elongated. No dorsal stripe; lateral stripe olive yellow on the second and third rows. Back uniform dark olive brown or blackish, without distinct spots. Abdomen whitish olive, lighter anteriorly, and a dark line along the middle posteriorly.

Descr. Form rather slender, the tail about one-fourth the total length. Head very narrow and much elongated; the snout very narrow, but rather obtuse. The back above the third row of scales is very dark uniform olive brown without spot or band, except a light medial line extending about an inch back of the head. Lateral stripe light olivaceous yellow; first row of scales a little darker, and similar to the abdomen, being of a very dull whitish olive. Bases of the scales of the first row black; bases of abdominal scutes the same, the color broader toward their extremities, and generally concealed by the incumbent scute. A narrow slate-colored line along the middle of the abdomen posteriorly. Head above dark olive; superior labials very light olive yellow, margined with black posteriorly, excepting the eighth. This is black anteriorly, its posterior end being occupied by a yellowish patch which is confluent with the yellow of the neck. Lower postorbitals yellow. Two small yellow occipital dots, and a small yellow dot on each side of the posterior part of the vertical plate; these sometimes absent.

Young specimens, and older ones, after the removal of the epidermis, exhibit faint indications of a very narrow dorsal stripe upon a single row of scales, but in one there is no trace of this, even upon the neck, where it is usually visible. These specimens also exhibit traces of two series of large alternating spots, which present somewhat the appearance of a zigzag line. In a young specimen there is a distinct series of spots on the first dorsal row, each spot covering one scale, and separated from those adjacent by two scales. Only one specimen is without the dark line upon the abdomen posteriorly. There are no irregular black blotches upon the abdomen as in *E. angustirostris*.

San Diego. Dr. J. F. Hammond.

Fort Tejon. J. Xantus.

This species is strongly marked, and will hardly be confounded with any at present known. It resembles most nearly *E. angustirostris*, under the head of which species the comparative differences are given in full. Two young specimens labelled by Dr. Hallowell "*Tropidonotus ordinatus*," belong here. *Eutænia ordinata* has a stouter body and head, and more pointed snout. There are nineteen dorsal rows, and a very different system of coloration.

E. ANGUSTIROSTRIS Kennicott.

Spec. char. Body moderately stout; tail less than one-fourth the total length, and very small. Head exceedingly elongated and narrow, more so than any other of the genus; snout very long, narrow and pointed. Crown plane above; eye large. Upper labials eight, sixth largest, seventh scarcely smaller. Dorsal rows twenty-one; outer row large, very faintly carinated, the second smaller but broader than the third; the next rather large and elongated, and strongly carinated. Dorsal stripe narrow, very indistinct. An indistinct, dull whitish lateral stripe on the second and third rows. Above the lateral stripes dark olive brown or black. Abdomen dark ashy olive or black.

Descr. The back above the third row of scales is dark olive brown without spots, but with each scale bordered with darker. The scales of the second and third rows are greyish olive, with distinct yellow borders. The first row and abdomen are ashy olive, with irregular heavy black blotches upon the

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latter, more numerous along the middle third, but offering no indication of a narrow black line as in *E. Hammondii*. On the first three rows some scattered scales have black spots on their bases and edges. Head above dark olive; upper labials light olive with vertical black edgings.

A young specimen is entirely black; the dorsal stripe obsolete, being indicated only by a faint line on a single row of scales; the lateral stripes very indistinct; the first and part of the second row of scales entirely black. A whitish line along each side of the abdomen formed by a white spot at the end of each scute. These are also margined posteriorly with the same color. Throat whitish.

The remarkable elongation of the snout will distinguish this species from any others at present known, excepting *E. leptcephala* and *Hammondii*, from which it differs in other respects. The snout is more elongated, and decidedly more pointed than in either; the head is not at all depressed anteriorly as in *E. leptcephala*, and the eye is strikingly larger. The colors of the back and abdomen are darker, and the rows of scales are twenty-one, not nineteen. As compared with *E. Hammondii*, which it most nearly resembles, beside the difference in the form of the snout, the head is depressed posteriorly (not anteriorly); hence the crown is quite plane throughout, while in *E. Hammondii* the crown is somewhat arched,—this form being more observable upon the occipital and frontal (vertical) region. In *angustirostris* the general form is stouter, while the head is longer, and hence a greater elongation of the vertical and frontal plates. The scales of the upper rows are also larger and more elongated, and more strongly carinate. The tail is shorter, being considerably less than one-fourth the total length, while in *Hammondii* it is fully or more than one-fourth. This member is also very slender, the body tapering abruptly near the anus in the former species. The dorsal stripe, though narrow, is not wanting, and the abdomen is much darker, being ashy olive with heavy black blotches throughout instead of light yellow or greyish olive, and there is no indication of the central line. The young black specimen is strikingly different from the young of *E. Hammondii*.

Parras, Coahuila, Mexico. Lieut. Couch.

E. CYRTOPSIS Kennicott.

Spec. char. Form very slender, but little stouter than that of *E. saurita*, but with shorter tail, one-fourth the total length. Head large. Eye very large. Superior labials eight, sixth and seventh largest. Three postorbitals, upper much the largest. Scales in nineteen rows. Color above olive brown, with two alternating series of elongated spots between the stripes, giving the appearance of a zigzag line. Dorsal stripe whitish, narrow, distinct to the tip of the tail. Lateral stripe on the second and third rows, of the same color, broad, distinct from head to anus. A series of black spots on the first dorsal row; abdomen uniform greenish white. Orbitals whitish; occipital spots obsolete.

Descr. This species somewhat resembles *E. Marciana* in the pattern of coloration, which, however, has the lateral stripe upon the third row only, instead of the third and second. The difference in form is most striking, the body being almost as slender as in *E. saurita*. The scales are rather larger than in *E. Marciana*, and those of the first row more elongated. The ground color above the lateral stripe is olive brown; the first dorsal row is whitish olive or greenish white. The abdomen is uniform greenish white, except a small black marginal spot near the extremity of each abdominal scute. The whitish dorsal row occupies one, and less than two half rows of scales, and is encroached upon by the black dorsal blotches which sometimes reach the central row. The lateral stripe is also encroached upon by the spots above and below it, though never entirely interrupted by them near the head as in *E. Marciana*. The head is dark olive above; labials margined vertically
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with black, somewhat as in *E. Marciana*, except the seventh plate, which in the former is heavily bordered with black on both edges; in the latter, slightly upon the anterior edge alone. There is a vertical light patch at the angle of the mouth crossing the posterior upper labial, and confluent with the white of the neck, and not distinct and crescent-shaped as in *Marciana*. Behind the occipital plates is a very large double black blotch. Behind this there are three or four perfect square blotches extending quite from the dorsal to the lateral stripe, each three scales in length, and separated by intervals of about two scales wide. Behind these the general pattern of spots is seen; it consists of two series of large oblong rhomboidal alternating spots, each about four scales long, and somewhat confluent with each other at the adjacent corners, giving the appearance of a zigzag line upon each side. On the first and second dorsal rows is a third series of very distinct black spots, each on parts of three scales, and the extremities of two abdominal scutes. The intervening spaces of greenish white ground color are equal in width to the spots.

No. 930, Rinconada Coahuila, Mexico, 179; 90, 19, 24 $\frac{5}{8}$, 6. Lieut. Couch.

Durango. Lieut. Couch.

Gila River. Dr. Webb.

Other specimens have the dorsal stripe on a single row of scales, and the lateral stripe has its upper border regular and distinct, without interruption from the middle series of spots, the lower edges of which reach only the upper edge of the third row instead of the lower edge as in the specimen above described. Instead of the distinct spots upon the first and second rows in that specimen, they are here broken up into black borders of three approximated scales. In the only large specimen of this variety, the keels of the first dorsal row are not parallel to those of the rows above, being directed obliquely downward and backward, so that the posterior end of one keel falls below the anterior end of the next succeeding, instead of forming a continuous line. The nose of this specimen is also more pointed than in the typical one.

REGINA Baird & Girard.

R. VALIDA Kennicott.

Spec. char. Body stout for the genus; head large, short but high; broad posteriorly. Snout elongated, narrow and pointed. Rostral as high as broad, subpentagonal, the apex pointed. Vertical very narrow, obtusely pointed posteriorly: occipitals small. Nineteen rows of scales, all carinated; the exterior very feebly. Light brownish ash above, with faint black markings upon the bases of the scales of the first, fourth and eighth rows of scales. Abdomen entirely uniform yellowish.

Descr. The body is stout for the genus, with the tail rather short. The head is very large and proportionally stout. It is very broad and high posteriorly, and tapers regularly to the snout, which is rather narrow, elongated, and pointed. Crown flattened as in other species of the genus. Snout elevated, rostral plate as high as wide, subpentagonal, and with the elongated apex pointed. Loral nearly as high as long. Anterior frontals triangular, elongated. Vertical very narrow, not widening anteriorly, the posterior point very obtuse and scarcely triangular. Superciliaries proportionally wide, and occipitals small. There is one rather large anteorbital, and two large postorbitals on one side, and three on the other, (which may possibly be the normal number). Upper labials large, sixth and seventh largest, eighth (the last) smaller. Inferior labials ten, sixth longest.

The dorsal rows are nineteen, all carinated, the outer row very slightly. The scales of the first row are much the largest; all the rest about equal.

The color above is entirely uniform light brownish ash, (clay color beneath the epidermis), with about every alternate scale on the fourth and fifth rows

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marked with black on each side near its base. Posteriorly the scales of the first row are faintly marked with black at their bases. These black markings are not prominent, and only perceptible upon close examination. The head, including the upper labials and rostral, has more of an olivaceous cast. The abdomen is entirely uniform pale greyish yellow, the tips of the scutella being, however, tinged with the ashy brown color of the back.

1309, Durango, Mexico. Lieut. Couch.

In its general aspect this species bears considerable resemblance to *Nerodia erythrogaster*, from which, however, it is, upon critical examination, at once distinguished by the number of dorsal rows and other generic characters. It will, perhaps, be found that the faint black markings on the first, fourth and eighth rows are the remaining indications of faded stripes.

NERODIA Baird & Girard.

N. COCCINI Kennicott.

Spec. char. Resembles *N. erythrogaster*, but the head is shorter and very broad; the muzzle broad and obtuse. Postorbitals three, much larger than in *N. erythrogaster*, the lower extending forward beyond the middle of the eye. Eight upper labials, all large, the seventh much larger than in *N. erythrogaster*; the dorsal scales are broader and less strongly keeled, and in twenty-three rows. Uniform dull light slaty brown above, paler than *erythrogaster*.

Descr. The head is short, but very broad and deep posteriorly; the nose is broad and obtuse. The outline presented by the head is subovoid, not regularly tapering from the angle of the jaws to the snout as in *N. erythrogaster*. The prefrontals are rather shorter than in that species. The postorbitals are very large, three in number, the lower one elongated forward to beyond the middle of the orbit. The color above is entirely uniform dull light slaty brown, lighter than in the lightest varieties of the *erythrogaster*. The abdomen in both specimens examined is uniform brownish white. Upon stretching the skin of one specimen, traces of the usual white transverse lines are seen between the scales. The young are probably marked somewhat as in *N. erythrogaster*.

No. 1319, San Diego, New Leon. 143+1, 71, 23, 37 $\frac{3}{4}$, 9 $\frac{3}{4}$. Lieut. Couch.

No. 1314, Santa Caterina, New Leon. 143+1, 86, 23, 26 $\frac{7}{8}$, 9 $\frac{1}{4}$. Lieut. Couch.

This species very closely resembles *N. erythrogaster*, but can be distinguished upon comparison by the lighter color, broader and shorter head, and by the larger postorbitals and anterior position of the lowest. From *N. Woodhousei* it differs in its uniform color, its much broader and shorter head, etc.

N. COMPRESSICAUDA Kennicott.

Spec. char. Body stout. Form triangular, much compressed toward the tail, where it is considerably higher than broad. Head elongated, rather narrow, but very deep. Plates of the crown large; vertical short, very broad; loreal small; three postorbitals, upper and lower small, but the central with its lower posterior angle prolonged to the labials. Twenty-one dorsal rows of scales, all carinate, in form rather wide; those of the first rows proportionally small. Ground color yellowish olive; four black stripes on the neck; behind this zigzag transverse black bands, which do not taper on the sides. Posteriorly these bands break into three series of spots symmetrically arranged, not alternating.

Descr. Body rather stouter than that of *N. Sipedon*, and presenting a subtriangular form. This is most evident posteriorly, where, and on the tail, the height is much greater than the transverse diameter. The tail is very large at the base as in *N. rhombifer*, and does not taper from the anus, 1860.]

but narrows abruptly at one-third its length from the base. Dorsal rows twenty-one, all distinctly carinate. The scales are rather broad, and much rounded posteriorly, those of the first dorsal row disproportionately small. The head is elongate and rather narrow posteriorly, but very deep and but little depressed on the snout. All the plates of the crown are large; the vertical very broad and short, the loral longer than high, the upper and lower postorbitals small, but the central elongated so as to reach the labial plates.

In pattern of coloration and structure, this species departs somewhat from the usual style of the genus. The ground color is light olive brown, crossed on the anterior half of the body by waving or somewhat zigzag transverse black bands, covering two or three scales longitudinally, and separated by intervals of one or two scales. These bands do not taper regularly on the sides as in *N. sipedon*, but are constricted upon about the sixth row on each side, but are as wide upon the third, as on the vertebral row. Posteriorly these bands become narrower, and finally break up into a dorsal series of vertically elongated spots, and a lateral series of small circular ones, which do not alternate with the dorsal series as in *N. sipedon*, *taxispilotus* and others. For two inches behind the head, the transverse bands are replaced by four distinct longitudinal black lines, the lateral ones each covering the third, fourth, and part of the second rows, the upper ones covering the seventh, eighth, ninth and part of the tenth rows; these black lines are separated by a little over one scale of ground color. None of the black markings involve the first dorsalrow, which is yellowish olive, excepting some irregular dark mottlings. The head is yellowish olive, with the middle of the occipitals and verticals black, and a black patch extending from the eye back above the labials. The rostral is yellow, distinctly margined above with black. All the labials above and below, and the inframaxillary plates are yellow, prominently margined with black. The abdomen is yellow, with two lines of black blotches.

1348, Tampa Bay, Florida. Mr. D. Welch.

HETERODON Pal. de Beauvois.

H. KENNERLYI Kennicott.

Spec. char. Head broad, very short anteriorly. Rostral plate very large. Loral plate very small, sometimes absent. Only two supplemental plates behind the azygas; the latter is sometimes replaced by two symmetrical contiguous plates, and without any supplemental. The prenasal and prefrontal in contact with the posterior process of the rostral. Dorsal row of scales twenty-three, all carinated except the first and second, which are perfectly smooth. Ground color light yellowish grey; a dorsal series of rather indistinct rounded or subquadrate brown blotches; a second series of smaller circular spots, much darker and more distinct; below this a third, and more indistinct series.

Descr. In its general form and appearance this resembles the *H. nasicus*, with which it is sometimes found associated. The body, however, is rather shorter and thicker than in *H. nasicus*, and the head is broader with the part of the head anterior to the eye decidedly shorter. The nasals are not as well developed longitudinally as in *H. nasicus*, but the result of this shortness of the anterior part of the head is seen in the very small loral which is frequently wanting entirely. There is never more than one loral while frequently two are seen in *H. nasicus*, in which the loral is in every case strikingly larger than in *Kennerlyi*. The most striking difference between these species is in the number of small plates surrounding the azygos, or postrostral. While in *H. nasicus* there are always at least ten of these, one or two of which margin the inner edges of the prenasals and prefrontals, there are never more than two, and frequently but one additional plate in *H. Kennerlyi*, and the prenasal and prefrontal are always in contact with the posterior process of the rostral. The azygos is short, nearly as broad as

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long, and usually there are just behind it two contiguous plates of about the same size separating it from the postfrontal, but not from the prefrontal. Frequently, however, the azygos is longitudinally divided and without any additional plates, but in contact with the rostral anteriorly, and the vertical posteriorly, and not separated from the postfrontals. The vertical, occipitals, superciliaries and labials are much as in *H. nasicus*, though generally less developed longitudinally. The rostral is as large as in *H. nasicus*. The two outer dorsal rows are both perfectly smooth; in *H. nasicus*, the second is distinctly though delicately carinate.

The ground color is light yellowish gray, with a dorsal series of rather indistinct subquadrate or rounded blotches, two to two and a half scales long, and separated by intervals of one or two scales, rather wider anteriorly. Below this is a series of very distinct purplish black circular blotches, covering four scales transversely and two longitudinally; below this, one or more indistinct series of spots. This pattern of coloration is very similar to that of *H. nasicus*, but the ground color is always lighter, and the dorsal spots are lighter and less distinct. The upper lateral series is of a purplish black, and much more distinct, forming a prominent character.

Abdomen nearly entirely black, except a few yellow scuta. The head is marked as in *H. nasicus*, except that the nasals, prefrontals and rostral are all yellowish, while in the latter species they are dark in front of the light transverse line which crosses the crown behind the rostral; and in *H. Kennerlyi* the light line across the superciliaries and vertical is much broader than in *H. nasicus*. This species differs from *H. simus* in many of the same features as does *H. nasicus*. These, together with the small or absent loreal, and small number of supplemental plates, will readily distinguish it.

Rio Grande. Dr. Kennerly.
Sonora.

ELAPS Schneider.

ELAPS EURYXANTHUS Kennicott.

Spec. char. Head very small, narrower than the neck; entirely black as far back as the angles of the mouth. Body banded alternately with black and light brick red, separated by narrow rings of creamy white, all the bands immaculate. First broad ring behind the occiput red instead of black as in the other species.

Descr. Body rather stout, but less so than in *E. fulvius*. Dorsal scale large. Plates of the head small except the rostral, which is very large and extends upward between the prefrontals. Prefrontals elongated laterally, more so than in *E. tener*. Post frontals small, elongated laterally; vertical very small and narrow, subhexagonal, pointed anteriorly, elongated and tapering posteriorly; it enters but slightly between the occipitals. Occipitals small, subtriangular, the anterior edge square, very slightly notched for the vertical. Seven labials above; posterior very small.

The fore part of the head is black, but the black instead of passing forward from the anterior part of the occipitals to near the eye, and thus leaving the three posterior labials yellow as in *E. fulvius* and *E. tener*, involves nearly the whole of the occipitals, and passes backward entirely behind the angle of the mouth and involves the whole of the lower jaw to behind the posterior labial, leaving a broad emargination in the black on the occiput in the bottom of which emargination are seen the white posterior tips of the occipitals. Behind this is a creamy white ring, (probably yellow in life) which is situated more posteriorly than in *E. fulvius*, and involves only the posterior tips of the occipitals and none of the labials. Next behind this white ring, instead of a black ring, as in the other species, is a broad light brick red one involving eleven scales. A creamy white ring three and a half scales wide separating
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rates this first red ring from a black one eight scales in width. Behind this are alternate immaculate black and red rings, seven or eight scales wide, and separated by white rings three to three and a half scales in width. There are eleven black and eleven red rings on the body separated by twice as many white ones. The tail is ringed with black and white without any red. All the rings run entirely around the body of the same color, and are wholly without spots, above and below. The plates of the head and peculiar style of coloration in this strongly marked species cannot be mistaken. The three colors, each immaculate, glossy, and clear, form a striking contrast, and the red is probably bright carmine in life, thus affording the most beautiful coloration possessed by any North American snake.

ELAPS DISTANS Kennicott.

Spec. char. Body slender, with very narrow black rings, four or five scales in width, separated by intervals, three or four times as wide, of brownish or reddish, entirely unspotted. No light rings separating the red and black ones. Under lip and jaw wholly without black, and the tip of nose light.

Descr. Body very slender; tail long for the genus. Dorsal scales small. Plates of the head generally larger than in *E. euryxanthus*; rostral broad and not as high as in *E. euryxanthus*. Anterior frontals rather small, and slightly elongated laterally; postfrontals large, pentagonal, as broad as long. Superciliaries quadrangular, elongated, narrow. Vertical, pentagonal, rather large, but narrow, the pointed posterior extremity inserted between the occipitals, as in *E. fulvius*.

The ground color of the body in the alcoholic specimen is reddish brown, probably brighter red in life, with twelve very narrow black rings from head to anus. At the edges of the black rings the reddish color becomes indistinctly lighter for half a scale, but there is no well defined light ring bordering the black as in the other species. On the tail are five broad black bands separated by narrow light rings. The anterior part of the head back to the middle of the occipitals and the upper jaw to the fourth labial is black, but this color does not extend on the lower jaw at all, and the lower edge of the rostral and upper labials is light. On the posterior part of the head is the usual light ring, but situated farther back than in *E. fulvius*, its anterior border passing across the middle of the occipitals a little behind the vertical and thence down and forward to the fourth labial, expanding below upon the whole of the lower jaw. On the neck behind this light ring is a black one, about five or six scales in width, which does not run entirely around the body, being interrupted for a short distance on the abdomen. Behind this, the black annulations are perfect, each four or five scales in width, and separated by intervals of fifteen to twenty scales of the ground color. The black annulations are broader on the vertebral region than laterally and beneath where they cover three or four dorsal scales, and the same number of abdominal scutellæ. The black rings on the tail are about eight scales wide, and separated by light intervals of only two or three scales.

The narrow black rings, separated by very wide intervals, will at once distinguish this species from any of the others here described. There are also no blotches or dots of black on the red intervals, and, if the colors of the specimen described have not been much altered by soaking, the absence of distinct light rings of a third color between the black and red ones will form a striking character. The color of the light occipital ring and of the light rings on the tail is probably yellow or white in life. The mutilated condition of the head prevents an accurate description of its outline, but it is apparently small and narrow as in *E. tener*.

1144. Batosegachie, Chihuahua. John Potts. 216, 48, 12, 22, 3.

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Notes and descriptions of new and little known species of American Reptiles.

BY E. D. COPE.

OPHIDIA.

CHILOMENISCUS Cope.

Size small. Form stout, body cylindrical, the head not distinct. Muzzle rounded, very prominent, and much depressed. Rostral plate large, with an extensive superior surface, and presenting an obtuse angle between the prefrontals: the inferior surface greater than the superior, owing to the backward position of the mandible. Head shields broad, normal, except in the confluence of the prefrontals with the nasals. Nostril connected to the anterior suture of the postfrontal by a groove. Loreal none, the postfrontals reaching the labials. One pre-two postoculars. Scales smooth. Tail short, the urosteges and anal plate divided. Teeth equal, or the posterior a little stouter. Palatines and pterygoids present.

This truly Calamarian genus is analogous to *Stenorhina* in the union of the nasal and prefrontal shields, and perhaps the form of the muzzle and inferior position of the mouth indicates affinity to *Chionactis*.

C. STRAMINEUS Cope.

Common suture of the prefrontals very small, (in one specimen obliterated by the rostral,) that of the postfrontals but half the length of their sutures with the prefrontals. Vertical presenting an obtuse angle anteriorly; the superciliary sutures converging posteriorly; posterior angle less than a right-angle. Occipitals short, their common suture scarcely longer than the frontal suture of the vertical. Superior labials seven, the second reaching the minute preocular, or should that plate be absent, as will probably occur occasionally, forming with the third and fourth the inferior border of the orbit. Inferior labials eight, fifth the largest. Genials two pair, posterior half the length of the anterior. Temporals 3—3; a larger central plate opposite the occipital suture. Scales in thirteen rows, hexagonal on the flanks, a little elongated on the back. Gastrosteges 117; one divided anal; urosteges 22. Total length of the largest specimen, nine inches; the tail, thirteen lines.

Coloration.—Inferiorly, and upon the first and second rows of dorsal scales, pale straw color. Superiorly, brownish straw color, each scale with a deep brown dot near its posterior extremity. Top of the head grayish, minutely punctulated with darker.

Hab. Cape St. Lucas, Lower California. Discovered by Mr. John Xantus. Museums of the Smithsonian Institution, Washington, and Academy of Natural Sciences, Philadelphia.

CATOSTOMA Wagler.

In the *Monatsberichte der Preuss. Acad. von Wissensch.*, 1859, p. 275. Herr Peters identifies this genus with the *Rhabdosoma* of Duméril, employing, however, the name *Geophis*, which was given by Fitzinger in the *Systema Reptilium*, p. 25, many years subsequently to that of Wagler. The typical species is *C. chalybeum*, which the combined diagnoses of Wagler and Peters do not enable me to recognize as having yet been received at our Museum from Mexico. The most common species of the north eastern region of that country will henceforth stand as *Catostoma semidoliatum* with the synonymes *Rhabdosoma semidoliatum* Dum. & Bibr., and *Geophis semidoliatum* Peters, l. c. 276.

NINIA Baird & Girard.

Professor Baird has kindly pointed out to me that this genus has been identified 1860.]

tified with the *Streptophorus* of Duméril, by Prof. Jan of Milan, and that the type of the former, *N. diademata* B. and G. is the *Streptophorus bifasciatus* of the *Erpetologie Generale*. From an examination of the type specimen of Baird and Girard's description, I have become convinced of the correctness of this identification. The species of the genus will then stand:

NINIA DIADEMATA. *Streptophorus bifasciatus*, Erp. Gen. vii. 520.

*NINIA ATRATA.** *Streptophorus Drozii*, l. c. p. 518.

NINIA LANSBERGII. *Streptophorus Lansbergii*, l. c. p. 518.

NINIA SEBAE. *Streptophorus Sebae*, l. c. p. 515.

In these Proceedings, 1860, p. 77, I questioned the propriety of associating this genus with the genera of *Calamarinæ*. I now believe that it cannot be arranged in that sub-family.

TROPIDOCOLONIA Cope.

T. KIRTLANDII Cope.

Regina Kirtlandii Kennicott, Proc. Acad. Nat. Sci. 1856, p. 95.

This beautiful species, first described by Mr. Kennicott under Baird and Girard's genus *Regina*, appears to be congeneric with the *Tropidocolonia lineatum* Cope of Kansas. In neither species is the nasal plate entirely divided, but a groove connects the nostril with the labial suture. The anal plate in the *Kirtlandii* is divided, entire in the *lineatum*. I am not prepared to regard this difference as generic here, though it certainly is among some serpents. In dentition this genus is isodont, and the head is not distinct from the body.

The Academy's Museum possesses a specimen of the *T. Kirtlandii* from Columbus, Ohio, presented by Prof. Lesquereux, and a second, half grown, from the neighborhood of *Trenton, New Jersey*, discovered by my friend Mr. C. C. Abbott of that place.

This specimen differs in no respect from that from Ohio. This species has therefore an extensive distribution, ranging from New Jersey to Illinois. Its habits according to Mr. Kennicott, are terrestrial, which statement is confirmed by the observations of Mr. Abbott.

TROPIDONOTUS Kuhl.

T. USTUS Cope.

Scales in twenty-one longitudinal rows, all carinate, those of the first, faintly. Those of the second row not larger than those of the vertebral. Head narrow, not depressed, the end of the muzzle slightly elevated. Lateral borders of the vertical plate slightly concave, not convergent posteriorly. Pre-frontals small. Nostril in the supero-posterior angle of the prenasal plate. Loreal longer than high. Preocular single, two postoculars. Superior labials eight, fourth and fifth bounding the orbit. Lower postocular in contact with the occipital and a large temporal plate, which extends to the eighth labial.

A second large, and three small temporals border the occipitals exteriorly. Ten inferior labials, sixth largest. Posterior pair of genials longer than the anterior. Tail one-fourth the total length. Gastrosteges 126; anal one, divided; urosteges 66. Total length 12 in., 1 line. Tail 2 in. 10 l.

Coloration. Above, a yellowish ferruginous, pale upon the head, very deep upon the tail. Upon careful examination there are to be seen very indistinct erect half bands upon each side, extending from the first to the central rows of scales, alternating with each other. Posteriorly they become entirely transverse. Belly salmon color, passing into orange ferruginous upon the urosteges. Each gastrostege has a large central area of yellow, bordered on each side with wax yellow, (*cereus* Lat.) these colors, however, blending posteriorly.

*See Proc. Phil. Acad. 1860, p. 76.

One specimen in alcohol, sent to the Smithsonian Institution, from Charlotte Harbor, Florida, by E. M. Baker.

T. CELAENO Cope.

Scales in nineteen or twenty-one rows, all carinate except the first. Head broad and distinct posteriorly, constricted at the orbits, and remarkably narrow anteriorly. Profile of the crown slightly, but regularly convex. Superciliary plates narrow and elongate. Vertical elongate, its lateral borders concave, not convergent posteriorly, its length greater than that of the occipital suture. Frontals small, the anterior almost triangular. Nasals and loreal rather large, the posterior border of the latter very oblique. Preocular one, postoculars three. Superior labials eight, eye resting on the fourth and fifth, sixth and seventh largest and bounded above by the first temporal. Remaining temporals four on each side. Inferior labials ten, sixth longest. Posterior genials longer than the anterior. General form rather slender, tail one-fifth the total length. Gastroteges 145; one divided anal; urosteges 71.

Coloration. The general hue is leaden black above and below, with the following paler markings. A band of leaden gray commences upon the neck, occupying the second, third, and part of the first rows of scales. This extends to the anus, becoming darker, and leaving the first row of scales posteriorly. Upon the anterior third of the body irregular narrow vertical bands extend from this, separated by black spaces of one and a half or two scales in width, which spaces are sometimes enclosed by the confluence of the bands on each side of the black vertebral line.

One specimen (No. 351,) discovered by Mr. John Xantus, at Cape St. Lucas, Lower California, and deposited in the Museum of the Smithsonian Institute.

This species may be distinguished from those called *Eutænia*, by Baird and Girard, by its divided postabdominal scutellum. It, however, bears quite a close resemblance to some of them, e. g., *E. Pickeringii*. It is unnecessary to institute any comparisons with our true *Tropidonoti*, (which possesses the divided scutellum,) it is so strikingly different from all of them.

T. TEPHROPLEURA Cope.

Scales in nineteen or twenty-one longitudinal rows, keels obsolete on the external series only; second row larger than those of the back. Head distinct, narrow anteriorly, its lateral outlines regularly converging from the canthus of the mouth. Outline of the crown slightly depressed behind the plane of the orbits. Head shields much elongated, especially the superciliaries and vertical, the latter twice as long as wide. The lateral borders do not converge, and the posterior angle is but little greater than a right angle. Nasals large; loreal as high as long; two pre-, three postoculars, the former partially united in an old individual. Superior labials eight, sixth much the largest, its superior border and two-thirds of that of the seventh in contact with the very large first temporal. Remaining temporals normally four, sometimes confluent in pairs. Inferior labials ten, sixth the longest. General form stout; tail one-fourth of the total length. Gastroteges 146; one divided anal; urosteges 83. Total length 32 inches, tail 8 in., 31.; of a larger specimen, 9 in., 8 l., and the total length 38 in. 3l.

Coloration. Above plumbeous brown, shading into plumbeous grey or ash upon the sides, which color fades into pale greyish yellow upon the middle of the belly. Urosteges ashy, with a dark shade along the central suture. When the skin of the upper part of the body is stretched, it is seen to be leaden black along the medial line, with two or three series of quadrate spots of the same color on each side. These spots usually alternate, but are sometimes confluent into oblique bands.

Two specimens (4681 *type*, and 4680,) in the museum of the Smithsonian Institution, Washington, discovered at Cape St. Lucas, in Lower California, by Mr. John Xantus.

The number of rows of scales will distinguish this species from *Tropidonotus Woodhousei* Hallow. *Tropidonotus Couchii* Cope (*Nerodia Couchii* Kennicott, Proc. Phila. Acad., Aug., 1860), has a very differently formed head, but one preocular shield, and a few other distinguishing peculiarities. *Tropidonotus validus* Cope (*Regina valida* Kenn. l. c.) possesses a short head, a rostral plate as high as broad, one preocular, and small occipitals, according to Mr. Kennicott, none of which peculiarities exist in the *T. tephroleura*.

The three *Tropidonotes* here described possess the true syncraterian type of dentition. So also, does the *Trop. rigidus* Holbr., but the *T. leberis* Holbr., and some other species included by Baird & Girard in their genus "Regina," exhibit an almost constant isodont dentition. It is possible that a genus intermediate between *Tropidonotus* and some forms of *Homalopsis*, may exist in nature; that such genus be characterized by the possession of teeth of equal lengths, and that the only name applicable to it be *Regina*; yet the generic separation of the *rigidus* from the *leberis* will not accord with the present views of most herpetologists.

HERPETODRYAS Boie.

H. BODDAERTII Schleg.

A variety of this species has been obtained in the vicinity of Xalapa, Mexico, by Sr. R. M. DeOca. It is distinguished by the color of the tail, which is of a bright salmon tint. Mus. Smithsonian Inst.

SPILOTES Wagler.

The species of this genus may be divided into two sections, one characterized by the possession of keeled scales, the other having them smooth. To the former belong the *S. pullatus*, *poecilostoma* and *poecilnotus*; to the latter, which Fitzinger has called *Drymarchon*, the *S. corais* and *melanurus* pertain. All the structural peculiarities of this latter group are shared by the *Colubri Couperi* and *obsoletus* of Holbrook's American Herpetology. The latter species is not the *obsoletus* of Say, as supposed by Dr. Holbrook, which has been correctly identified by Mr. Kennicott, and shown to belong to a different genus; vid. *Scotophis obsoletus* Kenn. Proc. Acad. Aug., 1860. We therefore propose that Holbrook's species in question be known henceforth as

SPILOTES COUPERI Cope.

Syn. *Coluber Couperi* Holbrook, N. Am. Herp. iii. 75, pl. xvi.
Georgia Couperi Baird & Girard, Catalogue, p. 92.

SPILOTES EREBENNUS Cope.

Syn. *Coluber obsoletus* Holbr. l. c. iii. p. 61, pl. xii.
Georgia obsoleta Bd. & Grd. l. c. p. 158. U. S. and Mex. Bound.
Surv. Rept. pl. xv.

PITYOPHIS Holbrook.

P. HEMATOIS Cope.

Scales in from thirty-one to thirty-five rows, the exterior ten or twelve entirely smooth, the central faintly carinate; the scales three times as wide as long near the middle of the body. Head distinct, elongate, depressed, especially upon the region of the sutura coronalis. Occipital shield as long as the vertical, but subject, as in other species of the genus, to subdivision. Length of the vertical one and a half times the anterior breadth, the superciliary borders concave and slightly divergent posteriorly. Posterior angle obtuse. Postfrontals four, elongate, all bordering the vertical. Rostral not prominent; as broad as high, possessing six sutural borders, the nasal twice as long as any of the others. Nasal shields large, loreal longer than high. Preoculars normally two, sometimes three, or one. Postoculars three, exceptionally four.

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Superior labials normally nine, (exceptionally ten,) the fifth entering the orbit. Inferior labials normally twelve; genials two pair, anterior twice the length of the posterior. Tail one-seventh of the total length. Gastroteges 247, an entire anal, urostege 61. Total length 5 ft. 4 in. Tail 9 in.

Coloration. The ground color above and below is a rich straw yellow. The muzzle is shaded anteriorly with ashy or fuscous; this color gradually fades into a lively sanguineous or testaceous, which tint prevails upon the posterior part of the head, and anterior part of the body. There arises upon the tenth or eleventh row of the scales of the neck upon each side, a longitudinal band of the same color, which deepens posteriorly, and unites with its fellow at intervals of three or four scales by a gradual widening upon its dorsal border. Thus a scalariform series of dorsal blotches is formed, whose transverse diameter increases regularly posteriorly, and whose intervals diminish, being anteriorly four scales,—upon the tail, one and a half. The connecting band remains unbroken upon the anterior fourth of the body only. Separated from this by an interval of one half or a whole scale, another longitudinal and very narrow band arises on the neck. It is much more distinct opposite the intervals between the dorsal blotches, and upon the disappearance of the line connecting the latter, partially assumes its position, and breaks up into an alternating series of very elongated spots. The dorsal intervals are thus widened to a breadth of seven and two halves scales. There also commences upon the neck a second lateral series of spots, which occupy a length of five scales on the fourth, fifth and sixth rows. Their length decreases to three scales opposite the anus, where they unite with the superior lateral series. Every second pair of gastroteges is tipped with sanguineous. All the markings of this serpent are sanguineous anteriorly, but deeper posteriorly, passing through shades of maroon, until upon the terminal third of the total length they are entirely black. A black or maroon band passes along the suture of the urostege. Belly immaculate.

Hab. Cape St. Lucas, Lower California, sent by Mr. John Xantus. Museums Smithsonian, Washington; Acad. Nat. Sciences, Philada.

This species will compare favorably for beauty with the elegant *Tropidonotus concinuus* of the lamented Dr. Hallowell, but readily yields the palm to the gorgeous *Elaps eurxanthus* of Kennicott.

LYCODON Boie.

Syn. *Lycognathus** Duméril, Erp. Gen. vii. p. 916.

L. LYROPHANES Cope.

In describing this species, I will repeat some of the generic characters, promising that the form belongs probably to the Dipsadinae, to the typical forms of which it is connected by *Tripanurgus Fitz.*

Dentition resembling that of *Macroprotodon cucullatus Cope*. Seven teeth upon the superior maxillary bone, of which one posterior is elongate and grooved; three central, small and recurved, and three anterior, very long, the first longest and least recurved. The central three are not separated from those anterior and posterior to them by spaces wider than those existing between themselves. Palatine teeth six, the anterior three the longest, all longer than the pterygoids. The three anterior mandibular teeth longer and more widely spaced than the posterior, having an outward direction as in *Hormonotus Hallow.*

Scales in twenty-one rows, rather broad posteriorly and upon the middle of the body, not larger upon the vertebral line. The body anteriorly is slender, contracting to a small neck. Tail less than one-sixth of the total length. Head very distinct, the temples much swollen, so that the greatest breadth in life is just posterior to the eyes, though the length of head posterior to the

* See my remarks upon this genus, Proc. Phila. Acad. 1860, p. 262.

angle of the vertical shield is one line greater than that anterior. Side of the head constricted at the orbits, the muzzle rather narrow and truncate. Rostral plate broader than high, with but four sutural borders, the superior very long; the apex apparent upon the surface of the head. Prefrontals much broader than long; one-third the size of that part of the postfrontals visible from above. Upon a vertical view, the postfrontals appear longer than broad. Occipitals, superciliaries and vertical developed; the last presenting a right angle posteriorly, and having the lateral borders slightly concave and converging; the first not longer, and about as wide as long, in contact with a large scale in their posterior, common emargination. Nasal plates distinctly divided, very small, higher than long. Loreal plates two, the anterior higher than long, intercalated superiorly between the pre- and postfrontal, posterior as long as high. Preoculars three, the superior largest, not in contact with the vertical; the inferior bounded anteriorly by the third upper labial. Postoculars three, the inferior a little the largest. Superior labials nine, fourth and fifth entering the orbit, sixth largest, higher than broad. Inferior labials twelve, the third and fourth narrow, and much produced posteriorly. Genials two pair, the anterior longest. Gastrosteges 236, one divided anal, urosteges 70. Total length 27 in. 10 lin. Tail 4 in. 4 lin.

Coloration.—The ground color is a light grey. The muzzle is crossed by an indistinct ashy band, which extends upon the anterior part of the postfrontals. The posterior half of these plates is involved in a deep brown band which crosses the head between the eyes, whose posterior border is very concave, extending upon the superciliaries to the vertical plane of the pupil of the eye. This band is continued posteriorly, upon the inferior postocular and sixth upper labial. A pair of broad diverging bands commences one band on either side of the centre of the vertical, crosses the superciliary and occipital shields, and following the expanded outline of the temporal and tympanic regions, contracts and becomes longitudinal and parallel upon the neck. A brown spot upon the posterior extremity of the vertical plates with a posterior elongation, completes the resemblance of this figure to a lyre, or still more to that musical (?) instrument familiarly known to children as the "Jews-harp." The ground color appears upon the vertex as an anchor-shaped figure, and on the cheek, as an oblique band. The back, as far as the anus, is ornamented with twenty-one pairs of deep brown spots, their gemination only apparent anteriorly by the punctulate character of the scales in the intervals between the pairs. These intervals are always about three scales wide; the lesser, two and a half anteriorly, one and a half posteriorly. Dorsal spots seven scales wide; as the scales are broader posteriorly, the spots are also. There is an irregular series of lateral spots, one opposite each of the intervals, sometimes confluent with the dorsal spots: anteriorly they form a very narrow broken band. Another series of spots involves the tips of pairs of the gastrosteges, which are separated by two, three, four, or even five immaculate ones. Ten confluent pairs of spots on the upper surface of the tail. Whole under surface whitish.

Type (Sm. No. 4080), discovered by Mr. J. Xantus at Cape St. Lucas, Lower California. Another specimen collected by Mr. Irwin, at Ft. Buchanan, Arizona, appears to be identical, though in a bad state of preservation.

The discovery of this species by Messrs. Irwin and Xantus, is one of the most interesting additions to North American Herpetology. The form is strictly tropical, for we learn from the *Erpetologie Generale* that the *L. geminatus* is Brazilian, and the *scolopax* has been brought from Guiana and Santa Cruz de la Sierra in the eastern region of Bolivia. There are no other species known. It is important to notice that the present species differs from those of South America in the possession of *two* loreals and *three* preoculars, but with our present knowledge of the *Dipsadinae*, generic difference can hardly be predicated upon peculiarities of this kind.

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TELEURASPIS Cope.

In these Proceedings for December, 1859, I characterized a genus of crotaline serpents under the above name. It was intended to include all the serpents hitherto arranged with Bothrops, which possess undivided urosteges. In examining the structure of these serpents, I recognized two sections of the genus, the one containing a single species, and characterized by the possession of a series of elevated scales exterior to the superciliary plate; the other containing several species, which have that plate, as is Bothrops, i. e. forming the superior border of the orbit. It seemed probable that these might be generically distinct, yet the possession of the horned eyebrow by but a single species, would not admit of such a conclusion. Since then, I have received from Dr. Albert Günther, his description and beautiful figure of *Lachesis nitidus*, published in the P. Z. S., Nov., 1859. This serpent, which was discovered by Mr. Fraser, in the Andes of Equador, is obviously a second species of the typical group of my *Teleüraspis*; we can perceive no propriety in its position in *Lachesis*, a genus having urosteges anteriorly two-rowed, at the tip four-rowed.

In the Monatsberichte der Königl. Preuss. Acad. for March 1859, p. 278. Herr. Peters characterized a genus *Bothriëchis*, for a species resembling a *Bothrops*, except in its entire urosteges, and keelless scales of the vertex. Excluding the latter character, which does not appear to be of generic value, this genus is exactly co-extensive with my second section of *Teleüraspis*. The following, therefore, will be what appears to me to be the correct nomenclature of the species included by me in *Teleüraspis* l. c. with the addition of those here mentioned.

Crotaline Viperide, without *crepitaculum* having a scaled scarlet vertex, superciliary plates present, and entire urosteges.

1. TELEÜRASPIS Cope, Proc. Philada. Acad. Nat. Sci. 1859, p. 338.

T. SCHLEGELI Cope, l. c.

Trigonocephalus Schlegeli Berthold, vid. l. c.

T. NITIDA Cope, hujus operis.

Lachesis nitidus, Günther, l. c.

2. BOTHRIËCHIS Peters, Monatsbericht Königl. Preuss. Acad. 1859, p. 278.

B. NIGROVIRIDIS Peters, l. c.

B. CASTELNAUI Cope, h. op.

Bothrops Castelnau Dum. & Bibr., vid. l. c.

Teleüraspis Castelnau Cope, l. c.

B. LANSBERGII Cope, h. op.

Trigonocephalus Lansbergii Schleg., loc.?

Teleüraspis Lansbergii Cope, l. c.

? B. NUMMIFER Cope, h. op.

Trigonocephalus nummifer Rüpp., loc.?

? *Teleüraspis nummifer* Cope, l. c.

Contributions to American Lepidopterology.—No. 6.

BY BRACKENRIDGE CLEMENS, M. D.

TINEINA. Fam. *TORTRICIDÆ*.

ANTITHESIA Stephens.

Fore wings much narrower at the base than across the inner angle; costa regularly arched; apex obtuse; hind margin obliquely rounded; apical nervule simple; disk moderately broad, rounded behind, and with a secondary cell.

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Hind wings much broader than the fore wings, ovate; branches of the subcostal connivent at their origins; discal vein curved; medio-discal on an erect moderate stalk; the two superior nervules of the median vein scarcely from a common point. Head roughened; with ocelli. Face rounded, rather narrow. Eyes prominent, rather large; antennæ approximated, inserted on the forehead; setaceous, with whorls of minute cilia, pubescent beneath. Palpi exceeding the clypeus, ascending, rather hairy beneath and at the end of the middle joint above, which is truncate; terminal joint minute, oval. Tongue about one-half as long as the anterior coxæ. Thorax with a bifid tuft behind. Abdomen tufted in the ♂.

A. nimbatana.—Head and palpi dark brown, the latter whitish beneath. Thorax dark brownish, pale ochreous white in the middle. Fore wings dark brownish, with an indistinct violet hue from the base to beyond the middle; apical portion of the wing whitish, with brownish dots along the costa. Hind wings pale grayish fuscous.

The larva binds together the leaves of the rose. The insect may be the *A. chroleucana* of Europe, and may not be a native of our continent. The apical edge of the dark brownish portion of the wing is *obliquely rounded*, and is sometimes varied with whitish on the inner margin and towards the base.

Mass. Penna. Ill.

A. bipartitana.—Fore wings white, with a dark brown basal patch and a rather broad central fascia of the same hue, with the apical edge straight. The costa exterior to the central fascia has two or three dark brown dots; the tip of the wing is varied with the same hue, and in the middle of the apical white portion is a pale brownish spot. *Cilia spotted with dark brown*. Hind wings whitish, fuscous at the apex and towards the hind margin.

This insect bears a superficial resemblance to *E. fasciata*.

Mass. From Mr. Scudder.

A. ? corucana.—Fore wings luteous, varied with dark brown, spotted towards the base with metallic leaden hued spots; a more or less distinct central fascia spotted with leaden spots, especially on its edges, and a band from the costa, near the tip of the inner margin, is edged with metallic leaden-hued lines on both sides. The central and subapical bands are often dark brown irrorated with luteous, and the basal patch sometimes distinct, and again scarcely, if at all, indicated. Hind wings dark brown.

In general appearance, this insect strongly resembles those of the genus *Exartema*, but wants the peculiar appendage at the base of the inner margin of the hind wings in the latter genus, besides differing from it in other respects. In structure it agrees very nearly with the genus in which it is placed.

LOZOTENIA Stephens.

Fore wings nearly as broad toward the base as at the inner angle; with the costa much arched at the base, emarginate from the middle to the tip, which is slightly produced upwards, and emarginate beneath the tip on the hinder margin. The inner angle obtusely rounded. In the ♂ the costa at the base has a fold or flap of scales on the upper surface. The disk is elongated, slightly curved, *without distinct secondary cell*. The second disco-central nervule is approximated to the medio-superior, and the posterior, very remote from the penultimate, is opposite at its origin to that of the first subcosto-marginal nervule. In the posterior wings the discal vein is curved and the disco-central is approximated to the median system.

Head scarcely rough, with a slight frontal tuft between the antennæ. With ocelli. Face smooth and rather narrow. Eyes prominent. Antennæ separated at their bases, setaceous, pubescent beneath, or microscopically ciliated. Palpi ascending, cylindrical, densely clothed with short scales; terminal joint extremely short, slender, ovate, about as long as the basal joint; middle joint

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three or four times longer than the terminal, without spreading scales at the end. Tongue nearly as long as the anterior coxæ. Thorax not tufted. Abdomen tufted at the tip in the ♂.

L. Rosaceana, Harris, Ins. Mass., 2d ed., 376.—Pale cinnamon-brown. Fore wings with a basal and oblique central fascia of a darker reddish brown and a triangular spot of the same hue on the costa, near the tip, and frequently with a subterminal band. The wing is more or less striated with dark reddish brown lines. Hind wings ochreous yellow, internally blackish.

The larva binds together the leaves of the rose and other plants.

L. fervidana.—Palpi, head and thorax brownish ochreous. Fore wings ochreous, with the basal patch reddish brown; a reddish brown central fascia, interrupted on the disk, with a shining dark brownish spot above it on the middle of the costa; near the tip, on the costa, is a dark brownish spot, and between the two costal spots, beneath the middle of the wing, is a diffuse patch of the same hue. Hind wings fuscous, along the costa yellowish white.

PERONEA CURTIS.

Fore wings with tufts of elevated scales scattered over the surface; costa not folded, rather abruptly arched at the base, slightly concave in the middle; apex slightly produced, and the hind margin beneath it slightly concave; inner angle rounded. The disk is placed in the middle of the wing, is rather narrow and without secondary cell; apical vein simple. In the hind wings the costal and subcostal are distinct, the branches of the latter connivent; discal vein curved; medio-discal on a short stalk at the bifurcation of the two superior branches of the median vein.

Head scarcely rough. Ocelli small. Face short, rounded, slightly tufted in the middle. Eyes prominent. Antennæ setaceous, pubescent beneath. Palpi exceeding the face by one half their length, rather truncate, ascending toward the base and porrected from the middle; terminal joint minute, almost concealed in the scales of the middle joint, which is thin and cylindrical at its base, arching upward on its upper edge, nearly straight beneath, and densely clothed with scales at its end, especially above. Tongue about one-half as long as the anterior coxæ.

P. Viburnana.—Palpi brownish gray. Head dark brownish. Thorax blackish brown in front, dark ochreous behind. Fore wings grayish, with a reddish brown costal patch at the base, and a large triangular patch of the same hue, extending from the middle of the costa to the tip, and nearly across the wing; it is margined internally with dark ochreous, and has an oblique line of the same hue from the costa, passing through its middle. The tufts are minute, black and disposed on ochreous colored bases. Hind wings fuscous.

The larva rolls and feeds on the leaves of Viburnum and wild cherry. It is immaculate pale green; head pale brownish. The rolled leaves contain a silken web or gallery, in which the larva lives.

PLATYNOTA.

Fore wings with tufts and lines of elevated scales disposed over the surface; costa broadly folded at the base in the ♂, where it is abruptly arched, and straight along the middle; the tip and hind margin rounded. The disk is placed in the middle of the wing, and is broadest in the middle, without secondary cell. There are three subcosto-marginal nervules; the apical branch is *bifid*, with two disco-central nervules, the lower one approximated to the median system; the medio-posterior is moderately remote from the penultimate branch, and is opposite the *second marginal nervule*. In the hind wings the costal and subcostal veins arise from a common stalk; the branches of the subcostal separate from each other at the origin of the discal vein, which is somewhat angulated; the two superior branches of the median arise at a *common point*, where is likewise received the medio-discal on a short oblique

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stalk, the nervule running parallel with the medio-superior nervule. In repose the wings are deflexed in the apical portion along the middle.

Head smooth, vertex elongated. Face smooth nearly naked, concealed by the labial palpi; forehead with a thin tuft. Eyes rather small, moderately prominent. Antennæ setaceous, pubescent beneath. Palpi exceeding the face by more than one-half the length, *crambiform*, porrected, flattened, and tapering from the middle to the end; terminal joint distinct, short, smooth and ovate; middle joint suddenly arching upward at the face, whence it is porrected and slightly deflexed, roughly clothed with scales above and beneath. Tongue rudimentary, almost obsolete.

P. sentana.—Head and palpi dark brownish, slightly sprinkled with grayish. Fore wings dark grayish brown, with an oblique line of dark brownish scales near the base, terminating in a tuft of the same hue on the fold. An oblique line of elevated dark brownish scales crosses the wing from the costa within the middle, to the middle of the inner margin, and in the middle of the wing, exterior to it, is a short blackish streak, beneath which the wing is discolored with dark reddish brown; along the costa, exterior and parallel to the central line, are two shorter and similar lines. Near the hind margin, and parallel with it, are two lines of elevated dark brownish scales crossing the nervules. Hind wings yellowish fuscous.

The larva feeds on the leaves of *Viburnum prunifolium*. It is dark brown, with paler brown papilliform points, and two indistinct subdorsal lines of the same hue. It leaves its food plant to weave a white silken cocoon, and appears as an imago early in July.

P. flavedana.—Reddish saffron. Fore wings with an oblique line near the base, terminating in a tuft on the fold; an oblique central fascia edged on each side with elevated scales, and a fascia near the tip, joining the central fascia, reddish brown. Near the terminal border of the wing is a line of raised scales of the general hue. Hind wings reddish saffron.

Male? Palpi reddish brown, terminal joint yellowish. Head and thorax ochreous yellow. Fore wings yellow, deeper at the base than at the tip, with the middle of the wing discolored with blackish brown, having a purplish hue. At the base of the fold, on its middle and about the end of the disk, are tufts of scales, and with two transnervular lines of scales in the yellow portion. The extreme hind margin is reddish ochreous, varied somewhat with dark brownish.

These specimens may be only variations of *P. sentana*.

ANCHYLOPERA Stephens.

Fore wings rather narrow, with the tip usually *produced acutely*, and the hind margin falcate or concave. The disk is slightly above the middle of the wing, widening from base to apex, with four subcosto-marginal nervules; apical simple; two distinct disco-central branches. The medio-posterior arises between the first and second marginal nervules. In the hind wings the discal vein is curved. The median vein is either *two-branched, with a medio-discal nervule, or three-branched with the two superior branches on a moderately long common stalk, and a medio-discal nervule on a short peduncle.*

Head rather rough. With ocelli. Face slightly tufted in the middle. Eyes moderate. Antennæ setaceous, pubescent beneath. Palpi exceeding the face a little, slightly ascending but porrected, thickly and truncately scaled towards the end; terminal joint slender, minute, usually drooping, and almost concealed in the terminal scales of the middle joint, which is somewhat curved and roughly scaled beneath and at the end above. Tongue about one-half as long as the anterior coxæ, and a little longer than the labial palpi.

§ *Tip of fore wings produced. Median vein of hind wings 2-branched, with medio-discal branch.*

A. Spireæfoliana.—Palpi white, reddish brown at the base. Head

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reddish brown. Thorax white, disk reddish brown. Fore wings white with a large reddish brown dorsal patch extending from the base to the middle of the wing, and rounded on the costal edge; an oblique fascia of the same hue from the middle of the costa to about the centre of the wing, with the costa exterior to it streaked alternately with white and reddish brown to the apex. The extreme apex reddish brown. Hind wings grayish fuscous.

The larva feeds on the leaves of *Spiræa opulifolia* (nine bark.) One of the veins of the leaf is drawn closely to the midrib so as to produce a fold in it from the base, in which the larva lives and feeds on the parenchyma of the leaf. The larva deserts the food plant to form its cocoon, which is slight and woven between applied or folded leaves. The first brood produce imagos early in July. There is nothing characteristic in the ornamentation of the larva; its head and body are pale green, or yellowish green.

A. nubeculana.—Fore wings white with a dark brown dorsal patch extending from the base to the middle of the wing, with its costal edge irregular or doubly curved. The oblique central fascia is almost obsolete except on the middle of the costa where it appears as a dark grayish brown spot, and in the middle of the wing beneath it is a grayish brown round spot exterior to which is a short black dash. The wing above the inner angle is varied with grayish brown and brownish. The costa exterior of the middle is alternately streaked with white and brownish, becoming reddish brown toward the tip. Extreme apex reddish brown.

A. Platana.—Fore wings pale reddish ochreous, whitish along the costa at the base, frequently with a semioval patch of the general hue at the base of the inner margin. An abbreviated central, oblique fascia of the general hue, with two reddish brown streaks in the middle of the wing near the hind margin, and the costa from the central fascia to the tip, streaked with the general hue and whitish, and with two white streaks in the cilia beneath the tip. Extreme apex reddish saffron. Hind wings whitish.

The larva folds the leaf of sycamore near the base, weaving a web and drawing the side of the leaf to the midrib in June and July.

§§ *Tip of fore wings not acutely produced. Fore wings with very faintly indicated secondary cell. Hind wings, median vein 2-branched, and with a medio-discal branch.*

A. striatana.—Fore wings grayish brown, with three white streaks from the base, one along the costa, one in the middle of the wing, and one along the inner margin. The costa from the middle of the tip is alternately streaked with white and greyish brown. Ocelloid patch whitish with one or two black streaks, and with scales somewhat silvery internally and externally to the streaks. Hind wings fuscous.

Dr. Morris. Baltimore and Easton.

§§ *Hind wings with median vein 3-branched, the two superior pedunculated. In repose the fore wings are hooked in the middle of hind margin.*

A. costomaculana.—Fore wings ochreous-white, with a costal somewhat triangular patch extending from the middle to the tip and rounded in the middle of the wing; in the middle and toward the tip it is dark reddish brown, and along the costa tinted with dark purplish. The costa minutely striated from the base. Hind wings fuscous, paler towards the base.

DYSODIA.

Fore wings with a *subvitreous spot on the disk*; narrow at the base, dilated beyond the middle; tip obtusely rounded, hind margin rounded, inner margin sinuous. The disk is above the middle of the wing and is dilated posteriorly. From the subcostal vein arise three very oblique marginal branches, the first behind the middle of the disk and the others approximated near its posterior

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end; the apical and post-apical nervules *arise at a common point*, from which is given off a faint discal vein, which is obsolete in the middle (?) and gives off on the costal side of the wing a disco-central branch; another arises on the median side from a short vertical stalk. Median vein 3-branched, the posterior opposite the first marginal. In the hind wings the subvitreous spot is *larger than in the fore wings and angulated*; the tip is very obtusely rounded, and the hind margin is *emarginate opposite the disk*, which is very broad. The costal and subcostal veins cross each other about the middle of the disk and are continued to the base of the wing separately; the subcostal is bifid beyond the origin of the discal vein which is faint and angulated, and the branches of the subcostal separate from the point of bifurcation. The median vein is three-branched, with a medio-discal nervule running parallel with the superior nervule from an oblique stalk.

Head smooth, although hairy; rather impacted. *Without ocelli*. Face broad, rounded. Eyes rather small, not prominent. Antennæ setaceous, pubescent beneath. Palpi exceeding the face by about one-third of their length, ascending and rather porrected, *tapering from the base to the tip* and rather thick; basal joint *very hairy*; middle joint tapering to the tip, *with an external ridge and squamose*, but not hairy; terminal joint distinct, rather slender, squamose, rather less than one half as long as the middle joint. Tongue stout, *and one half as long as the body beneath*.

Thorax thick and tufted; patagid with long elevated scales. All the femora and tibiæ *clothed with long hairs*.

D. oculatana.—Head, palpi and prothorax ochreous-fuscous. Thoracic tuft ochreous. Forewings fuscous, varied with ochreous-yellow, with a small subvitreous spot on the disk. The base of the wing and a band just internal to the discal spot ochreous-yellow, each varied with fuscous striæ; and crossing the middle of the nervules is another band of the same hue, slightly clouded with fuscous above the middle, having a spot of the same hue behind it, above the inner angle. Hind wings with a *large subvitreous spot*, produced towards the external margin; similar in color to the fore wings, but almost reticulated with fuscous.

The larva is quite as peculiar as the perfect insect. It is sluggish, with a thick and much contracted body, and uniform in diameter. Head as broad as the body, black. Color yellowish or orange yellow, thickly covered with rows of oval, black tubercles each having a hair. The terminal extremity is furnished with a black shield. The second segment (the one next the head) is naked, softish and rather swollen. Length about six lines. The larva has a disagreeable odor. It feeds on *Eupatorium ageratoides* (white snake-root) beginning on one side of a leaf to form a cone or cornet, cutting and rolling the separated portion, as it increases in size, sometimes across the entire leaf. At maturity it eats away the closed end of the cone and falling to the earth forms on its surface a silken cocoon. There are two broods of larva, one which matures in June, July, and another in the Fall, to appear as imagos in April. I have never seen the imago on wing, but it will be found, doubtless, wherever its food plant is distributed. The plant is a common one, especially northward. The insect is rather rare in this region.

STIGMONOTA Guenée.

There is but little that is characteristic in the wing structure. In the fore wings the costa is regularly arched, not broad at the base; apex obtuse, hind margin rounded, and slightly concave beneath the tip. The disk is rounded behind, placed above the middle of the wing, *with a small secondary cell and discal fold distinct*. In the hind wings the costal and subcostal veins arise from a common stalk about the middle of the cell. The discal vein is rather faint and slightly angulated in the middle, with a disco-central branch arising

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below the middle on a moderate vertical stalk. Median vein with the two superior nervules arising at a common point.

Head rather rough, with ocelli. Face broad, rounded. Antennæ setaceous, simple. Palpi a little longer than the head, slender, cylindrical and slightly scaly beneath, separated and slightly curved; terminal joint distinct, cylindrical and obovate; middle joint curved, slightly scaly beneath. Tongue equal in length to the labial palpi.

S. interstinctana.—Palpi whitish. Head and thorax dark brown. Fore wings dark brown, with a curved white, somewhat silvery dorsal streak divided in the middle by a dark brown line and a rather faint silvery streak at the inner angle. The costa from near the base to the tip is streaked with yellowish white, slightly silvery-hued. Hind wings dark brown, along the costa in the middle, white.

HALONOTA Stephens.

Fore wings with costa regularly arched, but not broad at the base, *with a fold at the base in the ♂*; tip rather acute, hind margin rounded, slightly indented beneath the tip. The disk is rather above the middle of the wing, with a moderate secondary cell and the fold distinct; *the discal vein straight*. In the hind wings the costal and subcostal veins are *distinct at the base*; the lower branch of the subcostal vein *is separated from the upper* and is borne on a short nearly straight stalk; discal vein angulated, giving rise below the middle to a disco-central vein on the nearly vertical stalk. Median with the two superior nervules arising from a common stalk.

Head scarcely smooth, with large ocelli. Face moderately broad, rather naked beneath the middle. Antennæ setaceous, minutely pubescent beneath. Palpi exceeding the face by nearly one half their length, moderately remote, applied to the face and thence porrected, rather broad with spreading scales at the tip of the middle joint above and almost tufted at the tip beneath; terminal joint slender, drooping somewhat, and *nearly as long as the middle joint*, but partly concealed in its terminal hairs. Tongue as long as the labial palpi.

H. simulana.—Palpi dull ochreous, fuscous at the tip. Head brownish ochreous. Fore wings brown with a slight brassy hue, with an ochreous, dorsal blotch plain in the ♂ and striated with brownish in the ♀. Costa streaked with ochreous, and with two slightly violet hued streaks from the costa, one running beneath the tip and the other to a faint ocelloid patch, behind which on the hinder margin are three black spots. The apical portion of the wing is variegated with ochreous. Hind wings fuscous, white on the costa.

Dr. Morris. Baltimore and Easton.

A. incanana.—Palpi white. Head dark gray. Fore wings dark brown, variegated with whitish along the inner margin toward the base, with an oblique dorsal white patch, terminating in the ocelloid patch, with a slender, irregular dark brown line on its middle, and one or two spots on the dorsal edge of the wing. The costa is streaked with white, slightly silvery; beyond the middle of the wing are one or two purplish-hued lines, one of which round the ocelloid patch, where it becomes somewhat diffuse. The ocelloid patch is ochreous, with three black streaks, and is placed nearly in the middle of the apical portion of the wing, with a white spot adjoining and beneath it. Hinder border with three or four terminal black spots above the inner angle. Hind wings dark fuscous, grayish towards the base.

EPHIPPIPHORA Duponchel.

Fore wings rather narrow; costa regularly arched; tip obtuse; hind margin rounded or slightly sinuous. The wing structure as usual. In the hind wings the costal and subcostal are distinct to the base; the branches of the latter
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are *connivent* from their origins. The discal vein is curved, and gives rise to an arched medio-discal nervule. In the median vein *the upper nervule is forked remotely* from the insertion of the medio-discal.

Head rather rough. Ocelli large. Face slightly tufted. Eyes rather prominent, round. Antennæ setaceous, pubescent beneath. Palpi slightly exceeding the face, ascending, truncate, and thickly haired beneath and at the tip; the terminal joint slender, obovate, much shorter than the middle, which from its clothing appears to be nearly truncate, broad and flattened. Tongue as long as the palpi.

E. parmatana.—Palpi grayish brown. Head brownish. Fore wings brown, varied with darker brown; with a white dorsal patch near the middle of inner margin, dotted with a few dark brown dots. The costa from the middle to the tip has *four white spots*, each of which has a dark brown streak or spot in the centre; the two nearest the base terminate in faintly violet-hued streaks, the external one running to the hind margin beneath the tip, and the internal, which is double, and fainter than the exterior one, terminates in a slightly silvery-hued ocelloid patch, having a pale ochreous centre and two black streaks. Hind wings dark fuscous.

AMORBIA.

The fore wings are as broad at the base as across the inner angle; the costa very abruptly arched at the base, and thence slightly and regularly arched to the apex, *and with dispersed tufts of scales on its surface*; tip obtuse; hind margin rounded; inner margin straight. The disk is rather narrow, extends beyond the middle of the wing, is without secondary cell, and with subcostal vein arched, the median straight; the apical nervule is *furcate near the tip*; the medio-posterior nearly opposite the first marginal nervule. In the hind wings the costal and subcostal veins are distinct; the subcostal vein is furcate external to the origin of the discal vein, with branches *separating from their origin*. Just interior to the origin of the discal vein *arises a subcosto-marginal nervule*; the discal vein is much curved, and the medio-discal nervule arises from the median vein, almost at the point of divergence of the two superior branches.

Head smooth. *Without ocelli*. Face nearly naked, with a thin horizontal tuft between the antennæ. Antennæ setaceous. Palpi exceed the face by about one half their length, ascending at the base, and rather thick and porrected, *beaklike*; densely clothed with rather appressed scales, convex above, and rather concave below; terminal joint *with its base concealed by its covering*, but slender when denuded, and about one half less long than the middle joint. Tongue about as long as the palpi.

A. humerosana.—Palpi grayish fuscous. Head gray. Fore wings gray, with minute tufts of blackish scales scattered over the surface. The inner margin is pale ferruginous from the base nearly to the inner angle, where the hue becomes somewhat diffuse, and is joined by an oblique dark gray central fascia from the middle of the costa. Hind wings rather dark fuscous.

CRÆSIA? Hübner.

Fore wings scarcely as broad toward the base as across the inner angle; costa arched toward the base, slightly arcuated from the basal curvature to the tip; *with single elevated scales scattered over the surface of the wing*; hind and inner margins nearly straight, inner angle rounded. The disk is rather narrow, extends beyond the middle of the wing, without secondary cell, and both the subcostal and median veins slightly curved; the apical vein is *furcate*, and the medio-posterior arises at a point opposite the middle of the space between the first and second subcosto-marginal branches. In the hind wings the costal and subcostal arise from a *common stalk*; the branches of the subcostal *separate from the point of origin*, with an oblique, angulated discal vein from the same

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point; the medio-discal nervule arises from a very short stalk placed at the point of separation of the two superior branches of the median vein.

Head smooth. *With small ocelli.* Face nearly naked, *with a rather long thin horizontal tuft on the forehead.* Antennæ setaceous, minutely ciliated in the ♂, pubescent in the ♀. Palpi exceeding the face by much more than one half their length, ascending toward the base, porrected *beadlike*, densely clothed with scales, which are rather spreading above; upper edge convex from the middle, beneath nearly straight; terminal joint *smooth*, distinctly separated from the terminal scales of the middle joint, which conceal its articulation, *less than one half as long as the middle joint.* Tongue about one half as long as the labial palpi.

C. ? reticulatana.—Palpi reddish. Head yellow. Fore wings bright deep yellow, beautifully and minutely reticulated with reddish orange. At the base of the inner margin is a small dark red spot, and on the middle of the margin is a triangular dark red dorsal spot, from which proceed two diverging narrow bands of the same hue, somewhat varied with reddish orange, one to the basal third of the costa, the other to the apical third, and crosses another narrow band of the same hue, in the middle of the wing, coming from a dark red spot near the middle of the costa, and is extended to the inner angle. Hind wings straw-color. *Tongue wanting.*

Male? Fore wings straw-color, striated with reddish orange rather than reticulated. The markings are essentially the same as in the ♀; their color is purplish red, and enclose reddish orange dots. Hind wings white. *Tongue one half as long as the palpi.*

C. ? sulfureana.—Fore wings shining pure yellow, slightly striated with reddish orange; from the middle of the inner margin two irregular reddish orange lines diverge, and throw off short lateral branches in their course; one runs to the basal third of the costa, the other towards the tip of the wing, where it is connected with small spots of the same hue on the costa, and a stripe along the inner margin. Hind wings whitish.

PÆCILOCROMA ? Stephens.

The fore wings are rather narrow and long; costa regularly arcuated; tip rather acute; hind margin slightly excavated beneath the tip; inner margin nearly straight. The disk extends rather beyond the middle of the wing, *with a rather large secondary cell*; the medio-posterior nervule arises opposite the basal end of the secondary cell. In the hind wings the branches of the subcostal are *connivent*; discal vein curved, and a curved medio-discal arising from the median vein, the upper nervule of which is *forked remotely* from the origin of the medio-discal.

Head rather smooth. With ocelli. Face smooth, with a slight horizontal tuft on the forehead. Antennæ setaceous, pubescent beneath. Palpi exceeding the face by more than one half their length, ascending from the base to the middle, and thence porrected; very broad in the middle, and arched above; the middle joint thickly clothed with scales, which form a tuft beneath towards the tip; the terminal joint slender, cylindrical, smooth, and almost concealed in the hairs of the middle joint. Tongue extends rather more than one half the length of the labial palpi.

P. ? dorsisignatana.—Palpi and head brown. Fore wings chocolate brown, grayish brown along the inner margin, beneath the fold, and nearer the base than the inner angle is a semi-oval chestnut brown dorsal spot extending a little beyond the fold. In the middle of the wing is a broad, rich brown, oblique fascia, beyond which the wing is somewhat varied with grayish. Costa near the tip slightly striated and grayish. Hind wings with pale shining fuscous.

P. ? similitana.—Palpi and head dull reddish brown. Fore wings some-
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what brighter reddish brown, with an obliquely placed deep chestnut brown dorsal demi-band, nearer the base than the inner angle, and extended to the disk, convex internally and concave externally, and with a small quadrate patch on the inner margin, near the inner angle. Near the hind margin are two subterminal ferruginous lines. Hind wings dark fuscous.

This insect may be the ♀ of the previous species.

MONOSPHRAGIS.

Fore wings with a *closely appressed, broad, rounded fold* at the base in the ♂. The costa is regularly arcuated from the base to the tip, which, as well as the hind margin, is rounded. The disk with a secondary cell; apical vein simple; the medio-posterior nervule arises at a point nearly between the origins of the first and second subcosto-marginal nervules. In the hind wings the branches of the subcostal vein are *connivent at their bases*; discal vein arched; the upper branch of the median is *forked near its middle*, and a curved medio-discal branch arises almost immediately from the median, behind the bifurcation of the upper branch. Thorax crested.

Head scarcely smooth. With ocelli. Face very slightly tufted in the middle. Antennæ *rather thick, with joints closely set and roughened*. Palpi *equal to the face*, arched, cylindrical, covered with appressed scales; middle joint thickened beyond the middle, and somewhat truncate; basal joint *with hairy scales*, rather longer than the apical, *which is minute*, smooth and placed in the middle of the second joint. Tongue equal to the palpi in length.

M. otiosana.—Dark brown, with a purplish hue. Fore wings with a rather large quadrate, very pale yellow dorsal patch, and a brownish white ocelloid patch, containing three black points. Costa near the tip, with a few whitish striæ, containing a brown central point. Tip and margin beneath it ferruginous. Hind wings dark fuscous.

LOZOPERA? Stephens.

Fore wings rather narrow; costa arcuated, rather abruptly near the tip of the wing; tip rather acute; hind margin obliquely truncate; inner angle rounded, *with the cilia produced*; inner margin *excavated* behind the inner angle, at the end of the submedian vein and thence to the base rounded. The disk is broad behind, without secondary cell, with the discal vein obliquely inclined to the base; apical vein simple; the two superior nervules of the median vein *arise from a common point*, and the medio-posterior nervule *is not remote*, and is opposite the second marginal nervule. Hind wings rather elongate, *not broader than the fore wings*; costal and subcostal veins *distinct to the base*; subcostal vein *forked in the apical third of the wing*, with the discal vein *extremely oblique*, arising from the subcostal *in the basal third of the wing*; the disco-central arises somewhat on the median side, on an oblique stalk; median three-branched, the medio-central and disco-central equidistant from the medio-superior nervule.

Head smooth. *Without ocelli*. Face smooth (?). Eyes round, moderately prominent. Antennæ slender, setaceous. Palpi exceed the face by more than one half their length, rather slender, curved and porrected; the middle joint *sub-tufted beneath*, with the hairs directed forward, and *thinly clothed above*; terminal joint placed above the tuft, slender, short, smooth. Tongue not more than one half as long as the labial palpi.

L. ? angustana.—Palpi and head white, tinged with yellowish. Fore wings pale greenish yellow, with three greenish brown streaks along the costa, the longest at the base, one about the middle, and one near the tip; a dark greenish brown dorsal patch about the middle of inner margin, and a greenish fascia from the *inner margin at the base*, inclines to the middle of the costa, and not extended to it. Hind margin with a few terminal dark brownish spots. Hind wings whitish, tinged with fuscous.

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ARGYROLEPIA? Stephens.

Fore wings with the costa regularly arched; tip obtusely produced; hind margin oblique and slightly concave beneath the tip; *cilia of the inner angle produced*. The disk ample, with the discal vein obliquely inclined; apical vein simple; medio-posterior scarcely remote from the penultimate branch. Hind wings with the subcostal vein *forked in the apical third*, with the discal vein *oblique but curved at its origin*, midway between the base of the wing and the fork of the subcostal; the disco-central on an oblique stalk, further from the medio-superior than the central is from the latter.

Head smooth. Ocelli very small, scarcely perceptible. Antennæ setaceous, pubescent. Palpi exceeding the face at least two thirds their length, porrected, rather slender; basal joint curved, and *equal to the face*; middle joint slightly hairy toward the tip; apical joint minute, ovate. Tongue as long as the labial palpi.

A. ? *lepidana*.—Palpi pale ochreous white. Head ochreous. Fore wings ochreous, somewhat silvery white at the base, with a broad, reddish, fawn-colored central fascia *parallel with the hinder margin*, varied somewhat with dark brown on the inner margin. This is edged externally by a somewhat silvery ochreous line, which is furcate above the inner margin, enclosing an ochreous spot. Apical portion of the wing reddish fawn-color, with a few black atoms in the middle of the wing. Hind wings dark fuscous.

CÆLOSTATHMA.

Fore wings with the costa at the base arched, and thence slightly to the tip; apex acute, hind margin slightly concave. The disk is placed in the middle of the wing, with the subcostal and median veins arched, rounded behind, and extending scarcely more than one half the length of fore wings. The subcostal vein has *two marginal nervules from the disk*, and the apical branch *gives rise to another near its origin, exterior to the cell*, and becomes *furcate behind the tip*. Hind wings not broader than the fore wings; costal and subcostal veins distinct, with the latter *furcate rather remote from the discal vein*, which is curved, and gives rise to a medio-discal nervule, almost in contact with the medio-superior at its origin.

Head smooth. With ocelli. Face with a slight horizontal tuft, and smooth beneath it. Antennæ *plumose in the ♂*, pubescent in ♀. Palpi exceed the face by one half their length, arching to the middle of the face, thence porrected and *tapering to the apical joint*; middle joint with rather long scales from *the middle to the tip above*, and on the entire undersurface; from its clothing, broad in the middle, and almost trapezoidal; apical joint smooth, distinct and short: about as long as the basal. Tongue as long as the palpi in the ♂; nearly obsolete in the ♀ (?)

C. *discopunctana*.—Yellowish or luteous yellow. Fore wings with two more or less distinct brown or reddish brown lines from the costa, inclined towards the inner angle; one nearly central and often shaded exteriorly, the other near the hind margin. Costa with four blackish brown dots near the tip, and a minute *black point on the disk*. Hind wings pale yellowish. The female is usually darker colored than the male.

SMICROTES.

Fore wings regularly arcuated from the base to the tip; tip scarcely acute, hind margin obliquely rounded; inner margin rounded. The disk is long and narrow, and extends to the apical third of the wing; discal vein oblique. The wing structure of fore wings as usual; medio-posterior remote from the penultimate branch; cilia of the inner angle somewhat produced. In the hind wings the costa is *emarginate or excavated a little exterior to the middle*, and along the hind margin; not broader than the fore wings. The costal and sub-

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costal veins are distinct to the base, *the latter forked near the tip of the wing*; discal vein arising near the middle of the wing, and curved; medio-discal on a very short stalk; the two superior branches of the median from a common point.

Head scarcely smooth. Ocelli small. Face narrow, rough. Antennæ approximated setaceous, pubescent. Palpi exceeding the face scarcely one-fourth their length, slightly curved, rather slender, and somewhat hairy; middle joint truncate, somewhat thickened at its end with scales; apical joint slender, apparently very minute being almost concealed by the terminal scales of the middle joint, but when denuded, at least one-half as long as the middle. Tongue slightly longer than the palpi.

S. peritana.—Brownish ochreous. Fore wings paler on the costa at the base than the inner margin; with a brown central fascia inclined to the inner angle from about the middle of the costa, edged internally with pale yellowish; this band is usually rather broad, but sometimes narrow. Near the tip, on the costa, is a dark brownish spot, with a line extending from it to the inner angle. Costa with a few minute brown points. Hind wings rather dark grayish.

EXARTEMA.

Fore wings with the costa regularly arched; tip obtuse and rounded; hind margin rounded, very slightly oblique; disk with secondary cell. Hind wings rather broader than the fore wings; *obtusely angulated on the hind margin, opposite the median nervules; inner margin deeply and sharply excised, with a cylindrical appendage along the inner margin from the base, the lower portion of which is free*; the branches of the subcostal are connivent; medio-discal arising on a short stalk at the bifurcation of the two superior branches of the median; discal vein curved.

Head rough. With ocelli. Tufted between the antennæ. Face smooth, rounded. Antennæ setaceous, pubescent beneath. Palpi *arched, applied to the face with the tips equal to the base of antennæ*; with rather hairy scales beneath from the base to the tip of middle joint, which is slightly scaly at the tip above; terminal joint minute, ovate, distinct and smooth. Tongue about equal to the palpi.

E. nitidana.—Palpi yellowish white, terminal joint fuscous. Fore wings dull sordid crimson, with a pure brown basal patch divided into two portions, one a streak above the median vein, the other a patch beneath it, slightly varied with reddish brown. The central fascia is pure brown, with an irregular internal edge, and externally subdivides into three broad streaks or projections; that on the inner margin truncate at the inner angle, one in the middle of the wing, and one near the costa acute. Slightly connected with the upper streak, is a curved one of the same hue, varied with reddish brown, running to the middle of the hind margin; all these streaks are bordered with ochreous. The costa is streaked with reddish brown. Hind wings dark fuscous.

E. permundana.—Palpi dull yellow, apical joint fuscous. Fore wings with a large dark brown basal patch, varied with testaceous or yellowish. The central fascia is dark brown, varied with testaceous, and is separated from the basal fascia by a yellowish band, containing dull silvery scales, or a tarnished silvery band; exteriorly, the fascia throws off three more or less distinct, short, rounded projections, two near the middle of the wing, and the other at the inner margin, with a triangular patch exterior to the latter; from the costa, near the tip, is an oblique, dark brown band, varied with testaceous scales, to the hinder margin, beneath the middle. The interspaces between these markings is filled up with yellowish, somewhat silvery-hued, or with dull, tarnished silvery hue, and the markings are edged with yellow. Costa with yellowish white streaks, with central dark brown streaks. Hind wings dark fuscous.

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The larva binds together the terminal leaves of *Spiræa*. It is pale green, touched with yellowish at the junction of the segments; head and shield black. The larva may be taken in the middle of June.

E. versicolorana.—Fore wings yellowish, varied with short, dark brown striae, and *shades* of the same hue, overlaid with testaceous scales. In the middle of the wing is a dark brownish shade, indicated on the middle of the costa by a nearly square spot. The oblique subterminal band is well indicated, does not reach the costa, and the cilia opposite to it on the hind margin are dark brown. At the tip is a dark brown spot, and the cilia of the tip likewise dark brown. Hind wings fuscous.

E. inornatana.—Head and thorax ochreous brown or dark reddish brown. Fore wings whitish testaceous or brownish testaceous, somewhat striated, but without distinct bands. The costa is ferruginous, with rather faint, pale colored streaks. The apical portion of the wing is either brownish ferruginous or testaceous brownish, with one or two faintly indicated lines. Hind wings reddish fuscous or yellowish white, and slightly fuscous along the hind margin.

The larva has the head and cervical plate colored black. The body, which is white at first, becomes pale green, with rather pale, reddish brown bands produced on the vascular line, and striped on the sides with the same hue; head, dark reddish brown. It inhabits, in May, a web woven between applied leaves of white oak. The pupa is contained in a flocculent silky cocoon, and is *without dorsal spines*. The pupa case remains in place after the escape of the imago, which appears about the middle of June.

E. fasciatana.—Fore wings with a blackish brown basal patch and a broad, nearly square, central fascia of the same hue, separated by a broad silvery white band, having a few dark brown dots on the costa, and a single line of the same hue from the inner margin to the middle of the wing. The oblique band near the tip, runs from the costa to the inner margin, is dark brown, overlaid with testaceous scales, and is bordered on each side by a stripe of dull silvery scales. Costa with geminated white streaks from the middle to the tip. Hind wings dark fuscous.

Variety?—Rather paler brown than the above, with similar markings, but the white band, near the base of the fore wings, is tinted with pale brownish, and is striated with dark brownish.

HEDYA Hübner.

Fore wings, costa regularly and slightly arched; tip rather acute, but not produced; hind margin slightly concave, inner margin rounded; disk with secondary cell. Hind wings broader than the fore wings; apex obtusely produced; hind margin concave beneath the tip. The branches of the subcostal are connivent; the upper branch of the median vein is *forked, rather remotely*, from the insertion of the medio-discal nervule, and the discal vein is nearly straight.

Head rough. Ocelli small. Antennæ setaceous, pubescent beneath. Palpi equal to the face, slightly ascending; middle joint thickened with scales towards its end, particularly beneath, truncate; terminal joint slender, drooping, minute, and is seen in the lower part of the scales of the middle joint. Tongue rather longer than the palpi.

H. Pyrifoliana.—Fore wings with a dark brownish gray basal patch; broadly white in the middle of the wing, with the patch produced towards the apex, and sometimes bluish pale gray and indistinct. Exterior to the middle of the wing are dull, bluish, transverse streaks; and near the apical portion of the hind margin and the inner angle, are short black streaks or spots. The apical portion of the wing has, more or less, the hue of the base. Costa with

obscure streaks from the middle to the tip. Hind wings fuscous. In ornamentation, this insect is much like *E. fasciata* n. a.

The larva is of a dull amber-brown color, with papilliform points, somewhat darker; head and shield blackish brown. It inhabits the pear and plum tree. One of the leaves of a terminal shoot is cut off at the base of its leaf-stalk, lined with silk, and folded; other leaves are attached to this, and it is used even after it has become dead and blackened, as a place of concealment. The larva may be taken in April and May, and becomes an imago early in June.

H. Scudderiana.—Fore wings with a rather small dark brown basal patch, with the edge obliquely inclined to the base, and rather wavy, broadly white in the middle, and somewhat mottled with brownish; dark brown and white in the apical portion. Along the edge of inner margin is a row of dark brown dots from the base. The costa geminated with yellowish from the middle to the tip. Above the inner angle, is a white ocelloid-like patch, encircled irregularly with bluish. Hind wings fuscous.

From S. H. Scudder, Mass.

BACTRA ? Stephens.

Fore wings with the costa regularly arched, rather abruptly near the tip, which is acute, but not produced; hind margin *truncate* from the tip, inner angle rounded, inner margin nearly straight. Wing structure as usual; disk rather narrow, without secondary cell. Hind wings broader than the fore wings, hind margin regularly curved from the tip to the basal angle; branches of the subcostal connivent; discal vein curved; the medio-discal, and the two superior branches of the median, from a common point.

Head scarcely smooth. With ocelli. Antennæ setaceous, pubescent. Palpi very little exceeding the face, cylindrical, slightly ascending; middle joint thickened with scales beyond the middle; apical joint very minute. *Tongue wanting*.

B. ? argutana.—Fore wings ochreous, tinted with reddish brown, and striated with the same hue toward the base, and with dull purplish from the middle to the tip. Above the inner angle is an indistinct ocelloid patch, containing two black spots, with a dull, silvery streak exterior to them, and the wing varied with purplish interiorly to it. The costa is streaked with pale ochreous with dark centres, the third from the tip giving rise to a very oblique purplish streak. Hind margin more or less yellowish behind the ocelloid patch and at the tip. Hind wings fuscous or pale ochreous.

I am well assured of the accuracy of my notes, and yet I find the record of the larval state of this insect quite anomalous: at least, the imagos produced from *three larvæ*, which one would declare distinct, are not to be distinguished from each other. One rolls the leaves of *witch hazel* into conical cornets, and binds the rolls with strong and numerous bands. It prepares for pupation by turning down a portion of the leaf. Its body is concolorous reddish, except a few spaces between the anterior rings, where it is pale brown; shield reddish; head pale brown. Another feeds on the leaves of *sumach*, rolling a leaf spirally in the first place, securing the rolls with bands, and afterwards joining the neighboring leaves to the one first inhabited. Its body is of a dirty greenish color, with obscure whitish papilliform points. Head whitish, or with a pale brown head and green body, striped with dark green. The third feeds on the leaves of *black thorn* and *elm*, drawing them into a fold from the base, and binding it to the midrib. It is concolorous lemon-yellow, with a yellowish brown head. The differences in color may be reconciled by the supposition, that the descriptions represent different periods in larval life; but if my notes are correct, it is difficult to account for the difference in habits, as shown in the third individual, which agrees in this respect with the larvæ of the genus *Anchylopera*.

[Aug.

ENDOPIZA ? Guenée.

Fore wings with the costa regularly arcuated; tip obtuse and rounded; hind margin rounded, as well as the inner margin. Neuration normal; disk with a secondary cell. Hind wings rather broader than the fore wings; costa slightly concave from the middle; hind margin slightly concave; subcostal nervules connivent at the base; discal vein curved, with the medio-discal arising from the bifurcation of the two superior branches of the median.

Head and face rough. With ocelli. Antennæ setaceous. Palpi slightly exceeding the face, slightly ascending, truncate; middle joint slender and cylindrical towards the base, thickened with scales at the tip, so as to be decidedly truncate; terminal joint minute, ovate. Tongue about as long as the labial palpi.

E. ? *Viteana*.—Antennæ, basal half pale brownish; apical half dark brown. Fore wings blackish brown, or purplish dark brown, from the base to the middle, and reddish brown or dull ochreous thence to the tip. Near the base is a somewhat curved slender band, and from the middle of the costa a central, oblique, dark brown, or dark reddish brown fascia, widening toward the inner margin, from which it is obliquely cut off by the paler color of the wing, leaving a small triangular spot on the margin near the inner angle. In the middle of the apical portion is a large roundish reddish brown spot, and the costa towards the tip is geminated with pale ochreous. Hind wings fuscous.

The larva feeds on the fruit of the grape in September; a silken gallery is attached to the external opening in the fruit. Its head is dark brownish; shield blackish; body immaculate dark green. It may likewise be taken on the fruit of the *wild raspberry* in July. The individual feeding on the grape undergoes transformation by weaving a cocoon on the surface of the ground, and that from the raspberry under an excised and turned down portion of a leaf. This, however, may not be its normal habit.

Another individual, whose imago is included in the description of *Viteana*, and is not distinguishable from it, except by the reddish brown hue of the apical portion of the fore wings, and the general purplish brown hue, differs in habits from it. It lives in a silken gallery, woven in a closed or applied leaf of sassafras; usually the leaf is folded along the face and united with the midrib. It is extremely active and agile in its motions, and weaves with great rapidity. It may be taken early in July. The pupa is contained in the folded leaf, without any cocoon, the tail being attached to a slight web. The imago appears in the latter part of July.

E? *agilana*.—Fore wings dark brown, sprinkled with pure brown from the middle to the tip; at the base is a dull metallic bluish spot, and about the middle of the disk a broad, short stripe from the costa, and streak from the costa at the end of the disk, of the same hue. At the inner angle is an indistinct ocelloid patch with an exterior streak and two internal spots of a dull metallic bluish hue. Costa geminated with yellowish from the first costal stripe. Hind wings dark fuscous, white along the costa.

CARPOCAPSA Treib.

Distinctively characterized by the large ocelloid patch at the inner angle of the fore wings, which are much wider across the inner angle than toward the base; tip usually acute, hind margin slightly concave, (*Pomonella* has neither of these traits; disk rather above the middle of the wing, rather narrow, with a secondary cell; apical vein simple. Hind wings slightly broader than the fore wings, nearly ovate; neuration normal, subcostal branches connivent, the two superior median nervules on a very short common stalk, medio-discal on a short, erected stalk.

Head rather rough. With ocelli. Antennæ setaceous, pubescent. Palpi ex-
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ceeding the face, ascending to its middle, rather slender, clothed thickly with rather appressed scales; apical joint rather stout, small, ovate and smooth. Tongue as long as the palpi.

C. Pomonella Linn.—Fore wings umber brown, with a slight coppery hue, varied or marbled with pale grayish. The ocelloid patch is very large, of a fine, deep brown color, with an external and internal streak of bright metallic-hued coppery scales, the latter having internal patches of black scales. Hind wings fuscous, with a coppery hue.

I can perceive no difference between this and the descriptions of the European representative of this species. The larva of both is of a pale pinkish color, and feeds on the fruit of the apple and the pear. The species has probably been introduced from Europe into the United States.

IOPLOCAMA.

Fore wings with a rather large, distinct ocelloid patch; nearly as broad at the base as across the inner angle; costa regularly arched from the base; tip obtuse; hind margin obliquely rounded; apical vein simple; disk rather above the middle of the wing, with secondary cell, median vein straight, subcostal curved towards the end. The hind wings are broader than the fore wings, ovate; external margin slightly dilated in the middle; subcostal branches connivent; discal vein arched; medio-discal on a short erect stalk and the superior branch of the median vein *furcate about the middle*.

Head rather smooth; with ocelli. Face broad. Eyes rather small, prominent. Antennæ setaceous, with very minute ciliations. Palpi exceeding the face by rather more than one half their length, slightly ascending and porrected, very thickly haired beneath, with a distinct tuft to the basal joint; middle joint with the hairs towards its tip, longer than the rest, and directed forward, almost smooth above; apical joint minute, and almost concealed in the terminal hairs of the middle joint. Tongue scarcely as long as the palpi.

I. formosana.—Fore wings dark brownish, with a most beautiful bluish-violet reflection, when viewed from the hinder margin to the base, irrorated with ferruginous brown. The costa toward the tip, as well as at the base, ferruginous-brown, the former streaked with dull silvery. Ocelloid patch, rather large, with two black central streaks and an internal dull silvery streak; the external silvery streak is connected with the third costal streak, which is extended obliquely to it. The costa from the middle to the tip, is geninated with yellowish. Hind wings dark fuscous.

From Mr. Kennicott, Ill.

This group of insects is probably the most difficult, in a systematic point of view, and the least interesting family in the order of Lepidoptera. The impression I have derived from the study of it, induces me to believe that it is owing chiefly to the artificial system by which it is at present interpreted, and which I have endeavored to follow in this paper. Numerous families, or so-called families, have been arbitrarily instituted on the most trivial and untenable characters, some of which are only sexual peculiarities, while ornamentation appears to be a far more important element than structure, in the diagnoses by which they are characterized. Such an arrangement possesses a certain amount of convenience, inasmuch as it frequently enables the student or inquirer to limit the probable number of genera to which an insect he may wish to classify may belong. This, however, is its total significance, and even in this respect it is often deficient and deceptive. This is a system of convenience and not of nature, which works on categories of structure and recognizable conceptions or ideas.

In my own view, from which, doubtless, many naturalists will dissent, ornamentation is purely an individual characteristic of species, and although in general sufficiently constant, subject to a degree of variation in the same species that is often very considerable. Why should that which is unstable in

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species receive the stamp of scientific approval in the recognition of superior groups, instead of that which is constant and fixed, which is more or less indicative of modes of life, which is the expression in the imago of those categories of thought that we designate genera and families? I cannot perceive why it should be preferred, when I recall the wonderful fertility in structural invention which characterizes every natural family, and the logical connections that exist between all those groups of species composing its various genera. If the specific conception is the same in the preparatory states, and the structure of the various imagos that result is nearly identical, differing in some trivial peculiarity, perhaps, to which we are unable to assign any significant value, would it not be more scientific and convenient, more natural and philosophic indeed, to regard such individuals as forming a distinct group in the genus, to which they are evidently so intimately related, regardless of peculiarities of ornamentation?

What would be thought of that system in anthropography which separated men of the same race upon a long or a short nose, a large or small ear, thin or thick lips, or wide or narrow shoulders? I am not prepared to assert, that a principle like this has been introduced into the system which represents the present arrangement of this family, but when one recalls its comparative *poverty* in generic characters in the imago, or otherwise the extremely close relationship indicated in the diagnoses of many of its genera, the probability of something similar to it having existence is at least suggested to the mind.

It would be well if entomologists would cultivate just and philosophic conceptions respecting the nature of the various groups at present recognized in our systems. No other department of Natural History offers, probably, equal facilities for observation and determining with accuracy the limits of generic and specific cycles. The mind, however, must be disabused of the fallacious notion that the imago is the most important part of species; that it is, indeed the species, or that classification can be truly and properly made on this basis alone. Perfect insects are easily arranged systematically upon a consideration of their *entire structure*, its general agreements and special differences, but there are considerations more important than these involved in the idea of species.

The "imago" is no more the *species* which it represents as an individual, than the principal *noun* of a grammatical sentence is the *idea* which may be conveyed to our mental perceptions. Each is necessary to the other, each incomplete without the other, and when a hiatus exists in either case, we are placed simply in a region of conjecture, respecting the significance connected with the representative presented to us. We have an object, but no idea. The noun and the imago may be well known to us, but until we have followed them through all the collateral terms in which they exist as the materials of thought, we cannot duly value the conceptions which may be connected with them.

The advocates of the Darwinian Theory of the origin of species would have us believe that species is an *abstraction*; that it represents nothing ideal; that in nature nothing but individuals exist, and in these must we look for the characteristics of species. The entire superstructure of reasoning on which the theory is built, is one that admits what is material in the specific group, probably because it is obvious to the senses of every one, but ignores the existence of that which is immaterial, intellectual, *spiritual* in every true specific creation, and which is to it as the soul to the material body of man; that which distinguishes the vital machine from mechanical inventions or imitations, created by the conceptions of the human mind. Nor does this belong to the imago alone, but is written in vital characters in the various transitional forms which belong to each species, in their organs, and their acts and manifestations of life, and intelligence or instinct. It is this, the definite conception, that casts

each individual of a species in the same organic and instinctive mould, that cannot change. Individuals of the same species may change in ornamentation, but never in structure, unless as the consequence of amalgamation with another species, or an occasional abnormal modification, which is individual, not specific, and disappears with the individual. The creative fiat involved in the life of every species and in its conditions, remains unalterable, because change in that which has an organic, vital and spiritual significance cannot take place without destruction to the species.

The supposition that "profitable variations of structure" may be initiated in the cell action of the reproductive system, in order that organisms may more successfully maintain an overestimated "struggle for existence," is simply a monstrous physiological fallacy and assumption. If we suppose amalgamating influences to be inoperative, where do we perceive the evidences of it? The vegetable perpetuates itself by a germ, which already has its type distinctly impressed on it before the character of its architecture is developed by the effect of influences under which it is gradually worked out, cell upon cell, in one season or through a long series of years. In the animal, the reproductive action is most probably, nay, there are well ascertained facts which directly teach us that it is a simple process of *continuous growth in species*. Thus species have not a transient existence, but rather a terrestrial immortality. Individual life is ephemeral, specific life co-eternal with the existence of the conception producing the representative forms. Individual lives are like the leaves of a deciduous tree, and having performed their functions are constantly shed, while the source of them continues to spread itself through space and time, until its appointed period has ended.

Under this simple view of species, supported alike by reason and all carefully collated physiological facts, how the study of the humblest branch of Zoology is ennobled. It acknowledges the existence in nature of a Principle as a creative power, similar to our own minds. It deals with living thoughts, and seeks to represent, through many misconceptions and difficulties, the logical sequences existing amongst them, and to seize the hidden meanings which appeal to our intelligence, in the ponderous volume on which they are inscribed.

NOTE.—The reader is requested to make the following corrections:—

In Paper 4, May, 1860, p. 160, for *Nomia*, read *Chrysopora*. *Nomia* is already in use to designate a genus of Bees.

In Paper 5, June, 1860, p. 219, line 21, for *graduation* read *gradation*.

September 4th.

Vice President BRIDGES in the Chair.

Twenty-seven members present.

The following papers were presented for publication: "Description of a new species of *Astroscoptes*, *Brev.*, in the Museum of the Academy of Natural Sciences of Philadelphia, by Charles C. Abbott."

"Description of a new species of *Chatoessus*, *Cuv.*, from New Jersey, by Charles C. Abbott."

And were referred to a Committee.

September 11th.

Vice President BRIDGES in the Chair.

Fifteen members present.

[Sept.

The following paper was presented for publication : "Descriptions of Reptiles from Tropical America and Asia, by E. D. Cope."

And was referred to a Committee.

September 18th.

Mr. LEA, President, in the Chair.

Thirty-six members present.

The following papers were presented for publication : "Descriptions of new species of Crinoidea from the Carboniferous rocks of Illinois and other Western States, by F. B. Meek and A. H. Worthen."

"On Milne-Edwards' Synonymy of Xiphigorgia setacea, by G. H. Horn."

"Descriptions of new Cretaceous Corals from New Jersey, by Wm. M. Gabb and G. H. Horn."

"Observations upon the form of the Occiput in the various races of Men, by J. Aitken Meigs."

"Descriptions of New Birds of Western Africa in the Museum of the Academy of Natural Sciences, by John Cassin."

"Catalogue of Birds from the Island of St. Thomas, West Indies, collected and presented to the Academy of Natural Sciences by Mr. Robert Swift, with notes, by John Cassin."

And were referred to Committees.

Mr. Lea read an extract from a letter from Bishop Elliott, of Georgia, dated University Place, Tennessee, Aug. 28th, 1860, informing him that he had found numerous living specimens of *Helix Cumberlandiana*, which he had transmitted to him. Mr. Lea stated that they had been received by him, and were very interesting, from their having been found near to and at the original locality from which the specimen first described had been taken by Dr. Troost.

Mr. Lesley stated briefly the results of some observations he made in the White Mountains of New Hampshire during the summer. His visits to this region in 1849, and subsequent years, had laid the foundation for a growing conviction that the range of the White Mountains would prove to be *synclinal* instead of *anticlinal*, and therefore of probably Devonian age. A section which he made in 1857, along the Grand Trunk R. R., showed him the *synclinal* structure, with comparatively low dips, and at least two main *anticlinal* divisions. The profile in the Franconia notch is evidently a cliff outcrop of a horizontal plate. The newly opened Greely Mountain House in Waterville, in a *cul-de-sac* valley at the head of Mad River, and six or eight miles in an east line through the woods from the Flume House, is surrounded by bold outcrops of nearly horizontal massive plates of granite. Ascending Mad River from Campton, the traveller has the White-face range on his right, with apparent gentle dips to the north-west. But on his left he has the Welsh mountain range and Mount Osceola, with an unmistakable and universal dip, never over 15°, and much of it under 10°, to the south-east, which can be studied for at least seven miles, north-east and south-east. Turning to the left and ascending Mount Osceola (which Mr. Lesley found by barometer to be over 2600 above the Greely House, and therefore not much lower than Mount Lafayette), the *bridle path* mounts over successive outcrop edges of perfectly horizontal plates of granite, as evidently and regularly bedded as any of the sandstone masses of the Alleghanies, the bed planes not being at all disguised 1860.]

by the cleavage planes. Between these plates of granite lie plates of unchanged dark blue sandstone; a rock which at the cascades (two miles from the house in another direction) has been mistaken for greenstone trap. The successive terraces and cliffs of the mountain are evidently the consequences of this horizontal and alternate structure. As in other horizontal mountain plateaus the terraces here are projected between the ravines in the form of noses, with straight crests, and terraced or stepped at their ends. In fact, to a practised topographical eye, the aspect of the whole White Mountain range is that of synclinal erosion.

Other considerations reinforce this opinion. The continuation and broadening of the range north-eastward through Maine and Lower Canada, where super-silurian rocks abound,—the termination of the range south-eastward before reaching Massachusetts and Vermont, as the Alleghany synclinal stops at Catts-kill before crossing the Hudson,—the presence of horizontal rocks at Worcester and more generally than would be supposed through middle New England—the fact that the Connecticut Valley runs everywhere under the western escarpment of the White Mountains, separating it from the silurian range of the Green Mountains,—and the presence of Potsdam and other low formations in eastern Massachusetts,—all these facts would find their explanation in a synclinal terminal eroded structure of the White Mountain mass.

The granite of Mount Osceola and the surrounding heights consists of large crystals of feldspar, smaller crystals of quartz and smaller flakes of mica. Here and there hornblende appears. The rock bears no resemblance to the subsilurian Highland and Blue Ridge range, and Adirondacks. It is friable under the weather, shedding its crystals upon the ground under every overhanging ledge. The boulders are rounded by the weather action apparently more than by movement; for they have only travelled down the slopes beneath the cliffs from which they have fallen, and where those that remain are sharp-angled. The peculiar gravel and sand of the Mad River Valley is a local drift of similar origin. The metamorphism of these granites is considered by Logan, Hunt, and others, as no longer disputable. They could easily originate in the clayey sandstones of Formations VIII., IX. and X., of the Appalachians.

Considering the whole White Mountain mass a synclinal plateau, then the summit of Mount Washington, which is such an acknowledged anomaly, becomes regularly the single residual fragment of the highest formation which escaped erosion. Its rock is so different in texture and structure from the rest of the mountains that no other explanation seems possible; and if this hypothesis be adopted, there is no longer any need of that which supposes the submergence of New England *up to the base* of the head of Mt. Washington and *no higher*, leaving the head in the air to escape the general rounding and polishing action. It becomes easy to consider the external difference due rather to the difference of the rock formations above and below that horizon.

It is to be hoped that a systematic explanation will be made of this interesting region and the structure made out and mapped, so that we may arrive at conclusions, instead of venturing conjectures.

September 25th.

Vice President BRIDGES in the Chair.

Thirty six members present.

The Committee on the paper of Mr. John Cassin, "Descriptions of New Birds from Western Africa in the Museum of the Academy of Natural Sciences," reported in favor of its publication in the journal of the Academy.

On report of the respective Committees, the following papers were ordered to be published in the Proceedings :

[Sept.

Description of a new species of *Astroscopus*, Brev., in the Museum of the Academy of Natural Sciences of Philadelphia.

BY CHARLES C. ABBOTT.

Astroscopus guttatus Abbott. Plate VII.

Spec. Char.—Body depressed anteriorly. Head flattened above. Two sub-quadrangular depressions posterior to the orbits. Eyes prominent, situated in circular depressions, and five and a half diameters distant. The base of the two dorsals equals in length the distance from the anterior insertion of the first dorsal to the extremity of the upper jaw. Opercular apparatus large, the branchial aperture unusually wide; the opercle marked with distinct radiating striae, and margined below with a smooth, thick and semi-transparent membrane, which extends beyond the insertion of the pectoral fin. The insertion of the ventral fins is opposite the margin of the preopercle and greatly anterior to the insertion of the pectorals. The insertion of the anal fin is slightly posterior to the anterior insertion of the second dorsal, and extends nearer the base of the caudal than that fin.

D, 4—14. V, 5. P, 16. A, 13. C, 12 —
2

Color.—In the alcoholic specimen. Back, upper portion of the cheeks, upper part of cranium, and upper jaw, bright chocolate; lighter on the head than body, and the depressions on the upper surface of the head very pale. Belly and throat pure white. The chocolate tinted surfaces are minutely covered with numerous circular spots or guttæ, of the same tint, but several shades lighter. The membrane of the first dorsal black; and the second dorsal has three irregular bands of dull black, obliquely across it. The caudal with three parallel bands of blackish-brown, the middle of which appears to be the continuation of a variable longitudinal band on the centre of each side. The anal has a variable band of dull brown, darker upon the posterior termination.

Locality.—Cape May, New Jersey. Beesley's Point?

Description of a new species of *Chatoessus*, Cuv., from New Jersey.

BY CHARLES C. ABBOTT.

Chatoessus insociabilis Abbott.

Spec. Char.—Body compressed, sub-elliptical; dorsal outline greatly arched anteriorly to the dorsal fin, slightly and obliquely curved posteriorly. Ventral outline regularly curved from posterior insertion of the anal fin to the throat. Abdomen compressed, carinate and serrated. The head is very small; the breadth anterior to the angle of the opercle six-sevenths of the length from occiput to the extremity of the snout. Snout globose; upper lip fleshy, longer than the lower, which is membranous. The angle of the jaws in a line with the centre of the orbits. Margin of opercle membranous, coarsely serrated; margin of preopercle, membranous and circular.

Dorsal fin quadrangular, the posterior ray prolonged; pectoral fin rounded, reaching beyond the base of the ventral fin; ventral fin equal in width to its length and reaching a slight distance beyond the posterior insertion of the dorsal fin; caudal fin forked. The number of the fin rays are,

D, 14. P, 16. V, 8. A, 32. C, 28, sometimes 29.

Color.—Back and upper third of the sides deep green, with a bluish cast in particular lights; lower two-thirds of the sides and the belly pure white. The deep green above and white beneath, meet abruptly, and do not blend to-
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gether, except on the peduncle of the tail. The fins partake of the color of the region to which they belong, and exhibit irregularly shaped spots on each. These markings on the fins are very variable, and in some specimens are wanting. A very deep glossy black circular spot, above the angle of the opercle, marks the beginning of the lateral line, which is only apparent on a very careful examination. Total length, 15 inches; greatest width, $5\frac{1}{2}$ inches.

This species is possessed of a gizzard similar to that of *C. ellipticus* *Kirtland*; to which species this bears considerable resemblance, yet is very distinct in its general form, color and habits.

The specimens of this fish, from which the description was taken, I procured in a secluded and very deep sheet of water, known as the "Sturgeon Pond," situated two miles below Trenton, N. J. The following items of its habits were collected from reliable fishermen and by my own observation. This fish is remarkably gregarious, and is never seen associating with any other than its own species; it is a lover of deep and still water, seldom rising to the surface, and appears very averse to the bright light of the sun. If driven into a stream of water with considerable current, they immediately show signs of uneasiness, and, if not soon liberated, die. Two localities only I am acquainted with that abound with this species, and both are deep small lakes formed by the junction of several small streams, and never in these streams has the fish been discovered, except when driven into them by the fishermen. As an article of food they are entirely worthless; yet they afford much sport to juvenile anglers, by the rapidity with which they may be taken, with a trout-fly, or common angling worm.

Descriptions of new Cretaceous Corals from New Jersey.

BY WM. M. GABB AND GEO. H. HORN.

Hypothoa irregularis.—Colony spreading, on shells, forming straight, or but slightly curved lines; branching nearly at right angles, though generally from but one side of the cell. Cells oval, flattened, placed closely together, united by a stout pedicle. Opening nearly central, with its greatest diameter in the direction of the length of the cell, often with an ovarian vesicle at the distal extremity.

The shape of the cell of this species relates it nearly to the *H. simplex* *D'Orb.*

Cellepora bilabiata.—Colony encrusting, generally in elongate patches. Cells in lines arranged in an irregular quincunx, convex. Opening, viewed from above, nearly circular. The cell walls above and below the mouth project, forming two labiate processes.

Cellepora carinata.—Colony encrusting. Cells in quincunx. Walls of cells meeting anteriorly, forming a carina, whose apex projects forward, and toward the oral opening, apex often perforated. Carina diminishing as it approaches the cell below.

Cellepora typica.—Colony encrusting, in large patches. Cells arranged in radiating lines, usually in quincunx, irregular exteriorly, small, rhomboidal, spaces between oral openings wide, perforated by numerous large accessory foramina.

This specimen was found encrusting a *Terebratula Harlani*, to which was also attached an *Ostrea pandra*, both being typical specimens.

Reticulipora sagera.—Colony large (about one inch in diameter), formed of plates, lateral plates not numerous, given off rectangularly; summit of plates perforated by cells, and thicker than the rest of the plate; lateral openings triangular, without any marked arrangement.

Resembles the *R. obliqua*.

[Sept.

Reptomulticava cepularis.*Alveolites cepularis* (?) S. G. Morton, Cretaceous.

Colony irregular, nodulated, with a tendency to an irregular pyramidal outline. Cells elongated, hexagonal, large.

This is probably the species named by Morton, but as no description or figure was given, it cannot be certainly stated.

Multicrescis parvicella.—Colony large, anastomosing in the manner of *Rhipidigorgia flabellum*. Cells small, resembling those of *M. lanata* D'Orb. Cellules wanting.

NOTE.—Figures of the above species will be given in the next number of the Journal of the Academy.

On Milne-Edwards' Synonymy of *Xiphigorgia setacea*.

BY GEO. H. HORN.

My attention was directed to the above, by finding the polypidom, called by Dana "*Gorgonia* (*Pterogorgia*) *setacea*," classed with the "*X. setacea*" of M.-Edwards, who considers them synonymous.

The "*X. setacea*" of Edwards is thus described:—

"Polypierôide en forme de rubans très-étroits, flexueux et très-longs, mais sans vestige de ramifications. Coenenchyme jaune; verrues calicifères arrondies, de couleur rose, et formant, de chaque côté, une bordure saillante.

Hab.—Mers d'Amérique."

Pallas' original description is—

"*Gorgonia*, simplex, rigida, cortice calcareo albo subverrucosa.

Locus.—Mare Americanum."

Dana subsequently amplified the above description, rendering it more explicit.

"*Gorgonia* (*Pterogorgia*) *setacea*. Whitish, simple, rigid, rarely with a single branch; surface subverruculose; verruculae minute (one-third of a line), and obsolete, numerous and crowded, mostly on two opposite sides, with a narrow, naked interval between.

Laguayra.—Z. Collins."

The latter description was derived from a specimen in the Academy's Museum, and does not resemble either the description or figure of Milne-Edwards.

The "*X. setacea*," as described and figured by Milne-Edwards, agrees in every important respect with the "*Gorgonia juncea*" of Pallas and subsequent authors.

"*G. simplicissima*, attenuata, subflexuosa, cortice crasso, rubro verrucoso." Pallas, 1766.

"*G. simplicissima*, teres, utrinque, attenuata, osse corneo fusco, carne ochracea bisulcata, osculis crebris linearibus notata." Ellis, 1786.

"*G. simplicissima*, longissima, teres; carne ochracea subminiata; osculis, crebris sparsis subgranulatis." Lamarck, 1816.

From the above descriptions, we conclude, that the species described by Milne-Edwards as "*setacea*," is none other than the "*juncea*" of older authors.

Pterogorgia simplex described by Valenciennes, in *Comptes Rendus*, xli. (pp. 10, et 13), differs from either the "*setacea*" or "*juncea*" in the form of its "verruces calicifères."

The true disposition of these polypidoms appears to be as follows:—

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Xiphigorgia juncea Horn.*Gorgonia juncea* Pallas, Elench. Zoop. 1766, p. 180.

Ellis, Nat. Hist. Zooph. 1786, p. 81.

Lamarck, Anim. Sans. Vert. 1816, p. 320.

Lamouroux, Polyp. Flex. 1816, p. 419.

Dana, Zoop. U. S. Exp. 1848, p. 664.

Xiphigorgia setacea Edwards, Coralliaires, 1857, p. 172.*Xiphigorgia setacea* Horn.*Gorgonia setacea* Pallas op. cit. p. 182.

Lamouroux, op. cit. p. 421.

Lamarck, op. cit. Deux. Edit. ii. p. 502.

Pterogorgia setacea Dana, op. cit. p. 653.*Xiphigorgia simplex* Horn.*Pterogorgia simplex* Gorg. Comptes Rendus, xli. p. 13.

Descriptions of Reptiles from Tropical America and Asia.

BY E. D. COPE.

SIDEROLAMPRUS Cope.

Scales smooth, toes 5—5. Palatine teeth none. Lower eyelid covered with large scales. Nostril in the centre of an elongate nasal plate. Two pairs of supranasals, contiguous. Internasal present, fronto-nasals absent. Frontal in contact with the interparietal, thus separating the fronto-parietals. Parietals small, widely separated by the broad occipital. Tail cylindrical.

This genus of scinks is most nearly allied to *Eumeces* and *Otosaurus*, but may be distinguished by the presence of two pairs of supranasals, and absence of fronto-nasal.

S. ENNEAGRAMMUS Cope.

Vertical plate elongate, broadest posteriorly, the lateral borders very concave. Palpebral plates five. Tail longer than the head and body. Color above glossy black, shading into ultramarine blue about the middle of the tail. A delicate line of the latter color occupies the centre of each of the central nine rows of dorsal scales. These are all discontinued upon the occiput, except the external one upon each side, which passes round the side of the head and meets its fellow upon the muzzle. The palpebral and supranasal plates are suffused with blue, and delicately bordered with black. Beneath dirty white, shaded with blue upon the abdomen and tail. Length of head and body to vent, 15 lines; of tail (mutilated) 16 lines.

This beautiful little scink was discovered by Sr. Rafael M. De Oca, in the vicinity of Jalapa, Mexico, and obtained for the Academy by Dr. Thomas B. Wilson.

TROPIDONOTUS COMPSOLEMUS Cope.

Scales in nineteen longitudinal rows, all keeled. Head distinct, short, deep; profile anteriorly descending. Rostral plate twice as broad as high. Prefrontals subtriangular; loreal longer than high. One rather narrow preocular; postoculars three, the lowest very small. Vertical and superciliaries elongate; lateral borders of the former scarcely converging; the latter narrow. Superior labials eight, fourth and fifth entering the orbit. Inferior labials nine. Tail slender, slightly compressed at the base, three-tenths of the total length. Gastrosteges 126; a divided anal; urosteges 67. Total length 16 inches; of tail 3 in. 6 lin.

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Coloration. Above blackish brown, darkest anteriorly. Very indistinct, pale transverse bands are apparent. They are irregularly oblique, and separated by intervals of two or three scales wide. Superior and inferior labials more or less completely margined anteriorly with yellow; genial and gular plates spotted irregularly with the same. General color beneath a peculiar stone brown. A darker shade occupies the centres of the gastrostege as far as the vent. This is almost excluded anteriorly by a central series of transversely elliptical yellow spots, one near the anterior border of each gastrostege. These become narrower, and broken, and upon the posterior two-thirds of the belly are almost lost. There is a very indistinct row of smaller spots upon each side of it anteriorly.

Habitat.? Key West. Mus. Comparative Zoology, Cambridge.

This species should be compared with *T. sipedon*, *T. celano* and *T. validus*. It differs from the first in the number of rows of scales, and from all three in the form of the muzzle and coloration of the lower surface.

THAMNOPHIS SCALARIS Cope.

Head narrow, elevated, the profile sloping in front, muzzle obtuse. General form moderately slender, the tail a little less than one fourth the total length. Superciliary and vertical plates elongate, the lateral borders of the latter straight and convergent. Occipitals elongate. Loral plate higher than long; one pre-, three postoculars. Superior labials eight, fourth and fifth entering the orbit. Inferior labials ten. Anterior genials longer than posterior. Scales in nineteen rows, not emarginate, the external smooth. Gastrostege 143; an entire anal; urostege 59 pair.

Coloration. Beneath, and upon the first row of scales, dark, ashy olivaceous, the latter frequently black at their bases. Second and half the third row of scales a little paler. The vertebral, and the borders of one row on each side of it, yellowish. The color of the remainder of the upper surface is brown, anteriorly shaded with olivaceous. This is crossed from the lateral to the dorsal stripe, on each side, by vertical bars, black, or deep brown bordered with black, numbering from the head to the origin of the tail, about sixty. There is a pair of large spots just behind the occipital plates, and one involving the temporals and the whole of the occipitals, its anterior border trilobate and produced upon the vertical and superciliaries. A short yellowish vitta extending from the posterior angle of the former plate along the occipital suture, represents a confluent pair of occipital spots.

Habitat. Jalapa, Mexico, found by Sr. R. M. De Oca. Mus. Academy. Presented by Thos. B. Wilson, M. D.

ARIZONA JANI Cope.

Head not very distinct, tapering. Rostral plate rounded, presenting an obtuse angle between the prefrontals. Post-frontals bent upon the sides of the head. Vertical longer than broad, the lateral borders much converging, posterior angle obtuse. Occipitals longer than vertical, subdivided as in *Pityophis* sp. Nostril between the nasals; loreal plate longer than high. One preocular not reaching the vertical, three postoculars. Superior labials eight, fourth and fifth entering the orbit, inferior labials twelve, sixth largest. Post-genials shorter than pre-genials. Scales of the body in twenty-seven or nine rows, the central thirteen keeled. Tail short.

Coloration. Above, a pale yellowish brown, browner on the crown and muzzle. A series of quadrate dorsal spots extends throughout the whole length, involving from thirteen to seventeen medial rows. Anteriorly they are separated by spaces eight scales wide, but these intervals diminish posteriorly. There is a lateral series of spots which alternate with those of the dorsal row, and are sometimes confluent with others, which form a series along the tips of the gastrostege posteriorly. Anteriorly the dorsal intervals are divided by a transverse series of three small spots, which are probably sometimes confluent. These markings are all black anteriorly; posteriorly, they are shaded with 1860.]

brown. Belly dirty yellowish. The length and number of gastrosteges of our specimen cannot be given, owing to its mutilated condition. Urosteges 58, the tail terminating in a rather long corneous appendage.

Habitat. Buena Vista, Mexico. Lieut. Couch. Mus. Smithsonian.

This genus is intermediate in structure between Rhinechis "Coluber" *Gthr.* and Pityophis. It has not the four postfrontals of the last, nor the divided anal shield of the first two. In form, the rostral plate is intermediate between those of "Coluber" and Pityophis. The present species is nearly allied to the *A. pleurosticta* Cope, (*Elaphis pleurostictus* Dum. & Bibr.) of Uruguay. Named in honor of Prof. Jan, of Milan, a distinguished herpetologist.

DROMICUS TEMPORALIS Cope.

Scales in seventeen longitudinal rows. Head distinct, eyes small, anterior; muzzle short. Mouth very inferior. Rostral plate prominent, but barely visible from above: prefrontals small: vertical broad, presenting an obtuse angle anteriorly, one less than a right angle posteriorly, the superciliary borders nearly parallel. Occipitals well developed, each bounded by three large, and two small temporals. Postnasal vertical, crescentic; loreal confluent with the preocular, (probably not a constant character); postoculars two on one side, one on the other. Superior labials seven, third and fourth entering the orbit. Inferior labials eight, fifth largest, seventh twice the size of the sixth. genae pairs equal. Gastrosteges 167, a divided anal; (tail mutilated). Length of head and body seventeen inches.

Coloration. Above, chocolate brown. A narrow yellow band with a broad blackish superior border extends from the throat to the vent, along the suture of the first and second rows of scales. The greater part of the first row, and the ends of the gastrosteges are involved in a blackish plumbeous band which extends from the throat to the vent: the central third of each scale of the fifth row on each side is brownish-yellow, the upper and lower thirds blackish; thus is formed a narrow black-edged band, which extends from the throat to the end of the tail. A yellow band extends from the superior border of the first upper labial, crosses the lower halves of the posterior labials, and widening, extends upwards upon the temples and neck, forming apparently the rudiments of a collar. Throat and belly saffron yellow.

Habitat. Probably Cuba.

Mus. Comparative Zoology, Cambridge, Mass.

AMASTRIDUM Cope.

Body cylindrical, elongate; tail moderate, slender. Head distinct, broad, short, tapering rather abruptly. Superior maxillary teeth in a continuous series, the last abruptly the longest, not grooved. Pupil round. Top of head flat, separated on the muzzle from the sides, by an angle. Superciliaries prominent. One anterior, two postoculars. Loreal none. Nasals large, one or two, the nostril situated in the centre of the anterior. Scales on the posterior parts of the body, slightly keeled. Anal and subcaudal scutella divided.

This genus differs from *Coronella* Laur. in the short, depressed, angular head, and the absence of the loreal plate. The form of the head somewhat resembles *Xenodon*, but the form of the body, the plating and dentition, are different.

A. VELIFERUM Cope.

Scales in seventeen longitudinal rows, smooth on the anterior half of the body; posteriorly a few dorsal rows with faint keels, becoming stronger toward the tail, and extending on all the scales near the anal region. Here they are tuberculous, as in *Aspidura trachyprocta nobis*. Tail nearly one-third the total length. Occipital plates large, almost reaching the labials in front, posteriorly acuminate; vertical long, acute behind; superciliaries large, promi-

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ment, broad behind. Postfrontals small, their anterior outline regularly curved; prefrontals small, quadrangular. Rostral nearly rectangular, not appearing on the surface of the head. Postnasal high, its apex visible from above, opposite the suture between the pre- and postfrontals. Superior labials seven, eye resting on third and fourth. Inferior labials nine. Genaials two pair, the anterior shorter.

Total length 14 in. 11 lin. tail 4 in. 10 l. Gastrosteges 127, urosteges 85.

Coloration. Above and below, reddish-brown, paler in the centres of the gastrosteges. Every fourth scale of the fifth row on each side, pale, the adjacent scales on the fourth and sixth rows, generally darker. Top of the head much lighter, varied anteriorly; palest behind the eye and above the labials. The latter are dark with a few light spots.

Habitat. Cocuyas de Veraguas, N. Grenada. Mr. R. W. Mitchell.

Mus. Academy Natural Sciences.

The colors of this species are quite similar to those of *Tantilla reticulata nob.* from the same locality. Its physiognomie is very unprepossessing.

SCOLECOPHIS FUMICEPS Cope.

Head not distinct from the body. Scales in fifteen rows. Frontal plates broad and short; vertical broad, presenting an obtuse angle anteriorly, an acute one posteriorly, its occipital suture longer than its superciliary. Occipitals large, as long as postfrontals and vertical together. Prenasal large; postnasal prolonged to the single preocular, excluding the loreal. Postoculars two. Superior labials seven, third and fourth entering the orbit, seventh largest. Temporals, two large and two small. Inferior labials six, fourth the largest. Breadth of anterior genaials equal to half their length, which is greater than that of the posterior pair. Gastrosteges 132; a divided anal; urosteges 42.

Total length 5 inches; tail 1 in. 10 lin.

Coloration. Above, uniform pale brown, shading into dirty white beneath. The top of the head, including the oculars and temporals, and for four scales back of the occipitals, blackish-brown. Rostral, prefrontals and upper labials, pale brownish.

Habitat. Probably Cuba.

Mus. Comparative Zoology, Cambridge, Mass.

Fam. ADENOMIDÆ.

Opisthoglossa platydactyla without maxillary teeth, with perfectly developed ear, parotid glands, dilated apophyses of sacral vertebra, and palmate feet.

ADENOMUS Cope.

Hylæform. Head broad, short. Parotids above the shoulder, long and narrow; skin rough. Vomerine teeth none. Tongue elongate, oval, almost cylindrical anteriorly, posteriorly entire, and free for about two-fifths its length. Tympanum indistinct. Fingers very slightly webbed, the palettes of moderate size. A subgular vocal sac.

A. BADIOFLAVUS Cope.

Muzzle short, elevated; canthus rostralis concave. Nostril oval, lateral. Eyes very large, transverse diameter of the eyelids greater than that of the ossa frontalia. Tympanum inconspicuous, surmounted by small tubercles. Skin of the whole upper surface tuberculous, and especially that of the scapular protuberance, and a short lateral fold. No gular or pectoral fold; tarsus half the length of the tibia, which is but little longer than the fourth phalanx. Two tubercles on the metatarsus, one on the metacarpus. First finger half the length of the fourth.

Coloration. Above, ground color, fulvous. The sides as far as the eye, a spot above the anterior canthus of the latter, one upon each eyelid, a band beginning upon the occiput and bifurcating between the parotids, and a large chevron-shaped band upon the sacral and iliac regions, ferruginous or bay. A 1860.]

broad band of the same bordered with yellow, crosses the closed femora, tibiae and tarsi. A similar one crosses the fore-arm. Upper lip varied with yellow; a band of the same, extending from the angle of the mouth to the shoulder. Under surface of the belly and extremities, saffron yellow, with some irregular medial spots of an orange bay color.

Length from muzzle to end of coccyx 1 inch, $2\frac{1}{2}$ lines. Femur from coccyx $6\frac{1}{2}$ lines, tibia nearly 7 lines.

Habitat. Ceylon. Mus. Acad. Nat. Sciences. From Mr. H. Cuming, in ex.

PHYLLOBATES TRUNCATUS Cope.

Skin above and below smooth, except some faint granulations upon the posterior part of the abdomen. Tongue small, linear, entire. Thumb nearly as long as the middle digit. Front and canthus rostralis convex. Muzzle concave truncate, elevated; nostrils lateral. Tympanum very near the eye, less than half its size.

Coloration. Upper and lower surfaces of head, body and extremities a dark ferruginous maroon. A pale, curved line upon each side; beneath this another one, which unites with its fellow upon the anterior part of the abdomen. From this point of junction a medial band takes its rise, and bifurcates posteriorly. A pair of parallel lines upon the throat, which unite anteriorly, following the curve of the mandible. Extremities sparsely and irregularly spotted with the same faint shade.

Habitat.? New Grenada. Mus. Academy. From the Philadelphia Museum, in exchange.

The species of this genus hitherto described, are *P. bicolor* Bibron, from Cuba, *P. melanorrhinus* Berthold, from New Granada, and *P. auratus* Girard, from Chili.

SPELERPES BELLII Gray.

"*Oedipus platydactylus* Tschudi." Baird, Journal Acad. Nat. Sci., Philada. 2d ser. vol. i. pp. 282-286, January, 1850. (Not of Tschudi.)

Speleperpes Bellii Gray, Catalogue Amphibia in Brit. Mus., p. 46, June, 1850.

Bolitoglossa Mexicana Duméril, (pars), Erp. Gen., vol. ix., p. 93, 1854. (Exclus. all the synonymy). Pl. 105, fig. 2.

"*Salamandra togata* Valenciennes, Mus. Paris." Duméril.

Specimens of this fine Salamander are now in possession of the Academy and of the Smithsonian Institute, which were brought from Jalapa, Mexico, by the well known collector, Sr. De Oca. Though it is a species apparently well known in European collections, considerable confusion exists with regard to the synonymy. This it is the object of the present article to set right as far as the means at the author's disposal may enable him to accomplish it.

The first published notice of this species is probably that of Professor S. F. Baird, in his valuable "Revision of the North American Tailed Batrachia," as above cited. He supposed it to be the *Oedipus platydactylus* of Tschudi, as it appears to me incorrectly, though the meagre diagnosis of that author renders any identification sufficiently hazardous. The name at the head of this article is that of Dr. J. E. Gray, whose description in the "Catalogue of Batrachia Gradiantia in the British Museum," no doubt, applies to this species. It is the first name published with an appropriate specific diagnosis, and therefore is adopted here. Dr. Gray was, however, not aware that to the present species belongs the synonymy and notice of the structure of the toes, quoted from Baird, under the genus *Oedipus* of the "Catalogue." That this is the case, I have upon the excellent authority of Prof. Baird himself, who states that the appearance of "sucker-like discs upon the extremities of the toes, similar to those of *Hyla*," resulted from the contraction of the integuments about the proximal phalanges, in an old specimen, thus giving prominence to the small tubercle upon the inferior surface of the extremity of each toe. The *Oedipus* of Gray appears to be the *Oedipus* of Tschudi, but I have seen neither specimens nor descriptions which correspond with that of his *O. variatus*.

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The best description of the *Spelerpes Bellii* is the first part of that above cited, from the *Erpetologie Générale*, and which should be regarded as indicating the *Bolitoglossa Mexicana* of the author of that work, although the same species is figured as a variety of another, described in the text in a supplement to the description of the first. The animal described in the supplement, is there regarded, it would appear, correctly, as the *Oedipus platydactylus* of Tschudi, and is not only specifically, but probably generically distinct from *Spelerpes Bellii*.

In size this species is only exceeded by some of the *Amblystomata* of the Mississippi Valley: one of our specimens is at least eight inches long. The tail, whose length is about equal to that of the head and body, is compressed toward the tip, but cylindrical and greatly swollen at the base, as in *Hemidactylum scutatatum*, though in a greater degree. It is encircled by grooves similar to those of the flanks. The toes are short, broad, depressed, very distinct, and with scarcely a trace of connecting membrane at the base, certainly much less in our specimens than is represented in the fig. in *Erp. Générale*. The extremity of each is provided beneath with a knob or callosity. The palatine teeth extend from the very exterior point of the posterior border of the palatine bones, and from two nearly transverse arched series, which meet near the centre of the suture with the sphenoid bone. This resembles the arrangement in the *Geotriton fuscus* and the *Heredia* of Girard, rather than the ordinary *Spelerpes*, where the series are shorter, more oblique, and not in contact. The patches of sphenoid teeth are more distinct and elongated than in the species of *Plethodon*, but less so than in *Pseudotriton ruber*. A considerable space separates these from the posterior angle of the palatine series.

The fresh specimens of this species that I have seen are of a lead color, other specimens are much darker, but whether this is a result of long preservation in spirits I am not able to state. Upon the back is a double row of obliquely pyriform spots of an orange red in life, but which became yellowish white in spirits. These become confluent upon the neck, and, according to authors, are sometimes preceded by a pair of large spots of the same color upon the occiput. Belly immaculate.

GEOTRITON CARBONARIUS Cope.

? "*Salamandra platydactyla* Cuvier, Mus. Paris."

? *Oedipus platydactylus* Tschudi, *Classif. der Batrachier*, p. 93, 1838.

Bolitoglossa Mexicana Dumeril, *Erp. Gén.*, vol ix. p. 93, 1854. (Specimens from Vera Paz.) Pl. 105, fig. 1.

There can be little doubt that a salamander exhibiting a structure of the feet similar to that of the present species, furnished the characters of Tschudi's genus *Oedipus*, and also that of Dr. Gray. What species this reptile pertained to, cannot readily be ascertained, as no description of it appears to have been published, unless it be identical with the *O. variegatus* of the latter author. In this case it is not probably the same as that figured in the *Erpetologie Générale*, and of which two specimens are before me.

It is evident that the *Oedipus* of Tschudi cannot be retained, as founded upon an undescribed species,—even were it sufficiently distinct. That it is not distinct from the *Geotriton* of Bonaparte, is very probable, although it is contrary to analogy to find a genus of reptiles in so southern a latitude as that of Jalapa identical upon another hemisphere. With the *Geotriton fuscus* *Bp.* before me, I find the following characters common to it and the species which is the subject of this article. Supra and postorbital bony arches absent. Palatine teeth in two transverse regularly arched series almost in contact medially. Sphenoid teeth numerous, in two oval patches upon the sphenoid bone, separated by an interval from the palatines. Tongue boletoid. Parotids none. Tail cylindrical. Digits 4—5, slender, united by a broad membrane.

The broad palmation of the fingers and toes distinguishes the genus from 1860.]

Spelerpes. In the latter genus and its allies, the toes are distinct at all seasons of the year, differing in this respect from the Tritons.

Upon comparing the dorsal vertebrae of the *Geotriton fuscus* and *carbonarius*, little material difference is apparent. Those of the former are not so stout, and have the external ridge of the anterior zygapophysis more compressed and elevated. In both, there is a single longitudinal spinous process, but little elevated, obsolete upon the posterior part of the vertebra.

The largest specimen of *Geotriton carbonarius* measured three inches from the end of the muzzle to the vent: from the latter point to the end of the tail is three in. three lines. The ground color above and below is black: the back is marked with a broad, irregularly defined brownish yellow band, which extends upon the base of the tail, and bifurcates upon the neck and occiput, leaving a deltoid space of the ground color. This dorsal band is more uniform in a younger specimen. The soles of the feet are pale. There are ten teeth in each of the palatine series, and about three hundred and thirty in the confluent sphenoidal patches. These patches are distinct anteriorly and posteriorly. In *Spelerpes Bellii*, they are entirely distinct, and more clavate in outline.

Catalogue of Birds from the Island of St. Thomas, West Indies, collected and presented to the Academy of Natural Sciences by Mr. Robert Swift. With Notes,

BY JOHN CASSIN.

1. *TINNUNCULUS SPARVERIUS*, (Linnaeus).

Falco sparverius, Linn. Syst. Nat. i. p. 128, (1766).

Falco dominicensis, Gm. Syst. Nat. i. p. 285, (1788).

Wilson's Am. Orn. ii. pl. 16, iv. pl. 32. Aud. B. of Am. pl. 42, oct. ed. i. pl. 22.

In a very fine series of specimens in Mr. Swift's collection, I find some characters which are slight, but may be constant, and possibly indicate specific distinctness from the common bird of the United States. The wing coverts have much more numerous spots of black, and the outer tail feather has its inner web always partly, and frequently entirely rufous, the same color as the other tail feathers, and its outer web white, with segments or semi-circular spots of black, having for their bases the shaft of the feather, and all the feathers of the tail are more or less edged and banded with black on their upper surface. These characters are not usually seen in *F. sparverius* of the United States, but are present in every specimen in the present series, and seem especially to characterize the adult plumage. The colors also are rather brighter than in our northern species.

Seven specimens are in this collection, of which four are in adult plumage. In all of them, of whatever age, there is a large rufous space on the crown, and the size is very nearly the same as that of specimens from Pennsylvania, or perhaps slightly smaller. The plumage of the present specimens does not correspond with that of either of the proposed distinct species of authors.

2. *GYMNOGLAUX NUDIPES*, (Daudin).

Strix nudipes, Daud. Traite d'Orn. ii. p. 199, (1800).

Sclater's Ibis, 1859, pl. 1. Vieill. Ois. Am. Sept. pl. 16.

Two specimens in Mr. Swift's collection are much as represented in Mr. Newton's excellent plate, and as described in his very valuable paper on the Birds of St. Croix, in Sclater's Ibis, as cited above. A wide superciliary band of white is, however, more conspicuous in both of the present specimens, than as represented in the plate, and there are a few other not important differences. The *tarsus* is bare for about its lower two-thirds, in this singular species, and covered with very small circular or hexagonal scales. Bill and claws light greenish-yellow, which is probably also the color of the feet in the adult bird.

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This curious and little known owl, is an exceedingly interesting contribution by Mr. Swift to the collection of this Academy, to which specimens from him were for the first time presented some years since. Previously, it was unknown to the naturalists of this country, though they were constantly reminded of it by Vieillot's plate in Ois. d'Am. Sept., cited above. The specimens described originally by Daudin, were from the Island of Porto Rico.

3. *TYRANNUS DOMINICENSIS*, Brisson.

Tyrannus dominicensis, Briss. Orn. ii. p. 394, (1760).

Tyrannus griseus, Vieill. Ois. d'Am. Sept. i. p. 76, (1807).

Vieill. Ois. d'Am. Sept. pl. 46. Aud. B. of Am. pl. 170, oct. ed. i. pl. 55.

Numerous specimens very similar to specimens from Florida, but rather lighter colored. I am not sufficiently acquainted with the difficult group of American flycatchers to have entire confidence in my provisional conclusions, but, at present, I am inclined to think the bird now before me, in Mr Swift's collection, is probably entitled to be regarded as distinct, specifically, from the bird of the Southern United States usually bearing the same name.

4. *TYRANNULA MARTINICA*, (Linnæus).

Muscicapa martinica, Linn. Syst. Nat. i. p. 325, (1766).

Muscicapa albicapilla, Vieill. Ois. d'Am. Sept. p. 66, (1807).

Muscicapa martinicana cristata, Briss. Orn. ii. p. 362.

Vieill. Ois. d'Am. Sept. pl. 37. Brisson Orn. ii. pl. xxxvi. fig. 2.

This species scarcely appears to have been identified by late naturalists, but like many others founded on Brisson's descriptions and figures, it is undoubtedly an absolute and veritable existence. That great ornithologist and most excellent describer, mainly, and in fact almost entirely, relies on specimens actually before him, for descriptions, and is exceedingly careful to refer to the collections in which they are to be found. His figures frequently are not recognizable, but no descriptions extant are more complete and satisfactory.

One specimen only, in Mr. Swift's collection, is not in fully mature plumage, but appears to be the bird described by Brisson, as above, to which Linnæus gave a name, and an abstract of Brisson's description. It more nearly corresponds with Vieillot's description than with his figure above cited, but appears to be the species of that author. It is a white-crested species, strictly of the same group, and much resembling *Tyrannula albiceps*, (D'Orbigny et Lafresnaye), and about the same size.

This is one of the most interesting birds in Mr. Swift's collection, and we hope to receive other specimens, which he has kindly promised to endeavor to procure. Like all birds in the present collection, it was obtained by Mr. Swift, in the Island of St. Thomas. Brisson's specimens were from the Island of Martinique.

5. *VIREOSYLVIA ALTILOQUA*, (Vieillot).

Muscicapa altiloqua, Vieill. Ois. d'Am. Sept. i. p. 67, (1807).

Vireo longirostris, Swains. Faun. Bor. Am. ii. p. 237, (1831).

Phyllomanes mysticalis, Cabanis ?

Turdus hispaniolensis, Gmelin ?

Cassin, B. of Cal. and Texas, pl. 37. Vieill. Ois. d'Am. Sept. pl. 38.

Edwards' Birds, v. pl. 253.

Mr. Swift's specimens appear to be rather large, but they are apparently identical with the bird of Jamaica and Cuba, and a visitor to Florida. It is easily recognized and distinguished from all other species by the narrow line of black running downward, on each side of the neck, from the base of the lower mandible. I much regret that there is not at present in the Acad. Mus. a series of specimens of this species, sufficient for comparison with those in the present collection, which, according to my recollection, are larger than usual, 1860.]

and especially stronger in the bill. All the specimens of this species, except one, and specimens of various other species of this group, were stolen by a visitor to the Acad. Mus. some years since, and never recovered.

Several specimens, in excellent plumage and condition, are in Mr. Swift's collection.

6. *DENDROICA PETECHIA*, (Linnæus).

Motacilla petechia, Linn. Syst. Nat. i. p. 334, (1766).

Motacilla ruficapilla, Gm. Syst. Nat. ii. p. 971, (1788).

Chloris eritachoides, Feuille, Jour. Obs. Phys. iii. p. 413, (1725).

Ficedula pensylvanica erythrocephalos, Briss. Orn. iii. p. 488.

Ficedula martinicana, Briss. Orn. iii. p. 490, (1760).

Edwards' Birds, v. pl. 256, fig. 2. Vieill. Ois. d'Am. Sept. ii, pl. 91.
Bris. Orn. iii. pl. xxii. fig. 4.

This is undoubtedly the true *Motacilla petechia*, Linnæus, founded on the description of *Ficedula martinicana*, by Brisson, as above cited. Though we have frequently seen this species in collections, Mr. Swift's specimens are the first that have come under our notice, the locality of which is authentic.

Numerous specimens in Mr. Swift's collection are in various plumages, though the greater number are nearly or quite mature, and show the reddish chesnut-colored crown quite well defined and conspicuous. This bird is larger than *D. aestiva* of the United States, with which it has sometimes been confounded, and is not difficult to recognize from Brisson's excellent description above cited. It is the same bird also as Brisson's *Ficedula pensylvanica erythrocephalos*, founded on Edwards' figure, above referred to, who (Edwards) expressly states that he did not know the locality of the specimen figured, but guessed, wrongly, that another, received from Pennsylvania, was the female of the same species. Hence concluding erroneously that his bird was a North American species. This erroneous guess and conjectural conclusion misled Brisson, Buffon, and a host of other authors, to the present era, but is easily detected by referring to the text of Edwards, vol. v. p. 99.

7. *PARULA AMERICANA*, (Linnæus).

Parus americanus, Linn. Syst. Nat. i. p. 341, (1766).

Motacilla eques, Bod. Tab. Pl. Enl. p. 46, (1783).

Motacilla americana et ludoviciana, Gm. Syst. Nat. i. p. 960, 983, (1788).

Sylvia torquata, Viell. Ois. d'Am. Sept. ii. p. 38, (1808).

Sylvia pusilla, Wilson, Am. Orn. iv. p. 17, (1811).

Buff. Pl. Enl. 731, fig. 1. Viell. Ois. d'Am. Sept. ii. pl. 99. Wilson, Am. Orn. iv. pl. 28. Aud. B. of Am. i. pl. 15 oct. ed. ii. pl. 91.

One specimen only, in Mr. Swift's collection, is specifically identical with numerous others now before me, from the neighborhood of Philadelphia. In nearly mature plumage and excellent preservation, and probably a winter traveller from its place of nativity in the North.

8. *MERULA FUSCATA*, (Vieillot).

Turdus fuscatus, Vieill. Ois. d'Am. Sept. ii. p. 2, (1807).

Vieill. Ois. d'Am. Sept. ii. pl. 57, bis.

Numerous specimens, and apparently a common species in several of the islands of the West Indies.

9. *PHONIPARA BICOLOR*, (Linnæus).

Fringilla bicolor, Linn. Syst. Nat. i. p. 324, (1766).

Tiaris omisssa, Jardine, Ann. and Mag. Nat. Hist. xx. p. 332, (1847)?

Catesby's Carolina, i. pl. 37. Gosse, B. of Jamaica, pl. 64.

Two specimens only, in Mr. Swift's collection, are not in fully mature plumage, and we look for others from him with interest. They do not correspond in all respects with specimens in the Acad. Mus., which we have hitherto regarded as certainly the species to which this name is applicable, but we cannot, at present, venture to indicate a different species. It is possible that these

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specimens are Jardine's *Tiaris omissa* described as above cited, from the Island of Tobago.

10. *CERTHIOLA FLAVEOLA*, (Linnæus).

Certhia flaveola, Linn. Syst. Nat. i. p. 187, (1766).

Nectarinia antillensis, Lesson, Traite d'Orn. i. p. 304, (1831).

Certhia bartholemica, Sparrin. Mus. Carls. No. 57, (1788)?

Catesby, Carolina, pl. 59. Swains. Zool. Ill. pl. 52. Gosse, B. of Jam. pl. 16.

Numerous specimens, in good plumage and excellent condition. They appear to be the same as described and figured by Mr. Gosse, as above, from the Island of Jamaica, and are probably of the species best entitled to the name given by Linnæus.

11. *LAMPORNIS AURULENTUS*, (Aud. et Vieillot).

Trochilus aurulentus, Aud. et Vieill. Ois. Dor. i. p. 29, (1802).

Trochilus dominicus, Linnæus?

Trochilus margaritaceus, Gmelin?

Gould, Monog. Troch. pt. xv. pl. Aud. et Vieill. Ois. Dor. pl. 12, 13.

Numerous specimens of both sexes, and in mature plumage.

12. *EULAMPIS HOLOSERICEUS*, (Linnæus).

Trochilus holosericeus, Linn. Syst. Nat. i. p. 191, (1766).

Gould, Monog. Troch. pt. xiv. Aud. et Vieill. Ois. Dor. pl. 6, 65.

Appears to be this species, and evidently abundant in the Island of St. Thomas. The numerous specimens in Mr. Swift's collection are in very fine plumage.

13. *CONURUS XANTHOLEMUS*, Selater.

Conurus xantholemus, Sclat. Ann. and Mag. Nat. Hist. 1859, p. 225.

Conurus chrysoygenys, Massena et Souance, Rev. et. Mag. Zool. 1854, p. 72?

Numerous specimens of both sexes, in mature plumage, and others, which are young birds. This appears to be the bird described by Mr. Selater, and we much suspect is also the bird described by Messrs. Massena and Souance, as above cited, its affinities being, perhaps, more accurately stated by the latter authors.

14. *MELANERPES PORTORICENSIS*, (Daudin).

Picus portoricensis, Daud. Am. du Mus. Paris, ii. p. 285, (1803).

Picus rubidicollis, Vieill. Ois. d'Am. Sept. ii. p. 63, (1807).

Vieill. Ois. d'Am. Sept. ii. pl. 117. Shaw, Nat. Misc. xxii. pl. 953.

Several specimens in excellent plumage and preservation.

15. *COCYZUS SENICULUS*, (Latham).

Cuculus seniculus, Lath. Ind. Orn. i. p. 219, (1790).

Aud. B. of Am. pl. 169, oct. ed. iv. pl. 277?

Several specimens in Mr. Swift's collection, quite identical with others before us, in Acad. Mus., labelled as from various localities in the West Indies, and Northern South America; but I think, scarcely, the bird figured by Audubon.

16. *CROTOPHAGA ANI*, Linnæus.

Crotophaga ani, Linn. Syst. Nat. i. p. 154, (1766).

Buff. Pl. Enl. 102.

Numerous specimens.

17. *COLUMBA CORENSIS*, Jacquin.

Columba corensis, Jacq. Beytr. Gesch. Vog. p. 31, (1784).

Columba monticola, Vieill.

Columba portoricensis, Temm.

Columba imbricata, Wagler.

Knip, Pigeons, i. pl. 15. De Sagra's Cuba, Aves, pl. 27.

Numerous specimens in mature plumage. Apparently precisely the same as the bird of Cuba, and other islands of the West Indies.

18. *ZENAIIDA AMABILIS*, Bonaparte.

Zenaida amabilis, Bonap. Comp. List.

Bonap. Am. Orn. iii. pl. 17, fig. 2. Aud. B. of Am. pl. 162, oct. ed. v. pl. 281.

Several specimens in very fine plumage and excellent preservation.

19. *CHAMÆPELIA TROCHILA*, Bonaparte.

Chamæpelia trochila, Bonap. Consp. Av. ii. p. 77, (1857).

Various specimens in Mr. Swift's collection appear to be this species. They are not, however, in mature plumage.

20. *EUPSYCHORTYX SONNINI*, (Temminck).

Perdix Sonnini, Temm. Fig. et. Gall. iii. p. 451, (1815).

Temm. pl. col. 75. Gould, Monog. Odont. pl. 11.

Very fine and mature specimens of both sexes.

Mr. Swift has had the kindness to inform me that this species was introduced into the Island of St. Thomas some years since, from Venezuela, and that it has now become of frequent occurrence, quite naturalized, and rearing young freely throughout the island. The present specimens are exactly the species figured by Mr. Gould under this name, and identical with specimens in Acad. Mus., labelled "Venezuela" and "Cumana."

21. *ÆGIALITIS WILSONIUS*, (Ord.)

Charadrius Wilsonius, Ord. Wilson's Am. Orn. ix. p. 77, (2d ed. 1825).

Charadrius crassirostris, Spix, Av. Bras. ii. p. 77, (1825).

Wilson, Am. Orn. ix. pl. 73. Aud. B. of Am. pl. 219, oct. ed. v. pl. 319.

Several specimens quite identical with the bird of the eastern and southern coasts of the United States. This species evidently has an extended range of southern migration during the winter season, though the present locality is the most southern that we have yet seen from the West Indies. Its range on the coast of the Continent is more southern, and certainly extends to the coast of Brazil.

22. *GALLINULA GALEATA*, (Lichtenstein).

Crex galeata, Licht. Verz. p. 80, (1823).

"*Gallinula chloropus*," Auct.

Bonap. Am. Orn. iv. pl. 27. Aud. B. of Am. pl. 244, oct. ed. v. pl. 304.

A single specimen, in very fine plumage.

23. *RALLUS LONGIROSTRIS*, Boddaert.

Rallus longirostris, Bodd. Tab. Pl. Enl. p. 52, (1783).

Rallus crepitans, Gm. Syst. Nat. i. p. 713, (1788).

Aud. B. of Am. pl. 204, oct. ed. v. pl. 310. Buff. Pl. Enl. 849.

Like many other of the shore birds common in the summer, on the coast of the United States, this species performs a very extensive migration, extending, probably, to almost the entire eastern coast of South America, and all the islands of the West Indies. The present specimens are identical with the bird which is abundant on the coast of New Jersey, and in much the same plumage seen in September, or later in the autumn.

The proper name for this species, I have no doubt, is that here given. The figure in Buffon, as cited, probably represents an autumnal or winter plumage.

24. *BUTORIDES VIRESCENS*, (Linnæus).

Ardea virescens, Linn. Syst. Nat. i. p. 238, (1766).

Wilson, Am. Orn. vii. pl. 61. Aud. B. of Am. pl. 333, oct. ed. vi. pl. 367.

A single specimen, not in mature plumage, is this, or a nearly allied species. Probably a winter sojourner from the North.

25. *NYCTHERODIUS VIOLACEUS*, (Linnæus).

Ardea violacea, Linn. Syst. Nat. i. p. 238, (1766).

Ardea jamaicensis et cayanensis, Gm. Syst. Nat. i. p. 625, 626, (1788).

Wilson, Am. Orn. viii. pl. 65. Aud. B. of Am. pl. 336, oct. ed. vi. pl. 364.

Another wanderer, possibly from the Southern States of North America, though understood to be resident in some of the West Indies. One specimen only, in Mr. Swift's collection, is in quite mature plumage, and is identical with specimens from the State of Georgia, in the Academy's Museum.

26. *ONYCHOPRION FULIGINOSUS*, (Gmelin).

Sterna fuliginosa, Gm. Syst. Nat. i. p. 605, (1788).

Wilson, Am. Orn. viii. pl. 72. Aud. B. of Am. pl. 235, oct. ed. vii. pl. 432.

A single specimen in mature plumage, is the same species figured by Wilson and Audubon. As a bird of North America, it is only known as inhabiting the extreme southern coast of the United States, but is abundant in the whole southern hemisphere.

27. *THALASSEUS*.

A specimen of a young bird of a large, thick-billed species, which I fail to recognize. It may, however, be a common species.

With this species we close this collection, which, though few in number of species, is a highly interesting and valuable contribution to the Museum of our Academy.

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Descriptions of new species of Crinoidea and Echinoidea from the Carboniferous rocks of Illinois, and other Western States.

BY F. B. MEEK AND A. H. WORTHEN,

Of the Illinois State Geological Survey.

Although we have not yet had time to write out full remarks upon the relations of the species described in this paper, we would state that we have compared them carefully, not merely with figures and descriptions, but with authentic specimens of a large majority of the known American Carboniferous species. In comparing them with the forms figured and described in the Iowa Report, as well as with a large number of other Western Carboniferous forms named and described, though not yet published, by Prof. Hall, we have possessed the advantage of having at hand, in almost every instance, the original types of those species which belong to, and are now in the possession of one of the authors.*

Full illustrations of all the species, together with remarks, comparisons and extended descriptions will appear in the forthcoming report of the Geological Survey of Illinois.

Genus *PLATYCRINUS*, Miller.

PLATYCRINUS PRATENANUS.—Calyx small, wider than high, distinctly truncated below and widening gradually upwards, composed of thick, smooth, slightly convex plates, which are united, (excepting the basal series) by grooved sutures. Base comparatively large, more than one-third as high, as wide, and provided with a small rim around the margin of the broad truncated under side; consisting of one pentagonal, and two hexagonal plates, the upper side of the latter being concave in the middle, and about twice as long as the superior lateral slopes; sutures carinated, the carinæ passing down over the marginal rim of the under side. Columnar facet large, or more than half as wide as the base, and slightly concave. First radial plates a little wider than high, quadrangular, nearly as wide at the base as above, somewhat convex on the

* Since this was in type we have received a copy of Prof. Hall's supplement to the Iowa Report, in which we see he describes other species not contained in the collections alluded to above. We have carefully compared his descriptions of these additional species with ours, described in this paper, and believe them to be all distinct, unless our *Dichocrinus conus* may be identical with his *D. laevis*.

under side, and provided with a rather broad rounded sinus above for the reception of the second radials, the lower margin of the excavation being but very slightly projecting. Second radial pieces small, much wider than long, triangular, and about filling the sinus in the upper side of each first radial; concave on their upper sloping sides, which support the primary divisions of the arms. (Anal and interradial pieces unknown.)

The arms, after the first division on the second radial plate, bifurcate again on the second piece, and at least two of the inner of these subdivisions, divide once more on the second piece, (in two of the arms examined). Above these last divisions each arm is slender, nearly cylindrical, and consists of a single series of plates for a short distance, then gradually passes into a double alternating series. The tentacles are closely arranged, and rather thick, where they connect with the arm pieces, but soon taper, and appear to be all made up of long slender joints.

Height from the base to the summit of the first radials, 0.35 in; breadth at the top of first radials, 0.45 inch; breadth of base, 0.37 inch; height of do., 0.13 inch; height of first radials, 0.24 inch.

Named in honor of Mr. Henry Pratten, deceased, formerly of the Geological Survey of Illinois.

Locality and position. Randolph County, Illinois. St. Louis, Limestone of the Subcarboniferous series.

PLATYCRINUS PENICILLUS.—Body small, subglobose, a little wider than long, composed of thin plates, connected by moderately distinct sutures, and ornamented by small tubercles or coarse granules, which, on the first radial plates, show a tendency to range themselves in a few radiating rows from the middle of the upper side. Base comparatively large, much depressed, considerably wider than high, and broadly truncate, with a marginal rim below. First radial pieces large, nearly flat, and a little higher than wide; widening somewhat from the base, subquadrangular, the upper angles being slightly truncate by the interradial and anal pieces; sinus in the upper side for the reception of the second radial pieces shallow, and apparently about half as wide as the superior edge. Second radials small, triangular, wider than long, and supporting on their upper sloping edges the first divisions of the arms. (Anal and interradial pieces unknown.)

Above the first bifurcation on the second radial pieces, the two divisions of the arms subdivide on the second piece, and the two middle subdivisions each bifurcate again on the second piece, beyond which they are all simple. Immediately above the last bifurcations, the arms consist of a single series of pieces, which are somewhat wedge-shaped, or alternately longer and shorter on opposite sides; then gradually pass into a double series of alternating joints above. The larger single arm pieces, below the bifurcations, and for a short distance above, are generally longer than wide, narrow around the middle, and broader at each extremity, the superior lateral angles projecting for the reception of tentacles. All the larger arm pieces are connected by peculiar undulating sutures.

The column is comparatively large, and seems to have been very flexible. Near the body it is rounded and composed of thin alternately larger and smaller segments, with sharp edges, which are often crenulated. Farther down it becomes alternately compressed in opposite directions, at intervals of about every five joints; while all the joints increase somewhat in thickness, and are ornamented with distinct spine-like projecting points or crenulations. About every fifth segment is more prominent on its edges than the others.

Length of body from base to the summit of the first radials, 0.21 inch; breadth, about 0.26 inch; length of arms, near 0.89 inch

Locality and position. Hardin County, Illinois. St. Louis Limestone, of the subcarboniferous series.

PLATYCRINUS PLENUS.—Calyx subglobose, wider than high, composed of thin,

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slightly granulose plates. Base basin-shaped, expanding rapidly from its small truncated columnar facet, considerably wider than high, and provided with carinated sutures. First radial plates large, about as high as wide, subquadrangular in outline, the two superior angles being rather distinctly truncated for the reception of the interradial pieces; all nearly, or quite as wide below as above, and provided with a rounded sinus in the upper edge equal to about half their own breadth, for the reception of the second radial pieces. Second radials very small, triangular, about half as long as wide, and supporting on their superior sloping sides, which are distinctly concave, the first divisions of the arms. (Anal plates unknown). Interradial pieces comparatively large, and each provided with a rather distinct central spine or tubercle.

The arms are rather small, and above the first division on the second radial piece, bifurcate again on the second piece, beyond which they appear to be simple in most cases, though some of them present the appearance of subdividing again on the second piece. Above the last bifurcation, they are at first composed of a single series of joints, but gradually pass into a double alternating series. All the joints below the bifurcations, and some of the larger single ones above, are rather long, constricted around the middle, and provided with a prominent projection on each side above.

The column is compressed, twisted, and composed of nearly equal, rather short segments, which are occasionally armed with short conical nodes or spines.

Height from the base to the summit of the first radials, 0.43 inch; breadth, 0.58 inch; breadth of base, 0.45 inch; height of do., 0.15 inch.

Locality and position, same as last.

Genus DICHOCRINUS, Munster.

DICHOCHRINUS CONSTRICTUS.—Body small, oval subglobose, widest above, constricted a little below the middle, and rounded or slightly truncate beneath; composed of thick plates, which appear to have been smooth, and are joined by linear sutures. Base comparatively large, or forming about one-third the entire length of the body, twice as wide as high, and more or less concave in the middle below; each of its pieces having five obscure angles above, with slight concavities between for the reception of the succeeding range of plates; columnar facet very small and round. First radial plates higher than wide, a little unequal, having an oblong subquadrangular outline, the two upper angles of each being slightly truncated, apparently for the reception of very small interradial pieces; one of them having a fifth obscure angle in the middle of the under side. Sinus in the upper side of each first radial for the reception of the second radials, rounded, and from one-third to one-half the breadth of these plates. Anal piece slightly larger than the first radials, and having a subpentagonal outline, narrowing upwards a little, and like the first radials, curving inward above. (Other parts unknown.)

Length, 0.39 inch; breadth above the middle, 0.38 inch; do. at the constriction below the middle, 0.32 inch; breadth of base, 0.33 inch; height of do., 0.14 inch.

Locality and position. Bloomington, Indiana; in beds probably equivalent to the Warsaw Limestone, of the subcarboniferous series.

DICHOCHRINUS CONUS.—Body large, obconical, longer than wide, composed of thin, smooth plates, which are united by close fitting, linear sutures. Base comparatively large, a little longer than wide, tapering regularly to the small inferior extremity, which is slightly truncate; both pieces subtrigonal in outline, though really hexagonal, if we count the slightly salient angles between the shallow sinuosities in the upper margins; columnar facet small, round? and provided with a small rim. Radial pieces large, longer than wide, presenting an oblong outline, slightly wider above than at the base; all more or less convex on the inferior margins, which in the anterior one, is provided with an obtuse central angle; sinus in the upper margin of each, about one-third as wide
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as the superior edge, and excavated down nearly one-fifth the length of the plate, its lower edge projecting distinctly outward. Anal plate hexagonal, as long as the radials, but a little narrower, about twice as high as wide.

Each radial plate, as well as the anal piece, has an obscure rounded ridge extending down the middle to its base, so as to give the body a slightly sub-hexagonal outline when viewed from below. These prominences are also continued on down upon the basal pieces, gradually becoming obsolete as they converge toward the narrow lower extremity.

Length of the body to the summit of the first radials, 1.31 inches; breadth about 1.16 inches; height of base 0.53 inch; breadth of do. above, 0.76 in.

Locality and position. Cedar Creek, Warren County, Illinois. Burlington, Limestone of subcarboniferous series.

DICHOCRINUS (PTEROTOCRINUS) CRASSUS.*—Body below the arms of medium size basin-shaped, or more than twice as wide as high, widening rapidly upwards from the base, and composed of thick, apparently, smooth plates, which are very slightly convex, and connected by linear sutures. Base comparatively large, about four times as wide as high, distinctly concave below, and widening upwards from its rounded lower margin; subcircular in outline, being scarcely impressed at the sutures; columnar facet round, concave, and about one-fourth as wide as the base. First radial plates broader than long, widening regularly upwards from the base, and all concave on the upper side, which is longer than either of the others; four of them quadrangular, and one on the anterior side probably subpentagonal, from the presence of a fifth obscure angle at the middle of the under side. Second radial pieces very small, about twice as wide as long, subtrigonal in outline, and supporting on their superior sloping sides, (which are a little concave,) the two middle arms, while the two lateral arms rest partly upon their wedge-shaped lateral extremities, and in part directly upon the first radials. The anal piece is rather more than half as large as the first radial plates, a little longer than wide, (the lateral margins being nearly parallel or slightly convex in outline,) and presenting a subquadrangular form, with a fifth obscure angle at the middle of the base.

*This and the first of the following species, evidently belong to the same group as the species upon which Mr. Lyon proposed, in the third volume of the Geological Survey of Kentucky, to found a new genus under the name of *Asterocrinus* (*Pterotocrinus*, Lyon & Casseday). The species of which it is composed present marked differences from what are regarded as typical species of *Dichocrinus* in the old world, and we have little doubt in regard to the propriety of separating them from that genus. As there are, however, some differences of opinion, amongst paleontologists, in relation to the limits of the genus *Dichocrinus*, we have concluded to place our species in the group *Pterotocrinus*, using the name provisionally, however, for the present, in a subgeneric sense.

Judging from the few species of this group we have yet seen, we are led to think the formula given by Messrs. Lyon and Casseday, in their paper published in the American Journal of Science, (January, 1859,) should be modified somewhat. In one of our species there is a minute triangular piece resting upon the middle of each first radial, and partly supporting on its superior sloping sides the two pieces regarded in Messrs. Lyon and Casseday's formula as the second radial. In another of our species this minute piece is represented by a larger one of the same form, which undoubtedly bears the relations to the other parts, of a dwarfed, but true second radial; while those resting upon, and partly upon it, assume the character of secondary radials and free arm pieces. Hence we think this minute piece (which is sometimes wanting), however small it may be, should always be regarded as a rudimentary second radial piece. If we are correct in these views, the formula of this group should be stated as follows:—

Basal pieces, 2.

Radials 1 or 2×5, the second being very small, minute, or sometimes obsolete.

Secondary radials, 1×10, or wanting; the first free arm pieces sometimes resting partly on the second and partly on the first radials; and where the small second radial and the secondary radials are wanting, all resting directly upon the first.

Arms, 20.

Interradials unknown.

Interbrachial appendages 5, large, and more or less expanded.

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The first arm pieces are much larger than the others, and consist of a single series; but above these the arms soon pass into a double series of small alternating pieces, which are considerably wider than long, and support on the inner side a double series of closely arranged tentacles. The arms, of which there are four to each ray, or twenty in the entire series, are rounded on the outside, and deeply grooved within, slightly tapering, apparently rather long, and entirely simple. The interbrachial appendage, rising from the middle of each group of arms, is thin or knife-like, and seems to have been nearly as long as the arms.

Locality and position. Hardin County, Illinois. Chester Limestone, of sub-carboniferous series.

DICHOCRINUS (PTEROTOCRINUS) CHESTERENSIS.—Body below the arms rather small, basin-shaped, or more than twice as wide as high, widening rapidly upwards from the base, the sides being slightly concave in outline; composed of moderately thick, apparently smooth plates, which are connected by linear sutures. Base more than one-third as broad as the body, about three times as wide as high, truncate and concave below, the concavity being margined by an angular rim; columnar facet small, or less than one-third as broad as the truncated under side of the base. First radial plates about the size of the basal pieces, though proportionally higher, twice as wide as long, and widening rather rapidly from below; four of them quadrangular, and one on the anterior side, pentagonal; all distinctly concave on the upper side, (which is longer than either of the others) and having their salient lateral angles above slightly truncated, apparently for the reception of small interradiar pieces. Second radial pieces minute, or merely rudimentary, triangular, and each partly supporting on its sloping upper edges two larger secondary radial pieces, which also rest with one side on the primary radials, and bear upon their superior sloping sides the first brachial pieces, the outer of which, likewise have one edge reposing upon the lateral superior edge of the first radial plates. Anal piece about one-third as large as the primary radials, ovate in form, the upper extremity being very narrow, and the long lateral margin convex, while its base has an obtuse angle on each side, and one in the middle.

The arms, of which there are four to each ray, or twenty in the entire range, are simple from their origin, rounded on the outside, deeply grooved within, and commence as a single series of larger pieces, but soon pass into a double alternating series of small pieces, which support on their inner sides two ranges of tentacles. The interbrachial appendages, if there are any in this species, are unknown.

Height from base to summit of first radial pieces, 0.16 inch; breadth at the top of first radials, 0.40 inch; breadth of base, 0.24 inch; height of do., 0.16 inch; length of anal piece, 0.15 inch; breadth of do., 0.09 inch.

Locality and position. Chester, Illinois. Chester Limestone of the sub-carboniferous series.

Genus TREMATOCRINUS, Hall, 1860.

TREMATOCRINUS FISCELLUS.*—Body short, subcylindrical, slightly longer than wide, truncated and concave at the base, and nearly flat above; sides rising

* In first sending on the description of this species to the Academy, we had proposed to found upon it a subgenus, which we placed provisionally under *Acanthocrinus*, stating, at the same time, that it presented differences from the type of that genus, that might be of full generic value. As this paper is going through the press, we have received a copy of Prof. Hall's Supplement to the Iowa Report (just published), in which we see he has described four species of this type under the name of *Trematocrinus*. We therefore cancel, in the proof of our paper, the description of the group, and refer our species, which is clearly distinct, specifically, from the forms described by Prof. Hall, to his genus *Trematocrinus*.

In our remarks (now cancelled) on this group, we had pointed out its relations not only to *Acanthocrinus*, but also to *Rhodocrinus*, Miller, and to *Goniatroidocrinus* of Lyon and Casseday. Its analogy to the latter is so striking, that we strongly suspect the same [1860.]

almost vertically to near the arms, where they curve a little outwards. Plates nearly smooth or subgranulose, and all convex, those of the subovate interradial spaces less prominent than the rays, and showing a very slight tendency to develop obscure ridges, one of which passes to each side; sutures moderately distinct. Base small, entirely within the concavity of the under side, concave, and obscurely pentagonal; columnar facet large, or occupying nearly the whole area of the base, obscurely marked by radiating striæ, and provided with a small pentagonal star-shaped central opening. Subradial pieces as wide as long, truncated, and narrower above than below, subquad-rangular in outline, but provided with a fifth very obtuse angle in the middle below, and having each inferior lateral angle slightly truncated. First radial pieces larger than the subradials, and wedged so far in between them as to come nearly in contact with the base, about as wide as long, heptagonal, the sides connecting with subradials being longer than the others. Second radials hexagonal, as long as wide. Third radials heptagonal, and supporting on their superior sloping sides the first secondary radials, each of which is succeeded by two others, the last of which supports the first true brachial piece.

The first interradial pieces rest upon the superior truncated side of the subradials, which are about equal in size; they are all hexagonal, the inferior lateral edges being very short, and the under side longer than either of the others. Above these there are in the second range three, in the third three or four, and in the fourth three pieces, the latter being surmounted by three or four others; all the series diminish gradually from below to the summit. (Anal plates unknown.)

The interbrachial pieces are all very small, two of them being wedged down in the narrow space between the first and second secondary radial pieces, while the others are arranged so as to form the upper and inner side of the two small ambulacral apertures—the outer and lower sides of which are formed partly by a sinus in the edge of the second secondary radial pieces, and partly by one side of the third.

The secondary radials diverge so that those belonging to different rays meet, over the centre of each interradial space, where the arms—of which there appear to be ten, arise. The first brachial pieces are not quite free, being flanked on either side by the interbrachial pieces, forming the summit of the apertures. They are all pierced directly through the middle by the arm openings.

The summit is very slightly convex, and composed of unequal plates, the larger of which are tumid, and the smaller less convex. Extending from each arm, towards the middle, there is a depression occupied by smaller pieces, while the larger and more convex plates occupy the prominences between. The specimen examined being a little defective on one side, the exact position of the anal opening, if any exists, cannot be determined.

Height to top of first brachial pieces, 0.48 inch; do. to ambulacral apertures, 0.39 inch; do. to top of vault, 0.56. Breadth below the arms, 0.51 inch.

Locality and position.—Burlington Limestone of subcarboniferous series. Burlington, Iowa.

Genus ACTINOCRINUS, Miller.

ACTINOCRINUS VALIDUS.—Body of medium size, subglobose, being more depressed above than below the arms; calyx somewhat ventricose, and formed of thick, convex, radiately costate plates, connected by moderately distinct sutures; summit composed of small irregular tuberculose pieces, and provided

ambulacral openings may exist in the type of that genus, and that in consequence of the imperfection of their specimens, Messrs. Lyon and Casseday may have failed to see them. If so, all the species will probably have to be ranged under their name, which was first published, unless when the characters and limits of *Acanthocrinus* are better known, it may be found that these American forms should only constitute a section of that genus. Prof. Hall seems to have overlooked the almost exact identity in the generic formula of his group with that given of *Goniasteroidocrinus*.

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with a subcentral proboscis; interradial spaces between the arms deeply excavated. Base rather small, truncated and concave below, about four times as wide as high, not provided with a continuous rim; composed of somewhat unequal plates, with deeply grooved sutures between; columnar facet nearly two-thirds as broad as the base, concave, and marked by fine radiating striae. First radial plates a little wider than high, two of them hexagonal, and three heptagonal, the angle at the middle of the lower side of each being very obtuse. Second radials wider than long, hexagonal and heptagonal, about one-half to two-thirds as large as the first radials, and like them ranging obliquely outward and upward from the base. Third radial pieces, smaller than the second, from which they extend almost horizontally outwards; arcuate transversely, their lateral extremities curving up to connect with the superior arm pieces, hexagonal, and each supporting on its superior (or more properly its outer) sloping sides two secondary radial pieces, which also extend out horizontally from the body.

The first anal piece is nearly as large as the first radials, about as wide as long, hexagonal, and supports on its superior sloping sides two smaller hexagonal and heptagonal pieces in the second range; above these there are in the next range, three or four smaller pieces, which connect with the vault and superior arm pieces above and on each side. The first interradial plates are about the size of the second radials, as long as wide, heptagonal (and hexagonal) and support two or three smaller pieces in the next range.

Of the distinct radiating costae on the first radial plates, from three to four pass across from one to the other, and from each to the base, and one or two to the second radial, and each first interradial above; while the third radials are destitute of costae.

Height from base to summit of third radials, 0.65 inch; do., to top of vault, 0.95 inch; breadth (across between the arms) 0.91 inch; breadth of base 0.42 inch; height of do., 0.12 inch.

Locality and position. Cedar Creek, Warren County, Illinois. Burlington Limestone of lower carboniferous series.

ACTINOCRINUS ASTERISCUS.—Body about medium size, depressed or subdiscoidal, rather more convex below than above the arms; calyx expanding rapidly from the base about half way up, then flaring outwards so as to bring the third radials and succeeding pieces nearly upon a horizontal plane, composed of thin, nearly smooth flattened plates, which are joined by close fitting sutures; summit much depressed, consisting of numerous medium-sized, convex plates, and provided with a subcentral proboscis; interradial spaces deeply excavated, so as to give the body a distinctly pentalobate outline, as seen from above or below. Base small, apparently rounded and destitute of a marginal rim, about three times as wide as high. First radial plates wider than long, expanding from below to the lateral angles, three of them hexagonal, and two heptagonal, the angle at the middle of the base of the latter being very obtuse. Second radials small, about twice as wide as long, hexagonal and pentagonal. Third radials slightly larger than the second, pentagonal, or occasionally hexagonal about twice as wide as high, and each supporting on its superior (or more properly, outer) sloping sides, two secondary radials; these are each succeeded by another, which in its turn, supports two of the first brachial pieces, making four arms to each ray, or twenty in the whole series, all of which seem to rise vertically from the point of attachment.

The first anal piece is small, longer than wide, hexagonal, and supports on each superior lateral edge a small pentagonal piece, and on its truncated upper end a long, narrow, irregular plate, which extends up and curves inwards with its superior extremity between two of the crown plates. On each side of the latter there is a large irregular curved piece, belonging, probably, to the anal series. The first interradial plates are larger than the first anal piece, and as wide as, or wider than long, hexagonal or heptagonal, and each supports on its superior lateral sloping edges smaller pieces, above which

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there are usually three, or occasionally four, irregular elongated pieces, similar to the upper of the anal series. Sometimes the middle one of these three pieces extends down between the others, so as to rest upon a short, truncated, upper end of the first interradial piece. (Other parts unknown.)

Height from base to top of vault, 0.47 inch; do. to arms, 0.37 inch; breadth across, from side to side, between the interradial 0.66 inch.

Locality and position. Same as last.

ACTINOCRINUS SPECIOSUS.—Body large, below the arms obconical, longer than wide, composed of convex, ornately costate plates, which are joined by more or less excavated sutures. Base of moderate size, cup-shaped, nearly as wide again as high, truncate below, and expanding rather rapidly upward, composed of regular subequal hexagonal plates, with broadly and deeply grooved sutures. Columnar facet rather large, or nearly equaling one-half the breadth of the base, flat, marked by obscure radiating striae, and provided with a very small continuous rim; perforated by a round central opening about one-third the diameter of the column at its junction with the body. First radial plates large, longer than wide, three hexagonal, and two heptagonal, generally widest a little above the middle. Second radials considerably smaller than the first, about as wide as long, and apparently all hexagonal. Third radials a little smaller than the second, wider than long, heptagonal, (and octagonal?) each supporting on its superior sloping sides two smaller heptagonal or octagonal secondary radials, which appear to have each supported two brachial pieces; resting upon and between the two secondary radials, there is a small hexagonal interbrachial piece, which appears to have supported two others on its upper sloping sides.

The first anal plate, which is nearly as large as the first radials, is heptagonal, longer than wide, and supports in the first range three much smaller pieces, the middle one of which, is pentagonal, and the others hexagonal; above these in the next range, there are four, and in the third, apparently three pieces, which is as far as they can be traced in the specimen examined.

The first interradial plates are slightly larger than the second radials, hexagonal, and each surmounted by two smaller pieces; above these there are, apparently, about three other ranges of two small pieces each.

The surface of the plates is neatly ornamented by narrow, sharply elevated ribs, about four to six of which radiate from the central region of each first radial plate to each of its sides, excepting below the middle, where there are usually about eight to ten. The costae on the other plates are less numerous in proportion to the size of each, and like those on the first radials, extend to the sides, those crossing any one side being all arranged parallel to each other so as to form with those on the adjacent plates a series of concentric equilateral triangles. Sometimes these costae are irregularly interrupted, or more or less notched, especially on the upper plates; and on some of the upper interradial pieces they show a tendency to become irregularly broken up into little spine-like projections.

Locality and position. Three miles west of Burlington, Iowa. Burlington Limestone of the subcarboniferous series.

ACTINOCRINUS SCILUTUS.—Body rather under medium size, unsymmetrically urn-shaped, the summit being moderately convex, and the calyx below the arms obconical, with a truncated base; expanding regularly with straight sides from the base to the third radials, above which the secondary radial, and first brachial pieces extend out horizontally, leaving excavated interradial spaces between the clusters of arms; sutures close fitting. Base of moderate size, more than twice as wide as high, truncated, and distinctly concave below, where it is as wide as at the summit; margin so deeply notched at the sutures as to present a distinctly trilobate appearance as seen from below; columnar facet rounded, about one-third as wide as the base, and provided with a minute central perforation. First radial pieces a little wider than long, two of them heptagonal, and three hexagonal, widening upwards from the base to

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the lateral angles, and each having a very prominent, compressed, central node extending obliquely outwards and downwards, from which one or two moderately prominent ridges pass down upon the basal plates. Second radials between one-half and two-thirds as large as the first, distinctly convex, or each rising into a small node; about one-third wider than high, two of them pentagonal, and three hexagonal. Third radials as wide as the second, but rather shorter, three of them pentagonal and two heptagonal, supporting on each of their superior sloping sides a slightly smaller secondary radial piece, each of which is surmounted by two brachial pieces; making, apparently, twenty arms in the entire range.

The first interradial pieces are about as large as the second radials, and like them provided with a central node; they are as long as wide, regularly hexagonal, and support on their superior sloping sides two smaller pieces in the second range, and two or three in the third, which connect on each side with the secondary radial, and first brachial pieces. The first anal plate is nearly as large as the first radials, as long as wide, hexagonal, and supports in the second range, two rather smaller pieces, one of which is hexagonal, and the other heptagonal; above these there are two others, which connect with the third radials, and secondary radial pieces on each side, and are surmounted by two or three small, irregular pieces, which are flanked on either side by the brachial pieces, and connect with those of the summit above.

The vault is composed of irregular, moderately convex pieces, of various forms, and provided with a subcentral proboscis, which rises abruptly from its surface.

Height from the base to the summit of the vault, 0.66 inch; do. to top of third radials on the anterior side, 0.44. Breadth of base, 0.34 inch; height of do., 0.14 inch; breadth across the summit, between the interradial spaces on opposite sides, 0.61 inch.

Locality and position. Cedar Creek, Warren County, Illinois. Burlington Limestone, of the subcarboniferous series.

ACTINOCRINUS ARANEOLUS.—Body small, much depressed, stelliform, nearly equally convex above and below the arms, with deeply excavated interradial spaces; composed of smooth or obscurely granulose, convex plates, which are strongly angular below the arms; sutures moderately distinct. Base small, flat and subhexagonal; columnar facet small, round, flat, and about one-third as wide as the base, pierced by a small central opening. First radial pieces on a plane with the base, strongly convex, and angular in the middle, from which a more or less angular ridge radiates to each of the sides, all slightly broader than long, and hexagonal or heptagonal, the seventh angle at the middle of the side connecting with the base being very obtuse. Second radial pieces nearly as large as the first, wider than long, distinctly curved upwards at the sides, and subangular along the middle; presenting a hexagonal outline as seen from below, but possessing an additional angle on each side, only seen in a lateral view. Third radials of the same size as the second, from which they extend horizontally outwards; curving distinctly upwards on each side, and pentagonal as seen from below, but each having one or two additional angles on each side, where they connect with the superior arm pieces extending out from the vault; supporting on their superior, or more properly outer, sloping sides apparently the first brachial pieces.

The interradials are about two-thirds as large as the first radial pieces, a little longer than wide, regularly hexagonal, and each support on their superior sloping sides two smaller pieces, which seem to belong more properly to the vault, than the interradial series.

The first anal plate is near two-thirds as large as the first radial, hexagonal, and supports two smaller hexagonal pieces in the next range; above these there are four others in the third range, which connect with those of the vault above, and with the superior arm pieces on each side.

The summit is composed of small, somewhat irregular pieces, some of which
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are tumid, and a few that extend out over the third radials become subconical. The proboscis is subcentral, of medium size, and rises abruptly from the much depressed vault. (Other parts unknown.)

Height, 0.22 inch; breadth across the disk, between the interradial spaces on opposite sides, 0.33; do., between the third radials on opposite sides, 0.54 inch; breadth of base, 0.14 inch.

Locality and position. Burlington, Iowa. Burlington Limestone, of the subcarboniferous series.

ACTINOCRINUS (AMPHORACRINUS*) SUBTURBINATUS.—Body rather under medium size, turbinate, or obconical below the arms, and depressed convex above; expanding regularly with straight sides from the column to the summit of the third radials, thence more abruptly to the arms; composed of flat, smooth or merely granulose plates, which are connected by close-fitting sutures. Interradial and anal spaces rather distinctly excavated between the groups of arms. Base comparatively small, subpentagonal, about one-third as wide as high, and not provided with a projecting rim; columnar facet concave, small or less than half the diameter of the base. First radial plates generally a little wider than long, widening from the base to the lateral angles, two of them heptagonal and three hexagonal. Second radials small, about twice as wide as high, quadrangular, or rarely with one of the upper angles slightly truncated so as to produce a fifth angle. Third radial pieces a little larger than the second, about twice as wide as high, hexagonal and heptagonal, and supporting on each superior sloping side in the anterior and two posterior rays, one (occasionally two on one side of the latter) small secondary radial piece, which gives rise to two brachial pieces; while in each of the two antero-lateral rays, the two small secondary radials are truncated above, and each supports a single brachial piece; making two arms to each of these rays, and four to each of the others, or sixteen to the entire series.

The first interradial plates are about two-thirds as large as the first radials, nearly as long as wide, and six to nine-sided. On the superior sloping sides of these, rest two smaller pieces, which partly support the secondary radials, and are surmounted by two or three irregular pieces, which extend up between the groups of arms. The first anal piece is as large as the first radials, about as long as wide, heptagonal, and surmounted by three smaller hexagonal pieces in the second range, the middle one of which extends above the others. Surmounting these there are also three pieces in the third range, the two lateral of which each supports an irregular piece above, while the middle one projects considerably beyond the others, and supports on its sloping sides a series of protuberant plates, which surround the small anal aperture.

The summit is composed of irregular unequal plates, one of which over each arm, and another near the middle, are larger than the others, and appear to have been convex, or may even have been extended into short spines. The anal aperture is lateral, being located a little above the elevation of the arm openings.

Height from base to summit, 0.59 inch; breadth across the summit between the groups of arms, 0.60 inch; do., from the arm openings on opposite sides,

* We think Austin's name *Amphoracrinus* should be retained, at least in a subgeneric sense. The lateral position of the anal and oral opening in this group, instead of having it placed in or near the centre of the vault, and extended in the form of a more or less elongated proboscis, must have been accompanied by some marked difference in the structure of the softer parts of the animal. Indeed it seems to us that in the classification of the *Crinoidea*, too much importance is often given to the number and arrangement of the pieces forming the cup, to the neglect of the *ensemble* of characters presented in the structure of all parts of the animal. When we see what widely dissimilar species are sometimes brought together in the same groups, by the present classification, we cannot avoid suspecting that it is, as now used, at least to some extent, analogous to the old artificial Linnæan classification in botany, and that it will some day give way to a more rational method that may make material modifications in the genera as we now understand them.

0.73 inch; breadth of base, 0.27 inch; height do., 0.07; height from base to anal opening, 0.46 inch.

Locality and position. Same as last.

Genus FORBSIOCRINUS.*

FORBSIOCRINUS? NORWOODI.—Body (as near as can be determined from a compressed specimen) obconical, or enlarging regularly upwards from the column; composed of nearly smooth, rather thick, flattened, or more or less arcuate plates, which are connected by linear sutures. Base small, and apparently nearly hidden by the column. Subradial plates rather irregular in form, four of them pentagonal, (one of the sides being very short) and one on the anal side apparently heptagonal, with unequal sides. First radial pieces nearly twice as wide as long, hexagonal and heptagonal, and a little arcuate transversely. Second, third and fourth radials, (and in the anterior ray the fifth,) all short, nearly of the same size, hexagonal and about twice as wide as long. Fifth radial pieces (sixth in the anterior ray) of the same size as the others, heptagonal, and supporting on their superior sloping sides the secondary radials, only three ranges of which have been seen; these latter alternate with interradians on each side, and show scarcely any tendency to diverge. (Anal pieces unknown).

Of the interradians, which are numerous, the first are nearly as large as the subradials, as long as wide, hexagonal, and support three smaller pieces in the second range. Above these four are seen in the next range, in one interradian space, which is as far up as they can be counted in the specimen examined, though it is evident from the breadth of the interradian spaces that they must increase in number at the same rate for several ranges above.

The column is round, comparatively thick at its connection with the base, from which it tapers towards the lower extremity. It is made up of extremely thin segments, which fit together by interlocking crenulations, formed doubtless by distinct radiating striæ on their upper and lower surfaces. Its central cavity is subcircular, and nearly equal to one-third the diameter of the column, at a distance of one inch below its connection with the base.

Named in honor of Prof. J. G. Norwood, of the University of Missouri.

Locality and position. Near Nauvoo, Illinois. Keokuk Limestone of sub-carboniferous series.

FORBSIOCRINUS? SEMIOVATUS.—Body below the first bifurcation of the rays, narrow semi-ovate, a little wider than long, expanding rapidly from the base to the summit of the first radial pieces, above which it widens very gradually, or becomes nearly cylindrical; composed of moderately thick, smooth, or sub-granulose plates, united by distinct sutures. Basal plates (as defined in this genus by Prof. Hall†) hidden by the column, if they exist. Subradials (of Hall, basal of Koninck and LeHon), of moderate size, wider than long, three of them on the anterior side pentagonal, the two upper sloping sides being considerably longer than the lateral margins; (the other two unknown). First radial plates on the anterior side, heptagonal, wider than long, the superior truncated edge being longer than either of the others. Second radials smaller than the first, hexagonal, and nearly twice as wide as long. Third and fourth radials, a little smaller than the second, wider than long, and quadrangular, or obscurely hexagonal, excepting in one ray where there are only four pieces, the last of which is pentagonal, or obscurely heptagonal, and supports the arms; in each of the other two rays seen, there is a fifth piece, which seems to be pentagonal, and supports the arms on its superior sloping sides. (Anal and interradian pieces unknown.)

* The two species we have here referred provisionally to the genus *Forbsiocrinus*, will probably be found to possess the characters of *Onychocrinus* of Lyon and Casseday; but as we have not yet seen the basal plates of either, we do not feel quite warranted in separating them from *Forbsiocrinus*,

†See Iowa Report, p. 630.

The arms above the first division on the fourth and fifth radials, consist of a single series of pieces, are rounded on the outside, and a little broader than their diameter at right angles to their outer surface. One of them is seen to bifurcate again on the sixth piece, and another on the eighth, beyond which they are not known to divide again. Between each two of the arm pieces, as well as the primary radial plates, the minute accessory patelloid pieces, pointed out by Prof. Hall in other species of this genus, are distinctly seen.

The column is comparatively large, near the body, tapers a little downwards, and is composed, for a short distance below its connection with the base, of extremely thin segments, which fit together by distinct interlocking crenulations around the margins; and a little farther down they gradually become alternately thicker and thinner. A transverse section shows the central cavity to be comparatively large, and distinctly pentapetalous as thus seen.

Height from the base to the top of the first radials 0.19 inch; do. from base to top of fifth radials 0.41 inch; breadth at the summit of the first radials 0.35 inch; breadth of base 0.15 inch.

Locality and position. Hardin County, Illinois. St. Louis Limestone of subcarboniferous series.

Genus ZEACRINUS, Troost.

ZEACRINUS DISCUS.—Calyx below the summit of the first radial plates small, subdiscoidal, or depressed, basin-shaped, about three times as wide as high, composed of smooth, very slightly convex plates, which are connected by moderately distinct sutures. Base small, flat, and pentagonal; columnar facet equalling about two-thirds the diameter of the base, round, concave, and marked by distinct radiating striæ, perforated by a round, minute central aperture. Subradial plates extending nearly horizontally outward from the base, so as to form a distinct pentagonal, star-shaped disk, all curving a little upwards towards their outer extremities; three of them pentagonal, and two hexagonal, in consequence of each having one angle slightly truncated by the anal pieces. First radial plates about twice as large as the subradials, rather more than half as long as wide, pentagonal, and all transversely truncate above, the upper side being longer than either of the inferior sloping edges, which are longer than the lateral margins.

The first anal plate is elongate pentagonal, and wedged down between one of the subradials, and the inferior sloping side of one of the first radial plates, its lower extremity resting upon a very short side of another subradial. Of the second anal pieces there are two, one of which stands upon the short truncated superior side of one of the subradials, and is supported on its right inferior sloping side by the first anal piece, and on the left by one of the first radials; the other stands upon the upper end of the first anal piece, being also partly supported on the right by one of the first radial plates, and on the left by the other second anal piece. Both the second anal plates project about half their length above the summit of the first radials. (Remaining parts unknown.)

Height to the summit of the first radial plates, 0.17 inch; breadth 0.46 inch; breadth of base 0.14 inch.

Locality and position. Sangamon county, Illinois. Upper Coal Measures.

ZEACRINUS TROOSTANUS.—Body rather small, depressed, basin-shaped below the arms, somewhat rounded and concave on the inner side, composed of apparently smooth plates, which are connected by linear sutures. Base very small, concave, and nearly or quite hidden by the column. Subradial plates unequal in size, a little wider than long, excepting the one on the anal side, four of them pentagonal, and one, which is longer than the others, heptagonal, (counting the part of each connecting with the base, as one side.) First radials nearly twice as wide as high, pentagonal, the superior horizontally truncated edge being longer than either of the inferior sloping sides. Second

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radial plates slightly larger than the first, wider than long, pentagonal, and indistinctly hexagonal; all longer on the inferior truncate side than either of the others; apparently four of them supporting on their superior sloping sides the first divisions of the arms, while the one on the anterior side is truncated above, and succeeded by three other very short, wide pieces, upon the last of which the first divisions of the arms rest.

Only two of the anal pieces are seen in the specimen examined; one of these, which is small, occupies a position partly between the right superior sloping side of the largest subanal piece, and the left inferior sloping side of one of the first radials. The other connects with this on the left, and rests upon the left upper sloping side of the large subradial piece, being apparently flanked on its left side by one of the first radial pieces.

The arms are nearly flat, or but slightly rounded on the outer side, and bifurcate again, after the first division on the second radial pieces (in the lateral and posterior rays), on the eighth, tenth, and eleventh pieces, and one of the subdivisions again divides on the twelfth or fourteenth piece, beyond which they are all simple.

Named in honor of Dr. G. Troost, deceased, former State Geologist of Tennessee.

Locality and position. Cedar creek, Warren county, Illinois. Burlington Limestone, of subcarboniferous series.

ZEACRINUS PLANOBRACHIATUS.—Body small, depressed, basin-shaped, concave below, rapidly expanding upwards, composed of apparently smooth plates, connected by moderately distinct sutures. Base small, and placed within the concavity of the under side; columnar facet very small. Subradial pieces as wide as long, or a little wider, four pentagonal, and one on the anal side hexagonal, having one angle slightly truncated. First radial pieces wider than long, expanding from the base, pentagonal, the upper side being horizontally truncated, and longer than either of the others. Second radial pieces nearly as large as the first, presenting a triangular outline (in the posterior and lateral rays), the lateral angles being probably truncated; supporting on their superior lateral sloping sides the first divisions of the arms. First anal plate narrow below, and wedged down obliquely between one of the subradials and the inferior sloping side of a second radial; supporting another piece on its left superior sloping side, and apparently a smaller one on its narrow truncated upper extremity.

The arms are rather flattened on the outer side, and after the first division on the second radial pieces (those seen), bifurcate again on the fifth and sixth pieces. Beyond this they are entirely simple, and composed of a single series of pieces, which are slightly wider than long, and alternately longer and shorter on opposite sides. On the longer side they project a little above, for the reception of the tentacles, which are composed of joints nearly twice as long as wide.

Height from base to summit of first radials, 0.13 inch; breadth at the top of first radials, 0.27 inch; length of arms, from their division on the second radial pieces, about 0.94 inch; length to bifurcation on the sixth piece, 0.19 inch.

Locality and position. Monroe county, Illinois. Keokuk Limestone of lower carboniferous series.

Genus CYATHOCRINUS Miller.

CYATHOCRINUS SAFFORDI.—Body subglobose, wider than high, the broadest part being below the middle, unsymmetrical, the anal side being longest, and most gibbous; composed of thin, smooth plates, joined by slightly raised, linear sutures. Base of moderate size, irregularly pentagonal, flat, or so slightly convex as to be scarcely seen in a lateral view, consisting of unequal, sub-hexagonal plates, the lateral and outer margins of which are nearly equal, while the side next the column is so short as to appear to terminate in an
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angle; columnar facet very small, and slightly projecting. Subradial plates rather large, wider than high, four of them hexagonal (the inferior angle being very obtuse or nearly obsolete), and one on the anal side, which is considerably larger than the others, irregularly heptagonal. First radial plates about the size of the subradials, somewhat unequal, hexagonal, generally wider than long, and tapering upward from the inferior lateral angles, bordered above by a slender, slightly reflexed rim; sinus in the superior edge, for the reception of the second radial piece, small. Anal plate small, about as wide as high, quadrangular, and, like the first radials, provided with a marginal rim; not projecting above the radial plates on each side of it.

Height to summit of first radials, 0.44 inch; greatest breadth, 0.67 inch; breadth of base, 0.45 inch.

Dedicated to Prof. Safford, State Geologist of Tennessee.

Locality and position. White's creek, Tennessee. Keokuk Limestone.

CYATHOCRINUS? SANGAMONENSIS.—Body beneath the summit of the first radial pieces semi-ovate, composed of thick, moderately convex, smooth plates, which are joined by strongly defined punctured sutures. Base pentagonal, equalling about half the breadth of the body, convex, and formed of equal pentagonal pieces, which are a little wider than long; columnar facet round, deep, and about one-third as wide as the base. Subradial pieces large, as wide as long; three of them hexagonal, with their superior sloping sides slightly longer than their lateral margins, which are longer than the basal edges; and the other two heptagonal, with unequal sides. First radials wider and shorter than the subradial pieces, about twice as wide as high, pentagonal, and of nearly equal size and form; their upper sides being horizontally truncate, straight or slightly concave, and considerably longer than either of the basal sides, which are much longer than the vertical lateral edges.

The anal plate is comparatively small, longer than wide, and projects somewhat above the summit of the first radials. It seems to be irregularly heptagonal or octagonal, but the exact form of its upper extremity is not distinctly seen in our specimen. Its base rests upon the short upper truncated extremity of one of the irregular heptagonal subradial plates, while on either side it connects with the first radials, and is supported on its right inferior sloping margin by a large oblong quadrangular subanal piece. This subanal plate is larger than the anal piece, and rests upon the superior sloping edges of the two heptagonal subradials, while its upper oblique side supports one of the inferior sloping sides of the first radial plates, on the right of the first anal piece. Arms, summit, and column unknown.

Height from the base to top of first radial pieces, 0.94 inch; breadth about 1.25 inches; diameter of columnar facet, 0.24 inch; breadth of base, 0.64 inch; height and breadth of subradials, 0.60 inch; height of first radials, 0.36 to 0.40 inch; breadth of do. about 0.68 inch.

Locality and position. Sugar creek, Sangamon county, Illinois. Upper Coal Measures.

CYATHOCRINUS? CRASSUS.—Body below the summit of the first radial plates depressed, or basin-shaped, about twice as wide as high, rounded or subtruncate below, and composed of smooth, strong, thick, slightly convex plates, which are joined by well defined, punctate sutures. Base very small, or about one-fourth the breadth of the body, pentagonal, concave, and apparently nearly hidden by the column. Subradial plates a little wider than high, extending at first nearly horizontally outwards from the base, after which they curve obliquely upwards, four of them hexagonal, and one on the anal side heptagonal; the angle at the middle of the base of each being but slightly salient. First radial plates larger than the subradials, nearly twice as wide as high, truncated horizontally, and nearly or quite straight on the upper side, which is longer than the inferior sloping edges; four of them pentagonal, and one on the left of the anal piece hexagonal.

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The anal piece is small, apparently pentagonal, and projects distinctly above the summit of the first radials, with which it connects on each side. Instead of resting directly upon the upper side of one of the subradials, it is supported on the upper slightly oblique truncated extremity of a very large pentagonal subanal piece, which rests upon the upper sloping sides of two subradial pieces, and supports the inferior sloping edge of a first radial plate on each of its oblique lateral margins.

Height from the base to the top of the first radial pieces, 0.45 inch; breadth, 0.90 inch; breadth of base, 0.23 inch; length of subradials, 0.36 inch; breadth of do. from 0.36 to 0.40 inch; length of first radials, from 0.28 to 0.30 inch; breadth of do. from 0.35 to 0.49 inch.

This, and the last species, together with such forms of *C. spuriosus*, *C. intermedius*, and *C. ? pentalobus*, Hall, should probably form a subgenus, bearing close relations both to *Poteriocrinus* and *Cyathocrinus*.

Locality and position. Ovan, Fulton county, Illinois. Lower Coal Measures.

CYATHOCRINUS SCITULUS.—Body below the summit of the first radial plates basin-shaped, about twice as wide as high, and truncated at the base, from which it expands rapidly upward; composed of thick, strong, subgranular plates, which are very convex in the middle, and deeply excavated at the corners; sutures moderately distinct. Base small, flat or truncate, on a plane with the subradials, so as not to be seen in a side view; columnar facet a little concave, occupying about two-thirds the area of the base, and perforated by a central opening equal to one-third its own diameter. Subradial pieces about as wide as long, directed obliquely outward and upward from the base; four of them pentagonal and one hexagonal, there being no visible angle at the middle of the under side in any of them. First radials much larger than the subradial pieces, about twice as wide as high, unequal, two on the anal side being shorter than the others; all pentagonal, distinctly truncate, and a little concave above, the upper side being much longer than either of the others; superior angles also slightly truncated for the reception of small interradials. Anal piece small, subquadrangular, widening from the base upwards, and projecting above the first radials.

The very prominent central portions of the subradial pieces are truncated below, on a plane with the base, and project out horizontally from it in such a manner as to form with the base a distinct five-rayed star, as seen from below. From near the middle of each subradial, there is a rather obscure angular ridge extending along each side of its prominent central portion to the basal pieces, and another connecting with a similar ridge near the edge of each first radial plate above. From the obliqueness of the upper truncated side of the first radial pieces, it is manifest that the other radials must have extended very obliquely outward from them.

Height to summit of first radials, 0.32 inch; breadth 0.66 inch; breadth of base, 0.21 inch; length of subradials, 0.21 inch; length of largest first radial pieces, 0.20 inch; breadth of do. 0.36.

Locality and position. Burlington, Iowa. Burlington Limestone of subcarboniferous series.

CYATHOCRINUS ANGULATUS.—Body of medium size, somewhat basin-shaped below the arms, wider than high, truncated below, and rapidly expanding upwards; composed of very thick, nearly smooth, tumid, angular plates, which are united by distinct sutures. Base small, and apparently projecting a little below the base of the subradials. Subradial plates as wide as high, four of them pentagonal, and one on the anal side hexagonal, there being no visible angle in the middle of any of them below. First radials larger than the subradial pieces, about twice as wide as long, pentagonal, or subpentagonal, the upper angles being sometimes slightly truncated; all broadly truncate, and a little concave above. Second radial pieces extremely short, but differing

somewhat in length. Third radials larger than the first, considerably wider than long, unequal, and presenting a triangular outline, the under side being longer than either of the others; supporting on their superior sloping sides the first divisions of the arms. Anal piece smaller than the subradials, a little narrower below than above, apparently pentagonal, though the upper side is not distinctly visible in the specimen described; extending partly above the summit of the first radial plates.

The arms are large, rounded, apparently simple, after the division on the third radial piece, and composed of a single series of pieces, which are wider than long, and alternately a little longer and shorter on the opposite sides.

The plates below the second radial series are remarkable for their thickness, and tumid, angular character, though the angles are not acute. On the subradials two of these angles or ridges pass from the middle to the base, nearly parallel to each other, and one to each of the first radial pieces above. On the first radials there are two of these angles, both of which pass from above obliquely to the base, where they connect with those on the subradial pieces, giving to each first radial a bilobate appearance,

Locality and position. Nauvoo, Illinois. Keokuk Limestone of lower carboniferous series.

Genus POTERIOCRINUS, Miller.

POTERIOCRINUS (SCAPHIOCRINUS) DECACTYLUS.—Body rather small, broad, obconical below the arms, expanding rapidly from the base; plates somewhat thick, nearly smooth, not convex, and connected by moderately distinct sutures. Base small, convex, or about half as high as wide, pentagonal in outline as seen from below, the upper angles of the plates being rather salient. Subradial plates somewhat unequal, a little wider than long, four of them hexagonal, and one on the anal side heptagonal; the upper sloping sides in all longer than those beneath, which are longer than the lateral margins. First radial plates about twice as long as the smaller of the subradials, four of them pentagonal, and one hexagonal, all wider than long, and wider on the upper horizontally truncate side than either of the others. Second radials about the size of the first, pentagonal, a little wider than high, truncated below, and provided with a salient angle in the middle above; supporting the arms on their superior sloping sides, which are longer than the lateral margins.

The first anal plate is large, or equalling some of the subradials in size. It is irregularly hexagonal in form, and rests between the superior sloping sides of two of the subradials, supporting on its right (longest) sloping side an inferior edge of one of the first radial pieces, and connecting on the left by a short vertical edge, with another first radial plate. On its upper sides it supports two smaller pieces in the second range, the exact form of which cannot be made out in the specimen examined.

The arms are long, large, and robust, subcylindrical, rather unequal, and appear to be all simple from their division on the second radial piece. They are entirely composed of a single series of pieces, a few of the first of which are longer than the others, and alternately longer and shorter on opposite sides; further up they are more regular, and shorter than wide. The column is rather small, or less than the diameter of the largest arms; it is round, and composed of thin, slightly unequal segments near the body. Its central cavity is small, and presents a regular pentapetalous section.

Height of body from base to the summit of second radials, 0.48 inch; breadth about 0.47; length of arms, apparently not less than 2.50 inches; breadth of do. from 0.11 inch to 0.16 inch.

Locality and position. Appanoose, Hancock county, Illinois. Keokuk Limestone, of subcarboniferous series.

POTERIOCRINUS SWALLOVI.—Body of medium size, obconical, or tapering regularly from above to its connection with the column; composed of smooth,

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nearly flat plates, which are connected by moderately distinct sutures. Base basin-shaped, truncate below, and expanding gradually upward, about half as high as wide, and composed of nearly equal pentagonal pieces; columnar facet large, concave, without a projecting marginal rim, pierced by a pentapetalous central opening, less than one-third the diameter of the column. Subradial plates unequal, some of them as long as wide, and others wider than long, three hexagonal, and two of the larger ones on the anal side, heptagonal, First radials rather smaller than the subradial pieces, all wider than high, pentagonal, somewhat unequal, and horizontally truncate above, the upper side being longer than either of the inferior sloping sides, which are longer than the lateral margins. Second radial pieces very short, apparently subquadrangular. Third radials short, or about three times as wide as high, pentagonal, and supporting on their superior sloping sides the main divisions of the arms.

The first anal piece is pentagonal, and rests between the two upper sloping sides of two subradials. On the right it supports one inferior sloping edge of a first radial plate, and connects with another anal plate on the left, which rests on the superior truncated end of one of the subradials. Both of these anal pieces are truncated above, and surmounted by two others, the former of which cannot be made out in the specimen described.

The arms are very long, robust, rounded, and after the first division on the third radial piece, bifurcate again on the eighth, ninth, and eleventh pieces, in three of the arms examined, above which they seem to be simple, and are each composed of a single series of pieces. The column is composed, near the body, of firmly anchylosed pieces, the sutures of which are not visible 0.20 inch below its connection with the base. Its central cavity presents, in a transverse section, the same pentapetalous form as the perforation of the base.

Length from base to summit of third radial plates, 0.79 inch; breadth about 0.62 inch; breadth of base, 0.38 inch; height of do. 0.19 inch; length of arms, about 3.50 inches.

Named in honor of Prof. G. C. Swallow, State Geologist of Missouri.

Locality and position. Burlington, Iowa. Burlington Limestone of the sub-carboniferous series.

ECHINOIDEA.

Genus ARCHÆOCIDARIS, McCoy.

ARCHÆOCIDARIS MICRONATUS.—The only specimens of this species yet obtained, consist of detached primary spines, and a few of the interambulacral plates. The plates are hexagonal, wider than long, and apparently nearly smooth, or only ornamented by a single row of small tubercles around the margin. Central tubercle prominent, and nearly equalling one-third the greater diameter of the plate, most elevated in the middle, which has a small central pit, and is separated from its surrounding lower margin by a distinct annular groove.

Primary spines long, tapering, a little compressed, or nearly round, and very slightly curved above the articulating extremity, near which they swell out so as to form a distinct, smooth, somewhat angular ring; from this to the articulating end, they contract abruptly; pointed at the upper extremity, and armed by rather strong, sharp, but short lateral spinules, which are directed obliquely outwards and upwards. Even under a magnifier the entire surface generally appears to be smooth, but when a well preserved specimen is examined with a good lens, in a favorable light, it is seen to be marked by extremely fine, obscure, closely arranged, longitudinal striae. The articulating end is distinctly perforated, and transverse sections show the central cavity to be comparatively large for some distance above.

Length of one of the interambulacral plates, 0.50 inch; breadth of do. 0.35 inch. Length of primary spine, 2.62 inches; greatest diameter of same above

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the head, 0.17 inch; diameter of head, 0.22 inch; length of lateral spinules, 0.10 inch.

Locality and position. Liberty, Randolph county, Illinois. Upper bed of Chester Limestone. Lower carboniferous series.

Genus PALÆCHINUS, McCoy.

PALÆCHINUS BURLINGTONENSIS.—The only specimen of this species we have yet seen is too imperfect to show the exact form of the entire fossil, though it seems to have been nearly spherical. It has four to five ranges of interambulacral plates near the middle of each area, and they decrease in number to three, two, and apparently at last to one at each extremity. The inner pieces are wider than long, and regularly hexagonal, excepting near the upper and lower extremities of the spaces, where they are about as long as wide, and occasionally pentagonal; those of the outer ranges are all pentagonal, their outer margins being truncate, and crenulated for the reception of the small ambulacral pieces.

The ambulacra are narrow, or about as wide as the first range of interambulacral plates on either side, slightly convex along the middle, and a little concave at the margins. They are composed of a double alternating series of very small pieces, which are two or three times as wide as long; about five to seven of them equalling the height of each contiguous interambulacral plate. They are each pierced by two small rounded pores near the outer margin, and all of nearly uniform size towards the extremities of the ambulacral areas, but in the central or widest part they become alternately wider at the inner and outer extremities; those having their narrower end outwards often wedging out to a point between the others before reaching the margin of the ambulacral space.

The surface of all the plates is ornamented by numerous regularly arranged granules, two of which occupy the inner half of each ambulacral piece.

As near as can be determined from our specimen, it must have been, when entire, not less than 2.25 inches in length, and about 2 inches in breadth. The largest interambulacral plates are 0.19 inch wide, and 0.17 inch in height; breadth of widest part of ambulacra.

Locality and position. Burlington, Iowa. Burlington Limestone of the lower carboniferous series.

Genus MELONITES, Owen and Norwood.

All the published figures of *Melonites multipora*, the type, and hitherto the only known species of this genus, give a very incorrect idea of the form and arrangement of its ambulacral pieces and pores. The three lateral series of these pieces on each side of the two middle ranges, instead of being as represented, composed two of quadrangular, and one of pentagonal pieces, placed in oblique transverse rows, and mounted one upon another so as to form at the same time regular longitudinal ranges, are made up of irregular alternating unequal pieces of various forms. They are also wedged in between each other in such manner, and so interrupted by small intercalated pieces, not properly belonging to either range, that it becomes very difficult to determine whether we should count them as four or as five rows, on each side of the mesial suture; or, in other words, as eight or ten rows to each ambulacrum. The same irregularity also occurs in the pores, which are round, in closely approximated pairs, and not arranged in regular longitudinal or transverse lines, but so as to show a tendency to assume a quincunx arrangement.

Should the genus of *Polypi*, to which Lamarck first applied the name *Melonites*, be retained, it will become necessary to give another name to the group now under consideration, in which case we would propose to call it *Melonchinus*. Although related to *Palæchinus* of McCoy, this genus is clearly separated by the number and arrangement of its ambulacral pieces and pores, as well as by

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its more numerous and greatly thicker interambulacral plates. The much broader and more deeply sulcated ambulacral areas of the two species now known, also give them a peculiar melon-like form, quite unlike any of the known species of *Palæchinus*.

MELONITES DANÆ.—Test large, subglobose, apparently slightly longer than wide. Interambulacral areas lance-oval in form, convex, and occupied by eight ranges of plates near the middle, where all, excepting those of the two outer ranges are a little wider than high, and regularly hexagonal; towards the upper and lower extremities of these spaces, the plates diminish in size and numbers, and become proportionally higher, a few of them assuming a pentagonal, or even a rhombic quadrangular outline. Those of the two lateral ranges all subpentagonal, their outer margins being somewhat rounded, and more or less indented for the reception of the outer extremities of the small ambulacral pieces. Plates apparently all of uniform thickness, the larger ones being about as thick as high, while the thickness of the smaller greatly exceeds their diameter in any other direction. Ambulacral areas about half as wide as the interambulacral spaces, convex in the middle, and broadly, as well as rather deeply sulcate along each side. Ambulacral pieces in four ranges, with some irregular intercalated smaller pieces between; those of the different ranges alternating, and all wider than high, as well as quite irregular in form and size. Those composing the two inner ranges generally four or five times as wide as high, but varying considerably in height. Usually about four to five of the outer ranges, (which are of the same height, but only half as wide as the inner,) equal the height of each of the contiguous lateral interambulacral plates.

The intercalated pieces start from the zigzag suture between the two outer ranges of ambulacral pieces, and extend outward and inward between them, but wedge out, or terminate abruptly, before reaching the outer margins, or the middle of the ambulacral areas. The pores are in pairs, two to each piece, and arranged in four double rows, two on each side of the mesial ridge or convexity of each ambulacrum. The entire surface is ornamented by regularly disposed granules, about twenty to thirty-five of which may be counted on each of the larger interambulacral plates, and as many, in proportion to size, on each of the smaller ones, including the ambulacral pieces.

Height, 4 inches; breadth, about 3·80 inches; breadth of one of the largest interambulacral plates, 0·24 inch; height of do. 0·18 inch; thickening, 0·17 inch.

This species attains about the same size as, and very closely resembles, *Melonites multipora* of Owen and Norwood, but may be at once distinguished by having only four rows of ambulacral pieces, and four double ranges of pores, while *M. multipora* has uniformly double this number, both of pieces, and of ranges of pores.

We take great pleasure in dedicating this noble *echinoid* to Prof. James D. Dana, of New Haven, Connecticut, one of the most profoundly learned of living savans.

Locality and position. Jersey county, near Warsaw, Illinois. Keokuk division of the subcarboniferous series.

Observations upon the Form of the Occiput in the various Races of Men.

BY J. AITKEN MEIGS, M. D.

In 1857, the collection of Human Crania in the Museum of the Academy of Natural Sciences of Philadelphia, contained 1,045 specimens of many different races of men. Since that time, by presentation, deposit and exchange, this total has been increased to 1,125. Eighty additions, therefore, have been made during the past three years. Of this number 27 are North American Indians; 1860.]

2 Araucanians; 25 Peruvians; 4 Chinese; 9 Sandwich Islanders; 2 Marquesans; 1 Feejee; 2 Swedes; 2 Thugs; 1 Hindoo; 1 Tchukchi; 1 Ice-lander; 1 Cossack and 2 Negroes.

The donors and depositors of these crania are Drs. W. S. W. Ruschenberger, Thomas J. Turner, J. E. Semple, and H. B. Trist, of the United States Navy; Drs. E. H. Abaddie and J. Letterman, of the United States Army; Prof. Wm. A. Hammond, Drs. J. Dickson Bruns, J. H. Slack, J. Clifford Parker, J. B. S. Jackson, and Messrs. George Gibbs, John Biddle, N. P. Buckley, Charles C. Abbott, and the writer of this article.

Forty-six of these crania were procured—some of them with considerable difficulty—by my enterprising friend and former school-mate, Passed Assistant Surgeon Thomas J. Turner, chiefly during his cruise in the Pacific. It affords me much pleasure to acknowledge, thus publicly, the value of his indefatigable and intelligent efforts to promote the interests of craniographic science. The thanks of those interested in this important branch of knowledge are also due to the gentlemen whose names are mentioned above.

Chiefly upon this collection, thus increased in the number and ethnical variety of its specimens, are based the following observations, which, in their general scope and tendency, may be regarded as a continuation of the leading inquiry started in my paper on the Jerusalem skull, which was published in the Proceedings of the Academy for September, 1859.

That inquiry, it may be remembered, was to ascertain whether from the form of the entire skull, or of some characteristic part of it, the race as well as the type to which any particular cranium belonged, could be definitely determined. As the basis of this inquiry, a fragmentary head was selected, having a very peculiar occipital conformation, but whose ethnical origin was wholly unknown. This cranium was subjected to a severe critical analysis and comparison with other heads in the collection. In the course of this comparison, whose leading results have already been communicated to the Academy, the following observations were made, and are now brought forward as another contribution to the sum of recorded human knowledge, and an additional step towards the emancipation of Ethnology from the dogmatism and conjectural assertion with which a host of pseudo-scientific writers have so industriously surrounded it, in their ill-advised attempts to solve definitely certain great questions concerning the origin and primitive affiliations of the races of men.

In the very front rank of ethnological inquiry stands Craniography. As the epitome, not of the skeleton merely, but also of the entire physical man, the cranium, by some of the best observers and profoundest thinkers of modern times, has justly been regarded as capable of furnishing valuable information concerning the zoological relations of the different races of men. This conviction animates the "Cephalogenesis" of Spix, the "Decades Craniorum" of Blumenbach, the numerous and important craniological papers of Retzius, the "Tabulæ Craniorum" of Sandifort, the "Crania Americana" and "Crania Ægyptiaca" of Morton, the "Atlas der Cranioscopie" of Carus, the "Crania Britannica" of Davis and Thurnam, the "Organischen Formenlehre" of Lucæ, the "Schædel, Hirn und Seele des Menschen und der Thiere" of Huschke, the "Crania Selecta" of K. E. Von Baer, and most recently of all the "Catalogus Craniorum Diversarum Gentium" of Prof. J. Van der Hoeven, of Leyden, well known as an able observer and a zealous cultivator of the natural history of man.

It must be confessed, however, that owing to the limited number of specimens in the various cranial collections, and the genealogical uncertainty which surrounds many of those which have been figured and described by different observers, craniography can, as yet, boast of but few established principles. The cranial descriptions published by Blumenbach and many of his successors are entirely too brief and vague for the purposes of that exact

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and minute comparison, which alone can lead to any really important results. Before the deeply interesting and complicated questions of ethnology can receive much light from craniography, the latter must furnish extensive comparisons of the heads of different races of men, not in respect to their general form only, but with reference to the exact conformation and minute anatomical peculiarities of each of the several natural regions of the skull—the crown, base, occiput, facial and lateral aspects. Convinced of the truthfulness of this statement, I have attempted, in the following pages, a comparison of the heads in the Morton collection, with reference to their occipital peculiarities only, hoping, at some future time, as leisure permits, to institute, in like manner, a comparison of these heads with regard to their coronal, basal, facial and lateral characters successively.

A peculiar flattening of the upper or parietal portion of the occipital region characterizes the heads of Norwegians (1260),* Swedish peasants (117, 1247, 1249, 1258, 1486 to 1488), Finland, Södermannland, Turannic and Cimbric Swedes (1545 to 1549, 121, 1532, 1550, 1362), Ostrogoths (1255), and Swedish Finns (1542 to 1544). From about the middle of the sagittal suture the parietal bones slope or shelve away posteriorly, so as to form an inclined plane, which modifies or interrupts the regular ovoidal form of the head, and terminates, in most instances, at the lambdoidal suture, or a little below it, on the superior portion of the os occipitis.† The occipital protuberance in all these crania is very well marked; and in some, apparently exaggerated by the peculiarity above mentioned. In the two “ancient Cimbric” skulls (1532, 1550), in a very old Cimbrian head (1362), from the Danish island of Møen, in the Baltic, and in the crania of an Ostrogoth (1255), and a Swedish woman of the 13th century (1249), the knob-like protuberance of the occiput gives to the calvaria a peculiarly elongated and kumbe-kephalic or boat-shaped form. This occipital prominence is also seen in a fragmentary Burgundian head (1533), from a tomb near Lausanne, in Switzerland, but is not so well marked.

From the investigations of Prof. Nilsson, it would appear that the aborigines of Scandinavia, had “short heads, with broad and flattened occiputs,”—features exhibited by other ancient people, such as the Lapps and Samoïedes, the Iberians or Basques of the Pyrenees, and the mysterious Pelasgi, whose traces are still found in Greece. The short-headed race of Scandinavia appears to have been followed by another race of men, whose skulls were characterized by prominent and narrow occiputs.‡ The hind-head of a large Danish cranium, figured by Nilsson,§ after Eschricht, of Copenhagen, is full and rounded.

In the skulls of “true Finns” (1534 to 1541, 1252, 1259), the occiput is neither prominent nor depressed, but flatly round, and in keeping, therefore, with the general globularity of the head. The Finnic cranial type appears to be preserved in its greatest purity among the primitive inhabitants of Esthonia. Dr. Hueck, in describing the head of an Esthonian, says, that

*The numbers inclosed in brackets are those by which the skulls are designated in my *Catalogue of Human Crania* in the collection of the Academy of Natural Sciences of Philadelphia.

†This conformation also pertains to the Greenland, Scandinavian and Cretin skulls, figured in Tables 3, 4 and 6, of Carus' *Atlas der Cranioscopie*, Heft 1. I find it also more or less strongly pronounced in the crania represented in Tables 3, 4, 8 and 9, (*Schädeln abnormer Form*), and 1, 3, 6, 9, 10 and 11, (*Schädeln bekannter Personen*) of the *Architectur des Menschenschädels*, of Dr. Lucae.

‡ Report of the British Association for the Advancement of Science, for 1847, p. 31.

§ Skandinaviska Nördens Urinvanare, ett försök i comparativa Ethnographien af S. Nilsson, Phil. Dr. etc., Christianstad, 1838, i. Häftet, plate D, fig. 10.

the occiput, in the region of the superior linea semicircularis, is strongly arched, both posteriorly and towards the sides.*

The well-characterized Norwegian and Swedish skulls in the Museum of the Academy have the basal portion of the occipital region quite flat, and parallel with the horizon, when the head rests squarely upon the lower jaw. The lower part of the occiput in the German heads is more prominent than in the Finns, less than in the Swedes, and still less than in the Cimbric; while the upper part is less flat than in the Swedes. The occipital region of the German skull, in point of conformation, occupies a place intermediate between that of the Swedes and Finns.

In the skull of a Dutchman (434), born in Utrecht, the posterior or occipital region is flat and broad, and presents to the eye a somewhat pentagonal outline.

The Anglo-Saxon and Anglo-American crania, though, like the Swedes, longer than the Germanic and Finnic skulls, have nearly the same rounded occiput as these latter. The parietalia of an Anglo-Saxon skull, figured in the first Decade of *Crania Britannica*, incline downwards and backwards towards the occiput, as in the Norwegian cast referred to above. The occipital bone is full and rounded, and has a considerable projection posteriorly.

Most of the skulls in the collection, marked "Celtic Irish," exhibit the same downward and backward inclination of the upper or parietal portion of the occipital region as described above. The occiput of No. 18 has the same boat-like shape as that of the Ostrogoth (1255) and the Cimbric (1532, &c). The occipital region of No. 42 differs from that of the preceding in being a little fuller. The same shelving of the upper occipital region is also present in Nos. 52 and 1186. It is also exhibited, though less markedly, in No. 1356, and still less in No. 985; while in No. 986, the occipital type approximates the Swedish form, being rounder, fuller, less inclined, and having the protuberance not so prominent. In several respects these skulls correspond with those found in the cromlechs or sepulchral mounds of Ireland, and described by Mr. Wilde as possessing the projecting occiput, which characterizes the dolicho-kephalic crania, found in ancient Danish tumuli. It would thus seem that the earliest inhabitants of Ireland, like those of Scandinavia, had short heads and flattened occiputs, while the people who succeeded them were remarkable for long, oval heads and prominent occiputs. Wilson and Bateman, on the contrary, have concluded, from their investigations, that the primitive people of Scotland and England possessed long, kumbe-kephalic or boat-shaped heads, peculiarly characterized by a narrow prolongation of the occiput in the region of the cerebellum. Prof. D. Wilson is inclined to regard this peculiar form of the hind-head as diagnostic of the primitive Caledonians. I find it equally well pronounced, however, in two Egyptian skulls (Nos. 837, 838), from the Pyramid of Five Steps, at Saccara.

In an ancient Briton, of the brachy-kephalic type, figured in *Crania Britannica*, the "occipital bone is somewhat full above the protuberance, which, itself, is strongly marked." In another ancient Briton, belonging to the dolicho-kephalic class, and represented and described in the same work, the occiput is full, prominent and rounded, and presents a strongly-marked transverse ridge.

Three oblong skulls from the catacombs of Paris (661, 662 and 663), have the occiput flattened almost vertically. In No. 663, the upper part of the occipitis presents a lozenge-shaped prominence, which, though flattened itself, somewhat destroys or interrupts the general perpendicularity of the back part of the head. No. 664, also from the catacombs, is a brachy-kephalic head, with a markedly perpendicular and wall-like flatness of the occiput. This head, I am inclined to think, is that of a Basque or Iberian of the Pyrenees.

There are no Spanish skulls in the Academy's collection. The private

* De Craniis Estonum Commentatio Anthropologica, etc., p. 7.

collection of Prof. Van der Hoeven contains several from Grenada, Catalonia, &c. Of one of these, No. 31, he writes in his catalogue,* "Occipitis pars superior gibba," and of another, No. 32, "os occipitis supra gibbum." In describing a Lusitanian skull, he says, "Occiput gibbum; lineæ semicirculares et protuberantia occipitalis vix distincta."

In the asymmetrical Slavonian skull from Olmutz in Moravia (1251), and in No. 1253, a Slave from Morlack in Dalmatia, the occiput is flatly globular or truncated. If classified according to its form, No. 1251 might be placed between the Turkish and Kalmuck types.

In a Polish skull in Prof. Van der Hoeven's collection, the occipital region is prominent at the apex of the lambdoidal suture. The occiput of another Poland skull is broad and gibbous in the upper portion.

In the Turkish skull figured by Blumenbach (table 2) the external occipital protuberance is but little developed, so that there seems to be no occiput. Two Turkish skulls obtained from a burial ground at Scutari, and described by Dr. Williamson,† have a rounded occiput.

In a Cossack skull (133) from Balaklava, the occiput is broad and very flat.

In the Hungarian cranium, according to Edwards,‡ the back of the head appears flat, forming almost a straight line with the nape of the neck.

A cast of the skull of a young Greek (1354), exhibits a moderately full and rounded occiput. In the Greek skulls, in the Chatham collection, the "occiput is well rounded, and does not, in general, project; the space for the downward projection of the brain in the occipital region is well developed."

The cranium of a Roman prætorian soldier, figured by Blumenbach,§ has the external occipital protuberance very broad and prominent. In the skull of a Roman soldier,|| taken from an ancient cemetery at York, the occiput is broad and rounded, and the protuberance rather prominent. So also in the Roman cranium described by Dr. Thurnam,¶ the occipital bone is full and prominent, especially in its upper half.

In an Etruscan skull in the Galerie Anthropologique at Paris, the occiput is full and rounded.**

The general form of the occipital region of the so-called Phœnician skull (1352) is like that of the Norwegian. In the latter, however, the external occipital protuberance, and the superior curved line are strongly pronounced; in the former the skull is quite smooth at this place.

All the Circassian skulls exhibit great fulness of the occipital protuberance. The upper part of the hind-head is flat. The occiput as a whole is rounded in the Armenian skull, No. 789, and in this respect is like the Persian skull, No. 731. Nos. 790, 791, 792 (Armenian) are longer and more angular heads, and owing to the prominence of the occipital protuberance, are more like the Circassian skulls. In Nos. 792 and 794, also Armenian, the occiput is flatly round. The rather short and angular Parsee heads, exhibit a rounded occiput—very well shown in No. 731, but less marked in No. 743, owing to the general prominence of the occipital bone. The form of the occipital region in the Afghan head, is like that of the Armenian and Circassian.

The Baluchi and Afghan heads in the Chatham collection have the "occiput

* Catalogus Craniorum Diversarum Gentium quæ collegit, J. Van der Hoeven. Lugdani Batavorum, 1860. This valuable catalogue contains a brief account of 171 human crania and 39 casts, with the principal measurements of all the skulls.

† Observations on the Human Crania contained in the Museum of the Army Medical Department, Fort Pitt, Chatham. By George Williamson, M. D., Dublin, 1857.

‡ Des Caractères Physiologiques des Races Humaines. Par W. F. Edwards, 1829.

§ Decades craniorum. Tab 32.

|| Described by Retzius in Müller's Archiv. für Anat., Phys., etc. Jahr. 1849, p. 576.

¶ Crania Britannica, Decade I.

** See Cranial Characteristics of the Races of Men, in Indigenous Races of the Earth, p. 313, for a drawing of this skull.

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well rounded, and the space for the downward development of the brain considerable." The occiput of a Candahar skull is "broad, flat and perpendicular, giving the skull something of the appearance of the flat-headed American Indians, although in a much less degree."

The Afghan head, as a whole, resembles, in several respects, the Hindoo type.

The ancient Assyrian skull is full and rounded in the occipital region.

The Egyptian skulls differ among themselves as regards the form of the occiput. Of the series termed "Græco-Egyptians" by Dr. Morton, Nos. 799, 801, 804, 812, 815, 821, 824, 856, 837, 838, 840 and 875, possess, in general, the same occipital form as is seen in the Swedish crania referred to above. Nos. 798, 808, 814, 817, 825, 850, 859, 868, 873, 884 and 893 have the occiput less ovoidal in shape and more rounded, owing to the external occipital protuberance being less prominent. These latter skulls are, in general, broader than the former, and exhibit a somewhat different configuration of the crown. The same difference is observable in the other groups of skulls representing the Egyptian race in the Academy's collection. Thus of the Ancient Theban Egyptians, Nos. 48, 60, 844, 846, 855, 862, 876, 1044, 1293 and 1295 exhibit a more or less rounded occiput, while in Nos. 847, 848, 849, 851, 853, 854, 860, 866, 867, 871, 880, 881, 882, 883, 887, 889, 894 and 1290, the occiput is either shelving, as in the Swedish skull, or elongated, owing to the great protuberance of the occipital boss, as in the kumbe-kephalic crania above alluded to. According to Dr. Morton, No. 1044 may serve as a *type* of the genuine Egyptian conformation. He describes it as a long, oval cranium with a receding forehead, gently aquiline nose, retracted chin, and a marked distance between the nose and mouth—features all characteristic of the monumental Egyptian. He makes no allusion, however, to the configuration of the occiput, which, as will be seen by referring to the wood cut on p. 17 of "*Crania Ægyptiaca*," or p. 38 of my Catalogue, is quite peculiar. Some idea of the variety of occipital forms among these Egyptian skulls, may be obtained by comparing together the wood cuts in my Catalogue representing Nos. 812, 878, 1044, 888 and 877 of the collection. Dr. Morton's descriptions of the Egyptian skulls are, in general, very brief. He seldom alludes to the shape of the occiput. He notices the "tumid" occiput of No. 871, and the "full" occiput of No. 867. The occipital region of Nos. 861 and 886 is intermediate in shape between the elongate and rounded forms. Of the ancient Egyptians from the Necropolis of Memphis, Nos. 1223, 1235, 1519, 1520, 1521 and 1522 possess a rounded occiput. In all the rest the posterior part of the head is elongated and flattened superiorly. This elongation is particularly well marked in Nos. 809, 810, 811, 813, 1201, 1291, and also in No. 819 from Arabat el-Matfoon, the ancient Abydos. In all these skulls the external occipital protuberance is exceedingly prominent. This statement applies also to three embalmed Egyptian heads found by Mr. Wm. A. Gliddon in a rock-tomb located about four miles west of the city of Alexandria, and belonging, probably, to the Ptolemaic era. Among the Memphite Egyptian skulls is one (No. 806) which is altogether peculiar and unlike the other heads of this series. It has a broad, low and flat occiput, while the coronal region is decidedly Gothic in its outline. All the crania obtained from the tombs opened by Prof. Lepsius at the base of the great Pyramid of Gizeh, are long, oval heads, with protuberant occiputs, flattened superiorly. Three Kens or ancient Nubians from the pits at Debôd, (827, 828, 829) exhibit the protuberant, shelving form of occiput. The hind head in No. 828 is exceedingly elongated. Dr. Morton speaks of the very full occiput of this skull. He makes no allusion to the occipital form in his descriptions of the others. The occiput of No. 826 is rounded. Two crania (830, 831) of ancient Egyptians, from the pits at Koum Ombos, have a rounded occiput. A third, No. 832, has the occiput superiorly flattened. The Academy's collection contains four skulls of ancient Egyptians, obtained by the late Mr. G. R. Gliddon from the crocodile mummy-pits called Margaret-es-Sa-

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moun, behind the village of Maabdeh, and opposite to Manfaloot. Three of these, Nos. 834, 836 and 1292, have the shelving occiput; in the fourth, No. 833, the occiput is rounded. Among the Egyptian skulls grouped in the Catalogue under the head of *Miscellaneous*, there is one (No. 822) which differs considerably in its general form and characters from the skulls with which it is associated. It was obtained by the late Mr. Gliddon from a tumulus at the Island of Beggeh, the ancient Senem, a sacred spot close to Philæ in Nubia. Mr. Gliddon seems to have regarded this skull as that of "a pilgrim to the Temple." The configuration of the crown is triangular, while the occiput is almost vertically flattened. Of the four other heads in this group, Nos. 802 and 1240 possess the rounded form of occiput, while in Nos. 803 and 1317 the hind-head is superiorly flattened.

The dolicho-kephalic Hebrew skulls in the collection, exhibit an occiput more or less regularly rounded, as is very well seen in Nos. 818, 842, 845, 865 and 870. In the oblong and somewhat angular head, No. 807, the basal portion of the occiput is perceptibly flattened, and the occipital protuberance somewhat more prominent than in the other skulls of this group.

In the Arab skulls the occiput is broad and flattened. In No. 781 the occipital region is flattened superiorly, as in the Norwegian and Swedish crania, and the occipital protuberance quite prominent. In No. 784 the head widens out behind the mastoid processes, giving the occipital region a full and rounded appearance. In No. 780 the occiput is flattened.

The Fellah skulls have very prominent occiputs, the occipital protuberance being more or less strongly marked. The Coptic skull exhibits great breadth and fulness of the whole posterior region.

The occiput of the cast of an Abyssinian skull in the collection (1361) is quite prominent; the hind-head shelves downwards and backwards somewhat like that of the Swede.

The occipital region of the Guanché cranium (23) is full and prominent.

The Hindoo skulls in the collection, also vary in the form of the occipital region. Some of the Ayrá, Brahminic or high caste heads of this group, such as Nos. 1329, 1331 and 1335 exhibit the Swedish form of occiput; others (Nos. 1330, 1384) the rounded shape. In four Thugs, the occipital configuration is intermediate between these two forms. In No. 1332 the occiput is almost vertically flattened. In 11 Bengalee crania, (Nos. 6, 25, 31, 81, 411, 413, 432, 443, 444, 948 and 1312) the occiput is flatly round. In 21 others (Nos. 4, 5, 8, 19, 20, 28, 32, 49, 51, 111, 410, 442, 547, 553, 554, 665, 1309, 1310, 1311, 1344 and 1554) posterior part of the head is superiorly flattened and inclined. In No. 20 the whole os occipitis stands out very prominently, and is separated from the ossa parietalia by numerous wormian bones. This feature is also seen, to some extent, in Nos. 1309 and 1310. Such a form of the occiput is very well exhibited in plate 20, fig. 1, of the Atlas to Vimont's *Traité de Phrenologie Humaine et Comparée*. In No. 29, a peculiar and asymmetrical skull, the occipital bone appears as if pressed from behind and beneath forwards and upwards. The hind-head of No. 1047 is almost vertically flattened.

In certain crania from the Indian Peninsula, Dr. Williamson says that the posterior part of the skull is large, and the occiput prominent; the space for the downward development of the brain of moderate extent. Two Hindoos and a Thug have the occiput prominent. In five crania from Ceylon, the occiput is well rounded.

There are thirteen Chinese skulls in the Academy's collection. Of these, Nos. 94, 550, 669, 670, 1526, and 1527 exhibit the elongate, shelving form of occiput, very well represented in the wood-cut on p. 47 of my *Catalogue of Human Crania*. In Nos. 3, 56, 426, 427, and 1028, the occiput is rounded, and in No. 1336 vertically flattened. The Chinese crania in the Chatham Museum have the occiput rounded and not prominent. According to Blanchard, in the Chinese skulls figured in Dumoutier's Atlas, "la région occipi-1860.]

tale s'étend peu en arriere." Blanchard informs us that this character is exhibited in many of the specimens of this race, contained in the anthropological collection of the Muséum d'Histoire Naturelle de Paris. In all these specimens he found the posterior part of the head a little less elongated than in the inhabitants of the Phillipine Islands.*

In a Japanese skull (668) the hind-head is rounded; in two Loo-choo crania (672, 673) it is shelving.

In two Burmese crania, (661, 667) the occiput is round and moderately full. The occipital region of a Siamese skull, from Bangkok (123) is broad and flat, and slightly resembles that of the Malay head.

Some of the Malay crania, (41, 1186, 1316, and 1525,) have elongate or shelving occiputs; in others, (46, 47, 201, 433, 543, 1338, 1339, 1341, 1523,) the occipital region is more or less flatly round; and in others still, (424, 425, 428, 429, 430, 459, 495, 544, 546, and 1337,) it is more or less globular. In Nos. 545 and 1340, the occiput is compressed behind, and somewhat beneath, so as to form a sort of inclined plane, sloping downwards and forwards, to the foramen magnum.

Nine Burmese and Malay crania in the Chatham collection have the occiput broad and well rounded; and the space for the downward development of the cerebellum in the occipital region extensive. In one Burmese skull, the posterior part of the head is large, and the occiput straight. In a Japanese skull the occiput is broad, flat, and almost perpendicular. This is true also, of some of the Malay skulls, and of two Burmese described by Dr. Williamson, in the appendix to his catalogue.

Finlayson, in describing the tribes of the Trans-Gangetic, or Indo-Chinese Peninsula, says that "the occipital foramen is often placed so far back that from the crown to the nape of the neck is nearly a straight line."† According to Dr. Ruschenberger, the occipital portion of the Siamese skull is nearly vertical, and compared with the anterior and sincipital division, very small.‡ In the inhabitants of Cochin-China or Annam, according to Morton, the occipital portion of the head is more elongated than in the Siamese.

Only one (1551) of the Lapland skulls in the Academy's collection has the shelving occiput; all the others, (1250, 1257, and 1552,) possess a broad and flatly rounded occipital region.

All the Eskimo crania in the collection have narrow, elongate, or ovoidal occiputs. In an Eskimo skull at Chatham, the "occiput is narrow and prominent."

In the Tehuktehi crania brought from Behring's Straits by my friend, E. M. Kern, Esq., the occiput is prominent and shelving. The skull of an Aleutian, from Unalashka, contained in the Rijk's Museum of Natural History, at Leyden, and figured and described by Prof. Van der Hoeven, has a prominent occiput.§

The occipital region of a Kamskatkan cranial cast (725) is full and protuberant. In the skull of a Northern Reindeer Tungus, figured by Blumenbach, in Table xvi. of his *Decades Craniorum*, "the occiput is remarkably prominent, so that the distance between the external occipital protuberance and the superior incisors is equal to nine inches." The Kalmauck (1553) and Burat skulls (1355) have globular occiputs.

The occipital region of the skull of an Icelander (125) is full, protuberant, and shelving.

* Voyage au Pole Sud et dans l'Océanie, &c. Anthropologie. Par Émile Blanchard. Paris, 1854.

† Embassy to Siam and Hue, p. 230.

‡ A voyage Round the World; including an Embassy to Muscat and Siam. By W. S. W. Ruschenberger, M. D. Philada., 1838, p. 209.

§ Beschrijving van drie Merkwaardige Menschelijke Schedels uit het Rijk's Museum van Natuurlijke Histore te Leiden. Door J. Van der Hoeven.

Four of the Kanaka skulls in the collection, (564, 695, 1300, and 1308,) have elongate or shelving occiputs. In three others, (566, 572,) the occiput is rounded. In two skulls from Oahu, (1023, 1024,) the occipital region is prominent; in another (1022) it is more rounded. Three Tahaitian crania (1017, 1019, 1020,) exhibit protuberant and shelving occiputs. In two other Tahaitian heads (1016, 1021) the occiput is more rounded, and in still another (1018) it is broad and flat. The crania of Sandwich Islanders, in the Chatham collection, possess rounded occiputs. In an Otahaitian skull the occiput is prominent.

There are three Marquesan skulls in the Academy's collection. In one of these, from Nukahivah, the occiput is narrow and shelving, and the occipital boss quite protuberant. In another, also, from Nukahivah, and a third from Christina, the occipital region is fuller and less prominent.

All the New Zealand crania in the Academy's collection exhibit the elongate and narrow form of occiput. In five New Zealand skulls in the Chatham Museum, "the occiput is not prominent, but well rounded off."

In a Feejee specimen from Bau, (1029) the occipital region is narrow and protuberant.*

Three Arickaree skulls, of the Upper Missouri, exhibit the same shelving occiput and prominent occipital protuberance, seen in the Swedish, Cimbrian, and Ostrogoth crania. They are long, oval skulls, and resemble, in their general configuration, the Swedish crania, as may be seen by comparing together No. 649 (Arickaree), and No. 1247 (Swede). One of the Arickaree skulls (No. 748), presents a somewhat modified occipital form. It is like that represented in plate 35 of *Crania Americana*, or fig. 2 of plate 96 of Vimont's Atlas. The superiorly flattened form of the occiput is also seen in the Assinaboin skulls, though less strongly marked. These crania are broader and less oval than the preceding. The same occipital form is also very well marked in Nos. 632 and 635 of the Cherokee group. These two crania are long ovals. In the other specimens of this group, the occipital protuberance is less prominent, and the whole hind-head more evenly rounded in the line of prolongation of the sagittal suture. These Cherokee skulls differ from each other in several particulars. In two Chetimache skulls, from Louisiana, the occipital region is flattened nearly perpendicularly from the superior spinous ridge upwards. In the Chippeway or Ojibway skull, No. 684, the hind-head is shelving; in No. 683 it presents a different form, as seen in plate 28 of *Crania Americana*. Two of the Kootenay crania (Nos. 744, 745), have the occiput protuberant and elongated. In No. 1227 the hind-head is flat. Two of the Creek skulls (Nos. 441, 579), are short heads with broad, globular occiputs. No. 751, a long, oval skull, has the superiorly flattened hind-head and prominent occipital protuberance well marked. In its general form, this head strongly calls to mind the Cimbric type or configuration. In No. 1454 the occiput is rounded. Dr. Morton, writing in 1839, says that "the present Creek nation is said to embrace the remains of no less than fifteen different tribes, which they have conquered at various times." This fact may explain the discrepancy in forms exhibited by the different specimens of this group. The Dakota skull (No. 605) has a globular occiput. In No. 112, the occipital region is very much elongated and shelving, as in the Creek skull (No. 751). The occiput of No. 204, resembles that of the Cayuga skull, figured in plate 35 of *Crania Americana*. The Huron cranium (No. 15) is beautifully lithographed in *Crania Americana*, pl. 37. Reference to it will show that the occiput is so flattened as to slant or incline from above downwards and backwards, and to

* One half of the crania contained in the Polynesian group of the Morton collection were procured by Dr. Thos. J. Turner, who is preparing a monograph on the cranial and other physical characteristics of this interesting race, several varieties of which he was able to study practically during his cruise in the Pacific.

occupy a position between the shelving occiput of the Swede and the vertically flattened form. Nos. 1217 and 1218 exhibit the same form. No. 607 approximates the shelving, or superiorly flattened shape. The exact form of the hind-head cannot be determined in the Illinois crania in the Academy's collection, for the whole of the os occipitis is wanting in No. 1010, and the greater part in No. 1051. In the former, the occiput appears to have been shelving; in the latter, flatly round or globular. In two Iroquois skulls (Nos. 16 and 119), the occiput is elongated and shelving. In a third (No. 989), it is almost globular. Of the Lenape, or Delaware Indian skulls, Nos. 40, 115, 118, and 1265, possess an elongated occiput, such as is seen in plate 32 of *Crania Americana*. In No. 418 the posterior region is rounded, and far less prominent. In Nos. 1263, 1562, and 1563, the hind-head is broad and squarely flattened. In No. 1264 the occipital protuberance is prominent and knob-like. No. 998 is flatly round in the occipital region. In all the Mandan and Minetari skulls, the form of the occipital region is very similar to that of the Arickarees and Assinabains. The form of the occiput varies among the different specimens of the Menominee group. Nos. 35, 44, 78, 454, and 563, exhibit the form seen in the Huron skull, figured in *Crania Americana*, plate 37. The other two (Nos. 1220 and 1222), are more elongated behind. No. 1058 of the Miami group, has an occiput like the Huron cranium just alluded to. In 1233 the hind-head is perpendicularly flattened. All the rest of this series exhibit the elongated form. In the three Mohawk crania, the occiput is superiorly flattened, and the occipital protuberance prominent. Two Moqui skulls (138, 139), are brachycephalic, with very flat occiputs. The Narragansett skulls in the collection differ from each other in the form of the occipital region. In No. 950 the hind-head is elongated. In No. 951 it is shelving, all that part of the occipital bone above the superior spinous ridge being tumid. The posterior part of the head, in Nos. 952 and 954, shelves or inclines from above downwards and backwards. In the latter skull the occipital base is very protuberant. In No. 953 the occiput is full and rounded, instead of being elongated, as in the others. This is true, also, of Nos. 956 and 693. In the latter, the os occipitis is somewhat pressed forwards under the parietalia. No. 1040 is a very peculiar, oblong head; the shelving and elongated occiput projects far behind the external auditory meati, and the basis-occipitis is quite flat. Nos. 955 and 957 have pointed or acuminate occiputs, which appear to be posthumously distorted. In No. 955 the left side of the occipital bone is flattened; in No. 957, the right. In the former the left side, and in the latter the right, appears to have rested upon the ground for a very long time, and to have been flattened by the weight of the superincumbent bones of the head. This flatness gives an acuminate appearance to the occiput, the point being to one or other side of the median line. Since the publication of *Crania Americana*, craniographers have been familiar with the vertical flatness of the occiput in crania of the Natchez tribe. This peculiar flatness is well shown in No. 1106. The shelving occipital form is shown in all the Natick skulls. Of the Osage crania, No. 54 is a short, angularly round head, with an occiput almost vertically flattened. In No. 660, a larger head, the tumid occiput gives a shelving form to the hind-head, seen in profile. In the Ottoes the occiput is broad and flatly round, and approximates strongly, the globular form exhibited in the Lapps and Kalmucks. The same form is exhibited in the round-headed Ottawa, No. 1007. In the other two Ottawa skulls, the hind-head is shelving. In the round-headed Ottigamies, the occiput is globular. In No. 415 of this group, this globular shape is destroyed by the tumid occiput. The two Pawnee skulls contrast strongly with each other in the shape of the occiput, which in No. 540 is flatly round, and in No. 1043 is excessively elongated and shelving. In two Penobscot skulls the occiput is rounded. Of the Potawatomic crania, No. 657, as shown in plate 34 of *Crania Americana*, has an angularly round

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occiput. In No. 736, a short, triangular skull; the occiput is flat. In the broadly oval cranium (No. 737), the hind-head is rounded. In No. 1352 the hind-head approximates the shelving type. The two Sauk skulls are unlike each other in the shape of the occiput. No. 561 has a broad, though protuberant hind-head. In No. 1246 the occipital region is rounded. The Seminole Indians are represented in the Academy's collection by sixteen skulls. No. 456 (figured in *Crania Americana*, pl. 24), is a round head, with a full and somewhat angularly rounded occiput. In No. 604 the knob-like protuberance of the occipital bone destroys the rounded form of the hind-head, and gives the latter a different shape, as will be seen by comparing the first cut on page 166 of *Crania Americana*, with plate 24 of that work. In No. 698 the hind-head is elongated and shelving. In No. 707 it approximates in its lower part the globular form, and is in striking contrast with No. 456, as may be seen by comparing together plates 23 and 24 of *Crania Americana*. In No. 708 it is more elongated and less broad, and in No. 754 rather flatly rounded. No. 726 is a short head, with a full, broad, but somewhat shelving occiput. No. 727 possesses a narrow and prominent occiput, which is wider between the parietal bosses than at the base. In No. 728 the occiput is fuller and more rounded. In No. 729 the hind head is rather narrow below, and protuberant. In No. 730 the occiput is broader at the base than above, and quite pointed. In Nos. 732, 733, 753,* and 1286, the occiput is protuberant and shelving above. A Shawnee skull, No. 606, has a very narrow, protuberant, and symmetrical occiput; the left, basal part of the occipital bone being flattened, perhaps posthumously. In No. 691 the occiput is flattened vertically on the right side. In No. 1210, a narrow, and highly arched skull, the hind head is narrow, and the upper part of the occipital bone prominent. The Shoshone skulls in the collection are not alike in the form of the occiput. No. 1446 exhibits a broad and somewhat flatly rounded hind-head, appearing as if pressed under the parietal bosses; the upper and posterior part of the head, just between the parietal protuberances, being broad and very elevated. In No. 1447 the occiput is protuberant and shelving. In No. 1448 the occiput is broad at the base, and flattened, though not vertically. No. 1449 possesses a rounded and not very prominent occiput. Two Upsarooka skulls, (Nos. 1228 and 1229), have the hind-head shelving, and the occipital base very prominent. In the Winnebago cranium (No. 559), the occiput is broad and globular. In No. 560 it is less broad and more projecting. In the Yamasse skulls (Nos. 1214 and 1215), the occiput is narrow and rounded. In No. 1216 it is broad and rounded, almost to globularity. There are four skulls of California Indians in the collection.† No. 1514 exhibits what may be called a pyramidal occiput. The occipital bone above the superior spinous ridge is very prominent, and constitutes a common centre, towards which the parietals slant from above downwards and backwards, and also at the sides, and the basal portion of the occipital bone upwards and backwards, somewhat after the fashion seen in some of the elongated Peruvian heads. No. 1027, a female cranium from Maré Island, California, is a long, narrow head, with a narrow and oval occiput. No. 943, also from Maré Island, exhibits a shelving occiput.

Of the crania marked "miscellaneous" in the Catalogue, No. 416, from a mound on the Upper Mississippi, possesses a narrow and prominent occiput. This skull is represented in plate 52 of *Crania Americana* in such a position that, at first sight, the occiput appears full and rounded. But if the observer will place his hand over the lower jaw, so as to hide it, and then hold the lithograph in such a manner that the base of the skull shall be parallel with

* The last skull of the Seminole group should be numbered in the Catalogue, 753, instead of 1556.

† Two of these are enumerated in the published Catalogue. The other two have been added to the collection by my friend, Dr. Thos. J. Turner, of the United States Navy, since the Catalogue was printed.

the plane of the horizon, he will then see that the head is in reality a long one, and that the occipital region is prominent and not round. No. 1237, from Illinois, is a broad, asymmetrical head, flattened behind slantingly, and rather to the left. Nos. 1315, 1510, and 1511 have broad, prominent, and somewhat shelving occiputs. No. 420, from the Cave at Steubenville, Ohio, has a low, broad occiput, flattened on the right side. In No. 436, also from the Cave-cemetery at Steubenville, the broad occiput is almost vertically flattened. In Nos. 437 and 438, also from Steubenville, the occiput is low, broad, and vertically flattened. The former is asymmetrical. The occiput is slantingly flattened in No. 439. No. 210 is wanting in symmetry. The occiput is flattened on the left side, perhaps posthumously. It appears to have been originally moderately full and rounded. In No. 658 the broad occiput is asymmetrically flattened to the right of the median line. No. 723, also non-symmetrical, has a low, broad, and vertically flattened occiput. In No. 53, from a mound at Circleville, the occipital protuberance is prominent, and the hind-head shelving. No. 1287, from a mound at Chillicothe, has a broad occiput, slightly truncated or flattened, directly behind. No. 1288, from the same place, occiput shelving and very protuberant. No. 992, from a mound in Tennessee, broad, asymmetrical, and perpendicularly flattened or truncated. No. 1270, from Detroit, occiput shelving and protuberant. No. 1271, from Ohio, occiput broad, and flattened directly behind. No. 1272, found with the preceding, occiput moderately prominent. No. 1455, from a mound in Florida; a very mis-shapen skull, with a low, broad, and asymmetrically flattened occiput. No. 417, Cayuga, of New York: occiput elongated and prominent. No. 1041, a Cheyenne of Missouri; occiput shelving and protuberant. No. 211, from Missouri; a broad and flat head, with globular occiput. No. 987, Chemesyan, from the N. W. coast of America; occiput full and rounded. No. 22, young Choctaw female, of Georgia; occiput protuberant and shelving. No. 39, Euchee Indian, of Florida; occiput full and rounded. No. 212, cast of a Kenahawha skull; occiput vertically flattened. No. 27, Massasanga Indian, of Peterboro', Upper Canada, and No. 455, Mingo Indian, from Ohio; occiput elongated and shelving. No. 1219 Nanticoke, (?) from the Wyoming Valley; occiput full and globular. No. 567, Naumkeag, of Massachusetts; occiput narrow and prominent. No. 33, Oneida warrior; occiput flattened; occipital base prominent. No. 1036, Pocasset Indian; occiput flatly rounded. No. 26, Quinipiack (Mohegan) Indian; occiput globular. No. 1516, Seneca Indian, from New York; occiput broad and truncated, or flattened directly behind. No. 1557, from the banks of the Susquehanna; form of the occiput very much like that of the California head (No. 1514). In Nos. 216 and 219, the occiput is shelving and protuberant. The same form is seen in the Maya skull (No. 990). The Araucanian skull (No. 651) has a full and rounded occiput. In No. 652 the occiput is arched. In No. 654 the occipital region is square and truncated, or vertically flattened, as is well shown in plate 68 of *Crania Americana*. In Nos. 655 and 656 the occiput is moderately full and rounded. In No. 995 the hind-head is fuller than in the preceding, and the occipital protuberance more prominent. In No. 997 the occipital boss is very prominent. In No. 221 the hind-head is shelving, and the occipital protuberance sharply pointed. In No. 222 the occiput is shelving and protuberant; in No. 120 it is broad and flatly round. The flattened form of the occiput of No. 1242 is well shown in the wood-cut on p. 75 of the Catalogue. The three Charib skulls in the collection have prominent and elongated occiputs. In the cast of a Patagonian skull, the hind-head projects far behind the meati. The whole of the occipital region is full and tumid. In many of the crania which we have passed in review, the elongation of the occiput backwards is chiefly due to the great prominence of the occipital boss. In the Patagonian head, this feature is not present. The hind head of the Puelche girl is rather flat. The head of a Puelche, from the Rio Negro, figured by d'Orbigny, has a truncated

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occiput.* In all the Brazilian crania, the occipital region is more or less elongated and superiorly flattened, as in the Swedes.

There are nine aboriginal American skulls in the collection at Fort Pitt, Chatham. These are described by Dr. Williamson† in his catalogue. No. 67, from Lake Huron, has a rounded occiput. No. 68, skull of a North American Indian, has the occiput projecting. In No. 69 "the vertex and occiput are well arched." In No. 70 the occiput is rounded. In No. 71 "the vertex and occiput are well rounded." In No. 473, from Canada, the occiput is large and well rounded, and the space for the downward development of the brain in the occipital region is very great. No. 474, also from Canada, is a round skull. No special statement is made concerning the form of the occiput, but from the general description of the head, I consider it to be oval. In No. 475, a Flathead, "the occiput descends from the vertex abruptly, and almost perpendicularly to the foramen magnum." In No. 476, a Charib, from St. Vincent, "the vertex gradually slopes backwards and downwards to the occiput, which projects, and is narrow from above downwards; the occiput is very flat, and nearly the whole of the occipital bone rests upon a plane surface."

The late Dr. Morton, as is well known, regarded flatness of the occiput as a characteristic feature of the aboriginal American skull. In *Crania Americana* (page 65), he expressly says that "flatness of the occipital portion of the cranium will probably be found to characterize the greater or less number of individuals in every existing tribe, from Terra del Fuego to the Canadas. If these skulls be viewed behind, we observe the occipital outline to be moderately curved outwards, wide at the occipital protuberances, and full from those points to the opening of the ear. From the parietal protuberances there is a slightly curved slope to the vertex, producing a conical, or rather a wedge-shaped outline." He says, furthermore, that even in the elongated heads of the Lenapes, the Iroquois, Cherokees, Mandans, Rickarees, and Assinaboins, "the characteristic truncation of the occiput is more or less obvious." In another publication,‡ when alluding to the physical characteristics of the Indian tribes, he again speaks of "the flattened or vertical occiput" as a characteristic common to them all. In the 3d edition of his *Catalogue of Skulls of Man and the Inferior Animals*, Dr. M. briefly describes a very remarkable head, found by Dr. Davis and Mr. Squier, in a mound in the Scioto Valley, Ohio, and described and figured by them in their "Ancient Monuments of the Mississippi Valley," plates 47 and 48. Dr. M. regarded this head as the "perfect type of the Indian conformation, to which the skulls of all the tribes, from Cape Horn to Canada, more or less approximate. It possesses the national characteristics in perfection, as seen in the elevated vertex, flattened occiput, &c. Similar forms," he continues, "are common in the Peruvian tombs, and have the occiput as in this instance, so flattened and vertical as to give the idea of artificial compression: yet this is only an exaggeration of the natural form, caused by the pressure of the cradle-board, in common use among the American nations."

In his last contribution to craniography,§ Dr. Morton describes the typical Indian skull to be of a decidedly rounded form, with the occipital portion flattened in the upward direction.

Dr. Morton's opinion concerning the typical form of the occiput in the various tribes of American Indians, though very generally acquiesced in by craniographers, has not been accepted by all without qualification.

"L'inspection des crânes mexicains," writes Dr. Gosse, of Geneva, représentés dans les *Crania Americana* me semble prouver que chez ces derniers,

* L'Homme Americain. Atlas, Plate i. fig. 1.

† Op. cit. pp. 64-67, 83, 85.

‡ Inquiry into the Distinctive Characteristics of the Aboriginal Race of America, p. 5.

§ The Physical Type of the American Indians.

la dépression de l'occiput était loin d'être aussi générale et aussi marquée que parmi les Incas et que chez les crânes examinés par Meyen ; car dans plusieurs d'entre eux, la tête est plutôt normalement développée en arrière. Ce qui m'étonne," he continues, "c'est qu' indépendamment de la transmission héréditaire, Morton n'ait pas fait jouer un rôle plus général à l'action prolongée de ce genre de berceau, le compagnon des peuples nomades sur l'aplatissement du derrière de la tête, qu'il considère comme un caractère normal du type américain."*

Dr. J. B. Davis also writes that though "this position of Morton's is no doubt founded in truth, yet it must be allowed to be liable to numerous exceptions." His doubts appear to have been awakened by the fact which he mentions, that the crania of Americans, figured by Sandifort and Milne-Edwards, (one of them given as a typical skull), are both distinguished by a considerable occipital projection.†

Prof. Daniel Wilson, of Canada, in a recent interesting paper on the Cranial Type of the American Aborigines,‡ tells us that he has carefully examined twenty-nine Indian skulls, three only of which he regards as brachycephalic. "One of these three, a very remarkable and massive skull, was turned up at Barrie, on Lake Simcoe, with, it is said, upwards of two hundred others. It differs from all the other Indian crania, in exhibiting the vertical occiput so very strikingly, that when laid resting on it, it stands more firmly than in any other position." He thinks there can be little doubt that the flattened occiput of this skull is the result of artificial compression of a much more decided nature than that of the cradle-board of the papoose.

Further on, he says, "I am struck, in the majority of the examples examined, with the total absence of any approximation to the flattened occiput." Fifteen of the crania referred to exhibit a more or less decided posterior projection of the occiput, twelve of these being markedly so, and seven of them presenting such a prolongation of it, as constituted one of the most striking features in one class of ancient Scottish crania, which chiefly led to the suggestion of the term *kumbecephale*."§ * * * "I think it extremely probable that further investigation will tend to the conclusion that the vertical or flattened occiput, instead of being a typical characteristic, pertains entirely to the class of artificial modifications of the natural cranium familiar to the American ethnologist, alike in the disclosures of ancient graves, and in the customs of widely separated living tribes."

From the details which I have presented above, it will be seen that the opinions upon this subject, entertained by Dr. Morton, cannot be substantiated by the aboriginal American crania in the Academy's collection. The vertically flattened occiput is by no means a distinctive character of these crania ; on the contrary, it is only an occasional feature among them, and is exhibited also by the skulls of other, and distant races of men. In fact, the occipital region of our American Indian skulls exhibits quite a variety of forms. In some, as we have already seen, the flatness is located superiorly, affecting equally the posterior superior part of the *ossa-parietalia*, and the upper part of the *os occipitis* ; in others, and they are comparatively few, the flattening is directly behind, and is vertical ; in a third variety the flatness is confined wholly to the basal portion of the occipital bone. In some of the skulls the occiput is evenly rounded, in the direction of the longitudinal periphery, the transverse diameter, behind the bony meati, being comparatively small ; in others it is full and globular. If the reader will place the *Crania Americana* before him, and compare together the outline representations of the posterior part of the skull in the different tribes of Indians, he will be struck with the

* Essai sur les Déformations Artificielles du Crâne. Paris, 1855, pp. 72, 74.

† *Crania Britannica*, Decade 3, p.

‡ *Canadian Journal of Industry, Science, and Art*. November, 1857, pp. 425, 427.

§ *Prehistoric Annals of Scotland*, p. 109.

difference of form which they exhibit. In some it is higher than broad; in others it is broader than high; in others again, the greatest breadth is between the parietal bosses; in a fourth variety the greatest breadth coincides with the base. In some, the contour of the hind head is almost square; in some almost circular; in some oblong; in others triangular, and in others still, pentagonal or very irregular. Now, none of these forms are diagnostic of the Indian skull. Indeed, they all appertain to the races of the Eastern continent, as well as to those of the Western.

It is very well known to craniographers that Dr. Morton, as early as 1846, pointed out the existence of at least four different forms of the Peruvian skull, all of which he regarded as artificial deformations, although in his *Crania Americana*, published long before, he contended that these forms were natural and congenital. Five years later, Dr. Rivero and Tschudi, without appearing to be aware of the views of Dr. Morton, arrived at the same conclusion—that these peculiar forms were congenital, and that there were four varieties of them. Now, in all these varieties the occiput, as might be expected, varies in form. One variety is very well shown in plate 2 of *Crania Americana* (No. 496 of the Catalogue), and also in the wood-cut representing No. 1277 of the Catalogue. This form of occiput is also seen in Nos. 1275, 1279, 1280, 1281, 1283, 1284, 1363, 1364, 1366, and many others. A very different form of the whole head, and of the occiput, which is flatly rounded, is seen in plate 7 of *Crania Americana*, representing a Peruvian, from Santa. No. 1276 exhibits a similar occiput. In his interesting work entitled *Three Years in the Pacific*, Dr. Ruschenberger alludes to the peculiarities of form shown in Peruvian skulls. He says that in many of the crania obtained by him at Santa, the occiput “is almost vertical, and rises quite abruptly from the great hole at the base” (p. 374). In plate 4 of *Crania Americana*, it will be seen that the occiput is much fuller and rounder than in the last specimens. Just such a form of the occipital region is represented in Nos. 1278, 1282, 1365, and 1366. Nos. 13, 30, 75, 77, 84, 85, 86, 87, 93, 95, 97, 446, and many others, are asymmetrical skulls, flattened behind in a manner more or less like one or other of the forms represented in plates 8, 11, and 11 B, of *Crania Americana*. In other skulls of this great Toltec group, the occipital flatness is almost vertical, and at the same time symmetrical, as above intimated. The superiorly flattened or shelving occiput is seen in some of the Peruvian skulls, as in Nos. 571, 631, and others. No. 696 has an occipital region very much like that figured in Vimont’s Atlas, plate 96, fig. 2; while Nos. 1420, 1425, and all the casts of skulls found on the Island of Titicaca, resemble, in the conformation of the occiput, the cranium represented in Table 1 of Fitzinger’s Essay *Ueber die Schädel der Avaren*.

The skulls of Aymaras, from Bolivia and Peru, figured by D’Orbigny, have projecting occiputs.*

The Mexican crania in the Academy’s collection differ from each other in the form of the occipital region.

A female skull (34), of this great family, obtained from Acapacingo, in the Valley of Cuernavaca, about fifty miles south of the City of Mexico, and regarded by Morton as belonging to the Tlaluic nation, exhibits an occiput moderately full and somewhat flattened above the slightly protuberant occipital boss. Two ancient Mexican crania (734, 735), exhumed near the Indian village of Guahapan, on the Mountain Popocatepetl, and perhaps of Aztec origin, differ in the shape of the hind head. No. 734 is asymmetrical, the right half of the occiput being flattened and pressed forward, while the left is undisturbed. The hind-head, as a whole, however, is full; and were it not for the lateral flattening, might be regarded as rounded, or even almost globular. In 735, on the other hand, the hind-head is narrower, and owing

* L’Homme Americain. Atlas.

to the strong development of the occipital protuberance, quite prominent, and somewhat shelving from above downwards and backwards. Two skulls (714, 715), from an ancient Mexican cemetery, at Otumba, have full, and more or less rounded occiputs. In another skull from Otumba (716), the hind-head is much more protuberant. (See *Crania Americana*, plates 59, 60, and 61.) In three crania (717, 718, and 720) from an ancient tomb at Tacuba, the hind-head is high, broad at the base, and the whole occipital bone prominent. The general form of the occipital region is shown in the outline wood-cut at the bottom of p. 233 of *Crania Americana*. Two Otomie crania (1323 and 1000), possess the same form of occiput. Three other Otomie skulls (1001, 1002, and 1003), have the hind-head elongated and shelving, and the occipital protuberance projecting very much. A short Tlascalan skull (1904), has a full and globular occiput. In the cranium of the Chechemecan female (1005), from a mound at Tezcuco, the occiput is more like that of Nos. 1001, 1002, and 1003 of the Otomie group. No. 1226, in the collection of the Academy, is the skull of a Mexican, from the cemetery of Santiago de Tlatilolco, near the City of Mexico. In this cemetery, many thousands of the natives were interred after the brave defence of their city against Cortes. It is probable, therefore that the individual to whom the skull belonged, stood up manfully in resistance to Spanish aggression. The hind-head is broad and very much flattened in the posterior parietal and upper occipital portions. The well-marked transverse ridge forms a prominent dividing angle between the superior and inferior portions of the os occipitis. The occiput of the two Pames skulls (681, 1313), from San Lorenzo, near the City of Mexico, is much like that of 1323 and 1000 of the Otomie group. In the skull of an ancient Mexican chief (1314) exhumed together with various aboriginal arms and utensils, from the Cerro de Quetsilas, near the City of Mexico, the occiput is of a peculiar form. It is broad, but has very little vertical diameter, owing to the flatness of the crown. The whole head looks as if it had been compressed between two opposing forces, one applied at the top and the other at the base of the cranium. In No. 682 the occipital region is flat, very high, and comparatively narrow. Owing to the parallelism of the two sides, it is oblong from above downwards. No. 234, said to be taken from the great Altar of Sacrifices, at Mexico, is remarkably flattened behind, and chiefly to the right of the median line. The occiput of 1353 is singularly distorted. A broad and deep sulcus or fissure extends in the median line, from a little before the coronal suture, entirely back to the foramen magnum, dividing the whole calvaria into two lobes. The occiput in 1566 is full and rounded. Of the two Lipan skulls, No. 1345 has a full and regularly rounded occiput; No. 1346 a longer and more protuberant one. The remainder of the Mexican crania enumerated in the catalogue, from 1515 to 689, have full, and more or less protuberant occiputs.

No. 722, from the battle field of San Jacinto, in Texas, exhibits a very peculiar form.

Some time ago, Dr. E. H. Abaddie, of the United States Army, presented to the Academy a series of six crania procured in New Mexico. These skulls are of considerable interest. Two of them, Nos. 1032 and 1033, were obtained from the ruins of Gran Quivira, New Mexico, by Major Carleton, who explored the ruins thoroughly. No. 1034 was disinterred by Dr. Abaddie, from the centre of the ruins of the church at Guarra, New Mexico. No. 931, a fragmentary skull, was found, with many other human remains, in a very bad state of preservation, in making excavations in an old field in Santa Fé, New Mexico. "This head," writes Dr. Abaddie, "and the accompanying remains, evidently belonged to the same race of Indians which formed the numerous population of the large towns, long since in ruins, and of which so little is known, as Gran Quivira, Abo, Guarra, Pecos, Old Church, &c."

All these heads are brachycephalic, and in all of them the occiput is more

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or less flattened. No. 1032 exhibits a perpendicular or wall-like flatness of the hind-head. Nos. 1034 and 931 are asymmetrical. In the first the occiput is flattened, chiefly to the right of the median line; in the other mainly to the left. No. 930, the skull of a Puéblo Indian, taken from the church-yard of the village of Laguna, and 1035, the skull of Jose Largo, a Mescalero chief, who was killed in an affray near Bosque Redondo, not far from the Pecos river, New Mexico, are both dolichocephalic heads. The occiput of the first is shelving; that of the second, rounded.

The Academy's collection contains three other New Mexican heads, which were procured and forwarded by Mr. Geo. Gibbs to Dr. J. H. B. McClellan, who placed them in the Museum of the Academy. One, of them (No. 935), is the skull of a chief of the Mogoyon Apache Indians, who was killed by the Navajó Indians, in a little ravine leading up the side of the Mesa de los Lobos, to the right of the Fort Defiance road, and at the head of Canon del Gallo, New Mexico. The occiput of this skull is prominent, and somewhat inclined from above downwards and backwards. No. 936 is the skull of a Navajó* Indian, picked up on the road leading from Albuquerque to Fort Defiance, at a place called the "Lake," situated on the Pacific slope of the Rocky Mountains, six miles from the summit. In the cranium, the occipital region is flatly round. No. 937, the skull of a Puéblo† Indian, of Laguna, New Mexico, possesses a vertically flattened occiput.

The negro crania in the Museum of the Academy exhibit a remarkable agreement in the shape of the occipital region. Of the group marked "American born," in the Catalogue, Nos. 1, 2, 69, 74, 421, 548, 1301, 1302, 1318, 1320, 235, and 236, are all oblong heads, with prominent, and more or less shelving occiputs. In Nos. 74 and 548 the basal portion of the occipital bone is very much compressed or flattened, like some of the Malay skulls. Nos. 549, 900, and 984 of this group have the occiputs more or less rounded. With the exception of Nos. 580, 1098, and 1101, in which the occiput is flattened at the base, and No. 1093, the occipital region of which is full and rounded, all the skulls of the native African group in the collection are long heads with prominent occiputs, which in form are sometimes shelving or inclined, sometimes oval, and occasionally narrow, and somewhat acuminate. The same statement applies in great measure to the two Hovah, and all the Australian skulls in the collection. No. 435, an Oceanic negro, is a short head, with the occiput inferiorly flattened. No. 1343, a Tasmanian from Van Diemen's Land, has a protuberant occipital region.

In table 6, 7, and 8 of Blumenbach's *Decades Craniorum*, the protuberant occiput of the negro is very well shown. In tables 17, 18, and 19, the form varies in several respects. The normal form of the negro occiput, and that to which the great majority of the African skulls in the Academy's collection conforms, is well illustrated in plates 2 and 3 of Prof. Van der Hoeven's valuable treatise entitled "Bijdragen tot de Natuurlijke Geschiedenis van den Negerstam." The protuberant occiput of the Ethiopian is also exhibited in

* "This tribe," writes a valued correspondent, Mr. Geo. Gibbs, "is said to number 1,200 souls, and to be a decidedly pastoral people, having in their possession at the present time (July, 1857), 60,000 horses, and 350,000 sheep. They can bring 2500 warriors into the field at one time. Their skulls are exceedingly difficult to procure, on account of their habit of stowing the dead away in hidden places."

† "These Indians," says Mr. Gibbs, "get their name from the Spanish word *puéblo*, because they live in little towns or villages, cultivating the soil in the neighborhood of the same. It is said that New Mexico boasts of twenty-seven of these *puéblos* at the present time, differing in population from 40 to 2,500 souls. Some of the principal *puéblos* are named Puéblo of Taos, Zuni, Laguna, San Felipe, Santa Domingo, Sandia, Isleta, and Acoma. With but few exceptions, the inhabitants speak different languages, though all of them use the Spanish. Nominally they are Catholics, having chapels in their midst, yet they continue to worship Montezuma (whom they believe to be residing in the sun), day and night, by means of never ceasing religious dances."

table 7 of Dr. Lucae's "Organischen Formenlehre," a work containing many interesting craniographic details.

From the foregoing facts we may conclude :—

1. That the form of the human occiput is not constant. On the contrary, it varies continually in the different races and tribes of men. It varies, also, to a greater or less extent, among the individuals of the same race or tribe.

2. That the different occipital forms may be divided into five classes or groups, which are reducible, however, to three. These are, 1st. The protuberant or prominent occiput, with the upper or parietal half somewhat flattened, so as to present an inclined or shelving appearance. (See p. 399.) 2d. The vertically flattened. 3d. The inferiorly flattened or compressed, in which the basal portion of the occiput slants upwards and backwards, as is shown in a strongly marked degree, in the Sandwich Islander head, fig. 69, on page 340 of "Indigenous Races of the Earth." 4th. The round. And 5th. The globular. As the last two merge more or less into each other, and as the third form may be regarded as, in many instances, a modification of the second, these five forms may, with greater simplicity, be thrown into three groups, viz. :—1st. The prominent and oval, or superiorly inclined. 2d. The perpendicularly flattened. And 3d. The more or less round or globular.

3. That to the first of these groups belong the Norwegians, Swedes, and some other Scandinavians; the Frisians and Batavians,* among the low Germans; the Anglo-Saxons and Anglo-Americans, the form of the occiput in these being between that of the Swedes and Germans; the Celtic Irish, and some tribes of the ancient Britons; the Phœnicians, Circassians, Armenians, Affghans, Baluchi; some of the Egyptians and Arabs, the Fellahs, Abyssinians, and Guanchés of the Canary Isles; some of the Hindoos and Chinese; the Loo-Chooans, certain Malays; the Eskimos, Kamskatkans, Reindeer Tungus, Icelanders, Tchukcthi, Unalashkans, some of the Kanakas, Tahitians, and others of the Sandwich Islands, Marquesans, of Nukahivah, New Zealanders, Feejeeans, and most of the African tribes. Among the aboriginal Americans, this form is exhibited by the Arickarees, Assinaboins, Cherokees, Chippeways; some of the Kootenays, Creeks, and Dacotas; by the Hurons, and probably the Illinois; by some of the Iroquois and most of the Lenapes; by the Mandans, Minetaris, Menominees, Miamis, Mohawks, and most of the Narragansetts, the Naticks, some of the Osages, Ottawatomes, Pawnees, and Sauks; by most of the Seminoles, by the Shawnees, Shoshone, Upsarookas, Californians, Cayugas, Cheyennes, Choctaws, Massasaugas, Mingos, Naumkeags, Mayas of Central America; by some of the Araucanians, the Charibs, Patagonians, Brazilians, Aymaras, and by some of the ancient Mound Builders, Peruvians, and Mexicans.

In the kumbekephalic variety of skulls, this form of occiput is often very much exaggerated, as is seen in certain ancient Cimbrian, Ostrogoth, and Burgundian heads; in some Egyptians and Celtic Irish, and in one Creek Indian skull.

4. That of the second form of occiput, or that in which the hind-head is more or less vertically flattened, we find examples in some of the ancient inhabitants of Scandinavia; the Lapps, Samoiedes, Iberians, or Basques of the Pyrenees; the ancient Pelasgi; Cossacks, Hungarians, Candaharians, some Arabs; one Chinese, the Siamese, some Malays and Javanese; certain tribes of the Transgangetic, or Indo-Chinese Peninsula, and occasionally among the Tahitians. To this group belong, also, the skulls of Chetimache, Natchez, Otoe, Kenehawha, Oneida, Seneca, and Puelche Indians; likewise a portion of the Kootenays, Lenapes, Miamis, Osages, Ottawas, Pottawatomes, Shoshones, Araucanians, Peruvians, and the majority of the Mound Builders.

Examples of the inferiorly flattened modification of, or deviation from this type, are found in some of the Malays, Polynesians, &c.

* See Catalogus Craniorum Diversarum Gentium quæ Collegit, J. Van der Hoeven, p. 14.

5. That the third form, in which the occiput is full and rounded, or globular, comprises the Danes, Finns, Esthonians; the short-headed Germans, whose crania, in general conformation, occupy a place between those of the Swedes and Finns; the Dutch, some tribes of the ancient Britons; the Slaves, Turks, Greeks, Romans, Etruscans, Persians, ancient Assyrians, some of the Egyptians, Hebrews, Copts, Hindoos; some of the Chinese, Japanese, Burmese, Malays; the Kalmucks, Burats, and some of the Kanakas. To this group belong, of the American Indians, the Ottigamies, Penobscots, Winnebagoes, Yamasees, Chemasyans, Euchees, Nanticokes, Pocassets, Quinpiacks, or Mohegans, and a portion of the Cheyennes, Creeks, Dacotas, Iroquois, Narragansetts, Pawnees, Pottawatomes, Sauks, Seminoles, Araucanians, Peruvians, and Mound Builders.

6. That the shelving or oval form of the occiput is most common in the dolichocephalic heads, and as these predominate in number over the brachycephalic, it is the most common form of all. Next comes the round or globular, and lastly the vertically flat—both these forms prevailing in the brachycephalæ.

7. That there is a marked tendency of these forms to graduate into each other, more or less insensibly. None of these forms can be said to belong exclusively to any race or tribe. None of them, therefore, can be regarded as strictly typical, for, a character or form, to be truly typical, should be exclusive and constant.

Dr. Fisher announced the death of A. M. C. Duméril, a correspondent of the Academy, at Paris.

October 2nd.

Mr. LEA, President, in the Chair.

Forty members present.

The following papers were presented for publication:

“Descriptions of New Corals in the Museum of the Academy of Natural Sciences, by George H. Horn.”

“The Reptilia of the North Pacific Exploring Expedition, Capts. Ringgold and Rodgers, mostly collected by William Stimpson, by Edward Hallowell, M. D., edited by Edward D. Cope.”

“Systematic Catalogue, with Synonymy, &c., of Jurassic, Cretaceous and Tertiary Fossils, collected in Nebraska, by the Exploring Expeditions under the command of Lieut. G. K. Warren, of the U. S. Topog. Engineers, by F. B. Meek and F. V. Hayden, M. D.

“Catalogue of Carboniferous Plants in the Museum of the Academy of Natural Sciences, with corrections in synonymy, descriptions of new species, &c., by Horatio C. Wood, Jr.”

“New Unionidæ of the United States and Northern Mexico, by Isaac Lea.”

And were referred to Committees.

Mr. Cassin offered the following resolutions, which were adopted:

Resolved, That the thanks of the Academy be presented to Mrs. Peter A. Browne, for the interesting and valuable collection of the hair of man, and of inferior animals, made by her late husband, an esteemed member of this Academy, and presented by her this evening.

Resolved, That the right of giving orders for admission, and of endorsing tickets of admission to the Museum of this Academy on public days, be 1860.]

hereby conferred on Mrs. Peter A. Browne, and that she and her immediate family be invited and authorized to visit the Hall and Library of this Academy whenever they think proper.

October 9th.

Mr. ASHMEAD in the Chair.

Thirty members present.

Dr. Leidy directed attention to three broken fossil teeth, which had been sent to him for examination by Dr. Shumard. They were from Washington Co., Texas, and indicated a miocene formation like that of Nebraska, which has proved to be so rich in remains of extinct mammalia. Two of the specimens belonged to a species of Hippotherium; the other appeared to indicate a new equine genus, different from any of those obtained by Dr. Hayden on the Niobrara River.

October 16th.

Vice-President BRIDGES in the Chair.

Forty-two members present.

The following papers were presented for publication :

“ Descriptions of new species of Apodal Fishes in the Museum of the Academy of Natural Sciences, by Charles C. Abbott.”

“ Descriptions of two new species of Pimelodus from Kansas, by Charles C. Abbott.”

“ Descriptions of four new species of North American Cyprinidæ, by Charles C. Abbott.”

“ Description of a new species of Exocetus from Chili, by Charles C. Abbott.

And were referred to a Committee.

Dr. Leidy directed attention to three skulls, of which two belonged to the existing *Dicotyles torquatus* and *D. labiatus*; and the third, to the extinct *D. compressus*. Dr. L. then exhibited the fore part of the skull of another extinct Peccary, which had been sent to him for examination by Dr. David D. Owen, who states the specimen was found in digging a well, in Gibson Co., Indiana, some 30 or 40 feet below the surface.

October 23d.

Mr. LEA, President, in the Chair.

Thirty-seven members present.

The following papers were presented for publication :

“ Observations on American *Tineina*, by H. G. Stainton, of London, England.”

“ Descriptions of new Carboniferous Fossils from Illinois and other Western States, by F. B. Meek and A. H. Worthen.”

“ The Stinging or Mound Ant, *Myrmica (Atta) molifaciens*, by S. B. Buckley.”

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“Descriptions of several new species of Plants, by S. B. Buckley.”
 “Descriptions of new species of Tertiary and Cretaceous Fossils, by
 William M. Gabb.”
 And were referred to Committees.

October 30th.

Mr. LEA, President, in the Chair.

Thirty-seven members present.

The Committee on the paper of Mr. Wm. M. Gabb, “Descriptions of new species of Tertiary and Cretaceous Fossils,” reported in favor of its publication in the Journal of the Academy.

On report of the respective Committees, the following papers were ordered to be published in the Proceedings:

Systematic Catalogue, with Synonyma, &c., of Jurassic, Cretaceous and Tertiary Fossils collected in Nebraska, by the Exploring Expeditions under the command of Lieut. G. K. Warren, of U. S. Topographical Engineers.

BY F. B. MEEK AND F. V. HAYDEN.

Of the 276 species and varieties enumerated in the following catalogue, 25 are from Jurassic rocks, 194 from Cretaceous, and the remaining 57 from Tertiary strata. None of the Jurassic species are known to occur in this country east of the Black Hills, or south of the middle of eastern Utah, though some of them will probably be found in New Mexico. One species is believed to be identical with *Ostrea calceola* of Roemer from the Jurassic rocks of Germany, and another (*Ammonites cordiformis*) is probably not distinct from *A. cordatus*, Sowerby, which occurs in the Jurassic series of England, France, Russia, &c. Nearly all the other Jurassic species mentioned in the list are closely allied to forms common in the lower part of that system (the Lower Oolite and Lias) in the old world, and several of them may prove identical on farther comparison.

Of the 194 Cretaceous species the following seven are common to the Nebraska and New Jersey beds viz.—*Nautilus Dekayi*, *Ammonites placenta*, *A. complexus**, *A. lobatus**, *Scaphites Conradi*, *Baculites ovatus*, and *Gryphæa vesicularis?*; and the following five species are probably common to Nebraska and foreign localities, viz.—*Nautilus Dekayi*, *Inoceramus problematicus*, *Gryphæa vesicularis*, *Cucullæa fibrosa*, and *Micorbacia coranula*.

The 57 Tertiary species are believed to be all distinct from foreign forms, and none of them have yet been found in this country east of Nebraska, or south of north eastern Utah. They are all, so far as known, extinct species.

JURASSIC SPECIES.

CEPHALOPODA.

BELEMNITIDÆ.

1. *Belemnites densus*, Meek & Hayden, March 1853, Pr. Acad. Nat. Sci. Phila. 58.

* We are indebted to Mr. Wm. M. Gabb, of Philada, for information in regard to the occurrence of these two species in New Jersey.

AMMONITIDÆ.

2. *Ammonites cordiformis*, M. & H. March 1858, Pr. Acad. Nat. Sci. 57.
 3. *Ammonites Henryi*, M. & H. " " " 57.

GASTEROPODA.

VALVATIDÆ.

4. **Valvata? scabrida*, Meek & Hayden (Manuscript).

LIMNÆIDÆ.

5. **Planorbis veterenus*, Meek & Hayden (Manuscript).

CONCHIFERA.

ANATINIDÆ.

6. *Thracia? sublævis*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 182.
 7. *Thracia? arcuata*, M. & H. " " " 182.
 8. *Myacites Nebrascensis*, M. & H. " " 182.
 9. *Myacites subellipticus*, M. & H.
Panopa (Myacites) subelliptica, M. & H. March 1858, Pr. Acad. Nat. Sci. Phila. 52.
 10. *Pholadomya humilis*, M. & H. March 1858, Pr. Acad. Nat. Sci. Phila. 52.

CARDIADÆ.

11. *Cardium [Protocardium?] Shumardi*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 182.
 12. *Tancredia Warrenana*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 183.
 13. *Tancredia? æquilateralis*, " " " 183.

ASTARTIDÆ.

14. *Astarte fragilis*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 183.
 15. *Astarte inornata*, M. & H. " " " 183.

UNIONIDÆ.

16. **Unio nucalis*, M. & H. March 1858, Pr. Acad. Nat. Sci. Phila. 52.

MYTILIDÆ.

17. *Modiola pertenuis*, Meek & Hayden.
Mytilus pertenuis, M. & H. March 1858, Pr. Acad. Nat. Sci. Phila. 51.

AVICULIDÆ.

18. *Monotis curta*, Hall sp.
Avicula curta, Hall, 1852, Capt. Stansbury's Report Exp. to Gt. Salt Lake, 412, pl. 2, fig. 1, *a* and *b*.
Avicula (Monotis) tenuicostata M. & H. March 1858, Pr. Acad. Nat. Sci. 50.

TRIGONIADÆ.

19. *Trigonia Conradi*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 183.

*These three species are only ranged provisionally in the Jurassic list.

ARCADÆ.

20. *Grammatodon inornatus*, Meek & Hayden.
Arca (Cucullæa) inornata, M. & H. March 1858, Pr. Acad. Nat. Sci. Phila. 51.

PECTENIDÆ.

21. *Pecten extenuatus*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 184.

OSTREADÆ.

22. *Ostrea (Gryphæa?) calceala*, Rømer, ii. 25, t. 18, fig. 19.

BRACHIOPODA.

LINGULIDÆ.

23. *Lingula brevirostra*, M. & H. March 1858, Pr. Acad. Nat. Sci. Phila. 50.
 24. *Rhynchonella* — ?

RADIATA.

ECHINODERMATA.

PENTACRINIDÆ.

25. *Pentacrinus asteriscus*, M. & H. Mar. 1858, Pr. Acad. Nat. Sci. Phila. 40.

CRETACEOUS SPECIES.

ARTICULATA.

ANNELIDA.

TUBICOLA.

26. *Serpula? tenuicarinata*, M. & H. May 1857, Pr. Acad. Nat. Sci. Phil. 134.

MOLLUSCA.

CEPHALOPODA.

TEUTHIDÆ.

27. *Phylloteuthis subovatus*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phil. 175.

BELEMNITIDÆ.

28. *Belemnitella bulbosa*, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 70.

NAUTILIDÆ.

29. *Nautilus Dekayi*, Morton, 1834, Synop. Or. Rem. 33, pl. 8, fig. 4, and pl. 13, fig. 4.

AMMONITIDÆ.

30. **Ammonites percarinatus*, Hall & Meek, 1854, Mem. Am. Acad. Arts and Sci. Boston, v. N. S. pl. iv. fig. 2.

*This species was first figured and described from young, or immature specimens, which differ remarkably from the adult. We have subsequently seen individuals of various sizes, which lead us to think it will probably prove to be identical with *A. Woolgari*, of Mantell, from the English chalk.

31. *Ammonites vermilionensis*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 177.
32. *Ammonites complexis*, Hall & Meek, 1854, Mem. Am. Arts and Sci. Boston, v. N. S. 394, pl. iv. fig. 1.
33. *Ammonites Halli*, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 70.
34. *Ammonites placenta*, Dekay, 1827, New York Lyc. Nat. ii. pl. 5, fig. 2. (Non *A. placenta* Leckenby, 1858.)
35. *Ammonites placenta*, var. *intercalaris*, M. & H. Pr. Acad. Nat. Sci. Phil. 177.
36. *Ammonites lobatus*, Tuomey, 1854, Pr. Acad. Nat. Sci. Phila. vii. 168, *Ammonites lenticularis*, Owen, 1852 Report Iowa, Wiscon. and Min. tab. 8. fig. 5 (non *A. lenticularis* of Phillips, 1825).
37. *Scaphites Mandanensis*, Morton sp.
Ammonites Mandanensis, Morton, 1841, Jour. Acad. Nat. Sci. Phila. viii. 208, pl. 10, fig. 2.
Scaphites Mandanensis, Meek & Hayden, Nov. 1836, Pr. Acad. Nat. Sci. Phila. 281.
38. *Scaphites abyssinus*, Morton sp.
Scaphites Mandanensis? Meek & Hayden, Nov. 1836, Pr. Acad. Nat. Sci. Phila. 281.
39. *Scaphites Cheyennensis*, Owen sp.
Ammonites Nebrascensis, Owen, 1852. Report Wiscon. Iowa and Min. pl. 7, fig. 2.
Ammonites Cheyennensis, Owen, " " " pl. 8, fig. 2.
Ammonites Moreauensis, Owen, " " " pl. 8, fig. 2.
Scaphites Conradi (pars), Meek & Hayden, Nov. 1856, Pr. Acad. Nat. Sci. Phila. 281.
40. *Scaphites Conradi*, Morton sp.
Ammonites Conradi, Morton, 1834, Synop. Org. Rem. 39, pl. 16, fig. 1, 2, 3.
Ammonites Dame, d'Orbigny, 1850, Prodrom. de Palæont. ii. 213.
Scaphites Conradi, d'Orbigny, 1850, " " " 214.
41. *Scaphites Conradi*, var. *gulosus*, Morton sp.
Ammonites var. *gulosus*, Morton, 1854, Synopsis Org. Rem. 39. pl. xvi. fig. 2.
42. *Scaphites Nicolletii*, Morton sp.
Ammonites Nicolletii, Morton, 1841, Jour. Ac. Nat. Sci. Phila. viii. pl. 10, fig. 3.
Scaphites comprinus [?], Owen, Report Wiscon. Iowa and Min. tab. 7, fig. 4.
Scaphites Nicolletii, Meek & Hayden, Nov. 1856, Proc. Acad. Nat. Sci. Phila. 281.
43. *Scaphites* (*Ammonites?*) *nodosus*, Owen, 1852, Report Iowa, Wiscon. and Min. 581, tab. 8, fig. 4.
44. *Scaphites nodosus* var. *plenus*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 177.
45. *Scaphites nodosus* var. *brevis*, Meek & Hayden (MSS.)
46. *Scaphites nodosus* var. *quadrangulus*, Meek & Hayden (MSS.)
47. *Scaphites nodosus* var. *exilis*, Meek & Hayden.
48. *Scaphites larvæformis*, M. & H. March 1856, Pr. Acad. Nat. Sci. Phil. 58.
49. *Scaphites Warreni*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 177.
50. *Ancyloceras? uncus*, Meek & Hayden.
Ancyloceras (*Hamites*) *uncus*, M. & H. Pr. Acad. Nat. Sci. Phila. 56.

51. *Helicoceras Mortoni*, Hall & Meek, sp.
Hamites Mortoni, Hall & Meek, 1854, Mem. Am. Acad. Arts and Sci. v. N. S.
 pl. iv. fig. 3.
Helicoceras tenuicostatum, M. & H. March 1858, Pr. Acad. Nat. Sci. Phila. 56.
52. *Helicoceras cochleatum*, Meek & Hayden.
Turrilites (Helicoceras) cochleatus, M. & H. March 1858, Pr. Acad. Nat. Sci.
 Phila. 55.
Helicoceras cochleatum, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 185.
53. *Helicoceras Nebrascense*, Meek & Hayden.
Ancylloceras? Nebrascensis, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 71.
Turrilites Nebrascensis, M. & H. Nov. 1856, " " 280.
54. *Helicoceras tortum*, M. & H. March 1858, " " 54.
55. *Helicoceras Cheyennense*, Meek & Hayden.
Ancylloceras? Cheyennense, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 71.
Turrilites Cheyennensis, M. & H. Nov. 1856, " " 280.
56. *Helicoceras angulatum*, M. & H. May 1860, " " 176.
57. *Helicoceras umbilicatum*, Meek & Hayden.
Turrilites? umbilicatus, M. & H. March 1858, Pr. Acad. Nat. Sci. Phila. 56.
Helicoceras umbilicatum, M. & H. May 1860. " " 185.
58. *Ptychoceras Mortoni*, M. & H. May 1857, " " 134.
59. *Baculites ovatus*, Say, Jour. Acad. Nat. Sci. Phila. vi. pl. v. fig. 5, 6.
60. *Baculites grandis*, Hall & Meek, 1854, Mem. Am. Acad. Arts and Sci.
 Boston, v. N. S. 402.
61. *Baculites asperoides*, Meek & Hayden (MSS.)
62. *Baculites compressus*, Say, Am. Jour. Sci. ii. 41.
63. *Aptychus Cheyennensis*, Meek & Hayden (MSS.)
64. *Aptychus fragilis*, Meek & Hayden (MSS.)

GASTEROPODA.

MURICIDÆ.

65. *Fusus (Neptunea) Dakotensis*, M. & H. March 1856, Pr. Acad. Nat. Sci.
 Phila. 65.
66. *Fusus (Pyrifusus?) Newberryi*, M. & H. March 1857, Pr. Acad. Nat. Sci.
 Phila. 66.
67. *Fusus subturritus*, M. & H. May 1857, Pr. Acad. Nat. Sci. Phila. 139.
68. *Fusus intertextus*, M. & H. " " " 139.
69. *Fusus? flexicostatus*, M. & H. March 1856, " " " 66.
70. *Fusus Vaughani*, M. & H. May 1857, " " " 139.
71. **Fusus vinculum*, Hall & Meek sp.
Buccinum? vinculum, H. & M. Mem. Acad. Sci. and Arts, Bos. v. N. S. pl. 3, fig. 5.
Fusus vinculum, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 183.
72. *Fusus Scarboroughi*, M. & H. May 1857, " " " 139.

*It is not improbable that this species may be found to possess affinities to some section of the genus *Tritonium* Link. It is certainly not a true *Buccinum*.

73. *Fusus Culbertsoni*, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 66.
Fusus Haydeni, Evans & Shumard, 1857, Trans. Acad. Sci. St. Louis, 41.
74. *Fusus Galpinianus*, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 65.
75. *Fusus? tenuilineatus*, Hall & Meek, 1854, Mem. Am. Acad. Arts and Sci. Boston, v. N. S. 394, pl. 3, fig. 9.
76. *Busycon Bairdi*, Meek & Hayden.
Pyruca Bairdi, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 66.
Busycon Bairdi, M. & H. June 1856, " " 126.

TURRITIDÆ.

77. *Turris minor*, Evans & Shumard sp.
Pleurotoma minor, E. & S. 1857, Trans. Acad. Sci. St. Louis, i. 41.
78. *Turris contortus*, Meek & Hayden.
Fusus contortus, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 65.
Pleurotoma contorta, M. & H. May 1860, " " 183.

BUCCINIDÆ.

79. *Buccinum constrictum*, Hall & Meek sp.
Buccinum constrictum, H. & M. Mem. Am. Acad. Arts and Sci. Boston, v. 391,
 pl. 3, fig. 7.
80. *Pseudobuccinum Nebrascense*, Meek & Hayden.
Buccinum? Nebrascense, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 67.
Pseudobuccinum Nebrascense, M. & H. May 1857, " " 140.

FASCIOLARIADÆ.

81. *Fasciolaria? cretacea*, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 66.
82. *Fasciolaria buccinoides*, M. & H. " " " 67.

NATICIDÆ.

83. *Natica (Lunatia) subcrassa*, M. & H. April 1856, Pr. Ac. Nat. Sci. Phil. 87.
84. *Natica (Lunatia) Moreauensis*, M. & H. Mar. 1856, " " 64.
85. *Natica (Lunatia) occidentalis*, M. & H. " " " 64.
86. *Amauropsis paludinæformis*, Hall & Meek, sp.
Natica paludinæformis, H. & M. 1854, Mem. Am. Sci. and Arts, Boston, v.
 389, pl. 3, fig. 3.
Amauropsis palludinæformis, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 185.

SCALIDÆ.

87. *Scala (Acirsa) cerithiformis*, Meek & Hayden.
Scala cerithiformis, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 63.
Turbonilla cerithiformis, M. & H. May 1860, " " 185.

CERITHIOPSISIDÆ.

88. *Cerithiopsis Moreauensis*, Meek & Hayden.
Turritella Moreauensis, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 70.
Cerithiopsis Moreauensis, M. & H. May 1860, " " 185.

STROMBIDÆ.

89. *Gladius? Cheyennensis*, Meek & Hayden.
Rostellaria fusiformis, H. & M. 1854, Mem. Acad. Sci. and Arts, Boston, v.
 N. S. pl. 3, fig. 10.
 (Non *R. fusiformis*, Pictet & Roux, 1848.)

APORRHAIIDÆ.

90. *Aporrhais Americana*, Evans & Shumard sp.
Rostellaria Americana, E. & S. 1857, Trans. St. Louis Acad. Sci. i. 42.
91. *Aporrhais Nebrascensis*, Evans & Shumard, sp.
Rostellaria Nebrascensis, E. & S. Aug. 1854, Pr. Acad. Nat. Sci. Phila. 164.
92. *Aporrhais sublevata*, M. & H. May 1860, " " 173.
93. *Aporrhais biangulata*, Meek & Hayden,
Rostellaria biangulata, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 65.
Aporrhais biangulata, M. & H. May 1860, " " 185.
94. *Aporrhais parva*, M. & H. " " " 178.

LITORINIDÆ.

95. *Fossar? Nebrascensis*, Meek & Hayden.
Natica ambigua, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 66.
 (Non *Fossar ambiguus*, Lin. sp.)

NERITOPSIDÆ.

96. *Neritopsis? Tuomeyana*, Meek & Hayden.
Natica Tuomeyana, M. & H. Nov. 1856, Pr. Acad. Nat. Sci. Phila. 270.

TROCHIDÆ.

97. *Margarita Nebrascensis*, Meek & Hayden.
Turbo Nebrascensis, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 64.
Margarita Nebrascensis, M. & H. May 1860, " " 185.
98. **Margaritella flexistriata*, Evans & Shumard sp.
Solarium flexistriatum, E. & S. Aug. 1854, Pr. Acad. Nat. Sci. Phila. 163.

DENTALIADÆ.

99. *Dentalium gracile*, H. & M. 1854, Mem. Am. Acad. Arts. and Sci. Boston, v. N. S. pl. 3, fig. 11.
100. *Dentalium pauperculum*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 178.

TECTURIDÆ.

101. *Tectura occidentalis*, Hall & Meek, sp.
Capulus occidentalis, H. & M. 1854, Mem. Am. Acad. Sci. and Arts, Boston, v. N. S. p. 385, fig. 13.
102. *Tectura? parva*, Meek & Hayden (manuscript.)
103. *Tectura? papillata*, Meek & Hayden.
Capulus fragilis, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 68.
 (Non *Tectura fragilis*, Gray & Gamard.)
104. *Anisomyon borealis*, Morton sp.
Hipponyx borealis, Morton. 1842, Jour. Ac. Nat. Sci. Phila. viii. pl. 11. fig. 6.
Helcion carinatus, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 68.
Anisomyon borealis, M. & H. Jan. 1860, Am. Jour. Sci. xxviii. 2d ser. 35.
105. *Anisomyon Shumardi*, Meek & Hayden (manuscript).

* We propose to establish a new genus, under the name of *Margaritella*, for the reception of many pearly Jurassic and Cretaceous shells usually referred to *Solarium*. It is evident from the pearly lustre, and other characters of these fossil shells, that they do not even belong to the same family as our recent typical species of the genus *Architectonica* (= *Solarium*.) The above species may be regarded as the type of the genus.

103. *Anisomyon patelliformis*, Meek & Hayden.
Helcion patelliformis, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 68.
Anisomyon patelliformis, M. & H. Jan. 1860, Am. Jour. Sci. xxviii. 2d. ser. 35, pl. 1.
107. *Anisomyon subovatus*, Meek & Hayden.
Helcion subovatus, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 68.
Anisomyon subovatus, M. & H. Jan. 1860, Am. Jour. Sci. xxviii. 2d ser. 35.
108. *Anisomyon alveolatus*, Meek & Hayden.
Helcion alveolatus, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 68.
Anisomyon alveolatus, M. & H. Jan. 1860, Am. Jour. Sci. xxxviii. 2d ser. 35.
109. *Anisomyon sexsulcatus*, Meek & Hayden.
Helcion sexsulcatus, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 68.
Anisomyon sexsulcatus, M. & H. Jan. 1860, Am. Jour. Sci. xxxviii. 2d ser. 35.

SOLIDULIDÆ.

110. *Solidula subelliptica*, Meek & Hayden.
Acteon subelliptica, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 63.
Solidulus (Acteonina?) subelliptica, M. & H. May 1860, " " 185.
111. *Solidula (Acteonina?) attenuata*, Meek & Hayden.
Acteon (solidulus) attenuata, M. & H. Mar. 1858, Pr. Acad. Nat. Sci. Phila. 54.
Solidulus attenuatus, M. & H. May 1860, " " 185.
112. *Cinulia concinna*, Hall & Meek, sp.
Acteon concinna, H. & M. 1854, Mem. Am. Acad. Arts and Sci. Boston, v. N. S. pl. 3, fig. 4.
Avellana subglobosa, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 64.

BULLIDÆ.

113. *Bulla occidentalis*, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 69.
114. *Bulla minor*, M. & H. " " " 69.
115. *Bulla volvaria*, M. & H. " " " 69.
116. *Bulla speciosa*, Meek & Hayden.
Bulla subcylindrica, M. & H. Nov. 1856, Pr. Acad. Nat. Sci. Phila. 270.
(Non *B. subcylindrica*, d'Orbigny, 1847).
Bulla speciosa, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 185.

CYLICHNIDÆ.

117. *Cylichna scitula*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 178.

CONCHIFERA.

PHOLADIDÆ.

118. *Pholas? Stimpsoni*, Meek & Hayden.
Xylophaga Stimpsoni, M. & H. May 1857, Pr. Acad. Nat. Sci. Phila. 141.
119. *Pholas (Martesia) cuneata*, M. & H. Mar. 1858, " " 53.
120. *Xylophaga elegantula*, M. & H. May 1857, " " 141.
121. *Teredo selliformis*, M. & H. May 1860, " " 178.
122. *Teredo globosa*, M. & H. March 1858, " " 53.

SAXICAVIDÆ.

123. *Panopæa occidentalis*, M. & H. Nov. 1856, Pr. Acad. Nat. Sci. Phil. 270.
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SOLENIIDÆ.

124. *Pharella? Dakotensis*, Meek & Hayden.
Solen? Dakotensis, M. & H. May 1857, Pr. Acad. Nat. Sci. Phila. 242.

CORBULIDÆ.

125. *Corbula crassimarginata*, Meek & Hayden (MSS.)
 126. *Corbula inornata*, M. & H. March 1858, Pr. Acad. Nat. Sci. Phila. 52.
 127. *Corbulamella gregarea*, Meek & Hayden.
Corbula? gregarea, M. & H. April 1856, Pr. Acad. Nat. Sci. Phila. 84.
Corbulamella gregarea, M. & H. May 1857, " " 143.
 128. *Næra ventricosa*, Meek & Hayden.
Corbula ventricosa, M. & H. April 1856, Pr. Acad. Nat. Sci. Phila. 83.
Næra ventricosa, M. & H. May 1860, " " 183.
 129. *Næra Moreauensis*, Meek & Hayden.
Corbula Moreauensis, M. & H. Ap. 1856, Pr. Acad. Nat. Sci. Phila. 83.
Næra Moreauensis, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 185.

ANATINIDÆ.

130. *Thracia subtortuosa*, Meek & Hayden.
Tellina subtortuosa, M. & H. Nov. 1856, Pr. Acad. Nat. Sci. Phila. 272.
 131. *Thracia gracilis*, Meek & Hayden.
Tellina gracilis, M. & H. April 1855, Pr. Acad. Nat. Sci. Phila. 82.
Thracia? gracilis, M. & H. Nov. 1856, " " 284.
 132. *Thracia Prouti*, Meek & Hayden.
Tellina Prouti, M. & H. April 1856, Pr. Acad. Nat. Sci. Phila. 85.
 133. *Pholadomya (?) fibrosa*, Meek & Hayden.
Avicula (?) fibrosa, M. & H., Ap. 1856, Pr. Acad. Nat. Sci. Phila. 86.
Pholadomya fibrosa, M. & H., Nov. 1856, " " 283.
 134. *Pholadomya subventricosa*, M. & H., May, 1857, Pr. Acad. Nat. Sci. Phila. 142.
 135. *Pholadomya undata*, M. & H., Ap. 1856, Pr. Acad. Nat. Sci. Phila. 81.

MACTRIDÆ.

136. *Mactra (Trigonella?) formosa*, Meek & Hayden, Nov. 1856, Pr. Ac. Nat. Sci. Phila. 271.
 137. *Mactra (Trigonella?) alta*, M. & H., Nov. 1856, Pr. Acad. Nat. Sci. Phila. 271.
 138. *Mactra (Trigonella?) siouxensis*, M. & H. May, 1860, Pr. Acad. Nat. Sci. Phila. 179.
 139. *Mactra (Trigonella?) Warrenana*, M. & H., Nov. 1856, Pr. Acad. Nat. Sci. Phila. 281.
 140. *Mactra (Trigonella?) gracilis*, M. & H., May, 1860, Pr. Acad. Nat. Sci. Phila. 179.

TELLINIDÆ.

141. *Tellina equilateralis*, Meek & Hayden, Ap. 1856, Pr. Acad. Nat. Sci. Phila. 82.
 142. *Tellina scitula*, M. & H., Ap. 1856, Pr. Acad. Nat. Sci. Phila. 82.
 143. *Tellina (?) formosa*, M. & H., May 1860, Pr. Acad. Nat. Sci. Phila. 179. 1860.]

144. *Tellina* (?) *subelliptica*, M. & H., Ap. 1856, Pr. Acad. Nat. Sci. Phila. 83.

145. *Tellina* (?) *Cheyennensis*, M. & H., Ap. 1856, Pr. Acad. Nat. Sci. Phila. 82.

VENERIDÆ.

146. *Venus circularis*, Meek & Hayden, Nov. 1856, Pr. Acad. Nat. Sci. Phila. 272.

147. *Meretrix tenuis*, Hall & Meek, sp.
Cytherea tenuis, Hall & Meek, 1854, Mem. Am. Acad. Arts and Sci. Boston, v. N. S. 383, pl. 1, fig. 8.
Meretrix tenuis, M. & H., May 1860, Pr. Acad. Nat. Sci. Phila. 185.

148. *Meretrix pellucida*, Meek & Hayden.
Cytherea pellucida, M. & H., Nov. 1856, Pr. Acad. Nat. Sci. Phila. 272.
Meretrix pellucida, M. & H. May 1860, " " " " 185.

149. *Meretrix Deweyi*, Meek & Hayden.
Cytherea Deweyi, M. & H., Ap. 1856, Pr. Acad. Nat. Sci. Phila. 83.
Meretrix Deweyi, M. & H., May 1860, " " " " 185.

150. *Meretrix Owenana*, Meek & Hayden.
Cytherea Owenana, M. & H., Nov. 1856, Pr. Acad. Nat. Sci. Phila. 272.
Meretrix Owenana, M. & H., May 1860, " " " " 185.

151. *Meretrix orbiculata*, Hall & Meek, sp.
Cytherea orbiculata, Hall & Meek, 1854, Mem. Acad. Arts and Sci. Boston, v. N. S. pl. 1, fig. 7.
Meretrix orbiculata, Meek & Hayden, May 1860, Pr. Acad. Nat. Sci. Phila. 185.

CYPRINIDÆ.

152. *Cyprina arenarea*, Meek & Hayden, May 1857, Pr. Acad. Nat. Sci. Phila. 143.

153. *Cyprina subtumida*, M. & H., May 1857, Pr. Acad. Nat. Sci. Phila. 144.

154. *Cyprina humilis*, M. & H., May 1860, Pr. Acad. Nat. Sci. Phila. 179.

155. *Cyprina ovata*, M. & H., May 1857, Pr. Acad. Nat. Sci. Phila. 144.

CARDIDÆ.

156. *Bucardia?* *Moreauensis*, Meek & Hayden.
Cyprina cordata, M. & H., May 1857, Pr. Acad. Nat. Sci. Phila. 143.
(Non. *B. cordata* sp. Buckm.)

157. *Tancredia Americana*, Meek & Hayden.
Hettangia Americana, M. & H., Nov. 1856, Pr. Acad. Nat. Sci. Phila. 274.
Tancredia Americana M. & H., May 1860, " " " " 185.

158. *Cardium speciosum*, Meek & Hayden, Nov. 1856, Pr. Acad. Nat. Sci. Phila. 274.

159. *Cardium rarum*, Evans & Shumard, Trans. Acad. Nat. Sci. St. Louis, i. 39.

160. *Cardium subquadratum*, E. & S., Trans. Acad. Nat. Sci. St. Louis, i. 39,

LUCINIDÆ.

161. *Lucina occidentalis*, Morton, sp.
Tellina occidentalis, Morton, 1842, Jour. Acad. Nat. Sci. Phila. viii. pl. 11, fig. 3.

Lucina occidentalis, M. & H., Nov. 1856, Pr. Acad. Nat. Sci. Phila. 272.

162. *Lucina subundata*, Hall & Meek, 1854, Mem. Am. Acad. Arts and Sci. Boston, v. N. S. pl. 1, fig. 6.

163. *Lucina ventricosa*, Meek & Hayden, (MSS.)

SOLEMYIDÆ.

164. *Solemya subplicata*, Meek & Hayden.

Solen subplicata, M. & H., Pr. Acad. Nat. Sci. Phila. Ap. 1856, 82.

ASTARTIDÆ.

165. *Crassatella Evansi*, Hall & Meek, 1854, Mem. Am. Acad. Arts and Sci. Boston, v. N. S. 383, pl. 1, fig. 9.

166. *Astarte gregaria*, M. & H., Ap. 1856, Pr. Acad. Nat. Sci. Phila. 84.

MYTILIDÆ.

167. *Mytilus subarcuatus*, Meek & Hayden, Nov. 1856, Pr. Acad. Nat. Sci. Phila. 276.

168. *Modiola* * *Meekii*, Evans & Shumard, sp.

Mytilus Galpinianus, E. & S., Aug. 1854, Pr. Acad. Nat. Sci. Phila. 164.

169. *Modiola attenuata*, Meek & Hayden.

Mytilus attenuatus, M. & H., Ap. 1856, Pr. Acad. Nat. Sci. Phila. 86.

AVICULIDÆ.

170. *Avicula linguiformis*, Evans & Shumard, 1854, Pr. Acad. Nat. Sci. Phila. 163.

171. *Avicula subgibbosa*, Meek & Hayden, May 1860, Pr. Acad. Nat. Sci. Phila. 180.

172. *Avicula Nebrascana*, Evans & Shumard, 1857, Trans. Acad. Sci. St. Louis, i. p. 38.

173. *Avicula Haydeni*, Hall & Meek, 1854, Mem. Am. Acad. Sci. and Arts, Boston, v. N. S. 382, pl. 1, fig. 5.

174. *Gervillia subtortuosa*, Meek & Hayden, Nov. 1856, Pr. Acad. Nat. Sci. Phila. 276.

175. *Inoceramus pertenuis*, Meek & Hayden, Nov. 1856, Pr. Acad. Nat. Sci. Phila. 276.

Inoceramus ventricosus, M. & H. March 1856, Pr. Acad. Nat. Sci. Phila. 87. (Non *I. ventricosus*, Sowerby.)

176. *Inoceramus pertenuis*, var. *subdepressus*, Meek & Hayden.

177. *Inoceramus subcompressus*, Meek & Hayden, May 1860, Pr. Acad. Nat. Sci. Phila. 181.

178. *Inoceramus fragilis*, Hall & Meek, 1854, Mem. Am. Acad. Arts and Sci. Boston, v. N. S. 388, pl. 2, fig. 6.

179. *Inoceramus problematicus*, Schlot. sp. ?

Mytilites problematicus Schlotheim, Petrefact. 312.

Inoceramus mytiloides, Mantell, 1822, Geol. Sussex, pl. 27, fig. 3 and pl. 28, fig. 2.

* The name *Valsella* Scopoli may have to be adopted for this genus.

- Inoceramus problematicus*, d'Orbigny, 1843, Palæont. Franc. t. iii. 510, pl. 406.
180. *Inoceramus pseudo-mytiloides*, Schiel., 1855, ii. Pacif. Rail Road Rept. 108, pl. 3, fig. 8.
181. *Inoceramus aviculoides*, M. & H. May 1860, Pr. Acad. Nat. Sci. Phila. 181.
182. *Inoceramus sublaevis*, Hall & Meek, 1854, Mem. Acad. Arts and Sci. v. N. S. 386, pl. 2, fig. 1.
183. *Inoceramus convexus*, Hall & Meek, 1854, Am. Ac. Arts and Sci. v. N. S. 386, pl. 2, fig. 2.
184. *Inoceramus tenuilineatus*, H. & M., 1854, Am. Ac. Arts and Sci. v. N. S. 386, pl. 2, fig. 3.
185. *Inoceramus cuneatus*, M. & H., May 1860, Pr. Ac. Nat. Sci. Phila. 181.
186. *Inoceramus Sagensis*, Owen, (?) 1852, Report, Survey Min. Iowa and Wiscon. 582, tab. vii. fig. 3.
187. *Inoceramus incurvus*, M. & H., Nov. 1856, Pr. Ac. Nat. Sci. Phil. 277.
188. *Inoceramus umbonatus*, M. & H., March 1858, Pr. Ac. Nat. Sci. Phila. 50.
189. *Inoceramus Mortoni*, M. & H., (MSS.)
190. *Inoceramus Nebrascensis*, Owen, 1852, Rept. Iowa, Wiscon. and Min. 582, pl. 8. fig. 1.
191. *Inoceramus Vanuxemi*, M. & H., May 1860, Pr. Ac. Nat. Sci. Phil. 180.
192. *Inoceramus Balchii*, M. & H., " " " " 180.
193. *Arca sulcatina*, Evans & Shumard, 1857, Trans. St. Louis Ac. Sci. 39.
194. *Arca exigua*, Meek & Hayden.
Cucullæa exigua, M. & H., Nov. 1856, Pr. Ac. Nat. Sci. Phil. 275.
195. *Cucullæa fibrosa*, Sowerby, 1818, Min. Conch. iii. 9.
Arca fibrosa, d'Orbigny, 1843, Palæont. Franc. t. iii. 212, pl. 312.
Arca (cucullæa) Shumardi, M. & H., Ap. 1856, Pr. Ac. Nat. Sci. Phil. 86.
196. *Cucullæa cordata*, Meek & Hayden.
Arca (cucullæa) cordata, M. & H., Ap. 1856, Pr. Ac. Nat. Sci. Phila. 86.
Cucullæa cordata, M. & H., Nov. 1856, " " " 285.
197. *Cucullæa Nebrascensis*, Owen, 1852, Rept. Wiscon. Iowa and Min. 582, pl. 8, fig. 1, 1 a.
198. *Axinæa siouxensis*, Hall & Meek, sp.
Pectunculus siouxensis, H. & M., 1854, Mem. Ac. Arts and Sci. Boston, v. N. S. 384, pl. 1, fig. 12.
Axinæa siouxensis, M. & H. May 1860, Pr. Ac. Nat. Sci. Phila. 185.
199. *Axinæa subimbricata*, Meek & Hayden.
Pectunculus subimbricatus, M. & H., May 1857, Pr. Ac. Nat. Sci. Phila. 146.
Axinæa subimbricatus, M. & H., May 1860, " " " 185.
200. *Limopsis parvula*, Meek & Hayden.
Pectunculina parvula, M. & H., Ap. 1856, Pr. Ac. Nat. Sci. Phila. 86.
Limopsis parvula, M. & H., Nov. 1856, " " " 285.

LEDIDÆ.

201. *Leda (Yoldia) scitula*, Meek & Hayden.
Nucula scitula, M. & H., Ap. 1856, Pr. Ac. Nat. Sci. Phila. 84.
Leda scitula, M. & H., May 1860, " " " 185.

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202. *Leda* (*Yoldia*) *Evansi*, Meek & Hayden.
Nucula Evansi, M. & H., Ap. 1856, Pr. Ac. Nat. Sci. Phila. 84.
Leda Evansi, M. & H., May 1860, " " " " 185.
203. *Leda* (*Yoldia*) *ventricosa*, Hall & Meek, sp.
Nucula ventricosa, H. & M., 1854, Mem. Ac. Arts and Sci. Boston, v. N.
 S. 385, pl. 1, fig. 11. (Non. *N. ventricosa*, Hind, 1843.*)
204. *Leda* (*Yoldia*) *subnasuta*, Hall & Meek, sp.
Nucula subnasuta, H. & M., Mem. Am. Acad. Arts and Sci. Boston, v.
 N. S. 384, pl. 1, fig. 11.

NUCULIDÆ.

205. *Nucula equilateralis*, M. & H., Ap. 1856, Pr. Ac. Nat. Sci. Phil. 84.
 206. *Nucula subplana*, M. & H., " " " " 85.
 207. *Nucula cancellata*, M. & H., " " " " 85.
 208. *Nucula planimarginata*, M. & H., " " " " 85.
 209. *Nucula absoletastriata*, M. & H., " " " " 275.

PECTENIDÆ.

210. *Pecten rigida*, Hall & Meek, 1854, Mem. Am. Ac. Sci. and Arts,
 Boston, v. N. S. 381, pl. 2, fig. 4, *a, b, c*.
 211. *Pecten Nebrascensis*, M. & H., Ap. 1856, Pr. Ac. Nat. Sci. Phil. 87.

ANOMIADÆ.

212. *Anomia obliqua*, M. & H., May 1860, Pr. Ac. Nat. Sci. Phila. 181.
 213. *Anomia subtrigonatis*, M. & H., May 1860, Pr. Ac. Nat. Sci.
 Phila. 181.

OSTREADÆ.

214. *Ostrea inornata*, M. & H., May 1860, Pr. Ac. Nat. Sci. Phila. 181.
 215. *Ostrea translucida*, Meek & Hayden, (MSS.)
Ostrea larva, Hall & Meek, (non. Lamarck) 1854, Mem. Acad. Arts and
 Sci. Boston, v. N. S. 406.
 216. *Ostrea congesta*, Conrad, 1843, Nicollet's Report, Explor. N. W.
 Territories, 167.
 217. *Ostrea patina*, M. & H., 1856, Pr. Ac. Nat. Sci. Phila. 277.
 218. *Gyphæa vesicularis*, Lamarck? sp.
Ostrea vesicularis, Lamarck, 1860, Am. Mus. viii. 160, T. 22, fig. 3.
Ostrea deltoidea, Lamarck, " " " and xiv. t. 21, pars.
Ostrea vesicularis of numerous authors.

BRACHIOPODA?

HIPURITIDÆ.

219. *Caprinella? coralloidea*, Hall & Meek, 1854, Mem. Am. Ac. Arts and
 Sci. Boston, v. N. S. 381, pl. 2, fig. 3.

* Should *Nucula ventricosa* of Hinds prove to be a true *Leda*, it will become necessary to give our Nebraska shell a new specific name, in which case we would propose to call it *Leda exigua*.

RADIATA.

FUNGIDÆ.

220. *Macrobacia coronula*, Goldf., sp. Petrefact. Germ. i. 50, tab. 14, fig. 10.

TERTIARY SPECIES.

GASTEROPODA.

CERITHIADÆ.

221. *Cerithium* (*Cerithidea*?) *Nebrascensis*, M. & H., June 1860, Pr. Ac. Nat. Sci. Phila. 125.

MELANIADÆ.

222. *Melania* ? *Warreni*, M. & H., May 1857, Pr. Ac. Nat. Sci. Phila. 137.
 223. *Melania subtortuosa*, M. & H., " " " " 136.
 224. *Melania Nebrascensis*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 124.
 225. *Melania tenuicarinata*, M. & H., May 1857, Pr. Ac. Nat. Sci. Phila. 137.
 226. *Melania convexa*, M. & H.
Turritella convexa, M. & H., March, 1856, Pr. Ac. Nat. Sci. Phila. 71.
Melania convexa, M. & H., " " " " 125.
 227. *Melania sublevis*, M. & H., " " " " 136.
 228. *Melania* ? *Anthonyi*, M. & H., " " " " 124.
 229. *Melania minitula*, M. & H., June 1856, " " " " 123.

VIVIPARIDÆ.

230. *Vivipara Conradi*, Meek & Hayden.
Paludina Conradi, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 122.
Vivipari Conradi, M. & H., May 1860, " " " " 185.
 231. *Vivipara Nebrascensis*, Meek & Hayden.
Paludina multilineata, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 120.
 (Non. *P. multilineata*, Say, 1829.
Vivipara multilineati, M. & H., May, 1860, Pr. Ac. Nat. Sci. Phila. 185.
 232. *Vivipara Leai*, Meek & Hayden.
Paludina Leai, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 121.
Vivipara Leai, M. & H., May 1860, " " " " 185.
 233. *Vivipara vetusta*, Meek & Hayden.
Paludina vetusta, M. & H., 1856, Pr. Ac. Nat. Sci. Phila. 121.
 234. *Vivipara retusa*, Meek & Hayden.
Paludina retusa, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 122.
Vivipara retusa, M. & H., May 1860, " " " " 185.
 235. *Vivipara trochiformis*, Meek & Hayden.
Paludina trochiformis, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 122.
Paludina Leidyi, ? M. & H., " " " " 123.
Vivipara trochiformis, M. & H., May 1860, " " " " 185.

VALVATIDÆ.

236. *Valvata subumbilicata*, Meek & Hayden.

- Planorbis subumbilicata*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 120.
Valvata subumbilicata, M. & H., May 1860, " " " 185.
 237. *Valvata parvula*, M. & H., June 1856, " " " 123.

HELICIDÆ.

238. *Columna ? teres*, Meek & Hayden.
Bulimus ? teres, M. & H., June, 1856, Pr. Ac. Nat. Sci., Phila. 117.
 239. *Columna ? vermiculus*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 118.
Bulimus ? vermiculus M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 118.
 240. *Bulimus limneiformis*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 118.
Bulimus Nebrascensis, ? M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 118.
 241. *Helix Leidyi*, Hall & Meek, June 1854, Mem. Am. Acad. Arts and Sci. Boston, v. N. S. 394, pl. 3, fig. 12.
 242. *Helix vetusta*, Meek & Hayden.
H. vitrinoides, M. & H., May 1857, Pr. Ac. Nat. Sci. Phila. 135. (Non. *H. vitrinoides*, Deshayes, 1830).
 243. *Helix obliqua*, M. & H., May 1857, Pr. Ac. Nat. Sci. Phila. 134.
 244. *Helix Evansi*, M. & H., May 1860, Pr. Ac. Nat. Sci. Phila. 175.
 245. *Helix (Polygyra) amplexus*, Meek & Hayden.
Planorbis amplexus, M. & H., May 1857, Pr. Ac. Nat. Sci. Phila. 21.
Helix (Polygyra) amplexus, M. & H., May 1860, Pr. Ac. Nat. Sci. Phila. 185.
 246. *Helix Nebrascensis*, Meek & Hayden.
H. occidentalis, M. & H., May 1857, Pr. Ac. Nat. Sci. Phila. 135. (Non. *H. occidentalis*, Recluz. 1845.)

LIMNÆIDÆ.

247. *Limnæa (Acella) tenuicostata*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 119.
 248. *Limnæa Meekana*, Evans & Shumard. (MSS.)
 249. *Limnæa ? multistriata*, Meek & Hayden.
Melania multistriata, M. & H., June 1826, Pr. Ac. Nat. Sci. Phila. 124.
 250. *Physa secalana*, Evans & Shumard, Aug. 1854, Pr. Ac. Nat. Sci. Phila. 156.
 251. *Physa (Aplexus) longiuscula*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 119.
 252. *Physa (Aplexus) subelongata*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 120.
 253. *Physa rhomboidea*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phil. 119.
 254. *Planorbis (Segmentina?) Nebrascensis*, Evans & Shumard, Aug. 1854, Pr. Ac. Nat. Sci. Phila. 164.
 255. *Planorbis (Segmentina?) vetulus*, M. & H., May 1860, Pr. Ac. Nat. Sci. Phila. 175.
 256. *Planorbis Leidyi*, M. & H., May 1860, Pr. Ac. Nat. Sci. Phila. 175.
 257. *Planorbis convolutus*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 120.

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258. *Planorbis planoconvexus*, Meek & Hayden.
Planorbis fragilis, M. & H., May 1857, Pr. Ac. Nat. Sci. Phila. 136.
 (Non. *P. fragilis*, Dunker, 1843.)
Planorbis planoconvexus, M. & H. May 1860, Pr. Ac. Nat. Sci. Phila. 185.
259. *Ancylus (Acroloxus) minuta*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 120.

CONCHIFERA.

CORBULIDÆ.

260. *Corbula perundata*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 116.
261. *Corbula (Potamomya) subtrigonalis*, Meek & Hayden.
Corbula subtrigonalis, M. & H. June, 1856, Pr. Ac. Nat. Sci. Phila. 116.
262. *Corbula (Potamomya) mactriformis*, Meek & Hayden.
Corbula mactriformis, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 117.

CYRENIDÆ.

263. *Corbicula Moreauensis*, Meek & Hayden.
Cyrena Moreauensis, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 115.
264. *Corbicula Nebrascensis*, Meek & Hayden.
Cyrena intermedia, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 116.
 (Non. *Cyrena (Corbicula) intermedia*, Mellville, 1843.)
265. *Corbicula cytheriformis*, Meek & Hayden.
Cyrena (Corbicula?) cytheriformis, M. & H., May 1860, Pr. Ac. Nat. Sci. Phila. 176.
266. *Corbicula occidentalis*, Meek & Hayden.
Cyrena occidentalis M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 116.
267. *Sphaerium planum*, M. & H., May 1860, " " " 175.
268. *Sphaerium formosum*, Meek & Hayden.
Cyclas formosa, M. & H., June 1856, P. Ac. Nat. Sci. Phila. 115.
Cyclas fragilis, M. & H., " " " " 115.
Sphaerium formosum, M. & H., May 1860, " " " 185.
269. *Sphaerium subellipticum*, Meek & Hayden.
Cyclas subelliptica, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 115.
Sphaerium subellipticum, M. & H., May 1860, " " " 185.
270. *Sphaerium recticardinale*, M. & H., " " " " 176.

UNIONIDÆ.

271. *Unio priscus*, M. & H., June 1856, Pr. Ac. Nat. Sci. Phila. 117.
272. *Unio subspatulatus*, M. & H., May 1857, " " " 146.
273. *Unio Deweyanus*, M. & H., " " " " 145.
274. *Unio Danæ*, M. & H., " " " " 146.

OSTREADÆ.

275. *Ostrea subtrigonalis*, Evans & Shumard, 1857, Trans. St. Louis Acad. Sci. i. 38.
276. *Ostrea glabra*, Meek & Hayden, Pr. Ac. Nat. Sci. Phila. 146.

[Oct.

Observations on American Tineina.

BY H. T. STANTON, OF LONDON.*

Tinea biflavimaculella. This is closely allied if not identical with *T. Spilotella* (see Linn. Ent. vi. p. 108, *Rusticella*, var. b.) *Spilotella* appears confined to the north of Europe, occurring in Finland and Scotland.

T. dorsistrigella, is allied to *T. ferruginella*, but the markings much are whiter and the dorsal streak is broader. *T. nubilipennella* is identical with our *T. fuscipunctella*.

T. lanariella, is identical with our everywhere abundant *T. biselliella*.

Xylesthia pruniramiella. This curious genus appears to be rather allied to *Ochsenheimeria*; another strange genus in this vicinity, *Hapsifera*, was founded by Zeller, in the *Isis* of 1847, p. 32.

Amydria effrenatella. I am disposed to place this in the genus *Euplocamus*; the palpi are very like those of *E. tessulatella*, Z. (Linn. Ent. vi. p. 96.)†

Anaphora plumifrontella. I am utterly perplexed with this; we have no European form at all resembling it.

Lithocolletis lucidicostella } These are allied to the group of
L. argentifimbriella, } *Cramerella*, *Tenella* and *Heegeriella*.

L. basistrigella. This is nearly allied to a South European species, *Suberifoliella*, (Zell. Entomol. Zeitung, 1850, p. 208); but it is smaller, the basal streak is shorter, the subapical streaks are more distinct and the ground color darker.

Tischeria citrinipennella. This is rather intermediate between the European *Complanella* and *Marginea*; it possesses a black spot at the anal angle, as in the last named species.

Phyllocnistis vitigenella. This is closely allied to our *Suffusella* and *Saligna*; but it is smaller, and the position of the subapical dorsal streak is different.

Coleophora coruscipennella. This is very nearly allied to our *C. Fabriciella*; but the anterior wings are a little browner. The antennæ quite agree with those of *Fabriciella*.

Plutella vigilaciella. This is our *P. porrectella*; you will find the larva in gardens on *Hesperis matronalis*.

Plutella limbipennella. This is our *P. cruciferarum*; it seems cosmopolitan, as I have seen specimens from various parts of the globe. Probably wherever man eats cabbages *Cruciferarum* will occur.

Argyresthia oreasella. This seems quite identical with our *A. Andereggiella*.

*Mr. Stanton has very kindly sent me the following observations, on a small lot of American Tineina, forwarded to him late in July. In return, I am indebted to him for an interesting suite of European genera and specimens of those insects which he considers identical with ours. It is quite needless for me to say that I regard any opinion Mr. Stanton may deliberately form, on questions of classification, to be final.

After having examined a specimen of the genus *Simaethis*, I must acknowledge that *Brenthia* seems congeneric with it. Whether the former genus naturally belongs to the *Pyralidina* must be left for future determination. My own opinion at present is, that it is improperly included in this well-marked group.—BRACKENRIDGE CLEMENS.

†This is true of the labial palpi; but the auxiliary palpi in *Amydria* are extremely short.
 1860.]

Bedellia? Staintoniella. Certainly a *Bedellia*, and I cannot distinguish it specifically from our *Somnulentella*, only it is smaller.

Cosmopteryx? gemmiferella. A true *Cosmopteryx*; but your specimens are not all the same species; four of them I take to be the true *Gemmiferella*. These have the central fascia reddish-orange, edged with silvery violet. This fascia is considerably broadest on the costa, its hinder margin being formed by two silvery-violet spots, which are by no means opposite; at the apex of the wing is a short silvery white scale [streak?], preceded by a violet silvery spot, with which it is not connected.

The other two specimens, for which I propose the name *Cosmopteryx Clemensella*, differ from *Gemmiferella* in the anterior wings being darker, the orange fascia is paler, not so reddish, its margins are pale golden. instead of silvery-violet, and its hind margin is almost straight, (this is very different from *Gemmiferella*); finally, the apical streak is continuous, not interrupted, and of a silvery white throughout. I shall describe this in an early number of the "Intelligencer," in some remarks on the extra-European species of *Cosmopteryx*.

Anorthosia punctipennella. This seems to be allied to *Cleodora*, and I do not feel confident that it is generically distinct.

Gelechia Agrimoniella. Allied to *G. ligulella* and *G. tæniolella*, but quite distinct.

G. roseosuffusella; a true *Gelechia*, allied to *G. decurtella*, (H. S. *Tineides*, tab. 72, f. 539).

G. Rhoifructella. This has considerable resemblance with our *G. Populella*; but the anterior wings are broader and blunter, and the anterior segments of the body are not pale.

G. rubidella; a true *Gelechia*, somewhat allied to *G. ericinella*, but smaller, and the anterior wings narrower.

G. detersella. I am uncertain about this; it is perhaps allied to our moss-feeding *G. affinis*. The name *detersella*, must be altered, that name having been used by Zeller for a Sicilian species of the genus (*Isis*, 1847).

The genus *Gelechia*, as at present constituted, is very elastic, and includes a variety of slightly different forms. *G. subocella* is our most discordant species.

Strobisia iridipennella. } These are very different from anything in
S. emblemella. } Europe, and the form of wing in *Iridi-*
pennella is so peculiar that you are clearly justified in forming a new
 genus; it is not improbably a connecting link between *Gelechia* and *Glyphip-*
teryx.

Butalis flavifrontella. } Zeller has described in the *Linnæa Ento-*
B. matutella. } *mologica*, vol. x., several North American
 species of *Butalis*. His *Basilaris*, p. 230, is perhaps identical with your
Flavifrontella, and his *Impositella*, p. 241, may have been described from a
 worn specimen of your *Matutella*.

Stilbosis tesquella. This is a very curious insect, resembling in form of wing *Asychna æratella*; the ornamentation is more like some of the *Lavernæ*.

Chrysocorys Erythtiella. This is a true *Chrysocorys*.

Brenthia Pavonacella. I am disposed to consider this not a *Tineina*, but rather one of the *Pyralidina*, allied to *Simaethis*; but I have never observed the strutting habit in any of our species.

Pigritia laticapitella. This is an obscure looking insect of doubtful location, reminding one most strongly of some of the aberrant *Butalidæ*.

[Oct.

Descriptions of new Corals in the Museum of the Academy.

BY GEO. H. HORN.

Madrepora perampla.

M. crassè foliata, frondibus profundè digitato-lobatis; lobis latè elongatis (sæpe 2' longis, 4"—8" latis, et 1"—4" crassis). Corallum infra, caliculis confertis (1"—1½" longis); supra tubiformibus, inequalibus (2"—3" longis et 1½" latis) erectis, nunquam nariformibus; stella conspicuâ, duabus lamellis latioribus.

The broad and thick lobes of this species distinguish it from either the *M. alces* or *M. palmata*. The calices are elongated, and with a distinct star. Immersed cells numerous, equalling in this respect the prominent calices. The lobes are broad, and arise from a common pedicle, which is very stout (4"—6"); they also show a tendency to further subdivision.

Locality.—West Indies. Dr. J. H. Slack.

Madrepora subaquila.

M. crassè digitata, (lobis 2' longis, 3" latis et 2½" crassis). Corallum infra caliculis confertis (1" longis); supra tubiformibus, inequalibus (2" longis et 1" latis); stella inconspicuâ.

The above description was derived from a branch, two feet in length, of a frond, whose mode of growth was nearly horizontal, judging from the relation of the calices to the upper surface. This species differs materially from any of the digitato-palmate madrepores heretofore described, in its mode of growth, its large calices, and its inconspicuous star. Its color is light brownish exteriorly.

Locality.—Unknown.

Madrepora tubigera.

M. prostrata, ramis paulum diffusis, strictè ramosis; ramulis attenuatis (base 3"), apice acutis. Corallum porosum, caliculo apicale elongato, cylindrico (3"—4" sæpe 5" longo et ¾" lato); lateralibus tubiformibus, sæpe labellatis et dimidiatis; stella conspicuâ.

This species is well marked. Its much elongated and delicate apical calice distinguishing it from all known prostrate branching madrepores.

Locality. Unknown. Dr. T. B. Wilson.

Merulina speciosa.

M. explanato-ramosa, latè undata; margine lobata, unifronte; superne ramis confertis (2—3½" altis). Corallum collibus rotundatis (1" altis), lamellis æqualibus serrulatis.

This species differs from any other of the genus *Merulina* in its branches arising from an explanate base. It grows in large subhemispherical clumps (10"—13" in diameter). The thickness of the explanate portion is often three lines. Its under surface is strongly ribbed, coarsely striate, and granulous.

Locality.—Unknown. Dr. T. B. Wilson.

Agaricia anthropylla.

A. latè explanata, undata. Corallum margine fragile. Superficie inferiore striata; superne laminis erectis (1—3½" altis) coalitis et meandrinis (sæpe 8" longis); collibus elongatis et æqualibus (1—1½" altis et latis) lamellis crassis confertissimis.

Grows in subhemispherical clumps, attached below by its centre. It differs from the other *Agariciæ* in its vertical and coalescing plates. The lamellæ are stout, being greater in thickness than the width of the spaces between them. Corallum thin at the edges, interiorly measuring from three to five lines.

Locality.—Unknown. Dr. T. B. Wilson.

1860.]

Catalogue of Carboniferous Plants in the Museum of the Academy of Natural Sciences, with corrections in Synonymy, descriptions of new Species, &c.

BY HORATIO C. WOOD, JR.

In the ensuing enumeration, it will be seen, that we first give our own decision, followed occasionally by remarks on synonymy, &c.; then the number of specimens with labels previously affixed, in quotation marks; then the locality, as far as known followed either by the name of the donor, or of the collection to which they formerly belonged, and their number in that collection.

The Academy is indebted to Dr. T. B. Wilson for the duplicates of the "Bristol Institute Collection," which form the bulk of the specimens. We do not know whether the numbers on them coincide with the original collection or not.

Those presented by Mr. J. P. Wetherill are especially interesting; many of them being the types of Steinhauer, and all probably having belonged to that author. They are labelled with Steinhauer's names, in the hand writing of Dr. Samuel Geo. Morton.

Besides those here enumerated, there are in the cabinet of the Academy a number of European vegetable reliquæ from various formations. These we had purposed arranging and cataloguing conjointly with the carboniferous; but owing to the press of other engagements must leave them till some future day.

We know of but one other foreign collection in the United States, and the partially arranged American suite of the Academy is large and increasing from day to day. We think it highly important that there should be a standard collection in this country, where investigators may deposit these types, and by comparison with which any disputes that may arise may be settled. The city of Philadelphia, the emporium of the coal trade, is certainly the proper place for this. Moreover, the collection of carboniferous plants, (native and foreign,) is probably much the finest in the country, numbering about a thousand specimens. We would therefore suggest to authors the propriety of sending, as far as practicable, types of their coal plants. We would also ask those living in the coal region, or engaged in the trade, to send specimens to the Academy, and thus forward the best interests of botanical science and practical geology.

Ord. Equisetacea.

Equisetites, Sternb.

E. macrodontus, n. sp.? Stem simple, articulated, obsolete costate; articulations short, swollen at the joints; sheaths multidentate; teeth longer than articulations, contracting at their base, expanded (and united?) above, then rapidly contracting, and terminating in a greatly elongated setaceous point, (?furnished on one border with a second short setaceous point.) Fructification not preserved.

Our specimen is a flattened impression on coal shales, the terminal sheath only being distinct. It is impossible to say with certainty, whether the second points belong to the large teeth, or whether they are the terminations of a smaller set placed between them.

Calamites,* Suckow.

C. radiatus? Brong.

1 specimen "C. radiatus?" In Pennant, Bris. Ins. Coll. No. 64.

C. decoratus, Art.

1 spec. Red Vein, Abersychan. T. B. Wilson, M. D.

2 spec. "Phylolithus sulcatus," Pudsy. J. P. Wetherill.

*Calamites was applied in 1751, (Guett. Mem. Ac. Sc. Par.) to a genus of fossil corals, but as the name is considered pre-Linnæan by authorities in that department of palæontology, and replaced by *Syringopora*, Goldfuss, of course we do not change it as applied to fossil botany.

C. ramosus, Art.

- 1 spec. *C. "nodosus,"* Sternb. Glamorganshire. T. B. Wilson, M. D.
 1 spec. "*Phyt. sulcatus.*" Near Bradford. J. P. Wetherill.
 1 spec. "*C. ramosus,*" Art. Br. Ins. Coll., No. 69.
 ? 1 spec. "*C. with scars of branches.*" Bris. Ins. Coll.

C. Cistii, Brongt.

- 1 spec. "*C. with impression of Sigillaria on the back,*" Radstock. Br. Ins. Coll., No. 82.
 1 spec. J. P. Wetherill.
 1 spec. "*C. Cistii?*" Red Vein, Iron Stone, Abersychan. T. B. Wilson, M. D.

C. dubius, Art.

- 1 spec. "*Phyt. sulcatus,*" Sheffield. J. P. Wetherill.

C. cannæformis, Brongt.

- 1 spec. "*Phyt. sulcatus,*" Near Bradford. J. P. Wetherill.
 1 spec. "*Phyt. sulcatus,*" Pudsy. J. P. Wetherill.
 1 spec. "*C. cannæformis.*" Brist. Ins. Coll., No. 63.

C. approximatus, Br.

- 2 spec. "*C. approximatus.*" In Pennant, Br. Ins. Coll., Nos. 58 and 59.
 1 spec. "*C. approximatus.*" Merthyr. T. B. Wilson, M. D.
 1 spec. "*C. ranceolatus*"!!!
 1 spec. England. Mr. R. E. Griffith.
 1 spec.

C. Steinhaueri, Br.

- 1 spec. Shelf Fork. T. P. Wetherill.
 1 spec. "*C. Steinhaueri,*" Bris. Ins. Coll., No. 78.

C. inæqualis, L. et H.

- 1 spec. "*C. ——— (irregular.)*" Pennant, Bris. Ins. Coll., No. 66.

We have identified this species with some hesitation, as its only distinguishing characteristic, (according to its discoverer,) is its irregularity. Our specimen perfectly possesses that peculiarity!

Besides the above, there are quite a number of foreign specimens of this genus in the cabinet, but, unfortunately, their specific characteristics are not sufficiently preserved for their identification.

Ord. ASTEROPHYLLITÆ.

ASTEROPHYLLITES.

A. equisetiformis, Brong.

- 1 spec. *A. equisetiformis.* England. Br. Ins. Coll., No. 23.

SPHENOPHYLLITES, Brong. (1822).

Sphenophyllum, Brong. (1828). *Rotularia*, Sternb. (1822.)

What influenced Mons. Brongniart in altering his first chosen name, we are unable to divine, unless he did it for the sake of euphony. And why not change Asterophyllites to Asterophyllum, on the same principle? Of course the first name must stand to the exclusion of the more euphonious.

S. erosa, nobis.

- Sphenophyllum, erosum*, L. et H. Foss. Flor. vol. i. tab. 13.
 1 spec. "*Sphenophyllum erosum.*" England. Br. Ins. Coll. No. 15.

S. angustifolia, Germ?

- Sphenophyllum, angustifolium*, Unger. Gen. N. spec. Foss. Plant. p. 71.
 1 spec. England. Dr. T. B. Wilson.

1860.]

TROCOPHYLLUM,* nobis.

Annularia, Sternb.

Annularia being pre-occupied as a generic name, in the sub-kingdom of Mollusca, (Schumacher, Essai Nat. Syst. 1817), we would substitute for it the one given above.

T. fertilus, nobis.*Annularia fertilus*, Sternb.

1 spec. England. J. P. Wetherill, Esq.

Ord. NEUROPTERIDÆ, Br.

NEUROPTERIS, Brong.

N. hirsuta, Lesq.

1 spec. (var. *acutifolia*), little seam under Slivin. T. B. Wilson, M. D.

1 spec. "*N. acutifolia*," Brong. Br. Ins. Coll. No. 103.

1 spec. *N.* ? Br. Ins. Coll. No. 112.

1 spec. (var. *cordata*), T. B. Wilson, M. D.

N. auriculata, Brong.

1 spec. "*N. auriculata* with *P. cyathea*." Br. Ins. Coll. No. 127.

N. Cistii, Brong.?

1 spec. "*N. Cistii*. In a nodule of clay iron-stone." Br. Ins. Coll. No. 128.

This form is, perhaps, only a variety of *N. minor*, nobis. But we have not seen a sufficient number of specimens to enable us to decide with certainty.

N. minor, nobis.

Lithosumunda minor, Lloyd, Lithophylacium, 1760. *Felicites linguarius*, Schloth. Naacht. zur Petref. 1822; ejusdem Flora der Vorwelt, 1804. *N. gigantea*, St. 1821, and *N. gigantea*, *N. Loschii*, *N. rotundifolia*, all of Brong. Prod. 1828.

We do not hesitate in re-uniting these forms, separated by Mons. Brongniart. He says, that he has never seen a specimen of *N. gigantea*, St., yet erects his specimens into new species on such differential characters as, "in the one, the pinules overlap by a little of their border,—in the other, there is a little space between them." Every tyro in recent botany knows that, among the ferns, the same plant varies in its different portions more than this. And we have specimens of this species, less than two inches in length, that do so. That the species of this genus do vary very much, is shown by *N. hirsuta*, Lesq., the several forms of which differ from one another much more than do any of these.†

1 spec. [var. (*flexuosa*). R. E. Griffith.

3 spec. "*N. flexuosa*." On slate. Br. Ins. Coll. Nos. 105, 106?

1 spec. "*N. gigantea*." In nodule of clay iron-stone. Br. Ins. Coll. No. 115.

1 spec. "*N. allied to Loschii*." Br. Ins. Coll. No. 120.

1 spec. "*N. allied to Cistii*." Br. Ins. Coll. No. 125.

*Perhaps some naturalists would consider that this genus should receive the name of Casuarinites, of which division of the old authors it is a section. But their genera of fossil plants were so vague that all modern authorities agree in discarding them. If we revive Casuarinites, Filicites, Phytolithus, &c., must also come again into use, much to the detriment of an already complicated and difficult branch of science. Moreover, as *A. quisetiformis* may be considered the type of the genus of Schlotheim, his name would rather take the place of Asterophyllites.

†Whether botanists agree with us in considering these forms as belonging to one species or not, *N. minor*, nobis, will have to replace *N. Loschii*, Br., and the specific name *minor* thus being pre-occupied, we would suggest *N. parva*, instead of *N. minor*, Lesq. It may be objected by some that *N. minor* is pre-Linnaean, but the tenth edition of his *Systema Naturæ*, in which the binomial nomenclature is employed, was published 1758; and we hold it to be a great injustice to earlier writers to reject their names when they are binomial.

- 1 spec. "N. allied to flexuosa." Br. Ins. Coll. No. 126.
 1 spec. "N. rotundifolia." Br. Ins. Coll. No. 127.
 5 spec. N. ? Br. Ins. Coll.

In these last, the specific name is not given,—the naturalist, apparently, not being able to decide as to them.

CYCLOPTERIS, Brong.

- C. obliqua*, Brong.
 1 spec. "C. obliqua." Clay iron-stone. Br. Ins. Coll. No. 101.
 ? 1 spec. "C. flabellata." Clay iron-stone. Br. Ins. Coll. No. 98.
 ? 1 spec. "C. ———? with N. cordata." R. E. Griffith.
- C. trichomanoides*, Brong.
 1 spec. "C. trichomanoides." Clay iron-stone." Br. Ins. Coll. No. 99.

C. camptonoura, n. sp.

Leaf petiolate, thin sub-cuneate, with margin apparently slightly lobate and serrate; nerves thin, very flexuous, at base of leaf few in number (about twelve), but rapidly and repeatedly forking, so that at margin they are very numerous and close.

The only specimen of this species which we have seen, has the nerves and interior of the leaf, as well as its base, perfectly preserved; but towards the margin, it becomes so indistinct, that we speak with great doubt as to its lobation and serration. The disposition and flexuosity of its nerves separate it widely, however, from all heretofore known species.

Habitat. England. Cab. of Acad. R. E. Griffith.

C. dilatata, L. et H.

- 1 spec. Clay iron-stone. Sheffield. T. B. Wilson, M. D.
 1 spec. Clay iron-stone. England. T. B. Wilson, M. D.

C. trilobus, nobis.

Sphenopteris dilatata, L. et H. *Adiantites trilobus*, Göep. *Cyclop. dilatata*, Sternb.

As the specific name *dilatata* is pre-occupied, *trilobus* will have to be retained.

- 1 spec. Br. Ins. Coll. No. 16.
 1 spec. "Sphen. dilatata." Br. Ins. Coll. No. 85.

NEGERATHIA.

N. flabellata, L. et H.

- 1 spec. England. R. E. Griffith.

Ord. SPHENOPTERIDÆ, Brong.

SPHENOPTERIS.

- S. artemesiaefolia*, Brong.
 2 spec. England. R. E. Griffith.
 1 spec. "Sphen. artemesiaefolia, N. cordata and P. polymorpha." Br. Ins. Coll. No. 68.
- S. elegans*, Br.
 1 spec. Br. Ins. Coll. No. 84.
 1 spec.
- S. affinis*, L. et H.
 2 spec. "S. affinis." Burdiehouse, Edinburg (Carbonif. limestone). Br. Ins. Coll. No. 87.
- S. lunearis*, Br.
 1 spec. England. R. E. Griffith.

1860.]

S. polyphylla, L. et H.2 spec. "*S. polyphylla*." Br. Ins. Coll. No. 88.*S. latifolia*, Brong.1 spec. "*S. latifolia*." England. R. C. Taylor.*S. obtusiloba*, Br.

2 spec. England. R. E. Griffith.

S. Conwayi, L. et H.2 spec. "*S. Conwayi*." Wales. Br. Ins. Coll. No. 88.

HYMENOPHYLLITES, Göep.

H. furcata, Göep.

1 spec. England. R. E. Griffith.

Ord. PECOPTERIDÆ, Br.

GLOSSOPTERIS, Brong.

G. Browniana, Br.

1 spec. Hawkesburg River, New South Wales. Br. Ins. Coll. No. 129.

The nervation is much closer and finer than in Brongniart's figure; but we have no doubt as to the identity of the two plants.

ALETHOPTERIS, Göep.

A. lonchitidis, Sternb.1 spec. "*P. candoliana*." Br. Ins. Coll. No. 153.6 spec. "*P. lonchitica*." In nodules of clay iron-stone. Br. Ins. Coll. No. 154.

1 spec. Philadelphia Library Company.

A. Serlii, Göep.8 spec. "*P. Serlii*." Br. Ins. Coll. Nos. 155, 161, 159, 162, 166, 167.1 spec. "*P. Serlii*." Somersetshire.3 spec. "*P. Serlii*." Camerton. Br. Ins. Coll. Nos. 158, 160.2 spec. "*P. Serlii*." Radstock. Br. Ins. Coll. No. 104.*A. heterophylla*, Göep.1 spec. "*Asterophyllites equisetiformis* with *P. heterophylla*." Br. Ins. Coll.

PECOPTERIS, Brong.

P. oreopterodes, Br.1 spec. "*P. oreopteroides*." Br. Ins. Coll. No. 153.? 1 spec. "*P. villosa*." Br. Ins. Coll. No. 142.*P. polymorpha*, Br.1 spec. "*P. polymorpha*." Br. Ins. Coll. No. 144.1 spec. "*P. polymorpha*." Sheffield.? 1 spec. "*Pecopteris*." Br. Ins. Coll. No. 175.1 spec. "*P. Miltoni*." Br. Ins. Coll. No. 140.1 spec. "*P. Cistii*." Radstock. Br. Ins. Coll. No. 151.1 spec. "*P. pteroides*?" Br. Ins. Coll. No. 138.*P. lepidorachis*, Br.1 spec. "*P. lepidorachis*." Br. Ins. Coll. No. 111.*P. unita*, Br.1 spec. "*P. unita*." Br. Ins. Coll. No. 118.*P. Pluckenetti*, Br.1 spec. "*P. Pluckenetti*." Br. Ins. Coll. No. 147.*P. pennæformis*, Br.1 spec. "*P. pennæformis*." Br. Br. Ins. Coll. No. 141.

- P. dentata*, Br.
 1 spec. "*P. dentata*." Br. Ins. Coll. No. 136.
 ? 2 spec. Br. Ins. Coll. Nos. 135 and 174.
- P. cyathea*.
 3 spec. "*P. cyathea*." Br. Ins. Coll. Nos. 148 and 152.
 1 spec. "*P. villosa*." Br. Ins. Coll. No. 149.
- P. arborescens*, Br.
 2 spec. "*P. arborescens*." Br. Ins. Coll. Nos. 132 and 133.
- P. muricata*, Br.
 7 spec. Pembrokeshire. Br. Ins. Coll. Nos. 131-160.

Ord. LEPIDODENDRÆ.

LEPIDODENDRON, Sternb.

- L. obovatum*, St.
 ? spec. "*L. elegans*." Br. Ins. Coll. No. 190.
 1 spec. "*Phytolithus cancellatus*." York. Mr. J. P. Wetherill.

L. dichotomum, Sternb.???

We label these specimens thus, solely on account of their being so labelled in England. Sternberg first described the plant with the name of *Lycopodites dichotomum*, giving an exceedingly indefinite figure and a worse description. Brongniart, in his prodrome, placed it in its proper genus,—changing its specific name to *Sternbergii*. In his Vers. ii. Sternb. again figured it, under the name of *Lep. dichotomum*. To this work we have not been able to gain access. But Unger, in his Genera and Species of Fossil Plants, has given a description, drawn, we suppose, from it. It is worthy of remark that this description does not agree with the figure first published by Sternberg! Nor does either of the two figures in the Fossil Flora, which also differ one from another!! In such a chaos, we are unable to decide what are the specific characters, or even whether there are any. If the two figures published by Lindley & Hutton belong to the same plant, we see no character by which *L. dilatatum*, of the same authors, can be separated from them. From some unknown cause, Unger does not notice *L. dilatatum*, neither as a good species, nor yet as a synonym.

- 4 spec. "*L. Sternbergii*." England. T. B. Wilson, M. D.
 2 spec. "*L. dilatatum*." England. T. B. Wilson, M. D.
- L. aculeatum*, Sternb.
 1 spec. "*L. obovatum*." England. ?
 1 spec. England. ?

L. imbricatum, Sternb.?

- 1 spec. "*L. allied to veltheimianus*." Br. Ins. Coll. No. 187.

L. caelatum, Sternb.

Sagenaria caelata, Br., *Phytolithus cancellatus* of Steinhauer, Phil. Trans., vol. i. (new series,) pl. 6, fig. 2, 1818; but not *Phyt. cancellatus* of Martin, Petrefacta Derbiensia, pl. 13, fig. 1, 1809, nor *Phyt. imbricatus* of same author, to which Steinhauer refers as identical with his *Phyt. cancellatus*, nor either of the two species referred to by Steinhauer, in Parkinson, Organic remains, pl. 1, fig. 6, pl. 2, fig. 4. We have not been able to find the description or names for these in Parkinson's Org. Rem. But as there are no descriptions of, or names to the plates, and also no index to the work, they may be named somewhere incidentally; which, in such a mass of text, we have not been able to find. Never having seen either Sowerby's British Mineralogy, or Volkman, Siles. Subterr., we can not say as to the identity of *Phyt. cancellatus* of those authors. But we have scarcely a doubt that they also differ, specifically, from all others, and amongst 1860.]

themselves. In such a case as this, of course it is useless to attempt to revive the old name.

1 spec. "*Phytolithus cancellatus*." (Steinhauer's type.*) Astercliffs, York. J. P. Wetherill.

L. rimosum, Sternb.

1 spec. "*L. allied to rimosum*." Frenchay. Br. Ins. Coll. No. 199.

1 spec. "*L. allied to rimosum*." England. T. B. Wilson, M. D.

1 spec. "*L. rimosum*." Br. Ins. Coll. No. 198.

L. ——— ?

25 spec. of branches, variously labelled, and mostly from Br. Ins. Coll.

Besides the above, there are quite a number of specimens belonging to the genera *Lepidodendron* and *Sigillaria*, with various labels, but which do not possess any specific character.

ULODENDRON.

U. parmatus, nobis.

Phytolithus parmatus, Steinhauer. Amer. Philos. Trans. vol. i. (new series,) pl. 7, fig. 1. Not *Phyt. parmatus* of same author, pl. 6, fig. 1.

1 spec. "*Phytolithus parmatus*" (Steinhauer's type). Shelf, near Bradford. J. P. Wetherill.

CYCLOCLADIA, L. et H.

C. ? Huttonia, nobis.

Phytolithus parmatus, Sternb. Am. Phil. Trans. pl. 6, fig. 1. *Cyclocladia majus* and *C. minor* of Lind. et Hutt.

1 spec. "*Phyt. parmatus*" (Steinhauer's type). Shelf, York. J. P. Wetherill.

If this genus, as is very probable, should prove to be merely the decorticated state of *Ulodendron*, this plant will be *Ulodendron Huttoni*, nobis.

SIGILLARIA, † Brongt.

Sub-genus CLATHRÆ, Br.

S. ornata, Br.

2 spec. "*S. ornata*." Br. Ins. Coll. No. 238.

1 spec. "*S. serlii*," Br. Ins. Coll. No. 240.

Sub-genus PHITODOLEPIS, Brong.

S. notata, Wood.

Phytolithus notatus, Steinhauer. *S. elliptica*, Br. (*S. notata*, Br.)?

We have but little hesitation in uniting these forms. If *S. notata*, Brong., is distinct from *S. elliptica*, Brong., it is also distinct from *Phytolithus notatus*, Steinhauer, which is identical with *S. elliptica*. The sharp angles and prolongations from them, mentioned by Brongniart as characterizing *S. notata*, Brong., do not exist, either in Steinhauer's figure, or in specimens in possession of the Academy, which, in all probability, are Steinhauer's types.

* Were it not for the possession of this type, we would not, perhaps, be warranted in giving so positively the synonymy of this species; but having this, we are enabled to decide regarding the points above given.

† In our classification of this genus we shall follow Goldenburg (*Die Pflanzen, des Steinkolen, von Saarbuck, 1857*), and reduce the genera indicated by us (*Pr. A. N. S. 1850*), to the rank of sub-genera. Although we have some hesitation as to the propriety of this, yet it is, perhaps, the better course, as these sub-genera approximate in indefiniteness to the genus *Sigillaria*. They have, without doubt, the same value as *Syringodendron*, and, in our opinion, the *Sigillaria* constitutes an order, and the present sub-genera the genera of it; but the weight of authority is against this. Under this classification the American forms described by us will stand—*S. perplexa*, *S. camptotaenia*, *S. solanus*, *S. magnifica*, *S. psilophloeus*.

We have, however, specimens so directly intermediate between *S. notata*, Br., and *S. elliptica*, Br., that we think the two species must be united. If not, *S. notata*, Br., will require a new name, and we would suggest *S. Brongniartii*.

2 spec. "*Phytolithus notatus*." Yorkshire. J. P. Wetherill. Probably part of Steinhauer's collection, and labelled in the same hand writing as his other types, as well as presented by the same individual.

1 spec. "*S. reniformis*?" T. B. Wilson, M. D.

S. orbicularis, Brong.

1 spec. "*S. orbicularis*." Br. Ins. Coll. No. 242.

? 1 spec. Br. Ins. Coll. No. 243.

This specimen has the scars very much closer than in any figure we have ever seen; but we scarcely doubt its belonging to this species.

S. transversalis, Brong.

1 spec. "*S. transversalis*." Br. Ins. Coll. No. 205.

S. pachyderma, Brong. (Decorticated.)

1 spec. "*S. pachyderma*." Radstock. Br. Ins. Coll. No. 214.

S. reniformis, Brong. (Decorticated.)

6 spec. "*S. reniformis*." Br. Ins. Coll. Nos. 220, 222, 223.

S. nodosa, nobis.

Favularia nodosa, L. et H.

1 spec. "*Favularia nodosa*." Br. Ins. Coll. No. 253.

S. tessellata, Brong.

1 spec. "*Phytolithus tessellatus*." Shelf, near Bradford. (Steinhauer's type.) J. P. Wetherill.

S. Knorii.

2 spec. England. R. E. Griffith.

1 spec. "*S. elegans*." Br. Ins. Coll. No. 241.

1 spec. Aberyschan. R. C. Taylor.

Sub-genus DITAXIS, Wood.

S. alternans, L. et H.

1 spec. "*S. allied to alternans*." Br. Ins. Coll. 218.

ULODENDRON, Rhode.

U. parmatum, nobis.

Phytolithus parmatum, Steinhauer.

LEPIDOSTROBUS, Brong.

L. variabilis, L. et H.

2 spec. England. R. E. Griffith.

Description of Several New Species of Plants.

BY S. B. BUCKLEY.

Trillium Texanum.—Leaves ovate-oblong, obtuse, sessile, smooth, or subpubescent, longer than the peduncle. Petals white, ovate-lanceolate acute, nearly equal or shorter than the sepals. Sepals oblong-ovate, obtuse. Plant 6-9 inches high, leaves 1½-2 inches long, 5 lines wide. Peduncle 6 lines long. Sepals 6 lines long, and 2 lines wide. Such is the size of a medium specimen. Flowers in March.

Banks of streams and low grounds. Panola County, Texas.

Æsculus arguta.—Fruit covered with prickles. Stamens erect, or slightly
1860.]

curved, much longer than the pale yellow corolla. Calyx campanulate, divisions obtuse, pedicels short, whole panicle subpubescent. Flowers dense. Leaflets 7, glabrous, ovate-lanceolate, acute at both ends, sharply and unequally serrate. Shrub 3-5 feet high, with a smooth bark. Flowers in March. Panicles 4-6 inches long. Leaflets 2-4 inches long.

Hills in the vicinity of Larissa, Texas.

Halesia reticulata.—Leaves broad-ovate, pubescent on the midribs, scabrous, obscurely dentate, teeth small, acute, under surface of leaves pale, much reticulated. Fruit 4-winged, two lateral wings double in width the others. Style long, mucronate. Leaves 4-5 inches long and 2-3½ inches broad. Fruit smooth, 1-1½ inches long, and 6-7 lines broad. Pedicels 5-7 lines long. Small trees, branches smooth, bark of trunk light gray, furrowed.

Banks of streams tributary to the Red River, above Nachitoches, Louisiana.

Fraxinus Nuttallii.—Leaflets 5-7, lanceolate, acute at both ends, irregularly toothed, upper surface smooth, under surface pale and subpubescent along the midribs, short-stalked, petioles long, glabrous, fruit ovate-lanceolate, three-winged acute at both ends, branches smooth, bark of trunk gray, and furrowed. Fruit about 2 inches long, by 5 lines broad. Leaflets 3-4 inches long by 1 inch broad, sometimes unequal at base.

In swamps, Wilcox County, Alabama. Small trees about 6 inches in diameter, and 20-25 feet high. As Nuttall had not material for a complete description, none can tell what is meant by his *Fraxinus triptera*; but as possibly he may have intended the tree now described, I call it Nuttall's Ash.

Carya Texana.—Leaflets 7-9, broad-ovate, or ovate-lanceolate, sharply serrate, smooth on both sides, paler beneath, acute at apex, subobtuse or acute at base. Staminate and pistillate catkins subpubescent. Fruit globular, slightly 4-angled. Shell thin, separating to the base. Trees three to four feet in diameter, and forty to fifty feet high. Bark of trunk very thick, deeply and irregularly furrowed, not scaly. Leaflets 6-8 inches long, and 2-3 inches broad.

Dry soil. Common in Upper Louisiana, and in Texas extending as far west as Atacosa County. "Thick bark, hickory."

Quercus Shumardii.—Leaves oblong, or obovate in outline, smooth, deeply sinuate-pinnatifid, sinuses broad, convergent, 3-5 on each side, lobes many-toothed, teeth sharply and setaceous acute. Acorn globular, or ovoid-oblong, subacute, cup shallow, slightly turgid, scales acute. A large tree with shining deep green leaves, those on the upper portion of the tree being much and deeply lobed. The lunas are generally deeper near the petiole than towards the apex of the leaf. Acorn resembles *Q. rubra*, but is more acute, 1-1½ inch long, and 6 lines to 1 inch broad. Limbs, trunk and branches much like the water-oak, *Q. aquatica*. Wood yellowish-white, fine grained, and esteemed for rails, boards, and the frame-work of buildings. I have measured specimens which were six feet in diameter, with an estimated height of 70-80 feet. Its leaves retain their greenness long after the first frosts, when those of the frost-oak, black-jack and scarlet-oak are dead.

It occurs in Upper Louisiana, Eastern and Middle Texas. Shumard's Oak. In honor of Dr. B. F. Shumard, State Geologist of Texas.

Quercus Texana.—Leaves ovate-oblong in outline, smooth, both sides deeply sinuate-pinnatifid, with broad, divergent sinuses, 3-5 on each side, lobes 1-3 toothed, teeth acute setaceous. Nut ovoid, oblong, acute, cup hemispherical, slightly turgid, scales acute, closely appressed. Tree 3-5 feet in diameter, and 60-70 feet high, branches smooth, bark of trunk of a dark slate color, slightly furrowed, very like *Q. phellos* and *Q. aquatica*, with which it is often associated. Lower leaves of this tree with lobes often truncate, while the upper leaves have deep, broad, divergent sinuses, and the

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upper lobes prolonged somewhat like those of *Q. falcata*. Like the water and willow-oaks, its leaves are green during the first of winter. Acorn about 1 inch long, and $\frac{1}{2}$ – $\frac{3}{4}$ inch broad. Leaves 4–8 inches long by 3–5 wide. A beautiful tree, with dense, deep green foliage. Wood close-grained, white, or of a light red color, and used for similar purposes as the Shumard Oak.

Quercus Durandii.—Leaves obovate, entire, or slightly 3-lobed at apex, with rudiments of one or more lobes at the margins, lobes very obtuse. When mature, smooth on both sides. Acorn round, or ovoid rotund. Cup very shallow, scales acute, closely appressed. Leaves 3–4 inches long, 1–2 inches wide. Acorns $\frac{1}{2}$ – $\frac{5}{8}$ inch long, about $\frac{1}{2}$ inch wide, scarcely one-eighth of an inch being included in the cup. Tree 2–3 feet in diameter, and 40–50 feet high. Bark of trunk, and branches light gray, scaly, resembling the white oak (*Q. Alba*). The leaves are mostly entire, varying from obovate to oblong-ovate. Wood white, close-grained, and very tough. It is o'ten worked into splints for baskets to hold the picked cotton. Used for farming utensils, and sought after to make screws for cotton gins. Called "Basket Oak," and "Bastard White Oak."

Wilcox County, Alabama, Upper Louisiana, and Middle and Southern Texas. Durand's Oak. In honor of E. Durand, of Philadelphia.

Quercus annulata.—Leaves broad-ovate, entire or irregularly and sparingly lobed, sinuses shallow, divergent lobes very obtuse, upper surface smooth and bright green, under surface pale, smooth, or subpubescent, petioles short. Acorn oblong-ovoid, with a depressed ring near the apex. Style cylindrical, long, truncate, cup shallow, one-third the length of the acorn. Acorn 5–9 lines long, and 3–4 lines broad. Leaves 2–4 inches long, mostly lobed. Bark of trunk and branches light gray, scaly. Small tree or shrub, bearing a great abundance of acorns.

Common on the rocky limestone hills in the vicinity of Austin, Texas.

Note on Quercus coccinea.

In Upper Louisiana and in Eastern Texas, last autumn, I often found *Q. coccinea* with acorns depressed at the summit and leaves agreeing exactly with Michaux's figure of that species, the accuracy of which has been questioned by some boanists. It had not the scarlet leaves after frost which is said to be characteristic of that species. Its bark is a dark gray or slate color, deeply furrowed, and wood porous, of a reddish cast, and esteemed of little use.

Myrmica (Atta) molefaciens, "Stinging Ant," or "Mound-Making Ant," of Texas.

BY S. B. BUCKLEY.

Neuter.—Color reddish-brown, labium brownish-black, mandibles subfalcate serrate, triangular, blackish-brown. Antennæ two-jointed, the anterior joint clavate, hairy, head disproportionately large, upper side rotund, occiput truncate, under side of head longitudinally concave, with a dark line extending along the middle of the cavity, mentum somewhat hairy, eyes black, thorax triangular, compressed, prothorax large, with a slight knot on the upper part of each side, metathorax upper side two-spined, pedicel long, two-knotted, anterior knot inclined forwards, legs long, slender, tarsi two-clawed, abdomen smooth, smaller than the head, ovate, slightly hairy near the sting. Female has head like the neuter, excepting its front is slightly hooded, thorax oval, or rhomboidal in outline, knotted, compressed, slightly hairy, metathorax has rudimentary spines, abdomen ovate, smooth on the upper part, with a few scattering hairs on the under side. Wings not extending beyond the abdomen.

These ants are the most numerous of any in Texas, where they have frequent

abodes in paths and roads, on the prairies and in the fields and woods. They form their habitations in the ground, where they have many apartments connected by tunnels about an inch in diameter. Some of their cellars have deep shelves on all sides, where their food is stored. Their rooms are rarely found at a greater depth than six feet, nor do their cavities often extend over a greater area than from four to six feet diameter, over which, at the surface, there is generally a more or less conical mound, sometimes as high as three feet, with a principal entrance at its summit. This mound is merely the dirt brought to the surface when they are making their tunnels and cellars. Many of their dwellings have no mound at the surface, it having been washed away by rains, and also either levelled by the hand of man or the feet of animals. We first noticed the exodus of their males and females on the twenty-seventh of last July, when the whole community were in a violent commotion. Then the males and females issued from their doors in great crowds. Some flying away, while others were seized by the neuters and dragged struggling off. During the following month the females began to form new columns, commencing by a few neuters joining a female and digging a small hole to shelter her. This is daily and nightly enlarged, until its inhabitants and rooms become so numerous that it also sends forth swarms of females, and neuters to found new cities.

Their chief food is the seed of various plants and grasses, but, like most ants, they also eat flesh. They boldly attack all beetles and worms who venture near their doors, when great numbers seize the unlucky intruder, and, if it be a beetle, its legs are seized and body covered with ants, who bite and sting at the same moment, by which the beetle is soon killed, unless at the first he flies; and we have seen beetles fly away with ants hanging to their legs, nor did the ants let go, at least while the beetle was in sight. The stinging ant does not work during the hot sunshine; but they labor at night and during the cool of the day. On cloudy days their work continues. Indeed, night is the busy time, among all or nearly all of the ants of Texas. Seeds of various grasses and flowers are the principal food of the stinging ants, who, in seed-time during the summer, lay up stores of food for the winter season, when "Northers" come and storms rage, and confine the ants within doors sometimes a week or more at a time. One of their habitations in Dr. Linsecom's garden, at Long Point, in Washington County, Texas, was dug into to the depth of about two feet, and large quantities of water thrown in to destroy the ants. They recovered, and for several days after were busily engaged in bringing their store of seeds to the surface to dry. A part of these, by heat and moisture were sprouted, and unfit for preserving for future use, and these, when dry, were not taken back to their cellars. Most of the seeds were those of a species of geranium (*Erodium Texanum*). Miss Sallie Linsecom, a daughter of the Doctor, went into the garden daily to see the ants bring out their store of seeds, which she told us were more than half a bushel.

Mr. C. G. Caldwell, who resides on the Colorado river, about eighteen miles below Austin, has lately been digging in order to exterminate a nest. While there, recently, we became acquainted with the shape of their cellars and winding tunnels. Their apartments are rarely more than six or eight inches in diameter, with shelves, as before stated. Often a tunnel descends vertically to a room, then horizontally to another apartment, then up nearly perpendicularly to other cells, which last rarely become wet even by very heavy rains. Mr. Caldwell assured us that he had often seen their shelves full of seeds. By such an arrangement of their rooms they avoid storing seeds in heaps where they would be apt to spoil. During a very heavy rain at Cedar Creek Post-office, in Bastrop County, that whole region seemed to be flooded; and we waited with some impatience for the storm to abate, in order to see its damage to the ant,—the stinging ants having many nests in a prairie, which the rain had covered with water. Next day we saw them bringing to the surface

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grass seeds to dry from their cellars. Every ant-hill in the vicinity had more or less seed strown around their outer doors. A few days later we visited the same locality, and the seeds had disappeared,—having doubtless been stored away again by the ants.

They cannot carry as heavy burdens as the cutting ant (*Myrmica Texana*), nor do they, like that ant, place their load upon their backs, but carry it with their mandibles and head; and, whatever they wish to take home, is, if too large, cut into segments to be thus transported.

The stinging ants are generally peaceable in their habits, rarely fighting with other species, or among themselves. In one or two instances we have noticed two different houses, situated a few rods distant, connected by a well beaten path, along which ants were passing back and forth, from one house to the other, in the greatest harmony; but one of these may have been a colony founded by the other.

Once we noticed two of these ants, which probably belonged to different houses, combating in an ant-path, along which a few ants were passing to and fro. Occasionally one of these would stop a moment, look at the contest and pass on. The struggle was obstinate and long. We became tired of the sight, and, after considerable trouble, succeeded in parting them,—both being quite lame. One we put far away, and left the other walking slowly around in search of his enemy, when, on reaching the path, he seized the first ant he met, and the fight was more animated than ever,—one of the parties being robust and untired. Suddenly they stopped, looked a moment, and then began caressing each other, soon after which they started side by side for their town, not far distant. It seemed as if the first fighter, blinded by rage, had lastly fought his own brother. We have been stung several times by them, and think the pain about equal to that caused by the sting of the honey-bee.

Descriptions of New Carboniferous Fossils from Illinois and other Western States.

BY F. B. MEEK AND A. H. WORTHEN,

Of the Illinois State Geological Survey *

Z O O P H Y T A .

SPHENOPOTERIUM, (new gen.)

σφην, a wedge; *πότηριον*, a cup.

Corallum free, (or attached?) cuneate or irregularly subturbinate, and provided with a few large inseparable cells, which increase in number by lateral and interstitial development. External wall rather dense, but perforated by a few pores, which seem to terminate in the cancellated substance of the coral without reaching the cells; surface marked by numerous fine, anastomosing striæ. Cells circular, or when crowded, more or less angular; without diaphragms, columella, or well developed rays, their walls being merely marked by distinct vertical striæ, and pierced by numerous pores which appear

*Illustrations with more extended descriptions, remarks, &c., to appear in the forthcoming report of the Illinois survey.

NOTE.—While investigating the fossils described in this and our paper published in the last number of the Proceedings, we have been placed under many obligations to the Secretary of the Smithsonian Institution, for the free use of the extensive collections of works on Palæontology, Geology, and various branches of Natural History, belonging to the Smithsonian library. Also, for the use of rooms in the Institution, and for access to the large and rapidly accumulating geological and palæontological collections in the Smithsonian Museum.

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to terminate in the porous substance of the corallum, between the cells, without directly connecting them.

This small group of corals appears to be more nearly related to *Cyathocoris*, of Edwards and Haime, than to any other genus, either recent or fossil, with which we are acquainted. It differs, however, in having the outer walls perforated, and in being destitute of distinct rays, as well as in the peculiar wedge-like form of the base of the corallum, which is also usually, if not always, free instead of attached. We regard the first of the following species as the type of the genus.

SPHENOPOTERIUM OBTUSUM.—Corallum short, abrupt cuneiform, wider than high; base carinate, nearly straight, or very slightly sinuous in the middle; sides expanding rapidly upwards from the keel. Cells from four to about nine, comparatively large, generally rather deep, conical, and where not more than four or five, rounded, and separated by thick interstices, but becoming angular, with thin intervening partitions, where more crowded. Surface striæ fine, and showing a tendency to converge towards the middle of the base, often anastomosing, so as to form a kind of shagreen-like style of ornament.

Length or height of a large specimens with nine cells, inch; breadth, inch; thickness, inch; diameter of one of the cells, 0.29 inch.

Locality and position.

SPHENOPOTERIUM COMPRESSUM.—Corallum compressed, wider than high, carinate on each lateral margin, and apparently retaining a scar of attachment at the middle of the base; sides sulcate between the cells, widening rapidly upwards on the edges, and very gradually on the sides. Cells three or more, comparatively large, rather deep, rounded, with thin walls; arranged in a row parallel to the longer transverse diameter of the corallum. Surface finely shagreened by the anastomosing of the striæ.

Length or height, 0.57 inch; breadth, 0.93 inch; thickness, 0.35 inch; diameter of cells, 0.26 inch.

It is possible this may be a variety of the preceding species, though its compressed form, thinner walls, and lateral carinæ, give it quite a different aspect.

Locality and position. Same as last.

SPHENOPOTERIUM ENORME.—Corallum small, subglobose, obtusely subtrubinate; rounded, and apparently retaining some remains of a scar of attachment at the base. Cells four or more, rather irregularly disposed, circular, and moderately deep. Surface slightly more coarsely marked than the last, but otherwise similar.

Height, 0.45 inch; transverse diameter about 0.43 inch; breadth of cells, about 0.18 inch.

Locality and position. Rockford, Indiana, from beds probably of upper Devonian age, but containing Carboniferous *Goniatites*.

SPHENOPOTERIUM CUNEATUM.—Corallum compressed, cuneate, longer than wide, base sharp, a little rounded on the lateral edges. Cells from two or three, to five or six, rather deep, arranged alternately on each lateral edge, and directed obliquely outward and upward; rounded or somewhat oval at the aperture, and more or less compressed towards the base; sometimes having one or two slightly prominent ridges extending part of the way up the sides; punctæ of the walls numerous and distinct. Surface striæ fine, closely arranged, rather regular, and minutely crenulate, directed obliquely inward and downward from the cells, and passing more or less nearly parallel to each other to the base, on the lower flattened half.

Length, 0.75 inch; breadth, 0.43 inch; thickness, 0.21 inch; diameter of cells, about 0.15 inch.

Locality and position. Spurgen Hill, Ia. From beds generally considered on parallel with the Warsaw Limestone.

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E C H I N O D E R M A T A .

ASTERIDÆ.

Genus PALASTERINA, McCoy.

Subgenus SCHOENASTER.

The specimens of the beautiful star-fish, upon which we propose to found this subgenus, are unfortunately not in a condition to enable us to work out fully the details of its structure. As far as can be determined, however, it agrees in most of its characters with *Palasterina*, though it differs from the typical species of that genus (*Uraster primævus*, Forbes) in having the adambulacral plates arranged with their longer diameter directed obliquely outward, instead of at right angles to that of the rays. This oblique arrangement, or lateral imbrication of these pieces, gives to each range, as seen from below, a peculiar twisted or rope-like appearance, which suggested the name *Schoenaster* (σχῶνις a rope, ἀστὴρ, a star.)

Although we place it for the present as a subgenus under *Palasterina*, we think it more than probable that when better specimens can be examined, it will be found to present other differences of sufficient importance to entitle it to rank as a distinct genus, in which case it can retain as a generic name that by which we have designated it as a subgenus.

PALASTERINA (SCHOENASTER) FIMBRIATA.—Body depressed, pentagonal, the angles being extended into narrow, acutely pointed rays or arms, which are convex above, and about equal in length to the diameter of the disk. Upper side of the disk and arms composed of small, solid, convex, or somewhat tumid plates. Ambulacral furrows deep; rather narrow, and bounded on each side by the single row of oblique adambulacral pieces, which also form the sides of the arms, beyond the disk, where some six or seven of these pieces occupy a space of 0.35 inch. Disk apparently not provided with a regular range of marginal pieces; concave in outline between the rays, where it is, like the sides of the arms, fringed by a single range of short, lanceolate spines.

The plates forming the upper side of the rays near the disk, are hexagonal, pentagonal, or irregular in form, and consist of about five or six ranges between the marginal rows, with a few much smaller intercalated pieces. Farther out they gradually pass into two mesial ranges of oblong, alternating pieces, arranged with their longer diameter parallel to that of the ray; and two series of much smaller, pentagonal or hexagonal alternating plates on each side, between the middle ranges and the adambulacral rows. Towards the extremities of the rays, these two ranges of small pieces on each side diminish in size, and at last become obsolete, leaving only the adambulacral and middle ranges.

None of the specimens are in a condition to show the form and arrangement of the plates forming the disk, nor the position of the vent and madreporiform plate. Near the extremities of the arms the dorsal pores, which are comparatively small, pass chiefly between the ends of the oblong plates, forming the two mesial ranges; but farther in, towards the disk, they seem to be somewhat irregularly distributed. There appear to be five bilobate, oral pieces, but we suspect each of these is divided by a close fitting suture, so as to make ten in the entire series.

Greater diameter, 2.37 inches; lesser do., 0.89 inch; breadth of ambulacral furrows, about 0.10 inch; length of marginal spines, 0.07 inch.

Locality and position. St. Clair county, Illinois. St. Louis Limestone of Lower Carboniferous series.

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MOLLUSCA.

BRACHIOPODA.

Genus CHONETES, Fischer.

CHONETES PLANUMBONA.—Shell of medium size, nearly semicircular; length from two-thirds to three-fourths the breadth; hinge line about equalling the greatest breadth; front rounded, or forming with the sides a nearly semicircular curve; lateral margins intersecting the hinge at right-angles, or sometimes very slightly sinuous near the ears. Ventral valve gibbous, most convex in the middle, and flattened at the umbo, destitute of any traces of a mesial sinus; ears a little compressed; cardinal margin sloping slightly from the beak, on each side of which it is armed with five or six spines; area of moderate breadth; foramen broad, triangular, the upper angle being rounded. Dorsal valve concave, or following nearly the curve of the other valve; cardinal process moderately prominent, nearly or quite closing the foramen of the opposite valve; interior without a prominent mesial ridge, rather distinctly granulose, the granules being arranged in radiating lines; visceral scar rather large; impressions of adductor muscles small and deep. Surface of both valves apparently smooth or only marked by obscure undulations of growth, but showing under a lens nearly obsolete traces of depressed rounded radiating striae, crossed by minute concentric lines or wrinkles.

Length 0.42 inch; breadth 0.49 inch; convexity 0.16 inch.

Locality and position. Monroe County, Illinois. Keokuk Limestone of Lower Carboniferous series.

Genus PRODUCTUS, Sowerby.

PRODUCTUS NANUS.—Shell very small, nearly hemispherical; hinge about equalling the greatest breadth; anterior side regularly rounded; sides intersecting the hinge nearly at right-angles. Ventral valve gibbous, without any traces of a mesial sinus; ears triangular, convex, and moderately distinct from the swell of the visceral region; umbo convex, incurved, and apparently extending slightly beyond the hinge line. Surface ornamented by comparatively large, rounded, radiating costae, which more than equal the depressions between, on the convex part of the valve, but decrease in size, and become more numerous by division, and the implantation of others between, around the anterior slope; crossed by numerous very fine concentric striae, only visible under a lens. The visceral region is also marked by moderately distinct rather regular wrinkles, while the bases of a few scattering spines are seen on the anterior slope. (Dorsal valve unknown.)

Length 0.37 inch; breadth 0.45 inch; convexity 0.25 inch.

Locality and position. Jefferson County, Iowa. Lower Coal measures.

PRODUCTUS PARVUS.—Shell rather small, nearly hemispherical, without any traces of a mesial sinus; length and breadth nearly equal; hinge about equalling the greatest breadth; front rounded; sides sometimes slightly sinuous near the ears. Ventral valve gibbous, regularly arched, not depressed in the visceral region; beak incurved a little beyond the hinge; ears small, convex, nearly rectangular at the extremities of the hinge, moderately distinct from the swell of the umbo. Dorsal valve deeply concave, particularly in the middle and towards the beak. Surface of both valves ornamented by numerous small, rounded, rather closely arranged, occasionally bifurcating striae, about six of which may be counted in the space of one-tenth of an inch. Spines erect, apparently confined to the ventral valve, each ear of which supports some seven or eight, while there are usually about three times that number scattered around the anterior and lateral slopes. Sometimes very

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obscure traces of small concentric wrinkles are indistinctly visible near the beak and on the ears, particularly of the ventral valve.

Length 0.59 inch; breadth 0.60 inch; convexity of ventral valve 0.34 inch.

This shell might be mistaken for an imperfect specimen of *P. fasciculatus* of McChesney, from which species it differs, however, in having finer striae, a more deeply concave dorsal valve, and in being always destitute of a mesial sinus in the ventral valve. When good specimens of these species can be compared they may be distinguished at a glance, by the more extended anterior, and the fasciculate character of the striae upon that part of the shell in *P. fasciculatus*.

Locality and position. Chester, Illinois. Chester, Limestone of Lower Carboniferous series.

PRODUCTUS SCITULUS.—Shell small, gibbous, wider than long, hinge line rather more than equalling the breadth of the central part of the valves; anterior side rounded, or sometimes a little flattened; sides rounding to the front, and somewhat contracted near the ears. Ventral valve gibbous, rather strongly arched, moderately produced, and presenting scarcely any indications of a sinus; ears triangular, convex, or somewhat vaulted, and separated from the swell of the umbo and the prominent visceral region, by a rather distinct rounded depression; beak convex, incurved and apparently extending a little beyond the hinge line. Surface marked by numerous fine, regular, radiating striae, about seven of which may be counted in the space of one-tenth of an inch; crossing these there are on the visceral region small, irregular concentric wrinkles; a few scattering bases of spines are also sometimes seen on the anterior slope (in casts), where two or three of the striae become more prominent than the others. (Dorsal valve unknown).

Length, from beak to anterior slope, 0.36; do., from beak to anterior margin, measuring over the curve of the ventral valve, 0.45 inch.

Locality and position. Alton, Illinois. St. Louis Limestone, of Lower Carboniferous series.

Genus RHYNCHONELLA, Fischer.

RHYNCHONELLA SUBTRIGONA.—Shell rather above medium size, trigonal subglobose, wider than long, truncated in front, and on each postero-lateral slope; anterior margins of the valves sharply and deeply serrated. Ventral valve nearly flat, or arching a little from the umbo along the middle towards the front, on each side of which the antero-lateral margins are at first elevated, then very abruptly deflected toward the other valve; front curving down nearly at right-angles to the plane of the valve, and extended so as to fill a broad, deep, rather rounded sinus in the front of the other valve; postero-lateral margins very abruptly deflected downwards; beak small, rather pointed, incurved, and extended somewhat beyond that of the other valve; mesial sinus broad, shallow, undefined, and not extending more than half-way back from the front. Ventral valve gibbous, elevated in the middle near the anterior side, thence sloping abruptly, with a moderately convex outline to the beak; antero-lateral and lateral margins curving strongly to meet those of the opposite valve; mesial fold not well defined. Surface of each valve ornamented by from eighteen to twenty-four rather rounded plications, about four or five of which occupy the mesial sinus and fold; fine obscure, concentric striae are also seen on well-preserved specimens.

Length (of a medium-sized rather gibbous specimen), 0.90 inch; breadth 0.98 inch; convexity 0.91 inch.

Locality and position. Keokuk Limestone, Warsaw, Illinois.

Genus ATHYRIS, McCoy.—SPIRIGERA, D'Orbigny.

ATHYRIS PARVIROSTRA.—Shell of medium size, subquadrate, moderately gibbous, length and breadth about equal, sometimes a little wider than long; 1860.]

greatest convexity near the middle of the valves, which are equally convex. Lateral margins rather narrowly rounded in the middle, thence converging with a slightly convex outline to the middle of the front, which is faintly subtruncate; from the most prominent part of the lateral margins, they converge to the beaks at an angle of about 97° . Both valves without a distinct mesial fold or sinus, though they are each sometimes marked by a narrow, scarcely perceptible flattening along the middle. Beak of ventral valve small, slender, and closely incurved upon that of the opposite valve, which is little less prominent. Surface marked by fine lines of growth, and small, rather obscure, concentric wrinkles. Internal spiral appendages, each making about twelve turns.

Breadth of a rather wide specimen 0.82 inch; length of do. 0.75 inch; convexity 0.52 inch.

Locality and position. Near Warsaw, Illinois. Keokuk Limestone of Lower Carboniferous series.

CONCHIFERA.

Genus PECTEN, Linnæus.

PECTEN TENUILINEATUS.—Shell rather small, broad ovate or subcircular, ventral border regularly rounded; posterior edge forming a broad, gentle curve along the middle and below, and intersecting the hinge above at an angle of about 110° ; anterior margin rounding regularly into the base from near the middle; hinge short, or about half the length of the valves, from the posterior to the anterior side. Right valve compressed; posterior ear nearly obsolete, flat, and not separated from the posterior margin by a sinus; anterior ear larger than the other, rounded at the extremity, and separated from the margin below by a deep, acutely angular sinus, from the extremity of which there is a sulcus extending obliquely upward in the direction of the umbo; beak rather compressed, located slightly behind the middle of the hinge, and not extending above its margin; surface apparently smooth, but showing under a good magnifier extremely fine, closely arranged concentric striæ, which become much stronger on the anterior ear. (Left valve unknown.)

Height, from ventral margin to the hinge, 0.56 inch; breadth, from anterior to posterior side, 0.53 inch; length of hinge, 0.27 inch; convexity of right valve, 0.08 inch.

Locality and position. South line of Clinton county, Illinois. Upper Coal Measures; associated with *Modiola tenuiradiata* (= *Mytilus tenuiradiatus*, Swallow), and *Aricula? longispina*, (= *Gervillia longispina*, Cox,) or a closely allied species.

Genus AVICULOPECTEN, McCoy.

AVICULOPECTEN OWENI.—Shell small, truncato-subcircular; base regularly rounded, posterior margin rounding from above the middle to the ventral border; anterior side rounded below; hinge equalling about two-thirds the diameter of the valves, from the posterior to the anterior side. Left valve moderately convex; anterior ear compressed, separated from the swell of the umbo by a rounded shallow depression, and defined by a shallow sinuosity of the anterior margin; having the form of an equilateral triangle, the anterior side of which is shorter than either of the others, very slightly rounded at the nearly rectangular extremity; posterior ear a little smaller than the other, compressed, very short, and not separated from the margin below by a distinct sinus, terminating in an obtuse angle of more than 100° ; umbo rather convex, located apparently a little behind the middle of the hinge, and scarcely extending beyond its margin; surface ornamented by numerous fine, closely arranged, radiating striæ, which increase by implantation, and are crossed by a few irregular concentric marks of growth.

Diameter, from ventral margin to hinge, 0.48 inch; do. from the anterior

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to the posterior margin, 0.50 inch; length of hinge, 0.35 inch; number of striae in 0.10 inch near the ventral margin, about 13.

Named in honor of Dr. D. D. Owen, the well known Western geologist.

Locality and position. Near Warsaw, Illinois. Keokuk Limestone of Lower Carboniferous series.

AVICULOPECTEN COXANUS.—Shell (left valve) rather small, very thin, compressed, broad subtrigonal ovate in outline, exclusive of the ears, slightly oblique; anterior and posterior sides rounding from below the ears to the base, which is regularly rounded; anterior ear of moderate size, triangular, and flattened, so as to be quite distinct from the umbonal slope, separated from the margin below by a broad, subangular sinus; slightly rounded at the extremity, and marked by about eight small radiating costæ, which are crossed by smaller and less regular marks of growth; posterior ear of nearly the same size as the other, flattened, but not very distinct from the umbonal slope, separated from the posterior margin by a regularly rounded, moderately deep sinus—acutely pointed at the extremity; hinge a little less than the breadth of the shell, and ranging nearly at right angles to its longer axis; beak compressed, scarcely projecting beyond the cardinal margin, and located very slightly in advance of the middle. Surface ornamented by small, simple, depressed, rigid costæ, which alternate in size, the smaller ones dying out at various distances between the margin and the umbo. (Right valve unknown.)

Length, or transverse diameter, 0.51 inch; height, from base to hinge, 0.53 inch; convexity (of left valve) 0.05 inch.

Dedicated to Edward T. Cox, Esq., of the Geological Survey of Kentucky.

Locality and position. Adams county, Illinois, dark bituminous Shale of Coal Measures.

AVICULOPECTEN BURLINGTONENSIS.—Shell of about medium size, very thin and fragile, suborbicular, slightly wider than long, broadly and regularly rounded on the ventral margin, more narrowly rounded near the middle on each side, thence sloping towards the beak at an angle of about 100° ; hinge straight, between two-thirds and three-fourths as long as the transverse diameter of the valves, and ranging at right angles to their longitudinal axis. Left valve much compressed; anterior ear of moderate size, flat, subtriangular, the anterior side being shorter than either of the others, and rounding somewhat into the hinge,—defined by a broad rectangular sinus at its base; posterior ear flat, separated from the border below by a wide, rather deep subangular sinus, and terminating in an angle of about 45° ; beak compressed, and located a little in advance of the middle of the hinge. Surface ornamented by eighty to ninety small, nearly equal, radiating costæ, which increase by implantation, and about equal the breadth of the depressions between. Costæ crossed by numerous very regular, undulating, and distinctly imbricating, concentric laminae of growth, which become closely arranged, and sharply elevated on the ears, where the radiating ribs are not developed. (Right valve unknown.)

Diameter, from the ventral border to the hinge, about 2.18 inches; do. from the anterior to the posterior side, 2.30 inches; convexity, near 0.30 inch; length of hinge, 1.63 inch; number of radiating costæ in 0.40 inch near the ventral margin, 10 to 12; number of concentric imbricating lamellæ in same space, about 18.

Locality and position. Burlington, Iowa. Burlington Division of the Lower Carboniferous series.

AVICULOPECTEN KONINCKII.—Shell large, subcircular, rather compressed, wider parallel to the hinge than the diameter at right angles to the same; broadly rounded on the pallial margin, and more narrowly rounded on each side a little below the middle. Hinge straight, apparently rather less than the greatest breadth of the valves below, and ranging very nearly at right
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angles to the vertical axis of the shell. Left ? valve compressed ; anterior ear flat, having the form of an inequilateral triangle, the anterior side of which is much shorter than either of the others ;—rather acutely angular at the extremity, and separated from the margin below by a nearly rectangular notch ; posterior ear apparently nearly of the same size as the other, compressed, and separated from the margin below by a rounded, moderately deep sinus ; beak, small, compressed, and not extending above the hinge ; surface marked by rather small, obscure, depressed, radiating costæ, which are crossed by a few faint marks of growth.

Greatest breadth parallel to the hinge, a little below the middle, 3.39 inches ; diameter at right angles to the same, 3 inches ; length of hinge 3 inches.

A fragment, probably of the other valve of the same species, embedded in the same mass with that described above, has much more prominent and more angular costæ, crossed by smaller, closely arranged concentric lines, so as to give them a slightly crenulated appearance.

Named in honor of Prof. L. De Koninck, the distinguished palæontologist of Liege.

Locality and position. Alpine, Iowa. Lower Coal Measures.

AVICULOPECTEN INTERLINEATUS.—Shell rather small, compressed, broad ovate or subcircular, exclusive of the ears ; length and breadth nearly equal ; hinge straight, scarcely equalling the greatest breadth, ranging at right angles to the axis of the shell. Left valve with base regularly rounded ; posterior and anterior margins prominent near the middle, and rounding to the pallial margin, rather distinctly sinuous under the ears ; anterior ear triangular, flattened, so as to be quite distinct from the umbonal slope ; posterior ear somewhat larger than the other, compressed, triangular, the hinge side being longer than either of the others, rather acutely angular at the extremity ; beak a little nearer the anterior than the posterior side, not oblique ; surface ornamented by about fifteen regular, very prominent, slender, concentric costæ, separated by spaces some four or five times their own breadth ; spaces between the costæ occupied by numerous very fine, regular, closely arranged concentric striæ, which are crossed by very obscure traces of radiating ribs.

Diameter, from hinge to pallial border, 0.60 inch ; breadth, 0.62 inch ; convexity, 0.12 inch. (Right valve unknown.)

Locality and position. Lasalle, Illinois. Upper Coal Measures.

AVICULOPECTEN AMPLUS.—Shell large, distinctly inequivalve ; height and breadth about equal ; ventral margin regularly rounded ; posterior and anterior sides rounding to the base ; hinge line straight, less than the breadth of the valves. Left valve convex, particularly in the umbonal region ; posterior ear very short, obtusely subangular, and sometimes defined by an obscure sinus in the margin below ; anterior ear separated from the swell of the umbo by a more or less deeply rounded sulcus, (form unknown ;) beak rather gibbous, incurved, slightly oblique, and extending a little above the hinge. Surface ornamented by distinct, narrow, rather elevated, obscurely subnodose, radiating plications, separated by spaces five to seven times their breadth, and crossed by fine, indistinct lines and wrinkles of growth ; between the costæ there are also fine radiating striæ, one or two of which are often larger than the others. Right valve flat, or a little concave ; posterior ear short, nearly rectangular, the margin below it being faintly sinuous ; anterior ear also short, and separated from the margin below by a very deep, narrow, somewhat arched and angular sinus ; beak entirely obsolete ; surface smooth, or only having indistinct marks of growth, and a few faint radiating lines.

The hinge area of both valves is rather broad, and marked parallel to its margin by fine grooves. In the left valve it is slightly inclined towards the right side, over that of the other valve, in which it is also inclined, backwards

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in the same direction. An internal cast of one of the left valves shows a large, circular, muscular impression, located a little behind the middle of the valve.

Height, 3·67 inches; breadth, 3·69 inches; convexity of left valve, 0·70 inch; number of radiating costæ in 0·88 inch, at a distance of 2 inches from the beak, five.

In the shortness of its ears, the deep sinus in the anterior edge of its right valve, and its surface markings, this species seems to bear close relations to the typical forms of the genus *Monotis*, but it wants the cartilage-pit under the beak, said to be characteristic of that genus, while its geological position is far below the range of any of the known species of *Monotis*.

Locality and position. Monroe county, Illinois. Keokuk Limestone of Lower Carboniferous series.

AVICULOPECTEN PELLUCIDUS.—Shell small, extremely thin, broad subovate or subcircular, exclusive of the ears, slightly oblique; hinge margin straight, less than the greatest diameter of the valves, from the front to the posterior side; ventral margin nearly regularly rounded; anterior edge rounded near the middle, and passing by a slightly oblique curve into the ventral border; posterior margin most prominent below the middle. Left valve much compressed; anterior ear rather small, triangular, flattened and distinct from the umbonal slope, separated from the anterior edge by a broad, subangular sinus; posterior ear about the same size as the other, flat, and terminating in a rather acute angle, separated from the posterior margin by a broad, very shallow, rounded sinus; beak compressed, or but slightly convex, and located near the middle of the hinge. Surface ornamented by very fine, radiating, thread-like striæ, which increase by implantation, and are generally rather smaller than the depressions between; crossing these are equally fine, regular, less distinct, concentric lines. (Right valve unknown.)

Diameter from ventral margin to the hinge, 0·36 inch; breadth from the posterior to the anterior side, 0·35 inch; length of hinge, 0·23 inch; number of radiating striæ in 0·10 inch, at the ventral margin, about 12.

Locality and position. Adams county, Illinois. Coal Measures, in dark bituminous shale.

Genus AVICULA, Klein.

AVICULA OBLONGA.—Shell small, nearly semicircular, slightly oblique; hinge straight, and longer than any other part of the valves. Left valve moderately convex; anterior wing triangular, compressed, separated by a broad, undefined sulcus, from the swell of the umbo, very slight sinuous on its margin, which intersects the hinge border nearly at right angles; posterior wing larger than the other, compressed, broadly sinuous in outline, and terminating in an acute angle; beak small, pointed, slightly oblique, incurved, and scarcely passing beyond the hinge line; surface ornamented by about twenty-six simple, sharply elevated, linear, radiating costæ, separated on the middle of the valve, by spaces from three to five times their own breadth, and crossed by similar regularly disposed concentric lines, so as to produce a neat, coarsely cancellated style of ornament. (Right valve unknown.)

Diameter from ventral margin to hinge, 0·39 inch; breadth from the posterior to the anterior edge, 0·60 inch; length of hinge, 0·56 inch; convexity of left valve, 0·07 inch.

Locality and position. Warsaw, Illinois. Warsaw Limestone of Lower Carboniferous series.

Genus MYALINA, Koninck.

MYALINA ANGULATA.—Shell rather large, obliquely subovate, longer than high, nearly or quite equivalve, very convex near the front, cuneate posteriorly and above; hinge margin rather long, straight, and carinated; posterior

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margin convex along the middle, and rather distinctly concave in outline near the hinge above; base very abruptly rounded, or subangular near the front; anterior side oblique, nearly straight, broadly and distinctly flattened at right angles to the plane of the valves; umbonal slopes extremely prominent, and distinctly angular, ranging at an angle of 58° with the hinge line; beaks terminal, elevated a little above the hinge, incurved, acutely angular, and strongly compressed at right angles to the hinge. Surface of casts retaining rather obscure marks of growth.

Height, measuring at right angles to the hinge, 3.32 inches; length parallel to the hinge, 3 inches; length, measuring from the beaks obliquely, to the most prominent part of the base, 3.35 inches; convexity of the valves, 1.30 inch.

Locality and position. Chester, Illinois. Chester Limestone of the Lower Carboniferous series.

MYALINA CONCENTRICA.—Shell small, thin, rather compressed, subquadrate, a little higher than long, not very oblique; hinge straight, slightly less than the length of the valves below; anterior side a little arcuate, ranging at an angle of about 85° with the hinge, and curving rather abruptly inward from the umbonal slopes; posterior side compressed, straight, or very slightly sinuous in outline above, and intersecting the hinge at about the same angle as the anterior border; base regularly rounded; beaks pointed, incurved, and scarcely rising above the hinge; umbonal slopes rather compressed; surface marked by slender, somewhat obscure, regularly arranged lines, separated by smooth spaces some eight to ten times their own breadth.

Height, 0.67 inch; length, 0.59 inch; convexity of a left valve, about 0.22 inch.

Locality and position. Spergen Hill, Indiana; from an Oolitic bed containing great numbers of small fossils, described by Prof. Hall, and placed by him on a parallel with the Warsaw Limestone of the Lower Carboniferous series.

MYALINA RECURVIROSTRA.—Shell of medium size, rather thick, obliquely trigonal, ovate, inequivalve, (the left valve being more convex, and thicker than the other,) very gibbous, and narrowly rounded along the umbonal slopes; hinge nearly or quite straight, more than equalling the height in young specimens, but proportionally a little shorter in mature shells; posterior margin a little convex, ranging nearly at right angles to the hinge above, and rounding gradually forward below; base narrowly rounded; anterior margin oblique, or ranging at an angle of about 55° with the hinge, slightly convex in outline, and separated by a shallow, oblique depression, from the umbonal ridge above, and broadly sinuous along the middle; beaks small, pointed, terminal, that of the left valve being spirally incurved, so as to make nearly one entire turn at the extreme point, which is directed obliquely forward; surface marked by distinct lines, and imbricating laminae of growth, which are quite prominent on the anterior side, and near the cardinal margin of the left valve, but more obscure on all parts of the other.

The ligament area is comparatively narrow, and marked by longitudinal furrows; immediately under the beak the anterior margin is thickened, so as to present a broader area than the hinge, from which it is separated, in the left valve, by an oblique groove, and in the other by a prominent corresponding ridge. The posterior muscular impression is large, narrow, ovate, acutely angular above, rounded below, and ranging nearly parallel to the posterior border. The pallial line is well defined; anterior muscular scar small, oval, and located near the beaks.

Length, measuring forward and upward from the postero-basal extremity to the beaks, 2.10 inches; height, 1.67 inch; convexity, about 1 inch; length of posterior muscular scar, 0.75 inch; breadth of do. at lower extremity, 0.28 inch.

Locality and position. Near Springfield, Illinois. Coal Measures.

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Genus SOLEMYA, Lamarck.

SOLEMYA RADIATA.—Shell very thin, narrow, or elongate subelliptical, moderately convex; ventral margin straight, or slightly concave along the middle; anterior (longer) side narrowly rounded at the extremity, the most prominent part being a little above the middle; posterior (shorter) side rather narrowly rounded; dorsal border nearly parallel to the base in front of the beaks, and declining more rapidly, with a slightly concave outline behind them. Surface with obscure concentric marks of growth, crossed by flat, nearly obsolete, radiating plications, which are sometimes separated near the middle of the valves, by spaces greater than their own breadth; on the anterior side, where they are very oblique, and more closely arranged, they sometimes become irregular, and scarcely distinguishable from finer irregular radiating striae; not well defined on other parts of the shell.

Length 1.10 inch; height 0.50 inch; convexity 0.36 inch.

Locality and position. Grayville, Illinois. Coal measures.

Genus LEDA, Schumaker.

LEDA (YOLDIA?) LEVISTRIATA.—Shell rather under medium size, narrow subovate, moderately convex in the central and anterior regions, more compressed posteriorly; base forming a broad semioval curve, the most prominent part of which is a little in advance of the middle; anterior side rounded; posterior side somewhat contracted, or narrower than the other, and more abruptly rounded at the extremity, which is a little gaping; dorsal margin declining gently, and rather concave behind the beaks, nearly horizontal and slightly convex in front of them; beaks depressed and located a little behind the middle; surface apparently smooth, but when examined by the aid of a good lens it is seen to be marked by extremely fine, obscure, regularly arranged concentric striae.

Length 0.57 inch; height 0.20 inch; convexity 0.14 inch.

Locality and position. Waterloo, Monroe County, Illinois. Upper part of St. Louis Limestone, of the Lower Carboniferous series, where it was found associated with some of the small fossils described by Prof. Hall, from Spurgeon Hill, Indiana.

Genus SCHIZODUS, King.

SCHIZODUS CHESTERENSIS.—Shell rather large, transversely ovate, convex in the anterior and umbonal regions, and cuneate posteriorly. Anterior side regularly rounded; base forming a broad, irregular, semioval curve, being usually slightly more prominent a little behind the middle than elsewhere, thence nearly straight and ascending gradually to the posterior extremity; posterior side contracted, considerably longer than the other, and abruptly rounded or subangular at the termination, the most salient part being rather above the middle; dorsal margin nearly straight and declining gradually behind the beaks, from which it rounds regularly into the anterior margin in front. Beaks gibbous, rather elevated, incurved, and located less than one-third the length of the shell from the buccal margin. Muscular impressions shallow; those in front ovate, placed near the margin, and a little above the middle; those on the posterior side oval, and located near the dorsal edge, about half-way between the beaks and the anal extremity. Surface marked only by fine lines of growth.

Length (of internal) 1.38 inches; height 1 inch; convexity 0.78 inch.

Resembles closely the Permian species *Axinus obscurus*, Sowerby, but is less elevated in proportion to length, and has rather more oblique umbones; while the most salient part of its posterior margin is a little above, instead of below the middle. It is usually found in the condition of internal casts.

Locality and position. Chester, Illinois. Upper part of Chester Limestone, of the Lower Carboniferous series.

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Genus *CARDIOMORPHA*, Koninck.

CARDIOMORPHA RADIATA.—Shell subcircular, gibbous in the central and umbonal regions, base more narrowly rounded than the front or anal margin; cardinal border a little arched; beaks gibbous, abruptly pointed, incurved and showing a tendency to curve forward at the immediate points, depressed or rising but little above the hinge margin; surface ornamented by numerous fine, regular, radiating, rather rounded striæ, about equalling the depressions between. (Hinge and interior unknown.)

Allied to *C. ovata* of Hall, (Rept. Survey Iowa, pl. 7, fig. 10), from near the same horizon, but more rounded in outline, and has much less elevated and less curved beaks. Both these species differ from the typical forms of *Cardiomorpha*, Koninck, in having radiating striæ, and may prove to be generically distinct when specimens showing the hinge and interior are obtained.

Length 0.95 inch; height 1 inch; breadth or convexity 0.77 inch.

Locality and position. Rockford, Indiana. From beds containing Carboniferous species of *Goniatites*, but generally supposed to be of Upper Devonian age.

GASTEROPODA.Genus *BELLEROPHON*, Montfort.

BELLEROPHON CRASSUS.—Shell large, very thick, subglobose, or a little longer than wide; volutions expanding somewhat rapidly, rounded over the dorsum and sides; umbilical region excavated, but not perforate; mesial band narrow, rather prominent, and margined on each side by a raised line; aperture transverse, reniform, or sublunate; lip strongly thickened near the umbilical excavations on each side, but not covering them, thinner and but slightly prominent on either side of the narrow sinus in its outer margin, and spreading in the form of a moderately thick, smooth, callus, over the inner whorls within the aperture, and between the callosities on each side; surface marked by rather distinct irregular wrinkles, and lines of growth, the former of which are strongest on each side near the lip.

Greatest length 2.20 inches; breadth at the aperture 2 inches; breadth of the mesial band near the aperture 0.12 inch.

Locality and position. Pittsburg, St. Claire County, Illinois. Lower part of the Coal measures.

Genus *PLEUROTOMARIA*, Defrance.

PLEUROTOMARIA SUBCONTRACTA.—Shell small, conical subovate, longer than wide; spire moderately elevated, rather pointed at the apex. Volutions five and a-half to six, obliquely flattened or concave above, excepting near the suture, where there is a subangular prominence occupied by a series of small nodes or granules; those of the spire having a second angle a little below the middle. Body whorl forming rather more than half the entire length, biangular around the middle, the lower angle being less prominent and more obtuse than the other, and not exposed on the spire; vertically flattened or a little concave on the outer side, and convex below. Suture linear, but occupying a rather distinct rounded constriction or depression. Aperture broad subovate, approaching a rhombic subquadrate outline; columella not distinctly perforate. Surface ornamented by about fifteen revolving lines, some ten or twelve of which occupy the under side of the body whorl, where they are larger than on any other part of the shell; crossing these there are very fine transverse striæ, which are closely arranged on the upper slope of the whorls, particularly in crossing the spiral band, but on reaching the lower angle of the body whorl, they become stronger, so as to give it a crenulated appearance. Spiral band narrow, flat and located just above the middle angle of the body volution.

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Length 0.33 inch ; breadth 0.24 inch ; apical angle nearly regular, divergence 60°.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal measures.

PLEUROTOMARIA GRANULOSTRIATA.—Shell very small, conical subovate, or subtrochiform ; spire moderately elevated ; volutions five, increasing rather gradually in size, compressed convex, last one prominently rounded or subangular around the middle ; suture well defined ; aperture subcircular ; spiral band not very distinctly defined, located near the middle of the body whorl and passing around just above the suture on the outer turns ; columella imperforate. Surface ornamented by about twelve or thirteen comparatively distinct revolving lines, eight of which occupy that portion of the body whorl below the band, where they are a little smaller and more closely arranged than above.

On the upper slope of the whorls above the band, the three or four revolving lines occupying that part of the shell are crossed obliquely by distinct transverse lines, which are so much stronger on the revolving striæ than between them, that they present the appearance of small nodes or granules, at the points of crossing. One of the revolving lines, which is larger than the others, passes around on the middle of the revolving band, and is neatly and regularly crenulated by the crossing of the transverse lines.

Length 0.17 inch ; breadth 0.15 inch ; apical angle regular, divergence 60°.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal measures.

PLEUROTOMARIA TENUICINCTA.—Shell small, conical ovate, spire moderately elevated ; volutions seven, obliquely flattened or a little concave above, convex and more or less distinctly angular around the middle, last one tumid below ; suture distinct ; spiral band very narrow, concave, located a little above the middle of the body whorl, and passing around rather below the middle of the others ; aperture subcircular ; umbilical region indented, but apparently not distinctly perforate. Surface ornamented by about eighteen to twenty rather distinct revolving lines, only two or three of which occupy the flattened or concave upper slope above the band, where they are less prominent than the others ; while the two forming the margins of the band are more salient than any of those below ; fine, regularly arranged striæ, which are much more distinct on the slope above, than below the band, mark the whorls transversely.

Length 0.24 ; breadth 0.20 inch ; apical angle a little convex, divergence 60°.

Locality and position. Springfield, Illinois. Upper Coal measures.

PLEUROTOMARIA PRATTENI.—Shell very small, conical ovate, the length being greater than the breadth ; spire rather elevated, but not acute at the apex ; volutions six to six and a-half, slightly convex, increasing gradually in size, those of the spire more or less distinctly angular around the middle, last one sometimes slightly flattened near the middle just below the angle, and convex on the under side ; suture well defined. Spiral band of moderate breadth, not very distinctly defined, sometimes slightly concave, occupying the more or less compressed middle portion of the last whorl, and passing around so as to bring its lower margin a little above the suture on the other turns. Aperture subcircular ; columella arcuate, a little flattened below, and imperforate ; outer lip thin ; sinus narrow and deep. Surface marked by about eighteen to twenty very small, obscure revolving striæ, some twelve or thirteen of which occupy the body whorl below the band, where they are a little larger than those above the angle, and more regularly arranged ; lines of growth very fine and obscure.

Named in honor of Mr. Henry Pratten, deceased, formerly of the Geological Survey of Illinois.

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Length 0.24 inch; breadth 0.18 inch; apical angle convex, divergence about 37°.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures. Abundant.

PLEUROTOMARIA SUBSINUATA.—Shell, conical ovate; spire elevated; volutions six, convex, last one, in mature shells, sometimes obliquely flattened a little above, just below the suture, thence rounded below; suture linear, but occupying a more or less deeply rounded depression; spiral band not well defined, angular, located above the middle of the body whorl, at the lower edge of the slight flattening of its upper side, and passing around the middle of the upper turns; sinus of the lip, judging from the curve of the lines of growth in crossing the band, shallow, and not very clearly defined; aperture subcircular; columella indented in the umbilical region, but not distinctly perforate. Surface ornamented by about fourteen to eighteen distinct revolving lines, three of which, on the middle of the last turn, are larger than those above, while those below gradually diminish in size toward the umbilical pit; only two or three of the smaller lines usually occupy the slightly depressed upper part of the whorls, where they are crossed by a series of regularly arranged, transverse costæ or wrinkles; lines of growth obscure.

Length 0.40 inch; breadth 0.31 inch; apical angle convex, divergence 55°.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures.

PLEUROTOMARIA CHESTERENSIS.—Shell of medium size, turbinate; spire moderately elevated; volutions about six, increasing rather gradually in size, convex, distinctly carinated around the middle, and flattened, or a little concave above and below the carina, the flattened space above being oblique, and that below vertical; last whorl provided with a second carina below the other, and a little convex on the under side; suture linear; umbilicus small, or nearly closed; surface marked by numerous fine, regular, thread-like revolving lines, crossed by similar striæ, which, in traversing the spiral band,—which occupies the space on the middle of the body whorl between the two carinæ,—make a gentle backward curve, parallel to the border of the rather shallow sinus of the outer lip; aperture subcircular, approaching a subquadrate outline.

Length 0.75 inch; breadth 0.72 inch; apical angle regular, divergence about 60°; breadth of spiral band 0.14 inch.

Similar in form and general appearance to *P. tabulata*, Conrad, but differs in having a small umbilicus, while the axis of that shell is not perforate. It also differs in having a much broader spiral band, which occupies the space between the two carinæ, instead of coinciding with the upper angle. Again the upper carina of the shell under consideration is never crenulated, as in Conrad's species.

Locality and position. Chester, Illinois. Chester Limestone of the Lower Carboniferous series.

PLEUROTOMARIA SUBSCALARIS.—Shell large, rather thick, conical ovate; spire moderately elevated; volutions six, those near the summit of the spire flattened, the others convex, and provided with a distinct, sharp carina, which occupies a position a little above the middle of the body whorl, passes around near the middle of the second, becomes lower on the third, and sinks below the suture on the others. Below this angle there is on the body volution, a second less distinct subangular prominence, with a broad, vertical, nearly flattened, or slightly concave space between the two. Under side of last turn a little convex, and the umbilical region somewhat indented, but not perforate; suture well defined. Spiral band narrow, and occupying the principal angle of the whorls.

The surface of our specimen is somewhat eroded, but it retains traces of about twenty rather strong revolving lines, eight or nine of which occupy the upper side of the whorls, above the carina, some three or four the flattened

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outer side of the body whorl, and the remainder the under side. On the upper sloping surface of the whorls there are also regularly arranged, oblique transverse striæ, which, in well-preserved specimens, are probably continued upon the outer and under sides of the last turn.

Agrees with *P. tabulata*, Conrad, in size and general appearance, but differs in having the upper whorls of the spire more depressed, and without any angle visible above the suture. The principal angle on its lower whorls also appears to be destitute of the crenulation, so distinct on that of *P. tabulata*.

Length 1·67 inch; breadth 1·52 inch; apical angle convex, divergence 70°.

Locality and position. Macoupen County, Illinois. Lower Coal Measures.

PLEUROTOMARIA SPECIOSA.—Shell attaining a medium size; spire moderately elevated; volutions seven to seven and a-half, subangular just below the suture, thence obliquely flattened to a much more distinct revolving angle a little below the middle of the upper turns, and about the middle of the body whorl. Below this second angle the outer side of the last turn is vertically flattened or a little concave, so as to produce a third obtuse revolving prominence below the middle, beneath which the under side of the whorl is convex. Suture well defined. Spiral band narrow, very prominent, angular and regularly crenulated by cross lines, occupying and partly forming the middle angle of the body whorl, which passes around on the upper whorls a little more than one-third of their breadth above the suture. Aperture subcircular, approaching subpentagonal; umbilicus small. Surface ornamented by eighteen to twenty-two thread-like revolving lines, about twelve of which occupy the under side of the body whorl, four to seven the upper slope, and two or three the outer flattened space. Crossing all these there are numerous extremely fine, very regular, closely arranged transverse lines, about every fourth or fifth one of which is considerably enlarged near the suture; and they all curve obliquely backwards in approaching the spiral band.

Length about 0·55 inch; breadth 0·51 inch; apical angle regular, divergence 32°; breadth of spiral band not more than about 0·03 inch.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures.

PLEUROTOMARIA TURBINIFORMIS.—Shell rather large, trochiform, height and breadth nearly equal; spire conical, moderately elevated; volutions about five and a half to six, flat, last one distinctly angular around the outer side, and flattened or slightly convex below; umbilical region somewhat excavated, but not perforate; spiral band extremely narrow, grooved, occupying the angle around the outer side of the body whorl, and passing around scarcely above the suture on the other volutions, margined above and below by a sharply elevated line; suture linear, but well defined, having a somewhat banded appearance, in consequence of the development of a rather distinct revolving line at the upper margin of each whorl; aperture apparently rhombic subquadrate. Surface ornamented by about twenty obscure, closely arranged, revolving striæ, crossed by stronger, very regular transverse lines, which are most distinct on the upper part of the whorls, and pass with a gentle curve obliquely backwards and outwards to the spiral band. Below the angle the body whorl is nearly smooth, or only marked by very obscure lines of growth, and faint traces of revolving striæ.

Length about 0·93 inch; breadth nearly 0·97 inch; apical angle regular, divergence 64°.

Locality and position. Lasalle, Illinois. Upper Coal Measures.

PLEUROTOMARIA SCITULA.—Shell small, trochiform, length and breadth nearly equal; spire depressed conical; volutions six, a little convex, last one prominent and narrowly rounded or subangular on the periphery, slightly convex below; suture somewhat channelled; aperture subcircular, approaching a subquadrate form; umbilical region impressed, but not distinctly perforate; spiral band

rather narrow, concave, and located above the narrowly rounded periphery of the body whorl, passing around rather below the middle of the other volutions. Surface ornamented by from about seventeen to twenty-two revolving lines, only three or four of which occupy that part of the body whorl above the band, where they are larger and more widely separated than below; distinct, but much smaller, regularly arranged, thread-like lines mark the volutions transversely.

Length and breadth each about 0.22 inch; apical angle convex, divergence 79°.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures.

PLEUROTOMARIA SHUMARDI.—Shell trochiform, of medium size, very thin; spire moderately elevated, conical, pointed at the apex. Volutions about six, increasing rather rapidly in size, obliquely flattened above; those of the spire being somewhat angular near the lower side; last one very prominent, and angular around the middle, the immediate edge of the angle being terminated by the narrow spiral band, convex below. Band slightly concave, and margined above and below by a small line or indistinct angle, the lower one of which scarcely rises above the suture on the upper whorls. Suture well defined. Umbilicus small, or nearly closed. Aperture rhombic subquad-rangular, wider than high. Surface ornamented by numerous transverse lines, which are very regular and closely arranged on the upper whorls, but become stronger, more distinct, and less regular on the last turn. In crossing the upper flattened sloping sides of the whorls, these lines arch a little forward, and pass very obliquely backwards from the suture to the band; on the under side of the body whorl they are small, nearly obsolete, and crossed by obscure traces of fine revolving striae.

Named in honor of Dr. B. F. Shumard, State Geologist of Texas.

Length 0.70 inch; breadth 0.73 inch; apical angle rather distinctly concave, divergence 70°.

Locality and position. Warsaw and Keokuk, Illinois. Base Geode bed, Warsaw Limestone, of Lower Carboniferous series.

Genus STRAPAROLLUS, Montfort?—EUOMPHALUS, Sowerby.

EUOMPHALUS PLANODORSATUS.—Shell of medium size, subdiscoidal, spire nearly flat, or but slightly elevated above the body whorl. Volutions about five, increasing gradually in size from within, flat above, and provided with a moderately distinct revolving angle about two-thirds of the distance across from the inside; from this angle the outer whorl is rounded over the periphery to about the middle of the under side, where there is another angle, from which it rounds into the umbilicus; suture well defined. Umbilicus large, deep and showing about one-half of each inner whorl; aperture subcircular. (Surface unknown.) Height about 0.30 inch; breadth 1 inch.

Allied to *E. pentangulatus*, Sowerby, but differs in having the angle on the upper side of the whorls located nearer the outer margin, and the periphery or outer side of its volutions more broadly rounded.

Locality and position. Thompson's quarry, Randolph County, Illinois. Chester Limestone, of Lower Carboniferous series.

EUOMPHALUS UMBILICATUS.—Shell of medium size, depressed subtrochiform; spire rather elevated for a species of this genus. Volutions five to five and a-half, convex, increasing gradually in size, nearly horizontally flattened on the upper side, about half-way across from the suture, where there is a rather distinct revolving angle, below this angle the upper oblique outer slope is slightly flattened to near the middle of the outer side, which, in the last whorl, is narrowly rounded; under side of body volution rounded to a moderately distinct angle near the middle, thence rounding into the umbilicus. Suture well defined. Umbilicus large, or nearly twice as wide as the diameter

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of the last turn, very deep and permitting the inner side of all the volutions to be seen to the summit of the spire. Surface marked by fine, rather obscure lines of growth.

Height 0.88 inch; breadth 1.08 inch; breadth of umbilicus, measuring from its marginal angle on the middle of the under side of last whorl, 0.68 inch; apical angle convex, divergence about 100° .

Locality and position. St. Clair County, Illinois. Lower Coal Measures.

Genus NATICOPSIS, McCoy.

NATICOPSIS NODOSUS.—Shell obliquely subrhomboidal, rather thick; spire depressed; volutions four and a-half, convex, increasing rapidly in size, last one large, gibbous, oblique, and composing three-fourths of the entire length, round on the outer side, and having shallow revolving depressions near the suture above; suture moderately distinct; aperture subovate; lip sharp; columella distinctly flattened, somewhat callous, not perforated. Surface ornamented by numerous, nearly round, distinct nodes, which are arranged in oblique rows, parallel to the lines of growth near the aperture of the last turn, but become more crowded, and show a tendency to assume a quincunx arrangement on other parts of the shell; lines of growth fine, rather regular and scarcely deflected from their course by the presence of the nodes.

Length, measuring from the most extended part of the aperture below, obliquely to the apex of the spire, 1 inch; breadth 0.52 inch; apical angle convex, divergence about 96° .

Locality and position. St. Clair County, Illinois. Lower Coal Measures.

NATICOPSIS HOLLIDAYI.—Shell obliquely oblong-oval, thick and solid; spire depressed subconical, pointed at the immediate apex; volutions four to four and a-half, convex, excepting just below the suture, where there is a shallow revolving depression,—rapidly enlarging, the last one forming more than two-thirds the entire length; suture linear; aperture ovate around the margin, but contracted by the broad columella so as to be nearly semicircular within; columella distinctly flattened, broad, and marked along its sharp, nearly straight inner margin, by a well defined opercular impression. Surface ornamented by very fine regular lines of growth, and numerous small nodes, arranged in oblique rows; the larger nodes on the last half and upper part of the body whorl being more or less elongated in the direction of the lines of growth.

Length 1.15 inches; breadth 1.20 inches; apical angle nearly regular, divergence 107° . Named in honor of Mr. George H. Holliday, of Carinville, Macoupen County, Illinois, to whom we are indebted for the specimens described.

Locality and position. Hodges Creek, Macoupen County, Illinois. Coal Measures.

Genus PLATYOSTOMA, Conrad.

PLATYOSTOMA NANA.—Shell quite small, subglobose, wider than high; spire much depressed; volutions three, increasing very rapidly in size, last one large and ventricose; suture rather deeply defined; aperture large, broad obovate, straight on the inner side, equalling nearly seven-eighths of the entire length of the shell; surface marked by fine lines of growth, which become stronger, and very regular near the suture on the upper side of the whorls.

Length 0.19 inch; breadth 0.21 inch; length of aperture 0.15 inch, breadth of do. 0.11 inch; apical angle about 123° .

Differs from *P. Peoriensis*, McChesney, in being much smaller, and in having one whorl more, while its aperture is widest above instead of below.

Locality and position. Springfield, Illinois. Upper Coal measures.

PLATYOSTOMA? TUMIDA.—Shell rather large, thin, subpyriform, a little longer
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than wide; spire much depressed, or nearly flat; volutions four to four and a-half, convex, increasing rapidly in size, last one large, or forming about eight-ninths of the entire length, prominent and narrowly rounded above, contracted and extended below; suture well defined; aperture large, longer than wide, obovate, the inner side being nearly straight; columella not perforate; surface (of an exfoliated specimen) retaining traces of rather strong revolving lines.

Length 1.21 inches; breadth 1.17 inches; length of aperture 1.05 inches; breadth of do. 0.63 inch; apical angle regular, divergence 132°.

It is only provisionally we have placed this species in the genus *Platystoma*; the only specimen yet obtained being merely a cast retaining portions of the shell, but not giving a clear idea of its generic characters. It differs from the typical species of that genus in having revolving lines, and will probably be found to present other differences. When better specimens can be examined, we suspect it will prove to belong to an undescribed genus, though we have not the means of settling the question at present. If a new genus is established for its reception, a shell figured by Murchison, De Verneuil and Keyserling (*Geol. Russia*, pl. 23, fig. 14), as an undetermined species of *Ianthina*, (= *Scalites Verneulii*, of D'Orbigny), should probably be placed in the same group.

Locality and position. Grayville, Illinois. Coal Measures.

Genus EUNEMA, Salter.

EUNEMA? SALTERI.—Shell elongate conical, turreted, acute at the apex. Volutions thirteen, slightly convex, increasing very gradually in size, ornamented by two small revolving carinæ a little below the suture, the lower one of which is larger than the other; last whorl having a third angle near the middle, which passes around just above the suture on the other volutions; below this third angle there is on the under side of the last turn a fourth nearly obsolete revolving prominence. Suture linear. Aperture ovate, a little oblique. Columella arcuate, not perforate. Lines of growth fine, rather obscure, and passing straight across the whorls.

Length 0.50 inch; breadth 0.17 inch. Length of aperture 0.17 inch; breadth 0.10 inch. Apical angle convex, divergence 20°.

This beautiful little shell differs from the typical species of the genus in which we have provisionally placed it, in having the lines of growth straight instead of sinuous. This character, and the revolving carinæ, would also separate it from *Loxonema*, to which we were at first inclined to refer it. On a hasty examination it might be referred to the genus *Murchisonia*, some species of which it nearly resembles in its general appearance; a careful examination, however, has satisfied us that its lines of growth do not make the slightest curve, so as to indicate the existence of a sinus in any part of the lip. We suspect it may belong to an undescribed genus; though, if it were from a more modern formation, we should scarcely hesitate to place it in the genus *Turritella*.

Named in honor of Mr. J. W. Salter, the distinguished Palæontologist of the British Geological Survey.

Locality and position. Springfield, Illinois. Upper Coal Measures.

Genus LOXONEMA, Phillips.

We doubt the propriety of referring such forms as are here described, to the recent genus *Turbonilla*, (= *Chemnitzia*, D'Orbigny,) since they are generally not only much larger shells, but differ in not having, so far as we have been able to see, the apex of the spire reversed, as in the species upon which the genus *Turbonilla* was founded. We therefore agree with those who prefer to retain Phillips' name, *Loxonema*, for these older fossil species.

LOXONEMA SCITULA.—Shell small, elongate, conical; spire elevated and regularly tapering; volutions eight to eight and a half, very slightly convex, increasing gradually in size, last one rounded and not produced below; suture

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moderately well defined; aperture obliquely ovate, acutely angular above. Surface ornamented by distinct, regularly disposed, straight vertical folds or costæ, about fourteen or fifteen of which occupy each turn; folds equalling the depressions between, and on the last turn becoming suddenly obsolete below the middle; no lines of growth visible.

Length 0.23 inch; breadth, 0.10 inch; length of aperture, 0.07 inch; breadth of do., 0.04 inch. Apical angle regular, divergence 25°.

Locality and position. Springfield, Illinois. Upper Coal Measures.

LOXONEMA RUGOSA.—Shell small, elongate, conical; volutions seven and a half to eight, very slightly convex, increasing gradually in size, last one abruptly rounded in the middle, not extended below; suture rather slightly impressed; aperture ovate. Surface of each whorl ornamented by about eighteen to nineteen straight, distinct, vertical folds or costæ, which equal the depressions between, and are disposed so as to range in regular lines from the last whorl to the summit of the spire; those on the body whorl becoming abruptly obsolete below the middle. No lines of growth visible.

Length, 0.44 inch; breadth 0.18 inch; length of aperture 0.12 inch; breadth of do., 0.08 inch. Apical angle convex above, divergence 25°.

Near the last, but differs in having the spire less attenuate above, and in having more costæ to each turn. The costæ also differ in being ranged in right lines, all the way up the spire, while those of the adjacent whorls, in the last, alternate. This latter character gives quite a peculiar aspect to this species.

Locality and position. Same as last.

LOXONEMA CERITHIFORMIS.—Shell rather under medium size, elongate, conical; spire elevated, gradually tapering to an acute point. Volutions, eleven to twelve, convex, and increasing gradually in size; last one not much enlarged, somewhat prominently rounded below the middle. Suture well defined. Aperture oval, subrhombic, a little longer than wide, apparently provided with a small, rather oblique notch at the base of the columella; outer lip thin, broadly and deeply sinuous above and prominent below, so as to present a distinct inversely sigmoid outline; columella arcuate. Surface nearly smooth, but showing under a lens very fine, obscure lines of growth, which curve parallel to the margin of the lip; just below the suture these lines are gathered into a series of minute, short, regularly arranged wrinkles or crenulations, scarcely visible without the aid of a magnifier.

Length, 0.70 inch; breadth, 0.24 inch; length of aperture, 0.18 inch; breadth of do., 0.11 inch. Apical angle regular, divergence 24°.

Appears to agree very nearly with *Chemnitzia subconstricta* of Koninck, in form and surface markings; but differs, in the form of the aperture, and in having a small notch or sinus, with a slight projection of the lip, at the base of the columella.

Locality and position. Springfield, Illinois. Upper Coal Measures.

LOXONEMA INORNATA.—Shell small, conical subovate; spire moderately elevated, pointed at the apex; volutions seven, slightly convex, increasing rather gradually in size, last one somewhat prominently rounded in the middle, but not ventricose; suture rather shallow; aperture narrow subovate, acutely angular above, narrow, and provided with a small rounded sinus at the base of the columella below; columella arcuate; outer lip thin, and apparently but slightly sigmoid in outline; surface smooth, or only showing very obscure traces of fine lines of growth under a good lens.

Length, 0.38 inch; breadth, 0.18 inch; apical angle convex, divergence about 30°. Length of aperture, 0.16 inch; breadth of do., 0.09 inch.

Locality and position. Springfield, Illinois. Upper Coal Measures.

LOXONEMA NITIDULA.—Shell of medium size, subfusiform; spire elongated,
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conical, rather attenuate, and acutely pointed above; volutions eight to eight and a half, convex, and increasing rather gradually in size,—last one moderately large, somewhat contracted, and extended below; suture well defined, especially between the lower whorls; aperture narrow, subovate, a little oblique, acutely angular above, rather narrow, and terminating in a small rounded sinus at the base of the columella below, less than half the length of the entire shell; outer lip thin and sharp, with a scarcely sigmoidal margin; columella arcuate, and somewhat twisted below; surface smooth, but showing under a lens very fine, obscure lines of growth.

Length, 1·10 inch; breadth, 0·43 inch; apical angle regular, divergence 30°. Length of aperture, 0·47 inch; breadth, 0·20 inch.

Locality and position. Springfield, Illinois. Upper Coal Measures.

Genus EULIMA, Risso.

EULIMA? PERACUTA.—Shell comparatively large, elongate, conical; spire much elevated, attenuate, very acutely pointed at the apex, and sometimes subulate. Whorls about thirteen, nearly or quite flat, and increasing very gradually in size; last one forming a little more than one-third the entire length, slightly prominent around the middle, somewhat extended below; suture moderately distinct, particularly between the lower whorls. Aperture rather narrow, subovate, acutely angular above, and narrowly rounded below; outer lip thin and sharp; inner lip very slightly thickened, and a little reflexed below; columella arcuate or faintly sinuous. Surface polished, but showing under a good lens extremely fine, very obscure lines of growth.

Length, 1·67 inch; breadth, 0·54 inch; apical angle regular, divergence 22°. Length of aperture, 0·55 inch; breadth of do., 0·30 inch.

Locality and position. Jacksburg, St. Clair county, Illinois. Lower Coal Measures; also near Springfield, in Upper Coal Measures.

Genus MACROCHEILUS, Phillips.

Some confusion exists in regard to the limits of this genus, in consequence of the fact that Prof. Phillips did not define it clearly, and unfortunately included in it species belonging to several groups, without designating what particular species he regarded as the type of his genus. Nearly all subsequent authors, however, agree in referring to it those oval, or subglobose forms, with a thickened inner lip, and a more or less developed fold on the columella, such as *M. primigenious*, (= *Stylifer primigenious*, Conrad); while there are many other more elongated species referred sometimes to this genus, and sometimes to *Loxonema*, or to *Chemnitzia*.

It seems to us it would be better to regard as typical of this genus, only such species as have developed, in a greater or less degree, the fold and thickening of the inner lip,—nearly or quite all of which, so far as our observations go, are the shorter forms. The more slender, elongated species, with a comparatively small body whorl, somewhat extended below, and without any thickening of the inner lip, should, we think, be placed in a separate section, either of this genus, or of *Loxonema*, or constitute a distinct group from both.

MACROCHEILUS MEDIALIS.—Shell of medium size, rather thick, rhombic, oval; spire depressed conical, acutely pointed at the apex, forming near one-third of the entire length. Whorls six to six and a half, convex, increasing somewhat rapidly in size; last one large, but not ventricose, the widest part being near the middle; suture distinct. Aperture rather narrow, oval, acutely angular above, and narrowly rounded below; outer lip sharp, nearly straight, or but slightly prominent in the middle. Columella a little sinuous about half way up the aperture. Inner lip thickened to the top of the aperture, but not provided with a distinct fold or prominence below,—marked by small, regular, obscure transverse striæ or wrinkles above the middle. Surface apparently smooth, but showing under a lens traces of fine, very obscure lines of growth.

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Length, 1.12 inch; breadth, 0.68 inch; length of aperture, 0.72 inch; breadth of do., 0.39 inch. Apical angle convex, divergence 83°.

Locality and position. Springfield, Illinois. Upper Coal Measures.

MACROCHEILUS INTERCALARIS.—Shell of medium size, rhombic, oval; spire conical, forming more than one-third of the entire length, pointed at the extremity. Volutions six to seven, compressed convex, increasing rather rapidly in size; last one comparatively large, but not ventricose, widest near the middle, and compressed above. Aperture narrow, subovate, a little oblique, narrowly rounded, and faintly sinuous below, acutely angular above: outer lip thin, slightly prominent along the middle; columella having a small sinuosity in the middle, below which the lip is thickened, so as to form a moderately distinct oblique fold or obtuse prominence; inner lip not much thickened above. Surface smooth, but showing obscure traces of very fine lines of growth under a magnifier.

Length, 1.14 inch; breadth, 0.70 inch. Length of aperture, 0.70 inch; breadth of do., 0.32 inch. Apical angle convex, divergence 74°.

Locality and position. Same as last.

MACROCHEILUS PULCHELLUS.—Shell of medium size, rhombic, oval, or sub-fusiform; spire rather elevated, pointed at the apex, composing more than two-fifths the entire length. Whorls seven and a half, distinctly convex, increasing moderately in size, last one not ventricose; suture well defined. Aperture narrow, subovate, acutely angular above, and rather narrowly rounded below; outer lip sharp, and slightly sigmoid in outline; columella a little arcuate, or sinuous in the middle; inner lip moderately thickened, somewhat prominent, or showing a slight disposition to form an obtuse fold below. Surface polished, and having faint traces of fine lines of growth, which can only be seen by the aid of a magnifier.

Length, 1.30 inch; breadth, 0.79 inch; length of aperture, 0.75 inch; breadth of do., 0.34 inch. Apical angle convex, divergence 64°.

Locality and position. Same as last.

New Genus SOLENISCUS.*

The shell upon which we propose to found this genus, differs from the smooth species usually referred to *Loxonema* in having the body whorl contracted and extended below into a distinct straight canal, with a well defined oblique plait or fold rather low on the columella. In the last mentioned character, as well as in its smooth surface, it agrees more nearly with the genus *Macrocheilus*, but its fusiform outline, narrow aperture and distinct canal, are peculiarities which separate it clearly from that group, as usually understood. In its general appearance it resembles some species of *Fasciolaria*; but as it has only one, instead of two or three folds on the columella, and is entirely destitute of nodes, costæ, or revolving marks, while its outer lip is quite smooth within, there is little reason for supposing it to be really nearly related to that genus, which is unknown below the upper Cretaceous.

It is probable that when the aperture and columella of such species as *Macrocheilus linnaeiformis*, McCoy, and *Macrocheilus fusiformis*, Hall, (non *M. fusiformis* of Morris' Catalogue,) as well as of several of the smooth fusiform species referred by others to *Loxonema*, are better known, they will be found to possess the characters of this genus.

SOLENISCUS TYPICUS.—Shell fusiform; spire elevated, and acutely conical at the apex; volutions seven to seven and a-half, flat or but slightly convex, increasing rather gradually in size, last one comparatively large, slightly ventricose in the middle, and contracted into a distinct, straight canal below; suture moderately well defined; aperture very narrow, acutely angular above, and

*σάλησιςκος: a little channel, or gutter.

tapering into the canal below; outer lip thin, sharp, and scarcely sigmoid in outline; inner lip none; columella straight, and provided with a single distinct rather sharply elevated, oblique plait or fold, a little below the middle of the aperture; surface smooth, or only showing under a good lens faint traces of very fine lines of growth,

Length 0.73 inch; breadth 0.30 inch; apical angle slightly concave, divergence 0.40°. Length of aperture and canal, 0.34 inch; breadth of former 0.11 inch.

Locality and position. Springfield, Illinois. Upper Coal Measures.

CEPHALOPODA.

Genus ORTHOCERAS, Breynius.

ORTHOCERAS EXPANSUM.—Shell having the form of a moderately compressed, rapidly tapering cone; section subcircular, near the smaller end, but more oval towards the larger. Septa concave, and separated near the smaller end by spaces between one-fourth and one-fifth their own greater diameter; the intervals increasing somewhat, but not near in proportion to the expansion of the shell above; siphuncle subcentral, small where it passes through the septa, but swelling out into a globular cavity between. Surface apparently smooth.

Length of an entirely septate specimen imperfect at both extremities, 4.29 inches; greater diameter at the smaller end 0.80 inch, smaller do. of same about 0.71 inch; greater diameter at larger end apparently not less than 3.20 inches.

This species is allied in form and general appearance to *O. dilatatum*, DeKoninck, (An. Fos. p. 515, pl. 45, fig. 8, a, b, c), but differs in presenting an oval instead of a circular section; its siphuncle is also much more nearly central than is represented in DeKoninck's figure 8, a and b, pl. 45, and differs in its peculiarity of swelling out into globular cavities between the septa. Our species seems likewise to differ in its surface markings, being nearly or quite smooth; this, however, may be due, at least to some extent, to the exfoliation of the outer layers of the shell.

Locality and position. McDonough County, Illinois; the specimen being found loose, its exact geological position is unknown, though it is doubtless a carboniferous species.

Genus CYRTOCERAS, Goldfuss.

CYRTOCERAS CURTUM.—Shell rather under medium size, slightly arched and rapidly expanding; section oval, the transverse diameter being greater than from the dorsal to the ventral side; lateral margins a little flattened; ventral and dorsal sides very broadly rounded. Surface ornamented by numerous small, regularly arranged annular striæ, or impressed lines, which arch a little forward in crossing the dorsum, where they are separated by spaces several times their own breadth, excepting near the smaller extremity of the shell. On the sides and ventrum, they become much more crowded, and more deeply impressed. Septa rather deeply concave; siphuncle small, and placed about half-way between the middle and the dorsal side.

Length of a specimen imperfect at the smaller end, 1.25 inches; greater diameter at the aperture about 1.24 inch, smaller do. 0.92 inch; greater diameter at the smaller extremity 0.54 inch, smaller do. 0.45 inch.

Locality and position. Graysville, Illinois. Coal Measures.

CYRTOCERAS? DILATATUM.—Shell broadly conical, very rapidly expanding, thick, especially on one side, a little curved and apparently somewhat compressed; surface ornamented by numerous distinct, regularly arranged, subimbricating annular marks of growth: septa separated, at about about two inches from the smaller end, by spaces near one-twelfth of the greater diameter of the shell at the same place; (siphuncle and aperture unknown). Length

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of a septate specimen, incomplete at both ends, 1.18 inches; breadth of smaller end 1 inch, do. of larger end 2.97 inches.

Locality and position. Near Springfield, Illinois. Upper Coal Measures.

Genus NAUTILUS, Breynius.

NAUTILUS SUBGLOBOSUS.—Shell under medium size, subglobose, broadly rounded over the dorsum and sides; umbilicus (in casts) rather small, deep, conical, or with nearly vertical sides, showing rather less than the half of each inner whorl; volutions about three, increasing rapidly in size, especially in breadth, deeply embracing, subangular on the sides around the umbilicus; septa rather deeply concave, arching very slightly forward over the dorsal region, where they are separated by spaces a little less than one-fifth their own greater (transverse) diameter; aperture transversely subulate, or subreniform; lip deeply sinuous on the dorsal side; siphuncle central; surface apparently smooth. Length 2.11 inches; height 1.72 inch; breadth at aperture 1.95 inch.

This species is related to the following, but differs in having a wider umbilicus, with more rapidly expanding whorls. It is also more broadly rounded on the dorsum, and its septa are rather more closely arranged in proportion to the breadth of the whorls.

Locality and position. Chester, Illinois. Chester Limestone of Lower Carboniferous series.

NAUTILUS CHESTERENSIS.—Shell under medium size, subglobose, rounded over the dorsum and sides; umbilicus (in casts) small and deep, with nearly vertical walls, probably almost closed in adult specimens retaining the shell, apparently showing little of the inner whorls; volutions about three; increasing moderately in size, rather deeply embracing, abruptly rounded, or subangular around the umbilicus; septa not very concave, arching very slightly forward over the dorsal region, where they are separated by spaces a little less than one-fourth their own transverse diameter; siphuncle very nearly or quite central; aperture (as inferred from a section of the whorls) transversely subreniform; (surface unknown). Length 2.43 inches; height about 1.88 inches; breadth near the aperture about 1.80 inch; breadth of umbilicus (in cast) 0.54 inch.

Locality and position. Same as last.

NAUTILUS SPECTABILIS.—Shell large, subglobose; umbilicus moderately wide, deep, subconical, and showing rather more than half of each inner whorl; volutions increasing rather rapidly in size, or more than doubling their diameter each turn, broadly rounded over the dorsum, moderately concave within, and very narrowly rounded, or subangular along the middle of each side, where they are ornamented by a series of low nodes, some fourteen to sixteen of which may be counted on either side of each turn; section of the whorls subelliptical, the breadth being rather more than double the diameter from the dorsal to the umbilical side; siphuncle located a little outside of the centre. Septa distinctly concave, arching slightly forward over the dorsum, where they are separated by spaces less than one-fourth their own transverse diameter. (Surface, aperture, and number of whorls unknown.)

Length of a specimen, consisting entirely of septate whorls, 4.50 inches; height of do. 3.47 inches; breadth of the aperture 3.20 inches.

Locality and position. Gravel Creek, Randolph County, Illinois. Chester Limestone, of Lower Carboniferous series.

NAUTILUS (DISCUS*) PLANORBIFORMIS.—Shell of medium size, compressed

*We retain Prof. King's name *Discus*, in a subgeneric sense, for all the discoidal forms with a central siphuncle, simple septa, and slender contiguous whorls, all exposed in a wide, shallow umbilicus. It seems not to be quite synonymous with *Discites*, of McCoy, which is described as having the siphuncle "near the outer edge of the periphery." We have some doubts whether such forms should be retained in the same genus with the living species of *Nautilus*.

discoidal; umbilicus very wide, shallow, and showing nearly all of each inner whorl; volutions about four, increasing gradually in size, slightly embracing, nearly rounded in young shells, but becoming somewhat compressed on the sides and dorsum, in mature individuals—having a row of obscure nodes around each dorso-lateral margin; aperture a little oval, its longer diameter being in the direction of the plane of the shell: septa deeply concave, arching gently backwards on the sides and dorsum, and separated by spaces less than one-third the transverse diameter of the whorls; siphuncle small and central; surface apparently smooth.

Length 3.60 inches; height 3.21 inches; breadth 0.92 inch.

Locality and position. Alpine, Iowa. Coal Measures.

NAUTILUS (DISCUS) TRISULCATUS.—Shell discoidal, under medium size; umbilicus wide, moderately deep, and showing nearly all of each inner whorl; volutions slender, increasing very gradually in size, a little broader transversely than the diameter from the dorsum to the ventral margin, ventricose and rounded on each side, and provided with a deep rounded sulcus in each dorso-lateral region. Between these two sulci, the dorsum is narrow, prominent and less deeply grooved, the sulcus being bounded on either side by an angle. Surface retaining traces of rather strong longitudinal lines. Septa deeply concave, and arching distinctly backwards in each of the dorsal depressions, separated on the dorsum by spaces generally less than one-third the transverse diameter of the outer whorl at the place of measurement; siphuncle rather small, and placed a little nearer the dorsal than the ventral side. Length (of a specimen retaining a portion of the nonseptate whorl) 2.33 inches; height 1.82 inches; breadth about 0.87 inch.

Locality and position. Rockford, Indiana, in beds containing Carboniferous species of *Goniatites*, but usually regarded as Upper Devonian.

NAUTILUS (DISCUS) DIGONUS.—Shell rather small, subdiscoidal; umbilicus comparatively large, moderately deep, and showing all of each inner whorl; volutions about three or four, in contact, but not embracing, increasing gradually in size, broad and nearly flat on the dorsal side, which is marked by two very obscure longitudinal depressions near the aperture; distinctly angular on each dorso-lateral margin, thence rounding regularly into the umbilicus; surface of cast retaining traces of regular, equidistant longitudinal lines, and much finer and more closely arranged transverse striæ; aperture and section of the whorls nearly semicircular, the outer or dorsal side being almost straight, and the inner rounded. Septa distinctly concave; their margins curving obliquely backwards on the sides of the whorls, from the dorso-lateral angles, and deflected backwards in crossing the dorsum. Siphuncle small, located about one-third the diameter of each septum from the dorsal side.

Length, (of an imperfect specimen, about one-third of the outer whorl of which is non-septate,) 1.20 inch; height 1 inch; breadth across the dorsum of the outer whorl near the aperture, 0.62 inch; diameter of same from the dorsal to the ventral side, 0.40 inch.

Locality and position. Same as last.

NAUTILUS (DISCUS) SANGAMONENSIS.—Of this species we have seen but a single specimen consisting of about half of one volution. It is a little wider transversely than deep, and increases gradually in size from the smaller to the larger end, being evidently part of a discoidal shell, with an umbilicus about equalling the transverse diameter of the outer whorl. On the dorsum it is nearly flat, or but slightly convex, and the sides are a little concave. The ventro-lateral regions are obliquely flattened, so as to form an abrupt slope into the umbilicus, leaving a subangular prominence between the umbilicus and each slightly concave side. The ventrum is moderately concave along the middle, for the reception of the inner whorls, each of which was probably about one-third hidden.

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On each dorso-lateral angle, there is a series of rather low nodes, about twenty to twenty-two of which probably existed on each side of the entire whorl. The transverse section of the whorls has a nearly quadrangular form, if we regard the small ventral concavity, and the two sloping ventro-lateral margins together as one side. The septa are moderately concave, and arch gracefully backward on each side, while in crossing the dorsum they arch less deeply in the same direction. The siphuncle is small, and located a little nearer the dorsal than the ventral side. (Aperture and surface markings unknown).

Length, as inferred from the curve, about 2 inches; height about 1.45 inch; breadth near the aperture 0.88 inch.

Locality and position. Sangamon County, Illinois. Coal Measures.

Genus GONIATITES, De Haan.

GONIATITES GLOBULOSUS.—Shell under medium size, length and breadth nearly equal, very broadly rounded on the dorsum; umbilicus deep, less than half as wide as the greater (transverse) diameter of the outer whorl; volutions more than twice as broad transversely, as from the ventral to the dorsal side; sides subangular around the umbilicus; aperture transverse, lunate, much wider than high; (surface unknown;) surface of internal cast slightly constricted at intervals, as if from an occasional thickening of the lip. Septa moderately distant; dorsal lobe nearly as wide as long, and deeply divided into two slightly diverging, simple, lanceolate branches; dorsal saddle linguiform, and a little narrower than the dorsal lobe, but equalling it in length, slightly contracted in the middle; superior lateral lobe as long as the dorsal saddle, but narrower, and pointed at the extremity; lateral saddle a little broader than the dorsal saddle, which it resembles in other respects.

Length 1.18 inch; height, 1 inch; breadth at the aperture, 1.11 inch.

Locality and position. Upper Coal Measures, Springfield, Illinois.

GONIATITES IOWENSIS.—Shell attaining a rather large size, discoidal or compressed on the sides, and narrowly rounded on the dorsum; umbilicus shallow, about one-half as wide as the breadth of the outer whorl from the ventral to the dorsal side, showing apparently a little less than half of each inner whorl; volutions increasing gradually in size, but slightly convex on the sides, nearly twice as broad on a line from the dorsal to the ventral margins, as the diameter at right angles to the same, profoundly grooved on the ventral side for the reception of each succeeding whorl; aperture, judging from a transverse section of the volutions, narrow sublunate. (Surface unknown.)

Septa rather crowded and deeply sinuous; dorsal lobe large, considerably wider than long, profoundly divided into two large lanceolate branches, each of which is a little narrower above than in the middle, and abruptly contracted to an acute point at the extremity; dorsal saddle linguiform, slightly oblique, a little larger than either division of the dorsal lobe, and longer than wide; superior lateral lobe infundibuliform, as long as the dorsal saddle, but not more than half as wide, acutely pointed at the apex; lateral saddle a little shorter than the dorsal saddle, but narrower at the extremity; inferior lateral lobe rather shorter than the superior, particularly on the ventral side, but resembling it in other respects; ventral saddle shorter than the others, and broadly rounded.

Length 4.21 inches; height 3.43 inches; breadth at the aperture 1.10 inch.

Locality and position. Alpine, Iowa. Coal Measures.

GONIATITES LYONI.—Shell attaining a medium size, compressed, discoidal; umbilicus large, or nearly twice the diameter of the outer whorl, from the dorsal to the ventral side, very shallow, and showing about four-fifths of each inner whorl. Volutions slender, increasing very gradually in size, compressed, or about one-third deeper from the dorsal to the ventral side than the trans-
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verse diameter, rather narrowly rounded on the dorsum, compressed convex on the sides, and provided with a shallow concavity along the ventrum for the reception of the inner whorls. Septa moderately distant, and deeply divided into six lobes and six saddles; dorsal lobe longer than wide, infundibuliform, and acutely pointed; dorsal saddle as long as the dorsal lobe, but wider, and rounded at the end; superior lateral lobe half-ber-shaped, a little longer than the dorsal lobe, and sharply pointed at the extremity: lateral saddle longer and narrower than the dorsal saddle, linguiform, and regularly rounded at the summit; inferior lateral lobe similar to the superior, excepting that it is somewhat smaller; ventral saddle shorter and broader than the lateral saddle, rather oblique, and rounded at the end.

Length of an imperfect entirely septate specimen, 2.55 inches; height, 2.15 inches; convexity, 0.57 inch.

Locality and position. Rockford, Indiana, from the Rockford *Goniatite* bed, the exact age of which is somewhat doubtful, though it is generally considered of upper Devonian age.

NOTE.—In the last number of the Proceedings of the Academy, we described a new Echinoderm, under the name of *Melonites Danae*, mentioning, at the same time, that it differs from the type of the genus *Melonites*, in having only four, instead of eight double rows of pores to each ambulacrum. Since that time we have been led to regard this difference as being of more than specific importance, though until other species or better specimens are known, we cannot be quite sure it is of full generic value, especially since these forms seem to be exactly alike in other respects. We therefore now propose to found upon this species a subgenus, under the name of *Oligoporus* (*ὀλίγος*, few; and *πῶρος*, opening or pore.)

We also avail ourselves of the present opportunity to correct the following errata, which were overlooked in correcting the proof of the paper mentioned above:

Page 382, 15th line from the bottom, for *second radial* read *second radials*.

Page 382, for the 4th, 5th and 6th lines from the bottom, substitute *secondary radials* 1×10 : *resting partly on the second, and partly on the first primary radials; or, in the absence of the former, directly on the latter.*

Page 382, insert between the first and second lines from the bottom,—*Anal plate 1, (known); varying much in size and form.*

Page 386, 12th line from the bottom, for *Actinocrinus scitulus*, read *Actinocrinus scitulus*.

Page 389, 2d, 5th and 23d lines from the bottom, and 4th and 5th line from the top, for *Forbsiocrinus*, read *Forbesiocrinus*.

Description of a New Species of *Exocetus*, from Chili.

BY CHARLES C. ABBOTT.

Exocetus Chiliensis, Abbott.—*Spec. char.* Head of medium size, without scales, and trigonal. Body much compressed and tapering to the tail; peduncle of the tail very slender. Eye unusually large, circular, diameter entering two and two-thirds times in the length of the side of the head; the orbits are one diameter distant. The posterior extremity of the maxillary bone extends to a vertical line drawn anteriorly to the anterior margin of the orbit. The nostrils are situated anteriorly to the eyes, and are about three diameters distant. Anterior to, between, and posterior to the orbits, are numerous pores, with channelled, slender depressions over the forehead and occiput, leading to the orifices of these pores. A well-defined, carinated row of scales commence, on each side, at

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the lower margin of the opercular apparatus, and extend in a direct course, to the posterior insertion of the anal fin. The dorsal fin has its anterior insertion at the commencement of the posterior third of the total length of the body, and extends to within three-fourths of an inch of the insertion of the caudal fin. The pectoral fin has its insertion immediately behind the margin of the opercle, and the extremities of the rays reach the insertion of the caudal fin. The ventral fins are unusually small, and have their length equal to their width. The anterior insertions of the ventral fins are slightly posterior to the corresponding insertion of the dorsal fin, and its termination is opposite that of the dorsal fin. The caudal fin is deeply furcated, with the lower lobe of the fin one-third longer than the upper.

The numbers of the fin-rays are D, 16. P, 15. V, 6. A, 15. C, 20—

4

Color. In alcoholic specimens, the upper surface of the head and back are deep brown with a purple tint; lower portion of the sides and belly silvery white. The fins and opercle are bright silvery. Iris chestnut-brown.

Habitat. Chili.

Two well preserved specimens of this *Exocoetus* are in the museum of the Academy, presented by Mr. C. S. Rand. The colors of this species during life are evidently much brighter, giving it an appearance surpassed in beauty by no known species.

Descriptions of Four New Species of North American Cyprinidæ.

BY CHARLES C. ABBOTT.

1. *Catostomus Texanus*, Abbott.—*Spec. char.* Head somewhat compressed, large, constituting somewhat more than one-fourth of the total length. Eye small, longitudinally oval; its longitudinal diameter constituting one-twelfth of the length of the side of the head. Mouth large, with the labial papillæ moderately developed. Body moderately compressed; a dorsal gibbosity extends from the occiput, attaining its greatest height an inch from the occiput, and disappearing at the anterior insertion of the dorsal fin; it is carinated throughout its whole extent. Dorsal fin one-third longer than high; its base enters five and a-half times in the total length; its anterior margin equidistant between the base of the caudal and the extremity of the snout. The insertion of the ventrals is opposite the centre of the dorsal fin, and much nearer the base of the caudal than the extremity of the snout. The posterior extremity of the anal fin extends beyond the rudimentary rays of the caudal. The scales are of medium size, with a subcentric nucleus near the anterior margins of their free portions, from which radiate numerous striæ, and around which are numerous well defined ridges. The lateral line is nearly straight throughout its course.

The numbers of the fin-rays are D, 15. P, 16. V, 10. A, 7. C, 18—

5

Color. Upper surface of the head, back, and sides, a dull slate color; belly white (not silvery). Throat yellow.

Total length, 14 inches.

Habitat. Colorado and New rivers.

I am indebted to Dr. John L. Le Conte, for a note containing a description of this fish, noticing many peculiarities which the specimen (a stuffed one) does not now exhibit.

2. *Catostomus chloropteron*, Abbott.—*Spec. char.* Body considerably depressed, rapidly tapering posteriorly. The length of the head enters into the entire length of the body four and a-half times. Eye of medium size; the diameter of the orbit contained in the length of the head eight times. Mouth

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of medium size, with the labial papillæ very conspicuous. The dorsal fin, anteriorly, is slightly higher than long; its anterior insertion nearer the extremity of the snout than the insertion of the caudal fin. The anterior insertions of the ventral fins are opposite the anterior fourth ray of the dorsal and nearer the insertion of the caudal fin, than the extremity of the snout. The lateral line is nearly straight, and somewhat nearer the dorsal than the ventral outline.

The numbers of the fin-rays are D, 13. P, 16. V, 8. A, 7. C, 20.

Color. In alcoholic specimens, the back and sides above the lateral line are clear, light-blue, becoming pearly white upon the lower half of the sides and upon the belly. The fins are bright yellow.

Total length, $7\frac{1}{2}$ inches.

Habitat. Kansas.

Two well preserved specimens are in the Museum, presented by Dr. Wm. A. Hammond; both probably young.

3. *Gila affinis*, Abbott.—*Spec. char.* The body is slender; tail greatly attenuated. Head constituting somewhat more than one-fifth of the total length. Eye rather small, subelliptical, its diameter contained six and a-half times in the entire length of the head. The posterior extremity of the maxillary bone extends to a vertical line, drawn posteriorly to the anterior edge of the orbit. Anterior margin of the dorsal fin nearer the base of the caudal than the extremity of the snout. Anterior margins of the ventral fins somewhat nearer the extremity of the snout than the base of the caudal. The lateral line is nearly concurrent with the ventral outline.

The numbers of the fin-rays are D, 10. P, 16. V, 8. A, 9. C, 28—³

Color. In alcoholic specimens, the back and upper third of the sides are dull violet, becoming pale pink below the lateral line and upon the belly.

Total length, $6\frac{3}{4}$ inches.

Habitat. Kansas.

The Museum contains a single specimen, presented by Dr. Wm. A. Hammond.

4. *Semotilus Hammondi*, Abbott.—*Spec. char.* Body much compressed, and tapering rapidly to the tail. The head constitutes more than one-fourth of the length of the body, excluding the caudal fin. Snout conical; gape of the mouth oblique; the posterior extremity of the maxillary bone extending to a vertical line drawn through the extremity of the pupil. Eye subelliptical; its diameter entering eight times in the length of the side of the head. Anterior margin of the dorsal fin equidistant between the fork of the caudal fin and the extremity of the snout. Insertion of the ventrals slightly in advance of the dorsals. Dorsal fin somewhat higher than broad, and nearly quadrilateral. Anal fin one-third longer than broad, circular at its posterior extremity. Lateral line concurrent with the ventral outline. A number of irregularly situated tubercles on each side of the head, mostly existing in the orbital region.

The numbers of the fin-rays are D, 9. P, 18. V, 9. A, 9. C, 24—³

Color. In alcoholic specimens, the upper surface of the head, back, and sides, are a deep umber brown; belly of a bright yellow. A black spot at the anterior base of the dorsal fin, and another very faint at the centre of the base of the caudal. A faint black line concurrent with the lateral line.

Total length, 7 inches.

Habitat. Kansas.

The Museum contains a single specimen of this fish, presented by Dr. Wm. A. Hammond, to whom the species is dedicated.

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Description of new species of Apodal Fishes in the Museum of the Academy of Natural Sciences, of Philadelphia.

BY CHARLES C. ABBOTT.

Genus HERPETOICHTHYS, Kaup.

Diagn. Jaws nearly equally long. Snout short. Gullet wide. Eyes near the end of the snout. Head depressed, so that the eyes are nearer the upper surface than they are distant from each other laterally. Anterior nostril tubular at the extremity of the snout, and the hinder one at the commencement of the outer row of palatine teeth. Between the two, on the border of the upper lip, there is a small cutaneous tag. Pectoral fins moderately short. Six or seven nasal teeth, and from nine to thirteen vomerine ones.

1. *Herpetoichthys callisoma*, Abbott.—*Spec. char.* Head depressed; the facial outline slightly oblique, and without curvature. The jaws are flattened, and the snout terminates in a rather obtuse point. The eyes are large, longitudinally oval; the diameter of the orbits entering three times in the length of the side of the head, measuring from the angle of the jaws. The gill-opening is large and perpendicular; it is situated as much more posteriorly to the extremity of the snout, as anteriorly to the commencement of the dorsal fin, as four is to one. The dorsal fin arises nearly opposite to the tips of the rays of the pectoral, when it is extended backwards, and reaches to within a short distance of the extremity of the tail; it retains a uniform height until it nears the posterior eighth of the total length, when it rapidly decreases to its termination. The anus is situated slightly posteriorly to the anterior third of the total length; and, at its posterior margin the anal fin originates, and from thence proceeds the lower surface of the body, and is co-terminal with the dorsal fin.

The teeth upon the mandible and palate are biserial; the dentition elsewhere is uniserial. Nasal teeth eight; compressed, blunt, inwardly directed; four are upon the mesial line, the anterior two smaller than the others. Vomerine teeth eleven; these form a nearly straight line, and have the anterior six somewhat larger than the other five. Palatine teeth upon the outer row eleven; upon the inner row ten; they are similar to the nasal teeth. Mandibular teeth similar in shape to the nasal teeth, sixteen upon the outer row; ten upon the inner row.

Color. The head, and that portion of the back anterior to the pectoral fins, is dull brown, with a purple tint. On a line with the angle of the mouth, extending as far back as the base of the pectorals, this color is uniform, but below this line it becomes much paler and white, in irregular patches. Upon the head and neck there are numerous circular blackish spots, which occasionally run into each other, forming irregular blotches. The throat is longitudinally marked with slender black lines, which extend nearly parallel, and reach the base of the pectorals. The ground color of the body is a uniform yellowish-brown, lighter on the belly; along the sides, from the pectoral fin to the termination of the dorsal, are large, circular, equidistant, very deep brown spots, their diameter equal to two-thirds of the width of the body. Above and between the large lateral spots, exists a regular row of smaller, but similarly shaped spots; the first two commencing anteriorly to the insertion of the dorsal fin, and nearly joining upon the back. Beneath and between the large lateral spots are smaller ones of a similar shape; these are irregular in their position and number, and differ materially, in many respects, on the two sides of the body. The dorsal fin is white, marked with irregular spots, of a color similar to those upon the body. The anal fin is similar in its coloration to the dorsal. The pectorals have a number of very minute dots upon them.

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A row of circular spots commences on the belly, near the pectoral fins, and extends to the anus.

Total length, 38 inches. To anus, 13 inches.

Habitat. Pacific Ocean? Cabinet of the Academy.

A single specimen of this magnificent fish is in the collection presented by W. G. Burke, Esq. This specimen, at first glance, would not appear to belong to the genus *Herpetoichthys*; but the slight variations are not sufficient to refer the species to any other genus. The exact locality from which the species was obtained is uncertain, but various circumstances induce me to suspect it is a species belonging to the Pacific fauna.

Genus PISOÖDONOPHIS, Kaup.

Diagn. Teeth short, conic, and more or less blunt. Anterior nostril tube well developed, and approximating the corner of the mouth. Pectorals more or less fully developed.

2. *Pisoödonophis magnifica*, Abbott.—*Spec. char.* Head small, facial outline with an oblique curvature; the snout rather obtuse, with the upper jaw extending much beyond the lower, making the nasal teeth visible when the mouth is closed. The body is perfectly cylindrical, and tapers very gradually to the tail, which terminates in a conico-acute horny point. The dorsal fin has its anterior insertion at the occiput, and the fin terminates before it reaches the horny extremity of the tail. The anal fin is coterminous with the dorsal. The pectoral fin is small, circular, with twenty rays. The teeth are all very small, conical, and acute, six standing irregularly on the disc of the nasal bone. The teeth upon the palate, vomer, and mandible are biserial, and placed very close to each other. Palatine teeth ; vomerine teeth

Color. In alcoholic specimens, the ground color of this fish is pink, darkest upon the back, and nearly lost upon the belly, which appears white, without close inspection. At the base of the anterior nasal tubes are two very small dark chocolate-brown, semicircular spots; behind these, and anterior to the orbits, are situated two similar markings, but larger, and little deeper in color. Commencing at the insertion of the dorsal fin are two series of spots of chocolate color, separated only by that fin; these spots, if viewed from above, have the appearance of transverse bands. These spots are not, in every case, directly opposite, but they are generally so. Upon the sides is a single series of spots, of the tints of the dorsal markings, which are two-thirds of the width of the sides, measuring from the base of the dorsal to the centre of the belly. Upon the belly are three rows of small, circular spots, which are very irregular as to position.

Total length, 19 inches. To anus, 8 inches. To gill-opening, 1½ inch.

Habitat. Sandwich Islands.

The Museum of the Academy contains two specimens, which were collected and presented by Dr. J. K. Townsend.

3. *Muraena acutirostris*, Abbott.—*Spec. char.* Head much compressed; the facial outline moderately oblique; the jaws greatly attenuated, very slender; the lower mandible somewhat the smaller, with a gentle upward curve at its extremity. The fold of the skin, enveloping the dorsal fin, is unusually thin, and arises within a short distance of the occiput, with a slope of about forty-five degrees. The fin is equal in width to seven-eighths of the width of the body, and has no perceivable decrease until it approaches the posterior eighth of the body, when it decreases rapidly, and at its termination is only equal to one-seventh of the width of the fin upon the back. The eye is large, circular, its diameter equal to one-fifth of the length of the side of the head, measuring from the angle of the jaws; the orbits are one diameter

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distant, and the distance from the upper edge of the orbit to the facial outline is equal to the distance between the lower margin of the orbit and free edge of the upper lip. The gill-opening is rather small, oblique, situated as far posteriorly to the commencement of the dorsal fin as that is posterior to the angle of the jaws. (The pores upon the snout and lateral line, in this specimen, are not visible.)

The teeth are uniserial, compressed, and very acute; the palatines, vomerine, and mandibular teeth all inwardly directed. Nasal teeth fourteen; widely set, and from three to five minute teeth between each pair. Three teeth are placed upon the mesial line; the second one very slender, and the longest tooth in the mouth; the third is twice as great in circumference, and but little shorter than the second tooth. Twelve compressed, acute teeth are situated upon the vomer, in a direct line; the anterior tooth much the largest. Palatine teeth, thirteen, of a uniform size; the series commencing below the centre of the orbit and terminating shortly anteriorly to the angle of the jaws. The mandible is armed with twenty-six teeth upon each side; the anterior four of each side being nearly three times as great in size, more widely set, and the posterior pair have a single, compressed, very small tooth between them.

Color. The ground color of this species is a dark hair brown, nearly black upon the occiput and cheek, and along the base of the dorsal fin. The head, body, and both fins are irregularly reticulated with narrow bands of white, varying in width and becoming yellow on the posterior fifth of the dorsal fin, and upon that portion of the body, but in a less degree. Three broken lines of black extend along the body, from the angle of the jaws to the gill-opening. Iris chrome yellow. Total length $19\frac{1}{2}$ inches. To anus 9 inches. To gill-opening $2\frac{3}{4}$ inches.

Habitat. Sandwich Islands.

A single specimen of this peculiar *Muræna* was brought from the above locality, and presented to the Academy, by Dr. J. K. Townsend, to whom the Academy is indebted for many species of fishes, which enrich their ichthyological cabinet.

The peculiarity of this *Muræna*, which immediately falls under the notice of the ichthyologist, is the remarkably slender snout; which consequently gives the dentition an unusual aspect, in crowding the marginal nasal teeth and those upon the mesial line into close proximity; and the vomerine teeth so close to the palatines. The great acuteness of the teeth in every series, their close proximity, and inward direction, give this species a ferocious appearance, which certainly must be realized by every unfortunate fish, whose fate it is to be mangled by his jaws.

4. *Thyrsoidea Kaupii*, Abbott.—The genus *THYRSOIDEA* differs from *Muræna* by having the palatine teeth biserial.

Spec. Char. Head, facial outline, and general characters of the jaws, except their less tenuity, similar to *Muræna acutirostris*, Abb. The fold of the skin, enveloping the dorsal fin, is thick on the anterior portion of the fin, and prevents the rays from being felt. The commencement of the dorsal fin is twice as far distant from the gill-opening, as from the angle of the jaws. The eye is large, longitudinally oval; its longitudinal diameter entering four times in the length of the side of the head, measuring from the angle of the jaws. The anterior nostrils are furnished with long slender tubes, which extend to the free margin of the lip; the posterior nostrils are not tubular. The anus is situated two inches anteriorly to the centre of the total length. The body, posteriorly to the anus, tapers slowly to the extremity of the tail, which is very acute.

The nasal teeth number twelve; they are tall, slender, inwardly directed, with two very minute teeth between nearly every pair. Two teeth, similar to the marginal nasal teeth, stand upon the mesial line, and are the tallest teeth

in the mouth. Seven short-conical, rather blunt teeth, with the anterior two twice as large as the others, stand upon the vomer; the anterior second tooth a little beyond the line of the others, otherwise they form a straight series. The palatine teeth number twelve or thirteen; they are very much compressed, acute, are set near to each other, and are inwardly directed; these form the outer and principal series. Two much larger ones, very near the commencement of the outer series, and within that series, form the interior row. This inner row is similar in its characters, except as to number, to the outer row of palatines. The mandible is armed with a complement of twenty-two, short, compressed teeth, all inwardly directed; the six upon the extremity of the jaw, are three times as great in length, as the principal series, and between them is generally a pair of minute teeth, which are hidden by the lip, and often entirely concealed in the soft parts of the jaw.

Color. The head and body are of a uniform dark umber, the back and sides crossed by coarse reticulations of bright sienna. The fins are nearly black, with the reticulating bands that cross the body, continuous upon them. The head is free from the bands of sienna, as is the throat and a small anterior portion of the belly. Upon the throat and sides of the neck are narrow longitudinal black lines, extending as far back as the gill-opening.

Total length 18 inches. To anus 8 inches. To gill-opening 2 1-5th inches.

Habitat. Sandwich Islands.

This handsomely marked species of *Thyrsoidea* has every appearance of a *Muraena*, and unless closely examined might be referred that genus. The presence of the inner row of palatine teeth, however, preclude the propriety of its being so classed. This species belongs to that class of the genus, which has but *two* teeth upon the inner row of palatines; a peculiarity which is of too slight importance to be considered generic, and is too constant to be considered specific. The specimen from which the description was taken, was presented to the Academy by Dr. J. K. Townsend.

This species is named in honor of Dr. J. J. Kaup, of Darmstadt, to whom science is indebted for the first systematic elucidation of the history of the Apodal Fishes.

5. *Thyrsoidea eurosta*, Abbott.—*Spec. char.* Head large, depressed; the facial outline very slightly oblique. The fold of the skin enveloping the dorsal fin is very thick, and arises slightly behind the occiput, nearly perpendicularly; the fin is of uniform height for two-thirds of its length, when it slowly decreases to its termination. The eye is large, circular, and slightly behind the extremity of the snout; the orbits are one diameter and a half distant. The jaws are of equal length, and rather slender; the lower jaw with a slight upward curve at its extremity, making the large mandibular teeth partially visible when the mouth is closed. The nasal teeth number ten; they are biserial, and the inner row are twice as large in every respect as the outer row; they are conical, acute, and with a decided inward inclination. The palatine teeth number twenty-eight upon the outer row; and nine upon the inner row. The teeth constituting the outer row of palatines are short, very much compressed and acute; they have a moderate inward inclination. The inner row of palatines are widely set, of various lengths, and have a gape in their series, commencing posteriorly opposite the posterior margin of the orbit, and ceasing opposite the anterior edges of the orbit; the teeth upon the inner series are more than twice as large in all respects as those of the outer row. The vomerine teeth number twelve, nine of which are in a direct line, and the remaining three concurrent with the central three of the series. The lower jaw is armed with a complement of twenty-four compressed, acute teeth, having a decidedly inward inclination; the posterior twelve of these are closely set, and in an unbroken series; the anterior twelve are arranged in pairs, except at the extremity of the jaw, where they form two square patches of four teeth each.

Color. The body and head are of a uniform reddish brown, which become

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nearly black upon the under surface of the tail. The whole surface is minutely spotted, and reticulated with pale yellowish.

Total length, $13\frac{1}{2}$ inches. To anus 6 inches. To gill-opening $1\frac{1}{2}$ inches.

Habitat. Sandwich Islands.

This species is remarkably stout for its length, and presents an unusually large number of teeth for the size of the animal. But a single specimen is in the museum; which specimen was collected and presented by Dr. J. K. Townsend.

6. *Thyrsoidea concolor*, Abbott.—*Spec. char.* Head compressed, slightly depressed upon the occiput; jaws slender. The eye is large, circular, its diameter contained four times in the length of the side of the head, measuring from the angle of the jaws. The dorsal fin originates at the occiput, and has a slope at its commencement, of about forty-five degrees, the fin is of a uniform height, until midway between the anus and the extremity of the tail, when it commences gradually to decrease. The anus is slightly anterior to the centre of the body, and the anal fin, that there has its commencement, is equal in width to one-tenth of the width of the body, and extends to the extremity of the tail, preserving throughout a nearly uniform width.

The nasal teeth number twelve; they are all slender, conical and acute, with a pair of minute, compressed teeth between each pair of the marginal teeth; three teeth stand upon the mesial line, the centre one of which is the tallest tooth in the mouth. The outer row of the palatine teeth number sixteen; they are of uniform height, compressed, acute and with an inward tendency. The inner row consists of two teeth, placed at the commencement of the outer row: they are similar in all their characters to the teeth upon that row, except in being of nearly triple the height. On the vomer, exist ten conical, acute teeth, in a straight line; they are of a uniform size. The mandible is armed with a compliment of twenty compressed, acute teeth, having a decided inward inclination, but in a less degree than in the palatines; the anterior six teeth are much larger than the general series, and are more conical in their shape.

Color. The head, body and fins are of a uniform purplish brown, varying in its intensity upon the sides.

Total length, 11 inches. To anus $5\frac{1}{4}$ inches. To gill-opening $1\frac{1}{4}$ inches.

Habitat. Vera Cruz.

A single specimen is in the museum, presented by Dr. Burroughs, and labelled as procured at the above locality.

NOTE.—On pages 326 and 327, *hujus operis*, there are described two *Elcheostomoids*, named respectively—*Pæcilosoma transversum* and *Pileoma cymatogramma*.

As the name *Pæcilosoma*, has been changed to *Pæcilichthys*, the name of the species will hereafter be

Pæcilichthys transversus, Abbott.

Syn. *Pæcilosma transversum*, Abbott, Proc. Acad. Nat. Sci. Phila. 1860, p. 326.

As the genus *Percina*, Hald. is congeneric with *Pileoma*, De Kay; and is prior to that genus, the species described as *Pilcoma cymatogramma*, Abb. will hereafter be

Percina cymatogramma, Abbott.

Syn. *Pileoma cymatogramma*, Abbott, Proc. Acad. Nat. Sci. Phila. 1860, p. 327.

NOTE.—On page 365, *hujus operis*, for the figure 13, given as the number of rays of the anal fin, in *Astrosopus guttatus*, Abb., please substitute the figure 10.

Report upon the Reptilia of the North Pacific Exploring Expedition, under command of Capt. John Rogers, U. S. N.

BY EDWARD HALLOWELL, M. D.

EDITED BY E. D. COPE.

Nicaragua.

SAURIANS.

GECKOTIANS.

Geckotian Lizards—Lezards Geckotiens D. & B.

HEMIDACTYLUS CUV.

Sect. DACTYLOPERES. *Peropus* Wieg.

Div. A.—Subdigital lamella entire.

HEMIDACTYLUS PRÆSIGNIS nob.

Proceed. Acad. Nat. Sci., Oct. 1856, p. 222.

Char. Rostral plate bilobed; seven superior labials; mental plate very large, the sides excavated, rounded posteriorly; six plates in a transverse row beneath the chin, the two middle ones much smaller than the lateral; tail slender, long; color uniform chocolate-brown above; abdomen and under part of tail whitish. Total length, 6 inches. Tail, 3 inches, 3 lines.

Found also in Jamaica.

SPHÆRIODACTYLUS CUV.

For gen. char. see D. & B., tom. ii. 401.

SPHÆRIODACTYLUS MILLEPUNCTATUS nob.

Spec. char. Dorsal scales very small, unicarinate; color reddish, with numerous small brownish spots; under parts white; length of head and body, 11 lines.

Description. Scales upon muzzle larger than those upon the vertex; those upon body remarkable for their small size, being much smaller than those of the specimens in the Museum, marked *nigropunctatus*, from Jamaica, or of *Sphæriodactylus fantasticus*, from Mexico. Abdominal scales carinated, very much larger than those upon the throat and chin; color reddish-brown above, with numerous brown spots, intermingled with very minute white points; under parts white. Two specimens.

IGUANIANS.

Sauriens Eunotes D. & B. Lezards Iguaniens.

ANOLIS D. & B.

Div. A.—With fingers but slightly dilated.

ANOLIS REFULGENS Schlegel.

Draconura nitens Wagl. Dum. & Bib., tom. iv. p. 91.

This species is very well characterized by the larger row of scales along the median line of the back; the granulations upon the sides are much smaller than those of the back and abdomen, and there is a larger row of scales upon the back of the tail; immediately behind the mental plate are six scales, in a transverse row, the four intermediate quite small, the lateral much larger; the occipital scale lies in a well marked depression, the supra-orbital ridges are nearly in contact, and on the front part of the head is a longitudinal

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ovoid depression, the scales of which are smooth; those upon the snout carinated, as also the scales upon the abdomen; the colors of these specimens are much darker than that of another; brownish above, and orange colored mingled with yellow beneath; in the other, the general color is golden yellow, lighter beneath, with a tinge of white upon the abdomen. Total length, $5\frac{1}{4}$ inches; of tail, 2 inches 8 lines. Found also in Surinam. (D. & B.)

ANOLIS LONGICAUDA nob.

Spec. char. Scales upon the muzzle keeled; eight superior labials; scales of abdomen carinated; dorsal scales indistinctly carinated; median rows larger; tail very long; color green; gular pouch orange, with two indigo-colored lateral stripes, one on each side. Total length, 5 inches, 5 lines.

Description. 44 teeth in the upper jaw; 10 posterior tricuspid; 43 in the lower; the 10 or 11 posterior distinctly trilobed; scales upon the muzzle keeled; two crests upon the head, prolongations of the superciliary ridges, circumscribing laterally a longitudinal depression, broader in front; the scales in this depression polygonal, much larger than those upon the muzzle, keeled; eight superior labials; six rows of scales upon the side of the head anteriorly, between the superior labials and its upper margin; auricular opening moderate; abdominal scales much the largest, keeled; those upon the sides very small, granular; back covered with polygonal scales, indistinctly carinated; several of the median rows larger than the others; breadth of head posteriorly, one-half of its total length; body and extremities slender; tail very long and tapering, round at base, more than double the length of head and body; color bluish above, probably green during life; lighter upon the tail; abdomen, chin, under part of tail and extremities very light blue; gular pouch orange with two indigo-colored stripes, one on each side. Total length 5 inches, 5 lines; of tail, 3 inches, 10 lines. One specimen.

Gen. remarks. This species is quite different from *An. sericeus*, a Mexican species, in which the scales upon the back are granular, and of nearly equal size; it is also a stouter animal, and the tail is shorter. *Anolis tropidogaster nob.*, from New Grenada, is destitute of the two well marked crests so characteristic of this species, and the plates lying at the bottom of the longitudinal depression between them are much longer than those on the corresponding position in *tropidogaster*; and the shape of this depression is quite different, being much broader in front, in *longicauda*. In *Anolis pulchellus D. & B.*, the carinations of the scales before the back and abdomen are indistinct; whereas, in the present species they are well marked; the tail in the former is but one-third the total length.

ANOLIS CUPREUS nob.

Spec. char. Scales upon muzzle carinated; supraorbital ridges separated by several rows of scales; three or four rows of scales intervening between each interorbital ridge and the occipital scale; six superior labials; abdominal and dorsal scales very distinctly carinated; those upon tail very strongly keeled; copper colored above, whitish beneath; throat orange; in some specimens a black spot upon the shoulder. Length of head and body 1 inch 8 lines.

Description. A small species. Scales upon the muzzle very distinctly carinated; supraorbital ridges separated by several rows of scales; three or four rows of scales intervening between the supraorbital ridge and the occipital scale; six or seven supraorbital scales separated from the supraorbital ridge by a single row of granules; three scales carinated, and two of them much larger than the others; six superior labial scales; six or seven rows of scales upon the sides of the head anteriorly above the supraorbitals; auricular opening moderate; scales of the flanks smaller than those upon the back and abdomen; abdominal and dorsal scales very distinctly carinated; those upon

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tail very strongly keeled; copper colored above, whitish or yellowish white beneath; throat often orange, and in some specimens a black spot over the shoulder. Length of head and body 1 inch 8 lines. Seventeen specimens.

DACONURA Wagler, Wiegmann.

DACONURA BIVITTATA nob.

Spec. char. Head covered with polygonal plates of unequal size; color brownish above, with two lateral white vittae, bordered with black, one on each side, commencing behind the eyes, and extending the whole length of the body, as far as the base of the tail; underparts white. Total length $4\frac{3}{4}$ inches; of tail, 1 inch 4 lines.

Description. Seven supra labials, nostril in a single scale; plates upon front and muzzle unicarinate; superciliary wide, separated by two rows of scales, a single row between former and occipital scale; a single row of scales much larger than the rest, commencing at about three lines from the occiput, and extending along the median line of the back and tail above; scales upon back larger than upon sides; those of the belly very distinctly carinated; a gular fold; tympanum quite distinct; no femoral or anal pores; scales upon under part of tail strongly carinated; extremities slender; third and fourth fingers of nearly equal length; fourth toe much the longest; fingers and toes slender, not dilated, inner margin serrated; fingers and toes 5—5; tail very long, slender, tapering to a point.

Coloration. General color olive above, somewhat darker upon the sides; with two narrow white vittae, bordered with black, one on each side, commencing behind the eye and extending the whole length of the body, being lost upon the base of the tail; extremities indistinctly barred with brown above; under parts whitish.

Habitat. Nicaragua. A single specimen.

SCELOPORUS Weigm.

SCELOPORUS SCALARIS Weigm.

Twenty-six specimens (sixteen young).

TEIDE.

CNEMIDOPHORUS.

CNEMIDOPHORUS DECEMLINEATUS nob.

Spec. char. Nostril in the posterior margin of the naso-rostral plate; color grey above, with ten white lines, five on each side of the back; eight rows of abdominal scales. Total length $7\frac{1}{2}$ inches; tail $4\frac{1}{2}$ inches.

Description. The nostril opens in the posterior edge of the naso-rostral plate; five superior labials; a single row of large transverse scales on the anterior surface of the forearm; twenty-two femoral pores in the single specimen. The ground color above is greyish or olive; in the youngest specimens the intermediate space between the four upper white lines, jet black, forming three distinct jet black bands on each side; these jet black bands are more distinct in the youngest specimens; in the oldest the upper surface is of an uniform olive color, darker upon the sides; the entire surface of the abdomen, and the greater part of the under surface of the thighs, jet black; anterior part of forearms white spotted; these spots quite small, and by no means so distinct or near so large as in *C. lemniscatus*; in the younger specimens, presenting the form of vermiculations.

Dimensions. Length of head 10 lines; of neck and body to vent, 2 inches 1 line; of tail $4\frac{1}{2}$ inches.

Habitat. Nicaragua. Seventeen specimens.

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Gen. remarks. This species is readily distinguished from *C. lemniscatus*, the latter having but nine lines, the middle one of which bifurcates toward the occiput, and the sides more or less white spotted.

CNEMIDOPHORUS QUADRILINEATUS nob.

Spec. char. Nostril between the naso-rostral and naso-frenal plate; five supra-labials; eight rows of abdominal scales; color brownish black above; jet black upon the sides, with two very narrow white lines, extending from the temples in a line with the posterior margin of the eye, extending as far as the posterior extremities; a single row of broad scales upon the anterior surface of the forearms. Total length 3 inches 3 lines.

Description. The above appears to be one of the smallest of the species of *Cnemidophorus*. It is readily distinguished by its small size, and the peculiarity of its markings; in front of the gular fold is a row of four large scales, followed by several smaller ones; the back, between the two inner stripes, is vermiculated with black, the sides white spotted; the tail presents a white lateral stripe, a continuation of the lower one upon the side; under parts bluish, lighter upon the chin.

Dimensions. Length of head 5 lines; of body to vent 11 lines; length of tail $2\frac{1}{2}$ inches; total length 3 inches 4 lines.

Habitat. Nicaragua. Four specimens.

Gen. remarks. *Cnemidophorus præsignis* B. & G., from Chagres, said also to be common at Para, has ten rows of abdominal plates.

AMEIVA Cuvier.

AMEIVA PULCHRA nob.

Spec. char. Nostril between the naso-rostral and naso-frenal plates; a group of large scales upon the chin, surrounded by smaller ones; three or four large scales in front of the gular fold, surrounded by smaller scales; eight rows of abdominal plates; color olive above, with two lateral stripes of brown, one on each side, with numerous transverse rows of black. Total length $8\frac{1}{2}$ inches.

Description. This is a beautiful species of *Ameiva*, presenting distinctly the characters of the genus, viz.—the retractility of the tongue beneath the glettis, which distinguishes *Ameiva* from *Cnemidophorus*. In a natural series, it would take the place of *Ameiva Sloanæi*, which it resembles very closely in size, but the neck is not near so narrow as in that species; there is but a single row of large transverse scales in front of the forearm; the granulations upon the back are distinctly larger than those upon the sides; twenty femoral pores; the color of the head is light brown above, and upon the sides; olive colored or light brown upon the back, with a band of deep brown along each side, presenting numerous transverse bars of black; abdomen bluish, the rest of the under surface white, with a tinge of blue; in many of the specimens a row of white spots extends from the tympanum to the posterior extremity, occasionally assuming the form of a very narrow white line; a white spot upon the temple, and three or four around the margin of the tympanum. Eighteen specimens.

Habitat. Nicaragua.

SCINCIDÆ *Ophiophthalmidæ*.

Among the saurians of the collection from Nicaragua are two small lepidosaurians belonging to the subfamily *Ophiophthalmidæ*, and which appear to belong to a genus not yet described, having four toes to each of the anterior, and the same number to each of the posterior extremities. For the distinctive characters of the genera already known, see D. et B., tom. v., 806-831. It may be thus characterized;—No eyelid; nostrils lateral, opening in a single scale; no supero-nasals; teeth conical, simple; tongue bifid, 1860.]

covered with scales; palate without teeth, with a triangular excavation; auricular openings; four extremities each with four toes; scales smooth, neither femoral or præanal pores; palpebral circle, more or less complete. It will be observed that these characters are precisely the same as those of the genus *Ablepharus* of Fitzinger, as given by D. & B., except that the number of fingers and toes is four instead of five.

Gen. BLEPHARACTISIS nob.

BLEPHARACTISIS SPECIOSA nob.

Spec. char. An internasal, two fronto-nasals, a small frontal, a large interparietal, two parietals; color dark olive above, with two dark lateral stripes, one on each side; under parts lighter. Total length $1\frac{1}{2}$ inches; of head and body 8 lines.

Habitat. Nicaragua. Two specimens.

OPHIDIANS.

SYNCRANTERIDÆ.

LEPTOPHIS Bell.

LEPTOPHIS MARGARITIFERUS D. & B., tom. vii. p. 539.

Herpetodryas margaritifera Schlegel, *Essai la Physionomie des Serpens*, tom. i. p. 151, and tom. ii. p. 184. Two specimens.

Fam. CALAMARIDÆ.

LIONINIA nob.

Gen. Char. Frontal stout, hexagonal, somewhat longer than broad; nostrils between two plates; no frenal, one preocular, two postoculars; seven superior labials, the eye resting on the third and fourth; pupil round; scales smooth, quadrangular; tail quite stout, with bifid scutes. Size that of a Calamarian; palatine as well as mandibular teeth apparently of equal length.

LIONINIA VERMIFORMIS nob.

Spec. char. Color whitish above, with numerous small brown spots formed by a series of black spots, occupying each scale; in some specimens a narrow black dorsal line, extending from the occiput as far as the extremity of the tail; in others this line is quite indistinct; a spot or blotch upon the occiput, of the same color as that of the body; head brown above, lighter upon the snout; under parts of animal white. Total length, 5 inches, 1 line; tail 8 lines. Ab. scut. 122; a single preanal; subcaud. 26.

Habitat. Nicaragua; 3 specimens.

Gen. remarks. In the arrangement of the plates upon the head, this genus resembles very closely *Streptophorus*, but the form of the scales is quite different,—which in the latter genus are more or less carinated. It belongs to the family of Calamarians, as defined by Dumeril & Bibron, viz.: Body very slender, rounded, and about the same thickness from the head to the tail. E. G. tome vii. p. 48. It differs, however, from each of the nine genera of which that family is composed. In *Calamaria* and *Rhabdosoma*, the nostrils open in a single scale, as well as in *Rabdion*, *Homalosoma* and *Carphophis*. In *Elapoidis*, the scales are carinated. In *Aspidura*, the urostega are in a single row.

STENOCEPHALIDÆ. (*Serpens Opistoglyphes*) D. & B.

Gen. CONIOPHANES Hallowell.

Char. Head very much flattened, pupil round, supraciliaries not projecting; nostril in a single plate; a postnasal about twice as high as it is long; a somewhat quadrangular frenal; one antocular, two postoculars; a single

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anterior temporal; two internasals; two prefrontals, much longer than the internasals; a frontal longer than broad, occipitals large. Head somewhat broader than neck, posteriorly; scales smooth, lanceolate, 19 or 21 rows; nearly quadrangular upon the tail; anal and subcaudal scutes bifid; abdomen slightly angular; tail long and tapering; posterior tooth much longer than the rest and distinctly channelled; the teeth in the upper jaw increase in length as they recede backward.

CONIOPHANES FISSIDENS nob.

Spec. char. 19 rows of smooth scales near the middle; color brownish, approaching to violet, with two somewhat indistinct lateral stripes, and a median dark colored one upon the back; abdomen whitish, with a row of minute black points on each side and upon the tail; a narrow white vitta, commencing on the first labial, passes beneath the eye along the temples, and is lost upon the sides of the neck; another, shorter upon the back, commencing at the occiput. Total length 8 inches; of tail $7\frac{1}{2}$ inches; circumference 1 inch.

Habitat. Nicaragua. One specimen.

OXYCEPHALIDÆ.

DRYOPHIS AENEUS. One specimen.

CONOCERQUES. (Serpens Proteroglyphes.)

ELAPS Schn.

ELAPS MELANOCEPHALUS nob.

Spec. char. Entire head, chin and throat black; 16 black rings upon the body, margined with white; 4 distinct rings upon tail; inter-spaces between black rings spotted with black; 200 abdom. scuta; a double præanal; 52 subcaudal; 15 rows of scales.

Habitat. Nicaragua. One specimen.

BATRACHIA ANOURA.

RANIDÆ.

CYSTIGNATHUS MELANOTUS nob.

Spec. char. Color black above, black spotted; a black subround spot between the eyes; under parts white, minutely mottled and spotted with brown; body and extremities slender.

Description. Head of moderate size, eyes not remarkably prominent, tympanum well developed, tongue obcordate, not notched posteriorly; palatine teeth in two transverse rows; the anterior margin on a line with the posterior margin of the posterior nares; color as stated in the specific character.

Dimensions. Length of head 4 lines; greatest breadth 3; length of head and body 9 lines; length of anterior extremities 6 lines; of posterior, 1 inch; of thigh 3 lines; of leg 4; of tarsus 2 lines; of foot to extremity of longest toe $4\frac{1}{2}$ lines.

Habitat. Nicaragua. One specimen; perhaps the young of a larger animal.

HYLIDÆ.

HYLA GRISEA nob.

Spec. char. Skin smooth, tongue obcordate, notched posteriorly, palatine teeth in two fasciculi behind the posterior nares; color light grey, a brown above, with darker maculations; length $1\frac{1}{2}$ inches.

Description. Head triangular; snout somewhat acute; nostrils two lines apart; tongue obcordate, slightly notched posteriorly; extremities slender; toes palmate at their base, the webs reaching to the proximal extremity of the second phalanx, tympanum of moderate size, eyes slightly prominent. Color grey or brownish above, with a transverse bar of darker grey between the
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eyes; behind this a blotch with irregular margins, resembling the letter W; there are also upon the back irregular blotches of a darker grey than the surrounding surface; thighs mottled posteriorly with black and white, varied with grey in front; legs and tarsi with transverse bars of grey, also arms and forearms; under parts white.

Dimensions. Length of head 8 lines; greatest breadth 6; length of head and body 1 inch, 8 lines; length of anterior extremities 1 inch; of posterior, 3 inches; of thigh 8 lines; of leg 11; of foot to extremity of longest toe 11.

BUFONIDÆ.

BUFO MELANOGASTER nob.

Spec. char. Supra-orbital ridges slightly developed; internal nares of moderate size; tongue elongate, cordiform, rounded posteriorly; free for rather more than half of its length posteriorly; color grey with a longitudinal row of subround black spots on either side of the median line; extremities varied with black; under parts yellow marbled with black; length 1 inch, 1 line; of posterior extremities 1 inch, 3 lines; of anterior, 8 lines.

Habitat. Nicaragua. One specimen.

Gen. remarks. Most probably the young of a larger animal.

California.

SAURIANS.

IGUANIENS *Pleurodotes* D. & B.

SCELOPORUS BISERIATUS nob.

One specimen.

BATRACHIANS.

Urodela *Aretoderes* D. & B.

ANAIDES LUGUBRIS Baird. Six specimens—three adult, three young.

The lateral yellow spots are much more distinct in these specimens than in others in our collection. They are of a bright chrome yellow color, and irregularly disposed. In the young specimens, these spots are indistinct.

TARICHA TOROSUS Grans. One specimen, taken near Vallejo, California, Nov., 1855, by Mr. Wright.

BATRACHOSEPS ATTENUATUS Gray. Eight specimens—six adult, two young.

Oceania.

CHELONIANS.

CHELONIA MYDAS (young). Seven specimens. In five of these the nuchal plate is bifid.

Habitat. Bonin Islands.

SAURIANS.

VARANIDÆ.

VARANUS BIVITTATUS D. & B.

One specimen.

Habitat. Gaspar Straits.

SCINCOIDIANS ou Sauriens Lepidosaures D. & B.

EUPREPIS Wagler.

EUPREPIS CONCOLOR nob.

Spec. char. Nasal plate rounded posteriorly, anterior margin curvilinear;

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supero-nasals rather slender, contiguous; internasal lozenge-shaped; two fronto-nasals in contact; a frontal long with an acute angle anteriorly, its lateral margins nearly straight; two fronto-parietals rather long; an inter-parietal, two parietals; a small freno-nasal, two frenals, the anterior smaller than the posterior and nearly quadrangular in shape; two freno-orbitars; seven superior labials, inferior eyelid scaly; præanal scales unequal, the two middle oblong; scales of neck strongly tricarinate; color uniform brown above, white below. Length 7 inches, 8 lines; of tail 4 inches, 5 lines; of head 10 lines.

Habitat. Gaspar Straits. One specimen.

Gen. remarks. Dumeril & Bibron describe thirteen species of Euprepis, of which but two have the inferior eyelid destitute of a transparent disk, viz.: *E. Sebæ* and *E. Ernesti*. From both of these the species above described differs remarkably. In the latter the supranasals are not contiguous; in the former the carinæ upon the scales are indistinct; it is also a larger animal. The specimen above described was taken on South Brother Island, Gaspar Straits, by Mr. Squires, of the U. S. steamer *T. Hancock*. It is common. The Malay name is *Kædal*.

ABLEPHARUS. 2

ABLEPHARUS NIGROPUNCTATUS nob.

Spec. char. Internasal four-sided; the sides nearly equal; the posterior angle rounded; but much more acute than in *A. Peronii*; the fronto-parietals quadrilateral; no inter-parietal; two parietals, no naso-frenal; two freno-orbitars; seven superior labials; six præanal scales, the two middle the largest. Color greenish olive above, marked all over with black spots, the spots on the sides agglomerated so as to form a black band extending from the posterior margin of the eye as far as the posterior extremities; extremities and tail black spotted, the black spots smaller and most distinct upon the under part of the tail; chin black spotted; abdomen, as well as ground color of chin and under part of tail and extremities, light green.

Dimensions. Length of head 4 lines; greatest breadth $2\frac{1}{2}$; length of body 1 inch, 3 lines; of tail 8 lines.

Habitat. Bonin Islands. One specimen. Taken Oct., 1854, by Capt. Rodgers.

ABLEPHARUS PERONII D. & B. Tom. v. p. 814. Three specimens.

Habitat. Tahiti.

LYGOSOMA.

LYGOSOMA VERTEBRALE nob.

Spec. char. Lower eyelid transparent; two fronto-parietals; nasal plates quite separate; internasal five-sided; fronto-nasal not contiguous; two fronto-parietals; one inter-parietal; two parietals; frontal long, acutely angular posteriorly, obtusely so in front. Color: Head brown, mottled with darker brown upon the sides; a light colored stripe extending from the occiput as far as the root of the tail; on either side a row of dark brown blotches with minute intervening spots; a broad dark brown colored band on each side, extending from the temple along the side, about half-way down the tail; above this band, the ground color lighter, resembling that of the vertebral band; upper part of tail yellowish, minutely spotted with brown; abdomen white with a tinge of blue; chin, throat and under part of tail yellowish, brown spotted.

Dimensions. Length of head 4 lines; greatest breadth 2; length of body to vent 1 inch, 2 lines; of tail 11 lines. Total length 2 inches, 4 lines.

Habitat. Sandwich Islands.

Gen. remarks. A new and interesting addition to the species, not very numerous, of the genus *Lygosoma*.

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OPHIDIA.

Sub. ord. Opisthogyphes.

Gen. MEGALOPS nob.

Gen. char. Mandibular teeth, increasing in length posteriorly, recurved, nearly straight; two internasals much smaller than the prefrontals; frontal a little longer than broad, pentangular; a frenal; two antoculars, two postoculars; eye resting on the fourth supra-labial; pupil ovoid; eyes very prominent; body slender, much compressed; abdomen angular; tail rather short.

MEGALOPS MACULATUS nob.

Spec. char. Twenty-one rows of smooth scales; body presenting numerous sub-quadrangular and oblique blotches above, of a brown color; intermediate spaces white with a tinge of yellow; under surface white.

Abdom. scuta 170. A bifid præanal; 61 subcaudal scutellæ.

Dimensions. Length of head, neck and body 1 foot, 2 inches, 10 lines; length of tail $3\frac{3}{4}$ inches.

Habitat. Tahiti. One specimen, collected by Mr. Adams.

Gen. remarks. The posterior teeth in the upper jaw have been destroyed in the specimen, so that it is impossible to determine the family to which it belongs; most probably of the order Opisthogyphes; the head is otherwise much injured. A small and not very prepossessing looking serpent.

Sub. ord. Serp. Aglyphodontes ou Azemiophides, *D. & B.*

Gen. APEIDEA nob.

Char. Head long and narrow, broader posteriorly, almost truncate in front; teeth smooth recurved, the anterior, both in the upper and lower jaw, longer than the posterior; the same is the case with the palatines, equally spaced; nine plates upon the top of the head, the prefrontals remarkable for their large size; frontal longer than broad; two large occipitals; body very long, much thicker in the middle, compressed, with smooth scales, broader and shorter upon the back than upon the sides; abdomen angular; tail about one-third the length of head and body; urostega bifid; præanal scute bifid.

APEIDEA ROBUSTA nob.

Description. The teeth are strong, sharp-pointed, much inclined backward, the eyes are of moderate size, the pupil round; the rostral plate is triangular in shape, broader than high, the internasals of moderate size, the prefrontals very large, and more or less rhomboidal in shape; the frontal quite broad anteriorly, its latero-superior angles bevelled, presenting an obtuse angle posteriorly; the supra-oculars long, of moderate breadth behind; the occipitals much longer than broad; nostrils between two plates, large; the posterior the larger of the two; the frenal is remarkable for its great length and unusual position; its upper margin is curved, terminating in a point posteriorly, about one-half of it passing below the antocular; there are ten superior labials; the eye resting on the sixth and seventh; the seventh is larger and of quite a different shape from the others, its posterior portion being prolonged upward and backward to meet the inferior postocular; the antocular is remarkable for its very large size; it is more or less rhomboidal in shape, in contact in front with the prefrontal, above with the frontal and supra-ocular, below by the greater part of its extent with the frenal, and with the fifth and sixth supra-labials; of the two postoculars the superior is somewhat larger than the inferior; the anterior genials are much larger than the posterior; the neck is long and slender, the body much thicker, compressed *en toit*; scales smooth, those upon the sides lanceolate, the four or five rows upon the back larger; abdomen very angular; tail of moderate length, scales hexagonal; the two

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middle dorsal rows larger than the others; twenty-three rows of scales upon the middle of the body, eight near the origin of the tail. Color olive in spirits, probably green during life; abdomen and under part of tail green.

Dimensions. Length of head 13 lines; breadth posteriorly 6; length of back and body 2 feet, 9 inches; of tail 12 inches, 8 lines. Total length $4\frac{1}{2}$ feet; circumference of body at middle 2 inches. Ab. scut. 236; 1 bifid præanal; 146 urostega.

Habitat. Gaspar Straits. One specimen.

Proteroglyphes—Platycerques *D. & B.*

PLATURUS FASCIATUS Latreille. One fine specimen. Black bands complete; larger considerably upon the back than abdomen; a white spot on each side of the occipitals. Aricamate of the Tahitians. Captured in Bananas Bay, Tahiti, March 19th, 1855. Presented by Mr. Adams, of Papété. Total length 2 feet, 7 inches; of tail 8 inches; circumference 2 inches, 8 lines.

PLATURUS FASCIATUS Var.

Char. Snout black; extremity of tail black; forty complete black bands upon the body; besides three incomplete upon the neck; six complete black bands upon the tail; three and a-half rows of scales in black bands upon the back, and one and a-half in the white interspace. Total length 1 foot, $9\frac{1}{2}$ inches. The largest specimen measures 3 feet, 9 inches in length and 6 inches in circumference. The tail measures $4\frac{1}{2}$ inches in length by $1\frac{1}{4}$ inches in height at its base. The coloration corresponds with that of the plate of *Hydrophis colubrina*, in the Fauna Japonica. The abdomen, chin and throat are ochraceous throughout, the bands having disappeared entirely from the belly; 23 rows of scales near the middle of the body; chin and throat covered with scales; ab. scuta. 198, of which the 4 last are bifid; 32 bifid urostega. Besides the above there are two other specimens, from Cleopatra Island, more fully grown, one completely adult, (*Hydrophis colubrina* Schlegel's Fauna Japonica, tab. 10). The only difference which I observe between the latter and Prof. Schlegel's specimen, is that the scales in the latter do not appear to be quite so broad. The markings in the two specimens before us are quite different from those of the younger ones, in which the black and white bands are very distinct and complete, encircling the whole body; but in the one which may be nearly half grown, they are so only upon the tail and the posterior part of the body, the abdomen being of a dull, ochraceous yellow in the greater part of its extent, as well as the neck and throat, somewhat deeper brown opposite the bands; the length of this specimen is 2 feet, $9\frac{1}{2}$ inches; circumference 3 inches, 3 lines; the extremity of the tail is black; 6 complete bands upon the tail.

Two other specimens of this variety are in the collection, from Loo-Choo, younger than either of the others. In the smaller, which measures 1 foot, 2 inches in length, and 8 lines only in circumference, the black rings are of nearly equal length upon the back and abdomen, being very closely approximated in the latter position; the very tip of the tail in the smallest specimen is white. The specimen marked 243, taken by Capt. Stevens, at Cleopatra Island (north of Ousima), May, 1855.

PELAMIS Daudin.

PELAMIS BICOLOR Daudin. One specimen.

Habitat. Tahiti.

New Holland.

SAURIA.

LEPIDOSAURIAN or Scincoid Lizards.

Saurophthalmes D. & B.

LYGOSOMA Gray.

LYGOSOMA GUICHENOTI D. & B.

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Habitat. Sidney. One specimen.

LYGOSOMA TENIOLATUM D. & B.

Syn. *Lacerta teniolata* Shaw, Gen. Zool. tom. 3, p. 239.

Spec. char. Eyelid scaly, two fronto-parietals; nasals in contact; fronto-nasals separate; ground color of back and upper part of tail yellowish-brown, with a longitudinal band of black along the middle line of the back, commencing at the occiput, and lost upon the tail, bordered with white; a black lateral band on each side, commencing at the nostrils, between which and the eye it is narrow, and passing along the temples and sides of the body, as far as the origin of the tail, where it is continuous with a very narrow black band extending about an inch upon the tail.

BATRACHIA.

HYLIDÆ.

HYLA CYANEA Daud. One specimen. Sidney (young). Taken Dec., 1853.

Loo-Choo.

SAURIA.

SAURIENS EUNOTES D. & B.

Sub. fam. *Iguaniens Acrodontes.*

Gen. DIPLODERMA nob.

Gen. char. Head pyramido-triangular, covered with polygonal carinated scales, of unequal size; nostrils lateral in a large plate near its upper border; a small nuchal crest; no external ear openings; body covered with strongly carinated scales, many of which are quite large; those upon the anterior and lateral parts of the body quite small; tail long and slender, cyclo-tetragonal at base, covered with carinated scales, not verticillate; no femoral or anal pores; body slender, compressed; extremities slender, fingers and toes 5—5; tongue slender, adherent, notched posteriorly; 40 teeth in the upper jaw; five small incisors, two canines on each side, the second more robust and slightly longer than the first; the remaining teeth tricuspid, with obtuse summits, the five first smaller than the others; 34 lower, two canines of about equal length. The teeth, with the exception of the lanianaries and intermaxillaries, are all very closely in contact, inclining inward, and firmly imbedded in the jaw, and not along its border; no palatine teeth.

DIPLODERMA POLYGONATUM nob.

Description. A longitudinal row of carinated scales upon the snout behind the nostril; frontal region depressed; supraciliary ridges low, separated from each other by two rows of small scales, and communicating with the longitudinal ridge above mentioned by two or three scales on each side; supra-ocular regions convex; no well marked occipital scale; seven superior labials; a nuchal, not elevated crest; no transverse gular fold; neck slightly folded; body slender, covered with carinated scales, some of which, here and there interspersed, are much larger than the others; the axilla, and that part of the body immediately within the arm and above it, covered with very small scales; this patch of small scales contrasting strongly with the larger scales upon the back and sides; chin and throat covered with strongly carinated scales; scales of abdomen triangular, strongly uncarinate, the carina extending the whole length of the scale; upper surface of arms and extremities covered with strongly carinated scales; those on the inner and anterior surface of the arm smaller than those upon the corresponding surface of the forearm; posterior extremities covered with strongly carinated scales; third

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and fourth fingers of nearly equal length; fourth toe the longest; margins of fingers and toes serrated, the under surface protected with transverse scales; soles of feet covered with strongly carinated scales, ending in a spine; palms covered with very small scales.

Color. Uniform greenish-olive above, somewhat deeper upon the back, much lighter beneath, with a marked tinge of yellow; eight dark colored bands upon the tail.

Dimensions. Length of head 9 lines; greatest breadth 5 lines; length of body $1\frac{1}{2}$ inches; tail $5\frac{1}{2}$ inches; total length 7 inches 9 lines.

Habitat. Amakarima Island. One specimen.

Gen. remarks. Lyriocephalus, Otocryptus, Ceratophorus, and Phrynocephalus are Iguanian Acrodont saurians, with ears concealed beneath the integument; but Diploderma differs from each of these. Lyriocephalus has the snout surmounted by a rounded protuberance; the dentition of Otocryptus is altogether different, and in Ceratophorus, as its name indicates, the snout is prolonged into a sort of horn. See D. & B. tom. v. p. 433. The head of Phrynocephalus is nearly circular; the tail is much shorter, and the body is covered all over with minute scales, being quite a different animal in its general appearance.

OTOCRYPTIS Weig.

Among the saurians in the Loo-Choo collection is a very small Acrodont Iguanian, no doubt a young animal, which appears to belong to a genus very near if not identical with the Otocryptus of Weigmann. The form of the head, however, is different from that of Otocryptus, as described by Dumeril & Bibron, and the number of molar teeth is less, viz.:—eight instead of twelve. The specimen, small as it is, is much mutilated, and otherwise injured, but the following characters can be distinctly made out.

Gen. char. Head rounded, and high posteriorly, the anterior slope more gradual than the posterior, the front and vertex being nearly on a line; snout covered with polygonal scales; supraorbital ridges distinct; eyelids covered with carinated scales of nearly equal size; occiput covered with polygonal scales, partly smooth, partly carinate; temples covered with carinated scales; eyelids covered with small scales. The incisor teeth on each side separate, a conical canine, and eight tricuspid, the first three the smallest, the last two the largest; the same number in the lower jaw; ears concealed by the integument; body covered with scales arranged in transverse rows; five fingers without serratures, the fourth finger a little the longest, all armed with recurved nails; tail slender.

Dimensions. Length of head 4 lines; of neck and body $6\frac{1}{2}$ lines; of tail (mutilated) 10 lines; length of anterior extremities 6 lines; of posterior

Habitat. Loo-Choo. One specimen. Caught Nov. 1854, by McKnight.

Gen. remarks. But one species of Otocryptus is described by Dumeril & Bibron, viz.:—*O. bivittata* Weig., the habitat of which is unknown.

GECKOTIDÆ.

Lezards Geckotiens, ou Sauriens Ascalabotes D. & B.

Gen. HEMIDACTYLUS.

Sect. DACTYLOTELES D. & B.

Sub. div. A.—*Dact. fissipedes.*

HEMIDACTYLUS MARMORATUS nob.

Spec. char. Mental plate pentangular, small; behind these several series of unequal scales, larger than those upon the throat; a transverse row of plates immediately behind the mental and first infra-labials; the two middle much larger than the lateral ones; eleven supra-labials on each side; ventral

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plate pentangular, much broader than high, presenting an angle posteriorly; scales upon the muzzle and in front of the orbits, nearly equal, small; head covered with small granulations; five rows of very small circular tubercles on each side of the back above; a row of seven pores in front of the anus; color greyish, marked all over with black; abdomen white; chin and throat white, marked with brown.

Dimensions. Length of head 7 lines; greatest breadth $4\frac{1}{2}$ lines; length of head and body 1 inch 8 lines.

Habitat. Loo-Choo. One specimen.

HEMIDACTYLUS INORNATUS nob.

Spec. char. Mental plate triangular, large; but two plates immediately behind the mental, large and quadrangular; immediately behind them two others, smaller, and also more or less quadrangular; rostral plate broader than high, not presenting an acute angle posteriorly; the plates behind it rather small, with one intermediate, eleven supra-labials, the last six the smallest; but two rows of circular tubercles on either side of the median line; no tubercles upon the head; scales small, and for the most part equal; color uniform drab above, with a few dark colored maculations; under parts white.

Dimensions. Length of head six lines; greatest breadth four lines; length of body 1 inch 3 lines; of tail

Habitat. Loo-Choo. One specimen. Caught in a shed, Nov. 1854, (W. S.)

Gen. remarks. This species is readily distinguished from the preceding by the different shape and size of the mental plate, and arrangement of the scales posterior to it, and the presence of pores in front of the anus.

SCINCIDÆ.

PLESTIODON D. & B.

PLESTIODON MARGINATUS nob.

Spec. char. Rostral plate comparatively high; internasal presenting an obtuse and rounded angle posteriorly; fronto-nasal not in contact, being separated by a considerable interval; frontal plate heptagonal, more or less truncate anteriorly; seven superior labials; olive colored above, with a tinge of red upon the head, and a broad, brickdust colored stripe, commencing upon the temples, and extending along the sides of the neck, and the body, as far the root of the tail; under parts silvery white. Twenty-five rows of scales; five in front of the tail.

Dimensions. Length of head $11\frac{1}{2}$ lines; greatest breadth 8 lines; length of body 2 inches 8 lines; of tail 2 inches 9 lines; of anterior extremities 11 lines; of posterior 15 lines.

Habitat. Ousima, Japan, and Loo-Choo Islands.

Gen. remarks. The specimen from Loo-Choo is much smaller, and evidently the young of the same species. The lateral stripe of brown is bordered with obscure white, and there is a vitta of the same color running along the middle of the back. This species, with the exception of the lateral band bears a striking resemblance to *Plestiodon laticeps* of the Southern U. S., but the red upon the head is not near so deep, and the shape of the rostral and frontal plates is quite different, and the fronto-nasals are closely in contact. The smaller specimen, caught April, 1855, by Mr. Stimpson. The larger, May, of the same year.

OPHIDIA.

CROTALIANS.

BOTHROPS FLAVOVIRIDIS nob.

Description. The head is large, triangular in shape, covered above and below with smooth scales, in this respect differing from typical *Bothrops*, in which

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the scales upon the top of the head are carinate: eight superior labials; third and fourth the largest; seven temporals; the two anterior, of which the superior is the larger, separated from the orbit by a row of small scales; the plates over the eyes are of moderate size, single; the rostral plate is broader than high; the head is much larger posteriorly than in front, where it is somewhat truncate; neck much contracted; body rather slender, presenting near the middle twenty-seven rows of lanceolate carinate scales, the carinæ extending the whole length of the scale, and the rows running very obliquely; besides these carinated scales there are two other inferior rows, running very obliquely, which are smooth, the total number of rows of scales being thirty-one; the scales upon the tail are much broader than those upon the back; the ground color of the head above is ochraceous yellow, presenting numerous dark colored lines, probably green during life; a narrow vitta of the same color extends from behind the eye to the posterior and external angle of the head, a short distance above the commissure of the jaw; a bar, broader than the rest, is seen on each side of the inner aspect of the occiput, bending inward, and extending for a space of two and a half inches along the side of the neck; the jaws and throat are yellow (straw colored), as well as the abdomen; the under part of the tail is also yellow, but presents a number of bluish colored maculæ on each side; the ground color of the body above is dirty yellow, with longitudinal dark colored interrupted bars on each side of the median line, with intervening spaces of yellow; upon the tail the dark colored portions present the form of double triangles, united at their bases, upon the median line, with a subround yellow spot in the centre, and having upon their sides triangular interspaces of yellow; eighty-one urostege; ab. scuta sixty-one. The specimen being much mutilated, it is difficult to ascertain with precision its total length.

Habitat. Amakarima Island (one of the Loo-Choo group.)

PROTEROGLYPHES.

PLATURUS FASCIATUS.

One specimen, young, captured at Nara, Loo-choo, June, 1853, by W. Heine.

AGLYPHODONTES.

Gen. EURYPHOLIS nob.

Char. Scales and plates of the head polished, the plates of the head especially; eyes lateral, projecting; pupil round; body slender; tail short, with bifid scutella; nine plates upon the top of the head; the internasal small; the prefrontals large, the frontal larger than broad, pentagonal; nostril between two plates; a rather narrow frenal; one preocular; two postoculars; eight supra-labials; the eye resting on the fourth and fifth; scales hexagonal, semi-carinate upon the back.

EURYPHOLIS SEMICARINATUS nob.

Spec. char. Uniform green above, white beneath; total length 1 foot $7\frac{3}{4}$ inches; of tail 4 inches 5 lines; 189 sb. scut.; 1 bifid præ-anal; 77 sub. caud.

Description. This serpent has very much the general appearance of a *Leptophis*, but the tail is shorter; the scales upon the back are strictly hexagonal, those upon the sides have their posterior margins somewhat rounded; the three inferior rows on each side are smooth; of the plates upon the head, the posterior nasal is larger than the anterior; the frenal longer than high, resting upon the supralabials; the superior postocular larger than the inferior; three temporal plates; one in front immediately behind the postoculars and between the seventh supralabial and the occipitals, the other two, one above and the other behind these, between the occipital and the eighth supralabial plate; the frontal presents an acute angle posteriorly; the occipitals, of moderate size, pentangular; the neck is of nearly the same

thickness as the posterior part of the head; the scales upon the tail, with the exception of the inferior row on each side, which is smooth, are also semi-carinate; fifteen rows of scales upon the middle of the body; sixteen upon the neck (scales more narrow); eight at the origin of the tail.

Dimensions. Length of head 6 lines; breadth 4 lines; circumference of body at middle 14 lines.

Habitat. Loo-Choo. Caught by Mr. Wright, near Napa, Nov. 1854. Two specimens. Another from Japan.

In the collection are no turtles from the Loo-Choo Islands.

BATRACHIA.

Urodela.

Fam. ATRETODERES.

Gen. TRITON Laurenti.

TRITON SUBCRISTATUS Schlegel.

Syn. *Salam. subcristata* Schlegel, Fauna Japonica, p. 123, pl. iv. fig. 3.

Cynops subcristatus Tschudi, Class. der Batrachier, p. 94, pl. 2.

Cynops pyrogaster Gray, Cat. Brit. Mus. p. 25, No. 1.

Spec. char. Head flattened; skin granular; back above, in some specimens, presenting scattered yellow spots upon the back and sides; abdomen orange, with numerous black spots, resembling those of *Triton cristatus*; chin and throat orange; black spotted; under part of tail orange; tail long, much compressed.

Dimensions. Length of head six lines; greatest breadth 6 lines; length of neck and body 1 inch 9 lines; of tail 2 inches $8\frac{1}{2}$ lines; total length 4 inches $11\frac{1}{2}$ lines.

Habitat. Specimens marked No. 5, found in the Paddyfields at the Amakarima Isle, Loo-Choo, April, 1855, by Mr. Squires and Mr. Macomb. Other specimens, marked 53 in the Catalogue, from Ralousima. Those from this place, the northern half of Ousima proper, are yellow beneath, without the large black spots upon the abdomen.

Gen. remarks. This species resembles much *Triton cristatus* of Europe, but wants the white, minute points upon the sides and chin, and the tail is much longer. According to Prof. Schlegel, the osteology of the head is also different, and the number of vertebræ less, there being sixteen in *Triton cristatus*, and but fourteen in the present species. We have compared these specimens with one from Japan, due to the generosity of the Administration of the Garden of Plants, and find no difference except that the black spots upon the abdomen are not so numerous in the Japanese specimen, and the tail is shorter and less compressed at its root. The coloration above, in the Japanese specimen, is brown; in those from Amakarima Island, a deep black. We had proposed for this dark colored *Triton*, with its narrow and much compressed tail, the name *ensicauda*, but, without a greater number of specimens for comparison, we are unwilling, at present, to consider it a distinct species.

ANOURA.

HYLIDÆ.

HYLA CYANEA Daudin (young). One specimen.

RANIDÆ.

RANA RUGOSA (young). Two specimens. Taken at Loo-Choo, April, 1855, by Mr. Stimpson.

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Japan.

No turtles were collected at Japan, and it is to be regretted that we have no specimen of the *Megalobatrachus* among the Batrachians. For a fine figure of the latter, see the *Fauna Japonica*, and for the plates of *Trionyx* and *Emys*, the *Abbildungen* of Prof. Schlegel.

SAURIANS.

AUTOSAURIANS.

Sub. Fam. *Autosaures calodontes* D. & B.

LEIODACTYLES.

Gen. TACHYDROMUS Daud.

TACHYDROMUS SEXLINEATUS D. & B. Five specimens.

The ground color of four of these specimens above, is uniform brown, interspersed with small black spots; in the remaining one, green, the superior lateral vitta bordered inferiorly with black. During life, dark coppery brown; below white, like white lead. W. S.

Habitat. Simoda, Japan, Island of Nippon, May, 1855. Common among grass in lowlands. W. S.

TACHYDROMUS JAPONICUS D. & B. Three specimens.

Erpet. Gen. tom. v. p. 161.

Habitat. Ousima, Japan. Caught May, 1855, by Mr. Stimpson.

SCINCIDÆ.

PLESTIODON D. & B.

There is, in the collection of Com. Rodgers, but one specimen of five-lined *Plestiodon*, which, both by Prof. Schlegel and Dumeril & Bibron, have been considered identical with the *Plestiodon quinquelineatus* of the U. S. Prof. Schlegel states that he had before him two complete suites of the North American and Japanese species, composed each of thirty individuals of all ages, the one collected at Japan, by MM. de Siebold and Bürger, the other by Prof. Trout, upon the banks of the Tennessee river. The examination of this large number of specimens proved to him that there existed not the slightest difference between these individuals, brought from points of the globe so distant the one from the other, although situated under nearly the same parallel. (*Fauna Japonica, Reptilia, p. 99.*)

Dumeril & Bibron say, that having examined two of the Japanese specimens, the North American species exists also in Japan. (*Erpet. Gen. tom. v. p. 710.*) The most striking difference that we observe in the single specimen before us, consists in the presence in the one from Japan, of a plate above the anterior frenal, which is wanting in all the others; this doubling may be, and probably is, an accident, and an abnormal division of the anterior frontal plate. There are, also, but twenty-four rows of scales in the Japanese specimen. The coloration of the specimens from these different localities is very much alike, except that the vertebral line does not bifurcate upon the head in that from Japan. The fronto-nasals are not in contact, but in some of the North American specimens this is the case, in others not. We have always doubted, notwithstanding the high authority of the authors quoted, the absolute identity of species so remote. Since the above was written, another specimen has been placed in our hands, in which there is no naso-frenal, only two frenals, an anterior and a posterior, and there is a difference in the number of rows of scales, there being twenty-seven in the Japanese, and thirty-two in the North American. In a specimen from South Carolina, presented by Dr. Blanding to the Academy, there are thirty-two rows: in one from the Loo-Choo Islands, by Dr. Joseph 1860.]

Wilson, U. S. N., but twenty-four. The scales upon the back, in the Loo-Choo specimen, are broader than those in the one from South Carolina. The fronto-nasal and fronto-parietal much smaller in the Loo-Choo specimen, the former less than half the size; in the latter the frenal is more high and narrow; in the one from South Carolina, there is a naso-frenal, a plate which does not exist in the specimen from Loo-choo. In the large North American specimens in the Green collection, we count twenty-nine and thirty rows of scales: both these have a naso-frenal in front of the anterior frenal. In a specimen from Arkansas, presented by Mr. Pitcher, we find twenty-nine rows of scales, and no naso-frenal, a near approach to the Japan; but the scales upon the back are evidently less broad. In another specimen from South Carolina, presented by Prof. Leidy, we find thirty-two rows, with a naso-frenal; scales of the back high. In another from South Carolina, presented by Mr. Reid, we find twenty-nine and thirty rows. In the specimen from Japan, which is young, the ground color between the stripes is jet black; in those from Loo-Choo, which are more mature, the color above is olive, with a dark colored lateral band on each side, between the lateral stripe; the most constant difference determined by the above comparisons, therefore, would appear to be the less number of rows of scales in the Japanese, the greater breadth of the dorsal rows, and the absence of the naso-frenal plate. We have had, however, but three Asiatic specimens for observation, but would suggest whether they be not really distinct species from the North American, although resembling each other so much in color; and in case future observation should decide this to be the case, would propose for the Japanese species the name *PLESTIODON LATISCUTATUS*.

Gen. *LYGOSAURUS* nob.

Char. Nostril in a single plate; neither supero-nasal, nor naso-frenal; two fronto-nasals; an interparieto-fronto parietal; two parietals; a first and second frenal; two freno-orbitars; six superior labials; body covered with hexagonal scales, tricarinate upon the back; fingers and toes 5—5; the two inner and outer ones quite short; tail cyclo-tetragonal at base, longer than head, neck and body.

LYGOSAURUS PELLOPLEURUS nob.

Spec. char. Light brown above, with four longitudinal rows of minute black spots, extending a considerable distance upon the tail; a lateral dark-colored band on each side, commencing behind the eye and extending the whole length of the back and body, being lost upon the tail; abdomen and under part of extremities white; the scales upon the under part of the tail spotted with black. Total length 3 inches, 7 lines; tail 2 inches.

Description. The size of this delicate-looking little Lepidosaurian is about the same as that of *Lygosoma laterale*; the head is small, the snout rather pointed, the supra-orbital regions somewhat prominent; the internasal is broader than long; the fronto-nasal single, truncate posteriorly, presenting three facets in front, the middle one broad; frontal truncate anteriorly, the edges bevelled, angular posteriorly; the fronto-parietals and parietals present nothing remarkable, but the interparietal, instead of being placed exclusively between the parietals, lies also and for the greater part of its extent between the fronto-parietals; it is narrow in front, broad behind; the inferior eyelid is protected by two rows of scales, the inferior row quite large, beneath which, and above the supero-labials, there are two interrupted rows of triangular scales; four supra-orbital scales; auricular openings pyriform in shape, with no scales upon their borders; scales hexagonal, those upon the abdomen and sides smooth, those upon the back tricarinate; 24 rows of scales, six in front of the arms and of nearly equal size; extremities slender, each provided with

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a nail, the third finger the longest, the first very short, almost rudimentary, the second and fifth of nearly equal length; the first two quite short, the fourth the longest; fingers and toes not denticulated upon the edges, the inferior surface covered with transverse scales. Color and dimensions as above.

Habitat. Ousima, Japan. Two specimens,—one from Loo-Choo.

Gen. remarks. Although the two animals resemble each other so much in their general form, the arrangement of the plates upon the head is quite different. In *Lygosoma laterale* the scales are quite smooth.

OPHIDIA.

Fam. TYPHLOPIDÆ.

OPHTHALMIDIUM D. & B.

Char. A narrow rostral, bent upon the snout; a supra-ocular; a pair of preoculars; a pair of nasals; a pair of oculars, with the eye distinct at the upper part; a pair of fronto-nasals; a pair of post-oculars; an anterior frontal; a frontal; a pair of parietals; an interparietal; eyes latero-superior; body covered with smooth hexagonal scales; tail very short.

OPHTHALMIDIUM TENUE nob.

Spec. char. Color uniformly brown above, lighter below; 10 rows of subcaudal scales; 282 horizontal rows, 20 longitudinal rows, 4 pair of supralabials; nostrils very small, in the suture between the nasal and fronto-nasal plates, beneath the extremity of the snout.

Dimensions. Length of tail $1\frac{1}{2}$ lines; of head and body 5 inches. Total length 5 inches, $\frac{1}{2}$ line.

Habitat. Hong-Kong, China. Three specimens.

Fam. AGLYPHODONTES D. & B.

Gen. ELAPHIS Aldrovandi.

Char. Nostrils between two plates; a frenal; two antoculars, the inferior small, intercalated between the third and fourth supra-labials; the one resting on the fourth and fifth; two internasals, smaller than the prefrontals: a frontal longer than broad; three temporals on each side; scales elongated, lanceolate, weakly keeled; tail of moderate length, scutes bifid.

ELAPHIS BILINEATUS nob.

Spec. char. Nine rows of scales, the dorsal ones carinate; color black, as in *Coryphodon constrictor*, but with two white lines on each side of the neck, extending some distance along the body. Total length 3 feet, 4 inches.

Description. This species, in its general conformation, has a marked resemblance to *Coryphodon constrictor* (Bascanian B. & G.), the pupil is round, the supraciliaries projecting very slightly, the superior antocular much excavated; of the supralabials the sixth and seventh are the largest; the frenal is not elongated, but rhomboidal, with its posterior and inferior angle prolonged; of the two anterior temporal plates the superior is the more narrow and smaller; the frontal plate is pentangular, less excavated laterally than in *Coryphodon constrictor*; the three inferior rows on each side are carinated, the carinæ not extending the whole length of the scale; the præanal scute is bifid; abdomen angular; posterior teeth longer than the anterior. Ab. scut. 193; subcaud. 1 bifid præanal; 76 subcaud.

Habitat. Volcano Bay, Jesso. One specimen, caught by Dr. Morrow, May 30th, 1854.

Gen. LEPTOPHIDIUM nob.

Char. A rostral, two internasals much smaller than the prefrontals; frontal longer than broad, presenting an acute angle posteriorly; occipitals large; 1860.]

nostril between two plates, a frenal; two antoculars, and two postocular plates; eye margined inferiorly by the fourth and fifth supralabials; scales quadrangular smooth; a double præanal plate; tail short with bifid scutes; eye rather large, pupil ovoid.

LEPTOPHIDIUM DORSALE nob.

Spec. char. Nineteen rows of smooth scales; eight superior labials; the fifth in contact with the inferior postocular; an oblique brownish band behind the eye; another on each side of the head, passing across the temples; inferior and superior labials, rostral and internasals with dark-colored maculations; a transverse bar across the prefrontals posteriorly; two longitudinal brownish stripes upon the neck, commencing at the occipitals; a series of transverse light brown fasciæ upon the anterior third of the dorsum, about 12 in number, bordered with light yellow; fawn color above, white below, with a tinge of green. Ab. scut. 100; 1 bifid præanal; 85 subcaud.

Dimensions. Length of head 6 lines; greatest breadth 3; length of body $8\frac{1}{2}$ inches; of tail 2 inches, 3 lines. Total length 11 inches, 3 lines.

Habitat. Hakodadi, Japan. One specimen, taken on a hill-side, near Hakodadi, Island of Jesso, June, 1855, by W. Stimpson.

LEPIDOCEPHALUS nob.

Gen. char. Head rather short and broad behind triangular; temples swollen; two internasals, two prefrontals, larger than the internasals; a frontal, as in *Coronella*; nostril between two plates; a narrow frenal; a preocular; two postoculars; the eye resting on the fourth and fifth supralabials, four or five lines from the extremity of the snout; posterior superior maxillary teeth much longer than the others; scales upon the back quadrangular, with rounded posterior margins, semicarinate; tail of moderate length, with bifid scutes.

LEPIDOCEPHALUS FASCIATUS nob.

Spec. char. Eight supralabials; 17 rows of scales, the four inferior rows smooth; a series of thirty-five dark-colored bands upon the body; nine upon the tail; tip of tail black; 216 ab. scut.; a single præanal; 65 subcaud.; length 3 feet.

Description. General appearance that of *Coronella*: the pupil is round; there are seven temporal plates; of the superior labials the posterior and superior angle of the third is prolonged so as to touch the eye in front, occupying the position of an inferior preocular; the sixth and seventh supralabials are the largest; the neck anteriorly is of nearly the same thickness as the head; the body moderately robust, the abdomen angular; the tail rather slender, not pointed at the tip; throat and abdomen white; a series of black longitudinal blotches upon the under surface of the tail at its middle: superior labials margined with black; a black quadrangular blotch behind the eye: upper part of head black, intermingled with yellow spots; a narrow transverse band upon the neck with an anterior prolongation; the interspaces between the black bands upon the back white or yellowish.

Dimensions. Length of head 1 inch; greatest breadth $7\frac{1}{2}$ lines; length of body 2 feet, $7\frac{1}{4}$ inches.

Habitat. Japan and Loo-Choo. Two specimens from each locality. Those from Loo-Choo captured by Mr. Heine.

Gen. PROTERODON nob.

Char. The anterior teeth longer than the posterior, with a marked interval between the first, second, third and fourth of the upper jaw; two internasals; two prefrontals; a frontal, as in *Coronella*; a frenal; one antocular; two postoculars; four temporals; the superior of the two anterior quite small and

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narrow-pointed behind; eye resting on the fourth and fifth supralabial; scales quadrangular; those of the back slightly carinate; præanal scute bifid; tail rather short, with bifid scutes.

PROTERODON TESSELLATUS nob.

Spec. char. Twenty-one rows of scales; three or four rows on each side smooth; the others, with a slight carina, extending half-way along the middle; olive-colored above; throat yellow, black spotted; abdomen orange, tessellated with black; length 3 feet.

Description. The head is rather long, flattened behind, pupil round, the supraciliary not projecting over the eye; the frenal is quite small; of the two postoculars the superior is the larger; the temporal plate immediately behind them is remarkable for its form; it is quite narrow and somewhat lanceolate in shape; of the two posterior temporals the upper is much longer than the inferior; there are eight supralabials, though this is somewhat doubtful from the diseased condition of the three anterior ones, the seventh being the largest; the scales posterior to the occipitals (about a dozen rows) are quite smooth; the neck is narrower than the head; the body moderately stout; the tail rounded above and upon the sides, flattened beneath, tapering to a point. Ab. scut. 211; subcaud. 73; a double præanal plate.

AMPHIESMA TIGRINUM D. & B., *Erp. Gen. t. vii. p. 732.*

Tropidonotus tigrinus Schlegel, *Fauna Japonica*, p. 86. Two specimens caught at Nippon, Japan, May, 1855, by Mr. Stimpson. Ab. scut. 162; 1 bifid præanal; subcaud. 175.

Gen. remarks. This is evidently the *Tropidonotus tigrinus* of Prof. Schlegel, whose remarks in regard to the differences between the one under consideration and the *Tropidonotus natrix* of European authors, are perfectly correct. *Trop. tigrinus* has a great resemblance to the *Trop. hydrus* of Fitzinger, of which we have eight specimens in the Bonap. Coll., the markings and the number of rows of scales are the same in both; but the shape of the head is very different. That of *tigrinus* is broad, and the snout is rounded, but in *hydrus* it is more acute. The two serpents in fact belong to different genera.

BATRACHIANS.

RANIDÆ.

RANA RUGOSA Schlegel. *Fauna Japonica*, p. 160, tab. 3, fig. 3 and 4, D. & B., *Erpet. Generale*, tom. viii. p. 368.

Four specimens of small size, presenting the conical pustulations upon the longitudinal elevations upon the back described by Dumeril & Bibron, three other specimens from Ousima, and two from Simoda, of the size of *Rana halecina*, with vocal vesicles very distinct. The specimens from Ousima, and two larger ones from Simoda, are perfectly white beneath. Taken in the Paddy fields at the island of Ousima, May, 1855, W. S. Cream colored and greenish mottled. The large specimens from Simoda, Island of Nippon, were found in the Paddy fields back of the town, May, 1855. This species has bladders, one on each side of the neck behind the jaws, which swell in globes one-half an inch in diameter; and when the croaking noise is made, they as rapidly fall flat against the neck. Above dark greyish, with darker brown spots on the hinder legs; sides yellowish brown; belly white; fore legs inclining to flesh color; back sometimes streaked with black, as in our Pickerel frog. Other specimens much smaller, marked 13 in the catalogue, were found along the shores of mountain streams, at Simoda, Japan, May, 1855. Above very dark brown, irregularly and distantly punctate with black. Below pale greyish, mottled with white. Another specimen of *rugosa* by Dr. Morrow from Simoda.

1860.]

RANA MARMORATA nob.

Two specimens of a frog, the coloration of which, though the animal is not so large, corresponds with the figure of *Rana esculenta*, as given in the Fauna Japonica. It differs, however, very considerably from the numerous specimens of *Rana esculenta* in the Bonap. collection of the Academy. The spots upon the back are not so regular and well defined as in *esculenta*, and there exist on each side of the ventral line four or five longitudinal elevations, resembling somewhat those of *rugosa*. The sides are marbled with black, and there is a black band extending from the front of the eye to the tip of the snout; extremities black spotted; thighs posteriorly marbled with black; under parts white. Length 1 inch 9 lines; of anterior extremities 1 inch; of posterior 2 inches, 10 lines.

Habitat. Simoda. Five specimens obtained by Dr. Morrow.

A small specimen of a *Rana* not figured in Schlegel, perhaps the young of a large species is.

RANA NIGROMACULATA nob.

Spec. char. Vomerine teeth in two patches between the internal nares; olive colored, with numerous black spots upon the back, of considerable size, but varying in this respect; a black band extending from the eye to the snout on each side; legs and tarsi banded with black, thighs mottled posteriorly with blotches of the same color; under parts white; web of the toes extending as far as the base of the antepenultimate phalanx, except in the third, in which it reaches to the base of the proximal extremity of the third phalanx.

Dimensions. Length of head and body 1 inch; of anterior extremities $\frac{1}{2}$ an inch; of posterior $1\frac{1}{4}$ inches.

Habitat. Japan. One specimen discovered by Dr. Morrow.

In the collection of reptiles from Japan, by Dr. Morrow, is one specimen of a *Rana* figured in Schlegel, considered by Prof. S. as identical with the *Rana temporaria* of Europe. This species, however, has even a stronger resemblance to the *RANA SYLVATICA* of the United States, with which it appears to be identical, and from which, indeed, I do not find any marked points of difference. The large blotch behind the ear, and the longitudinal black mark upon the arm exist, in all these specimens, and the longitudinal ridge on each side of the body. Length of head and body 1 inch 11 lines; of thigh 1 inch 2 lines; of leg 1 inch 2 lines; of tarsus 7 lines; of foot to extremity of longest toe 1 inch; of arm 5 lines: of forearm 5 lines; of hand to extremity of longest finger 5 lines. Found in the Paddy fields back of Simoda, Island of Nippon, Japan, May, 1855. This species has no cheek bladder. (Notes of Mr. Stimpson.)

HYLIDÆ.

HYLA VIRIDIS? Laurenti.

Syn. *Hyla arborea* Schlegel, Fauna Japonica, p. 112, pl. 3, fig. 526.

Habitat. Simoda, Japan; found in the mud in the Paddy fields back of Simoda, Island of Nippon, May, 1855. The color during life, according to Mr. Stimpson, is bright light green above. A golden band along each side of the head, including the eye; sides minutely sprinkled with copper color; belly white; puffs at the throat. Five specimens.

Gen. remarks. We can find no marked difference of structure between this animal and the *Hyla viridis* of Laurenti, but no mention is made in the description of the former of the golden band along each side of the head.

POLYPEDATES VIRIDIS nob.

Char. Head large; snout truncate; eyes large; nostrils small, two lines
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apart; canthus rostralis slightly excavated; the ridge between the snout and the eye separating this region from the upper part of the head, presenting a slight convexity inward: tongue cordiform, notched posteriorly, eustachian foramina more oval in shape than the posterior nares; vomerine teeth in two transverse rows, on a line with the anterior margins of the posterior nares, inclining backward toward each other, separated by an interval of more than half a line; skin smooth above, of a carulean color in alcohol; the posterior part of thighs, legs and tarsi whitish; under parts white, the abdomen very much granulated; fingers and toes semipalmate; a series of dark colored spots upon the flanks.

Dimensions.—Length of head and body 1 inch 4 lines; breadth of head $6\frac{1}{2}$ lines; of arm 4 lines; of forearm $3\frac{1}{2}$ lines; of hand to extremity of longest finger 5 lines; of thigh 8 lines; of leg 8 lines; of foot to extremity of longest toe 6 lines.

Habitat. Loo-Choo. Taken at Loo-Choo, December, 1854, by Mr. Wright. Color during life pale green above, below pale red; no dark line of separation between these colors. (Notes of Mr. Stimpson.)

Gen. remarks. This species evidently belongs to the same genus as *Polypedates megacephalus*, found at Hong Kong, and remarkable for the two patches of rugosities upon the vertex; the animal, however, is quite different from the *Polypedates rugosus* of Ceylon and the Philippines.

POLYPEDATES BURGERII D. & B.

Erpet. Generale, tom. viii. p. 521.

Syn. *Hyla Burgerii* Schlegel, Fauna Japonica, p. 113, pl. 3, fig. 728. Ousima, Japan. A small specimen from the Loo-Choo islands.

IXALUS Tsch.

IXALUS JAPONICUS nob.

Char. Head of moderate size; nostrils small, lateral, $\frac{1}{4}$ line apart; body rather slender, much more so than in *Hyla versicolor*; posterior extremities quite long, webs reaching to the antepenultimate phalanx; color ash grey above, in some specimens very pale; a transverse blotch upon the head, with a posterior triangular prolongation; several other blotches upon the back, one presenting the form of the two halves of the letter X, separated by a horizontal line. In one of the specimens the transverse bar is wanting; a brownish spot in front of the shoulder; a narrow oblique band behind the tympanum; lower lip spotted with black; upper lip also, but the spots are broader and more oblique; an oblique fold above the tympanum, commencing behind the eye; tympanum distinct, of a brownish color; upper part of head and anterior part of body presenting a number of tubercles; canthus rostralis concave; ridge between the eye and the nostril presenting a convexity inward; snout rounded, and somewhat acute; abdomen and under part of thighs posteriorly granulated.

Habitat. Japan.

Gen. remarks. This species corresponds very nearly with the description of *Ixalus semifasciatus* D. & B., in tom. viii. p. 523 of the Erpetologie Generale. It is there mentioned, however, that the palmation of the toes does not extend beyond one-half of their length. In the Japan specimens it would appear to be larger. In Schlegel's figure, which represents a much smaller animal, there are no webs to the toes. *Ixalus semifasciatus* is an inhabitant of Java. Future observation must determine whether the two animals be identical or not.

China.

There are in the collection no Chelonians from China, and but three Saurians, 1860.]

viz., a Geckotian, an Agamian, and a Scink. Except a few serpents, all the other specimens are Batrachians, which appear to abound in that region of the globe.

SAURIA.

GECKOTIDÆ.

HEMIDACTYLUS CUV.

Sect. DACTYLOTELES D. & B.

Subdiv. A.—*Dactyloteles fissipedes* D. & B.

HEMIDACTYLUS PUMILUS nob.

Char. Supraorbital regions not remarkably prominent; frontal region covered with granulations, larger than those upon the vertex and occiput; granulations upon body uniform or nearly so; ventral plate with fine facets, a little broader than long; in contact with the ventral are two plates, the first in contact with the first supralabial, the second with the second, the anterior larger than the posterior, and pentangular in shape; eleven supralabials; eight inferior labials; no pores in front of arms or along the thighs; color greyish; thighs with yellow above, the latter color predominating upon the head, with numerous dark colored transverse marmorations upon the back; under parts white.

Dimensions. Length of head 6 lines; breadth $3\frac{1}{2}$ lines; length of neck and body $1\frac{1}{4}$ inches; of tail 1 inch $4\frac{1}{2}$ lines.

Habitat. Hong Kong. One specimen.

LEZARDS IGUANIENS ou Sauriens Eunotes D. & B.

Gen. CALOTES Kaup.

CALOTES VERSICOLOR D. & B. Two specimens. Cum-Sing-Moon, China. Dr. MORROW.

LEZARDS SCINCOIDIENS ou Sauriens Lepidosaures.

Saurophthalmes D. & B.

EUMECES QUADRIVIRGATUS nob.

Spec. char. Supra-nasals but little extended at their external margin; neither slender nor much developed; internasal remarkable for its great breadth compared with its length, measuring $1\frac{1}{4}$ lines transversely, and about $\frac{1}{2}$ a line longitudinally; fronto-nasals in contact, their internal margins truncate; frontal hexagonal; the anterior and posterior angles obtuse, somewhat broader in front than behind; two fronto-parietals in contact, each with five distinct facets: interparietal short and broad; seven superior labials; a freno-nasal, a first and second frenal, the second much larger than the first; two freno-orbital plates, each of moderate size; twenty rows of small, hexagonal scales; body slender; tail cyclo-tetragonal at base, compressed toward the tip; color jet black above, with four longitudinal, narrow, white or yellow colored vittæ, broader and bluish upon the tail; the two middle ones commence each at the snout, pass over the eye, and extend on each side of the neck and back, and are lost upon the middle third of the tail, at its extremity; the inferior one commences at the armpit and terminates at the groin; under parts white, with a tinge of blue upon the abdomen.

Dimensions. Length of head 6 lines; greatest breadth 4 lines; length of neck and body 1 inch 11 lines; of tail 3 inches $5\frac{1}{2}$ lines; of anterior extremities $8\frac{1}{2}$ lines; of posterior extremities 11 lines. Total length 5 inches, 10 lines.

Habitat. Hong Kong Island, China. Near the summit of the mountain. Caught May 4th, 1854, by Mr. Wright.

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OPHIDIA.

AGLYPHODONTES.

HERPETODRYAS Boie.

HERPETODRYAS CHLORIS nob.

Spec. char. Internasals very much smaller than prefrontals, rostral plate pentagonal, the other plates upon the head presenting nothing remarkable; eight superior labials, the eye resting on the fourth and fifth; anterior genieals much longer and broader than the posterior; fifteen rows of smooth scales upon the middle of the body; tail rather long; a double row of bifid præanal scutes; 161 ab. scut, 86 subcaud. Color uniform green above, white below.

Dimensions Length of head 8 lines; greatest breadth 4 lines; length of body 1 foot 7 inches; of tail 8 inches 5 lines.

Habitat. Hong Kong Island. Caught May, 1854, by Mr. Brooke.

LEPTOPHIS Bell.

LEPTOPHIS TRIFRENATUS nob.

Spec. char. Body very long and somewhat slender; seventeen rows near the middle, the three median ones carinated; color olive above, barred with black posteriorly; under parts yellow, black spotted upon throat; posterior margin of scale at posterior part of body margined with black; ab. scut. 187, subcaud. 110. Total length 5 feet. (Fr.)

Description. The plates upon the upper part of the head present nothing remarkable; the nostril is deeply excavated between the plates; there are three frenals, the one immediately behind the post-nasal five-sided, nearly quadrangular in shape, the two behind it smaller and resembling it; there are two post-oculars, and eight superior labials, the eye resting on the fourth and fifth; the scales upon the sides of the body are smooth and quadrangular, those upon the middle of the back carinated. Coloration: The general tinge above is olive, the posterior part of the body being barred irregularly with black; tail olive colored above, barred transversely at its root with black, and maculated with black toward its posterior extremities; posterior border of the labial plates margined with black; middle portion of abdomen maculated with black; posterior part distinctly margined to a greater or less extent with black posteriorly; under part of tail yellow; the posterior margin of scutes black.

Dimensions. Length of head $1\frac{1}{2}$ inches; greatest breadth 11 lines; length of body 3 feet $7\frac{3}{4}$ inches; of tail 1 foot $2\frac{1}{2}$ inches.

Habitat. Hong Kong, China. Caught on the island of that name, April, 1854, by Lieut. Brooke.

AMPHIESMA D. & B.

AMPHIESMA STOLATUM. One specimen caught on a hill at Whampoa, China, July, 1851.

AMPHIESMA FLAVIPUNCTATUM nob.

Char. Head small, eyes somewhat prominent, internasals small and triangular, prefrontals of moderate size, pentagonal; three or four post-oculars; eight supralabials, the eye resting on the third and fourth; a small plate intercalated between the second and third; seventeen rows of lanceolate scales, near the middle of the body, the two inferior rows smooth. Color dusky yellow, with numerous yellow spots along the margin of the scales, a black undulating band running transversely behind the occiput, and two oblique ones upon the side of the head, the one commencing at the inferior margin of the eye, passing over the inferior post-ocular, and extending between the fifth and sixth supra labial to the inferior margin of the jaw; another commencing behind the post-orbital, and extending obliquely across the temples, and terminating at the 1860.]

inferior and posterior margin of the seventh supralabial plate; under parts yellow, the posterior margin of each scute bordered with black—128 ab. scut. 1 bifid præanal; 78 urostega.

Dimensions. Length of head 9 lines; greatest breadth $5\frac{1}{2}$; length of body 1 foot $2\frac{1}{4}$ inches; of tail 6 inches, 8 lines. Total length 1 foot, 9 inches, 8 lines.

Habitat. Island of Hong Kong, May, 1854, by Mr. Brooke. The specimen of the expedition having been somewhat injured, the above description was taken from a larger specimen in the collection of the Academy, which is stated to have been captured in Canton River.

OPISTHOGLYPHES D. & B.

PLATYRHINIENS.

HOMALOPSIS Kuhl.

? *HOMALOPSIS BUCCATUS* Fitzinger. D. & B., tom. vii., p. 968. One specimen, caught on the Island of Hong Kong, May, 1854, by Mr. Brooke.

PROTEROGLYPHES.

NAJA HAJI. One specimen, caught among stones on the shore of Hong Kong Harbor, May, 1854.

BATRACHIA.

RANIDÆ.

RANA TIGRINA Daud.

Syn. *Rana rugulosa* Weig., Nov. Act., tom. xvii., p. 258, tab. 21, fig. 2.

Rana tigrina Daud. Hist. Nat. des Grenouilles des Rainettes et des Cra-pauds, p. 864, pl. xx.

Rana limnocharis Boie., MS.

Rana Cancrivora D.

Rana vittigera Weig., Nov. Act., vol. xviii, tab. 21, fig. 1.

Rana mugiens Daud., pl. xvii.

Rana brama Lesson, Belanger, Voy. aux Indes Orientales, pl. vi.

Spec. char. General appearance very much like that of *Rana rugosa*, Schlegel, but it wants the vocal vesicles, and the longitudinal folds on either side of the back; head large, rather narrow in front; an oblique fold extending from the eye to the shoulder, with small vomerine teeth in two large patches situated very obliquely; tongue long, bifid posteriorly; tympanum very distinct; extremities robust; a longitudinal glandular band running across the frenal region, which is excavated, and passing under the eye; an oblique fold extending from the eye to near the shoulder; color dark brown above, dark spotted, with numerous elevated longitudinal ridges upon the back, placed irregularly; upper jaw spotted with black; thighs marbled posteriorly with black, upon a yellow ground; legs tarsi and under part of feet banded with black; skin not smooth but warty; the trails on the posterior part of the body largely developed; under parts yellow, the chin slightly marbled with black.

Dimensions. Length of head 1 inch 4 lines; breadth 1 inch three lines; length of head and body 3 inches; length of arm 6 lines; of forearm 6; of hand to extremity of longest finger 7 lines; of thigh 1 inch 4 lines; of leg 1 inch $4\frac{1}{2}$ lines, of feet to extremity of longest toe 1 inch $4\frac{1}{2}$ lines.

Habitat. Hong Kong; bought in the market of that place, Sept., 1854, by Wm. Stimpson.

RANA TRIVITTATA nob.

Spec. char. Head triangular, snout rather acute, palatine teeth but slightly developed, in two converging rows, their posterior extremities wide apart; tongue pyriform, deeply notched behind; body and extremities slender; color brownish, dark spotted, with three longitudinal white lines extending the whole length of the head and body commencing at the snout, the two exterior passing

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over the eye; a truncate band reaching from the snout to the eye; extremities banded and brown spotted; two brownish bars on each side of the thighs posteriorly; under parts white.

Dimensions. Length of head 5 lines; greatest breadth 4; length of head and body 11 lines; length of anterior extremities 7 lines; of posterior 1 inch 10 lines.

Habitat. Hong Kong, China.

RANA NEBULOSA nob.

Spec. char. Quite small, head rather broad posteriorly, extremities slender, palatine teeth in two bunches between the internal nares; tongue pyriform free at the sides, and very much so posteriorly, notched behind; tympanum distinct; color brown above, skin smooth; chin, throat and abdomen white or grayish; under part of extremities flesh colored.

Dimensions. Length of head 4 lines; greatest breadth 4; length of head and body 10 lines; of anterior extremities 6 lines; of posterior 1 inch 1 line.

Habitat. Hong Kong, China.

Gen. remarks. The young no doubt of a larger animal.

RANA GRACILIS Weig., Nova. Acta, vol. xvii., p. 257.

Spec. char. Snout somewhat acute, supraciliary regions prominent; nostrils wide apart; skin of the back thrown into longitudinal rugose folds; body slender; head long and rather broad posteriorly, posterior extremities stout; color above brownish, dark spotted; with transverse dark colored blotches upon the back; a narrow longitudinal white line extending from the snout to the posterior extremity of the body, absent in some specimens; webs of the hinder extremities reaching to the base of the penultimate phalanx, except of the 4th, where it reaches the base of the antepenultimate; thighs and legs spotted and banded with brown; a series of longitudinal dark colored bars, broader below the hips; under parts white.

Dimensions. Length of head 7 lines; greatest breadth 5; length of head and body 1 inch 2 lines; length of anterior extremities 8 lines; of posterior 1 inch 11 lines.

Habitat. China, caught at Whampoa, June 1854, by Mr. Stimpson.

Gen. remarks. According to Weigmann, this small species is found on the island of Lucon as well as in China. They are used abundantly as an article of food in both places, and captured by thousands, especially for the market of Macao.

RANA MULTISTRIATA nob.

Spec. char. Color greyish above, with transverse angular bars of a darker color: upper and lower jaw dark-spotted; abdomen white; length 1 inch 3 lines.

Description. Head long, eyes not prominent, tympanum of moderate size, tongue obcordate, hollowed posteriorly; palatine teeth *en chevron*, between the interior nares; anterior extremities slender, posterior rather stout; color greyish above, with transverse angular bars of a darker color upon the head and body, one passing between the eyes, posteriorly prolonged *en triangle*; thighs round and mottled with grey and white; legs barred posteriorly with black; arms and forearms barred with black; upper lip barred with dark brown; lower, brown spotted, the interior margin rounded; chin mottled with brown; abdomen white, under parts of extremities plush color.

Dimensions. Length of head 6 lines; greatest breadth 5; length of head and body 1 inch, $2\frac{1}{2}$ lines; of anterior extremities 8 lines; of posterior, 1 inch, 9 lines; of thigh 6 lines; of leg 6; of tarsus 3.

Habitat. Hong-Kong, China. Two specimens.

OXYGLOSSUS Tschudi.

Oxydozyga Kuhl, MS. *Rhomboglossus* D. & B., MS.
1860.]

Char. Head triangular, tongue oval, attached in front, free on the greater part of its extent posteriorly; body short and thick, rugose above; eyelids warty; anterior extremities of moderate thickness, posterior rather stout, fingers slightly webbed at their base, four fingers, five toes, the second finger much the longer, the two outer ones of nearly equal length; the web of the toes extending to the base of the terminal phalanx.

OXYGLOSSUS LIMA Tschudi.

Syn. *Oxydozyga braccata* Kuhl, MS.

Bombinator lima Mus. Lugd. et Francf.

Oxyglossus lima Tschudi. *Classif. der Batrachier.* (Mem. Acad. Neuch. tom. i. p. 85.)

Spec. char. Brownish above, with a tinge of yellow below; a brown band bordered with white upon the posterior of the thighs.

Dimensions. Length of head 7 lines; greatest breadth 6; length of head and body 1 inch 2 lines; length of anterior exterior toes 6 lines; of posterior, 1 inch 7 lines; of thigh 6 lines; of leg 6; of tarsus 3; of foot to extremity of longest toe 7 lines.

Habitat. Hong-Kong.

Gen. remarks. In the webbing of the feet this animal resembles *Dactylethra*; but in the form and arrangement of the tongue, and in other respects, it is quite different. Dumeril & Bibron have given Bengal and Java as the habitat.

BUFONIDÆ.

BUFO Laur.

BUFO GRISEUS nob.

Char. Head short and broad, snout slightly truncate; two rather long elliptical paratoids, toes semipalmate, numerous subround tubercles, above upon the back, color greyish above, white or light yellow beneath, with dark-colored markings upon the abdomen.

Dimensions. Length of head 4 lines; greatest breadth 4; length of body 9 lines; of arm 3 lines; of forearm 3 lines; of hand and fingers 3 lines; of thigh 4 lines; of leg 4; of tarsus 3 lines; of foot to extremity of longest toe 4 lines.

Habitat. Hong-Kong, China, July, 1854. Caught by Mr. Stimpson in the marshes of Whampoa.

ENGYSTOMA Wagl.

ENGYSTOMA PULCHRUM nob.

Char. Head small, triangular, snout acute; two tubercles upon the heel; toes semipalmated; ground color of head and body above yellowish, presenting several series of undulating bands, on the side of the latter resembling the contortions of certain geological formations; a black band across the head between the eyes posteriorly; a series of undulating bars in front of this; snout dark-colored, two dark-colored bands meeting near the middle of the body, and diverging; within them numerous dark-colored lines and oval spots bordered with white; similar oval spots between the thighs; arms partly yellowish; chin and throat mottled with black.

Dimensions. Length of head 3 lines; greatest breadth 3; length of head and body 10 lines; length of anterior extremities 6 lines; of posterior 1 inch, 7 lines.

Habitat. Hong-Kong, China. Common in the brackish water marshes between Hong-Kong and Whampoa, China. June, 1854. It is colored on the back with bluish, brown, white, yellowish, etc, concentrically arranged as in Agate.

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HYLIDÆ.

POLYPEDATES Wagl.

POLYPEDATES MEGACEPHALUS nob.

Spec. char. Head large, two oblong patches of rugosities, upon the vertex: snout truncate, nostrils lateral, quite near the extremity of the snout; skin smooth, tongue cordiform, notched posteriorly, from behind and at the sides; palatine teeth on a level with the anterior border of the posterior nares, converging toward each other, separated from each other by an interval of half a line; body and extremities slender; fingers very slightly webbed at base, posterior webs extending to the base of the penultimate phalanx, except on the fourth where it extends to the base of the antepenultimate; color brown with dark-colored blotches upon the back bordered with white; sides marbled with dark-brown; lower parts light yellow.

Dimensions. Length of head 8 lines; greatest breadth 7; length of head and body $1\frac{1}{2}$ inches; length of anterior extremities 1 inch; of thigh 10 lines; of leg 9 lines; of tarsus 6 lines; of foot to extremity of longest toe 7 lines.

Habitat. Hong-Kong, China. Caught May, 1854.

Java.

OPHIDIA.

PYTHONIDÆ—Pythoniens holodontes D. & B.

Div. B.—Nostrils vertical.

PYTHON MOLURUS Gray. One specimen.

Habitat. Java. Taken on the Island of Java, purchased and presented to the expedition by Dr. Hamilton. Killed and skinned at Hong-Kong, (not in good preservation). This specimen measured 16 feet in length.

Cape of Good Hope.

TESTUDINATA.

Chersites D. & B. Testudines terrestres.

Gen. HOMOPUS D. & B.

In the collection of the expedition are eight specimens belonging to this genus, characterized by the presence of four toes only to each extremity.

HOMOPUS AREOLATUS D. & B.

Erpet. Gen. tom. ii. p. 146, pl. 13, fig. 2 and 3.

Testudo areolatus, Reil. Monog. Test. The central portion of the disk in these specimens is from light chocolate brown to darker, in some almost black. The sternum in some specimens is much darker than in others.

SAURIA.

GECKOTIDÆ.

Sauriens ascalabotes D. & B.

PHYLLODACTYLUS.

PHYLLODACTYLUS PORPHYREUS D. & B.

Spec. char. Head of moderate size, triangular, mental plate of moderate size, pentangular, eight inferior labials, nine superior, ground color above yellow, marbled all over with brown; under parts yellow.

Dimensions. Length of head 5 lines; greatest breadth $3\frac{1}{2}$; length of body 1860.]

13 lines; of tail 1 inch, 6 lines; of anterior extremities 6 lines; of posterior, 8 lines.

Habitat. Cape of Good Hope. Found in the moist crevices of rocks; common near Simon's Town, Oct. 1853.

AGAMIDÆ.

AGAMA Daud.

AGAMA ATRA Daud.

Agama atra D. & B., tom. iv. p. 493.

Agama atra Smith, Zoology of S. Africa, Appendix, p. 14. Four specimens. Very common at the Cape of Good Hope. Found sunning themselves on rocks; motions slow. Collected Oct. 1855, by Lieut. Van Wyck.

AGAMA ACULEATA? One specimen. D. & B. tom. iv. p. 499. Very common at the Cape of Good Hope. Found sunning themselves on rocks; motions slow. Collected by Lieut. Van Wyck.

ZONURIDÆ.

ZONURUS GRISÆUS D. & B., tom. v. p. 350. Seven specimens. Taken under stones in high ground. Very common at the Cape of Good Hope. Oct. 1853. W. S.

AUTOSAURIENS.

EREMIAS KNOXII D. & B. tom. v. p. 299. Smith, Zoology S. Africa, pl. 43. One specimen. Taken in arid places, near Cape Horn. Its motions are exceedingly quick. Oct. 1853. W. S.

SCINCIDÆ.

GERRHOSAURUS.

GERRHOSAURUS SEPIFORMIS D. B. Smith, Zoology of S. Africa, pl. 41. D. & B., tom. v. p. 384.

Scincus sepiiformis Schneider. Hist. Amphib. fascic. ii. p. 191.

Scincus sepiiformis Merrem, Tent. Syst. Amphib. p. 70. One specimen, found under a stone on a grassy plat near Simons Town, Cape of Good Hope, Oct. 1853. W. S.

Gen. ACONTIAS Cuvier.

ACONTIAS MELEAGRIS D. & B. tom. v. p. 802, pl. 58. One specimen, found under a stone, in a moist situation, near Simon's Town, Cape of Good Hope, Oct. 1853. W. S. According to Dumeril & Bibron, this species is very common in the neighborhood of the Cape of Good Hope.

OPHIDIANS.

PROTEROGLYPHES.

Serpens proteroglyphes ou Apistophides D. & B. 1st Sect. Conocercal proteroglyphes.

Gen. NAJA.

NAJA HAJI. Aspis of the old authors. *Uraus* Wagler.

Var. *intermixta* D. & B. One specimen. Smith, Zoology of Southern Africa, Var. B. pl. xix. This specimen was captured at Constantia, Cape of Good Hope, Oct. 1853, by Capt. Ringgold. Another specimen, brown above, with yellow spots upon the neck. The latter specimen measures 4 feet 5 inches in length; tail $8\frac{1}{2}$ inches.

SOLENOGLYPHES.

Serpens solenoglyphes ou Thanatophides D. & B.

[Oct.

Gen. ECHIDNA Merrem.

ECHIDNA ARIETANS Merrem, Puffadder, D. & B. tom. v. p. 1425. One very fine specimen. Taken near Cape Town, Cape of Good Hope, Oct. 1853. Purchased.

AGLYPHODONTES.

CORONELLA CANA D. & B. One specimen. Taken near Simon's Town, Oct. 1853. Lieut. Van Wyck.

HOMALOSOMA LUTRIX D. & B., tom. vii. p. 110. One specimen. Found under stones on the hill's head, Simon's town, Cape of Good Hope, Oct. 1853. U. S.

EPANODONTIENS.

ONYCHOCEPHALUS.

ONYCHOCEPHALUS DELALANDII D. & B., tom. vi. p. 573. One specimen.

BATRACHIA.

RANIDÆ.

RANA GRAYII Smith, Zoology of South Africa. Pl. 78, fig. 2. Common in moist grounds. Five specimens.

Madeira.

SAURIA.

Lezards LACERTIENS ou Autosaures D. & B.

Cælodontes Leiodactyles.

Gen. LACERTA.

LACERTA DUGESII Milne-Edwards, Am. Sc. Nat., tom. xvi. p. 84, tab. 6, fig. 2.

Lacerta maderensis Fitz., Neu. Class. der Rept. p. 51.

Lacerta dugesi D. & B., tom. v. p. 236.

Habitat. Madeira. Seven specimens. Five adult, two young. In one of the young specimens the black lateral bands are destitute of yellow spots. Taken at the Island of Madeira, July, 1853. (C. Ames.)

BATRACHIANS.

RANIDÆ.

RANA VIRIDIS Roesel. *Rana maratima* Risso. Two specimens.

Habitat. Madeira. The spots upon the back do not appear to be so numerous as in the European specimens of *R. viridis*.

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Nov. 6th.

MR. LEA, President, in the Chair.

Forty members present.

The following paper was presented for publication :

"Descriptions of new species of the reptilian genera *Hyperolius*, *Liuperas* and *Tropidodipsas*, by E. H. Cope."

And was referred to a Committee.

Dr. Darrach presented the following list of plants, which appeared in flower in the neighborhood of Philadelphia during the months of July, August, September and October, together with a list of ferns growing in this neighborhood :

1. July.

RANUNCULACEÆ.

Clematis Virginiana.
Anemone Virginiana.
Delphinium consolida.

NELUMBIACEÆ.

Nelumbium luteum.

NYMPHÆACEÆ.

Nuphar Kalmiana.

CISTACEÆ.

Lechea major.
 " *minor*.

DROSERACEÆ.

Drosera rotundifolia.
 " *longifolia*.

HYPERICACEÆ.

Ascyrum crux andreae.
 " *stans*.

Hypericum prolificum.
 " *angulosum*.
 " *mutilum*.
 " *sarothra*.

Elodea Virginica.

CARYOPHYLLACEÆ.

Dianthus armeria.
Silene stellata.
 " *antirrhina*.

MALVACEÆ.

Abutilon Avicenna.
Sida spinosa.

LINACEÆ.

Linum Virginianum.

1860.]

BALSAMINACEÆ.

Impatiens pallida.
 " *fulva*.

ANACARDIACEÆ.

Rhus typhina.
 " *glabra*.
 " *copallina*.
 " *toxicodendron*.

VITACEÆ.

Ampelopsis quinquefolia.

CELASTRACEÆ.

Celastrus scandens.

POLYGALACEÆ.

Polygala incarnata.
 " *sanguinea*.

LEGUMINOSÆ.

Crotalaria sagittalis.
Desmodium nudiflorum.
 " *acuminatum*.
 " *lævigatum*.
Stylosanthes elatior.
Lespedeza procumbens.
 " *repens*.
 " *violacea*.
 " *angustifolia*, v.

Apios tuberosa.
Cassia Marilandica.

ROSACEÆ.

Agrimonia eupatoria.
Waldsteinia fragarioides.
Potentilla arguta.
Geum Virginianum.

MELASTOMACEÆ.

Rhexia Virginica.
 " mariana.

ONAGRACEÆ.

Epilobium angustifolium.
 Enothera biennis.
 Ludwigia alternifolia.
 " palustris.
 Proserpinica palustris.

CRASSULACEÆ.

Penthorum sedoides.

UMBELLIFERÆ.

Discopleura capillacea.
 Sium lineare.

ARALIACEÆ.

Aralia racemosa.

RUBIACEÆ.

Gallium concinnum.
 Cephalanthus occidentalis.

DIPSACEÆ.

Dipsacus sylvestris.

COMPOSITÆ.

Liatrix spicata.
 Sericocarpus solidagineus.
 " conyzoides.
 Aster macrophyllus.
 Eclipta procumbens.
 Gnaphalium polycephalum.
 Antennaria margaritacea.
 Bidens frondosa.
 Diplopappus umbellatus.
 Solidago odora.
 " Muhlenbergii.
 Chrysopsis mariana.
 Inula helenium.
 Cirsium lanceolatum.
 Sonchus oleraceus.

LOBELIACEÆ.

Lobelia Nuttallii.

CAMPANULACEÆ.

Campanula aparinoides.
 " Americana.

ERICACEÆ.

Gaultheria procumbens.
 Clethra alnifolia.
 Rhododendron maximum.
 Chimophila umbellata.
 " hypopitys.

LENTIBULACEÆ.

Utricularia vulgaris.
 " clandestina.

SCROPHULARIACEÆ.

Gratiola aurea.
 Pysanthes gratioloides.
 Gerardia flava.
 " purpurea.
 Chelone glabra.
 Mimulus alatus.
 " ringens.

VERBENACEÆ.

Verbena hastata.
 Phryma leptostachya.

LABIATÆ.

Teucrium Canadense.
 Trichostema dichotomum.
 Mentha viridis.
 " piperita.
 " Canadensis.
 Lycopus Virginicus.
 Pycnanthemum linifolium.
 Origanum vulgare.
 Monarda fistulosa.
 Nepeta cataria.
 Brunella vulgaris.
 Scutellaria integrifolia.
 " versicolor.
 Stachys palustris.
 " v. aspera.

BORRAGINACEÆ.

Echinosperrum lappula.
 Cynoglossum Morrisoni.

POLEMONIACEÆ.

Phlox paniculata.

CONVOLVULACEÆ.

Cuscuta arvensis.
 " gronovii.

GENTIANACEÆ.

Sabbatia angularis.

ASCLEPIADACEÆ.

Asclepias rubra.
 " purpurascens.
 " incarnata.

ARISTOLOCHIACEÆ.

Aristolochia serpentaria.

PHYTOLACCACEÆ.

Phytolacca decandra.

CHENOPODIACEÆ.

Chenopodium album.

Chenopodium urbicum.
 " botrys.
 " ambrosioides.
 Atriplex hastata.

POLYGONACEÆ.

Polygonum sagittatum.
 " acre.

SAURURACEÆ.

Saururus cernuus.

CERATOPHYLLACEÆ.

Ceratophyllum demersum.

CALLITRICHACEÆ.

Callitriche verna.

PODOSTEMACEÆ.

Podostemon ceratophyllum.

EUPHORBIACEÆ.

Euphorbia maculata.
 " hypericifolia.

Acalypha Virginica.

URTICACEÆ.

Urtica dioica.
 " urens.

Bœmeria cylindrica.
 Humulus lupulus.

TYPHACEÆ.

Typha latifolia.
 Sparganium simplex.

LEMNACEÆ.

Lemna minor.

NAIDACEÆ.

Potamogeton fluitans.
 v. natans.

ALISMACEÆ.

Alisma plantago.

ORCHIDACEÆ.

Gymnadenia tridentata.
 Platanthera flava.
 " blephariglottis.
 Spiranthes gracilis.
 " cernua.

LILIACEÆ.

Lilium Canadense.
 " superbum.

MELANTHACEÆ.

Melanthium Virginicum.
 Zygadenus leimanthoides.

1860.]

XYRIDACEÆ.

Xyris bulbosa.

Orders 54.

Species 154.

August and September.

MALVACEÆ.

Hibiscus moscheutos.

POLYGALACEÆ.

Polygala ambigua.
 " polygama.
 " cruciata.

LEGUMINOSÆ.

Desmodium pauciflorum.
 " humifusum.
 " rotundifolium.
 " canescens.
 " Dillenii.
 " paniculatum.
 " ciliare.

Lespedeza Stuevei.

" hirta.
 " capitata.
 " v. angustifolia.

Phaseolus perennis.

Galactia glabella.

Amphicarpæa monoica.

Cassia chamæcrista.

" nictitans.

ROSACEÆ.

Sanguisorba Canadensis.
 Geum strictum.

LYTHRACEÆ.

Cuphea viscosissima.

ONAGRACEÆ.

Gaura biennis.
 Myriophyllum verticillatum.

UMBELLIFERÆ.

Archemora rigida.
 Archangelica hirsuta.

RUBIACEÆ.

Diodia teres.

COMPOSITÆ.

Vernonia noveboracensis.
 Eupatorium purpureum.
 " rotundifolium.
 " pubescens.
 " sessilifolium.
 " perfoliatum.
 " ageratoides.

Mikania scandens.

Aster corymbosus.
 " radula.
 " spectabilis.
 " patens.
 " cordifolius.
 " undulatus.
 " ericoides.
 " multiflorus.
 " dumosus.
 " miser.
 " tenuifolia.
 " simplex.
 " puniceus.
 " prenanthoides.
 Diplopappus linariifolius.
 Solidago bicolor.
 " latifolia.
 " cœsia.
 " puberula.
 " stricta.
 " speciosa.
 " v. angustata.
 " neglecta.
 " altissima.
 " ulmifolia.
 " nemoralis.
 " gigantea.
 " lanceolata.
 Ambrosia trifida.
 " artemisiæfolia.
 Xanthium strumarium.
 " spinosum.
 Rudbeckia laciniata.
 Helianthus angustifolius.
 " giganteus.
 " divaricatus.
 " decapetalus.
 Coreopsis trichosperma.
 Bidens frondosa.
 " cernua.
 " connata.
 " crysanthemoides.
 Helenium autumnale,
 Tanacetum vulgare.
 Gnaphalium uliginosum.
 Erechtites hieracifolia.
 Cirsium discolor.
 " altissimum.
 " muticum.
 Lappa major.
 Hieracium scabrum.
 Nabalus albus.
 Mulgedium acuminatum.
 LOBELIACEÆ.
 Lobelia cardinalis.
 " syphilitica.
 OROBANCHACEÆ
 Epiphegus Virginiana*

SCROPHULARIACEÆ.

Gerardia tenuifolia.
 " quercifolia.
 " pedicularia.
 Pedicularis lanceolata.

VERBENACEÆ.

Verbena urticifolia.

LABIATÆ.

Lycopus Virginicus.
 Cunila mariana.
 Pycnanthemum incanum.
 " lanceolatum.
 Hedeoma pulegioides.
 Collinsonia Canadensis.
 Monarda punctata.
 Lophanthus nepetoides.

GENTIANACEÆ.

Gentiana Andrewsii.
 " saponaria.
 Bartonia tenella.

ASCLEPIADACEÆ.

Gonolobus macrophyllus.

AMARANTACEÆ.

Amarantus hybridus.
 " spinosus.
 " albus.

POLYGONACEÆ.

Polygonum orientale.
 " Pennsylvanicum.
 " persicaria.
 " hydropiper.
 " hydropiperoides.
 " erectum, v.
 " Virginianum.
 " tenue.
 " articulatum.
 " arifolium.
 " dumetorum.

ORCHIDACEÆ.

Platanthera cristata.
 " ciliaris.
 Goodyera pubescens.

PONTEDERIDACEÆ.

Pontederia cordata.
 Heteranthera reniformis.
 Schollera graminea.

October.

HAMAMELACEÆ.

Hamamelis Virginica.
 Orders 20.
 Species 127.

List of Ferns.

POLYPODINEÆ.
Polypodium vulgare.
 “ *hexagonopterum.*
Allosorus atropurpureus.
Pteris aquilina.
Adiantum pedatum.
Woodwardia angustifolia.
 “ *Virginica.*
Camptosorus rhizophyllus.
Asplenium pinnatifidum.
 “ *trichomanes.*
 “ *ebenum.*
 “ *angustifolium.*
 “ *thelypteroides.*
 “ *filix femina.*
Dicksonia punctilobula.
Woodsia obtusa.
 “ *ilvensis.*
Cystopteris fragilis.

Aspidium thelypteris.
 “ *noveboracense.*
 “ *spinulosum.*
 “ *v. dilatatum.*
 “ *cristatum.*
 “ *marginale.*
 “ *acrostichoides.*
Onoclea sensibilis.
 OSMUNDINEÆ.
Botrychium lunarioides.
Lygodium palmatum.
Osmunda regalis.
 “ *claytoniana.*
 “ *cinnamomea.*
Botrychium Virginicum.
Ophioglossum vulgatum.
 Species 32.
In addition.
Echium vulgare.
Aster longifolius.

Nov. 13th.

MR. LEA, President, in the Chair.

Thirty-two members present.

The following papers were presented for publication :

“Description of a new species of *Cassidulus* from the Cretaceous formation of Alabama, by Wm. M. Gabb.”

“Description of a new Genus and species of *Amorphozoa* from the Cretaceous formation of New Jersey, by Wm. M. Gabb.”

And were referred to a Committee.

Dr. Rogers exhibited some experiments to show the decomposing power of Carbonic Acid in solution, on bodies containing alkalis and alkaline earths. Specimens of several kinds of glass, mica and trap rock in fine powder, placed on filters, were treated with a solution of carbonic acid dissolved in water. A notable proportion of the alkaline bases was dissolved, as was shown by its action on turmeric paper. Dr. Rogers referred to the bearing of this fact in Geology, especially the absence of alkalis in the ashes of coal and the disintegration of rocks.

Nov. 20th.

MR. LEA, President, in the Chair.

Fifty members present.

Dr. Fisher exhibited a specimen of Peat, obtained by Mr. J. C. Trautwine on the Atrato River, from a bed of leaves. The bed was about thirty feet thick, and the specimen exhibited was taken from about fifteen feet below the surface. On the surface the leaves were fresh, but were gradually changed at different depths, so that the bottom of the bed closely resembled bituminous coal.

Dr. Rogers exhibited Prof. Way's electric light, produced by the ignition of 1860.]

a stream of mercury. He also exhibited the original experiment made by Dr. Hare several years since, when Dr. Rogers was his assistant, and explained the difference between them as consisting in the one light being formed by a self-sustaining battery, and the other by a battery transient in its effects.

Dr. Leidy read a letter from Mr. Robert D. Owen, of New Harmony, announcing the death, on the 13th inst., of Dr. David Dale Owen, late a Correspondent of the Academy.

On motion of Dr. Rogers, the Secretary was directed to communicate to the immediate relatives of Dr. Owen the regret of the Academy at its loss.

On motion of Dr. Rand, the thanks of the Academy were presented to Messrs. Van Amburg & Co. for donations to the Museum, and the privilege of giving orders of admission to the Museum on public days was granted to the same.

Nov. 22d.

SPECIAL MEETING.

MR. LEA, President, in the Chair.

The President announced the decease of our respected Vice-President, Major Le Conte, on the 21st inst., and stated the object of the meeting to be to express the sense of the Academy at its loss. After a short review of the character and labors of Major Le Conte, by Dr. Fisher, Dr. Elwyn, Mr. Foulke and Mr. Lea, Dr. Fisher offered the following resolutions, which were unanimously adopted :

Resolved, That the Academy has heard with the deepest regret of the death of our late esteemed Vice-President, Maj. John Le Conte, who has for so many years adorned the ranks of the students of Natural Science in America, and who at the time of his decease was one of the oldest naturalists in our country.

Resolved, That Mr. John Cassin be requested to prepare a biographical notice of Maj. Le Conte.

Resolved, That the Secretary be instructed to send to the family of our deceased Vice-President a copy of these resolutions, and that they be published in the daily journals of this city.

Resolved, That the members of the Academy will meet at the Hall of the Academy at 10 o'clock, A. M., on Saturday the 24th inst., to proceed from thence to attend the funeral of the deceased.

Nov. 27th.

Vice-President BRIDGES in the Chair.

Thirty members present.

The following papers were, on report of their respective Committees, ordered to be published in the Proceedings :

[Nov.

Descriptions of new species of the Reptilian genera *Hyperolius*, *Liuperus* and *Tropidodipsas*.

BY E. D. COPE.

HYPEROLIUS FULVOVITTATUS Cope.

Tympanum concealed. Head elongate, external nares lateral. Internal nares circular; eustachian orifices elongate oval. Tongue elongate, deeply bifid. Skin of the dorsal region smooth. Tibia longer than femur; fifth toe much shorter than the fourth, and longer than the third. Length of head and body $10\frac{1}{2}$ lines.

Coloration. Above pale yellowish brown (in spirits), with a light fulvous band upon each side, passing from the end of the muzzle to the thigh. Two bands of the same color extend one on each side of the vertebral line, and passing above the eyes, become confluent on the muzzle. These bands are about as wide as the spaces of ground color they enclose. Beneath, light yellowish brown.

Hab. Liberia. Mus. Acad. Nat. Sci. Presented by Dr. Goheen.

LIUPERUS BILIGONIGERUS Cope.

Form very stout. Head broad, short, frontal region a little wider than each palpebra. Muzzle prominent, very obtuse in profile. Canthus rostralis rounded, nostrils vertico-lateral. Eyes very prominent. Tympanum concealed; eustachian orifices exceedingly minute. Tongue small, elliptic oblong, entire. Skin above and below very smooth, some granulations upon the posterior faces of the femora. A few small glandulous elevations between and posterior to the eyes, and upon the anterior part of the back. A pectoral fold. Two rounded tuberosities on the carpus; fourth digit shortest, third longest. Femora very stout. Tarsus equal to the fore arm in length, furnished with a minute, acute tubercle near the middle of its posterior face, which is not brown tipped; and at its inferior extremity with two transverse, compressed tubercles or spurs, which are tipped with brown. Metatarsus not tuberculous. Length of head and body measured beneath, 11 lines; of tibia, $4\frac{1}{2}$ lines. Breadth beneath, from axilla to axilla, $4\frac{1}{2}$ lines.

Coloration. Above marbled with pale rufous brown, with darker markings intermixed. These are, a narrow band bisecting each eyelid; a blotch extending from eye to shoulder; a pair of small spots upon the back, posterior to the eyes; another larger pair, one behind each suprascapular region; one upon each side of the coccyx; a curved band extending from iliac region to femur, and a lateral band extending from behind the shoulder, which vanishes before reaching the thigh. A pale dorsal line, lightest posteriorly. Beneath, dirty white.

Hab. Buenos Ayres. Mus. Acad. Nat. Sci. Presented by Dr. Kennedy.

In *Liuperus marmoratus* *D. & B.*, the tympanum is distinct, and the skin is very tuberculous. In *L. sagittifer* *Schm.*, the frontal region is much narrower, and a series of tubercles extends from the eye, posteriorly.

TROPIDODIPSAS LUNULATA Cope.

Body much compressed, its vertical diameter near the middle two and a half times as great as near the neck. Tail slender, cylindrical, between one-fourth and one-third the total length. Head very distinct, elongate, de-

NOTE.—The following papers, viz., “Mexican Humming Birds, Nos. 3 and 4,” by Raphael Montes de Oca, “Contributions to the Carboniferous Flora of the United States, No. 2,” by Horatio C. Wood, Jr., and “Contributions to American Lepidopterology, No. 7,” by Brackenridge Clemens, M. D., were read to the Academy Nov. 20th, but were inadvertently omitted in the minutes of that date.

pressed. Muzzle rounded; eye very large, with a round pupil. Rostral plate broader than high, its superior border rounded. Prefontals small; postfrontals large, bent upon the sides of the head. Vertical large, longer than broad, its lateral borders concave. Superciliaries very large, arched; occipitals rather broad, their common suture not longer than the vertical plate, bounded externally by three temporals. Two temporals in contact with the two postoculars. One large preocular not in contact with vertical. Loreal single, not longer than high. Nasals two, the nostril between them large. Superior labials nine, fourth, fifth and sixth entering the orbit. Inferior labials fourteen, second to sixth very narrow; eighth largest. Scales in twenty-three rows; anteriorly four or five, posteriorly thirteen median rows weakly keeled. Gastrosteges slightly recurved upon the sides, not angulated, 204 in number. A divided anal, urosteges 136. Total length 25 in. 3 lin.; tail 7 in. 3 lin.

Coloration. Ground, a light greyish rufous (tinged with yellow beneath,) densely punctulated above and below, with rufous brown. The upper surface is crossed by about thirty-five transverse crescent shaped, fulvous brown bands, bordered with black. Upon the median line anteriorly these are one or two scales wide, but become much narrower as they are prolonged obliquely backward upon the sides, vanishing upon the third row of scales. Posteriorly they are broader, and extend to a dark brown spot, which occupies the ends of every third pair of gastrosteges. A short, deep brown median vitta upon the neck; a spot of the same at the posterior extremity of the occipital suture, one upon each occipital, and one upon the posterior part of the vertical plate. A light brown band crosses the postfrontal plates, extends through the eye, and for a short distance upon the neck, involving nearly the whole of the last labial shield, and the upper borders of the three anterior to it. Remaining labials and throat light yellow.

Hab. Honduras. Mus. Smithsonian Institute. Obtained by Mr. A. H. Rüse, of St. Thomas, W. I.

Tropidodipsas Gthr. is one of the few genera of Dipsadine serpents characterized by the possession of keeled scales. I have referred the present species to it with some hesitation, on account of the difference between the form of its head and that of *T. fasciata*. Günther states that the head of the latter is shorter than that of *Dipsas nebulata*. In *T. lunulata* the head is more like that of a *Herpetodryas*. The dentition is isodont.

Description of a new genus and species of Amorphozoon, from the Cretaceous formation of New Jersey.

BY W. M. GABB

I received some time ago from Mr. C. C. Abbott, with some other cretaceous fossils, a small fossil, that I at once referred to the Amorphozoa. I was unable to decide in what genus to place it. After a careful study of the subject, I am satisfied that it cannot belong to any existing genus. It is, however, closely related to *Siphonia* of Parkinson. I propose the generic name

DESMATOCIEUM, Gabb.

Gen. char. Elongated, regular in form; tubulate through the whole length; stem robust and with several inflations, but no distinct head.

D. trilobatum. Pl. 69, f. 39—39 a, Jour. Acad. Nat. Sci., 2nd series, vol. 4.

Length of the fragment $1\frac{1}{4}$ inches. Width of smallest lobe $\frac{1}{3}$ of an inch. Width of second lobe $\frac{2}{3}$ of an inch. The first lobe is somewhat elongate, the second is more compressed. There have been at least three lobes, but the upper one is broken.

Near Mullica Hill, N. J. My collection.

[Nov.]

Description of a new species of *Cassidulus*, from the Cretaceous formation of Alabama.

BY W. M. GABB.

C. micrococcus. Pl. 8, fig. 1. Oval, slightly flattened, widest just behind the mouth; ambulacral summit in advance of the centre: below slightly concave; peristome small, the channels between the tubercles very narrow; surface above minutely and sparsely granulate; below covered with small, closely arranged tubercles, placed irregularly.

Ripley Group, Eufala, Ala.

This species resembles *C. æquorus* of Morton, but is twice or three times as large; the upper surface, which is distinctly granulate in Morton's species, is apparently smooth, except under a glass, in this. Below, the tubercles on this species are very small, closely and irregularly arranged. In *æquorus* they are much larger, and placed further apart. The anal furrow does not approach so near the lower margin as in *æquorus*.

Contributions to the Carboniferous Flora of the United States.—No. II.

BY HORATIO C. WOOD, JR.

CYCLOPTERIS, Brong.

C. crispa, nobis.

Syn. *Filicites crispa*, Germ. & Kaulf. Nova Acta Acad. C. L. C. Nat. Cur. vol. xv. par. ii. page 229, pl. 66, fig. 6, 1831. *Adiantites Germari*, Göpp, Sys. Fil. Foss. Nova Acta, vol. xvii. Sup. p. 218, 1836. *Cyclopteris Germari*, "Göpp," Unger, Gen. et Spec. Foss. Plant. p. 96, and Prof. Lesquereux, Geol. of Pennsylvania, vol. ii. p. 856.

C. Wilsonii, nobis.

Leaf sub-orbicular or subobovate, narrowed at base, thin, plicate; margin irregular, incised, fimbriate, especially above; fimbria stout, unequal, often bifurcate, sometimes branched; nerves numerous, thin, close, arcuate, flexuous, dichotomous. Rachis unknown.

The nervation of this species, as well as the peculiar form of the fimbria, separates it from *C. fimbriata*, Lesq., *C. laciniata*, Lesq., and *C. crispa*, nobis. Among the Neuropteris, it is most nearly allied to *N. dentata*, of Lesq. and may possibly prove to be the cyclopteroid form of that species. In the only specimen that we have seen, both of the leaves have one margin folded beneath them, and are variously plicated. One leaf, only, has the basal margin of one side distinct; this part of the border is not fimbriate, but undulate, probably, however, there will be found to be a variation in this respect. It affords us much pleasure to dedicate this handsome plant to Dr. T. B. Wilson, who has done so much for the advancement of natural science in America.

Cabinet of the Academy.

LEPIDODENDRON, Sternb.

L. rectangulum, nobis.

Leaf scar almost a square; angles about 90°; margin moderately broad, generally distinct, often slightly raised; vascular scar broad, sub-rhomboidal, with a small triangular depression at its apex and its basal angle rounded, but the others acute, situated in and filling up the apex of main scar, marked internally with three (often obsolete) dots, which are disposed in a curve near its basal angle; appendices distinct, sub-parallel to the margin; medial line not well marked, but with a number of heavy transverse wrinkles.

1860.]

This handsome and distinct species was discovered at Ashland, Schuylkill County, Pa., by Mr. T. Guilford Smith, and by him presented to the Academy.

L. chilallœum, nobis.

Leaf scar sub-oval, elongate and acuminate above and below, often communicating one with another; margins distinct, broad, alternately contracted and enlarged for half the length of the scar; vascular scar sub-rhomboidal, their transverse diameter very much exceeding their height, (sometimes four times as great); internal markings and appendices obsolete; medial line, above the vascular scar, well marked and furnished with a triangular depression, below, almost obsolete, but crossed by a number of heavy transverse wrinkles.

The form of the ribs ally this plant to *L. dirochilum*, nobis, but the internal markings as well as shape of main scar widely separate it from that species.

L. salebrosum, nobis.

Leaf scar rhomboidal, uneven; margin heavy, raised, irregularly plicate, quite flexuous; angles sometimes rounded, sometimes acute; medial vascular cicatrix sub-central, small, in one scar in our specimen marked with two very much raised lines, in the form of a cross, (this may be accidental); appendices and medial line obsolete.

Cabinet of the Academy. *Locality* unknown.

L. uræum, nobis.

Scars elliptical, very much elongate, caudate and slightly curved above and below, impressed with flexuous transverse wrinkles disposed with some approach to regularity; margin raised, very narrow, almost linear; vascular scar sub-rhomboidal or subtriangular, (in the one case having the basal angle acute, in the other, the base merely convex, remaining angles being mostly obtuse), situated a little above the centre of the main scar, impressed with three dots arranged in a curve near its base; medial line not very distinct, but running the whole length of the leaf scar—above the cicatriculus—smooth and furnished with a triangular expansion approaching in size to the vascular scar—below the cicatriculus—crossed by many heavy transverse flexuous wrinkles; appendices subdistinct, irregularly curved and of considerable length; tubercles oval, elongate, somewhat acuminate, situated at base of vascular scar, and close to the medial line.

In our specimen the total length of the leaf scar is 2 9-10ths inches, being five times as great as its breadth. The vascular scar is placed somewhat obliquely in the main scar. At the extremities of the latter, the two margins are so approximated as to be merely separated by a groove. This species is, perhaps, closely allied to *L. caudatum*, Ung. We have never seen Sternberg's figure of that plant, and Unger's description is excessively meagre: but out of the few given characters our specimen differs in the great rugosity of the medial line, as well as in the obtuseness of the angles of the cicatriculus. We may be mistaken in our idea as to the relationship of the two plants, as Unger's description leaves one so much in the dark.

Private collection. Found by Mr. John Fulton in the Broad Top Coal Field, where it appears not to be uncommon.

SIGILLARIA, Brongt.

Sub-genus RHYTIDOLEPIS.

S. cymatoides, nobis.

Stem costate; costæ narrow, convex; furrows very distinct, marked in decorated state, with numerous longitudinal striæ, which are also found more or less deeply excavated on the ribs; scars somewhat elongate, as wide as the ribs, disposed in quincunx, the space between them being a little less than half their length, impressed with very numerous transverse striæ, their lower

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half tumified, so as to form, as it were, grooves between them, crossing the ribs at an angle of about 60°, (these are much more strongly marked when the bark is removed); vascular scars three, composed of a central dot with a curved linear impression on each side.

Locality. Hazleton Mines. Cabinet of the Academy. Presented by Matthew Baird, Esq.

S. notata, nobis.

Phytolithus notatus, Steinh., *S. elliptica*, Brongt. *S. attenuata*, Lesq.

We see no character on which Prof. Lesquereux's species can be separated. He says: "This species, viz. figs. 1 and 2, could perhaps be referred to *S. elliptica*, Brgt. and viz. fig. 3, to *S. Sillimanii*, Brgt. But the form of the scars in figs. one and two is broader and shorter than in the varieties of *S. elliptica*. The author (Brongt.) says that '*S. elliptica* has the scars only half as broad as the ribs, whilst in our species they fill nearly the whole breadth.'" Afterwards, when reconciling the three varieties together, he says, "But it must be remarked with Artis (Anted. Phytol.) that the distance between the scars of the leaves, as also the breadth of the ribs, is variable on the same tree. The ribs enlarge towards the base of the tree and the scars become broader and nearer together." Now is not this argument as applicable to the identity of *S. elliptica* and *S. attenuata*, as to that of the three varieties of the latter, which certainly differ as much, if not more, from one another, than from the different forms of *S. elliptica*? The most important character separating the two? species, as given by the Professor, is the difference in the proportion of the width of scars to that of ribs. The breadth of the scars in his first variety is certainly very great, but in an English specimen (which we doubt not was Steinhauer's type) now in possession of the Academy, the breadth of the scars bears a proportion to that of the ribs almost as great as in Lesquereux's second fig. and much greater than in his third variety. Some of the varieties of *S. elliptica*, Brongt., figured by Goldenberg, (Flor. Sarapont. Fossil.) also scarcely differ in this respect from the second form of *S. attenuata*, and have the breadth greater than in the third variety. The Professor remarks: "The reason for admitting these three specimens as three forms of the same species are; * * * * *, and that they have the same general form of scars, ribs, and furrows; the same disposition of scars of the vessels either upon their naked surface or the corticated narrow striated portion." These are the very reasons which have influenced us in uniting the different forms; the specimens in the foreign collection of the Academy possessing these characters in common with Lesquereux's plates. We have elsewhere shown that *S. elliptica*, of Brongt., is synonymous with *Phytol. parmatus*, of Steinhauer, and that *S. notata*, Br., (if it is a good species) is not, and therefore propose to call the latter *S. Brongniartii*.

Sub-genus SYRINGODENDRON, St.

S. bistriata, nobis.

Stem ecostate; bark thin, striate; stria very numerous, flexuous, occurring in two forms, the one deep and strongly marked, the other small and straighter: scars sub-rotund, disposed in pairs about eight lines apart, very small.

When decorticated, the scars are very elongate, often pyriform, and the striae very numerous, small and less flexuous.

Cabinet of the Academy. *Locality* unknown.

NOTE.—I take this opportunity of correcting the very numerous typographical errors in my recent catalogue. The printer failed to send to me a revise, and errors noted in the first proof were not corrected, and consequently misprints abound. The following are the most important:

Page 436, substitute Catalogue of Foreign Carboniferous, &c., for "Catalogue of Carboniferous," &c.; line 22, their for "these"; l. 33, macrodon for 1860.]

"macrodontus." Page 438, l. 1, Trochophyllum for "Trochophyllum;" l. 6 and 7, fertilis for "fertilis;" l. 15, cordata for "cordata." Page 439, l. 27, triloba for "trilobus;" l. 33, Noeggerathia for "Noeggerathia;" l. 46, linearis for "linearis." Page 440, l. 15, Hawkesbury for "Hawkesburg;" l. 10, 19, 24 and 29, Göpp for "Göep;" l. 31, oreopteroides for "oreopterodes;" l. 45, Pluckenetii for "Pluckenetti." Page 441, l. 12, Lepidodendron for "Lepidodendron;" l. 31, either—or for "neither—nor." Page 442, l. 27, Huttonia for "Huttoni;" l. 33, Rhytidolepis for "Phitodolepis;" l. 53, solanota for "solanus," psilophloea for "psilophloeus."

Contributions to American LepidopteroLOGY.—No. 7.

BY BRACKENRIDGE CLEMENS, M. D.

BOMBYCIDÆ.

OYLOTHRIX.

Fore wings with the tip and inner angle rounded; inner margin about one-half as long as the exterior; hind margin entire, very oblique; woolly toward the base, with the hairs curled. The subcostal vein sends off two marginal nervules from the cell, one near its superior angle and the other above the origin of the discal vein. Exterior to the cell it becomes 3-branched; giving off the apical nervule first near the second marginal and immediately subdividing into post-apical and subcosto-inferior. The disco-central arises from the middle of the angulated discal vein. The median is 4-branched, the posterior arising about the middle of the cell and the branches equidistant, except the medio-discal and superior. The fold of the wing is thickened. Submedian vein furcate at the base, with a branch to inner margin in the basal third of the wings. Hind wings longer than the abdomen, smooth, without costal vein, and bristle and socket. The subcostal vein is bifid, indistinctly furcate at its base, its lower branch giving rise to the discal vein, which is slightly angulated beneath the origin of the disco-central nervule. Median vein 4-branched, the posterior arising about the middle of the cell.

Head small, rather impacted on the thorax, not depressed, without ocelli. Face extremely narrow; eyes small and round. Antennæ, basal joint slightly tufted, the stalk simple from the base to the middle, and thence to the tip with extremely short pectinations; about as long as the thorax. Labial palpi cylindrical, very short. Tongue wanting. Thorax thick, with long, rather erected silky hairs. Abdomen pilose, without apical tuft, and the legs very hairy, even to the tips of the tarsi; posterior tibiæ with two extremely short apical spurs.

O. salebrosa.—Fawn color. Face, labial palpi and breast beneath the mouth dark brown. Antennæ grayish. Thorax with whitish hairs on the disk in front, and a pencil of the same on each side behind tegula. Along the base of the nervules of the fore wings is a rather broad grayish space, extending from the costa almost to the inner margin, with each of the nervules marked on both sides by a short brown line, while the nervules are grayish. The inner streak of the subcosto-inferior nervule is blackish brown, and on the discal vein is a streak of the same hue. In the space between the median and submedian veins the wing is reddish brown, mixed with blackish, with two blackish points extended into the grayish space on each side of the thickened fold. Hind wings concolorous, pale luteous. Legs with whitish hairs, *tarsi black*.

NOTE.—The species marked with an [*] in the present paper are not in the collection of the writer; should any one, therefore, recognize the descriptions he will feel much obliged for specimens of the insects so marked.

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The wings of the specimen described are badly denuded from the disk to the costa, yet the markings given above are sufficiently distinct and characteristic to indicate the insect hereafter. The genus belongs to the family Bombycidae.

Mexico, near Jalapa.

ARCTIIDÆ.

ECPANTHERIA, Hübner.

Fore wings about one-third longer than the hind wings, with the subcostal vein having a single marginal branch from the cell and another midway between the post-apical and inferior nervules; the latter arises a little exterior to the discal vein and the former midway between the apical nervulet and the second marginal. The median vein is 4-branched, with the posterior moderately remote from the penultimate. Hind wings as long as the abdomen, with the interior sometimes dilated and rather caudate; neuration arctiæ-form.

Head small, depressed, smooth; without ocelli. Face moderate, retreating. Eyes rather small. Antennæ serrated in the ♂, simple in the ♀. Labial palpi short, not extending beyond the clypeus, rather stout and porrected; middle joint short, terminal joint very small. Tongue rather thick, slightly longer than the anterior coxæ.

Body stout. Thorax globose, smooth, with scales. Patagia erected, overlapping the front of mesothorax, nearly square. Breast and abdomen smooth. Legs thick and smooth, the tibial spur of fore legs moderate, hind tibiæ with two minute apical spurs.

Table of Species.

Thorax white.

With many blackish or brown ringlets.

Abdomen yellow, with bluish black dorsal spot^s,

Abdomen red, with broad blue bands,

Abdomen dark blue above, with luteous spots ♂

Abdomen luteous, with blue, purple, or green bands ♀

Scribonia.

caudata.

Cunigunda.

With ten bluish black spots,

Without ringlets or spots,

With ocellated spots.

Abdomen blue, with crimson bands,

Abdomen ochraceous, with lateral blue spots.

Hind wings of ♂ hardly tailed,

Hind wings of ♂ with rather long tail,

extrema.

obliterata.

nigriplaga.

simplex.

decora.

Thorax cinereous. Fore wings with white, black bordered streaks,

incarnata.

E. Scribonia, Stoll.—White. Thorax and fore wings with numerous brown circles, on the latter arranged in five or six illy defined, curved bands. Hind wings with a few circles along the exterior margin and a row along the hind margin. Abdomen beneath white, with three rows of small brown circles; above bluish black banded with yellow, or orange yellow, with two lateral rows of dark margined, whitish spots. Sometimes the thorax, under portion of the body, the base and basal margins of the fore wings are pale brown.

Texas. Col. of Capt. Pope, Smithsonian Institution. Ill., Mr. Kennicott: N. Y., Ga., S. America.

**E. caudata*, Walker.—White. Head dark blue in front, excepting a white spot on the face. Antennæ dark blue. Thorax with numerous brown ringlets, some of which are tinged with pale metallic blue or green. Abdomen red, clothed with testaceous hairs at the base; dorsal segments with broad
1860.]

blue bands, which are partly interrupted in the middle, and wholly interrupted on each side. Knees and tarsi beneath metallic blue. Fore wings with five or six oblique bands of small, separated brown ringlets, those along the costa are larger and with broader borders, and nearly subquadrate. Hind wings with the inner angle prolonged into a short tail.

Mexico.

* *E. incarnata*, Walker.—Gray. Head with a curved white black-bordered band in front of the antennæ, and with a black border on each side, behind, and toward the mouth. Tongue pale testaceous. Palpi red, white beneath. Antennæ black, white at the base. Thorax with fine slender black stripes, the middle one and the inner pair abbreviated in front, accompanied with some white and red hairs behind; a white stripe on each side, widening from the head to the fore wings. Breast mostly white. Abdomen dark blue, with a red stripe on each side; under side testaceous, with a black stripe. Femora with red, black-bordered stripes; tibiæ with white stripes; tarsi with red bands. Fore wings with various irregular white black-bordered streaks, which are broadest and most oblique along the costa, where the black hind border of them is dilated and forms a discal mark; these streaks are mostly red on the under side. Hind wings red [?] at the base and with two crimson macular oblique bands, which on the under side toward the costa are white, with black borders.

Arachnis aulæa? Mexico.

* *E. extrema*, Walker.—White. Head bluish black in front. Antennæ black, tinged with blue at the base. Thorax with ten bluish black spots, two in front, two behind, and each three of the other six forming two intermediate bands. Breast blackish brown. Abdomen bluish black, with a testaceous stripe on each side; under side white, with three rows of black spots. Legs bluish black, with white streaks and spots. Fore wings with two oblique, more or less interrupted dark brown bands, the intermediate spaces with various dark brown spots, dots and streaks.

Male.—Hind wings grayish brown, with two white spots, one costal, the other discal; cilia partly white.

Female.—Hind wings white, with a few grayish brown submarginal spots and marginal dots.

Mexico.

* *E. obliterateda*, Walker.—White, stout. Antennæ black beneath. Abdomen above luteous, with two rows of white spots; base and tip white. Femora and tibiæ with luteous stripes; ungues black. Fore wings with four oblique bands of connected testaceous ringlets. Hind wings with three more indistinct bands of the same, their hind borders slightly emarginate and undulating, with the inner angle somewhat dilated.

West Indies.

* *E. nigriplaga*, Walker.—White. Antennæ black. Thorax with greenish or bluish black ringlets. Abdomen dark metallic blue, with crimson bands, clothed with blackish brown hairs at the base; tip with white hairs on each side; under side with tawny hairs at the tip. Tibiæ with black bands; tarsi black, partly white at the base. Fore wings with greenish or bluish black ringlets, whose disks are grayish or dingy white; these are largest on the borders, very small on the disk or toward the tips of the wings. Hind wings with two large black spots on the fore border, hairy, vaulted cylindrically and each including a tuft along the abdomen, their tails reaching to the tip of the abdomen, and each with a large black elliptical spot.

Jamaica.

* *E. simplex*, Walker.—*Male*. White. Head in front and beneath, and palpi blackish brown. Antennæ blackish brown, minutely pectinated,

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white above. Disk of the thorax with blackish brown ringlets, which vary in size and number. Abdomen orange above, white at the tip, with brown and white bands at the base, and with a row of blue spots along each side. Legs brown, with white stripes; tarsi with white bands. Fore wings with six oblique bands of pale brown ringlets.

West Indies.

* *E. decora*, Walker.—*Male*. White. Head blue about the eyes; vertex with a black band, which encloses a whitish spot. Palpi and antennæ black. Thorax with nine blue ocelli, two in front, then four in a curved band, and behind them three which form a triangle. Abdomen luteous, blue at the base, and with two rows of transverse blue spots; tip white, with four streaks, the outer pair black, the inner pair blue, united hindward. Legs with black stripes and bands; tarsi blue. Fore wings with numerous black ocelli, which are disposed in six oblique irregular bands; some angular and incomplete ocelli along the costa, and a blue mark on the discal areolet. Hind wings with a black interrupted stripe along the interior border, which terminates in a rather long tail.

St. Domingo.

* *E. Cunigunda*, Cramer.—*Male*. White. Head metallic blue in front and about the eyes. Thorax and fore wings with dark brown ringlets, which on the latter form six oblique bands. Scutellum with two blue spots. Abdomen above dark blue, clothed with brown hairs at the base, whitish at the tip, with a row of luteous triangular spots along each side; hind borders of some of the segments partly luteous; under side slightly testaceous, with three rows of blue spots. Femora with a blue spot on each tip; fore femora and tibiae partly blue; tarsi blue. Fore wings with subquadrate, slightly testaceous black-bordered costal spots. Hind wings with the inner angle prolonged into a short tail, and having a black spot.

Female.—White. Palpi partly brown. Antennæ black, white at the base. Thorax with four pairs of testaceous ringlets of different sizes and shapes. Abdomen above luteous, with three blue, purple, green or gray bands; these are more or less dilated and connected on each side, and excavated in the middle, and in one specimen the abdomen is gray above, with three luteous black-bordered stripes. Tibiæ with brown ringlets; tarsi blackish. Fore wings with six oblique bands of connected testaceous brown ringlets, which are very variable in size and shape, and are in some cases partly confluent, and in one variety those in the fifth are partly shaded with brown; the borders of the costal ringlets, and of a reniform discal ringlet, are darker than the others in the wing. The ringlets are still more variable and irregular in the hind wings, which are occasionally nearly wholly pale brown.

Honduras, S. America.

ARACHNIS, Hübner.

Fore wings nearly one-third longer than the hinder pair, much longer than the body. The subcostal vein forms a small costal cell, immediately behind the origin of the discal vein, and gives rise to a marginal nervule which sends off, near its middle, a short nervulet to the costa; near the tip of the wing it sends off the post-apical nervule and behind it becomes bifid. The subcosto-inferior arises on a short stalk common to it and the discal vein. The median is 4-branched, the medio-posterior being very remote from the penultimate branch. Hind wings about equal to the abdomen, broader than the anterior pair, with neuration as usual in the family.

Female.—Head quite small, somewhat depressed, smooth; with ocelli. Face moderately broad, slightly inclined. Eyes very small. Antennæ simple. Labial palpi rather short, scarcely extending beyond the clypeus, but slightly curved and ascending, and slightly hairy beneath; third joint short. Tongue exceeding the tips of labial palpi by one-half its length.

1860.]

Body rather stout. *Thorax smooth, with scales.* Patagia moderate, trapezoidal, not concealing the vertex. Breast and abdomen smooth except toward the base; legs rather stout, femora downy, the hind tibiæ having four short spurs.

A. aulæa, Hübner.— f. 913-14. *Epantheria incarnata?* Mouse gray. Antennæ black, whitish at the base. Labial palpi crimson, with whitish hairs beneath. Head with a pale yellowish white band in front, above the eyes, black-margined beneath, and a black circle between the antennæ. Patagia each with a black circle on their edges, and a pale yellowish white stripe on the sides of thorax from the head to the base of fore wings. Tegulæ with two black-marginal lines, and the disk of thorax with a central line of the same hue, and one on each side of it that corresponds to the upper one on the tegulæ. Fore wings with six irregular, oblique, pale yellowish white streaks along the costa, bordered with black lines, with a black spot on the disk beneath the third band. Beneath the median vein the wing is veined with black lines enclosing pale yellowish white spaces, and between the nervules on the hinder margin is a series of streaks of the same hue, black-margined. Hind wings black, crimson toward the base, with a macular band of the same hue about the middle of the wing and one on the hinder margin. On the under surface of both pairs of wings all the spots are crimson. Abdomen with a dark brown central band widening from the base and margined with black, with a band on each side, crimson from the base to the middle and thence to the tip luteous. Breast whitish, with a dark brown circle on each anterior coxæ, which are tinted with crimson internally. All the femora crimson internally; tarsi annulated with crimson.

Unless Mr. Walker's description refers to this insect, I think it has not been described since the time of Hübner. I have recognized the genus under which this author placed it, because I regard the insect as distinct generically from *Epantheria*. The two genera are, however, beyond doubt nearly related, while at the same time the neuration of the wings shows close relationship to the genus *Arctia*.

Mexico, near Jalapa.

ARCTIA, Schrank.

Fore wings with the subcostal nervure having two marginal nervules from near the end of the cell, and with a long, narrow costal cell formed between the second marginal and subcostal vein, and extended a little beyond the origin of the post-apical, or without this cell. The subcosto-inferior nervule and the discal vein arises at a common point, and toward the apical portion of the wing is given off the post-apical nervule and the apical nervulet. The median vein 4-branched, the posterior nervule being very remote from the others. Hind wings broader than the fore wings, as long or rather longer; neuration as usual in the family. Sometimes the neuration of the fore wings varies from that of the typical species, in having a single marginal nervule from the cell and another between the origins of the post-apical nervule and apical nervulet, thus resembling the wing structure in *Spilosoma*; in the latter, however, the second marginal arises on the interior side of the post-apical.

Head small, rather sunken on thorax, hairy, and with ocelli. Face narrow and hairy. Eyes small. Antennæ in the ♂ shortly pectinated, in the ♀ serrated and sometimes slightly pectinated. Labial palpi porrected, hairy and exceeding the clypeus by about one-half their length; the third joint subacuate, nearly or quite as long as the second joint. Tongue with slender filaments, as long as the anterior coxæ.

Body thick. Thorax covered with thick hair. Patagia rather large, more or less overarching the vertex. Breast rather hairy; legs rather stout, with all the femora hairy; anterior tibiæ longer than last joint of tarsus, with tibial spur concealed, the posterior tibiæ having four moderate spurs.

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Table of Species.

- I. Fore wings black, brown or whitish.
 * *Fore wings spotted, not striped.*
 a. Fore wings brown.
 Abdomen spotted above with black; hind wings with blue black spots, Americana.
 Abdomen with disk black; hind wings black-banded, Parthenos.
 b. Fore wings black or blackish.
 Fore wings with a few spots, Placentia.
 " with many spots, Virginalis.
 c. Fore wings whitish or flesh-colored.
 Hind wings cinnabar red; fore wings with large brown spots, Caja.
 " saffron-colored, Dahurica.
 " flesh-colored or pinkish, Dione.
 ** *Fore wings striped.*
 Fore wings with five stripes, Quenselii.
 " with three stripes; Virgo.
 Fore wings with the apical veins pale, Virguncula.
 " with the apical veins dark.
 Fore wings with a furcate apical stripe, Nais.
 " with a crucial subterminal stripe, Phyllira.
 Fore wings with two stripes, fervida.
 *** *Fore wings with a spot and a stripe.* hyperborea.
 II. Fore wings fulvous or yellow, black spotted.
 Hind wings somewhat cinereous, gelida.

Mr. Walker regards Caja as common to Europe and the United States, and says that "the white markings in the American species sometimes overspread nearly the whole surface of the wing, and in other cases they entirely disappear. The black spots on the hind wings are almost equally variable." The description below is drawn from the European species.

Fore wings with a long, narrow costal cell.

* *A. Caja*, Linn.—Umber brown. Patagia tipped with red. Fore wings very pale yellowish white at the base, with four umber brown spots; with two pale yellowish white streaks on the costa over the disk and an irregular crucial mark of the same hue in apical portion of the wing, consisting of a band from the costa to the inner angle, where there is a small brown dot, crossed by a broad line from near the tip, beneath which it is angulated, to the middle of the inner margin and connected sometimes by a streak along the fold with the basal patch. Hind wings red, with three spots in the middle of the wing, one on the discal vein; the origin of medio-posterior and middle of submedian and three along the hinder margin all dark bluish black. Abdomen red, with black dorsal spots.

California, West coast of America.

* *A. Dahurica*, Boisdu.—Flesh-colored. Occiput with three black stripes from the body and with numerous, black intercostal spots on the anterior wings. Posterior wings saffron-colored, with the base and cilia yellow, spotted with black.

California.

* *A. Quenselii*, Geyer.—Zutr. Samm. Ex. Sch., 14, 424, f. 847, 8. *Female*. Black. Thorax with four testaceous stripes. Abdomen with two testaceous stripes. Fore wings with luteous stripes furcate and confluent 1860.]

toward the tip of the wings. Posterior wing with testaceous stripes connected toward the tip.

Labrador.

* *A. gelida*, Moochler, Ent. Zeit. Stell., ix. 17, 3, 174. Black. Thorax with two yellow stripes. Abdomen yellow on the sides, spotted with black. Fore wings somewhat yellowish, with angular black spots. Posterior somewhat cinereous.

Labrador.

With two distinct marginal nervules from the disk.

A. Virgo, Hübner.—Thorax buff-colored, sometimes tinged with reddish, with two black spots, one on each patagium; disk with an oval black stripe, and each of the tegulae striped broadly with black. Fore wings black, with the margins, the veins and their branches, a broad line along the fold, a stripe from the origin of the subcosto-inferior nervule angularly furcate beneath the median vein, an oblique stripe near the tip of the wing, with two spots on the costa behind it, and one on the disk, all buff-colored, sometimes tinted faintly with reddish. Hind wings red, spotted with large black spots. Abdomen red, with a black macular band on the dorsum.

New York, Nova Scotia. Illinois, Mr. Kennicott.

With two distinct marginal nervules. Labial palpi little exceeding the clypeus.

A. Dione, Drury.—Reddish white or flesh-colored. Thorax with two black stripes in front, one on each side at the base of the wings, with three of the same hue on the disk, one central and one on each tegulae. Fore wings with a black stripe along the submedian vein and black cuneiform spots on the disk and between the nervules. Hind wings white or flesh-colored, with black spots and sometimes with yellow along the margins. Abdomen spotted with black.

N. Y., Ga. Mass., Mr. Scudder. Ill., Mr. Kennicott.

* *A. Virguncula*, Kirby.—Black. Thorax buff-colored, with five black spots. Fore wings with the margins, the veins and the branches reddish buff-colored. Hind wings luteous, spotted with large black spots. Abdomen reddish buff, with a macular band of triangular spots above.

New York, Canada.

* *A. Nais*, Drury.—Thorax white, with two black spots in front and three black stripes. Fore wings black, with three white stripes, the second furcate, and oblique, subapical white bands. Sometimes the oblique bands are wanting, as likewise some of the stripes. The veins sometimes testaceous. Hind wings yellowish or red, more or less varied with black. Abdomen white, with a broad black stripe; sometimes nearly wholly brown.

Mass.

A. Phylira, Drury.—Thorax buff-colored, with a short black stripe on each patagium, a broad stripe on the disk, one on each tegulae and a short one on the sides at the base of the wings of the same hue. Fore wings black, with a buff-colored stripe along the costa, deflected at the apical third of the wing to the inner angle, a broad stripe of the same hue beneath the median vein extended to the hinder margin and turned at an acute angle toward the costa. The median stripe is likewise produced along the fold, joining the deflected portion of the costal stripe at the inner angle. Inner margin buff-colored. Hind wings bright red in the ♀, often yellowish red in the ♂, and with large black spots in the former, which are frequently almost obsolete in the latter. Abdomen red, black above.

Ill., Mich., Mass., Penn., Texas. Col. of Capt. Pope. Smithsonian Institution.

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* *A. Placentia*, Abbott and Smith.—Blackish brown. Fore wings with a dot or three pale testaceous spots. Hind wings red, with the margin and several submarginal spots blackish brown. Abdomen above red, with dorsal spots and the tip blackish brown.

Georgia.

* *A. virginialis*, Boisd.—Abdomen above fulvous, banded with black, beneath black. Fore wings black, with about twenty yellowish white spots. Hind wings fulvous, with black bands.

California.

* *A. hyperborea*. *Eyprepia hyperboreus*, Curtis, Ap. Ross. Nar. 2d Voy. lxxi. 17.—*Male*. Chestnut brown. Fore wings with costal spot and interrupted streak behind isable yellow. Hind wings with a brown band, a spot and the margin ochreous.

Arctic America.

* *A. Americana*, Harris.—“Fore wings brown, with several spots and broad winding lines of white. Hind wings ochre-yellow, with five or six round blue-black spots, three larger than the others. Thorax brown and woolly. Patagia edged with white before and with crimson behind. Outer edges of tegulæ white. Abdomen ochre-yellow, with four black spots in the middle above.”

Trenton Falls, N. Y.; Lake Superior.

Fore wings with a single marginal nervule from the cell and another beyond the origin of the subcosto-inferior nervule.

A. Parthenos, Harris. Var.?—*A. Americana*, Walker, 607?—Thorax reddish brown. Vertex and the ends of patagia bright red. Thorax banded in front and along the tegulæ with pale yellow. Fore wings rather dark yellowish brown, with two rows of pale yellow, separated spots, one along the costa with three nearly joining over subcostal nervules, and one along the fold with a stripe at the base of it. Along the hinder margin is an indistinct row of pale yellow spots, those in the middle nearly obsolete. Hind wings yellow, with a broad black band in the middle furcate externally and a sub-terminal undulating one of the same hue, with the nervules between the bands touched with black. Abdomen, disk black, the tip somewhat orange yellow, beneath reddish.

Mass. Mr. Scudder. British America.

* *A. fervida*, Walker, 612.—Blackish brown. Abdominal segments with bright red dorsal bands. Fore wings with a white fringe along the outer border; two pale testaceous streaks, one extending in the disk from the base to half the length, the other short, oblique, about two-thirds of the length, extending from near the fore border into the disk; under side red, with brown borders. Hind wings bright red, with very broad blackish brown borders, which in their narrowest part are accompanied by a slender brown band; under side like the upper side, but without the band. Body 6 lines long; wings 16 lines.

Guatemala.

ECTYPIA.

Fore wings about one-third longer than the hind wings, with two subcosto-marginal branches from the cell, the second forming a costal cell with the subcostal by a branch which joins it at the origin of the post-apical. The apical nervule with a moderate apical nervulet. The subcosto-inferior nervule and the discal vein arise on a short common stalk, the latter angulated. The median vein is 4-branched, the posterior nervule being remote from the others, which are aggregated. The neuriation of the hind wings, which are 1860.]

as broad as the anterior pair, is as usual in the family, except that the costal and subcostal veins show a tendency to separate at the base.

Head rather small, sunken, subtubed between the antennæ; without ocelli. Face moderately broad, hairy, retreating. Eyes rather small. Antennæ shortly pectinated in the ♂, serrated in the ♀ (?) Labial palpi rather slender, subascending, exceeding somewhat the clypeus, slightly hairy beneath, with the second joint slightly larger than the basal, and the terminal joint short, globose. *Tongue rudimentary.*

Thorax smooth, with decumbent hair. Patagia moderate. *Abdomen wanting.* Legs smooth; fore tibiæ nearly as long as the femora; *hind legs wanting.* The specimens described are much mutilated.

A. bivittata.—White. Labial palpi blackish, white beneath. Thorax with two lateral black stripes, margined externally by another, luteous. Fore wings with a few black spots and short black streaks. On the discal vein are two spots and another on the origin of the medio-posterior nervule. At the extreme base, almost on the costa, are one or two dots and the submedian vein is tipped on its end with black. Sometimes a short black stripe in the fold at the base and a few black spots near the tip of the wing. Hind wings without spots. Tarsi black.

Imago on wing April 21st. Texas. Capt. Pope's collection. Smithsonian Institution.

HYPANTRIA, Harris.

Mr. Walker does not recognize this genus, but refers the species *Dr. Harris* placed in it to *Euproctis* of Hübner. The structure of *E. auriflua* does not, however, authorize this step. In it the antennæ are deeply pectinated in the ♂, the palpi are differently formed, the tongue more rudimentary, the costal and subcostal veins in the hind wings distinct to the base, although connected in the middle of the cell by an intercostal branch, and in the fore wings the second subcosto-marginal nervule arises between the post-apical and apical nervulet. The head is without ocelli and the structure of the legs in *auriflua* differs from that in *textor*. A consideration of these differences and the structural agreement of *textor* with other genera of the family Arctiidæ, the habits and structure of the larva can leave no doubt, I think, respecting its true position and the naturalness of the genus.

The structure of the fore and hind wings, like that in the genus *Spilosome*.

Head moderate, somewhat sunken and woolly; with ocelli. Face tapering and vertical. Eyes moderately large. Antennæ shortly pectinated in the ♂, serrated in the ♀. Labial palpi rather hairy beneath, scarcely extending beyond the clypeus; *second joint very short, and the terminal joint nearly rudimentary.* Tongue nearly as long as the anterior coxæ, filamentous.

Body rather stout. Thorax woolly. Patagia not erected, rather broad and flattened. Breast woolly; abdomen rather smooth. Legs with the femora woolly; tibial spur of the fore legs long and curved; hind tibiæ with a pair of small apical spurs.

Table of Species.

Abdomen white.

Fore wings without spots,

textor.

Fore wings spotted with black,

Cuneæ.

Abdomen luteous.

Fore wings black in greater part, with white veins,

Echo.

H. textor, Harris.—Pure white, immaculate. Antennæ blackish brown. Palpi blackish. The fore coxæ and femora luteous.

Ga., Mass., Penn.

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H. Cunea, Drury.—White. Thorax usually unspotted, sometimes with a few black spots. Antennæ blackish brown. Fore wings with highly variable markings; usually with numerous black spots, sometimes with but few of them. Hind wings without spots. Abdomen white, with three rows of minute black spots, frequently inconspicuous. The fore coxæ and femora luteous; tarsi blackish.

Ga., Mass., Penn.

H. Echo, Ab. & Sm.—White. Fore wings mostly black with white veins and spotted with black. Abdomen luteous, spotted with black.

Dr. Fitch in his 3d Report describes two other specimens which are referred to this genus.

SPILOSOMA, Stephens.

Fore wings with a single marginal nervule from the cell and another interior to the origin of the post-apical nervule; apical nervule with a nervulet to the costa near the tip. The subcosto-inferior and discal vein, which is angulated, arise at a common point. Median vein 4-branched, with the posterior nervule remote from the others.

Hind wings about equal to the length of the abdomen, with the wing structure common to the family.

Head moderate, rather woolly, somewhat sunken and sometimes depressed; with ocelli. Face moderately broad, tapering. Eyes moderately large. Antennæ shortly pectinated in the ♂, serrated in the ♀, sometimes simple. Labial palpi more or less exceeding the clypeus, subsaccedent, hairy beneath; the first and second joints usually short, sometimes the joints nearly equal; the first joint squamous and ovate or subconical. Tongue slender and as long as the anterior coxæ.

Body rather stout. Thorax woolly. Patagia usually flattened, sometimes erected and somewhat trapezoidal. Breast woolly. Abdomen rather smooth. Legs downy or hairy; tibial spur of fore legs long and curved; hind tibia with two pairs of spurs near the tip, sometimes minute.

Table of Species.

Wings white.

Abdomen with black spots.

Fore wings with many black spots,

Acrea.

Fore wings with a single discal dot,

Virginica.

Abdomen not spotted.

Fore wings with oblique, imperfect bands of brownish dots,

congrua.

Wings fulvous,

Isabella.

S. Isabella, Ab. & Sm.—Fulvous, or brownish ochreous, sometimes slightly tinged with reddish. Fore wings with a black spot on the disk and a subterminal of the same hue, sometimes faintly banded. Hind wings roseate or yellowish tinged with roseate, with two discal black spots and four of the same hue along the hinder margin. Abdomen with three rows of black spots. Fore femora crimson internally; tibiae and tarsi black.

This insect usually regarded as belonging to the genus *Arctia*, certainly cannot be included in it, in consequence of structural differences.

S. acrea, Drury.—White. Antennæ black. Fore wings dotted with black spots, those along the costæ being the largest. Hind wings white in the ♀, and orange yellow in the ♂, spotted with black. Abdomen orange yellow above, with the tip white, and with three rows of black spots.

S. Virginica, Fabr.—White. Antennæ blackish brown, with white

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tomentum. Labial palpi blackish, beneath yellowish. Wings with a discal black dot or dots, sometimes wanting; under surface of hind pair always with a black discal spot. Abdomen luteous above, with three rows of black spots. The anterior coxæ and femora luteous, the femora with a black spot.

* *S. congrua*, Walker, 669.—White. Tarsi with black bands. Fore coxæ and fore femora luteous, with black spots on the inner side; fore tibiæ striped with black on the inner side.

Male.—Head and fore part of the thorax with a slight testaceous tinge. Fore wings with four oblique, very imperfect and irregular bands, composed of pale brown dots. Body 6-7 lines; wings 16-20 lines.

Georgia.

* *S. Jussiaæ*.—*Arctia Jussiaæ*, Poey, Cent. Lep. Cuba. *S. Jussiaæ*, Walker, 670. Wings white. The fore wings above and the hind wings beneath with a black point in the middle. Anterior femora and the abdomen at the sides fulvous. Abdomen with quintuple series of points.

Cuba. Larva feeds on the leaves of *Jussiaea erecta*.

EUCHÆTES, Harris.

Fore wings rather broad, trigonate. The subcostal vein gives rise to two marginal nervules from the posterior part of the disk, and between the second marginal nervule and the apical is formed a short, costal cell. The post-apical nervule arises midway between the costal cell and apical nervulet. The discal vein which is angulated and the subcosto inferior are given off from a common point. The median vein is 4-branched, the posterior nervule moderately remote from the penultimate. Hind wings as broad as the fore wings, with the neurulation common to the family.

Head moderate, depressed; with ocelli. Face inclined. Eyes small. Antennæ slightly pectinated in the ♂, serrated in the ♀. Labial palpi rather stout and ascending on the face nearly to the base of the antennæ; basal and middle joints nearly equal; terminal short, three or four times less long than the middle joint. Tongue rather longer than the anterior coxæ.

Body stout. Thorax rather woolly. Breast woolly; abdomen smooth. Legs with hairy femora; anterior tibiæ nearly as long as anterior tarsi, internal spur concealed and half as long as the tibiæ; hind tibiæ with two pairs of spurs.

E. Egle, Drury.—*Spilosoma Egle*, West., Walk. Bluish cinereous. Occiput with a narrow luteous line. Abdomen whitish beneath, above dark yellow, with a dorsal and lateral row of black spots. Fore coxæ woolly and touched at the sides with luteous.

Mass., Samuel H. Scudder, Esq. New York, Mr. Akhurst.

The following insect differs from the Massachusetts specimen very curiously, and I am at a loss how to reconcile the differences between them. The fore wings correspond more nearly to Dr. Harris' description than the specimen from his own State, but the palpi do not agree with those of the species he described. The larva of E. Egle is common enough in this vicinity, but I have never met with the perfect insect, nor have I been successful in various attempts to carry it through its transformations.

In the Texan specimens the costal cell of the fore wings is longer and narrower than in the foregoing, and sometimes gives rise to the post-apical nervule. The head is perfectly smooth; the palpi are porrected, short; scarcely exceeding the clypeus; rather hairy towards the base beneath; the basal and middle joints nearly equal; terminal joint globular, and one-half as long as the middle.

The body is rather slender. Thorax and breast perfectly smooth. Legs smooth; anterior tibiæ scarcely longer than the basal joint of the anterior

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tarsi, and terminating in front in a rather long, curved spire, with the internal spur as long as the tibiæ.

Var.? *E. Eglenensis*.—Bluish cinereous. Palpi bright reddish at the base, with dark cinereous tips. The occiput and post-orbits are red orange. The external edge of the fore wings is pale luteous. The abdomen above is bright red orange, with a dorsal row of small black spots and one on each side; beneath cinereous. The thorax beneath and the anterior coxæ are tinged with red orange.

The imago is on wing during the month of August.

Texas. Capt. Pope's collection. Smithsonian Institution.

HALESIDOTA, Hübner. LOPHOCAMPA, Harris.

Fore wings narrow; the subcostal vein with two marginal nervules from the disk, with an apical nervulet near the tip, midway between the origin of which and that of the subcosto-inferior nervule arises the post-apical. Median vein 4-branched, the posterior nervule moderately remote from the penultimate. Hind wings, neuration arctiæform.

Head moderate, short, rather woolly; with ocelli. Face tapering, moderately broad. Eyes rather large. Antennæ slightly pectinated in the ♂, serrated in the ♀. Labial palpi stout, porrected, exceeding the clypeus somewhat, and squamose; the basal and middle joint about equal; terminal joint conical, very minute. Tongue as long as the thorax beneath.

Body stout. Thorax smooth, with decumbent hair. Patagia erected, moderately large. Breast slightly hairy; abdomen smooth. Legs stout and smooth; the tibial spur of the fore legs rather long, concealed; hind tibiæ with four moderate spurs.

Table of Species.

Fore wings banded.

Fore wings with four bands.

“ with bands black-bordered,

“ with bands of spots,

tessellaris.

{ annulifascia.

{ maculata.

{ fulvo-flava.

Fore wings with two bands,

Fore wings not banded.

Fore wings spotted or sprinkled with dots.

Abdomen luteous or yellowish.

Thorax with two brown stripes,

Caryea.

Thorax with six white luteous bordered spots,

palpalis.

Fore wings with indistinct hyaline spots.

Thorax with three white stripes,

bicolor.

Fore wings streaked with white.

Abdomen crimson, tip black,

strigosa.

Fore wings mottled with grayish.

Abdomen red, banded with black,

cingulata.

Fore wings not spotted nor striped,

insulata.

**H. Caryæ*, Harris, Ins. Mass., 2d ed., 278.—Pale ochre yellow. Thorax with the tegulæ edged with light brown internally. Fore wings thickly and finely sprinkled with little brown dots and with two oblique brownish streaks passing backwards from the costa, with three rows of white semi-transparent spots, parallel to the hinder margin. Hind wings very thin, semi-transparent, and without spots.

**H. annulifascia*, Walker, 734.—Pale testaceous. Proboscis and antennæ tawny. Thorax with two tawny stripes, which converge hindward. Fore wings with tawny punctures, which are most numerous and partly con-

fluent on the disk beyond the middle, and with four oblique bands of whitish tawny-bordered spots; veins tawny. Hind wings whitish, with a slight testaceous tinge.

H. Caryæ?

H. tessellaris, Ab. & Sm.—Pale ochreous yellow. Antennæ and labial palpi pale orange yellow, the terminal joint of the latter blackish. Tegulæ edged internally with bluish green and with a blackish dot on the middle of each in front. Abdomen pale orange yellow above. Fore wings with dusky bands edged on each side with a delicate, crenated blackish line, one at the base furcate above subcostal vein, one across the middle of the disk, one on discal vein extended to the median vein, one across the nervules, sometimes interrupted in the middle, and one along the hinder margin. Hind wings paler than the fore wings.

* *H. fulvo-flava*, Walker, 733.—Testaceous, paler beneath. Thorax with two tawny stripes, which converge behind, and two tawny spots in front between the stripes. Femora and tibiæ hairy; fore femora and tibiæ tawny above. Fore wings yellow, with a tawny spot at the base, with two oblique, tawny bands, with darker borders; these bands are partly connected, and the inner one is especially irregular and ramose, being forked in front and dilated in the disk toward the base, and emitting a branch to each border. Hind wings whitish, with a slight testaceous tinge.

H. maculata?

Nova Scotia, United States.

* *H. maculata*, Harris, 279.—Pale ochre yellow. Fore wings with large, irregular, pale brown spots, arranged almost in transverse bands. Mass.

H. bicolor, Walker.—*Male*. Reddish tawny. Head white. Antennæ whitish above. Thorax with three white stripes. Breast white. Fore femora and tibiæ thickly clothed with white hairs. Fore wings testaceous, with indistinct hyaline spots. Hind wings white.

Mr. Walker says the specimen from which this description was drawn, is injured, and that it may be a variety of *H. anulifascia*.

Mexico.

* *H. insulata*, Walker.—*Female*. Pale testaceous, paler beneath. Head with a pale luteous band behind the antennæ. Palpi blackish above toward the tips. Antennæ black, pale luteous at the base. Abdomen above luteous. Legs blackish; coxæ luteous. Hind wings a little paler than the fore wings. Abdomen with rows of black dots; femora blackish above, whitish testaceous beneath.

Male.—Abdomen unspotted. Femora luteous, with black tips; fore femora blackish above, except toward the base.

Jamaica.

Variety.—Cream color. Palpi black above and towards the tips. Antennæ black, cream color at the base. Abdomen luteous above, with three rows of black dots. Fore legs blackish above; middle tibiæ and tips of the posterior femora and of the hind tibiæ gray.

St. Domingo, S. America.

* *H. palpalis*, Walker.—*Male*. Deep brown. Vertex and front whitish, with two brown spots. Palpi with a testaceous band near the tips. Antennæ black. Thorax with six white luteous-bordered spots, two in front, and two on each side by the wings, the hind pair elongated. Breast, abdomen and legs luteous. Fore tibiæ and tarsi brown, the former and the fore metatarsus each with a broad white band; posterior tibiæ and tarsi with brown bands. Fore wings with four clusters of white and testaceous spots, one at the base,

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one on each border before the middle, and the largest one extending hindward from the tip to the inner angle; the testaceous spots are smaller and less numerous than the white spots which mostly enclose them. Hind wings luteous.

Jamaica.

* *H. strigosa*, Walker.—Head and thorax brown above. Head whitish about the eyes, and with a whitish band on the vertex. Palpi brown, whitish beneath and toward the tips. Antennæ whitish, with two brown bands. Thorax with four whitish stripes; fore part bordered with reddish white, and with one stripe of the same color. Abdomen crimson, black at the tip, and with a row of black spots along each side; under side whitish, with four rows of black spots. Legs whitish; femora and tibiæ striped with brown; tibiæ striped with red. Fore wings brown, with very numerous whitish streaks. Hind wings almost limpid, with more or less broad brownish borders.

St. Domingo.

* *H. cingulata*, Walker, 1710.—Red. Abdomen with black bands, which are interrupted toward the base. Fore wings thickly mottled with indistinct gray marks. Hind wings a little paler than the fore wings.

Male.—Palpi with brown tips.

Female.—Palpi with black tips. Disk of the thorax slightly brownish.

Jamaica and South America.

HYPERCOMPA, Stephens.

Fore wings usually with two subcosto-marginal nervules from the disk and a costal cell formed by the second branch, sometimes much contracted and narrow and placed above the discal vein or exterior to the disk; in this case there is but one marginal nervule from the disk. The post-apical nervule arises either about midway between the end of the costal cell and the apical nervulet or from the end of the cell. The subcosto-inferior and discal arise at a common point, the latter curved. Median vein 4 branched, the posterior nervule remote from the penultimate branch. Hind wings broader than the fore wings; neuration arctiæform, the subcostal becoming furcate exterior to the origin of the discal vein.

Head moderate, free, smooth; with ocelli. Face and vertex narrow. Eyes rather large and prominent. Antennæ slender, filiform and ciliated in both sexes. Labial palpi somewhat exceeding the clypeus, rather porrected but subsascending, smooth and toward the base pilose; the middle and basal joint nearly equal, the terminal joint quite short and ovate. Tongue as long or nearly as long as the thorax beneath.

Body slender. Thorax smooth. Patagia cylindrical or revolute, scarcely ascending above the vertex and pilose. Breast and abdomen smooth. Legs rather slender; the tibial spur of the anterior concealed; hind tibiæ with four moderate spurs, longer than the hind femora.

Table of Species.

Hind wings white.

{ Fore wings with white spots, *Var. Lecontei*.

{ Fore wings with two brown stripes and a subterminal band, *militaris*.

Fore wings with a white stripe,

“ with two white spots, *contigua*.

“ with a white subapical band, *confinis*.

Fore wings with the costa yellowish or brownish, *fulvicosta*.

Hind wings luteous.

Fore wings brown, with white spots and stripes, *Clymene*.

Fore wings yellowish, margined with brown, *interrupto-marginata*

Fore wings with a very narrow subcostal cell exterior to the disk, giving rise at its end to the second marginal and post-apical nervules.

H. militaris, Harris.—White. Head, patagia and femora buff yellow. Thorax and abdomen with a dorsal brown stripe. Fore wings very variable in their markings, usually with a brown stripe along the costa from the base not extended to the tip, and one along the inner margin with an oblique band extended from it near the inner angle to the tip of the wing; hind margin from the tip to beyond the middle with a brown stripe. Hind wings without spots.

Variety. H. Lecontei, Boisd.—The fore wings are brown, spotted with white, and the hind wings sometimes with a brown dot.

H. interrupto-marginata, De Beauv., vid. Proceedings, May, 1860, p. 161. *H. Comma*, Walker, p. 652.

* *H. confinis*, Walker.—White. Head, prothorax, fore coxæ and abdomen at the base luteous. Palpi with black tips. Antennæ black. Thorax and abdomen with a brown stripe. Fore wings brown, with a discal, slightly angular white stripe, and an elongate-triangular oblique subapical white band.

* *H. contigua*.—White. Head, prothorax and fore coxæ luteous. Palpi black, luteous at the base. Antennæ black. Thorax and abdomen with a brown stripe. Fore wings brown, with a white discal stripe, which widens from the base to a little beyond the middle, and with two large subapical white spots. Hind wings with a small brown spot near the hind border.

* *H. Clymene*, Esper.—Luteous. Antennæ black. Palpi with black tips. Prothorax with two brown dots. Thorax with a white disk and a single brown stripe. Abdomen most frequently with dorsal brown spots. Fore wings brown, with a white angulated stripe at the base, three white spots before and a divided subapical one behind. Hind wings frequently with two posterior brown spots.

H. fulvicosta.—White. Palpi yellow orange, tips blackish. Head, prothorax, the anterior edge of the fore wings, especially beneath, yellow orange; sometimes the costa of the fore wings is dark brownish. Breast and legs yellow orange, the middle and fore tibiæ and tarsi blackish. Abdomen tipped with yellowish orange.

Illinois. From Mr. Robt. Kennicott.

PHRAGMATOBIA, Stephens.

The neuration of the fore and hind wings, (*P. fuliginosa*), like that in *Spilosoma*. *Wings somewhat diaphanous.*

Head rather small, hairy, sunken; with ocelli. Face rather broad. Eyes small. Antennæ *ciliated*, in the ♂ serrated, in the ♀ simple. Labial palpi short, slightly exceeding the clypeus, *very hairy*; the basal and middle joints about equal and the latter thickened; terminal joint short, ovate and obtuse. Tongue not more than one-half as long as anterior coxæ.

Body thick. Thorax with long hair. Patagia moderate, erected and overlapping the mesothorax. Breast hairy; abdomen smooth. Legs with hairy femora; tibial spur of the anterior concealed; the posterior tibiæ with four spurs.

* *P. vagans*, Boisd.—Dark gray or grayish luteous. Fore wings immaculate. Hind wings black; ciliæ grayish luteous. Beneath the wings are cinereous with a black lunule.

North California.

* *P. assimilans*, Walker.—*Male*. Red. Antennæ testaceous. Thorax [Nov.

with brown hairs. Wings red; veins darker. Fore wings slightly brown along the costa and elsewhere, indistinctly sprinkled with pale brown, with two blackish dots, one at the base of the anterior inferior veins, the other between the first and the costa. Hind wings brighter red, with three black dots, two in the disk, and one near the hind border towards the inner angle.

Variety.—Fore wings almost wholly brown. Hind wings with a broad, blackish submarginal stripe.

* *P. albicosta*, Walker.—Blackish brown. Antennæ black. Thorax in front with a white band, which is most apparent on each side. Fore coxæ with red stripes. Costa of the fore wings white.

Male.—Abdomen above with red, half interrupted bands; tip thickly tufted with white hairs.

Female.—Abdomen above bright red, with black dorsal dots; tips white?

Mexico.

* *P. fuliginosa*, Stephens.—Fore wings reddish fuliginous or dark reddish brown, with a black spot beyond the middle. Hind wings black or dull pink, with hind margin black; cilia pink. Abdomen with three rows of black spots. The fore femora bright pink.

St. Martin's Falls, Albany River, Hudson's Bay and Europe.

LITHOSIIDÆ and GLAUCOPIDIDÆ.

LYCOMORPHA, Harris.

Wings narrow. Fore wings nearly fusiform. Near the posterior end of the disk the subcostal vein gives rise to two marginal nervules and two nearly equidistant exterior to the disk. Without post-apical nervule. The subcosto-inferior nervule and the discal arise on a common stalk, the latter angulated in the middle and receiving the discal fold. The median vein is 4 branched, the posterior arising at a point opposite the middle of the space between the first and second marginal nervules. Hind wings without costal vein. Subcostal bifid near the tip, the lower branch giving rise to an oblique discal. Median vein 3-branched, the superior nervule receiving the discal fold.

Head smooth, free, without ocelli. Face rounded. Eyes moderate. Antennæ a little shorter than the body, biserrated or very minutely pectinated. Palpi short, little exceeding the clypeus, cylindrical, porrected; the basal joint long, nearly equal to the front; the middle and terminal joints equal, very short and ovate. Tongue a little longer than the thorax beneath.

Body slender, nearly cylindrical, not metallic. Patagia scale-like. Hind wings equal in length to the body. Legs rather slender; fore tibiæ with a short concealed tibial spur; hind tibiæ with one middle spur and two moderate apical spurs.

L. Pholus, Fabr.—Bluish black. The tegulæ and the basal fourth of the wings luteous.

Nova Scotia, Mass., Penn.

CTENUCHA, Kirby.

Wings broad, or narrow, elongate-trigonal. Fore wings with the subcostal vein giving rise near the posterior end of the disk to a single marginal nervule, and another exterior to the disk and nearer to it than to the post-apical nervule, which is given off near the apical nervule. The subcosto-inferior nervule and discal branch from a common stalk, the latter straight and the discal fold received by the medio-superior nervule. The median vein 4-branched, the posterior much behind the marginal branch, and rather remote from the penultimate. Hind wings without costal vein; subcostal bifid, with the discal given off from the fork and receiving the discal fold at its angle. Median

vein 4-branched, with the posterior remote from the other branches, which are aggregated.

Head moderate, free, neck distinct, slightly hairy above: with ocelli. Face smooth, rather narrow. Eyes moderately large, prominent. Antennæ about one-half as long as the body, deeply pectinated in the ♂, slightly pectinated in the ♀. Palpi porrect, exceeding the front somewhat, squamose; basal joint slightly hairy; the basal and middle joint nearly equal; the terminal shorter, acuminate. Tongue as long or nearly as long as the thorax beneath.

Body cylindrical, slender, more or less metallic. Patagia scale-like. Hind wings equal to the body in length. Abdomen with a lateral tubercle on the basal segment. Legs rather slender; fore tibiæ with a short tibial spur; hind tibiæ with four moderately long spurs.

Table of Species.

Head above orange yellow.

Fore wings with costa luteous.

Cilia white; wings broad,

Latreillana.
fulvicollis.

Cilia blackish; wings narrow,

Head red or crimson.

Fore wings with four yellowish white stripes,

venosa.

Fore wings with a white costal and discal stripe,

ruficeps.

Fore wings without stripes.

Wings blackish; fringes white,

rubriceps.

Wings broad; palpi porrect; post-apical nervule interior to apical nervulet.

C. Latreillana, Kirby.—Dark brown or blackish brown. Palpi pale orange, tips blackish. Face dark blue. Head above, prothorax beneath and the tegulæ in front pale orange. Thorax and abdomen dark metallic blue. Wings with whitish cilia, except in the middle. The fore wings in the ♀ have the extreme costa luteous.

Wings moderately broad; antennæ moderately pectinated.

* *C. rubriceps*, Walker.—Dark brown, black. Head and palpi towards the base clothed with bright red hairs. Wings fringed with white. Fore wings with blackish veins. Hind wings bluish black. Abdomen of the ♂ sericeous green above.

New Grenada.

Wings moderately broad; post-apical nervule interior to apical nervulet.

C. venosa, Walker.—Dark brown, black beneath. Head above, prothorax beneath, clothed with bright red hairs in the ♂, and with yellow hairs in the ♀. Face dark blue. Palpi blackish, base bright red. Patagia and tegulæ in front striped with yellow, the latter likewise on the superior edge. Wings fringed with white. Fore wings with four yellowish white stripes; the first costal, second on the subcosto-inferior nervule, third on the median vein, extended to the two middle branches; fourth on the submedian vein. Hind wings and abdomen of the ♂ dark bluish black, of the ♀ blackish.

Mexico. Capt. Pope's collection. Smithsonian Institution.

* *C. ruficeps*, Walker.—Blue. Head above and thorax in front beneath clothed with crimson hairs. Palpi black, with crimson hairs towards the base. Thorax with a lappet on each side and a white spot on each shoulder. Legs white beneath. Wings blackish brown, blue at the base. Fore wings with a white costa and a white interrupted stripe extending from the base to near two-thirds of the length in the disk. Hind wings with a white discal stripe tapering from the base to half the length.

Mexico.

[Nov.

Wings long, narrow; fore wings opaque, post-apical exterior to apical nervulet; hind wings hyaline in the middle. Palpi curved.

C. fulvicollis, Hübner.—*Glaucoptis (Ctenucha) semidiaphana*, Harris, Cat. N. A. Sphin., 38, 4. Slate-colored or blackish brown. Antennæ bluish black. Palpi, basal joint ochreous, the other joints blackish. Head above, patagia, prothorax beneath, tegulæ in front and a stripe beneath the fore wings ochreous or orange. Fore wings with a luteous stripe along the extreme costa. Wings with cilia of the general hue. Abdomen bluish black, scarcely metallic.

Illinois. Mr. Kennicott.

AGLAOPE, Latr., Boisd.

Wings extremely narrow. Hind wings ovate-lanceolate, narrower than the fore wings; length much less than that of the body; length of the fore wings somewhat more than that of the body. The disk of fore wings closed by a very faint, irregular vein, with *two disco-central nervules*; subcostal vein with a single marginal nervule from the posterior end of the disk and with the apical branch *trifid* near the tip of the wing or *bifid* with a long fork. Median vein 4-branched, with the posterior scarcely remote from the penultimate. Fold of the wing thickened from the base to the tip. Submedian with a short fork at the base of the wing. Hind wings without costal nervure; subcostal bifid, with an oblique discal vein arising near the base of the lower branch, and angulated above the medio-superior nervule, where it receives the discal fold. Median vein 4-branched, with nervules nearly equidistant.

Head rather small, free, smooth; with large ocelli. Face smooth, rounded, rather narrow. Eyes rather small, scarcely prominent. Antennæ with bases approached, much shorter than the body, rather deeply pectinated in the ♂, less pectinated in the ♀. Palpi very minute, filiform, drooping, with only two distinct joints; terminal joint acute. Tongue about as long as the thorax beneath.

Body extremely slender, cylindrical, not metallic. Patagia cylindrical, minute. Abdomen without lateral tubercle, tufted at the tip and along the sides. Legs extremely slender; fore tibiæ without tibial spur; hind tibiæ with two very minute apical spurs.

A. Americana, Boisd., Griff. An. Kingd. Lep. *Procris Americana*, Boisd., S. G. Lep., i. pl. 16, f. 7; Guer. Icon. Règ. An. Ins., pl. 84, bis. f. 11. *Procris dispar*, Har., Cat. *P. Americana*, Har., Cat. N. A. Sphin., p. 35. *Ctenucha Americana*, Walker, 286.—Blue black. Prothorax above entirely fulvous or orange.

Mass., New York, Penn., Ga.

Subcostal vein exterior to the disk, trifid; apical branch with a long fork.

A. coracina.—The specimens are imperfect and denuded. The entire insect is black, without the orange colored prothorax of *Americana*.

Texas. Capt. Pope's collection. From Smithsonian Institution.

ACOLOTHUS.

The following insect greatly resembles *Americana* in appearance and almost exactly in ornamentation. It must, however, be very distinct from it. The wings are extremely narrow. Hind wings broader than the fore wings, less ovate than in *Americana*, and rounded at the interior basal angle; length rather more than that of the body. The disk of the fore wings is closed by a rather faint, irregularly oblique vein, with *one disco-central nervule*, and angulated at the medio-superior nervule, where it receives a rather faint discal fold. The subcostal vein with three equidistant, moderately erect marginal

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nervules *from the disk*, with the apical vein *simple*. Median vein 4-branched, with the posterior nervule and the marginal opposite at their origins. The fold is thickened and the submedian vein simple. In the hind wings the subcostal vein shows a tendency to separate into two veins from its point of bifurcation towards the base of the wing and resembling two veins crossing each other; exterior to the point of bifurcation and a little behind the middle of the lower branch arises a decided, curved discal vein which receives, just above the medio-superior nervule, a decided or thickened discal fold. The median vein is 4-branched, with the two posterior branches equidistant from the second one.

Head moderate, free, smooth; with large ocelli. Face broad, rounded. Eyes rather small, round and scarcely prominent. Antennæ nearly as long as the body, moderately pectinated in the ♂, minutely pectinated in the ♀. Palpi equal to the front, filiform, porrected, distinctly 3-jointed and with joints nearly equal; terminal joint obtuse. Tongue about one-half as long as the the thorax beneath.

Body short, rather slender, not metallic. Patagia very minute. Abdomen *as long as the thorax beneath*, not tufted at the tip and scarcely tufted along the sides, with a minute, lateral tubercle on the basal segment. Legs extremely slender and rather short; fore tibiæ with a slender tibial spur from the middle; hind tibiæ with two minute apical spurs.

A. falsarius.—Black. Prothorax fulvous, especially on the sides, *with a point on the median line black*. Hind wings rather thin.

Penn.; Ill., from Mr. Kennicott.

PROCRIS? Fabr.

Fore wings somewhat fusiform. The subcostal vein *with two distinct, rather long marginal nervules*, with apical vein *simple*, with *two disco-central nervules*. The median 4-branched, the medio-posterior opposite the first marginal nervule and the two upper branches on the line of the discal vein, which is straight. The fold of the wing is thickened from the base to the tip. Submedian simple. Hind wings not as broad on the fore wings at their broadest part, ovate. The subcostal vein is bifid, the lower branch giving rise to a decided rather oblique discal vein and which is angulated above the medio-superior nervule, where it receives the discal fold. Median vein with four, equidistant nervules.

Head moderate, advanced, but without decided neck; with rather large ocelli. Face moderate, oblique and *projecting tubercularly* at the base of the antennæ, and in the middle. Eyes small. Antennæ *incrassated at the tip*, *as long as the thorax beneath*, with rather deep pectinations in the ♂, serrated or minutely pectinated in the ♀. Palpi *rudimental, tubercular*. Tongue rudimental.

Body rather thick, short. Patagia rather elevated, consisting of two transverse plates rounded above, making the prothorax more than ordinarily wide above. Abdomen ovate, without apical tuft, less long than the thorax beneath. Legs short and slender; fore tibiæ unarmed; hind tibiæ with two very minute apical spurs.

P. Smithsoniana.—The entire insect is greenish black; immaculate. Texas. Capt. Pope's collection. From the Smithsonian Institution.

MALTHACA.

Fore wings rather broad, obovate; the discal cell broad behind, fusiform. The subcostal vein sends two short nearly erect marginal nervules to the costa, and from the superior angle of the disc arise two long nervules, on a short common stalk, the lower one of which is the apical, but delivered rather above

[Nov.

the tip. The discal vein is rather faint and gives rise to two disco-central nervules, the upper one rather on the costal side of the wing. Median vein 4-branched, the posterior nervule arising a little behind the first marginal branch. The fold is thickened and the submedian shortly forked at the base. Hind wings ovate; as broad as the fore wing and in length equal to that of the body. Without costal vein. Subcostal is furcate, the lower branch giving rise at an obtuse angle to a thickened discal vein, which is angulated above the medio-superior nervule, where it receives the discal fold, and above this is given off a single disco-central nervule. Median vein 4-branched, with branches equidistant, except the two superior ones.

Head moderate, free, vertex rather elongated, smooth; ocelli large. Face moderately broad, rounded, slightly protuberant. Eyes rather small, scarcely prominent. Antennæ with bases almost united, rather thick, but tapering at the tips, pectinated. Palpi extremely short. Tongue about one half as long as the thorax beneath.

Body slender, cylindrical. Patagia minute, rolled. Abdomen not tufted at the tip or on the sides, about one half the length of the body beneath. Legs slender; fore tibiæ with a short concealed spur on its middle; hind tibiæ with two extremely minute apical spurs.

M. perlucidula. Blackish brown. Wings slightly transparent. Fore wings with the basal half luteous *above the fold*. Hind wings luteous along the costa from the base to the middle.

Ill., Mr. Kennicott. Md., Dr. Morris.

CROCOTA, Hübner.

Fore wings rather broad, trigonate. The subcostal vein, almost above posterior end of the disk, gives rise to a single marginal nervule, and the apical branch is trifid at the tip; and sometimes with a second short marginal branch from about the middle of the apical nervule. The subcosto inferior and the discal arise on a short common stalk, the latter vein angulated. The median is 4-branched, with the posterior remote from the others. Hind wings rounded, broader than the fore wings, with the costal and subcostal veins from a common stalk, the former simple and the latter bifid, with an angulated discal vein from the point of bifurcation. Median *with three branches*, the posterior remote.

Head moderate, free, smooth; ocelli small. Face moderate, flat, smooth. Eyes rather large, prominent. Antennæ not more than half as long as the body, rather stout, setaceous and slightly setose. Palpi rather slender, porrected, exceeding the clypeus by at least one half their length, and pubescent; the terminal joint pointed and slender, about one half as long as the middle joint. Tongue slender, about one half as long as the anterior coxæ, or rudimentary.

Body smooth, rather slender; length less than that of the hind wings. Patagia scale-like. Abdomen smooth, beneath one half as long as the body. Legs rather slender; fore tibiæ with a short, concealed, middle spur; hind tibiæ with four short spurs.

Somewhat allied to the Arctiidae.

Table of Species.

Wings with a discal dot.	
Abdomen ferruginous, with dorsal and black dots,	<i>ferruginosa</i> .
Abdomen rose color,	<i>brevicornis</i> .
Abdomen reddish brown or fulvous,	<i>rubicundaria</i> .
Wings without discal dot.	
Abdomen red, with a black stripe,	<i>laeta</i> .
Abdomen testaceous; wings subhyaline,	<i>cupraria</i> .

C. rubicundaria, Hübner, Samml. Ex. Sch. iii. 28, 256, f. 511, 5, 12. 1860.]

Arctia rubricosa: Harris, Ins. Mas. 2d ed. 274. Fulvous or reddish brown. Antennæ fulvous, blackish on the sides. Fore wing sometimes with a brown discal spot. Hind wings more or less red, with a more or less distinct marginal black band, sometimes absent, and sometimes with a dark brown discal dot.

Fore wings with a second marginal nervule on the middle of the apical.

Variety? Yellowish. Fore wings without discal dot. Hind wings with a discal dot and rather broad, distinct dark brown marginal band.

C. brevicornis, Walker, 536. Fawn color or luteous fawn color. Antennæ black, short. Abdomen rose color. Fore wings rosy beneath. Hind wings rose color, with an indistinct and sometimes quite obsolete brown stripe in the hind border, and a brown dot in the disk. Body $2\frac{1}{2}$ — $3\frac{1}{2}$ lines long; wings 8—10 lines.

I have specimens which correspond very nearly to the above description. The anterior portion of the body is luteous, as are the fore wings, but combined with a reddish hue. Hind wings cinnabar red, without marginal band or discal spot, and in one specimen the terminal joint of the palpi is blackish.

Ill., Mr. Kennicott.

C. ferruginosa, Walker, 535. Ferruginous. Abdomen pale ferruginous, with a row of dorsal black dots. Hind wings pale ferruginous, with a blackish dot in the disk, and two or three blackish spots along the border. Length of the body $3\frac{1}{2}$ —4 lines; of the wings 10—11 lines.

It is possible this insect may be the *rubricosa* of Harris. I have specimens which agree in general with Mr. Walker's description, but they possess noticeable differences in structure as compared with the others described previously. In these the *tongue is rudimentary; fore wings with a second marginal branch in the middle of the apical nervule*. In every other particular the structure conforms to that of the genus. These differences may be sexual. In ornamentation they are reddish brown, scarcely ferruginous, and in addition to the discal dot, have a rather faint dark brownish band crossing the nervules. Hind wings rather paler than the fore wings, one specimen with a blackish discal spot, the other without it, and faint blackish spots along the margin near the inner angle.

My own impression is that *rubicundaria* of Hübner and *rubricosa* of Harris is a variable insect, and that *ferruginosa* of Walker, and perhaps *brevicornis*, are not true species. I am much more uncertain, however, respecting the latter than the former.

**C. cupraria*, Walker, 536. Testaceous. Fore legs mostly brown. Wings slightly rosy testaceous, subhyaline, with a slight cupreous tinge towards the tips. Length of the body 3—4 lines; of the wings 9—11 lines.

Jamaica? S. America.

**C. laeta*.—*Lithosia laeta*, Boisd. Guer. Icon. Règ. An. Ins. pl. 88, f. 6, p. 519. *C. laeta*, Walker, 537.

Grayish black. Tongue testaceous. Abdomen red, with a black stripe which is broader beneath than above. Fore wings red along the costa. Hind wings red, with a broad grayish black border. Length of the body 3 lines; of wings 9 lines.

N. America?

ATOLMIS? Hübner.

Fore wings rather elongated, subelliptical truncate. Disk rather narrow closed by a very faint vein. Subcostal vein *remote from the costa*, with two marginal nervules from near the middle of the disk rather erected, and another exterior to the disk, between it and the furcate apical nervule. The subcosto-inferior and discal from a short common stalk. Median 4-branched, the posterior remote from the others, arising interiorly to the first marginal nervule.

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Hind wings much broader than the fore wings; with the costal and subcostal veins from a common stalk, the latter bifid beyond the disk, which is closed by a faint vein. Median vein 3-branched, the two superior on a common stalk, which becomes bifid opposite the fork of the subcostal.

Head rather small, free, smooth; without ocelli. Face moderate, flat, smooth. Eyes moderate, prominent. Antennæ simple, setose in both sexes? Palpi moderate, recurved, but little exceeding the clypeus, squamose; the basal joint tumid, and about equal to the middle joint, which is cylindrical; the terminal joint slender and nearly equal to the middle joint. Tongue slightly more than one half as long as the thorax beneath.

Body moderately thick, rather less than the length of the hind wings. Patagia small, nearly cylindrical. Abdomen beneath one half the length of the body. Legs rather stout; fore tibiæ with a short spur at the base; hind tibiæ with four moderate spurs.

A. ? *miniata*. *Lithosia miniata*, Kirby, Faun. Bor. Am. iv. 305, 1. *Gnopria vittata*, Harris, Ins. Mas. 2d ed. 262. Scarlet or yellow tinged with scarlet. Antennæ black. Palpi tipped with black. Fore wings with three broad slate colored or lead colored stripes, the first near the costa; the third near inner margin; the second short in the middle of the wing posteriorly. Hind wings blackish slate colored, scarlet or pinkish at the base. Abdomen black with a broad scarlet stripe beneath.

NUDARIA? Haw., Steph.

Wings rather broad, semi-diaphanous, rounded. In the fore wings the subcostal vein forms a large subcostal cell over the discal vein, giving rise about the middle of the cell above to a marginal nervule, and beneath to the subcosto-inferior and discal vein, the latter having a disco-central nervule. At the apex of the cell behind, the vein becomes trifid, dividing into a marginal, post-apical and apical nervules, the latter with a nervulet from its middle. Hind wings about equal to the body in length; without costal vein; subcostal vein with a marginal nervule arising from the disk near the discal vein, and becoming bifid exteriorly at a point remote from the discal vein; with a disco-central nervule. Median 3-branched, with the posterior nervule somewhat interior to the origin of the marginal nervule.

Head free, rather small, smooth; without ocelli. Face smooth, rather narrow, clypeus prominent. Antennæ setiform, moderately long, scarcely ciliated in the males. Palpi slender, slightly curved, but little exceeding the clypeus, slightly hairy at the base; the basal joint twice larger than the middle; terminal joint minute, ovate. Tongue as long as the thorax beneath.

Body slender. Patagia nearly obsolete. Legs rather long and slender; fore tibiæ unarmed; hind tibiæ with four spurs, the middle pair short.

Eggs globular, pale yellow; producing larvæ one week after deposition. The larva in escaping from the egg is geometriform, with ten legs. This refers to the species described below which differs sufficiently in structure from the European *N. mundana*, it appears to me to authorise the separation of our species from the group containing the European species. It may belong to the *Geometrina*.

N. mendica, Walker, 576. Pale yellowish. Fore wings with the costa at the base frequently touched with ochreous, with two irregular oblique blackish, sometimes pale grey, bands, composed of large spots; one on the middle of the disk, and the other crossing the nervules, and a single spot of the same hue near the hind margin in the medio-central interspace, sometimes connected with the posterior band.

Penna., N. Y.

PSYCHOMORPHA, Harris.

“Antennæ in the male pectinated on both sides, the pectinations rather 1860.]

short, simple in the female. Proboscis moderate, spirally rolled. Palpi slender, nearly horizontal, extending a little beyond the clypeus, covered with loose hairs so as to conceal the joints. Wings short, somewhat triangular, with the outer margins rounded; discal areolet of the hind wings short, closed by a sinuous vein. Body slender, hairy at the tip. Legs short, hairy; spurs of the hind tibiae three, slender, nearly concealed by the hairs.

*P. *Epimenis*, Drury. "Brownish black. Fore wings sprinkled in spots with light blue scales, which form a narrow band near the hinder margin, and marked with a large yellowish white patch beyond the middle. Hind wings with a broad dark orange-red band behind the middle. The white spot of the fore wings is indented towards the middle of the wing, and on the under side there is a small triangular spot near the base of the wing, and a short transverse one beyond it which unites behind with the angular projection of the large white patch. Expands rather more than one inch."

COSMOSOMA, Hübner.

Wings mostly hyaline. The subcostal vein of the fore wings is adjacent to the external margin, with a single nervule from the disk arising at a point midway between the medio posterior branch and its penultimate. The apical branch beyond its middle sends off the post-apical nervule and near its tip an apical nervule to the costa. Median vein 4-branched. Hind wings about half as long as the fore wings; without costal vein; subcostal bifid from the origin of the discal vein, which is very obliquely inclined towards the base and curved above the median where it receives the discal fold. Median vein *bifid exterior to the disk, with the lower branch furcate at its tip.*

Head moderate, smooth, neck not distinct; with ocelli. Face moderate, smooth, vertical. Eyes moderately prominent. Antennæ rather more than one half as long as the body, pectinated to the tips in the ♂, less so in the ♀. Palpi rather stout, curved, exceeding the face, smooth, but hairy at the base; basal and middle joints nearly equal; terminal small and conical. Tongue equal to the thorax beneath.

Body scarcely equal to the fore wings in length, rather slender, nearly linear. Patagia small. Legs moderately stout, smooth; fore tibiae with a moderate, concealed spur from the base; hind tibiae with four rather small spurs.

C. *Omphale*, Hübner. Bright red. Antennæ black, with white tips. Head blue. Thorax most frequently striped with black. Abdomen with a black dorsal stripe, and the tip black, varied with blue. Wings margined with black and with black veins.

Fla., Mexico, near Jalapa.

ORMETICA.

Wings opaque. Fore wings rather narrow, equal in length to that of the body; hind margin very obliquely rounded, with the inner angle opposite the middle of the costa. The subcostal vein is adjacent to the costa, and gives rise to a marginal nervule from the disk nearly opposite the penultimate branch of the median vein, and another exterior but near to the disk. The post-apical arises just exterior to the second marginal nervule, and the apical is bifid at its posterior third. The discal vein and the subcosto-inferior arise at a common point, the former very obliquely inclined to the base, but straight. The median is 4-branched. Hind wings *extremely short*, not one half as long as the anterior; without costal vein; subcostal vein arched, with a marginal nervule from the point of origin of the discal, and bifid at the tip much exterior to the cell. Discal vein *vertical*. Median 3-branched.

Head rather large, smooth, free; with small ocelli. Face tapering, smooth, vertical. Eyes rather large, prominent. *Antennæ wanting*. Palpi curved, cylindrical, ascending to the middle of the front, stout, smooth; basal joint

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short, rather hairy beneath; middle joint smooth, rather thickened in the middle and about four times as long as the apical joint; terminal joint very short, ovate. Tongue as long as the thorax beneath.

Body not metallic, rather stout, equal in length to the fore wings, smooth. Patagia moderate, decumbent, and overlapping the meso-thorax. Abdomen tapering at the tip, more than one half as long as the body beneath. Legs smooth, rather stout; tarsi roughened with spines; fore tibiæ with a stout internal spur from the base; hind tibiæ with four spurs.

O. sphingiformis. Bluish black. Face with a blue band. Body with a yellow stripe on each side extending from the head to the tip of the abdomen. Palpi blackish, whitish at base and on the second joint beneath. Fore wings with the extreme costa from the base to beyond the middle yellow, with a broad stripe of the same hue from the base to the hind margin beneath the tip, somewhat contracted behind. Hind wings, exterior half yellow, interior half black. The under surface of the wings the same as above. Abdomen beneath with a central yellow stripe. Legs black; fore coxæ each with a yellow spot; femora white internally; tibiæ striped with white. Length of body 9 lines; of the wings 19 lines.

Mexico, near Jalapa.

The structure of this insect shows marked affinities to the group of Sphinges.

CYANÓPEPLA.

Female? Fore wings much longer than the body, moderately broad, rounded at the tip, and very oblique along the margin. The subcostal vein adjacent to the external margin, with a single marginal nervule from near the hind end of the disk, and a second marginal nervule just exterior to it. The apical branch near its exterior third sends off a post-apical nervule, and near the tip a nervulet to the costa. The subcosto-inferior nervule and the discal vein arise at a common point, the latter angulated. Median vein 4-branched, with the posterior nervule rather remote from the others, and the origin of the first subcosto-marginal nervule. Hind wings rather more than one half as long as the fore wings, nearly equal to the length of the body. Without costal vein. Subcostal bifid at the origin of the discal vein, which is much curved. Median vein 4-branched, the superior branch is medio-discal, the two middle ones from a common base, the posterior remote.

Head moderate, smooth, without distinct neck; without ocelli. Face rather narrow, smooth. Eyes rather small, moderately prominent. Antennæ more than one half as long as the body, minutely pectinated or serrated beneath. Palpi curved, ascending rather above the middle of the face, smooth, slightly hairy at the base; middle joint rather more than twice longer than the basal joint; terminal joint very minute, ovate. Tongue equal to the thorax beneath.

Body metallic, cylindric, scarcely slender, smooth. Patagia rather small, somewhat erected. Abdomen less than one half as long as the body beneath. Legs rather slender, smooth; fore tibiæ with a short, concealed middle spur; hind tibiæ with four rather short spurs. Tarsi minutely spinous.

C. cruenta. Black. Palpi blue. Head and body metallic blue. Fore wings with a large crimson spot at the base, extended to the middle of the disk and to the fold beneath, and another of the same hue, oval and obliquely placed in the median nervules; inner margin at the base and a streak along the submedian vein metallic blue; cilia at the tip white. Hind wings dark bluish black, immaculate. Length of the body 7 lines; of the wings 20 lines.

Mexico, near Jalapa.

ΕΥΣΗΡΟΜΙΑ, Hübner.

Group, *Horamia*, Walker.

Wings narrow. Fore wings much longer than the body. The subcostal 1860.]

vein is adjacent to the external margin, with two marginal nervules from the hinder end of the disk, the first opposite the penultimate branch of the median, the second forked at about its middle. The apical branch gives rise at about its middle to the post-apical. The subcosto-inferior and the discal vein arise at a common point, the latter slightly curved. Median vein 4-branched, the posterior remote from the penultimate. Hind wings equal to the length of the body. Without costal vein. Subcostal vein bifid from the origin of the discal vein, which is very obliquely inclined to the base and suddenly curved about the middle of the disk, where it receives the discal fold; immediately beneath this arises a medio-discal nervule. Median vein bifid from the disk.

Head rather large, smooth, free; with ocelli. Face narrow. Eyes rather large, prominent. Antennæ shortly pectinated or serrated to the tip, whence it is moniliform, and more or less dilated or fusiform about the middle. Palpi curved, ascending to the middle of the face; basal joint hairy beneath; middle and terminal joint smooth and cylindrical. Tongue about as long as the thorax beneath.

Body cylindrical, smooth. Patagia small. Abdomen obtuse, with a prominent tubercle on each side of the basal segment. Legs slender and long; fore tibiæ with a moderate spur from the base; hind tibiæ towards the ends and the hind tarsi plumose. Hind tibiæ with two short spurs.

E. plumipes.—*Sphinx plumipes*, Drury, Append. ii. *Aglaope plumipes*, Westw. ed. Drury ii. 51, pl. 27, f. 3. Blackish, somewhat tinged with blue. Antennæ with ochreous tips. Face yellow, with a blackish central stripe and a yellow spot between the antennæ. Thorax with four yellow spots and tegulæ striped with yellow on the inner edge. Abdomen with tip dark yellow and banded with the same hue between the segments; the two segments next the basal banded with white beneath. Wings concolorous dark brown, immaculate. The fore coxæ each with an orange yellow spot; legs black, middle femora striped with dark yellow; hind tibiæ and tarsi with yellow hairs, broadly banded at the end of each with black.

Texas. Coll. Capt. Pope. Smithsonian Institution.

Variety? Walker, 252.—Palpi short; third joint small. Black, indistinctly tinged with blue. Head, thorax, base of the wings and abdomen towards the base with white dots. Wings blackish brown. Abdominal segments with white bands. Legs partly covered with white scales; hind tibiæ with a white band before the middle, beyond which they are deeply plumose towards the base.

Honduras.

**E. Pretus*.—*Sphinx adscita Pretus*, Cramer, Pap. Exot. ii. 121, pl. 175, f. E, F. *Horamia Pretus*, Hübn. Verz. Schmitt, 125, 1351; Samml. Exot. Schmitt, Ad. pl. f. 1—4. *E. Pretus*, Walker 252. Palpi long; third joint elongated. Fawn colored. Antennæ banded with black. Prothorax and basal portion of the abdomen whitish. Hind wings somewhat brown. Fore wings testaceous. Femora and tibiæ black at the tips.

Jamaica.

PÆCILOPTERA.

The wings are longer than the body. The anterior rather narrow, enveloping the body when folded; apex obtusely rounded and hind margin slightly oblique. The subcostal nervule gives rise to a marginal nervule, about its middle, and within the disk forms a large secondary cell, from the hind end of which arise three distinct marginal nervules, the lower one reaching the costa rather above the tip. The disk extends rather beyond the apical third of the wing, and the discal vein gives rise to three nervules. The median is 3-branched, the posterior branch being remote from the others and arising op-

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posite the origin of the subcostal branch, which forms the secondary cell. The fold is thickened, and the submedian furcate at its base. The hind wings are rather broader than the fore wings; obliquely rounded along the hind margin from the tip to the base; costa nearly straight. The costal nervure distinct and simple: the subcostal simple and rather attenuated from the discal vein towards the base. The discal vein gives rise to two nervules, and sends a false nervule through the disk towards the base of the wing. The median subdivides into three equidistant nervules.

Head rather small, smooth, free; without ocelli. Face rather narrow, tapering, vertical. Eyes small, salient. Antennæ slender, with joints closely set, *serrated beneath with scales*. Palpi slender cylindrical, curved, ascending rather above the middle of the front; basal joint squamose; middle and terminal joints smooth and equal in length. Tongue about one half as long as the body.

Body slender, scarcely equal in length to the fore wings. Patagia scale-like. Abdomen slender, more than one half as long as the body beneath. Legs smooth and slender; fore tibiæ with a long, concealed internal spur; hind tibiæ with a pair of apical spurs.

The wing structure of the insect included in this genus resembles most strikingly that of the *Tineina*, and must form a group connecting the *Glauco-pidipæ* directly with it.

P. compta.—Palpi pale yellow, with the ends of the second and third joints black. Head yellow, with a black spot between the antennæ and a black band across the face. Thorax reddish orange, with two black spots in front; neck yellow, edged behind with blackish. Fore wings reddish orange, with four bluish black patches placed transversely on the wing and containing yellow spots; the first at the base; the second interior to the middle of the wing; the third exterior to the middle, constricted toward the costa and connected behind with the subterminal patch, which is constricted in the middle. The hind wings are slightly hyaline; dark brown.

Texas. Capt. Pope's Coll. From the Smithsonian Institution.

December 4th.

MR. JOSEPH JEANES in the Chair.

Twenty-four members present.

The following paper was presented for publication:

“Description of two new species of *Pimelodus*, from Kansas, by Charles C. Abbott,” and was referred to a Committee.

Mr. Durand stated that he had received the following note from Mr. Thomas Meehan, of Germantown:

“In looking over the last issue of the Proceedings of the Academy of Natural Sciences, I notice that Mr. Buckley describes a new large *Carya Texana*. As Major Le Conte has already described a species as *Hickorea (Carya) Texana*, and by a comparison of Buckley's description with Le Conte's, (see Proceedings, 1853,) it is evident that they are two distinct species, is it not worth having the error corrected?”

Mr. D. agreed fully with Mr. Meehan, and proposed the substitution of *Carya Buckleyi* for the name of *Texana*, given by Dr. Buckley, and already occupied.

1860.]

Dr. Corse, in presenting a specimen of tuberculous disease in a sheep, called attention to the importance of collecting more detailed and numerous data, having reference to the connection between good agriculture, food, water and shelter, and the health of our domestic animals, used as food for man.

December 11th.

MR. LEA, President, in the Chair.

Forty members present.

Mr. Vaux, on behalf of the Publication Committee, laid on the table Part 4, Vol. iv. of the Journal.

Mr. Lea read the following letter from Mr. Marcou :

Boston, 26th Nov., 1860.

At the end of the "Proceedings" for 1859, there is a Catalogue of the Fossils of the Cretaceous Formation of the United States, by Mr. Wm. M. Gabb, where I see placed the *Ostrea Marshii* and *Gryphæa dilatata*, var. *Tucumcarii*, found by me in the Jurassic strata of Pyramid Mount in New Mexico. Mr. Gabb ought, I think, in thus placing these fossils, at least to have mentioned in a note that I have placed them in the *Jurassic formation of the United States*.

In a notice of *Geological Discoveries made by Capt. J. H. Simpson*, by Messrs. Meek and Engelmann, published in April, 1860, "Proceedings," page 126, I observe a paragraph entitled *Jurassic Rocks*, where they have found a *Gryphæa* probably identical with *G. calceola*, Quenstedt, and a plicated oyster closely allied to *Ostrea Marshii*, in the strata of the Utah Territory, where, since 1854 I have indicated the existence of the *Jurassic Formation*. Notwithstanding that Messrs. Meek and Engelmann say that this species of *Ostrea Marshii* is distinct from the species of Mr. Marcou, and notwithstanding the probable identity of *Gryphæa calceola*, I do not doubt that Mr. Engelmann has found in Utah, at Ducherne river and at Weber river, the *Gryphæa dilatata*, var. *Tucumcarii*, and the *Ostrea Marshii* indicated by me in the Jurassic rocks of Pyramid Mount. These two fossils are too numerous around the Tucumcari Mountains, north of the Llano Estacado, not to be distributed over other parts of the plateau which surrounds the Rocky Mountains. The *Gryphæa calceola* of Quenstedt is very closely allied to *Gryphæa dilatata*, and with many geologists it is considered but a variety. Dr. B. F. Shumard, in "Observations upon the Cretaceous Strata of Texas (*Trans. Acad. of Sci., St. Louis, p. 587*," maintains that my *Ostrea Marshii* of Pyramid Mount is identical with his *Ostrea subovata* from Fort Washita, and that my *Gryphæa dilatata*, var. *Tucumcarii*, is found at Fort Washita, in strata two hundred feet above beds that contain well-marked cretaceous types. The question to resolve is, actually to give a detailed section of Fort Washita, with plates of fossils, as I have done for Pyramid Mount, to do the same for the strata of Utah Territory, and compare the three localities. Then we shall see if Washita is identical with Pyramid Mount and with Utah, or if Pyramid Mount and Utah are identical, and different from Washita.

Mr. Gabb remarked that, while he strongly deprecated anything like the unfortunate discussions that have taken place on the above subject, he still considered that the candid expression of the views of persons holding a difference of opinion on scientific points, was the only way to arrive at the facts. The omission of the note, in regard to the position to which Prof. Marcou referred these species, was accidental, and not an intentional slight, as Prof. M. seems to imply.

Nevertheless, the species are not, in his opinion, identical with the species bearing the same names in Europe. As far as can be determined, *Ostrea*

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Marshii, Marcou, is not *O. Marshii*, Sow., and therefore the name *O. subovata*, Shumard, is the real name of the species. *Gryphæa Tucumcarii*, M., is at least as nearly related to the typical specimens of *G. Pitcherii*, Morton, now in the Museum of the Academy, as the forms referred to *Pitcherii* by Marcou, and known to geologists as var. *navis*. The specimen from the plains of Kiamesha, mentioned by Morton, is more nearly of the shape of *Tucumcarii* than the one figured, but no palæontologist would hesitate for a moment in pronouncing them identical.

In regard to the real position of these species, Dr. Shumard, in Marcy's Report on the Red River of Louisiana, places *O. subovata*, on the same horizon with *G. Pitcherii* and *Ammonites vespertinus*, both of which species are, in other parts of the United States, found associated with species that are everywhere characteristic of the chalk, such as *Baculites anceps*, *Gryphæa vesicularis*, *Ostrea larva*, *Exogyra Matheroniana*, of D'Orbigny, (or *E. Texana*, Roemer,) *Nautilus Dekayi* and other species, not only found in the United States, but in Europe, Chili and India, and never found outside of the Upper Chalk of English authors, the Senonien of the French.

Mr. Gabb did not pretend to deny the existence of the older members of the cretaceous formation in North America, but said, that outside of the evidence in "Geology of North America," founded only on the doubtful recognition of two or three species of *Ammonites* from weathered fragments, all the testimony yet collected tends to prove the existence only of the Upper Chalk, unless, perhaps, some of the lower beds (Nos. 1 and 2) of Nebraska may prove, as he thinks probable, to belong to the Lower Chalk of the English, the Turonien of continental writers. Still the evidence is only negative. True, the beds of New Jersey cannot be distinguished lithologically from the green sand of England and France, but even Prof. Marcou would not now have the temerity to call them upper green sand or even "Turonien" in face of the palæontological evidence to the contrary; and yet, lithological evidence is among the strongest brought to bear on his Jurassic and Triassic of the West. That Jurassic and Triassic rocks do exist on this continent is now beyond doubt, but that Jurassic and Triassic, is not the Jurassic and Triassic of Marcou. That *Ostrea Marshii* has been found in the far West, associated with *Ammonites cordatus*, it is no evidence that the *O. Marshii* of Prof. Marcou is the *O. Marshii*, Sow.

In conclusion, he remarked that in the above opinions he was upheld by every American geologist who has investigated the subject.

Mr. Cope read the following list of the recent species of Emydosaurian reptiles represented in the museum of the Academy.

ALLIGATORIDÆ.	<i>Crocodylus palustris</i> ,
Alligator Mississippiensis,	<i>Crocodylus porosus</i> ,
Jacare sclerops,	<i>Crocodylus vulgaris</i> ,
Jacare fessipes,	<i>Crocodylus Americanus</i> ,
Jacare vallifrons.	<i>Mecistops leptorhynchus</i> ,
CROCODYLIDÆ	<i>Mecistops bathyrhynchus</i> ,
<i>Osteolaemus tetraspis</i>	<i>Gavialis Gangeticus</i> .

In all, twelve species, represented by thirty-eight specimens.

OSTEOLAEMUS, Cope, was characterized as a genus of Crocodiles presenting several points of analogy to the Alligators. The nasal bones were prolonged anteriorly, and uniting with the short spine of the intermaxillary, divided the external nasal orifice, as in the genus Alligator. The eyelids were entirely osseous, as in Caiman. There was no transverse bony ridge between the orbits. The dermal plates upon the tail, extremities, and thorax, were more or less completely ossified; upon the gular region the ossification was most complete, the shields having a coarse sutural articulation. The digits of the posterior extremity were very slightly webbed. Cervical plates distinct from the dorsal.

Two specimens were exhibited; one, a skin brought from the Ogobai River, Western Africa, by Mr. P. B. Du Chaillu; the other, the skull of a half-grown individual, obtained from the Museum of the Pennsylvania University. These Mr. Cope regarded as belonging to a species hitherto unknown, and which he proposed calling *Osteoleaemus tetraspis*. He briefly characterized it as follows: Proportions of the head somewhat similar to those of *Crocodylus trigonops*, Gray, of India. Breadth of muzzle at ninth tooth equal to the distance between the external nasal orifice and anterior border of the orbit, and to the width of the table of the cranium posteriorly. A short ridge in front of

each orbit, directed obliquely inward. Teeth $\frac{17}{15}$, rather compressed. Four

nuchal shields, in a single transverse series; four cervical, in pairs. Dorsal shields in six rows. Posterior extremities without fringe. Total length of the entire specimen, five feet.

Mr. Cope alluded to the remarkable extent to which ossification was carried in this species. The cranium was much more rugose and pitted than in the adult specimens of much larger species, and the crotaphite foramina were roofed over by bone. The latter peculiarity was sometimes observed in the genera *Jacare* and *Caiman*. The osseous gular and thoracic buckler was also similar to that exhibited by those genera, and by the extinct "*Crocodylus*" *Hastingsiæ*, the existence of which has been shown by Professor Huxley. And alluding to the numerous points of analogy to the Alligatorial or American type, Mr. Cope mentioned the occurrence of South American forms of tree-snakes in Western Africa; e. g. *Dryophis Kirtlandii* and *Thrasops flavigularis*, *Hallowell*.

Mecistops bathyrhynchus was the name by which Mr. Cope proposed to characterize a species, of which a large skull was in the Academy's museum. This skull was of a very elongate form; on this account, and from the fact that the nasal bones disappeared some distance posterior to the external nasal orifice, he concluded that it belonged to *Mecistops*, *Gray*, although that genus was mainly characterized by the position of the cervical dermal shields. The breadth of the muzzle at the tenth tooth was twice that at the notch, and was contained two and half times in the space between the orbit and nasal orifice. The length of the muzzle anterior to the tenth tooth equalled the length posterior to that point, plus three-fourths the length of the orbit. The latter was scarcely larger than the external nasal orifice. The width of the table of the cranium posteriorly, entered into the total length, measured from the posterior border of the former, four times; was equal to the length of the symphysis mandibuli; was greater than the width of the muzzle measured across the palate between the twelfth and thirteenth teeth, and was exactly twice the width of the os frontis. The snout was more rounded and elevated than in the known species of *Mecistops*; the superior maxillary bone at its posterior extremity formed a perpendicular wall. The length of the ramus of the inferior maxillary from the angle, was thirty-two inches, the symphysis extending one-fifth the distance.

Neither ridge nor convexity in front of the orbits Teeth $\frac{19}{15}$. Native country

of the species unknown.

Mr. Cope stated that in the present species the muzzle was less depressed, and more rounded laterally than in the species of *Crocodylus*; also that the fourth and tenth teeth above, and fourth below, were of proportionally large size.

Mr. Lea read two letters from Prof. Tyson, State Geologist of Maryland, in relation to some remarkable infusorial beds of *Tripoli*, observed by him in Maryland. The specimens were presented to the Academy:

No. 1 is from a bluff on the Patuxent, below Lyon's Creek, the bed being three feet thick, overlying the green sand.

No. 2 is from a bluff two miles below Nottingham, the thickness ten feet.

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No. 3 is from "Holland's Cliffs," three miles south of "Lower Marlboro'", and is thirty feet thick.

No. 4 is from the "Cove," on the south side of Herring Bay, eight miles east of Nos. 1 and 2.

Prof. Tyson has traced this "Tripoli region" from near the head of West River, in Anne Arundel County, twenty-five miles southward, to Prince Frederick, in Clavert County. It may be found to extend eighteen or twenty miles further south, to near the lower end of Calvert County. It is well exposed in high cliffs on the Patuxent, as well as on the Chesapeake Bay. It probably extends over most of Charles County, and of the southern part of Prince George County.

It belongs to the Miocene period, and rests upon the most important fossil shell bed of the Tertiary region. Prof. Tyson states that Dr. C. Johnson has made out more than one hundred forms of Diatoms in No. 3.

Dr. Fisher exhibited a stereoscopic picture of a parasitical insect, taken by means of a new and ingenious arrangement of the ordinary microscope, by Dr. R. E. Griffith. The insect was magnified between 20 and 25 diameters.

December 18th.

Vice-President BRIDGES in the Chair.

Forty members present.

The following papers were presented for publication in the Proceedings:—

"Description of some new Species of Tertiary Fossils from Chiriqui, Central America, by Wm. M. Gabb."

"Descriptions of three new Species of Star-fishes from Cape San Lucas, Lower California, by John Xantus."

"Descriptions of new North American Coleoptera, in the Cabinet of the Entomological Society of Philadelphia, by George H. Horn."

"Catalogue of Colubridæ in the Museum of the Academy of Natural Sciences of Philadelphia, &c., Part 3, by E. D. Cope."

And were referred to Committees.

December 25th.

Vice-President BRIDGES in the Chair.

Twenty-nine members present.

On report of the respective Committees, the following papers were ordered to be published in the Proceedings:—

The Humming Birds of Mexico.

BY RAFAEL MONTES DE OCA,

Of Jalapa, Mexico.

No. 3.

CAMPYLOPTERUS PAMPA, Gould.

ORNISMYIA PAMPA, Lesson.

PAMPA CAMPYLOPTERA, Reichenbach.

The people of Coatepec, nine miles from Jalapa, give to this species of Humming Bird the name of *Chupa-mirto fandanguero* or Fandango Myrtle-sucker, 1860.]

for the reason, apparently, that it has a somewhat musical voice. It is the only Humming Bird which to my knowledge has any notes which are sufficient to recognize it by in the woods, and though rather monotonous, are quite pleasing.

In the neighborhood of Jalapa this species is found occasionally, but in the above-mentioned place is more abundant, although very difficult to obtain. It inhabits the forest in the winter season, and generally feeds on the flowers of high bushes called *Asaretos*, which at that season are in full bloom and densely covered with beautiful smooth emerald green leaves, amongst which it is very difficult to see this bird, though it often betrays itself by its musical notes, especially in the morning. The males, I think, only sing, or at least much more than the females.

Very few specimens of this kind are seen in summer time in this neighborhood. It is found also near Cordova, and goes as far south as Guatemala, where perhaps it builds its nest, for I have never seen nor heard of a nest being found here.

The general appearance of this species is as follows: the upper part of the head is beautiful metallic ultramarine color. Wing coverts and tail coverts, and upper part of the body bronze green. Throat, under wing coverts, breast and belly, iron gray color, and the under tail coverts the same, but tinged with chestnut. Quills purplish black with the vanes black and resembling whalebone, the three principle ones rather wider than common. Tail feathers yellowish bronze green, all except the two central, with the half towards the point bluish black, three on each side tipped with chestnut iron gray. The feet are dark iron gray, nails and upper mandible black, under mandible iron gray. Its size from the point of the bill to the tip of the tail is from $5\frac{1}{2}$ to $5\frac{3}{4}$ inches, wing $2\frac{3}{4}$, tail 2, bill $1\frac{1}{2}$ inches. The female is almost precisely like the male, with the difference of about $\frac{3}{8}$ of an inch in size, and either less blue or with it less brilliant on the top of the head.

No. 4.

THAUMASTURA ELIZE, Gould.

TROCHILUS ELISA, Lesson.

MIRTIS ELISA, Reichenbach.

LUCIFER ELISA, Bonaparte.

CALOTHORAX ELISA, G. R. Gray.

This species of Humming Bird is one of the rarest that is found in Mexico. It is small, very beautiful, and possesses wonderful rapidity of flight, moving its wings with such velocity that it is almost impossible to see them when flying, and it may easily be mistaken for a large bee on account of the strange buzzing sound produced by their incessant motion. In the vicinity of Jalapa this bird is called *Mirto de colo de tisera*, or the shear-tailed Myrtle-sucker.

This Humming Bird is extremely shy, and differs in its habits and manner of living from other species. It rises very early in the morning, and the few specimens that have come under my observation I never saw after seven or eight o'clock in the morning, and again about five o'clock in the afternoon until dark; in the intermediate time I have never seen it. When once this bird is found eating at one place it is almost sure to be found there at the same hour for several days in succession, so that once failing to obtain it, all that is necessary is to wait for it the next day. It feeds on the *Masapan* and *Tobaco* flowers, I think preferring the latter.

This bird is found also at the Barrancas de Jico (or Precipices of Jico) about twenty miles from Jalapa; there it builds its nest, which I have seen. It is very small, round, and flat on the bottom, neither so deep nor so thick on the lower part as the generality of other Humming Birds. The eggs are two, rather long in proportion to their diameter. The nest is covered on the outside with moss from stones, and lined inside with *tule* or cattail silky floss.

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In this bird the upper part of the head, the wing coverts, tail coverts, and the upper part of the body are bright yellowish green bronze, except on the top of the head, which is rather duller. The throat is beautiful metallic shining amethyst color. The breast forming a kind of band across and communicating in a faint line on each side of the neck with the corner of the eye, is white, slightly tinged with chestnut. The flanks, legs and lower part of the belly are of the same color. The sides of the body under the wings are mixed, scale-like, with bronze, green and chestnut color. The quills are purplish gray black, the tail bright purplish black, the second and third feathers having edges of light chestnut, not reaching to the point, and giving them the appearance of being spatulate in form. The tail is composed of six feathers, two on each side about the same length, and the third about one-third shorter. The feet, nails, and bill are black. The bill is considerably curved. Total length $3\frac{3}{4}$ inches, wing $1\frac{1}{2}$, tail $1\frac{1}{2}$, bill $\frac{7}{8}$.

The female is like the male in the color of the upper parts of the body. The throat and breast and abdomen are grayish white, tinged with chestnut, very pale on the last, sides under the wings light chestnut, mixed with bronze green towards the breast. The tail feathers are ten, light chestnut in their half towards the body, and the terminal half black, with the first and second widely tipped with white, and the third slightly. The middle feathers are bronze green. The female is about one-eighth of an inch shorter than the male.

Catalogue of the Colubridæ in the Museum of the Academy of Natural Sciences of Philadelphia. Part 3.

BY E. D. COPE.

PSAMMOPHIDINÆ.

MALPOLON Fitz. Type *M. lacertinus*.

Neue Classif. pp. 29, 59, 1826. *Cælopettis* Fitz., 1843, Dum. & Bibr. Günther nec Wagler, 1820; *Rhabdodon* Fleischm., 1831; "*Bothriophis* Eichw.," Gthr.: *Taphrometopon* Brandt, 1839.

162. *M. lacertinus* Fitz. "*Coluber monspessulanus* Hermann," also "*Merrem*," (1804 & 1820), Bonap., (descriptions not recognizable). Hence *Cælopettis monspessulana* Bp. Fauna Italica, 1832; *Natrix lacertina* Wagl. in Spix, Serp. Bras., 1824 Fig.; *Psammophis lacertina* Boie, Isis, 1827; Schlegel, Ess. *Cælopettis lacertina* Wagl. Natur. Syst., 1830; Günther, Cat. Brit. Mus., 1858; *Col. insignitus* Geoff. St. Hilaire, Hist. Egypt, 1827 Fig.; *Cælopettis insignitus* Dum. Bibr. Erp. Gen. vii. 1130, 1854; "*Taphrometopon lineolatus*, Brandt, Karelina, Rev. Mag. de Zoologie, 1840," Dum. Bibr. *Rhabdodon fuscus* Fleischm. 1831.

Three sp. Italy, Dr. Wilson, (Bp. Coll.)

Var. *Neumayeri* Bp.

One sp. Algiers, " "

Two sp. Italy, " "

PSAMMOPHIS Fitz. Type *P. crucifer*.

Neue Class. Rept. 29, 59, June 1826. (nec H. Boie Bull. de Sci. Nat. et Geol. Ferrussac, Oct. 1826, which must be regarded as a synonyme of *Coronella* Laur.!) F. Boie, Isis 1827, 521, et auctorum. *Macrosoma* Leach, in Bowditch's Ashantee, 1819, (nec Hübner, Lepidoptera, 1816.)

163. *P. crucifer* Fitz. l. c. Boie l. c., Dum. Bibr. Erp. Gen. 1854. *Coluber crucifer* Merr. Beiträge, 1821, fig. ?*Col. lurus* Klein, Tent. 1775; founded on Seba, 53, f. 2.

One spec. Cape Good Hope, Gard. Plants in ex.

1860.]

164. *P. sibilans* Fitz.l.c. Günther Cat. Brit. Mus. 1858. *Coluber sibilans* Linn., 1766. *Col. moniliger* Daud., 1802. *Psammophis moniliger* Boie, 1826. Wagler, Schleg., Dum. Bibr.
 One sp. Africa, ?

165. *P. Phillipsii* Hallow., Proc. Acad. Nat. Sci., 1854, p. 100; do. 1857, p. 69. *Coluber Phillipsii* Hallow., l. c. ii. 1844, 169.

This species has three very narrow longitudinal light bands, which correspond in position with the vertebral, and light inferior borders of the dark lateral bands of the *P. sibilans*. These are not alluded to in any of Dr. Hallowell's descriptions. This species appears to us to be closely allied to the *sibilans*, but has more the aspect of a tree snake, in the narrow, obliquely arranged scales, and rather larger eye.

One sp. Liberia, Dr. Goheen.
 One sp. (young, Proc. 1857, p. 69.) " "

TRAGOPS Wagler. Type *T. prasinus*.

Nat. Syst. Amphib. 1830, 184.

We have placed this genus and *Passerita* with *Psammophis*, on account of the similarity of dentition, and from the fact that the *T. tropidococyx* (*Dryiophis* Gthr.) "possesses the habit and physiognomy" of that genus, according to Dr. Günther, who has made known the species.

166. *T. prasinus* Dum. Bibr. *Dryiophis prasinus* Reinwt. *Dryinus nasutus*, Beil. *Tragops nasutus* Wagler.

One sp. Java, Dr. Ruschenberger.
 One sp. Anger, "
 One sp. Ceylon, Mr. Cuming in ex.
 One sp. India, Dr. Burrough.

Var. *laetus nobis*. Anal shield entire. Colors much brighter and yellower than other specimens; otherwise similar.

One sp. Philippines, Mr. Cuming in ex.

PASSERITA Gray. Type *P. mycterizans*.

Ann. Philos. 1825, 208. *Dryinus* Merrem, 1820, nec Fabricius. Dum. Bibr. 1854, vii. 808. *Dryiophis* "Dalman," Boie Isis, 1827, nec Fitzinger. Neue Class, 1825. (Quid "*Dryiophis* Dahlman" Boie in Ferussac, Bull. de Sc. Nat. et Geol., Oct. 1826?) *Herpetotragus* Fitz., 1843.

167. *P. mycterizans* Gray. *Col. mycterizans* Linn. *Dryiophis nasutus* Merr. et auctororum.

One sp. Madras, Mr. F. Brown.
 One sp. India, Dr. Burrough.
 One sp. Ceylon, Cuming ex.

We would direct the attention of herpetologists who have large suits of specimens of this species at their command, to the variations in the relative lengths of the tail and body. In our specimens from Madras and Ceylon, the length of the former is to that of the latter, about as one to two; in the specimen presented by Dr. Burrough, as one and one-third to two. In the latter, the lateral and superior surfaces of the proboscis are verrucose, and the body is more slender in proportion to its length.

168. *P. fusca*. *Dryinus fuscus* Dum. Bibr. Erp. Gen. vii. p. 812. *Passerita mycterizans*, var. *Dryinus fuscus* Gthr. Cat. Brit. Mus. p. 161. *Dryiophis* c. Boie, Isis, 1827, 546; "eine dritte durch Leschenault von Ceylon, der *aenea* ähnlich."

Four specimens of this serpent from Ceylon agree in having a more attenuated form than the *mycterizans*. The tail is to the body, in length, as

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one and one-third to two; the lateral and superior surfaces of the proboscis are verrucose. The head is very much attenuated. A dark brown band passes through the eye, and there is a diamond shaped blotch with a posterior elongation, on the top of the head.

DRYOPHIDINÆ.

LANGAHA Bruguière. Type *L. nasuta*.

Journ. Phys. 132, 1784. *Xiphorhynchus* Wagl., 1830. *Xiphorina* Fitz., 1843.

169. *L. nasuta* Shaw, 1790. *L. Madagascariensis* Latr., 1801. *L. ensifera* Dum. Bibr., 1854. *Dryophis langaha* Schleg., 1837.
One sp. Madagascar, Gard. Plants in ex

DRYOPHIS Fitzinger. Type *D. fulgida*.

Neue Classification, 1826, p. 66—et auctorum. *Oxybelis* Dum. Bibr. 1854.

a. Scales smooth: *Oxybelis* Wagl., 1830.

170. *D. argenteus* Schleg.

One sp. Cayenne, Mr. Amory Edwards.

171. *D. acuminatus* Gthr. *Coluber acuminatus* Wied, 1822. *Dryinus aeneus* Wagl., 1824. *Dryiophis auratus* Schleg., 1837.

One sp. Brazil, Dr. McMurtrie.
One sp. Veraguas, New Grenada, Mr. R. W. Mitchell.
One sp. Panama, Drs. Gallae & Le Conte.
Two sp. S. America, Mr. Cuming in ex.
Two sp. " ?

It is this species of *Dryophis* to which Prof. Baird alludes (Proc. Acad., 1859, 300) as having been obtained so far north as Guayamas, Sonora. A single specimen procured by Capt. Stone at that place is in the Mus. Smithsonian.

172. *D. Kirtlandii* Hallow. Proc. Acad. Nat. Sci. Phil., 1854, p. 100. *Leptophis Kirtlandii* ibid, l. c. 1844, 62. *Oxybelis Kirtlandii* ibid, l. c. 1857, 59. *Ox. Lecomptei* Dum. Bibr. vii. 821, 1854.

Two sp. Liberia, Dr. Goheen.
One sp. " Dr. Savage.
One sp. " Mr. E. T. Cresson.
Two sp. Gibson, Dr. Ford.
One sp. " Mr. Du Chaillu.

b. Scales carinate: *Dryophis*, Fitz. Wagl.

173. *D. fulgidus* Fitz.

One sp. Surinam, Dr. Hering.
One sp. Panama, Dr. Le Conte.
One sp. Tsalco, San Salvador, Capt. J. Dow.

The above specimens have ten upper labial shields. Günther gives nine as the ordinary number.

174. *D. brevirostris nobis*.

Near the middle of the body, scales in fifteen rows; elsewhere in thirteen. Carination very faint anteriorly; visible upon five rows posteriorly. General form extremely slender; length of tail to that of body as two to three. Head small, muzzle short. No loreal, one post, one preocular, the latter reaching the vertical. Nostril near the middle of the nasal plate. Superior labials six, fourth and angle of third entering orbit; last very long. Inferior labials seven, suture of the first pair unusually long. Pupil round. Gastroteges 179; an entire anal, urosteges, 170. Total length 40 in. 6 l. Tail 16 in. 3 l.

1860.]

Coloration, greyish green, tinged with rufous upon the upper surface of head and body. A narrow black line passing back from the eye, parallel to the commissure of the mouth. No lateral stripe.

Habitat. Veraguas, New Grenada. From a valuable collection made in that place by R. W. Mitchell, Esq.

AHAETULLINÆ.

CHRYSOSPELEA Boie. Type *C. ornata*.

Isis von Oken, 1827, p. 546. *Chironius* Fitz. Isis, 1827, 265, nec Neue Class. 1826.

175. *C. ornata* Boie, l. c. *Coluber ornatus* Shaw, 1803. *Col. ibiboca*, Latr. 1801! *Chironius ibiboca* Fitz. l. c.

Var. <i>A. Gthr.</i>		
One sp.	Philippines,	Mr. Cuming in ex.
Var. <i>B. Gthr.</i>		
One sp.	Siam,	Dr. Ruschenberger.
Two sp.	?	?
176. <i>C. rhodopleurum</i> Boie.	<i>Dendrophis rhodopleuron</i> Reinw.	
One sp.	E. Indies.	Smiths. Inst.

AHAETULLA Gray. Type *A. picta*.

Annals of Philosophy, 1825, p. 208 (September) ?*Leptophis* Bell, Zoological Journal, 1825, p. 328 (October). Gray, in King's Australia, ii. p. 432, 1827. *Dendrophis*, Fitzinger, Neue Classif. p. 60, 1826 (June). Boie, Ferrusac, Bullet. Sci. Nat. et Geol. 1826, 238 (October). Wagler, Naturlich Syst. p. 183, 1830. Fitzinger, Syst. Rept., 1843, p. 27. Dumeril, Prodrome Général, 56, 1852. Günther, Cat. Brit. Mus., 148, 1858.

177. *A. picta nobis*. "*Coluber filiformis* Linn. Mus. Ad. Fried., pl. 17 f. 2." Description and fig. not recognizable. *Col. pictus* Gmel. 1788. *Col. coeruleus*, Bonaterre, 1790. *Col. decorus* Shaw, 1802. *Ahaetulla decora* Gray, 1825. *Dendrophis decorus* Fitz., 1826. *Dendr. picta* Boie, 1826. Wagler, Schlegel, Fitzinger, Dumeril, Günther. ?*Leptophis purpurascens* Bell, 1826. *L. mancas* ibid. *Ahaetulla Bellii* Gray, Ind. Zool., 1834. *Leptophis pictus* Cantor, 1847.

One sp.	near Calcutta,	Dr. R. Coates.
Three sp.	Ceylon	Mr. Cuming in ex.
One sp. " <i>(Ular lidi</i> of the Chinese)"	Singapore,	?
Five sp.	Philippine Is.	Mr. Cuming in ex.
One sp.	Java,	Dr. Ruschenberger
One sp.	?	?

THRASOPS Hallowell. Type *T. flavigularis*.

Proc. Acad. Nat. Sci. Phil., 1857, p. *Dendrophis* Boie, Isis, 1827, p. 520 (nec Fitzinger, 1826). Schlegel Essai, 1837. *Leptophis* Wagler, Nat. Syst. p. 1830. Fitz. Syst. Rept., 1843. Dumeril, Prodrome, 1852 (nec Bell, 1825). *Ahaetulla* Gthr., Cat. Brit. Mus. p. 151, 1858 (nec Gray, 1825).

In this genus the scales are arranged in subtransverse rows, and are carinate; in *Philothamnus Smith*, they are similarly arranged and smooth; in both genera the gastrosteges are weakly keeled, the urosteges scarcely at all. In *Gastropyxis nobis*, the scales are arranged quincuncially and are keeled; the gastro- and urosteges sharply angulated. In all three the dentition is syncranterian. In *Hapsidophrys Fisch.*, the frontal region is much arched; otherwise nearly similar to *Thrasops*.

178. *T. flavigularis* Hallowell. l. c. *Dendrophis flavigularis*, Hallowell. l. c. 1852, p. 205. We find no external character in this fine serpent which can, in our

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opinion, justify its separation from the next succeeding species. This is interesting when we recollect that the *Dryophis* of the same region is congeneric with the South American form, and not with that inhabiting the East Indies; a fact pointed out by Dr. Günther, in his paper on the geographical distribution of reptiles.

Two sp. Gaboon, West Afr. Dr. H. A. Ford.

179. *T. ahaetulla nobis*. *Coluber ahaetulla* Linn. *Col. liocercus* Neuw. *Leptophis ahaetulla* Bell. *Dendrophis ahaetulla* Fitz. Boie. *Dendrophis liocercus*, Schleg. *Leptophis liocercus* D. & B. *Ahaetulla liocercus* et *Linnaei* Gray, 1830. Gthr.

Two sp. Surinam, Dr. Colhoun.
One sp. Brazil, ?
One sp. loc ignot. ?

180. *T. Mexicanus nobis*. *Leptophis Mexicanus* D. & B. *Ahaetulla Mexicana* Günther.

One sp. Omoa, Honduras, Dr. J. L. Le Conte.
Two sp. loc. ignot. Mr. Cuming in ex.

181. *T. occidentalis nobis*. *Ahaetulla occidentalis*, Günther, Proc. Zool. Soc., 1859, p.

One sp. Isth. Panama, Dr. J. L. Le Conte.
One sp. ? Mr. Cuming in ex.

?Var. In a third specimen, locality unknown, an additional superior labial shield, and a postnasal longer than high, are the indices of greater elongation of the prefrontal, nasal and intermaxillary bones. In every other respect similar to the above. The proportions of body and color prevent its reference to *T. ahaetulla*. We await additional specimens before forming an opinion respecting it.

PHILOTHAMNUS Smith. Type *P. semivariatus*.

Zool. South Africa, pl. 59, 1849.

182. *P. natalensis* Smith l. c. pl. 64.

We are not convinced of the identity of this species with *P. Chenonii* (*Leptophis Chenonii* D. & B.) Dr. Leach's diagnosis of his *Coluber irregularis* in the appendix to Bowditch's Ashantee, will probably apply equally well to several species; hence, we cannot adopt his name without more evidence than has been offered.

One sp. Africa. Mr. Cuming, in ex.

In this specimen the tail is rather longer in proportion to the body, than Dr. Smith describes. The length of the former is thirteen inches; of the latter, nineteen.

183. *P. depressirostris nobis*.

Scales smooth, in fifteen rows, arranged as in *T. Mexicanus*, more obliquely than in *T. occidentalis*. Length of tail to total length, as one and one-third to three. Muzzle elongate, depressed, truncate; rostral plate twice as broad as high. Postnasal longer than prenasal; loreal three times as long as high. One pre-, two postoculars. Nine superior labials, fifth and sixth entering the orbit. Eye very large, oval. Occipitals broad anteriorly, narrow and truncate posteriorly, about equal to the vertical in length. Dentition as in *T. ahaetulla*. Anal plate divided. Total length 45 in. 6 l.

Coloration. Above uniform deep green; beneath and upon the lips light green. An inconspicuous temple streak. A very delicate black line traverses the centre of each of the two rows of scales that bound the vertebral row, extending from the nape to the origin of the tail.

Habitat. Cocuyas de Veraguas, New Granada; one specimen, presented to the Academy by Mr. R. W. Mitchell.

1860.]

This species bears considerable resemblance to *T. occidentalis*, but is distinguished by prominent characters.

In the animal which is the subject of this description, an entozoon (*Pentastomum gracile*) had entered the right internal nostril, and penetrating the membranes of the meatus near its anterior orifice, had attached itself to the periosteum in the right posterior sinus of the intermaxillary bone. The body of the animal entirely filled the meatus, and extended as far as the mouth of the œsophagus of the serpent.

GASTROPYXIS nobis. Type *G. smaragdina*.

Supra p. 556.

184. *G. smaragdina nobis*. *Dendrophis smaragdinus* Boie, 1827. Schlegel, 1837. *Leptophis gracilis* Hallow., 1844. *Leptophis smaragdinus* Dum. & Bibr., 1854. *Ahaetulla smaragdina* Gthr., 1858.

Four sp.	Gaboon, W. Africa.	Dr. Ford.
One sp.	Guinea.	Mr. Du Chaillu.
One sp.	Liberia.	Dr. Goheen.
One sp.	?	?

COLUBRINÆ.

PHYMNOMODON nobis. Type *P. chalceus*.

Form slender, head moderately distinct. Cephalic plates normal: two nasals, a loreal, one preocular. Scales carinate, arranged quincunially, those of the vertebral series not larger. Gastro- and urosteges not angulated; the latter divided, the postabdominal plate entire. Pupil round. Palatine teeth very little longer than pterygoids. Superior maxillary teeth minute posteriorly, becoming much longer anteriorly; none grooved.

In the system of the *Erpetologie Générale*, this genus might be placed near *Eugnathus D.* & *B.* Its true affinities are not with *Euprotodon* and *Lycophidium*, but with *Thrasops Hallow.*, and *Thamnophis Fitz.* (*Eutænia B. & G.*), being distinguished from the latter principally by the dentition.

185. *P. chalceus nobis*.

Similar in appearance to *Thamnophis proximus nobis*. Muzzle rather narrow; rostral plate nearly as high as broad. Vertical rather large, its lateral borders converging, presenting a right angle posteriorly. Nasals equal in size. Loreal trapezoid, posterior inferior angle acute. Preocular not reaching vertical. Three postoculars. Eight superior labials, eye resting on fourth and fifth. Nine or ten inferior labials; post-geneials separated, longer than the anterior. Scales in nineteen longitudinal rows, elongate, emarginate at the tip, those of the external row not larger than the others, keeled. Gastroges 152; urosteges? (tail mutilated). Length of body 11 in. 8 l.

Coloration. - Olivaceous above, shading into leek green upon the flanks, and greenish-white upon the belly. A vertebral band of light green bordered with black extends from the occipital plates to the origin of the tail, involving one and two halves rows of scales. Another narrower and paler band extends upon the third and fourth rows of scales upon each side from the neck to origin of tail. This band is bounded above by an interrupted narrow black border. Temporal region lively green, plates of head and muzzle tinged with fulvous. Upper labials and preocular white; a narrow black postocular vitta. All the plates and scales above and below, refulgent with a brilliant metallic lustre, as in *Ahaetulla* sp.

One sp. Siam. Dr. W. S. W. Ruschenberger.

PHILODRYAS Wagler. Type *P. Olfersii*.

Nat. Syst. Amphib. 185, 1830. *Chlorosoma* Ib. l. c. *Dryophylax* Dum. & Bibr. *Erp. Gen.* vii. 1103, 1854, nec Wagler, 1820.

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As Wagler's name, *Chlorosoma*, as applied to this genus, is etymologically untrue, we have followed Dr. Günther in employing the name which immediately succeeds it in the "Natürliches Syst."

186. *P. Olfersii* Wagl. l. c. *Herpetodryas Olfersii* Schl. *Dryophylax Olfersii* D. & B. One sp. Brazil. ?

187. *P. viridissimus* Günther. *Chlorosoma viridissimum* Wagl. l. c. *Herpetodryas viridissimus* Schl. *Dryophylax viridissimus* Dum. & Bibr.

One sp. Surinam. Dr. Colhoun.
One sp. Patr. ignot. ?

188. *P. crassifrons* nobis.

Expression slightly homalopsine: the eyes more anterior and vertical, the muzzle shorter, and the labials higher than is usual among tree-snakes. Vertical plate nearly as broad as long; occipitals broad, rounded. Postoculars two; preocular not reaching the vertical. Postfrontals broad transversely, inferiorly bordered by the postnasals and third upper labial, suture with the former longer. Superior outline of the rostral rounded. Nostril a slit; nasals confluent, posterior inferior angle acute. Loreal none. Superior labials eight, all higher than long, except the first and last; eye over the fourth and fifth, small. One large and three small temporals bound the external border of each, occipital. Inferior labials ten or eleven, sixth largest, last two or three very small. Pre-generials longer than the posterior pair. Scales in nineteen longitudinal rows, smooth; gastrosteges undulate near their extremities, obtusely keeled. Gastrosteges 206, one divided anal, urosteges 123.

Coloration. Above uniform dark green, beneath greenish-white, chin tinged with yellowish.

One sp. Cayenne. Gard. of Plants. (as *Dryophylax viridissimus*)

In the proportions of the body, this serpent much resembles the *P. viridissimus*, but even assuming that the absence of the loreal shield is accidental, the proportions of the head and plates are different from those seen in our specimens of that species, and in the published figures of it.

GONYOSOMA Wagler. Type *G. oxycephalum*.

Nat. Syst. Amphib. p. 184, 1830.

189. *G. oxycephalum* Wagler. *G. viridido*. Descr. et Icon. Amphib. pl. 9.

One sp. Java. Dr. W. S. W. Ruschenberger.

This specimen has 27 and 28 rows of scales upon the anterior part of the body.

CHLOROPHIS Hallow. Type *C. heterodermus*.

Proc. Acad. Nat. Sci. Phila. 1857, p. 61.

Body cylindrical, tail not long; head rather short, eyes large. Scales smooth, anteriorly in oblique transverse series. Nasals two, nostrils between; loreal large; one pre-, two postoculars. Gastrosteges faintly angular; anal plate entire, urosteges divided. Dentition syncranterian.

We are inclined to regard the arrangement of the plates upon the muzzle of the specimen from which Dr. Hallowell drew up his diagnosis, as abnormal. Another specimen from Guinea exhibits the plates as described. This genus seems to differ from *Hapsidophrys* Fisch., in having a shorter tail, as well as smooth scales.

190. *C. heterodermus* Hallow. l. c.

One sp. Gaboon. Dr. A. H. Ford.
One sp. Guinea. P. B. DuChaillu.

LIOPELTIS Fitz. Type *L. tricolor*.

Systema Reptilium, 1848, p. 26.

This genus differs from *Chlorophis* in having a single nasal plate, more 1860.]

depressed head, equal teeth, and bifid anal plate. It seems to include *Herpetodryas tricolor* Schleg., *Cyclophis calamaria* Gthr., *Cyclophis major* Gthr., and the species below-mentioned. The scales are not keeled and the general form is less elongate than in *Opheodrys* Fitz.

191. *L. vernalis nobis*. *Coluber vernalis* DeKay, Holbrook, etc. *Herpetodryas vernalis* Hallow., Proc. A. N. S. 1856, p. 243. *Chlorosoma vernalis* Bd. & Grd. *Cyclophis vernalis* Gthr.

Two sp.	Nebraska.	Dr. Hammond.
Two sp.	Kansas	"
One sp.	Michigan.	Dr. Miles.
One sp.	Allegheny Co. Penna.	Mr. Trout,
One sp.	Berks Co. Penna.	? ?
Two sp.	Morris Co. N. J.	Dr. J. C. Fisher.
One sp.	New Jersey.	Mr. C. C. Abbott.
One sp.	Rhode Island.	Mr. S. Powel.
One sp.	Massachusetts.	Dr. Holbrook.
Three sp.	?	?

The most frequent anomaly in the arrangement of the plates of the head of this species is the union of the nasal and loreal. Two labials are sometimes confluent and the preocular is occasionally divided.

OPHEODRYS Fitz.

Syst. Rept. 1843, p. 26. *Cyclophis* Gthr. Cat. Col. Brit. Mus. 1858, p. 119.

192. *O. æstivus* Fitz. *Coluber æstivus* Linn. *Herpetodryas æstivus* Schleg., Dum. & Bibr., Hallow. *Leptophis æstivus* Bell., Eolbr., Bd. & Grd. *Cyclophis æstivus* Gthr.

One sp.	"Massachusetts."	Smiths. Inst.
One sp.	New Jersey.	Mr. Ashmead.
One sp.	Pennsylvania.	Mr. Allison.
One sp.	Washington, D. C.	Mr. Burtt.
One sp.	South Carolina.	Dr. Holbrook.
One sp.	Texas.	Dr. Woodhouse.
One sp.	"	Dr. Heermann.
One sp.	?	Dr. Wilson (Bp. Col.)
Five sp.	?	?

DROMICUS Bibron. Type *D. fugitivus*.

Sagra's Hist. d'He Cuba, 1840, p. 221.

193. *D. fugitivus* Gthr. *Col. fugitivus* Donnd. *C. cursor* Shaw. *Herpetodryas cursor* Schleg. *Dromicus cursor* Bibr.

Var. Gthr.	One sp.	Trinidad.	Dr. S. W. Mitchell.
	One sp.	?	?
?? Var.	One sp.	Martinique.	Gard. Plants, in ex.

194. *D. ater* Gthr. *Natrix atra* Gosse.

One sp.	Jamaica.	Dr. Fisher.
Four sp.	?	?

195. *D. antillensis* Dum. & Bibr. *Psammophis antillensis* Schl.
One sp. St. Thomas. Mr. Robt. Swift.

DRYMOBIUS Fitz. Type *D. margaritiferus*.

Syst. Rept. 1842, p. 26.

a. One preocular plate.

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196. *D. margaritiferus* Fitz. *Herpetodryas margaritiferus* Schl. *Leptophis margaritiferus* Dum. & Bibr. *Zamenis tricolor* Hallow. *Dromicus* (!) *margaritiferus* Gthr.

One sp.	Omoa, Honduras.	Dr. Le Conte.
One "	Honduras.	Dr. Woodhouse.
One "	Panama.	Dr. Le Conte.
Three "	Central America.	Mr. Cuming, in ex.

197. *D. Boddærtii nobis*. *Coluber Boddærtii* Steetzen, 1795. *Col. fuscus* Hallow. Proc. A. N. S. Phila. 1845, II. p. 241, nec Linn. *Herpetodryas Boddærtii* Schleg., Dum. & Bibr., Gthr.

Unicolor var.	Two sp.	Surinam.	Mr. Wood.
	Two "	Caraccas.	Mr. Ashmead.
	One "	?	Mr. Cuming, ex.
	One "	Veragua, N. Grenada.	Mr. R. W. Mitchell.
Banded var.	One "	Caraccas.	Mr. A. B. Durand.
	One "	?	Mr. Cuming, ex.

In the banded variety a light band runs along the fourth row of scales. In our second specimen the light color of the abdomen involves the first two rows, leaving a narrow brown band upon the third row, below the light one.

198. *D. Rappii nobis*. *Herpetodryas Rappii* Gthr., Catal. Snakes Brit. Mus. 1858, p. 116.

One sp.	Caraccas.	Mr. Ashmead.
Two "	?	?

b. Preoculars two, scales keeled. *Dendrophidium* Fitz.

199. *D. dendrophis nobis*. *Herpetodryas dendrophis* Schleg., Gthr. *H. Poitei* Dum. & Bibr.

One sp.	S. America.	?
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c. Preoculars two, scales smooth. *Masticophis* Bd. & Grd.

200. *D. flagelliformis nobis*. *Herpetodryas psammophis* Schl. *H. flagelliformis* Dum. & Bibr., Gthr. *Psammophis flagelliformis* Holbr. *Masticophis flagelliformis* Bd. & Grd.

One sp.	Georgia.	?
One sp. Young.	S. Carolina.	Dr. Blanding, ("Coluber reticularis.")

201. *D. testaceus nobis*. *Coluber testaceus* Say, 1853. *Psammophis flavigularis* Hallow., 1852. *Masticophis flavigularis* et *testaceus* Bd. & Grd., 1853. *Herpetodryas flavigularis* Hallow. et Gthr. (Quid *Coryphodon testaceus*? Gthr.)

Three sp.	Texas.	Dr. Heermann.
Two sp.	Cross-Timbers, Ind. Ter'y.	Dr. Woodhouse.
One sp.	Cape St. Lucas, Lower Cal.	Smithsonian Inst.

In one of the specimens from Texas, the anterior part of the tail, and part of the body are lustrous black; in all three the teeth are of a light sea-green color, at their bases. In the specimen from Cape St. Lucas, the head is deep brown; a light line extends anterior to the eye, and one along the median upper labials, which sends a vertical branch to the postoculars. Throat and chin brown with yellow variations, anterior part of the body crossed for a short distance by incomplete cross bands. (Vid. Hallowell, U. S. Pac. R. R. Surv. Rept. x. Williamson's Exp. Reptiles, p. 12.)

202. *D. tæniatus nobis*. *Leptophis tæniata* Hallow. Proc. Ac. Nat. Sci. Phil. 1852, p. 181. *Masticophis tæniatus* B. & G. Cat. Serp. 1853, 108. *Leptophis lateralis* Hallow. Proc. Acad. 1853, p. *Masticophis Schottii* B. & G. Cat. Serp. 1853, p. 160.

The fundamental pattern of coloration in this species consists in a unicolor 1860.]

dorsal region, and lineated sides, a dark line running through the centre of each row of scales upon the latter region and upon the ends of the gastrosteges. The intervals between these lines may be variously shaded. When a light color appears between each, we have the form *tanitatus*. (U. S. Pac. R. R. Expl. Rept. x. Beckwith's Rept. Pl. xxiii.) When the intervals involving the ends of the gastrosteges, the first, second and half the third rows of scales, are dark, half the third and fourth being bright yellow, we have *lateralis* or *Schottii*. (Mex. Bound. Surv. pl. 17.) Sometimes only the interval between the lines of the second and third rows is dark; sometimes this occurs, the inferior half of the first row being also shaded. The uniform olive brown of the back is formed by the confluence of the widened longitudinal bands; the exterior basal portions of the dorsal scales, are however sometimes yellow, like the ground upon the sides.

One sp.

California.

Dr. Heermann.

One sp.

Arizona.

Smiths. Inst.

HERPETOBRYS Boie. Type *H. carinatus*.

Bullet. de Sci. Nat. et Geol. Octob., 1826, p. 237. *Macrops* Wagl. Nat. Syst. Amphib. 1830, p.

203. *H. carinatus* (Boie) Schlegel. Herpetologists have distinguished two species as confounded in the *H. carinatus* of Schlegel's *Essai*, and have characterized them as possessing, the one, smooth scales, the other, carinate. After a careful study of our specimens, we have arrived at the conclusion that there is no ground for regarding one series of specimens possessing carinæ upon the scales, as representing a species distinct from another series, whose scales are keelless. Specimens in which two or three labials enter the orbit and which have the anal divided, differ in this respect, as do also those with an entire anal plate, and three or two upper labials entering the orbit. A specimen from near Rio Janeiro is obviously *Natrix scurrula* of Wagler, (Spix, Serp. Braz. pl.) Another specimen from Surinam is quite as slender as *Ahaetulla picta*. In color, specimens vary from black olivaceous with a yellow dorsal line, and spots upon the first row of scales upon the tail, to gray brown with oblique transverse bands. A specimen received from the Garden of Plants, exhibits two preoculars, and three or four postoculars. That a careful anatomical investigation may demonstrate the existence of several species among these individuals, is not improbable.

Besides the synonymes ordinarily quoted under the "species" *fuscus* and *carinatus*, there may be added, *Coluber Spixii* Hallowell, Proc. Phil. Acad. ii. p. 241, and *C. Pickeringii* Hallow. l. c. p. 242.

Ten sp.

Surinam.

Dr. Hering.

Three sp. (Types Hallow. sp.)

Near Caraccas.

Mr. Ashmead.

One sp. ("*Dendrophis viridis* D. B.")

Para.

Col. Abert.

One sp.

Surinam.

Dr. Colhoun.

One sp.

Rio Janeiro.

?

One sp.

?

Gard. Plants in ex.

Three sp.

?

?

204. *H. sebastus nobis*.

As a representative of its genus, this species is of a very elongate and compressed form, with the scales arranged in transverse series, and with two medial dorsal rows, larger than the others; the dentition isodont.

The specific characters are as follows: tail one-third the total length. Scales large, in ten longitudinal rows, entirely smooth. Anal shield entire. Head distinct from the neck, lanceolate. Eye large, superciliaries prominent. Upper head shields large. Vertical elongate, broad anteriorly, lateral borders concave, convergent. Post-frontals bent upon the sides. Rostral as high as broad. Nostril between two nasals, each of the latter higher than broad. Loreal rectangular, longer than high. One preocular scarcely reaching the vertical. Postoculars two, inferior largest; the two bounded posteriorly by the

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occipital and a large temporal plate. As second large temporal, separating the last upper labial from the occipital. Superior labials nine, fourth, fifth and sixth entering the orbit; seventh subtrigonal, last two elongate. Inferior labials ten; post-genials longer than anterior. Gastrosteges not angulated, 153 in number.

Coloration.—A light brownish fulvous, paler on the belly, darker upon the occipital region.

One specimen, native country unknown, but may perhaps prove to be from Eastern Asia or Malaysia.

ZAOCCYS nobis. Type *Z. dhumnades*.

Form slender, vertebral line angular. Two medial series of dorsal scales; those of the sides quincuncially arranged. Two nasals, one loreal, two preocular shields.

The large isodont serpents which have the median dorsal line elevated into a ridge, and the sides compressed more or less "*en toit*" appear to us to be naturally distinguished as follows:

A. Two median dorsal series of scales.

Herpetodryas. Scales in more or less transverse series, one preocular.

Zaocys. Scales in quincunx; two preoculars.

B. One median dorsal series of scales.

a. Loreals more than one.

Ptyas. Preoculars two or more.

b. Not more than one loreal or preocular.

Spilotes. Scales in sub-transverse series; head very distinct from neck; loreal trapezoidal.

Cœlognathus. Scales quincuncial; head but little distinct; loreal trapezoidal.

Gonyosoma. Loreal three times as long as high or absent; muzzle very acute.

In proposing the name *Zaocys* for the *Coryphodontes carinatus* and *fuscus* of Günther, and in retaining Fitzinger's name *Ptyas* for the *C. Blumenbachii* and *C. korros* of the *Erpetologie General*, we are giving expression to an opinion long held by us, as to the unnatural association of species in the so-called genus *Coryphodon*, of those authors. In it we find cylindrical terrestrial serpents united with compressed subarboricole species, upon a peculiarity whose value as an index of nature appears to us entirely imaginary. The very nature of the *coryphodontian* type of dentition as distinguished from the *isodontian* and *syncranterian* would lead us to infer its inconstancy; and it does exist, we believe, in species claimed to be isodont; e. g. in the genera *Lampropeltis*, *Drymobius*, etc.

205. *Z. dhumnades nobis*. *Coluber dhumnades* Cantor, 1842. "*C. nigromarginatus* Blyth, 1855." *Coryphodon carinatus* Gthr., 1858.

Three sp. Ningpo, China.

Dr. McCartee.

Besides the species of this genus, and of *Herpetodryas*, *Dendrophis pseudodipsas* of Bianconi, from Mosambique, possesses two medial dorsal series of scales.

PTYAS Fitz. Type *P. mucosus*.

Systema Reptilium, p. 26, 1843.

206. *P. mucosus nobis*. *Coluber mucosus* Linn. *Col. Blumenbachii* Merrem. *Coryphodon Blumenbachii* Dum. & Bibr. *Ptyas Blumenbachii* Fitz.

One sp. East Indies,

Mr. Yarrow.

207. *P. korros nobis*. *Coluber korros* Reinwt., Schleg. *Coryphodon korros* Dum. & Bibr. *Coluber cancellatus* Oppel.

One sp. (80 in.) Siam,

Dr. Ruschenberger.

One sp.

?

?

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SPILOTES Wagler. Type *S. pullatus*.

Natur. Syst. Amphib. p. 179, 1830. *Drymarchon* et *Thamnobius* Fitz., 1843. *Georgia* Baird and Girard, 1853.

208. *S. pullatus* Wagl. *Coluber pullatus* Linn. *Col. variabilis* Neuwied. *Spilotes variabilis* Dum. & Bibr.

One sp.	Brazil,	Dr. Strain.
One sp.	Surinam,	Mr. Keller.
One sp.	S. America,	Mr. Cuming in ex.
Two sp.	"	?

209. *S. poecilostoma* Dum. & Bibr. *Coluber poecilostoma* Neuw. One sp. S. America, ?

210. ?*S. poecilonotus* Gthr. One sp. Caraccas, Mr. W. G. Boulton.

Our specimen differs from Günther's type, in having the carination of the dorsal scales quite weak, the lateral borders of the vertical plate but little concave, the last two upper labials confluent on both sides, and nearly all the scales on the anterior half of the body with yellow centres.

211. *S. melanurus* Dum. & Bibr. One sp. Panama, Drs. Gallaer & Le Conte. One sp. Caraccas, Mr. Ashmead.

This species is certainly very nearly allied to the *S. coraïs*, but we cannot at present agree with Günther in regarding it as the young of that species. The *coraïs* is stouter in form, and does not probably exhibit a black tail, and black lines upon the neck, at any age.

212. *S. coraïs* Dum. & Bibr. *Coluber coraïs* Cuvier. One sp. (very large) Surinam, Dr. Hering. One sp. (half grown) " " One sp. (very young) " Dr. Colhoun.

In the young specimen there are forty-one pairs of oblique dark grey cross-bands on the body above.

213. *S. erebennus nobis*. *Coluber obsoletus* Holbrook, not Say. *Georgia obsoleta* Bd. & Grd.

Independently of color, this species differs from the *coraïs* in the shorter loreal, longer inferior postocular, and longer external longitudinal border of occipital plate. The fifth and seventh superior labials are entirely separated by the sixth.

One sp. Eagle Pass, Texas, Smithsonian Inst.

214. *S. Couperi nobis*. *Coluber Couperi* Holbrook. *Georgia Couperi* Bd. & Gird.

In this noble species there is one superior labial less than in *S. coraïs*: the fifth and seventh labial plates form a suture above the sixth, as in that serpent.

One sp. Georgia, Dr. Holbrook.

COELOGNATHUS Fitzinger. Type *C. radiata*.

Syst. Rept. p. 26, 1843. *Composoma* Dumeril, Prodrôme de la Class. Ophid. p. 57, 1853. *Spilotes* Günther, 1858, nec Wagler, 1830.

Coluber reticularis Cantor and *Spilotes Hodgsonii* Gthr. belong to this genus.

215. *C. melanura*. *Coluber melanurus* Schl. *Composoma melanurum* Dum. *Spilotes melanurus* Gthr.

One sp. Java, Gard. Plants, Paris, in ex.

This specimen agrees exactly with Herr Schlegel's description, though sent with the label "*C. radiatum*, Var. B, D. & B."

216. *C. limicolor nobis*.

CYNOPHIS Gray. Type *C. helena*.

Ann. Mag. Nat. Hist., 1847, p. 246. *Plagiodon* Dum. Erp. Gen. vii. p. 169, 1854.

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217. *C. helena* Günther. *Coluber helena* Daud., 1802. *Cynophis bistrigatus* Gray, l. c., 1849.

Our single specimen differs slightly from descriptions in the arrangement of the colors upon the upper surface of the body. Hence we append the following notes.

Scales small, entirely smooth, in twenty-seven longitudinal series. Tail two-ninths the entire length. Head slightly distinct, acute. Rostral plate rather prominent, as high as broad, visible from above. Two small supplemental plates between it and the prefrontals: the latter as long as broad. Postfrontals longer than broad; superciliaries narrow; vertical rather broad anteriorly, elongate, the lateral borders straight, and so convergent as to render it almost trilateral. Occipitals elongate truncate posteriorly, two elongate temporals bound the external border. Nasals two, large, nostrils between; loreal longer than high, the posterior border curved oblique. Preocular large, reaching the vertical, rugulose; postoculars two. Superior labials ten, eye resting on the fifth, sixth and seventh; eighth longer than high, ninth higher than long, both bounded above by an elongate temporal. Inferior labials twelve, seventh largest; pregenaeals longer than postgenaeals. Postabdominal scute entire. Gastrosteges 223, a little recurved upon the sides; urosteges 88 pair. Total length, 29 in. 3 l., of tail 6 in. 6 l.

Coloration. Under surface light yellow, with a few black specks upon the extremities of the scales anteriorly. Above a delicate fawn brown, the two inferior rows of scales paler. Anterior to the middle of the body, the scales of the rows between the third and tenth assume a darker shade; this becomes a distinct lateral band posteriorly, and extends to the extremity of the tail. On the anterior third of the body, the skin, upon being stretched, exhibits the following pattern. Pale trigonal areas, alternating and extending from the median line to the ninth row of scales upon each side. A series of small light spots upon the eighth row alternates with these. Lower down, opposite to the first, are diamond shaped pale areas, and a second row of larger alternating spots upon the second, third and fourth rows of scales. The spots of this and of the upper series become larger anteriorly, and are bordered above and below with black; the pale areas become obsolete. There are two parallel black lines upon the neck; one oblique, upon each side of the neck; one extending from the eye to the mouth, upon the upper border of the eighth superior labial, and an obscure one upon the common suture of the occipitals.

One sp.

Ceylon,

Mr. Cuming in ex.

ELAPHE Fitzinger. Type *E. ? sauromates*.

In Wagler's *Icones Amphibiorum*, 1833, pl. 27. *Syst. Rept.*, 1843, p. 26. *Elaphis* Gthr. *Catal.*, 1858, p. 92, nec Dum. & Bibr., 1854.

218. *E. quateradiatus*. *Tropidonotus elaphis* Wagl. *Natrix elaphis* Bonap. *Elaphis quateradiatus* Dum. & Bib.

Six sp.

Italy,

Dr. Wilson. (Bp. Coll.)

219. *E. tæniurus nobis*.

As in many other serpents of Eastern Asia, the maxillary and mandibular teeth become gradually longer anteriorly. Head slightly distinct, lanceolate, muzzle obtuse. Tail one-fifth the total length, flat beneath. Twenty-five rows of scales, those from the ninth to the sixteenth keeled. Rostral plate broader than high, the labial suture one-third the nasal, less than the prefrontal. Eight superior labials, fourth and fifth bounding the orbit. Seventh much longer than high, bounded above by a long temporal, and by a short one, which also bounds the eighth labial. Postoculars two, superior largest. Preoculars two, as in other species of the genus, the superior very large, its horizontal diameter greater than the length of the loreal. The latter plate much longer than high. Postfrontals large, bent upon the sides. Anterior

border of the vertical shorter than the straight, convergent lateral; posterior angle obtuse. Superciliaries large. Occipitals elongate, external borders convergent, bounded by two long temporals. Inferior labials ten, eleven, or twelve. Gastrosteges 232; one divided anal; urosteges 101 pair. Total length of specimen from Ningpo 64 in., tail 13 in.; specimen from Siam 30 in., tail 6 in., 3 lines.

Coloration. Above, an olivaceous ash, or clay color, more olive anteriorly. A blackish lateral band extends from the tip of the tail, throughout the posterior third of the body, where it extends from the second to the ninth rows of scales, reducing the ground color to a dorsal stripe of three or four scales in width. It is divided by a number of irregular narrow vertical lines, at regular distances. The superior border is prolonged upon the anterior two-thirds of the body as an irregular, narrow, longitudinal black band, connected with that of the opposite side by similar short transverse bands at distances of four or five scales. Irregular black borders and centres of the median lateral scales, are the only indications of the inferior part of the lateral band anteriorly. Gastrosteges tipped with black anteriorly; the central parts become gradually darker posteriorly, but finally give place to a yellow median band which extends to the tip of the tail. This is bounded by a blackish band on each side, which is separated from that of the sides by another yellow one, which involves the tips of the gastrosteges, and first row of scales. The only marking upon the head is a black postocular vitta, which extends along the upper borders of the labials and no farther, parallel to the commissure of the mouth. Pectus, throat, chin and superior labials yellowish.

One sp.	Ningpo,	Dr. McCartee.
One sp.	Siam,	Dr. J. E. Simple, U. S. N.

We can find no notice of this fine serpent, except a brief description appended to specimen *c* under *Elaphis virgatus* of the British Museum Catalogue. This specimen, which is from Chikiang, China, most probably belongs to the present species. *Elaphis virgatus* differs from *taeniurus* in its more elevated rostral with more equal borders, its shorter loreal and preocular, etc.

E. bilineatus *Hallowell*, Proc. Acad., 1860, p. 497, from Japan, is nearly allied to, if not a variety of, *E. quadrivirgatus* *Gthr.*

NOTE.—In these Proceedings, 1860, p. 241, we characterized a genus of serpents from West Africa, having entire urosteges, under the name *Pariaspis*. This name we find must give way to *Elapops*, *Gthr.*, of a few months prior date; vid. Ann. Mag. Nat. Hist. 1859, 151. *E. modestus* *Gthr.*, appears to differ from *E. plumbeater* in having but one postocular, two temporals bounding the occipital instead of one, and in color. In the latter species there is no shade of olivaceous. The plate represents a rather broader vertical and perhaps a smaller rostral. We look for further specimens to substantiate these differences.

Ozyrhopus melanocrotaphus *nobis*, l. c., p. 260, is apparently *Crotaphopeltis rufescens* *Fitz.* The latter genus differs from *Sibon* in its entire anal plate.

Phimothyra nobis, l. c., p. 253, is intended to take the place of *Salvadora* *Bd. & Grd.*, the latter name having been previously applied by *Linnæus* to a genus of plants.

Phyllobates auratus, l. c., p. 372, was erroneously stated to inhabit Chili. It has as yet been found only on the Island of Taboga, Bay of Panama.

We are authorized to state that *Lampropeltis multistriata* *Kennicott*, l. c., p. 328, is a misprint for *L. multistrata* *Kenn.*

Descriptions of some New Species of Tertiary Fossils from Chiriqui, Central America.

BY W. M. GABB.

The following species were collected by Dr. John Evans during his examinations, under the patronage of the U. S. Government, in Chiriqui. I have, as yet, received no definite information in regard to their exact locality or geological position. The material is too scant to form a definite idea in regard to their age, but I believe them to be Miocene. Full information on the subject will be contained in Dr. Evans's report. It is worthy of notice that among a large number of specimens there should be so few species. The matrix is a dark, almost black, highly bituminous shale.

TEREBRA.

T. Evansii. Shell turritid, whorls about eight or nine, angulated above; suture distinct; surface polished and marked by an impressed line about a third of the width of the whorl from the upper edge; below marked by several faint revolving lines. Aperture subquadrate, columella somewhat prolonged, tortuous, and with two faint folds; outer lip sinuous, most prominent near the lower part of the mouth. Rather common.

Dimensions.—Length, 1 inch; width of body-whorl, .5 in.; length of aperture, .4 in.

TELLINA.

T. semilævis. Shell subtriangular, truncate posteriorly, inequilateral; beaks one-third of the distance from the posterior extremity, with a faint angulation extending from them, parallel with the posterior side, to the margin; posterior side nearly straight; posterior angle obtuse; anterior end regularly rounded; surface, in the young state, smooth; in the adults, with the marginal half concentrically striate. Very rare.

Dimensions.—Length, .6 in.; width, .75 in.; thickness, .35 in.

CHIONE.

C. sulcata. Shell ventricose, robust, produced posteriorly; umbones large and round; anterior margin regularly rounded, basal sinuous, posterior nearly straight. Umbonal ridge rounded, with the shell posterior to it at a right angle with the rest of the shell, and with a very distinct depression or sulcus anterior to it. Surface marked by about twenty heavy transverse ribs, crossed by numerous radiating impressed lines. Inner margin crenulate. Rare.

Dimensions.—Length, .6 in.; width, .8 in.; thickness, .6 in.

ARCA.

A. Chiriquiensis. Ventricose, inequilateral, umbones very large; hinge line short, with the teeth very small and at right angles to the hinge. Surface marked by numerous radiating ribs, with the depressions between them of about the same size as the ribs: these are crossed by very distinct lines of growth; and on the ribs are numerous small nodes, which appear to be independent of the lines of growth, and are not merely squamose elevations. These nodes are most prominent on the anterior ribs, and become gradually fainter posteriorly until, posterior to the umbonal ridge, they disappear. Area wide and marked by very few angular lines. This species is exceedingly common, and is sometimes nearly three inches across.

Dimensions of the most perfect specimen.—Length, 1.5 in.; width, 1.6 in.; depth of valve, .8 in.

MEMBRANIPORA.

M. speciosa Gabb and Horn. Colony in small encrusting patches, com-
1860.]

posed of cells arranged in irregular lines; cells large, broadly oval; openings of the same shape as the cells, though smaller, by the projection inwards of the wall of the cell. Between the cells are numerous small interspaces formed by the inaccurate apposition of the cells. In this species we found no ovarian vesicles. The common base of the colony is longitudinally and obliquely striate.

Descriptions of Three New Species of Starfishes from Cape St. Lucas.

BY JOHN XANTUS.

1. *ASTERIAS SERTULIFERA*, Xantus.

With five moderately tapering and somewhat angular arms. Length of each arm about two and a quarter times the diameter of the disk. Ambulacral spines very slender, flattened, linear, mostly in a single row. Exterior to them, on the ventral side, a double or treble row of stouter spines of equal length, also somewhat flattened, with blunt extremities. Back of the arm with five pretty regular rows of cylindrical or moderately-tapering spines nearly as large as those on the belly. The lateral rows are more regular than the others, and the spines of these rows arise from a very regular series of subtriangular ossicles, one spine to every alternate ossicle. These back-spines are all crowned at or near their tips with a thick wreath of minute pedicellariæ. No pedicellariæ in the intervals between the spines. Rarely a large pedicellaria in the ambulacral furrows.

Diameter, four and a half inches.

Related to *A. glacialis*.

Found on rocks at low-water mark.

2. *HELIASTER MICROBRACHIA*, Xantus.

Arms thirty-five in number, each in length forming about one-eighth the entire diameter of the body. Ambulacral pores very small, in four rows. Ambulacral spines stout, blunt, and forming a single row. Lateral spines of the arms compressed, very broad and flat, often bifurcated at their extremities. Dorsal spines very small and numerous, uniformly distributed, scattered without order over the surface of the disk and arms.

Diameter, seven inches.

3. *HELIASTER KUBINJI*, Xantus.

Arms twenty-two to twenty-four in number, each in length forming rather less than one-third the whole diameter of the body. Ambulacral spines in a single row. Ventral spines compressed at their extremities. Dorsal spines capitate, in four to six series on the back of the arms; on the disk much larger and less numerous, and with flat or even concave tops. Pedicellariæ thickly distributed between the spines.

Diameter, seven inches.

Collected at Cerro Blanco, off Cape St. Lucas.

I take pleasure in dedicating this species to my countryman M. Kubinji, the accomplished Director of the Hungarian National Museum at Pesth.

Type specimens of all of the above species have been transmitted to the Museum of the Smithsonian Institution.

Descriptions of Two New Species of Pimelodus, from Kansas.

BY CHARLES C. ABBOTT.

1 *Pimelodus Hammondii*, Abbott.—*Spec. char.* Body slender, elongated, and much compressed; the dorsal outline anterior to the dorsal fin, and the facial outline, descend obliquely to the margin of the jaws, without curva-

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ture. The head is much depressed, and very broad, constituting somewhat less than one-fifth of the total length. The mouth is small, and has the upper jaw the longer. The maxillar barbules extend a slight distance beyond the branchial aperture. The eye is of medium size, circular; its diameter entering six times in the length of the side of the head; the orbits are nearly four diameters apart. The spine of the dorsal fin is perfectly smooth; and the spine of the pectoral very coarsely serrated. The caudal fin is moderately forked.

The numbers of the fin rays are D, 1-6. P, 1-10. V, 8. A, 24. C, 27 -
 $\begin{matrix} 5 \\ 5 \end{matrix}$

Color. In alcoholic specimens, the head, back and upper half of the sides are bright sienna; the belly silvery white. Margin of the dorsal, caudal, and anal fins, glossy black; the marking on the anal broader and not so deep. Numerous small, circular black spots are scattered irregularly over the body, in appearance similar to those of the Trout (*S. fontinalis*), except in color.

Habitat. Fort Reily, Kansas.

This species is named in honor of Dr. Wm. A. Hammond, who has presented the Academy with many new and valuable western fishes.

2. *Pimelodons notatus*, Abbott.—*Spec. char.* The head and body are very much compressed, and the body tapers rapidly to the tail. The peduncle of the tail is slender and increases in width as it approaches the insertion of the fin. The facial outline is very oblique, and with the dorsal outline makes considerable curvature, from the anterior insertion of the dorsal fin to the extremity of the upper jaw. The eyes are large, situated equidistantly between the extremity of the upper jaw and margin of the opercle; the diameter of the orbit is contained four times in the length of the side of the head. The spines of both dorsal and pectoral fins are finally serrated. The anterior insertion of the dorsal fin is equidistant between the insertions of the pectoral and ventral fins. The extremities of the rays of the pectoral extend to the insertion of the ventral fins. The extremities of the rays of the ventral extend beyond the anterior insertion of the anal fin. The anal fin is large; the base equal to one-fourth of the total length. The caudal fin is very deeply forked.

The numbers of the fin-rays are D, V, A, C.

Color. In alcoholic specimens, the head and back are umber color; sides and belly yellowish, with metallic lustre. A circular black spot exists at the origin of the lateral line.

Total length seven inches.

Habitat. Fort Reily, Kansas.

Dr. Wm. A. Hammond has presented the Academy with a single specimen of this *Pimelodus*.

Descriptions of new North American Coleoptera, in the Cabinet of the Entomological Society of Philadelphia.

BY GEO. H. HORN.

NOMARETUS Lec.

N. imperfectus.—Black, smooth and glossy; antennæ and palpi rufous; thorax cordate, canaliculate, narrowed posteriorly, with a slight transverse and rather deep basal impression; elytra each four striate, striæ punctate, and decreasing in length from the suture outwardly, fourth stria obsolete, the arrangement of the striæ forms an oblong space, which is slightly flattened, sides of elytra smooth and glossy.

Length .40.

Plate 8, fig. 1.

This beautiful little insect, of which but few specimens have been obtained, has been found only in Hampshire county, Virginia, in the most rocky portions 1860.]

of the Allegheny ridge, which traverses that section. The species may be easily distinguished from any other of this genus, by its four striate elytra, the species previously described have their elytra ten or eleven striate.

ARHOPALUS, Serv.

A. Wilsonii.—Brown, head large, eyes and tip of mandibles black; antennæ long, equalling, in males, one and a half times the length of the insect; thorax spheroidal, faintly margined anteriorly and posteriorly with yellow; elytra each with a short basal band of yellow, which does not extend completely over the humerus, an oblique yellow band a little before the middle, which widens as it passes outwardly, with a marginal and a faint sutural extension of the same towards the base of the elytra; femora slightly clavate; posterior tibiæ much flattened, curved, and blackish towards the tips; tarsi testaceous, claws black.

Length, .75.

Plate 8, fig. 4.

Two specimens. Comal county, Texas. It affords me pleasure to dedicate this beautiful species to my friend, Dr. Thomas B. Wilson, whose labors for entomological science I endeavor to acknowledge.

CLYTUS, Fabr.

C. nitidus.—Black, antennæ short, head large, with two vertical yellow lines; thorax spheroidal, margined anteriorly and posteriorly with yellow, at the posterior third are four short yellow bands in one transverse row; elytra with four yellow bands, the third and fourth transverse, the latter terminal, the anterior two bands oblique, and united by a sutural stripe; an obsolete patch of yellow near the humerus; incisures margined with yellow; sides of pectus yellow; legs rufous, hairy; posterior pair elongate; femora clavate, covered with minute cinereous hairs, and blackish towards the tips; posterior femora not spinous.

Length, .42—50.

Plate 8, fig. 2.

Only two specimens have been examined. It may be worthy of notice that these were obtained from widely separated localities. The specimen in the Society's cabinet was taken in Comal county, Texas, while that in the collection of Mr. George Newman was obtained in Gloucester county, N. J. They have been several times compared, and have been found to differ only in size, the Texas specimen being the larger.

LEPTURA, Linn.

L. aurata.—Yellowish; eyes black; labrum sometimes of a metallic green color; head and thorax rufous, the latter somewhat globular, much contracted anteriorly and slightly posteriorly; elytra yellowish, clothed with short golden hairs, densely punctured, slightly narrowed posteriorly, with a lateral and a sutural stripe on each, extending over three-fourths of the length of the elytra. The lateral stripe is sometimes broad and clavate; legs yellowish; femora more or less clavate.

Length, .32—34.

Plate 8, fig. 5.

Allegheny Ridge, Western Virginia. Abundant. The male of this species is much smaller than the female, more slender in form, and elytra much more narrowed toward the apex, and the lateral and sutural stripes not so broad.

L. nitidicollis.—Black; first joint of the antennæ brown; mandibles and palpi yellowish, with the tip of the former and last joint of the latter blackish; head and thorax glossy, the latter narrowed in front, obtusely

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angulated at the sides, dorsal line distinct; elytra gradually tapering toward the apex, which is round, a linear marginal, and a median yellowish stripe on each elytron, extending nearly to the apex, where it becomes confluent with the suture, the median is suddenly expanded anteriorly to the scutel, and posteriorly from the suture outward; legs rufous; femora slightly clavate, and black toward the tips.

Length, '32—36.

Plate 8, fig. 6.

Allegheny Ridge, Western Virginia. This species varies by the posterior fourth of the median stripe in some specimens tapering to a point, and in others it is separated from the remainder of the stripe.

The male, as in the former species, is smaller and more slender in form than the female.

EGILOPSIS.

Antennæ approximate, longer than the body, densely pilose beneath, first joint cylindrical, equalling in length the third or fourth joint.

Eyes lateral, slightly angulate posteriorly, front elongated, inflexed; head and prothorax of equal breadth; elytra somewhat broader; prothorax unarmed; ungues not connate at base.

This genus belongs in the same group of the Lamiaë, with the American genera *Hippopsis* and *Spacalopsis*.

A. cinerea.—Elongate, cinereous, antennæ black, with the proximal extremity of the joints ringed with ash color; thorax cylindrical, much longer than wide, with four longitudinal dark stripes, two lateral, and two close together on the superior surface; elytra, with two dark obsolete stripes on each, one sutural and the other traversing the middle of each elytron; sparsely punctured, with black, erect hairs scattered over the surface; apices of elytra spinous, and slightly pilose.

Length, '25—30.

Plate 8, fig. 7.

The Society possesses two specimens; they were taken in Comal county, Texas, by E. T. Cresson.

EURYOPTERA.

Eyes deeply emarginate; palpi nearly equal; labrum not emarginate; anterior coxæ not contiguous; meso-sternum triangular, apex acute.

E. sanguinicollis.—Black, opaque, finely granulate, head black, antennæ black, brownish toward the tips, slightly pilose; thorax bright red, slightly canaliculate, twice as broad as long, obtusely angulated on the sides, much contracted posteriorly, narrower than the elytra; elytra black, sides flattened anteriorly, narrowed in the middle, and much broader posteriorly; legs black, pilose; femora strongly clavate; tarsi clothed underneath with silvery white pubescence.

Length, '54.

Plate 8, fig. 3.

Northern New York, Mr. T. B. Ashton. The general appearance of this beautiful insect, is that of a *Callidium*, with a slightly canaliculate thorax; it differs, however, in the non-contiguity of the anterior coxæ.

The Reports of the Recording Secretary, Librarian and Curators were read, as follows:—

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REPORT OF THE RECORDING SECRETARY FOR 1860.

During the year ending 30th November, 1860, there have been elected twenty-one members and six correspondents.

One member has resigned.

Three members have forfeited their membership.

The elections of four members have been reconsidered and declared null and void under Art. IV. of Chapter II. of the By-laws.

Seven members have died, to wit: Major John Le Conte, late Vice-President of the Academy, Mr. George W. Carpenter, late Treasurer of the Academy, Edward Hallowell, M. D., Mr. Augustus E. Jessup, Mr. Peter A. Browne, Bernard Henry, M. D., Henry Clay Caldwell, M. D., late U. S. Navy.

The deaths of the following correspondents have been announced: Mr. Victor Audubon, Prof. A. M. C. Dumeril, Dr. David Dale Owen.

On the 26th of June, Mr. William C. Henszey was unanimously elected Treasurer, to fill the vacancy occasioned by the death of Mr. George W. Carpenter.

During the same period the following papers were read before the Academy, and published in its Proceedings and Journal, except one of those read before the Biological Department, which was published in a medical Journal selected by the author, Mr. Gabb's Catalogue of the Museum and Dr. Fisher's Index, not yet printed.

By J. G. Anthony: "Descriptions of new Species of American fluviatile Gasterpods."

By Charles C. Abbott, six, to wit: "Descriptions of new Species of American fresh-water Fishes." "Description of a new Species of Chatoëssus, etc." "Descriptions of new Species of North American Cyprinidæ." "Description of a new species of Exocetus from Chili." "Descriptions of new Species of apodal Fishes, etc."

By W. G. Binney, two, to wit: "Notes on American Land Shells, No. 6." "Description of new Species of Pulmonata, etc."

By J. B. Buckley, three, to wit: "Texas Ants." "The Stinging or Mound-making Ant of Texas, etc." "Descriptions of several new Species of Plants."

By P. P. Carpenter, "Notice of a Collection of Shells, made at Cape San Lucas, Lower California."

By John Cassin, four, to wit: "Catalogue of a Collection of Birds, made during the survey of a route for a ship canal across the Isthmus of Darien, etc., with notes and descriptions of new species," two papers. "Descriptions of new Birds of Western Africa, etc.," published in the Journal. "Catalogue of Birds from the Island of St. Thomas, W. I., etc."

By Brackenridge Clemens, M. D., five, to wit: "Contributions to American Lepidopterology," parts 3, 4, 5, 6, 7.

By T. A. Conrad, three, to wit: "Descriptions of new Cretaceous and Eocene Shells of Mississippi and Alabama, etc.," two papers, published in the Journal. "Notes on Shells."

By E. D. Cope, eight, to wit: "Catalogue of the Venomous Serpents in the Museum of the Academy of Natural Sciences of Philadelphia, etc.," two papers. "Catalogue of the Calamarian Serpents in the Museum of the Academy of Natural Sciences of Philadelphia." "Catalogue of the Colubridæ, in the Museum of the Academy of Natural Sciences of Philadelphia," with notes and descriptions of new Species. "Notes and Descriptions of new and little-known American Reptiles." "Descriptions of Reptiles from tropical America and Asia." "The Reptilia of the North Pacific Exploring Expedition, etc., by Edward Hallowell, M. D., edited by E. D. Cope." "Descriptions of new Species of the Reptilian Genera Hyperolius, Liuperus and Tropidodipsas."

By Rafael Montes d'Oca, four, to wit: "The Mexican Humming Birds," parts 1, 2, 3 and 4.

By James C. Fisher, M. D.: "Index to the Genera described or referred to

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in the first series of the Proceedings of the Academy of Natural Sciences of Philadelphia, vols. i. to viii. part 1."

By William M. Gabb, ten, to wit: "Descriptions of new Species of Fossils, probably Triassic, from Virginia," published in the Journal. "Descriptions of new Species of Cretaceous Fossils," published in the Journal. "Descriptions of new Species of Cretaceous Fossils from New Jersey." "Descriptions of some Cretaceous Fossils from South America, etc." "On the identity of *Ammonites Texanus*, Rømer, and *A. vespertinus*, Morton." "Catalogue of the Museum of the Academy of Natural Sciences of Philadelphia." "Description of a new Species of Cephalopods from the Eocene of Texas." "Descriptions of new Species of Cretaceous and Tertiary Fossils," published in the Journal. "Descriptions of a new Species of *Cassidulus*, etc." "Descriptions of a new Genera and Species of *Amorphozoa*, etc."

By Wm. M. Gabb and George H. Horn, "Descriptions of new Cretaceous Corals from New Jersey."

By Theodore Gill, six, to wit: "Notes on the Nomenclature of North American Fishes." "On the pertinence of the *Alosa teres*, De Kay, to the Genus *Dussumiera*." "Conspectus Piscium in Expeditione ad Oceanum Pacificum septentrionalem C. Ringgold et J. Rodgers ducibus a W. Stimpson, M. D., collectorum: Sicydiania." "Monograph of the Genus *Labrisomus*." "Monograph of the Genus *Labrax*, Cuv." "Monograph of the *Philypnii*."

By W. A. Hammond, M. D., U. S. A., and S. W. Mitchell, M. D.: "On the physical and chemical characteristics of Corroval and Vao, etc., and on a new alkaloid containing their active principle."

By George H. Horn, three, to wit: "Descriptions of three new species of *Gorgonidæ*." "On Milne Edwards' Synonymy of *Xiphigorgia setacea*." "Descriptions of new Corals in the Museum of the Academy of Natural Sciences of Philadelphia."

By Robert Kennicott, "Descriptions of new North American Reptiles, etc."

By J. W. Lapham, "A list of the Fresh-water Shells of the State of Wisconsin."

By Isaac Lea, LL.D., thirteen, to wit: "Description of three new Species of Exotic Uniones." "Description of Exotic Unionidæ," published in the Journal. "Description of four new Species of Unionidæ." "Description of fifteen new Species of Uruguayan Unionidæ." "Descriptions of five new Species of Uniones from Alabama." "Descriptions of four new Species of *Melaniania* of the United States." "Descriptions of fourteen new Species of *Schizostoma*, *Annulosa* and *Lithasia*." "Descriptions of two new Species of Uniones from Georgia." "Descriptions of three new Species of Uniones from Mexico." "Descriptions of six new Species of Unionidæ from Alabama." "Descriptions of seven new Species of Unionidæ from the United States." "Descriptions of three new Species of Exotic Unionidæ." "New Unionidæ of the United States and Northern Mexico," published in the Journal.

By John L. Le Conte, M. D., two, to wit: "Notes on Coleoptera found at Fort Simpson, Mackenzie River, etc." "Synopsis of the *Scaphidiidæ* of the United States."

By James Lewis, M. D.: "Catalogue of the shell-bearing Mollusca observed in the vicinity of Mohawk, N. Y., etc."

By F. B. Meek, "Description of new fossil remains collected in Nebraska and Utah, etc."

By F. B. Meek and F. V. Hayden, M. D., two, to wit: "Descriptions of new Organic Remains from the Tertiary, Cretaceous and Jurassic rocks of Nebraska." "Systematic Catalogue, with synonymy, etc., of Jurassic, Tertiary and Cretaceous Fossils, collected in Nebraska, etc."

By F. B. Meek and A. H. Worthen, two, to wit: "Descriptions of new Species of Crinoidea, etc." "Descriptions of new Carboniferous Fossils, etc."

By James Aitken Meigs, M. D.: "Observations on the form of the Occiput in the various races of men."

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By R. Ostensacken, "Appendix to the paper entitled 'new Genera and Species of North American Tipulidæ with short palpi.'"

By Temple Prime, two, to wit: "Descriptions of new Species of *Cyrena* and *Corbicula*, etc." "Synonymy of the Cyclades, etc., part 3."

By John H. Redfield, "Descriptions of a new Species of *Marginella*."

By Henry D. Schmidt, "Method of painting moist anatomical preparations."

By Capt. J. H. Simpson, "Notice of Geological Discoveries, etc."

By H. T. Stainton, (London), "Observations on American *Tineina*."

By William Stimpson, "Prodromus Descriptionis Animalium evertentorum, etc. Pars viii. Crustacea Macrura."

By Philip R. Uhler, "Hemiptera of the North Pacific Exploring Expedition, etc."

By Alexander Wilcocks, M. D.: "Reflections upon the nature of the temporary star of the year 1572, etc." published in the Journal.

By Horatio C. Wood, Jr., three, to wit: "Contributions to the Carboniferous Flora of the United States," Nos. 1 and 2. "Catalogue of Carboniferous Plants in the Museum of the Academy of Natural Sciences of Philadelphia."

By J. J. Woodward, M. D.: "Remarks on errors in the Anatomical Diagnosis of Cancer."

In all ninety-six papers of which three were read before the Biological Department.

The following addition to the By-Laws was adopted on the 31st of January.

CHAPTER XIV.

PUBLICATION FUND.

ARTICLE I.—The Academy hereby establishes a permanent fund to be called the "Publication Fund," the principal of which shall always be kept invested in good securities, and the interest accruing thereupon shall be applied to the payment of the expenses of publishing such matters, stated or occasional, as the Academy may think proper to issue.

ARTICLE II.—All monies which may be paid or contributed to the "Publication Fund," shall be held by the Academy in trust for the purposes set forth in the first article of this chapter.

ARTICLE III.—The said monies shall from time to time be invested in the corporate name of the Academy, in the public loans of the State of Pennsylvania or those of the city of Philadelphia, or in such sound real estate securities as the Academy may direct.

ARTICLE IV.—No investment shall be changed without the consent of the Academy, and all monies received in consequence of any such change shall be invested for the same trusts as the original fund.

ARTICLE V.—The Treasurer shall open a separate account in the proper books of the Academy, under the head of the "Publication Fund," in which shall be entered all payments and contributions for the purposes of said Fund, and all other matters and things relating to said account.

ARTICLE VI.—Any person who shall pay to the Treasurer of the Academy the sum of twenty-five dollars in aid of this fund, shall be entitled to receive a copy of the Proceedings during life, and any person who shall in like manner pay the sum of fifty dollars shall be entitled to receive a copy of the Journal during life.

ARTICLE VII.—To every person whose contribution to the Publication Fund shall entitle him to receive a copy of the Proceedings or Journal or both, a certificate shall be issued, in such form as the Academy shall prescribe, containing a copy of this chapter and a statement of the amount of his contribution.

The following amendment to the By-laws was adopted on the 28th of February:

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The Department B shall be denominated the Geographical Department of the Academy.

No report of the organization of this department has been communicated to the Academy.

All of which is respectfully submitted.

B. HOWARD RAND, M. D.,

Recording Secretary.

REPORT OF THE LIBRARIAN FOR 1860.

The Library of the Academy has, during the past year, been increased by 351 volumes and 629 periodicals and pamphlets, on subjects belonging to the Natural Sciences. Of these works, 111 are from authors, 160 from editors, 321 from Societies, 45 from Dr. J. H. Janeway, 32 from Dr. S. Weir Mitchell, 167 from Dr. Thomas B. Wilson, and 144 from other members and correspondents. During the year that has just closed, 269 volumes have been bound: 71 at the expense of Dr. Wilson, and 198 by the Academy. The department of the Library appropriated to periodicals, as was stated in the last report would be the case, is very much straitened for room, and the recommendation then made in regard to the construction of additional cases is now repeated. Unless additional room is obtained, it will be impossible to place the books properly upon the shelves. No books are believed to have been lost or missed from the Library during the last year.

It is of great importance that all valuable books of Natural Science, in all its departments, should be added to the Library as soon as they are published, in order that it may keep pace with the progress of knowledge and maintain that superiority as a Library of reference which it now possesses. The ordinary means of the Academy will not permit this, and meet its other necessary expenses. Several gentlemen have united in a subscription of a certain sum per annum for 5 years, to meet this want. These subscriptions are not binding unless 25 subscribers are obtained. Four are yet wanting to complete the number, and it is hoped that these will soon be found, so that the Library may be placed in such a condition as will secure its most eminent usefulness in the cause of Science.

Respectfully submitted,

JAMES C. FISHER, M.D.,

Librarian.

REPORT OF THE CURATORS FOR 1860.

All departments of the Museum of the Academy under the general charge of the Curators, continue in their usual good state of preservation, exhibit great forwardness in their arrangement, and have been constantly increasing through donations.

Since the last Report was presented to the Academy, the following additions have been made to the collections:

Mammals.—Of these, 32 specimens of 23 species have been received. Among them may be especially mentioned a fine specimen of the Moose, presented by H. T. Desilver, Esq. The others were presented by the Smithsonian Institution, John Krider, Dr. J. H. Slack, Dr. Jos. Wilson, Capt. J. M. Dow, Major Le Conte, C. J. Hering, D. Samuel, and Dr. Corse.*

Birds.—During the present year the extensive collection of birds, for which the Museum of the Academy has been especially distinguished, numbering about 26,000 mounted specimens, but which had merely been deposited with

* The names of the donors are given in the order of value of their contributions.

the Academy by Dr. Thomas B. Wilson, was now presented by this gentleman to the Institution.* In addition to these, Dr. Wilson presented 2000 skins, or unmounted specimens, and more recently 27 birds from Jalapa, Mexico.

54 specimens, 34 species of birds collected by Mr. Du Chaillu, in Western Africa, were purchased and presented by Dr. T. B. Wilson, Jos. Jeanes, Sam. Jeanes, Ed. Harris, I. Lea, W. S. Vaux, Dr. J. D. Logan, J. C. Trautwine, Dr. W. M. Uhler, E. Durand, C. E. Smith, Aubrey H. Smith, W. P. Foulke, Fairman Rogers, Dr. J. L. Le Conte, and Jos. Leidy.

17 specimens of birds from Hudson Bay were presented by the Smithsonian Institution; specimens were presented by Dr. Jos. Wilson and Lieut. Thos. T. Field; an interesting collection from St. Thomas, W. I., was presented by Robt. Swift, and a collection from New Grenada, S. A., by Wm. P. Breed. In addition, Dr. J. K. Kane presented a collection of eggs, obtained by his brother in the Arctic region.

Reptiles.—Of these, the Smithsonian Institution presented 80 specimens of 48 species, all North American, and mostly Western; Dr. T. B. Wilson presented 100 specimens of 16 species from Jalapa, Mexico; and others were received from Dr. J. H. Slack, Dr. Jos. Wilson, Major Le Conte, Capt. John M. Dow, E. T. Cresson, W. J. Taylor, John Krider, Van Amburg & Co., Sam. Darrach, Dr. Semple, and Messrs. Cope and Powel.

Fishes.—Of these, Dr. J. H. Slack presented a collection from Minnesota, consisting of 100 specimens of 8 species; Mr. C. C. Abbott presented 16 specimens of 11 species; Mr. S. Ashmead 7 species; and others were presented by Isaac Tyson, Major, Le Conte, T. W. Norris, S. Powel, W. Coleman, Dr. T. C. Dunn, Dr. J. C. Morris, W. E. Halloway, L. Purves, Dr. R. P. Harris, E. P. Mason, and N. and E. Smith.

Mollusks.—The Smithsonian Institution presented 350 species marine and fluviatile shells, from Wilkes' Exploring Expedition; Mr. S. S. Haldeman presented 42 fluviatile shells, being types of descriptions and figures; Mr. J. S. Phillips presented 51 fluviatile gasteropods, not previously in the collection of the Academy; F. A. Sauvalle presented 93 species of Cuban terrestrial gasteropods; Temple Prime 47 cyclididæ; Mr. Binney 42 species of shells; and others were presented by the Smithsonian Institution, Edward M. Kern, A. A. Gould, Isaac Lea, R. Swift, Capt. M. Blanchard, Dr. Jos. Wilson, Dr. N. Koller, and Lieut. T. Y. Field.

Articulates.—Messrs. C. C. Abbott, H. C. Wood, G. H. Horn, and E. D. Cope presented 380 specimens of about 50 species of spiders, collected in Pennsylvania and New Jersey; J. M. Glasco presented 150 coleoptera, from Texas; and other insects, spiders, myriapods and crustacea were presented by Isaac Tyson, Augustus Milson, Capt. John M. Dow, Dr. Semple, Dr. Bridges, Mr. Powel, and Mr. Ashmead.

Radiates.—5 Echinoderms were presented by Dr. Jos. Wilson; 1 by Capt. Dow; and specimens of Hyalonema were presented by Dr. Ruschenberger and Dr. Sinclair.

Anatomy.—The skull of a walrus was presented by Dr. J. K. Kane; the skull of a Camanche Indian by A. E. Carothers; and miscellaneous specimens were presented by Dr. J. B. S. Jackson, Samuel Darrach, and C. C. Abbott. The widow of the late Peter A. Browne presented to the Academy his collection of the hairs of the various species of men and inferior animals.

Organic Remains.—A large collection of coal plants of Pennsylvania, consisting of upwards of 700 specimens, were purchased from Eli Bowen and presented by Joseph Jeanes, Isaac Lea, W. S. Vaux, W. R. Lejee, E. S. Whelen, Dr. Le Conte, Dr. T. B. Wilson, W. Maetier, B. Marsh, J. C. Trautwine, W. C. Henszey.

* See page 86 of this volume of the Proceedings.

Foulke, Jos. P. Smith, Ch. E. Smith, Saunders Lewis, Griffith, and Cooke. Mr. W. S. Vaux presented 20 specimens of 15 species of coal plants, and others were presented by Dr. W. C. Dixon, H. C. Wood, W. M. Gabb, M. Baird, T. Ward, and J. T. Piggott.

Dr. J. H. Slack presented a valuable collection of remains of Mosasaurus, Myliobates and Characodon, from the New Jersey green sand; Messrs. Abbott and H. C. Wood presented remains of Crocodilus, Priscodelphinus, and Turtles, from New Jersey; and Mr. Abbott also presented remains of several extinct fishes. Mr. Lea presented several bones of the extinct Hippopotamus of Italy; Prof. Rogers a saurian vertebra from the North Carolina coal field; and A. C. Orrick a Mastodon tooth from Missouri.

Small collections of invertebrate fossils were presented by W. M. Gabb, E. L. Perkins, C. C. Abbott, F. Kellog, Dr. C. M. Wetherill, Dr. Moore, E. D. Cope, H. C. Wood, C. C. Cadwalader, W. J. Taylor, P. T. Tyson, T. A. Conrad, and A. L. Gerhart.

Minerals.—Specimens of coals and mineral oils, from Western Pennsylvania, were presented by G. T. Lewis; and Dr. W. M. Garsia presented 20 specimens of mineral from Chili. Other specimens were presented by Capt. Nicholson, W. S. Vaux, T. F. Moss, E. L. Perkins, W. L. Mactier, J. H. Janeway, J. H. Thompson, Potts & Klett, P. C. Horn, Dunlap, Rand, Hartman, Lea, Marsh, McKibben, Short, Hanson, Wood, Hœckley, and Pierce.

Botany.—H. W. Ravenel presented the 5th fasciculus of his *Fungi Caroliniani*, and Cryptogamic specimens were presented by H. C. Wood, Dr. Hufnagle, D. R. Bennett, Rand, and Kaul.

Submitted by

JOSEPH LEIDY,

Chairman of the Curators.

The Committee on the Jessup Fund presented the following rules, which were adopted:—

- I. Applications for benefits from the Jessup Fund shall be made in writing to the Committee every three months.
- II. Benefits from the Fund shall not be received by the same person for a longer period than two years, without the unanimous consent of the Committee.
- III. The beneficiaries shall devote one-half of their time, under the direction of the Committee, to the study and arrangement of the Museum of the Academy.

IV. Each beneficiary shall receive \$20 monthly by an order from the Committee on the Treasurer.

The following amendment to the By-Laws was finally adopted:—
To Article VII. Chapter 10, add the words, “of more than twenty of those extra copies.”

The election of Officers for the ensuing year was held in accordance with the By-Laws, with the following result :—

<i>President,</i>	ISAAC LEA, LL. D.
<i>Vice-Presidents,</i>	Robert Bridges, M. D., Wm. S. Vaux.
<i>Corresponding Secretary,</i>	Thomas Stewardson, M. D.
<i>Recording Secretary,</i>	B. Howard Rand, M. D.
<i>Librarian,</i>	James C. Fisher, M. D.
<i>Treasurer,</i>	Wm. C. Henszey.
<i>Curators,</i>	Joseph Leidy, M. D., Wm. S. Vaux. John Cassin, J. Dickinson Sergeant.
<i>Auditors,</i>	Wm. S. Vaux, Joseph Jeanes. Aubrey H. Smith.
<i>Publication Committee,</i>	Wm. S. Vaux, Isaac Lea, Robert Bridges, Joseph Leidy, Thomas Stewardson.

ELECTIONS IN 1860.

The following persons were elected Members, viz :—

Jan. 31. Wm. M. Gabb, Wm. L. Mactier.

Feb. 28. Franklin A. Comly, William W. Longstreth, Samuel M. Felton.

March 27. E. Otis Kendall, Alexander Johnston, Thomas Meehan, Charles A. Kingsbury, M. D.

April 24. Solomon W. Roberts, Edward Burd Grubb.

May 29. Andrew Coates, Francis Moore, M. D., John G. Bell, Edward R. Mordecai, M. D., Henry M. Watts, D. G. Elliott.

June 26. J. T. Platé, Philip A. Cregar, Joseph W. Drexel.

July 31. George S. Pepper, Wm. P. Wilstach, James C. Hand, Edward Craig Mitchell, Chris. J. Cleborne.

Sept. 25. Richard Wood.

Oct. 30. William S. Torr, John Ashhurst, M. D., George W. Carpenter, Jr.

Nov. 27. Edgar L. Thompson, Rowland E. Evans, Robert Bolling, M. D., William Potts, Wm. B. Sinclair, M. D., U. S. N., David Reece, Hugh D. Vail.

Dec. 25. A. J. Foard, M. D., U. S. A., John Warner, Felix B. Carbonell, Edward Parrish.

The following persons were elected Correspondents, viz :—

Feb. 28. Prof. Charles Smallwood, M. D., Montreal.

March 27. Hermann Walthu, M. D., Dresden ; Wm. B. Carpenter, M. D., F. R. S., London ; Charles Darwin, F. R. S., London.

Nov. 27. Theodore Gill, Washington ; Chev. A. C. Bernardi, Paris.

Dec. Prof. Jules Marcou.

CORRESPONDENCE OF THE ACADEMY, 1860.

Letters were received and read as follows, viz. :

Jan. 3d. From P. B. Duchailu, New York, Dec. 29th, 1859, in reference to claim for outfit.

From Committee of the Humboldt Foundation, in connection with the Royal Prussian Academy of Sciences, Berlin, June 28th and Nov. 3d, 1859, proposing to establish a fund in honor of Humboldt, for the furtherance of scientific pursuits.

From Prof. Encke, of Royal Prussian Academy, Nov. 17th, 1859, on the same subject.

10th. From Wm. J. Hamilton, Esq., London, Dec. 14th, 1859, acknowledging his election as correspondent.

From Dr. John Evans, Washington, Nov. 25th, 1859, in reference to a large meteorite near Port Orford, Washington Territory, and desiring aid in procuring the same.

From John Welsh, Esq., Philadelphia, Jan. 3d, 1860, acknowledging his election to membership.

17th. From W. E. Moore, East Brooklyn, Jan. 13th, 1860, asking orders for specimens of Natural History, to be collected by him in South America.

24th. Chas. J. Elliott, Montgomery Co., Pa., Jan. 17th, 1860, requesting a copy of the Constitution, &c., for the "Cabinet of Natural Science of Montgomery Co."

Feb. 7th. From the Physico-Medical Society of Würzburg, Sept. 26th, 1859 ;

Royal Danish Society of Sciences, Copenhagen, July 1st, 1859 ;

Royal Bavarian Academy of Sciences, Munich, Oct. 28th, 1859 ;

Imperial Society of Naturalists of Moscow, June 22d, 1859 ;

Royal Society of Sciences, Göttingen, Sept. 13th, 1859 ;

Royal University Library, Göttingen, Oct. 21st, 1859 ;

Royal Society of Sciences, Upsal, Sept. 15th, 1859 ;

H. G. Bronn, Heidelberg, July 16th, 1859 ; severally acknowledging the receipt of the publications of the Academy.

From the Royal Danish Society of Copenhagen, July 1st, 1859 ;

Royal Bavarian Academy of Sciences, Munich, Oct. 1st, 1859 ;

Imperial Society of Naturalists, Moscow, June 13th, 1859 ;

Zoological Society, London, Jan. 20th, 1860 ; severally accompanying donations to the Library.

From the Naturforschende Gesellschaft, Freiburg, Oct. 20th, 1859, accompanying donation to the Library, and acknowledging the receipt of the Proceedings of the Academy.

From H. Davis, McGregor, Iowa, Jan. 21st, 1860, offering collections in exchange, &c.

G. C. Swallow, Columbia, Mo., Jan. 20th, 1860, acknowledging his election as correspondent.

Dr. Evans, Washington, Feb. 4th, 1860, in reference to a memorial to Congress on the subject of the meteorite in Washington Territory.

21st. T. Oldham, Esq., of the Geological Museum, Calcutta, June 28th, 1859, transmitting survey of India.

British Museum, Dec. 20th, 1859, acknowledging the receipt of the publications of the Academy.

March 6th. From C. W. Holman, New York, Feb. 28th, 1860, asking a copy of the annual reports for the Library at Westerås, Sweden.

March 13th. From C. Smallwood, M. D., Canada East, March 6th, 1860, acknowledging his election as correspondent.

Lucien Buquet, Feb. 18th, 1860, transmitting publications of the Entomological Society of France.

T. Dunlap, Esq., Philadelphia, March 13th, 1860, accompanying donation to Library.

S. M. Felton, Philadelphia, March 5th, 1860, acknowledging his election to membership.

Mrs. Lucy W. Say, Newburg, N. Y., March 2d, 1860, in reference to the appropriation of the proceeds of the sale of the American Conchology.

April 3d. C. J. Hering, Surinam, Feb. 20th, 1860, accompanying donation to Museum.

R. Champley, Scarborough, England, March 6th, 1860, asking drawing of *Alca impennis*, &c.

Charles Müller, Berlin, Feb. 28th, 1860, in reference to exchanges.

Smithsonian Institution, Jan. 6th, 10th, and 12th :

Academy of Sciences, St. Louis, Mo., severally acknowledging the receipt of the publications of the Academy.

Chas. F. Loosey, N. Y., Nov. 15th, 1859, transmitting the report of the first meeting of the Miners and Smelters, Vienna.

Royal University of Christiania, Norway, Nov. 15th, 1859, transmitting *Scripta Academica*.

10th. Geological Society of London, Dec. 15th, 1859 ;

Royal Bohemian Society of Sciences, Prague, Nov. 20th, 1859 ;

Society of Friends of Natural Knowledge, Mecklenburg, Oct. 29th, 1859 ; severally acknowledging the receipt of the publications of the Academy.

Natural History Society of Wurttemberg, Jan. 10th, 1860, transmitting donations to Library, and acknowledging the receipt of the publications of the Academy.

Natural History Society of Riga, Oct. 26th, 1859 ;

Royal Jablonowski Society at Leipsig, Nov. 20th, 1859 ;

Royal Bohemian Society of Sciences, Prague, Nov. 28th, 1859 ;

Society of Naturalists at Altenburg, Nov. 15th, 1859 ; severally transmitting donations to the Library of the Academy.

17th. Geological Society of Dublin, March 27th, 1860 ;

G. W. Fahnestock, Philadelphia, April 11th, 1860 ; severally transmitting donations to the Library.

New York State Library, Albany, April 10th, 1860, acknowledging the receipt of the Proceedings of the Academy.

May 1st. Thos. H. Huxley, London, April 16th, 1860, acknowledging his election as correspondent.

15th. H. De Saussure, Geneva, Switzerland, April 20th, 1860, acknowledging his election as correspondent.

H. T. Desilver, Philadelphia, May 15th, 1860, accompanying donation to Museum.

22d. Natural History Society of the Grand Duchy of Nassau, 1859 ;

Royal Academy of Sciences, Amsterdam, Nov. 30th, 1859 ;

Imperial Academy of Sciences, Vienna, Dec. 17th and July 7th, 1859 ;

Royal Academy of Sciences, Stockholm, Nov. 24th, 1859 ; severally accompanying donations to the Library.

Société de Physique et d'Histoire Naturelle, Geneva, Nov. 5th, 1859, accompanying donations to the Library, and acknowledging the receipt of the publications of the Academy.

Natural History Society of the Grand Duchy of Nassau, Weisbaden, 1859

Royal Academy of Sciences, Amsterdam, Oct. 25th, 1859 ;

Smithsonian Institution, April 13th, 1860 ;

Imperial Academy of Sciences, Vienna, Feb. 4th and Oct. 11th, 1859 ;
 Linnæan Society of London, Jan. 1st, 1860 ;
 Natural History Society of Westphalia, Feb. 1st, 1860 ; severally acknowledging the receipt of the publications of the Academy.

Robert Champley, Scarborough, England, May 6th, 1860, acknowledging the receipt of photograph of *Alca impennis*, &c.

June 5th. Lyman C. Draper, Secretary of the Historical Society of Wisconsin, in reference to exchanges.

12th. Smithsonian Institution, June 6th, 1860, accompanying donation to the Library.

George Crowther, New York, May 17th, 1860, in reference to a supposed new butterfly.

19th. United States Legation, Paris, April 30th, 1860, transmitting two livraisons of the *Annales des Mines*.

26th. E. R. Mordecai, Mobile, June 18th, 1860, acknowledging his election to membership.

July 3d. A. P. Turner, New Harmony, Indiana, June 25th, 1860, offering shells from Wabash river, &c.

Royal Society of Edinburgh, March 9th, 1860 ;

Imperial Society of Natural Sciences, Cherbourg, Jan. 20th, 1860 ;

Smithsonian Institution, March 21st and June 15th, 1860 ;

Geological Society of London, May 17th, 1860 ; severally acknowledging the receipt of the publications of the Academy.

H. W. Ravenel, Aiken, S. C., June 22d, 1860 ;

War Department, Washington, June 18th, 1860 ; severally accompanying donations to the Library.

Dr. Hoernes, Vienna, April 23d, 1860 ;

Prof. Edward Suess, Vienna, April 23d, 1860 ;

Chas. Darwin, Kent, England, May 8th, 1860 ;

Geo. R. Von Frauenfeld, Vienna, June 5th, 1860 ;

M. Flourens, Paris, May 14th, 1860 ; severally acknowledging their election as correspondents.

17th. Royal Prussian Academy of Science, Berlin, Dec. 31st, 1859 ;

Senckenberg Natural History Society, Frankfort, Feb. 1st, 1860 ;

Catholic University of Louvain, Nov. 18th, 1859 ;

Natural History Society of Freiburg, May 10th, 1860 ;

Royal Gardener's Society, Berlin, April 5th, 1860 ; severally accompanying donations to the Library, and acknowledging the receipt of the publications of the Academy.

Physico-Medical Society of Würtzburg, April 2d, 1860 ;

Imperial Academy of Sciences, Vienna, March, 1860 ;

Imperial Leopold Charles Dutch Academy of Natural History, Jena, Feb. 27th, 1860 ; severally accompanying donations to the Library.

Imperial Leopold Charles Dutch Academy of Natural History, Jena, Feb. 18th, 1860, acknowledging the receipt of the publications of the Academy.

24th. D. G. Elliott, New York, July 23d, 1860, acknowledging his election to membership.

Charles M. Wetherill, La Fayette, Indiana, June 15th, 1860, accompanying a donation to the Museum.

Royal Academy of Sciences, Letters and fine Arts, Belgium, Sept. 23d, 1858 ;

Physico-Medical Society of Würtzburg, April 2d, 1860 ; severally acknowledging the receipt of the publications of the Academy.

Sept. 18th. J. Barrande, Paris, Aug. 20th, 1860, acknowledging his election

as correspondent and announcing the presentation of several of his publications to the Academy.

Society of Naturalists of New Granada, Bogota, June 14th, 1860, accompanying donation to the Library, and acknowledging the receipt of the publications of the Academy.

Royal Society of London, May 24th, 1860, acknowledging the receipt of the publications of the Academy.

Oct. 2d. Naturforscher Verein in Dorpat, Jan., 1860, accompanying donation to the Library of the Academy.

Smithsonian Institution, March 31st, 1859, acknowledging the receipt of the publications of the Academy.

Charles des Moulins, Bordeaux, July 19th, 1860, acknowledging his election as correspondent.

16th. S. S. Haldeman, Columbia, Pa., Sept. 6th, 1860 ;

F. A. Sauvalle, Havana, April 2d, and Philadelphia, June 14th, 1860 ; severally accompanying donations to the Museum.

Society of Arts and Sciences, Utrecht, Feb., 1860, acknowledging the receipt of the Proceedings of the Academy.

23d. Royal Academy of Sciences, Letters and fine Arts, Belgium, March 20th, 1860 ;

Royal Geographical Society of London, July 13th, 1860 ;

Royal Imperial Geological Institute, Vienna, Aug. 27th, 1859, and March 26th, 1860 ;

W. Haidinger, Vienna, March 28th, 1860 ;

Literary and Philosophical Society, Manchester, May 30th, 1860 ;

Leeds Philosophical and Literary Society, July 24th, 1860 ;

Royal Academy of Sciences, Letters and fine Arts, Belgium, Sept. 16th, 1860 ; severally acknowledging the receipt of the publications of the Academy.

Oct. 23d. Physico-Medical Society of Upper Hesse, June 20th, 1860 ;

Royal Imperial Zoologico-Botanical Society, Vienna ;

Imperial Academy of Sciences, Vienna, June 25th, 1860 ;

Russian Imperial Mineralogical Society, St. Petersburg, April 23d, 1860 ; severally accompanying donations to the Library.

Society of Natural Sciences in Emden, May 21st, 1860 ;

Royal Society of Göttingen, June 3d, 1860 ; severally accompanying donations to the Library, and acknowledging the receipt of the publications of the Academy.

Nov. 13th. Royal Saxon Society of Sciences, Leipsig, July 5th, 1860 ;

Royal Society of Sciences, Upsal, Aug. 4th, 1860 ;

Imperial Academy of Sciences, Belles Lettres and Arts, Lyons, July 11th, 1860 ;

Imperial Society of Naturalists, Moscow, June 13th, 1860 ; severally accompanying donations to the Library.

Royal Physical Society, Edinburgh, April 2d, 1860, accompanying donation to the Library, and acknowledging the receipt of the Proceedings of the Academy.

British Museum, Oct. 26th, 1860, acknowledging the receipt of the Proceedings.

20th. Richard Owen, New Harmony, Indiana, Nov. 14th, 1860, announcing the death of Dr. David Dale Owen, late a correspondent of the Academy.

London Athenaeum, Oct. 30th, 1860, acknowledging the receipt of the Proceedings.

Dec. 4th. Royal Academy of Sciences, Lisbon, May 26th, 1860, accompanying donations to the Library.

11th. Dr. John Gistel, Ratisbon, April 20th, 1860, of the same tenor.

- *18th.* T. J. Hale, Albany, New York, Dec. 17th, 1860, in reference to exchanges of plants.

DONATIONS TO MUSEUM.—1860.

January 3d. A collection of minerals and silurian fossils, from New York. Presented by Edward L. Perkins.

10th. A collection of fishes, crustacea, &c., from Newport, R. I. Presented by Messrs. Powel, Bridges and Leidy.

A white rabbit. Presented by Mr. John Krider.

A small collection of fossils. Presented by Wm. M. Gabb.

A large fungus. Presented by Wm. Kaulf.

17th. A collection of fishes, from Newport, R. I. Presented by Messrs. Powel and Bridges.

Several coal plants. Presented by Wm. M. Gabb.

Human skull, from Marquesas Island. Deposited by Dr. Turner and J. A. Meigs.

Collection of Reptiles. Presented by Dr. Wilson, U. S. N.

24th. Several cretaceous fossils, from New Jersey. Presented by C. C. Abbott.

Collection of remains of Mosasaurus, from Monmouth Co., N. J. Collection of shells from do. Presented by J. H. Slack.

A Remora, from Newport, R. I. Presented by W. E. Holloway.

February 7th. Fungus plant, from a deep coal mine, Pottsville, Pa. Presented by D. R. Bennett.

A bean, from Japan. Presented by I. Lea, LL. D.

Twelve species of shells. Presented by W. G. Binney.

Forty-seven species of Cyclididae. Presented by Temple Prime.

An agate geode, from the Uruguay R., S. A. Presented by J. H. Thomson.

Two fishes, from the coast of New Jersey. Presented by L. Purves.

Remains of Mosasaurus, fishes, &c. From Monmouth Co., N. J. Presented by C. C. Abbott.

Specimens of fossil fishes, from Delaware Water Gap. Presented by the same.

Chaetodon from Newport. Presented by E. P. Mason.

Plectopoma from Newport. Presented by N. and E. Smith.

14th. Small collection of Eocene fossils, from Whenlock, Texas. Presented by F. Kellog.

Mounted specimen of Ateles ater, from South America. Presented by J. H. Slack.

Seven skins of Mammals, viz:—

3 Spermophilus Beechii, 1 Neotoma Mexicana, 1 Lepus artemesia, 1 Lepus, 1 Sciurus, from Western North America. From the Smithsonian Institution.

21st. Specimen of Hematite, from Lancaster Co., Pa. Presented by Wm. L. Mactier.

Specimen of Struvite, from St. Pauls, Hamburg. Presented by John H. Janeway.

Specimen of Agalmatolite, from Moore Co., N. C. Presented by B. G. Dunlap.

Collection of seven hundred coal plants, purchased from Mr. E. Bowen by members of the Academy.

Two teeth of Mosasaurus, from Monmouth Co., N. J. Presented by J. H. Slack.

A specimen of Favosites, a Devonian fossil from the gravel in the neighborhood of Philadelphia. Presented by Dr. Leidy.

Tooth of *Carcharodon acutidens*, from J. H. Slack.

A specimen of Meteoric Iron, from Xiquipilco near Toluco, Mexico. Presented by Wm. S. Vaux.

March 6th. Collection of coal plants 20 specimens, 15 species, from Carbondale, Pa. Presented by Wm. S. Vaux.

Two specimens of Crinoid stems, from White Creek Spring, Davidson Co., Tenn. Presented by Wm. S. Vaux.

Crocodile vertebra, and two phalanges of a saurian, cretaceous, from Monmouth Co., New Jersey. Presented by C. C. Abbott.

Skin of ocelot, *Felis pardalis*, from Central America. Presented by Dr. Wilson, U. S. Navy.

Miocene leaves, from Bridgeton, New Jersey. Presented by C. C. Abbott.

Hyalonema mirabilis, from Hakodadi, Japan. Presented by Dr. Ruschenberger.

13th. Collection of Birds from Hudson's Bay, viz:—

Nyctea nivea, *Bubo virginianus*, *Somateria molissima*, *Astur atricapillus*, *Surnia ulula*, 2 *Dafila acuta*, *Anas boschas*, *Mergus serrator*, 2 *Nettion Carolinensis*, *Bucephala albiola*, *Forlea affinis*, *Pelionetta perspicillata*, *Spatula clypeata*, *Podiceps cornuta*, *Bucephala Americana*, *Ceryle alcyon*, *Chroicocephalus Philadelphia*. Presented by the Smithsonian Institution.

Lorius coccineus, from the Feejee Islands; tail feathers of *Phæthon rubricauda*; 5 specimens of Echinoderms and Star-fish, from Guaymas, Gulf of California; 2 specimens of shells from Panama. Presented by Joseph Wilson, Jr., M. D., U. S. Navy.

Model of a Catamaran. Deposited by J. H. Slack.

Specimens of *Helocætes ferianum*, from Gloucester, N. J. Presented by Theo. Scattergood.

Unio obesus, from specimens of different ages, from Brunswick, Geo. Presented by Isaac Lea, LL. D.

20th. Four bones of the Hippopotamus major, from Florence, Italy. Presented by Isaac Lea, LL. D.

Specimens of Galena, 2 of Iron pyrites and 1 of limestone, from Hakodadi, Japan. Presented by Capt. Nicholson.

Specimen of crystallized phosphate of lime in guano, from Avis Island, Caribbean Sea. Presented by Potts & Klett.

Unio Wilsoni, Lea, from N. South Wales. Presented by Dr. T. B. Wilson.

A collection of mounted birds, numbering about 26,000 specimens, and a collection of bird skins, chiefly duplicates, now in the Hall of the Academy, about 2000 specimens, being his entire collection heretofore deposited. Presented by Dr. Thomas B. Wilson.

April 3d. Specimens in Alcohol of *Dryophis fulgida*, *Boa constrictor*, *Cæcilia*, *Imantodes curchoa*, *Bufo*, *Tiliqua*, Bats, Insects, Scorpions and Myriapods, from near Volc. Palco, San Salvador.

Crabs and ophiocoma, from Panama. Presented by Capt. John M. Dow.

Euprepis, *Euprepis Harlani*, *Boödon*, *Agama*, *Atractaspis irregularis*, *Pariaspis plumbeatra*, *Dryophis Kirtlandi*, *Triglyphodon pulverulentus*, from Liberia. Presented by E. T. Cresson.

Specimens of Chameleon and Mantis, from West Coast, Africa. Presented by Dr. Semple, U. S. Navy.

10th. Tooth of Mastodon, from Benton Co., Mo. Presented by A. C. Orrick, Esq.

Skull of the Walrus. Presented by Dr. John K. Kane.

Sulphate of Barytes, from England. Presented by Wm. S. Vaux.

Three jars with bats, reptiles and fishes, from S. Carolina. Presented by Major Le Conte.

17th. 18 species of pulmonate shells, from the Smithsonian Institution; 15 do. from W. G. Binney; 1 do. from Mr. Powel; 2 species of marine shells, from Capt. Miles Blanchard.

Euneetes murinus, from Surinam. Presented by G. W. Fahnestock.

Two Owls, from Realijo, Nicaragua; a large Pinna, and ligneous texture of an Aloe. Presented by Lieut. Thomas Y. Field.

Two *Geomys pinetis*, *Mustela noveboracensis*, from Georgia. Presented by David Samuel.

White ant of Africa; and polyyps, from the Atlantic Ocean. Presented by J. C. Semple, M. D., U. S. Navy.

Pseudoapatite, from Freiberg, Saxony. Presented by T. F. Moss.

Bradypus tridactylus. Presented by C. J. Hering.

A topaz. Presented by I. G. Cassatt and C. W. Frost.

May 1st. Carbonate of Copper, from Chili. Presented by P. C. Horn.

Fragments of the jaw of a crocodile, from the Green Sand of Monmouth Co., N. J. Presented by H. C. Wood, Jr.

Palatine plate of *Myliobates*, fragments of teeth of *Mosasaurus*, and a collection of shells and belemnites, from Monmouth Co., N. J. Presented by Dr. J. H. Slack.

8th. Specimen of Stilbite, and one of Stilbite and Heulandite, from Flat Rock Tunnel; large fungus, found growing on a paper mulberry tree, Philadelphia. Presented by T. B. Rand.

15th. Specimen of *Tringa Temminckii*, from Marquesas Island. Presented by Joseph Wilson, M. D., U. S. Navy.

Eleven specimens of birds' eggs, collected by Dr. Kane in the Arctic region. Presented by Dr. J. K. Kane.

Fifty-one species of U. S. fluviatile gasteropods, not in the collection of the Academy. Presented by J. S. Phillips.

A fine specimen of the Moose, *Cervus alces*, from Moose-head Lake, Maine. Presented by H. T. Desilver.

Specimens of Lepidoptera, from Manilla.

Fishes, 6 species 4 genera, from the Atlantic Ocean. Presented by Isaac Tyson.

Tropidonotus sirtalis, from Darby, Pa., *Bascanion constrictor*, from do. *Heterodon platyrhinus*, from N. Jersey. Presented by Dr. Leidy.

22d. Specimen of Cannal coal, from Armstrong Co., Pa.; do. coal oil crude, from Suesco Works, Pa.; do. do. refined, from Penna. Salt Co., Pa.; do. Petroleum crude, from Oil Creek, Pa.; do. do. refined, from Penna. Salt Co., Pa.; do. do. once distilled, from Peterson's Well, Pa.; do. do. crude, from Paint Creek, Johnson Co., Ky. From Geo. T. Lewis, Esq.

Specimens of Unionidæ. Presented by Isaac Lea, LL. D.

June 5th. Tarantula and 7 scorpions, from Cuba. Presented by Dr. Augustus Milson, through Dr. Atlee.

Eggs of *Ampularia*, from Florida. Presented by R. Harris, M. D.

Specimen of *Bryttus Chætodon*, from Trenton. Presented by C. C. Abbott.

Between 3 and 400 species of 65 genera of marine and terrestrial shells of Wilkes Exploring Expedition. Presented by the Smithsonian Institution.

One hundred and thirty species of Palæozoic fossils, from Iowa. Received in exchange from J. N. H. Barris.

Two salamanders, and a small collection of Myriapods; a crab, from Newport. From Mr. Powel.

19th. Twelve specimens of ores of zinc, from Bethlehem, Pa., from Mr. Roepper in exchange.

Brcuite, Anthophyllite, Tremolite, &c., from Lancaster and Chester Co., Pa. Presented by W. D. Hartman and Isaac Lea.

Dermognathus fusca and Carphophiops amorna, from New Jersey. Presented by C. C. Abbott.

Vertebra of a Saurian, from Chatham Co., N. C. Presented by Robert E. Rogers.

July 3d. A specimen of Sigillaria, from Hazelton. Presented by Matthew Baird, Esq.

Two specimens of Coal Plants, from Pottsville, Penna. Presented by T. Ward.

Two specimens of Selenite, from Chili. Presented by Dr. W. M. Garsia.

Forty-eight specimens of Land Shells, from Sandwich Isles. Presented by E. M. Kern.

Cast of the Skull of a Flathead Indian, about 22 years of age, who died recently in Boston, also some of the hair of the same. Presented by Dr. J. B. S. Jackson.

Specimen of an Anaconda. Deposited by Dr. J. H. Slack.

Fungi Caroliniani. Fasc. 5. Presented by H. W. Ravenel.

10th. Costal plate of a fossil turtle. Presented by W. W. Fraley.

A collection of 19 specimens of ores of copper, from Chili. Presented by Dr. W. M. Garsia.

24th. Red oxide of copper, specimens of Chlorastrolite, a fossil shell, and specimens of mud and sand, from Lake Superior. Presented by Theo. F. Moss.

A collection of fossils. Presented by Dr. C. M. Wetherill.

Hyla xanthoœnemia, from New Jersey. Presented by Dr. Leidy.

Silver ore, from Nevada Ter. Presented by J. McKibben.

September 4th. A fine specimen of the Meteorite which fell May 1st, 1860, in Guernsey Co., Ohio. Presented by Benj. V. Marsh.

Specimen of bituminous coal from Green River City, Muhlenburg Co., Ky., on banks of Green River, 39 feet above high water. The equivalent of No. 11 of Owen's Reports of Geological Survey of Ky., 4½ feet thick. Presented by J. Short, Esq.

Specimen of bituminous coal, 4 feet vein, supposed to be equivalent of No. 9 of 3d vol. Owen's Report of the Geological Survey of Ky., from Green River City, Muhlenburg Co., Ky., 30 feet below No. 11, and 5 feet above high water. Presented by J. Short, Esq.

Specimens of peat in common use for fuel on railroads in Bavaria. Presented by Richard Wood.

Specimens of Elaps fulvus, Sceloporus undulatus, Anolis caroliniensis, Lygosoma laterale, Dermognathus amiculata; Insects from Mobile, Ala. Presented by Prof. W. J. Taylor.

Specimens of *Ophidia*, viz. 4 Pliocercus elapoides, 8 Catastoma semidoliatum, 30 Ninia diademata, 10 Lampropeltis polyzona, 7 Thamnophis proximus, 1 Thamnophis scalaris, 1 Sibon annulata. *Sauria*—Anolis, Sidrolamprus emreagramma, 6 Sceloporus variabilis, 3 Sceloporus scalaris. *Batrachia*—Bufo, 22 Rana, 2 Spelerpes bellii, 2 Geotriton carbonarius, from Jalapa, Mexico, (collected by R. M. De Oca). Presented by Dr. T. B. Wilson.

11th. Specimen of Porites furcata, from Santa Cruz, W. I. Presented by E. D. Cope.

Specimen of Favosites basaltiformis, from Warren Co., Pa. Presented by E. D. Cope.

56 specimens of Spiders, 23 species from Pennsylvania and Maryland. Presented by G. H. Horn.

18th. A large and interesting collection of birds, from the Island of St. Thomas, West Indies. Presented by Mr. Robert Swift.

A collection of birds from New Grenada, South America. Presented by Wm. P. Breed.

Cistudo ———, from Londongrove, Chester Co., Pennsylvania. Presented by E. D. Cope.

Large and fine specimen of Nickel, from Litchfield, Conn. Presented by Mr. H. C. Hanson.

Fine specimen of Sigillaria, from the mines of Messrs. Geo. Wiggins & Son, Tamaqua, Penn. Presented by Mr. John T. Piggott.

October 2d. Specimens of Millerite. Gap Mine, Lancaster Co., Pa. Presented by F. S. Heckley.

Specimens of Chlorastrolites. Isle Royal, Lake Superior. Presented by J. Newton Pierce.

25 specimens of Araneidæ, from Chester Co. Presented by E. D. Cope.

Sphæria Robertsii. Presented by Dr. Huffnagle.

A fish (Plectropoma,) from Newport, R. I., and a spectrum from Florida. Presented by Dr. R. P. Harris.

Dromicus fugitivus, Trinidad. Presented by Dr. S. W. Mitchell.

A collection, of hairs of various animals, made by the late Peter A. Browne, Esq. Presented by Mrs. P. A. Browne.

9th. 7 specimens 5 species of rodents. Presented by Mr. Krider.

Thamnophis radix, T. sirtalis, Tropidonotus sipedon, Rana Halecina, from Kansas. Presented by Mr. Krider.

Eleuterus cuspidata, Morrhua pruinosa, Anguilla oceanica, Argyreiosus vomer, Saurus fetens, Hippocampus hudsonius, Ophidium marginatum. From Beesley's Point, New Jersey. Presented by Mr. S. Ashmead.

A deformed leopard crab, having the left fore claw double. Presented by Mr. S. Ashmead.

100 specimens, 17 species of Araneidæ, from the neighborhood of Philadelphia. Presented by H. C. Wood, Jr.

66 specimens, 48 species of reptiles. 9 species of Thamnophis, 1 Bascanion, 2 Pityophis, 1 Elaps, 1 Siren. From Nebraska, Puget's Sound, Georgia, California, &c. Presented by the Smithsonian Institution.

A small collection of cretaceous and carboniferous fossils, from Texas. Presented by Dr. Moore.

16th. Shark (Alopias vulpes.) From Newport. Presented by Dr. T. C. Dunn through Mr. Powell.

An Iguana, and palatal teeth of the Drum-fish. Presented by Samuel Darrach through Dr. James Darrach.

Meriones Hudsonius. Presented by Dr. James M. Corse.

4 specimens of Achatina and 3 of Helix, from Cuba. Presented by Dr. N. Kollar.

Pomotis, n. s.; Plagyus cornutus, Hydrargyra. New Jersey. Presented by W. Coleman, Esq.

200 specimens of Spiders, from near Trenton, N. J. Presented by C. C. Abbott.

Catastomus tuberculatus; C. gibbosus; Pomotis appendix; Luxilus argenteus; Hygostoma Newmanii; Pimelodus catus; Ambloplites pomotis. Delaware River. Presented by C. C. Abbott.

A Unio. Presented by Isaac Lea, LL. D.

Three Land Shells. Presented by Temple Prime.

15 species of Marine Shells. Presented by W. G. Binney.

11 species of Shells, types of descriptions in Wilkes' Exploring Expedition. Presented by Dr. A. A. Gould.

93 species of Cuban Terrestrial Shells. Presented by F. A. Sauvalle.

9 species of Shells, from the Spanish Main. Presented by R. Swift.

42 Fluviatile Shells, types of descriptions and figures. Presented by Prof. S. S. Haldeman.

23d. Four Fossil Vertebræ, fragment of Fish-Jaw, and Teeth, from Mullica Hill, Gloucester Co., N. J. Presented by Chas. C. Abbott.

Coregonus albus, from Lake Champlain; *Morone Americana*, from New York; *Morone pallida*, from Delaware River. Presented by Thaddeus W. Norris.

November 6th. *Calyptrophorus trinodiferus*, *Athleta Tuomeyi*. Eocene fossils, from Alabama. Presented by T. A. Conrad.

Hyalonema Sieboldii. Skin of *Galeopithecus*. From Japan. Presented by Dr. Sinclair, U. S. N., through Dr. I. Hays.

Two *Baculites*, from the New Jersey Green Sand. Presented by C. C. Cadwalader.

Two Coal Plants, from Virginia. Presented by Dr. Dixon.

13th. *Retepora*, a Devonian fossil, from Huntingdon Co., Pa. Presented by W. J. Taylor.

Pomotis auritus and *Leuceoperca Americana*, from Lake Erie. Presented by Dr. J. C. Morris.

20th. 27 specimens of Birds, from Jalapa, Mexico. Presented by Dr. Thos. B. Wilson.

Skull of a Comanche Chief, supposed to be that of Yellow Jack, from Texas. Presented by A. E. Carothers.

December 4th. The following Birds, collected by P. B. Du Chaillu in Western Africa:—

1 *Gypohierax angolensis*, (young,) from Cape Lopez. Presented by Dr. T. B. Wilson.

2 *Spizætos*, from Ogobai River. Presented by Mr. Joseph Jeanes.

1 *Micrastur macrourus*, from Ogobai River. Presented by Mr. Samuel Jeanes.

1 *Aviceda cuculoides*, from Ogobai River. Presented by Prof. Jos. Leidy.

1 *Accipiter Toussenelli*, 1 *Accipiter Hartlaubii*, from Ogobai River. Presented by Mr. Wm. S. Vaux.

1 *Scotopelia Peli*, from Moonda River; 1 *Syrnium Woodfordii*, from Moonda River; 3 *Syrnium*, (young,) from Ogobai River. Presented by Dr. Thos. B. Wilson.

2 *Numida plumifera*, from Cape Lopez. Presented by Dr. T. B. Wilson.

2 *Phasidus niger*, from Cape Lopez. Presented by Mr. Joseph Jeanes.

Five Coleoptera. Presented by E. D. Cope.

A collection of 150 Coleoptera, from Upshur Co., Texas. Presented by J. M. Glasco.

A collection of Vertebræ and fragments of Jaw of *Priscodelphinus*. Fragments of Crocodile and Turtle bones, together with an *Ostrea*. From the Miocene Marl of Shiloh, N. J. Presented by H. C. Wood, Jr.

Four Coal Plants, and a small collection of Carboniferous Fossil Shells. From Broad Top, Pa. Several specimens of *Cyathophyllum*. 50 species of Native Mosses. Presented by H. C. Wood, Jr.

Fragment of an Indian Cranium, from near Trenton, N. J. Presented by C. C. Abbott.

11th. 10 specimens of Birds, from Jalapa, Mexico. *Accipiter gilvicolis*, *Buteo*, *Ramphastos carinatus*, *Aulacorampus prasinus*, 2 *Geotrygon*, *Dendrortyx barbatus*, *Tinamus*, *Gallinago*, and *Calidris*. Presented by Dr. Thos. B. Wilson.

The following, from Western Africa, from Du Chaillu's collection :—

- 1 *Polyboroides radiatus*. Presented by Isaac Lea, LL. D.
 - 1 *Haliæetus*; 1 *Circæetus zonurus*. Presented by Dr. T. B. Wilson.
 - 1 *Chætura Sabinei*. Presented by Mr. Joseph Jeanes.
 - 3 *Atticora nitens*. Presented by Mr. Samuel Jeanes.
 - 2 *Cecropis Gordoni*. Presented by Dr. Joseph Leidy.
 - 1 *Cypselus ambrosiacus*; 3 *Caprimulgus Fossii*. Presented by Mr. Wm. S. Vaux.
 - 1 *Eurystomus afer*; 1 *Halcyon senegalensis*. Presented by Dr. J. Dickinson Logan.
 - 1 *Halcyon Dryas*. Presented by Mr. Edward Harris.
 - 1 *Halcyon badius*. Presented by Mr. J. C. Trautwine.
 - 1 *Alcedo leucogaster*. Presented by Prof. Fairman Rogers.
 - 2 *Merops variegatus*. Presented by Mr. W. Parker Foulke.
 - 1 *Merops Bullockioides*. Presented by Mr. Aubrey H. Smith.
 - 2 *Meropiscus gularis*; 1 *Trogon narina*. Presented by Dr. T. B. Wilson.
 - 4 *Sycobius nitens*. From Dr. J. L. Le Conte.
 - 1 *Sycobius cristatus*; 2 *Sycobius nigrifrons*. Presented by Mr. Charles E. Smith.
 - 2 *Sycobius malimbus*. Presented by Dr. W. M. Uhler.
 - 2 *Sycobius Cassinii*. Presented by Mr. E. Durand.
 - 3 *Hyphantornis cinctus*. Presented by Dr. T. B. Wilson.
 - 1 Fossil *Ostrea* and 1 *Pecten*, from Tunis, Africa. Presented by Mr. Wm. S. Vaux.
- A collection of Fossils, 12 specimens, from Scioto River, Delaware Co., Ohio. Presented by Mr. A. L. Gerhart.
- 2 specimens of *Boa Constrictor*, very fine. Presented by Messrs. Van Amburg & Co.
 - 4 specimens of Infusorial Earth, from Calvert Co., Md. Presented by P. T. Tyson.
 - 5 specimens of *Aphredoderus*, from New Jersey. Presented by C. C. Abbott.
- Two Salamanders, from Chester Co. Presented by E. D. Cope.

18th. 129 specimens, 8 species Fishes of the genera *Pimelodus*, *Pomotis*, *Stizostedion*, *Bryttus*, *Esox*, *Pimephales*, and *Hybognathus*. 11 specimens, 4 species Reptiles of the genera *Aspidonectes*, *Natrix*, *Thamnophis*, and *Bascanon*. 3 skins of *Sciurus Hudsonius*. From Minnesota. Collected and presented by Dr. J. H. Slack.

A small collection of Insects and Spiders, from Canada. Presented by S. H. Matthews.

Jahrgang, 1859. Denkschriften der Kaiser, Akad. der Wissenschaften, Mathemat.-Naturwissen. Classe, Banden 16 und 17. Jahrbucher der K. K. Central-Anstalt für Meteorologie und Erdmagnetismus, von Karl Kreil, Band 6, Jahrgang, 1854. From the Imperial Academy of Sciences, Vienna.

Kongliga Svenska Vetenskaps-Akademiens Handlingar. Ny Följd. Andra Bandet. Första Häftet. Kongliga Svenska Fregatten Eugenies Resa Omkring Jordan under befäl af C. A. Virgin Aren 1851,—1853. Af K. Svenska Vetenskaps-Akademiens. Zoologi, 3. From the Royal Academy of Sciences, Stockholm.

Verhandelingen der Koninklijke Akademie van Wetenschappen, Deel 7. Jaarboek van de K. Akad. van Wetenschappen, 1858. Verslagen en Mededeelingen der Konink. Akad. van Wetenschappen. Afdeling Letterkunde Vierde Deel. Afdeling Natuurkunde Deel, 8 and 9. From the Royal Academy of Sciences of Amsterdam.

Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar. Temtonde Afgangen, 1858. From the Royal Academy of Sciences of Stockholm.

Jahrbücher des Vereins für Naturkunde im Herzogthum Nassau, Heft. 13. From the Natural History Society in Wiesbaden.

Die Athysanus-Arten der Gegend von Wiesbaden von C. L. Kirschbaum. 4to. tract. Wiesbaden, 1858. From the Author.

Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westphalens. Jahrgang 16, Erstes.—Viertes Heft. From the Society in Bonn.

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Memoires de la Société de Physique et d'Histoire Naturelle de Genève, Tome 15, Première Partie. From the Society.

Journal of the Proceedings of the Linnean Society, Nos. 7 to 15, incl. Botany and Zoology. Supplements to Botany, Nos. 1 and 2, 1859. Addresses of Thomas Bell, F. R. S., &c., President of the Linnean Society, for the years 1858 and 1859. Lists of the Linnean Society, of London, for 1858 and 1859. The Transactions of the Linnean Society of London. Vol. 23, parts 3 and 4. From the Society in London.

Forty-second Annual Report of the Trustees of the New York State Library. 1860. From the Trustees.

Hutchings' California Magazine. Nos. 39 and 40, Sept. and Oct., 1859. From the Publishers.

Charleston Medical Journal and Review. Vol. 15, No. 3, May, 1860. From the Editor.

Revue et Magasin de Zoologie pure et appliquée, par M. F. E. Guérin-Méneville. No. 4, 1860. From the Editor.

June 5th. Acta Societatis Scientiarum Indo-Neerlandicæ, Volumina 3 et 4. Natuurkundig Tijdschrift voor Nederlandsch Indië uitgegeven door de Natuurkundige vereeniging in Nederlandsch Indië Deel 14, Aflv. 4, 5, and 6, and Deel. 15, 19, and 17. From the Netherlands India Society of Sciences, Batavia.

Mémoires de L'Académie Impériale des Sciences, Arts et Belles-Lettres de Dijon. 2d serie, Tome 7th. From the Academy.

Mémoires de La Société Impériale des Sciences Naturelles de Cherbourg, Tome 6th, 1858. From the Society.

The Gardeners' Monthly. Vol. 2, Nos. 1 to 6. From the Editor.

The Canadian Journal of Industry, Science and Art. New series, No. 27, May, 1860. From the Canadian Institute.

The Dental Cosmos. New series, No. 11, Vol. 1, June, 1860. From the Editors.

The California Farmer, for April 27th, 1860. From the Editor.

Proceedings of the Boston Society of Natural History. Vol. 7, pages 225 to 256. From the Society.

Laws and Regulations of the American Philosophical Society, together with the Charter of the Society, and a list of its members. Philada., 1860. Proceedings of the American Philosophical Society. Vol. 7, January to June, 1860, No. 63. Transactions of the American Philosophical Society. Vol. 11, new series, part 3d, 1860. From the Philosophical Society.

The following is from Dr. T. B. Wilson, on the usual condition:

Bulletin Mensuel de La Société d'Acclimatation Zoologique. Tom. 7, No. 4, Avril, 1860.

12th. List of Members of the Royal Lombard Institution of Science, Letters, and Arts. From the Institution.

The Canadian Journal of Industry, Science and Art. New series, No. 27, May, 1860. From the Institute.

Proceedings of the American Antiquarian Society. April 25th, 1860. From the Society.

The Annals of Science, by Hamilton L. Smith, for Jan., March, April and May, 1854. From Dr. J. L. Le Conte.

Proceedings of the Royal Society of Edinburgh. Session 1858—59. From the Royal Society of Edinburgh.

The following are from Dr. Thos. B. Wilson, on the usual condition:

Zur Fauna der Vorwelt, Von Hermann von Meyer, Vierte Abtheilung, Lieferung 2.

Crania Britannica Decade 4. By Joseph Barnard Davis and John Thurnham.

Palæontographica, Von Hermann Von Meyer. 7 Band, 2 Lieferung, 8 Band, 3 Lieferung.

Hewitson's Exotic Butterflies. Part 34th.

Tables des Comptes Rendus des seances de L'Académie des Sciences. Tome 47.

Oiseaux de La Belgique et Leurs Œufs. Liv. 131 and 132.

Paléontologie Française, Terrains Jurassiques, par Alcide D'Orbigny, Livr. 109 and 110. Terrains Crétacés Livraisons 257 a 260.

Histoire Naturelle des Coléoptères de France, par. M. C. Mulsant, Barbipalpes, Longipèdes-Latipennés, Paris, 1856.

19th. Rheinisches Museum für Philologie, von F. G. Welcker und F. Ritschl. Neue Folge 15th Jahrgang, Heft. 2. From F. Leyboldt.

The Northmen in Iceland. Svo., 1859. Saga Játvardar Konungs Hins Helga, Udgiven efter Islandske oldbøger af det Kongelige Nordiske Oldskrift-Selskab. 8vo. tract, Copenhagen, 1852. From the Royal Society of Northern Antiquaries of Copenhagen.

Natuurkundige Tijdschrift voor Nederlandsch Indië uitgegeven door de Natuurkundige Vereeniging in Nederlandsch Indië, Deel 18th. From the Netherlands-India Society of Sciences.

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Caffeine, as an antidote in the poisonous narcotism of Opium. By Henry Fraser Campbell, M. D. Svo. tract, August, 1850. From the Author.

Southern Medical and Surgical Journal. Vol. 16, No. 5, June 1860. From the Editors.

California Farmer. Vol. 13, Nos. 11 to 13, 1860. From the Editor.

American Medical Times,—being a weekly series of the New York Journal of Medicine. Vol. 1, No. 1. New series, June 2d, 1860. From the Publishers.

The American Handbook of Ornamental Trees. By Thomas Meehan. 18mo. From the Author.

The Gardeners' Monthly and Horticultural Advertiser. Vol. 1, Nos. 1 to 12, 1859. From the Editor.

Palaontology, or a Systematic Summary of Extinct Animals and their Geological Relations. By Richard Owen, F. R. S. 8vo., Edinburgh, 1859. From Mrs. Lucy W. Say.

Journal of the Franklin Institute. 3d series, vol. 39, June, 1860, No. 6. From Dr. T. B. Wilson, on the usual condition.

Annales des Mines Cinquième Série Tome 15, 3d Livraison, 1859. Tome 16, 4th Livraison, 1859. From the Minister of Public Works, France.

On the Alloys of Copper and Zinc. By Frank H. Storer. 4to. tract, Cambridge, 1860. From the Author.

July 3d. General view of the Agriculture of the different Counties of Great Britain, drawn up for the consideration of the Board of Agriculture and Internal Improvement. Forty-five vols. 8vo. London, 1810 to 1813. From Dr. John H. Janeway.

The Dental Cosmos. Vol. 1, New Series, No. 12, July, 1860. From the Editors.

The California Farmer. Nos. 14 and 15, Vol. 13, May and June, 1860. From the Editor.

Walpers, Annales Botanices Systematicæ. Tomi. Quinti. Fasc. 5. From the Author, Dr. Charles Mueller.

Wahrnehmungen bei einer Bereisung des Kupfer- und Blei-Gebeites im nord-westlichen Theile der Vereinigten Staaten Nord-Amerika's. Von Dr. Charles Mayer Wetherill. 8vo. tract Wien. From the Author.

Ornithologie du Canada. Première Partie les Oiseaux de Proie et les Palmipèdes. Par J. M. Le Moine. 12mo., Quebec, 1860. From the Author.

Revue et Magasin de Zoologie pure et appliquée. Par M. F. E. Guerin-Meneville. No. 5, 1860. From the Author.

The Gardener's Monthly. Vol. 2, No. 7, 1860. From the Editor.

Southern Medical and Surgical Journal. Vol. 16, No. 7, July, 1860. From the Editor.

The Quarterly Journal of the Geological Society. Vol. 16, Part 2, May 1st, 1860. From the Society.

Address delivered at the Anniversary Meeting of the Geological Society of London, February, 1860, by J. Phillips, Esq., President. From the Author.

The Natural History of Washington Territory. By J. G. Cooper, M. D., and Dr. G. Suckley, U. S. A. 4to, New York, 1859. From the Authors.

An Illustration of the Genus Cinchona. By Aylmer Bourke Lambert, F. R. S., &c. 4to. London, 1801. From A. J. Brazier.

Reports of Explorations and Surveys to ascertain the most practicable and economical route for a Railroad from the Mississippi River to the Pacific Ocean, in 1853-6. Vol. 11, 4to. From the War Department.

Report of the United States and Mexican Boundary Survey. By William H. Emory, Major, &c. 3 vols., 4to. From John Cassin.

10th. Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth, Ninth, Tenth, Eleventh and Twelfth Reports of the State Board of Agriculture of the State of Ohio. From the Legislature of Ohio.

Rubi Germanici, descripti et figuris illustrati cura A. Weihe et Ch. G. Neesii ab Esenbeck. Bonnæ, 1822, fol. Fasciculi. 1 et 2. From B. Westerman & Co.

American Medical Times. Vol. 1, No. 1, New Series, July 7th, 1860. From the Editors.

Notice of Tertiary Fossils from Labrador, Maine, &c., and remarks on the Climate of Canada in the newer Pleiocene or Pleistocene period. By J. W. Dawson. 8vo. tract. From the Author.

Proceedings of the Boston Society of Natural History. Vol. 7, June, 1860, Pages 257-288. From the Society.

The Canadian Naturalist and Geologist. Vol. 5, No. 3, July, 1860. From the Nat. Hist. Society of Montreal.

American Journal of Pharmacy. 3d Series, Vol. 8, No. 4, July, 1860. From the Editor.

Annual of Scientific Discovery, a Year Book of Facts in Science and Art. 2 vols., 1855 and 1858. From David M. Warren.

Smithsonian Contributions to Knowledge. Vol. 11, 4to., 1859. From the Smithsonian Institution.

The following are from Dr. T. B. Wilson, on the usual condition :

Monographie des Picides. Par Alfred Malherbe. Livraison 4, 1859.

Catalogue of Lepidoptera Heterocera in the British Museum. Part 19. Pyralides, 1859, and Part 20. Geometrites.

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Histoire Naturelle Générale des Règnes Organiques. Par M. Isidore Geoffroy Saint-Hilaire. Tome 3, partie 1.

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Conchologia Iconica. By Lovell Reeve. Parts 195 and 196.

17th. Sitzungsberichte der Dorpater Naturforscher-Gesellschaft. 1854 bis 1856. Archiv für die Naturkunde Liv-, Esth.- und Kurland's Erste Serie Erster Band. Zweite Serie, 1 und 2 Band. From the Natural History Society of Dorpat.

Sitzungsberichte der Kaiserl.-Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche. Classe Nos. 21 bis 28, 1859, und Nos. 1. und 2, 1860 From the Vienna Academy.

Physikalische Abhandlungen der Königl.-Akademie der Wissenschaften zu Berlin, aus dem Jahre, 1858. Mathematische Abhandlungen der K. Akad. der Wissen. zu Berlin. Jahre, 1858. Monatsberichte der Königl. Preuss. Akad. der Wissen. zu Berlin, 1859. From the Academy.

Programmes des Cours de la Université Catholique de Louvain, 1855—60. Annuaire de la Université, &c., 1855—1859. Theses fac. Theol., 181—251. Theses fac. Medicin., 41—50. Theses fac. Philosoph., 8—12. Theses fac. Scient., 2—4. From the Catholic University of Louvain.

Bulletin de L'Académie Impériale des Sciences de St. Pétersbourg. Tome 1, Feuilles 1—6. Memoires de L'Académie Impériale des Sciences de St. Pétersbourg. Tome 1, 7th Serie. From the Academy.

Abhandlungen von des Senckenbergischen Naturforschenden Gesellschaft. Band 3, Lieferung 1. From the Society at Frankfurt A. Main.

Novorum Actorum Academia C. L. C. Germanicæ Naturæ Curiosorum. From the Academy at Jena.

Correspondenz-Blatt des Zoologisch-minerologischen Vereins in Regensburg. 13th Jahrgang. From the Society.

Berichte über die Verhandlungen der Naturforschenden Gesellschaft zu Freiburg i. B. Band. 2. Heft 2. From the Society.

Berliner Entomologische Zeitschrift. 3d Jahrgang, Viertes Heft. 4th Jahrgang, Erstes Heft. From the Berlin Entomological Society.

Sitzungsberichte für das Gesellschaftsjahr, 1859. Würzburger Naturwissenschaftliche Zeitschrift von der Physikal.- Medicin.- Gesellschaft. Band 1, Heft 1. From the Society, Würzburg.

Neues Jahrbuch für Mineralogie Geognosie, &c. Von R. C. von Leonhard und H. G. Bronn. 1860. Heft 2. From the Editors.

Archiv für Naturgeschichte. Von Dr. F. H. Troschel. Jahrgang 25, Heftes 5. Actes de L'Académie Imperiale des Sciences Belles-Lettres et Arts de Bordeaux. 21st year, 1859. Trimestre 3. From the Academy.

Verhandlungen des Vereines zur Beforderung des Gartenbaues in der Königl. Preuss. Staaten. Neue Reihe. Jahrgang 7, Heft 2. Wochenschrift des Vereines zur Beforderung des Gartenbaues, &c., für Gärtnerei und Pflanzenkunde, 1860, Nos. 1 bis 13. From the Society.

Ueber Inselbildung durch Korallen und Mangrovebüsche. Von Dr. S. F. Weinland. 8vo. tract, Stuttgart, 1860. From the Author.

Rede zum Geburts-Feste des höchstseligen Grossherzogs Karl Freiderich von Baden und zur Akademischen Preisvertheilung am 22 November, 1859. Von Dr. H. G. Bronn. 4to. tract, Heidelberg, 1859. From the Author.

Iconographie des Helminthes ou des Vers Parasites de l'Homme. Vers Cestoides par P. J. Von Beneden. 4to. tract, Louvain, 1859. From the Author. Mercantile Library Association, New York. 29th Annual Report, 1859-60. From the Association.

The American Journal of Science and Arts. Vol. 30, Second Series, No. 88, July, 1860. From the Editors.

The New Orleans Medical and Surgical Journal. Vol. 17, No. 4, July, 1860. From the Editors.

The North American Medico-Chirurgical Review. Vol. 4, No. 4, July, 1860. From the Editors.

Check lists of the Shells of North America, prepared for the Smithsonian Institution by Isaac Lea, P. P. Carpenter, Wm. Stimpson, W. G. Binney and Temple Prime. Catalogue of the described Lepidoptera of North America, prepared for the Smithsonian Institution by John G. Morris. From the Smithsonian Institution.

The California Farmer. Nos. 16 and 17, June, 1860. From the Editor.

American Medical Times. Vol. 1, No. 2, July, 1860. From the Editors.

The Mountain. By R. M. S. Jackson, M. D. From the Author.

The following are from Dr. T. B. Wilson on the usual condition :

Journal of the Franklin Institute. 3d Series, Vol. 40, July, 1860, No. 1.

Iconographie des Perroquets non figurés dans les publications de Levaillant et de M. Bourjot Saint-Hilaire. Par M. Charles de Souancé.

August 7th. On the relative cost of illumination in Lafayette, Ind. By Charles M. Wetherill, M. D. 8vo. tract, 1860. From the Author.

American Medical Times. Nos. 3, 4 and 5, 1860. From the Editor.

Revue et Magasin de Zoologie. No. 6, 1860. From the Editor.

The American Journal of the Medical Sciences. New Series, No. 79, July, 1860. From the Editor.

The Gardener's Monthly. Vol. 2, No. 8, 1860. From the Editor.

Charleston Medical Journal and Review. Vol. 15, No. 4. From the Editor.

Southern Medical and Surgical Journal. Vol. 16, No. 8. From the Editors.

Journal of the American Geographical and Statistical Society. Vol. 2, No. 1, 1860. From the Society.

The Dental Cosmos. Vol. 2, No. 1, 1860. From the Editors.

The Canadian Journal. New Series, No. 22, 1860. From the Canadian Institute.

The Mining Magazine and Journal of Geology, &c. 2d Series, Vol. 1, No. 6. From the Editor.

The Texas Almanac for 1860. From C. S. Forshay.

Description des Eaux Minero-Thermales et des Études de l'Isle d'Ischia. Par J. E. E. Chevalley. From M. C. Lea.

The Manufacture of Vinegar, its Theory and Practice, with especial reference to the quick process. By C. M. Wetherill. 8vo. From the Author.

The Institutes of Medicine. By Martyn Paine, M. D. 8vo. From the Author.

14th. Der Zoologische Garten, Organ für die Zoologische Gesellschaft in Frankfurt am Main. Jahrgang 1, Heft 1, bis 6, 1860. Ueber Inselbildung durch Korallen und Mangrovebüsche. Von Dr. F. Weinland. 8vo. tract, Stuttgart, 1860. Beobachtungen über die Anatomie des Nilcrocodils, eine Inaugural-Dissertation. Adolph Jäger. 8vo. tract, Tübingen, 1837. Ueber Zwei am Becken Verwachsene Männlichen Kalber. Von Dr. G. V. Jaeger. 8vo. tract. Ueber die Identität des Europäischen und Amerikanischen Bison. Von Dr. G.

V. Jaeger. 8vo. tract. Bemerkungen über die Veränderung der Zähne von Säugethiere im Laufe ihrer Entwicklung, namentliche bie dem Narwhal und dem Cachalot. Von Dr. G. V. Jaeger. 8vo. tract, Moskau, 1857. Ueber einen durch ringförmige Erhöhungen (Wachstumsringe?) ausgezeichneten höchst wahrscheinlich fossilen Stos Zahn des Elefanten. Von Dr. G. V. Jaeger. 8vo. tract, Moskau, 1857. Ueber da Zusammengesetzten Mägen Verscheidener Thiere, Eine Inaugural-Dissertation. Von Freidriche Martin Duttenhoffer. 4to. tract, Tubingen, 1832. From Dr. Joseph Leidy.

Report on Canadian Graptolites. By James Hall, Montreal, 1858, 8vo. tract. From the Author.

American Medical Times. Vol. 1, No. 6, 1860. From the Editor.

Proceedings of the Boston Society of Natural History. Vol. 7, pages 289 to 320 incl. From the Society.

Table de mortalité pour le Brabant, d'après les documents du recensement de 1856. Par M. Ad. Quetelet. 8vo. tract. Eclipse de Soleil du 15 Mars, 1858. Notice par M. Ad. Quetelet. 8vo. tract. From the Author.

Sur la différence des longitudes entre Berlin et Bruxelles déterminée par la télégraphie électrique. Par M. Encke. From the Author.

Note sur l'Aurore Boréale du 21 Avriel, 1859. Par M. Ernest Quetelet. From the Author.

Annuaire de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique, 1859. Bulletins de l'Académie Royale des Sciences, &c., de Belgique Tome 4, 5 and 6, 2d serie. Tables Générales et Analytiques du recueil des Bulletins de l'Académie Royal, &c., de Belgique, 1st Serie, Tome 1 a 23. Mémoires Couronnés et autres memoires publiés par l'Académie Royale, &c., de Belgique, Collection in 8vo., Tome 8. Mémoires de l'Académie Royale, &c., de Belgique. 4to., Tome 31. Mémoires Couronnés et memoires des Savants Étrangères, Publiés par l'Académie Royale, &c., de Belgique. 4to. Tome 29. From the Academy.

The Naturalist's Library, Mammalia. Vol. 10, Dogs. By Lieut. Col. Chas. Hamilton Smith. From C. W. Frost.

The following are from Dr. T. B. Wilson on the usual condition :

Bibliotheca Historico-Naturalis Physico-Chemica et Mathematica, 1858, July to December, and July to December 1859. By Ernest A. Zuchold.

Bulletin Mensuel de la Société Impériale Zoologique d'Acclimatation. Tome 7, No. 6, Juin, 1860.

Journal of the Franklin Institute. 3d Series, Vol. 40, August, 1860, No. 2.

Sept. 4th. The inferior surface of the Trilobite discovered. By Jacob Green, M. D. 12mo., Philadelphia, 1839. Advantages of Chemistry, an Introductory Address. By Jacob Green, M. D. 12mo., Philadelphia, 1834. From Wm. L. Mactier.

American Medical Times. Vol. 1, Nos. 7, 8 and 9. From the Editor.

The following are from Dr. T. B. Wilson on the usual condition :

Dr. A. Th. v. Middendorff's Sibirische Reise. Band 4, Theil 1, 4to., St. Petersburg, 1859. Karten-Atlas zu Dr. A. V. Middendorff's Reise in den Aussersten Norden und Osten Sibiriens. 1859.

Zoologischer Hand-Atlas. Von Dr. Hermann Burmeister. 4 Lieferung.

Description des Animaux sans vertèbres découverts dans le Bassin de Paris, &c. Par G. P. Deshayes. 19 and 20 Livraisons.

Trésor de Livres rares et précieux ou Nouveau Dictionnaire Bibliographique. J. G. T. Grasse. Tome 2, Livr. 3.

Conchologia Iconica. By Lovell Reeve, F. L. S. Parts 197 and 198.

Échinides des Département de la Sarthe par Cotteau et Triger. 4th Livraison.

Diagnosis Plantarum Novarum præsertim Orientalium nonnullis Europæis Boreali-Africanisque additis. Series 2, Nos. 4 and 6. Auctore E. Bossier, 1859.

Naturgeschichte der Insecten Deutschlands begonnen von Dr. W. F. Erichson, fortgesetzt von Prof. Dr. H. Schaum, Dr. G. Kraatz und H. v. Kiesenwetter Erste Abtheilung Coleoptera. Erster Band, Lieferung 4. Berlin, 1860.

Bulletin Mensuel de la Société Impériale Zoologique d'Acclimatation. Tome 7, No. 7, Juillet, 1860.

Monographie des Picides. Par Alfred Malherbe. Livr. 5.

Systematisches Conchylien-Cabinet. Von Martini und Chemnitz. 171st Lieferung.

Katalog Naturwissenschaftlicher Werke aus den Antiquarischen Lager. Von F. O. Wiegcl.

B. Westermann & Co.'s General Catalogue.

California Farmer. Vol. 13, Nos. 18—22. From the Editor.

Revue et Magasin de Zoologie pure et appliquée. Par M. F. E. Guerin-Meneville. 1860, No. 7. From the Editor.

Review of Professor Paine's Institutes of Medicine. By Bennett Dowler, M. D. 8vo. tract. From the Author.

Catalogue of the Terrestrial and Fluvial Gasteropods of North America. By W. G. Binney. From the Author.

The Gardener's Monthly. Vol. 2, No. 9. From the Editor.

Proceedings of the Royal Society. Vol. 10, No. 38. From the Society.

Twelfth Annual Report of the Board of Managers and Treasurer of the Maryland Institute. From the Institute.

11th. Catalogue of the Phænogamous and Filicoid Plants of Newcastle County, Delaware. By Edward Tatnall. 8vo., 1860. From the Author.

American Medical Times. Vol. 1, No. 10. From the Editor.

Southern Medical and Surgical Journal. Vol. 16, No. 9, September, 1860. From the Editors.

The New Orleans Medical and Surgical Journal. Vol. 17, Sept., 1860, No. 5. From the Editors.

American Journal of Pharmacy. 3d Series, Vol. 8, No. 5, Sept., 1860. From the Editor.

The Dental Cosmos. Vol. 2, No. 2. From the Editors.

The North American Medico-Chirurgical Review. Vol. 4, No. 5, Sept., 1860. From the Editors.

The Canadian Naturalist and Geologist, and Proceedings of the Natural History Society of Montreal. Vol. 5, No. 4, August, 1860. From the Society.

Ithyologie Analytique ou Essai d'une classification Naturelle des Poissons. Par A. M. C. Duméril. 4to., Paris, 1856. From Wm. M. Gabb.

18th. Troncature normale ou périodique de la coquille dans certains céphalopodes paléozoïques. Par M. Barrande 8vo. tract, 1860. État actuel des connaissances acquises sur la faune primordiale. Par M. Barrande. 8vo. tract, 1859. Colonies dans le bassin Silurien de la Bohême. Par M. J. Barrande. 1860, 8vo. tract. Faune primordiale dans la chaîne Cantabrique. Par MM.

Casians de Prado, Ed. de Verneuil et J. Barrande. 8vo. tract, 1860. Parallèle entre les dépôts siluriens de Bohême et d' Scandinavie. Par Joachim Barrande. 4to. tract, Prague, 1856. From the Author.

American Medical Times. Vol. 1, No. 11. From the Editors.

California Farmer. August, 1850, Nos. 23 and 24. From the Editors.

Charleston Medical Journal and Review. Vol. 15, No. 5, Sept., 1860. From the Editor.

Edinburgh new Philosophical Journal. New Series, Vol. 12, No. 1, July, 1860. From the Editors.

The American Journal of Science and Arts. Vol. 30, No. 89, Sept., 1860. From the Editors.

Catalogue of the Lepidopterous Insects in the Museum of Natural History at the East India House. By Thomas Horsfield and Frederic Moore. Vol. 2, 8vo., London, 1858—9. From the Secretary of State for India.

Descriptions of five new species of Gasteropoda from the Coal Measures, and a Brachiopod from the Potsdam Sandstone of Texas. By B. F. Shumard, M. D. 8vo. tract, 1860. Observations upon the Cretaceous Strata of Texas. By B. F. Shumard, 8vo. tract, 1860. Descriptions of new Cretaceous Fossils from Texas. By B. F. Shumard, M. D. 8vo. tract. From the Author.

The following are from Mrs. Lucy W. Say :

Manuel de Conchyliologie et de Paléontologie conchyliologique. Par le Dr. J. C. Chenu. Tome premier, 8vo., Paris, 1860.

Traité générale d'Oologie Ornithologique, au point de vue de la classification, par O. des Murs. 8vo., Paris, 1860.

Catalogue of Acanthopterygian Fishes in the Collection of the British Museum. By Dr. Albert Günther. Vol. 1, 8vo., London, 1859.

Histoire Naturelle generale et particulière des Reptiles. Par F. M. Daudin. 8vo. Vol. 8, Paris, 1802.

The following are from Dr. Thomas B. Wilson on the usual condition :

Bryologia Javanica. Fasciculi 21 and 32.

Novitates Conchologicae. 12 Liefierung, Tome 1.

Palæontographica. Von Hermann von Meyer. Band 7, Lief. 3, Band 8, Lief. 4.

Journal of the Franklin Institute. Vol. 40, No. 3, Sept., 1860.

Histoire Naturelle des Coralliaires ou Polyypes proprement dits. Par H. Milne Edwards. (Text.) Tome 3, Planches, Livr. 3, Paris, 1860.

October 2d. The Weal Reaf, a record of the Essex Institute Fair, held at Salem, Sept. 4, 5, 6, 7, 8, 10 and 11, 1860. From the Institute.

Artificial Lactation. By Charles M. Wetherill, M. D. 8vo. tract, 1860. From the Author.

American Medical Times. Nos. 12 and 13, Vol. 1. From the Editor.

Natuurkundig Tijdschrift voor Nederlandsch Indie uitgegeven door de Natuurkundige Vereeniging in Nederlandsch Indie. Deel 20, Vierde Serie Deel 6. From the Society.

Revue et Magasin de Zoologie pure et appliquée. No. 8, 1860. From the Editor.

Bibliothèque Universelle Revue Suisse et Étrangère. Tome 8, No. 32, 1860. From the Editors.

The Transactions of the Academy of Science of St. Louis. Vol. 1, No. 4. From the Academy.

The following are from Dr. T. B. Wilson on the usual condition :

Bulletin Mensuel de la Société Impériale Zoologique d'Acclimatation. Tome 7, No. 8.

An illustrated and descriptive Catalogue of recent shells. By Sylvanus Hanley. Part 3d, Letter-press and Plates. 8vo., London, 1842 to 1856.

The Dental Cosmos. Vol. 2, No. 4, October. From the Editors.

The American Journal of the Medical Sciences. No. 80, October, 1860. From the Editor.

9th. On a Terrestrial Mollusk, a Chilognathous Myriapod, and some New Species of Reptiles, from the Coal-Formation of Nova Scotia. By J. W. Dawson. 8vo. tract, Montreal, 1860. From the Author.

American Medical Times. Vol. 1, No. 14, Oct. 6. From the Editor.

Annales des Mines, Cinquième Série. Tome 16, 5th Livraison. From the Minister of Public Works, France.

Geological Survey of Canada, Report of Progress for the year 1858. 8vo., Montreal, 1859. From the Geolog. Survey.

The following are from Dr. T. B. Wilson on the usual condition :

Journal of the Franklin Institute. Vol. 40, No. 4, October.

Paléontologie Lombarde ou description des Fossiles de Lombarde. Par Antoine Stoppani. 12 Livraison.

Dr. A. Th. v. Middendorff's Sibirische Reise. Band 4, Theil 1, Zweite Lieferung.

Dubois Oiseaux de la Belgique et de leurs Oeufs. Livr. 135 and 136.

Die Vögel Griechenlands. Von Dr. Ritter A. Lindermayer. Passau. 8vo., 1860.

Bibliotheca Historico-Naturalis. Von Ernest A. Zuchold Erster Jahrgang, 1851, Hefts 1 und 2.

October 16th. The Gardener's Monthly. Vol. 2d, No. 10, Oct., 1860. From the Editor.

Annual Reports of the Trustees of the New York State Library for the years 1857, 58, 59, and 60. Twelfth Annual Report of the Regents of the University on the condition of the State Cabinet of Natural History, for the years 1857, 58 and 59. Seventy-third Annual Report of the Regents of the University made January 28th, 1860. Catalogue of the New York State Library. Vol. 4, 8vo. Results of a series of Meteorological Observations, made in obedience to instructions from the Regents of the University. From 1826 to 1850 inclusive. From the Regents of the University of the State of New York.

A Practical Dictionary of the English and German languages in two parts, English and German and German and English. By Dr. Felix Flügel, under the coöperation of Dr. J. G. Flügel. 2 vols., 8vo. Leipsic, 1858. From Mrs. Lucy W. Say.

First Report of Philip T. Tyson, State Agricultural Chemist, to the House of Delegates of Maryland, January, 1860. 8vo., Annapolis. From the Author.

23d. An Elementary Treatise on Human Anatomy. By Joseph Leidy, M. D. 8vo., Philadelphia, 1860. From the Author.

Review of the American Bombidæ, together with a description of several species heretofore undescribed. 8vo., tract, 1860. From the Author.

The Canadian Journal of Industry, Science and Art. New Series. No. 29, September, 1860. From the Canadian Institute.

American Medical Times. Vol. 1, Nos. 15 and 16, 1860. From the Editors.

Proceedings of the Royal Physical Society of Edinburgh, 1854 to 1858, Vol. 1. From the Royal Physical Society.

The Quarterly Journal of the Geological Society. Vol. 16, Part 3, No. 63. From the Geological Society of London.

Proceedings of the Royal Society of London. Vol. 10, No. 39. From the Royal Society.

Report of the Proceedings of the Geological and Polytechnic Society of the West Riding of Yorkshire, 1859. From the Society.

Fortieth Report of the Council of the Leeds Philosophical and Literary Society, 1859-60. Sensorial Vision. By Sir J. F. W. Herschel. 8vo. tract, 1858.

The Physical condition of the people in its bearing upon their social and moral welfare. By Rt. Rev. R. Bickersteth. 8vo. tract, 1860. From the Leeds Phil. and Lit. Society.

Memoirs of the Literary and Philosophical Society of Manchester. Second Series, Vol. 15, Part 2. Proceedings of the Literary and Philosophical Society, pages 60 to 252 inclusive, for 1858-59. From the Society.

The Journal of the Society of Arts and of the Institutions in Union. Vol. 8, Nos. 376 to 401 inclusive, from Feb. 3d, 1860, to July 27th, 1860. From the Society of Arts, London.

Actes de l'Académie Impériale des Sciences, Belles-Lettres et Arts de Bordeaux. 3d Ser., 21 An., 1859, 4 Trimes. From the Academy.

Vierter und Achter Bericht der Oberhessischen Gesellschaft für Natur- und Heilkunde. 1854 and '60. From the Society.

Kleine Schriften der Naturforschenden Gesellschaft in Emden. Nos. 6 and 7. Fünfundvierzigster Jahresberichte der Naturforschenden Gesellschaft in Emden, 1859. From the Society.

Verhandlungen der Russisch-Kaiserlichen Mineralogischen Gesellschaft zu St. Petersburg. Jahrgang, 1842, 1850 und '51, 1852 und '53, 1857 und '58. From the Society.

Bulletin de l'Académie Impériale des Sciences de St. Petersburg. Tome 1, Feuilles 7-36. Mémoires de l'Académie Impériale des Sciences de St. Petersburg. 7 Serie, Tome 2, Nos. 1-3, 1859. From the Academy.

Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg. Jahr. 14, 1860. From the Society in Mecklenburg.

Zeitschrift der Deutschen geologischen Gesellschaft. Band 11, Heft 3, 1859. From the Society in Berlin.

Nachrichten von der Georg-August-Universität und der Königl. Gesellschaft der Wissenschaften zu Göttingen. Jahre, 1859. From the Society.

Neues Jahrbuch für Mineralogie Geognosie, Geologie und Petrefaktenkunde. Von R. C. von Leonhard und H. G. Bronn. Jahrgang, 1860, Heft 3. From the Editors.

Über die Wohnsitze der Brachiopoden. Von Prof. Edward Suess. No. 2, Wein, 1860. From the Author.

Denkschriften der Kaiserl. Akad. der Wissenschaften, Mathematisch-Naturwissen. Classe, Band 18. Sitzungsberichte der Kaiserl. Akad. der Wissenschaftliche. Classe, Band 39, Nos. 3, 4 und 5. Band 40, Nos. 7, 8 und 10. From the Academy.

Verhandlungen der Kaiser.-Königl. Zoologisch-botanischen Gesellschaft in Wien. Jahrgang, 1859. From the Society.

Jahrbuch der Kaiser.-Königl. Geologischen Reichsanstalt. Jahrgang 10, 1859, Nos. 3 und 4. From the Institute.

Rede zum Geburts-Feste des höchstseligen Grossherzogs Karl Frederich von Baden und zur akademischen Preisvertheilung am 22. November, 1859. Von Dr. Heinrich Georg Bronn. 4to. tract. From the Author.

Tableau Méthodique et Descriptif des Mollusques Terrestres et d'Eau douce de l'Agenais. Par J. B. Gassies. 8vo., Paris, 1849. From the Author.

Journal de Conchyliologie. Tome 8, Nos. 1 et 2, 1860. From the Editors, MM. Fischer et Bernardi.

Monographie des Genres Galatea et Fischeria, par le Chevalier A. C. Bernardi. 4to., Paris, 1860. From the Author.

Bulletins de l'Académie Royal des Sciences, des Lettres et des Beaux-Arts de Belgique, 28 An. 2 Ser. Tomes 7 et 8. Mémoires Couronnées et Autres publiés, par l'Académie Royale, &c., collec. in 8vo., Tomes 9 and 10. Annuaire de l'Académie Royale, &c., 26th An., 1860. Observations des Phénomènes Périodiques. Sur la différence de Longitude des Observations de Bruxelles et Berlin, déterminée en 1857, par des signaux Galvaniques. From the Academy.

November 6th. Revue et Magasin de Zoologie pure et appliquée. Par M. F. E. Guérin-Méneville. No. 9, 1860. From the Editor.

Southern Medical and Surgical Journal. Vol. 16, No. 18, 1860. From the Editors.

Proceedings of the Boston Society of Natural History. Vol. 7, pages 321 to 352 incl. From the Society.

Proceedings of the Essex Institute. Vol. 2, Part 2. From the Institute.

The Dental Cosmos. Vol. 2, No. 4. From the Editors.

The American Medical Times. Vol. 1, Nos. 17 and 18. From the Editor.

The New Orleans Medical and Surgical Journal for Nov., 1860. From the Editors.

Proceedings of the Literary and Philosophical Society of Liverpool during the 49th Session, 1859-60, No. 14. From the Society.

Proceedings of the Royal Society. Vol. 10, No. 40. From the Society.

Edinburgh New Philosophical Journal. New Series, No. 24, Vol. 12, No. 2, October, 1860. From the Editors.

Sur le Néocomien dans le Jura et son rôle dans la série Stratigraphique. Par Jules Marcou. Genève, 1858, 8vo. From the Author.

Actes de l'Académie Impériale des Sciences, Belles-Lettres et Arts de Bordeaux. 3d Ser. 22 An., 1860, 2d Trimes. From the Academy.

Études Organiques sur les Cuscutes. Par M. Charles Des Moulins. 8vo., Toulouse, 1853. Catalogue Roissonné des Phanérogames de la Dordogne Supplément final, 1858. Par M. Charles des Moulins. 8vo., Bordeaux 1859. Les Savants Voyageurs a Bordeaux. Documents relatifs a la faculté Germinative conservée par quelques graines antiques. Sur les Chrysanthèmes d'Automne de nos jardins et sur quelques plantes qui leur sont congénères. Note sur le *Sisymbrium Bursifolium* de La Peyrouse. Deuxième et Troisième Memoires relatif aux causes qui paraissent influer particulièrement sur la croissance de certains Végétaux dans des conditions déterminées. Discours sur l'évolution des forces vitales dans la nature. *Erythraea* et *Cyclamen* de la Gironde. Rapport sur le mouvement Scientifique archéologique et littéraire dans la Gronde de 1855 a 1857. Documents relatifs a la naturalisation en France du *Panicum digitaria*. Résumé d'une publication de M. E. A. Carrière intitulée, les Hommes et les Choses en 1857. De la propriété littéraire en Matière de nomenclature scientifique. Comparaison des Départements de la Gironde et de la Dordogne sous le rapport de leur végétation spontanée et de leurs cultures. Par M. Charles des Moulins. 13 8vo. tracts. From the Author.

Mémoires de l'Académie Impériale des Sciences, Belles-Lettres et Arts de Lyon. Tomes 7, 8 et 9. From the Academy.

Nova Acta Regiæ Societatus Scientiarum Upsaliensis. Serie Tertiæ. Vol. 2. Årsskrift utgifven af Kongl. Vetenskaps-Societeten i Upsala, Forsta ärgängen. From the Society in Upsala.

Bulletin de la Société Impériale des Naturalistes de Moscou. Nos. 2, 3, and 4, 1859, No. 1, 1860. Nouveaux Mémoire de la Société Impériale des Naturalistes de Moscou. Tomes 11, 12 and 13, Livraison 1. From the Society.

Académie des Sciences et Lettres de Montpellier Mémoires de la Section de Médecine. Tome 3, Fasciculis 1 and 2. From the Academy.

G. Th. Fechner, Ueber einige Verhältnisse des Binocular Sehens. 4to., Leipzig, 1860. G. Mettenius, Zwei Abhandlungen. 1, Beiträge zur Anatomie der Cycadeen. 2 Über Seitenknospen bei Farner. 8vo., Leipzig, 1869. P. A. Hansen Auseinandersetzung einer Zweckmässigen Methode zur Berechnung der absoluten Störungen der kleinen Planeten. Dritte Abhandlung. 8vo., Liepzig. Berichte über die Verhandlungen der Königlich Sächsischen Gesellschaft der Wissenschaften zu Leipzig. Heft 1, 2 3 und 4, 1859 and 1860. From the Society.

Der Zoologische Garten Organ der Zoologischen Gesellschaft in Frankfurt am Main. Jahr. 1, Nos. 7—12. From the Society.

Zeitschrift der deutschen geologischen Gesellschaft. Band 11, Heft. 4. From the Society.

Memoires la Société Impériale des Sciences Naturelles de Cherbourg. Tome 7, 1859. From the Society.

Plantes vasculaires des environs de Cherbourg. Par Auguste le Jolis. 8vo., Paris, 1860. From the Author.

Archiv für Naturgeschichte. Von Dr. F. H. Troschel. 25 Jahr., Heft. 6 und Jahr. 25, Heft. 1. Prom Dr. Troschel.

11th Katalog Naturwissenschaftlicher Werke aus den antiquarischen Lager. Von F. O. Wiegel. From the Author.

13th. The rock oils of Ohio. By. J. S. Newberry. 8vo. tract, 1859. From the Author.

Southern Medical and Surgical Journal. Vol. 17, No. 11, Nov., 1860. From the Editors.

The North American Medico-Chirurgical Review. Vol. 4, No. 6, Nov., 1860. From the Editors.

American Medical Times. Vol. 1, No. 19, Nov., 1860. From the Editors.

American Journal of Pharmacy, 3d series, vol. 8, No. 6, Nov., 1860. From the Editor.

The Gardener's Monthly, vol. 2, No. 11, Nov., 1860. From the Editor.

Bulletin de la Société Botanique de France. Tome 6, No. 8, 1859. Wompage Rendu a la Mémoire de M. Alexandre de Humboldt dans la séance du 13 Mai, 1859. From M. Chs. de Moulins.

Walpers. Annales Botanices Systematicæ. Tome 5, fasc. 6. Auct. Dr. Carolo Mueller. From the Author.

The Proceedings of the Zoological Society of London, 1859. Part 3, June to December. From the Zoological Society.

Due Lettere di Prof. Michele Tenore con alcune Notizie sull' Isola d'Ischia. Ed. 2, Napoli, 1858. 8vo. tract. Ricerche sulla classificazione de Platini M. Tenore. 4to. tract. 1856. Sopra Alcuni Alberi mentovati negli scrittori del medio evo, osservazioni di Michele Tenore. Sopra alcune specie di Cipressi osservazioni del Cav. Prof. Michele Tenore. 4to. tract. Modena, 1853. Catalogo del Real Orto Botanico di Napoli. 4to. 1845. Michele Tenore. From E. Durand.

Essais de Géographie Malacologique par MM. les Docteurs De Grateloup et Ver Paulin. 8vo. Bordeaux, 1855. Conchyliologie Fossile des terrains Tertiaires du Bassin de l'Adour, par M. le Dr. Grateloup. Atlas. 4to. 1840. From M. de Grateloup.

The following are from Dr. T. B. Wilson, on the usual condition :

Bulletin Mensuel de la Société Impériale Zoologique d'Acclimatation. Tome 7, No. 9. Sept., 1860.

The Natural History of the Tineina, (vol. 5,) containing Coleophora. Part 2, 8vo. 1860. By H. T. Stainton.

Conchologia Iconica. By Lovell Reeve. Part 199.

Palæontographica. Beiträge zur Naturgeschichte der Vorwelt. Band 8. Lieferung 5. Von Hermann von Meyer. Band 9. Lieferung 1. Von Wilhelm Dunker. Cassel, 1860.

Trésor de Livres rares et précieux, ou Nouveaux Dictionnaire Bibliographique. Tome 2. Livr. 4.

Zoologischer Hand-Atlas von Dr. Hermann Burmeister. Lieferung 5.

Exploration Scientifique de l'Algérie, Botanique. Livraison 12—17.

Monographie des Picides, par Alfred Malherbe. Livraison 6.

Journal of the Franklin Institute, vol. 40, No. 5, Nov., 1860.

20th. American Medical Times, vol. 1, No. 10. From the Editors.

The New Orleans Medical and Surgical Journal, vol. 17, No. 6, Nov., 1860. From the Editors.

Charleston Medical Journal and Review, vol. 15, No. 6, Nov., 1860. From the Editor.

Bibliothèque Universelle Revue Suisse et Étrangère. Tome 9, No. 34, Oct., 1860.

The following are from Dr. Thomas B. Wilson, on the usual condition :—

Échinides du Département de la Sarthe par Cotteau et Triger. Livraison 6.

Novitates Conchologicae, par Dr. Louis Pfeiffer. Livraison 13, 14.

Monographie des Picides, par Alfred Malherbe. Livr. 7.

December 4th. Annales des Sciencias e Lettras, publicados debaixo dos auspicios da Academia Real das Sciencias. Sciencias Mathematicas, Physicas, Historico-Naturaes e Medicas. Tomo 1. Primeiro Anno. Outubro de 1857. Fevereiro de 1858. Tomo 2. Anno 2. Marco de 1858. Julhode, 1858. Annales Sc. Sciencias Moraes, Politicas e Bellas Lettras. Tomo 1. Anno 1. Setembro de 1857. Fevereiro de 1858. Tomo 2. Anno 2. Marcode, 1858. Novembro de 1858. Colleção de Opusculos Reimpressos relativos a Historia das Navegações, &c. dos Portuguezes, pela Acad. Real dos Sciencias. Tomo 1, No. 3. Historia da Prouincia Santa Cruz, feita por pero de Magolhaes de Gandavo. Quadro Elementar das relaçoens politicas e diplomaticas de Portugal

com as diversas Potencias do Mundo. Tomo 16 e 17. Lendas da India por Gaspar Correa. Tomo 1. Parte 1. e Parte 2. 4to. Memorias da Academia Real das Sciencias de Lisboa. Classe de Sciencias Mathematicas, Physicas e Naturaes. Nova Serie. Tom. 2, parte 1. Portugalliae Inscriptiones Romanas edidit. Levy Maria Jordao. Vol. 1. Portugalliae Monumenta Historica a saeculo octavo post Christum usque ad quintumdecimum. Leges et consuetudines. Vol. 1, fasc. 2. From the Royal Academy of Sciences of Lisbon.

The California Farmer, vol. 14, Nos. 8, 9 and 10. From the Editors.

The Dental Cosmos, vol. 2, No. 5, Dec., 1860. From the Editors.

Revue et Magasin de Zoologie pure et appliquee, No. 10, 1860. From the Editor.

Further Remarks on Numerical Relations between Equivalents. By M. Carey Lea. 8vo. tract. 1860. From the Author.

Catalogue of the Flowering Plants and Ferns of Ohio. By J. S. Newberry, M.D. 8vo. tract. Columbus, 1860. From the Author.

Supplementary Chapter to Acadian Geology. By J. W. Dawson, LL.D., &c. 12mo. Edinburgh, 1860. From the Author.

Southern Medical and Surgical Journal, vol. 16, No. 12, Dec., 1860. From the Editors.

American Medical Times, vol. 1, Nos. 21 and 22, Nov., 1860. From the Editors.

The American Journal of Science and Arts, vol. 30, 2d series, No. 90, Nov., 1860. From the Editors.

The Canadian Naturalist and Geologist, vol. 5, No. 5, Oct., 1860. From the Natural History Society of Montreal.

Observations on the Genus Unio. By Isaac Lea, LL.D., &c. Vol. 8, part 1. 4to. 1860. From the Author.

Athanasii Kircheri e Soc. Jesu Mundus Subterraneus. Tomus 1. Folio. Amsterdam, 1668. A General Natural History of new and accurate descriptions of the Animals, Vegetables and Minerals of the different parts of the World. By John Hill, M.D. Folio. London, 1751. From Mr. Walter Cresson.

Bulletin Mensuel de la Société Impériale Zoologique d'Acclimatation. Tome 7, No. 10, Octobre, 1860. From Dr. T. B. Wilson, on the usual condition.

11th. Introductory Discourse on Speculative and Inductive Medicine, delivered in the Medical Department of Pennsylvania College, Oct. 8, 1860, by Henry Hartshorne, M.D. From the Author.

The Quarterly Journal of the Chemical Society of London. Vol. 11, No. 4. Vol. 12. Vol. 13, Nos. 1, 2 and 3. From the Society.

American Medical Times, vol. 1, No. 23. From the Editor.

The Gardener's Monthly, vol. 2, No. 12. From the Editor.

On some questions concerning the Coal Formations of North America, by Leo Lesquereux. 8vo. tract. From the Author.

Natur-Andachten. Dichtungen aus dem Reiche der Natur und an ihre Freunde von Joh. Gistel, &c. &c. 8vo. Straubing, 1857. Achthundert und zwanzig neue oder unbeschreibene wirbellose Thiere, charakterisirt von Dr. Johannes Gistel. 8vo. Straubing, 1857. Vacua oder die Geheimnisse aus dem organischen und leblosen Welt, von Prof. Dr. Johannes Gistel. Erster Band. 8vo. Straubing, 1857. From Dr. Gistel.

The Proceedings of the Zoological Society of London, with Illustrations. Parts 1 and 2, Jan. to June, 1860. From the Society.

United States Exploring Expedition during the years 1838 to 1842, under the command of Charles Wilkes, U.S.N. Herpetology, by Charles Girard. With a folio Atlas. 1858. From Mrs. Lucy W. Say.

The following are from Dr. Thos. B. Wilson, on the usual condition :

Journal of the Franklin Institute, vol. 40, No. 6, 1860.

Notice sur quelques races de Chevaux, sur les haras et les remontes dans l'Empire d'Autriche, par M. Huzard fils. 12mo. tract. 1823. Paris.

Raupenkalender oder Verzeichniss aller Monate in welchen die von Rosel und Kleemann beschriebene und abgebildete Raupen nebst ihrem Futter zu finden sind. Von Johann Mader. Nurnberg, 1786. 12mo.

Examen Analytique des œufs de poule. Par B. G. Sage. 12mo. tract. Paris, 1823.

Exposition méthodique du Règne végétal. Par J. F. Caffin. 12mo. Paris, 1822.

Nomenclator entomologicus secundum Entomologiam Systematicamill. Fabricii, &c., a Frederick Weber. 18mo. Chilonii et Hamburgi, 1795.

Essai d'une Iconographie élémentaire et philosophique des Végétaux. Par P. J. F. Turpin. Paris, 1820. 12mo.

Des avantages de l'esprit d'observation dans les sciences et les arts, avec quelques remarques relatives a la Physionomie. Par X. A****. 12mo. Paris, 1809.

Nomenclator Entomologicus enumerans Insecta omnia in J. C. Fabricii Entomologia Systematica emendata et aucta 1792. 12mo. Mancunii, 1795.

Traite d education ou méthode abrégée pour elever les Serins ee Canarie, &c. Par C***. Lyon, 1768. 12mo.

Mocographie des Picides. Par Alfred Malherbe. Livr. 8.

Systematisches Conchylien-Cabinet von Martini und Chemnitz. Lief. 172.

Saunders and Hewitson's Exotic Butterflies. Parts 35 and 36.

Paleontologie Lombarde. Par A. Stoppani. Livr. 13.

Journal of the Academy of Natural Sciences. Vol. 4, Part 4. From the Publication Committee.

far as we desired. We therefore hesitated to publish the results of our examination of the chemical nature of these poisons, but upon more mature reflection have concluded to lay them before the scientific world, trusting at some future period to be enabled to present a more complete memoir on the subject, and to correct any errors into which we may have fallen in the course of the researches just concluded.*

May.

I.—PHYSIOLOGY.

A paper was read, entitled, "*Food of the Shad of the Atlantic Coast of the United States, (Alosa sapidissima,) and the functions of the pyloric cæca.*" By E. R. Mordecai, M. D., of Mobile, Alabama.

This paper, after calling to mind the anatomy of the alimentary canal of the shad, lays particular stress upon the facts that the teeth are very small, and of such an arrangement as to suggest its food to be easy of prehension; that the largest, longest, and also the greatest number of the cæca open into the *inferior* wall of the expansion of the intestine that is found beyond the pylorus.

On examining the intestines of a number of shad, fresh run from the sea, the cæca were always found to be distended by a brownish-looking fluid substance, not differing to the naked eye from a fluid material of the same color, filling the stomach. This fluid under the microscope, both that from the stomach and from the cæca, was seen to be composed of differently shaped and colored fragments of algæ and the calcareous shields of infusoria.

The food of the shad would therefore appear to be marine algæ, which are broken down by the powerful muscular walls of the stomach, aided by the broken shells of infusoria. The cæca are receptacles for food; enabling the animal to exist for a considerable time without receiving additional nourishment.

Arguments in favor of these views are drawn by Dr. Mordecai from an analogous condition of things in other fish, that ascend fresh water streams, or seek other places than those likely to supply them with food, for the purpose of spawning.

Specimens mounted for microscopical examination accompanied this paper; and the statements above made in regard to the contents of the stomach and the cæca, were abundantly verified by members of the Academy.

*Some misconception appears to have been occasioned by the names under which we have studied these poisons. In our first essay they were distinguished as "corroval and vao, two new varieties of woorara, the South American arrow poison." In consequence of this title, it has been supposed that we regarded corroval and vao as identical with the woorara of De-la-Condamine, Kolliker and others. No person, however, who went beyond the title of the papers, could possibly entertain this idea, since the toxicological distinction is drawn in the most definite manner. All the specimens of corroval and vao which we have seen, have come to us labelled *woorara*, and we have been informed that this term, or the more specific appellation, were indiscriminately used by the Indians of the Rio Darien.



DONATIONS TO LIBRARY.—1860.

January 10th, 1860. *Revue de Zoologie pure et appliquée*, 1859. No. 11. From the Editor.

Fünfter Jahresbericht des Germanischer National-Museums zu Nürnberg. 1859. 4to., from the Smithsonian Institution.

Acta Societatis Scientiarum Indo-Neerlandicæ. Vols. 1 and 2. 1856,—57. From the Society.

Transactions of the Zoological Society of London. Vol. 4. Parts 5 and 6. 1858—59. Proceedings of the Zoological Society of London, 1857. Pages 192 to 308, 1858, and 1859, Parts 1 and 2. From the Society.

The Quarterly Journal of the Geological Society. Vol. 15, part 4th, No. 60. 1859. From the Society.

The Canadian Naturalist and Geologist. Vol. 4, No. 6, Dec. 1859. From the Nat. Hist. Society of Montreal.

Boston Journal of Natural History. Vol. 7, No. 1. Proceedings of B. S. N. H. Vol. 7, pages 129 to 160 incl. From the Boston Society of Nat. History.

American Journal of Pharmacy, 3d series. Vol. 8, No. 1. Jan. 1860. From the Editor.

Southern Medical and Surgical Journal. Vol. 15, No. 12. Dec. 1859. From the Editor.

The Dental Cosmos. Vol. 1st, Nos. 1 and 6. From the Editors.

The American Journal of Science and Arts. Vol. 29, No. 85. Jan. 1860. From the Editors.

Lecture on *Sable Island*. By J. Bernard Gilpin. Wreck of the "Arno:"—a poem. By Hon. Joseph Howe. From the Author. 8vo. tract. Halifax, 1859.

Letter from Mr. Wallace, on the Geographical distribution of Birds. 8vo. tract. 1859. From the Editor of "The Ibis."

On Fossil Plants from the Devonian Rocks of Canada. By J. W. Dawson. 8vo. tract. 1859. From the Author.

Notices of Fossils from the Permian Strata of Texas and New Mexico. obtained by the United States Expedition, under Capt. John Pope, for boring Artesian Wells along the 32nd parallel, &c. By B. F. Shumard, M. D. 8vo. tract. 1859. From the Author.

Catalogue of Publications of Societies, and of other periodical works in the Library of the Smithsonian Institution. 8vo. 1859. From the Smithsonian Institution.

The Geology of Pennsylvania: a Government Survey. By Henry Darwin Rogers, State Geologist. Vol. 2d. 4to. 1858. From the State of Pennsylvania.

The Medical Examiner. 18 vols., from 1838 to 1856. From Dr. S. Weir Mitchell.

The following are from Dr. T. B. Wilson, on the usual condition:

Palæontographica. Beiträge zur Naturgeschichte der Vorwelt Achter Band Erste und Zweite Lieferung. Hermann Von Meyer. 4to. 1859.

Catalogue of Orthopterous Insects in the Collection of the British Museum. Part 1. Phasmidæ. By John Obadiah Westwood. 4to. London, 1859.

17th. On Numerical Relations existing between the equivalent members of elementary bodies. By M. Carey Lea. 8vo. tract. Part 1. From the Author.

Proceedings of the American Philosophical Society. Vol. 7, No. 62. July—December, 1859. From the Society.

Charleston Medical Journal and Review. Vol. 15, No. 1. January, 1860. From the Editor.

New Orleans Medical and Surgical Journal. Vol. 17, No. 1. January, 1860. From the Editors.

Catalogue of recent Marine Shells, found on the coasts of North and South Carolina. 8vo. tract. Portland, 1860. By J. D. Kurtz. From the Author.

24th. Proceedings of the American Antiquarian Society. Oct. 21st, 1859. From the Society.

St. Joseph's Journal of Medicine and Surgery. Vol. 2, No. 3. January, 1860. From the Editors.

Annual Report of the Directors of the Mint, for the fiscal year ending June 30th, 1859. From J. Ross Snowden.

First Report of the Geological and Agricultural Survey of Texas. 8vo. tract. 1859. From B. F. Shumard, M. D.

Catalogue of the Pennsylvania State Library. 8vo. 1859. From the State Department.

The following are from Dr. T. B. Wilson, on the usual condition;

Journal of the Franklin Institute, 3rd series. Vol. 29, No. 1. Jan. 1860.

Bijdragen tot de Dierkunde uitgegeven door het Koninklijk Zoologisch Genootschap Natura Artis Magistra. Amsterdam, 7th Aflevering, 1858.

A Monograph of the Trochilidæ, or Humming Birds. By John Gould, F. R. S. Parts 17 and 18.

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Proceedings of the Zoological Society of London, with illustrations. 1857, 1858, and parts 1 and 2 for 1859. From the Society.

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Twenty-fourth Annual Report of the Executive Committee of the Young Men's Association of the City of Buffalo. 8vo. tract, Buffalo, 1860. From the Association.

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Report of the Secretary of War, accompanying the President's Message at the First Session of the 35th Congress. From Major Wayne, U. S. A.

A Practical Treatise on the Honey Bee and Hive. By L. L. Langstroth. 3d Edition, 8vo. New York, 1860. From the Author.

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Notes on the Aurora of the 28th August, 1859, as observed at Lunenburg, Mass. By Prof. Wm. B. Rogers. 8vo. tract. From the Author.

Annals of Science, &c. Cleveland, Ohio, Nos. 23 and 24, Nov. 1st and 15th, 1853. From Horatio C. Wood, Jr.

Volume of tracts and pamphlets on Agricultural Chemistry and allied subjects. By J. B. Lowes and J. H. Gilbert. From the Author, through Dr. Evan Pugh.

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8th. Additions to the Flora of Wisconsin. By T. J. Hall. 8vo. tract, 1860. From the Author.

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Annual Report of the Superintendent of the Geological Survey of India, Calcutta, 1858-59. Memoirs of the Geological Survey of India. Vol. 1, part 3. Calcutta, 1859. From the Governor and Council of India.

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Neue Untersuchungen über den Bau des Rückenmarks, von Dr. B. Stilling, Funfte Lieferung.—Atlas Mikroskopisch Anatomischer Abbildungen zu den neuen Untersuchungen über den Bau des Rückenmarks, von Dr. B. Stilling. Vierte Lieferung Cassel, 1859.

15th. Eighth Supplement to Dana's Mineralogy. By Geo. J. Brush. 8vo. tract, 1860. From the Author.

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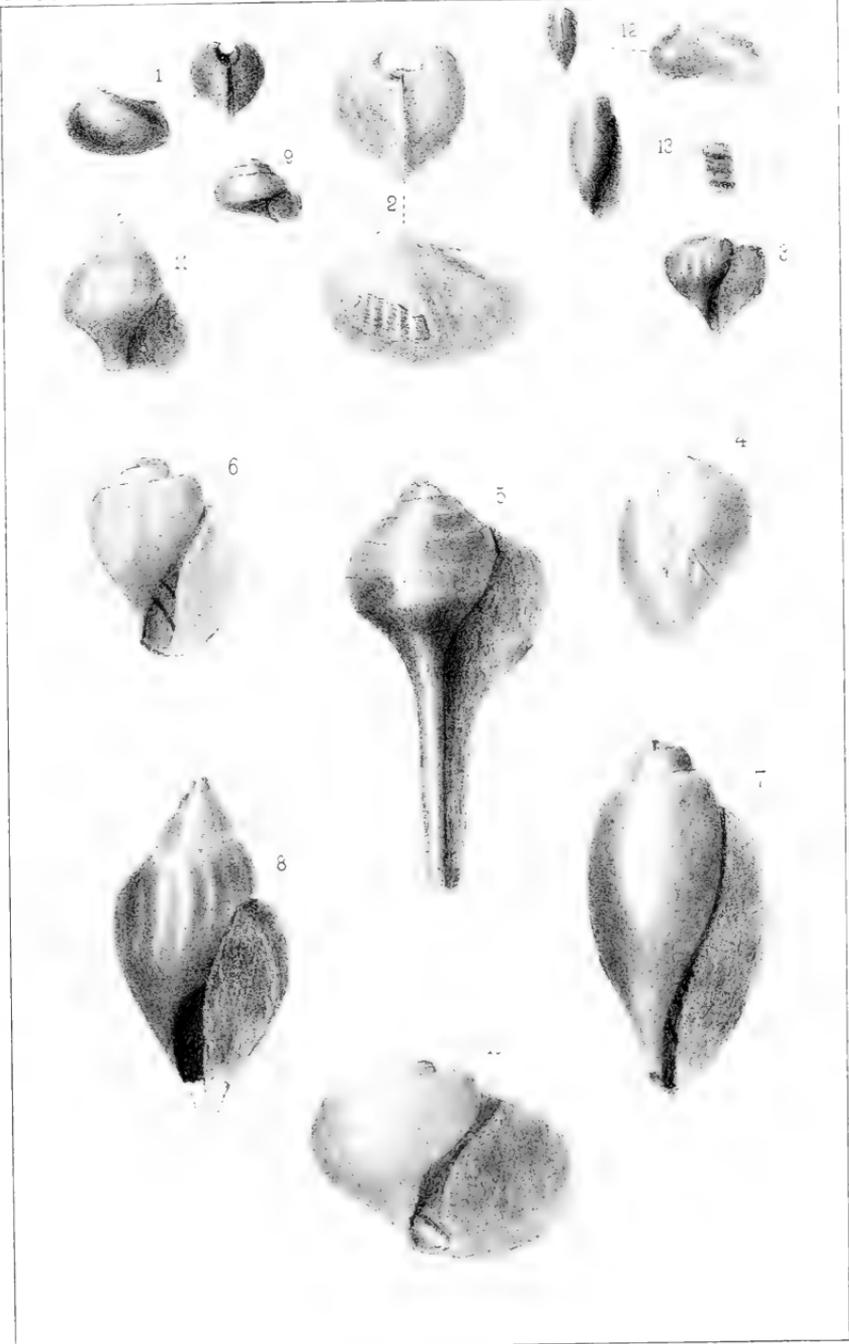
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Karte des San Juan-od-Haro-Archipels, Nach den Aufnahmen der Engl. Admiralität unter Kellett, Richards, &c., 1847, 1858, and 1859. Von. A. Peterman. From Dr. Peterman.

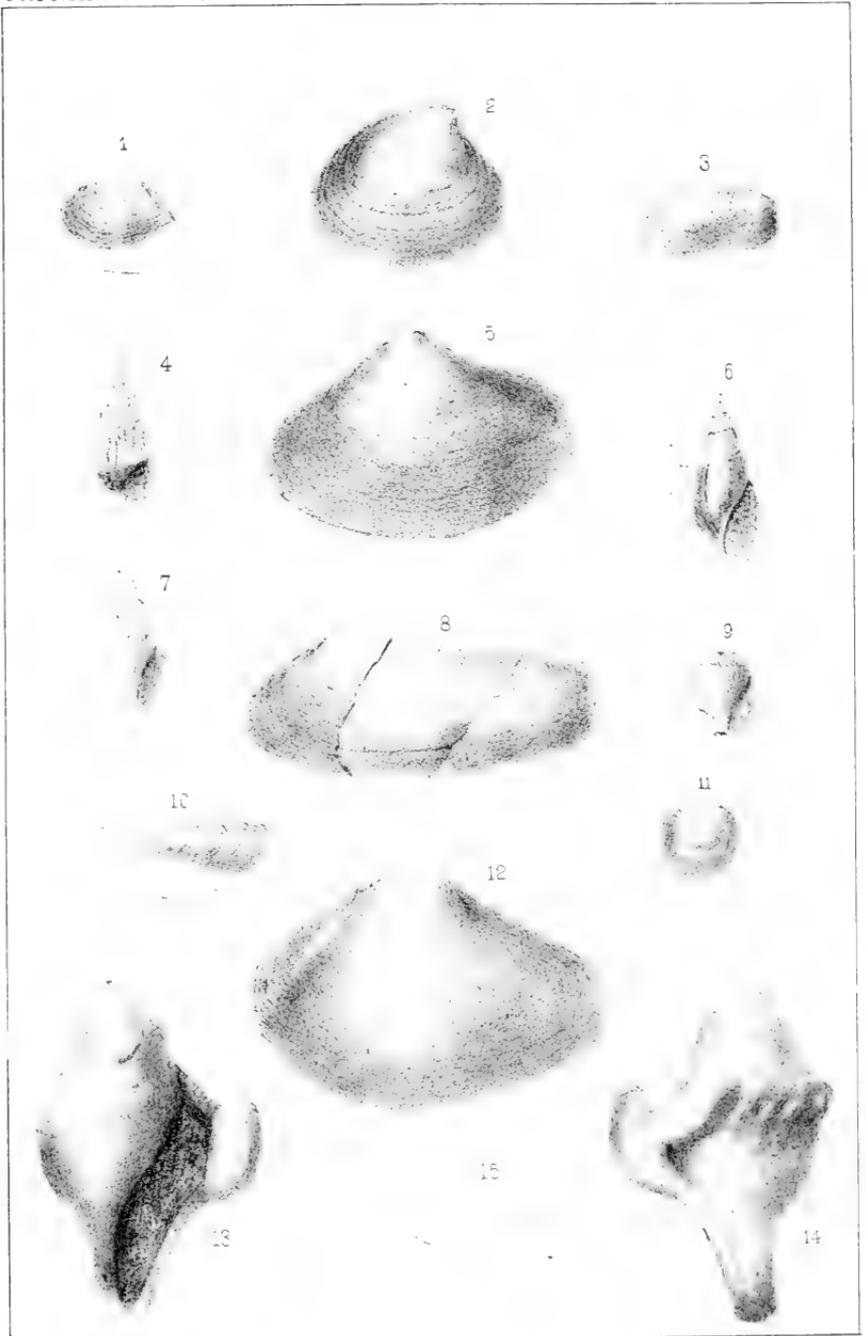
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Biographical Notice of Henry Bond, M. D., read before the College of Physicians of Philadelphia, April 1st, 1860. From the Author, Dr. Condie.

22nd. Sitzungs Berichte der Kaiserlichen Akademie der Wissenschaften, Mathemat.—Naturwissen. Classe, 1858, Band 33, Nos. 27-29, 1858, Band 34, 35, 36, and 37. Nos. 1 to 20. Register zu den Bänden 21, bis 30, der Sitzungsberichte der Mathemat. Naturwissen. Classe der K. Acad. der Wissenschaften, 3d part. Almanach der Kaiserlichen Akademie der Wissenschaften, Neunter

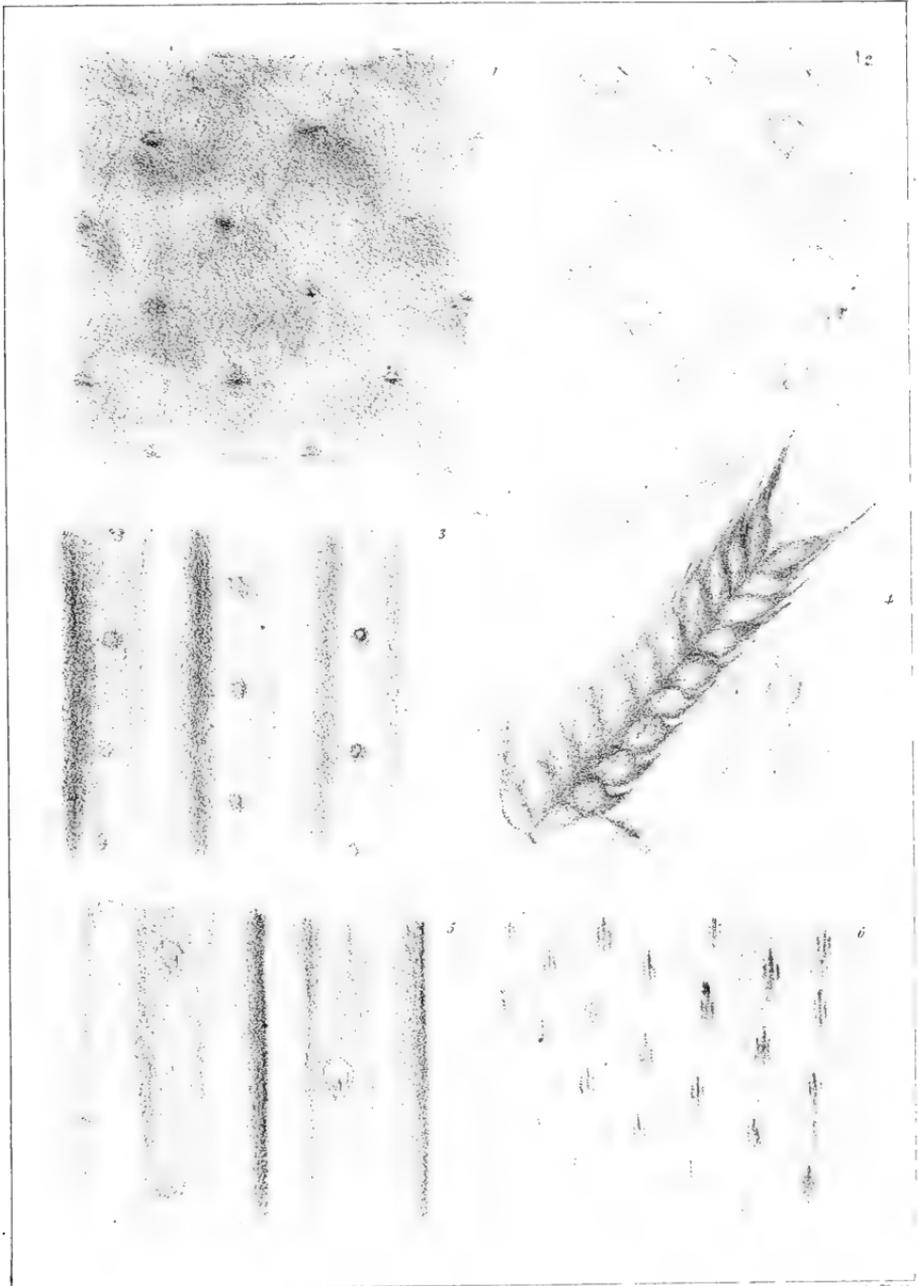






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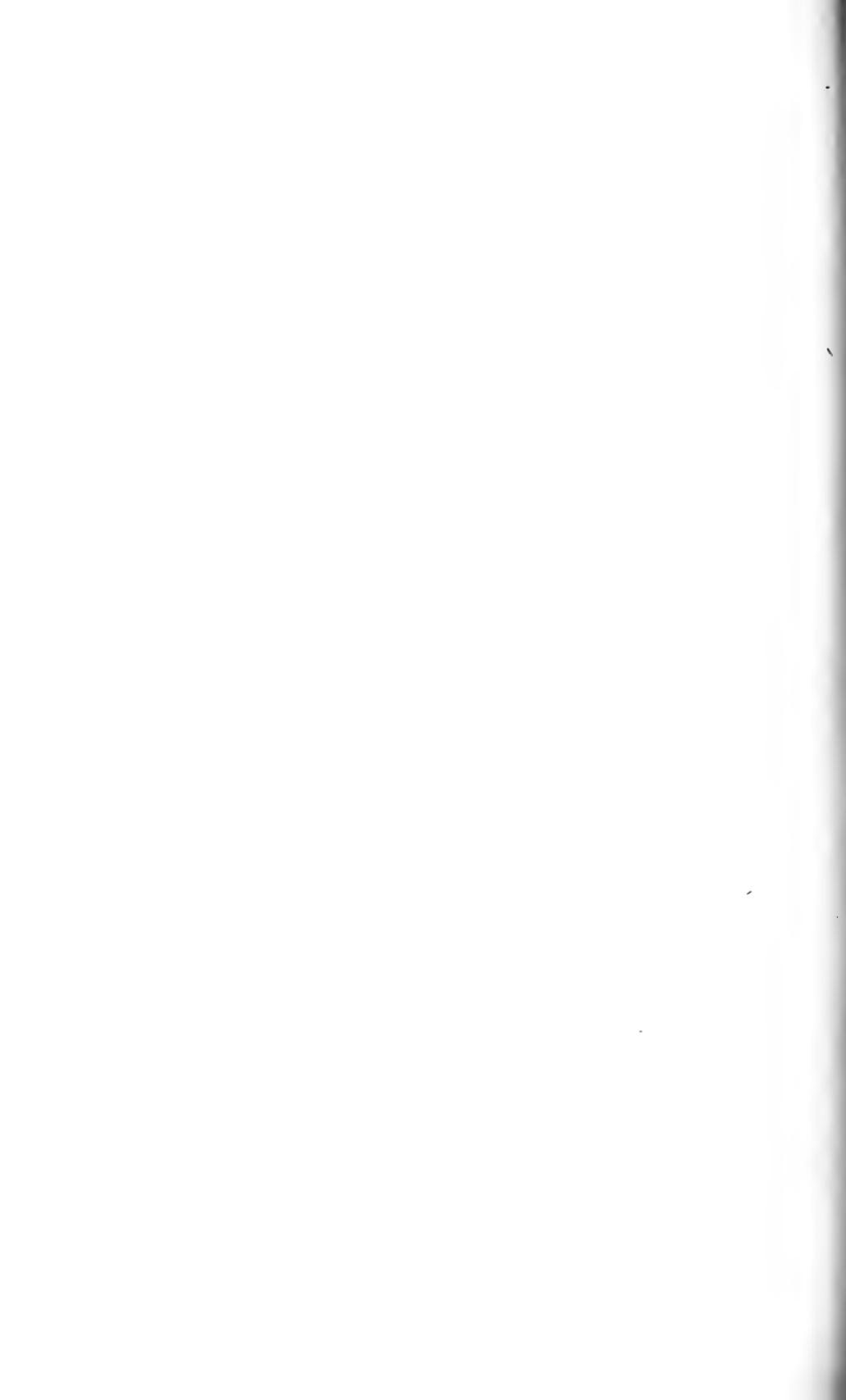


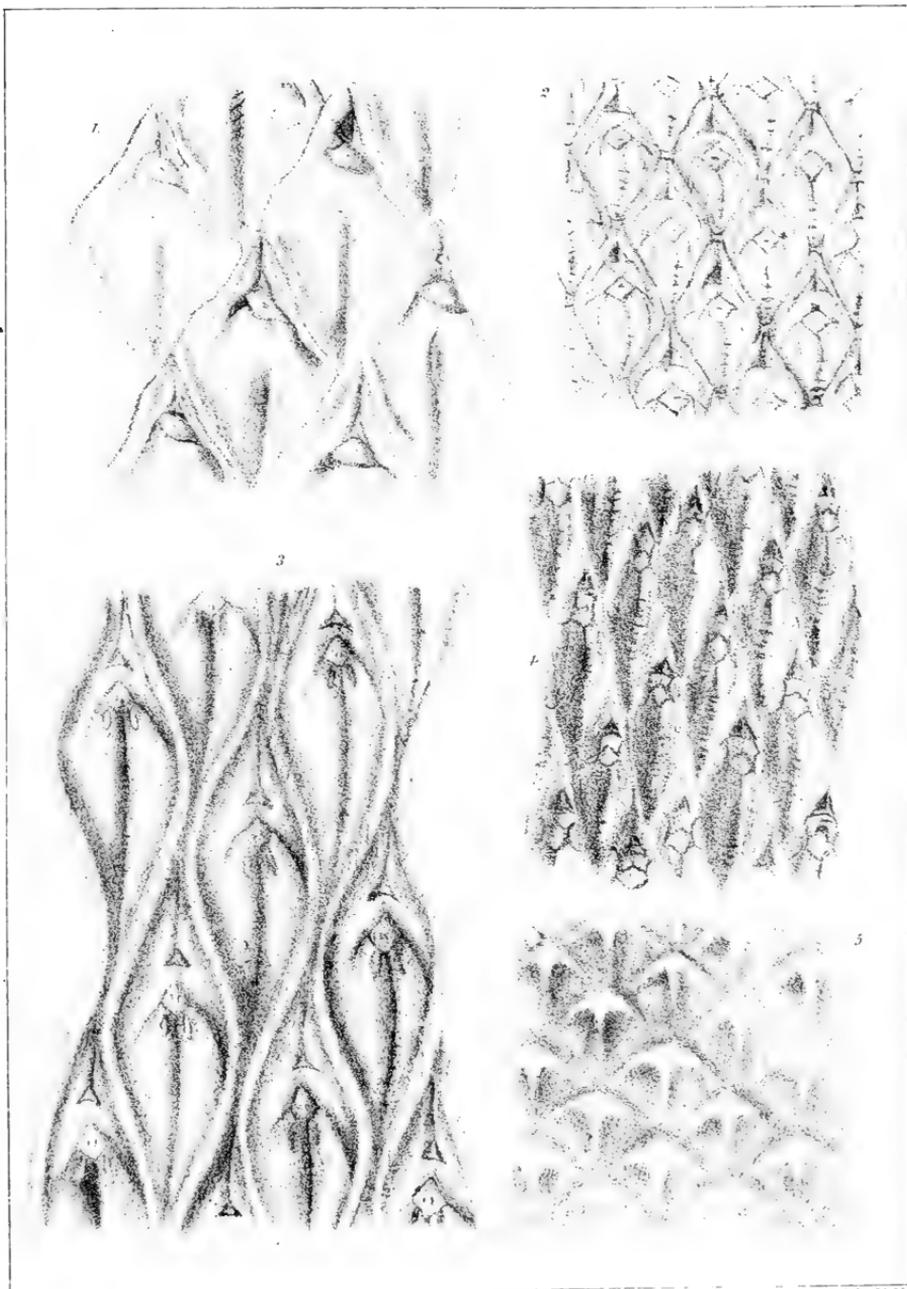


T. Sinclair's lith. Phil^a

- 1. *Asolanus Camptotainia*, Wood.
- 2. *A. Manephtacus*, Wood.
- 3. *Solenoula Psilophlacus*, Wood.

- 4. *Lepidostrobos Stachyoides*, Wood.
- 5. *Sigillaria Solenotus*, Wood.
- 6. *Asolanus Ornithienoides*, Wood.





T. Engelen's lib. Phil^a

1 *Lepidodendron Oweni* Wood

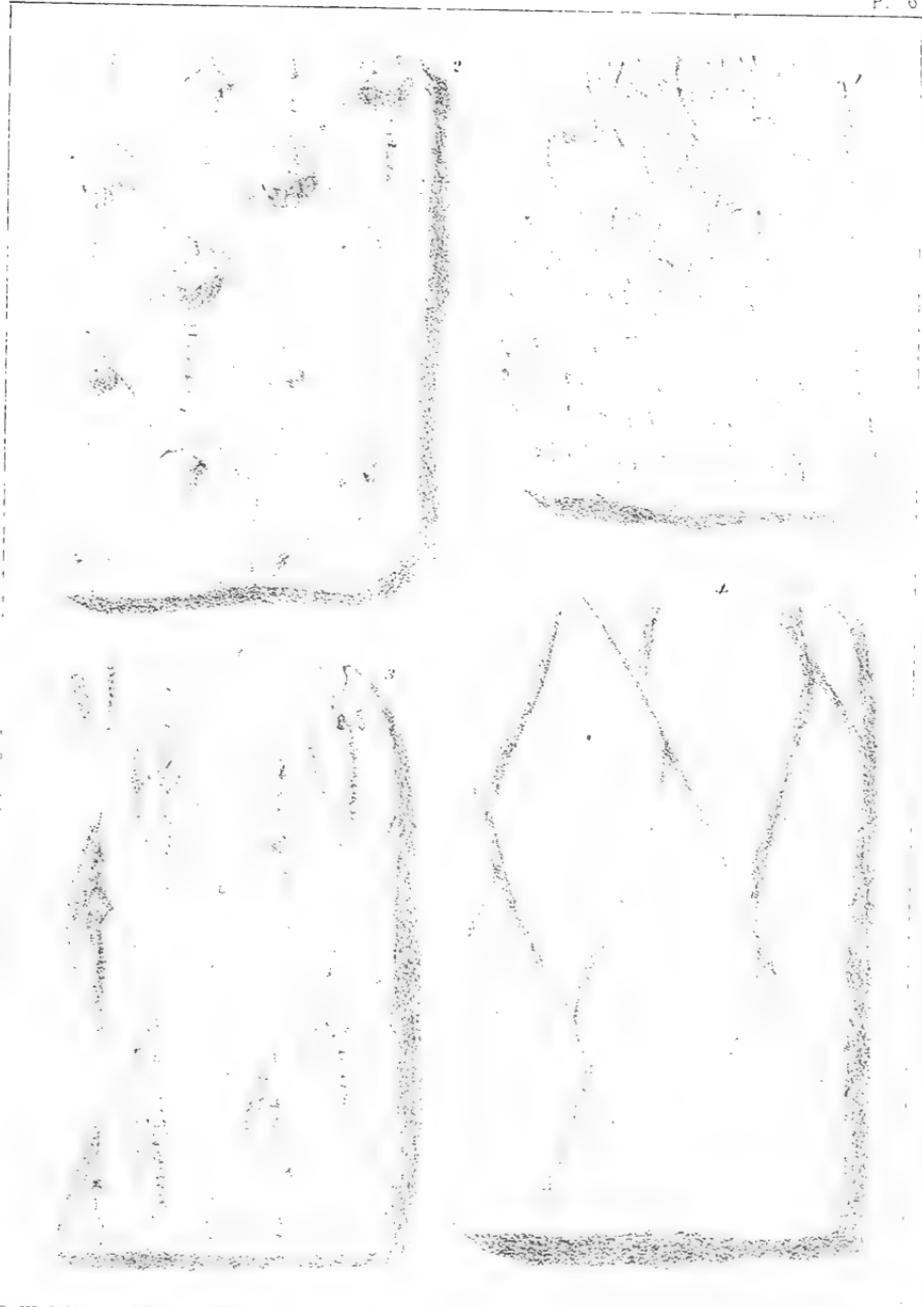
3 *L. McKiskeni* Wood

2 *L. Venustum* Wood.

4 *L. Lesquereuxi* Wood

5 *Lepidophloios Ichthyotepis* Wood





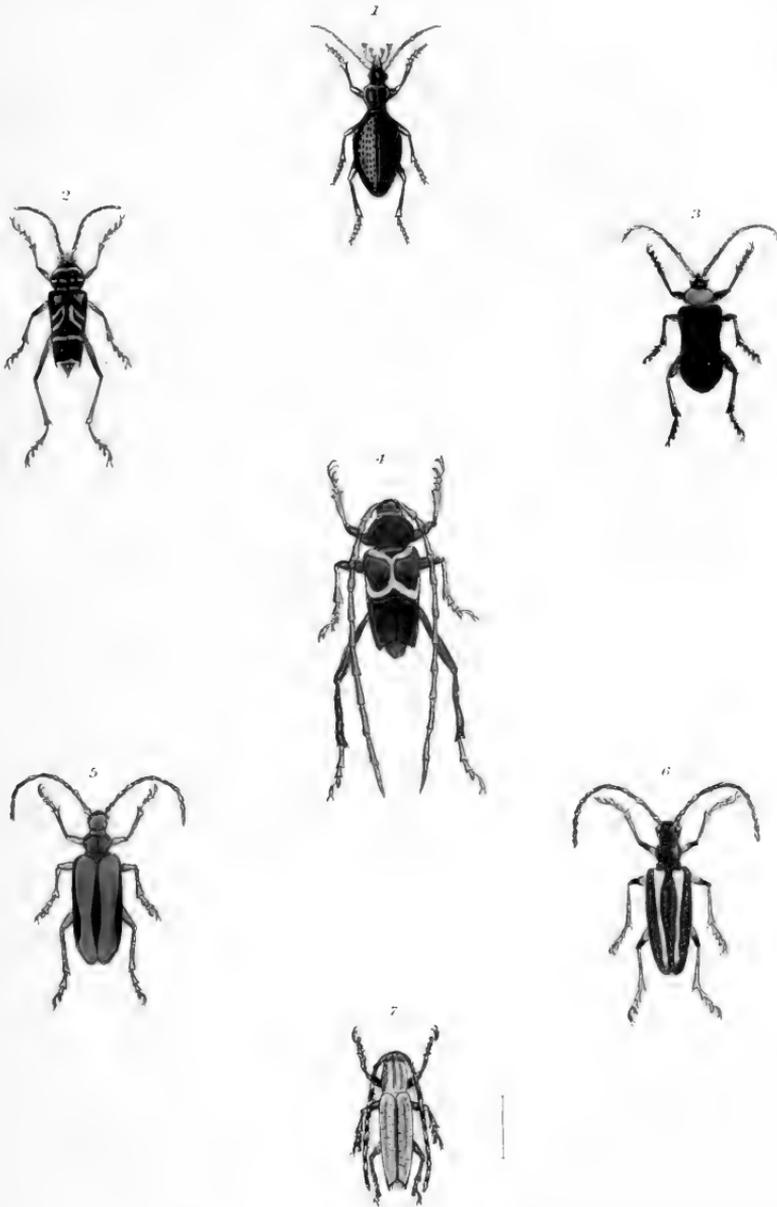
1 *Lepidodendron dikrocheilos* Wood 2 *L. Drepanaspis* Wood
3 *L. Boidae* Wood 4 *L. Maquam* Wood





ASTROSCOPUS GUTTATUS (ABBOTT)





1. *Nomarene imperfectus* 4. *Archopalus Wilsoni*
2. *Clytus nitidus* 5. *Leptura aurata*
3. *Euryoptera sanguineollis* 6. " *nitidicollis*
7. *Aegilopsis cuneata*



PROCEEDINGS
OF THE
BIOLOGICAL DEPARTMENT
OF THE
ACADEMY OF NATURAL SCIENCES
OF PHILADELPHIA.

1860.

Reported by WALTER F. ATLEE, Recorder.

Dr. JOSEPH LEIDY, Director.

January.

I.—PATHOLOGY.

Dr. J. J. Woodward read a paper entitled, "*Remarks on Errors in the Anatomical Diagnosis of Cancer.*"*

II.—CHEMISTRY AND TOXICOLOGY.

1. Dr. Mitchell stated that lately in examining, in conjunction with Dr. Hammond, the chemistry of corroval and vao, they had succeeded in obtaining, in a crystalline form, *corrovaline*. It is formed by evaporation from the solution in chloroform; one grain of corrovaline thus prepared was dissolved in one hundred grains of water, and one drop from the solution was sufficient to kill a mouse. The same quantity, in ten minutes, killed a frog.

2. Mr. Powel stated that when very young, in the laboratory of his uncle, Dr. Robert Hare, he had witnessed some very extraordinary poisonous qualities exhibited by the residue of the sweet oil of wine, distilled with some turpentine. The smell of this was sufficient to produce dizziness and lethargic symptoms.

*See American Journal of the Medical Sciences, for April, 1860.

February.

I.—ANATOMY.

Dr. Schmidt read the following paper upon a "*Method of Painting moist Anatomical Preparations.*"

Method of Painting Moist Anatomical Preparations.

BY H. D. SCHMIDT, M. D.

It is more due to neglect than any other motive, that I have not published, before this, the useful process of painting anatomical preparations, intended to be suspended in alcohol. The latter, as is known to every anatomist, affects the color of the different components of an organ, and thus renders them almost alike in appearance. This is a great disadvantage, as the object of such a preparation, is to show the relationship of the various parts of an organ, or that of different organs themselves. For instance, if the larger bloodvessels and ducts of a liver or kidney, &c., are injected and carefully dissected out, to exhibit their relative course, such a preparation will be of comparatively little value, if these vessels can not be readily distinguished from each other. This can only be accomplished by painting them with different colors. In dried preparations, this is easily done by coloring with oil-paint, commonly used by artists. But as the tissues of such preparations lose entirely their form by shrinking, they are rendered to a great extent unfit for study. It is different however, in the case of preparations intended to be preserved in a moist condition by suspension in alcohol. Here, the anatomist often becomes discouraged, when he finds his best dissections losing in appearance by the injurious action of the alcohol on the color of the tissues. To counterbalance this disadvantage, I have used a vehicle, which, while it unites with the tissues and thus adheres to them, is not affected injuriously by the action of the alcohol, but on the contrary, rendered only more firm. The process is so simple, that it seems rather strange not to have been resorted to long ago. The principle used as a vehicle, is *albumen*, in the form of the white of egg; and this is almost the only substance which will unite with the tissues, (as a great part of the latter consists of it,) without being injuriously affected by the alcohol. The colors used, of course must be mineral, and thoroughly ground with the albumen, on a plate of glass. After the preparation is painted, it is put into strong alcohol, which, to coagulate the albumen still more firmly, may be warmed. Not only the blood-vessels, ducts and nerves, may thus be beautifully colored, but with some artistical skill the color of the parenchyma of the organ may also be nicely imitated.

In the Anatomical Museum of the University of Pennsylvania, a liver with the blood-vessels and ducts carefully dissected, and painted with different colors by the above described process, can be seen suspended in alcohol. Likewise a kidney and a spleen; the color of the fresh parenchyma of the former is also imitated. These preparations I made three years ago, and up to the present time not the slightest change in the colors can be perceived; although they have often been carried to and from the lecture room. Another preparation, exhibiting the smaller muscles of the larynx, which are painted red, can also be seen. Intricate dissections of various regions can be made, the muscles, vessels, nerves, &c., colored, and their *form preserved* by the suspension in alcohol.

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In connection with this subject, Dr. Leidy stated that he is in the habit of suspending injected preparations in turpentine, by which liquid the tissues are rendered translucent. The jars in which they are thus suspended, are hermetically sealed by means of a piece of hog's bladder, well soaked and dipped in a cement of gum arabic, acetic acid and sugar. In order to suspend the preparation, a piece of whalebone or a bar of metal should be used; wood is too porous. Thus arranged the turpentine remains perfectly limpid.

Dr. Leidy added, that in these preparations, some change must take place in the air over the turpentine, for the bladder covering the jar bellies down, becoming concave. To give therefore a neater appearance to the preparation, he is in the habit of applying a second piece of bladder, prepared as the other; in which a small orifice is made with a pin, which prevents its retraction into the neck of the jar.

Mr. Slack stated that in England, glycerin was extensively used for mounting preparations, the high price of alcohol in that country preventing its general use for such a purpose.

II.—PATHOLOGY.

Dr. Leidy exhibited a portion of the stomach of a horse recently dead, which contained a number of spheroidal tumors, about an inch in diameter. The tumors contained a number of nematoid worms (*Spiroptera megastoma*) still alive.

Dr. Darrach, who had examined the structure of these tumors, had found their walls to be principally fibrous tissue, containing a puruloid matter filled with fine granules, which were the eggs of the worm. These tumors possessed orifices communicating with the stomach.

This horse was said to have died from *rupture* of the *diaphragm* caused by great distension of the intestines, in consequence of a large meal of Indian Corn. This rupture was situated in the muscular portion of the diaphragm, and was about six inches in length.

III.—TERATOLOGY.

Dr. Morris related a case of *arrest of development* in the hand of a young man with whom he is acquainted. This arrest is in two of his fingers. This condition of things is attributed by Dr. Morris to the action of filaments thrown around the fingers, and checking their growth, probably about the third or fourth month of intra-uterine life. These filaments or ligatures were assigned first by Dr. Montgomery as a cause of this phenomenon.

Dr. Mitchell while acknowledging, as a general rule, the justice of the reason assigned by Dr. Morris, for these arrests of development, declared that it could not explain those cases where for a series of generations the same deformity exists.

The mother of the person alluded to here, attributed the condition of her son's hand to her having witnessed the amputation by a surgeon of the same fingers while pregnant.

April.

Dr. Mitchell read the following paper on Corroval and Vao.

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On the Physical and Chemical characteristics of Corroval and Vao, two recently discovered varieties of Woorara, and on a new Alkaloid constituting their active principle.

BY WILLIAM A. HAMMOND, M. D.

Assistant Surgeon U. S. Army, and

S. WEIR MITCHELL, M. D.

Lecturer on Physiology in the Philadelphia Medical Association.

The two new varieties of woorara, which, so far as relates to their physical and chemical characteristics, we design considering at present, were brought in February, 1857, from the Rio Darien, in New Granada, by Drs. Ruschenberger and Caldwell of the United States Navy. By these gentlemen they were presented to Prof. Joseph Carson, of the University of Pennsylvania, to whom we must express our acknowledgments for the opportunity afforded us of analyzing and experimenting with these curious poisons.

The corroval, the more powerful of the two, has the general appearance of a vegetable extract of a brownish black color. The fracture is somewhat conchoidal, but some of the fragments in our possession have a surface such as would be given to the superficies of an inspissated vegetable infusion on cooling. When pulverized, it is of a tawny yellow appearance. Its taste is an intense and very persistent bitter. The saturated aqueous infusion is of a very dark brown, almost black color, and of neutral or exceedingly slight acid reaction. The alcoholic tincture is of a pale yellow tint. Both water and alcohol extract the poisonous principle, as do also ether and chloroform, though to a very diminished extent. No crystals are deposited from either of these solutions, except from the ethereal. They consist entirely of fatty substances.

The residue, insoluble in water, submitted to microscopical examination, is seen to consist of vegetable cells, starch granules, portions of woody tissues, oil globules, &c.; small grains of silica are also to be observed. No parts of animals of any kind can be discovered by most careful examination with object-glasses of high power and excellent defining quality. If the fangs of poisonous serpents, the livers and other parts of the body were used in the manufacture of corroval, we should undoubtedly have detected their anatomical elements. We therefore regard it as certain that such substances do not enter into the composition of the material under consideration.

Corroval burns with a yellow flame, and gives off a considerable amount of smoke and vapor. This latter has an odor very similar to that of human excrement, and, as we have ascertained, possesses all the poisonous activity of the corroval in substance. A mouse made to inhale the fumes died in less than two minutes. Corroval heated upon platinum foil, in the flame of the blow-pipe, is almost entirely volatilized. The ash consists of silica, iron, and certain saline substances.

In external characteristics vao cannot be distinguished from corroval. That in our possession is a dark brown extract, hard, and perfectly dry, and unaffected by exposure to the atmosphere. It yields its toxic principle to water and alcohol, the infusions being of similar physical qualities and reaction with those of corroval. The insoluble portion

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consists of a white or light gray deposit of a shred-like and flocculent appearance. Examined under the microscope this is seen to be principally composed of amorphous matter with which, however, starch granules and cells of vegetable origin, together with masses of woody tissue and fragments of silica are mingled. No animal structures are to be detected on the most minute examination.

Vao subjected to the action of heat acts in a manner not distinguishable from that of corroval, giving off a vapor with similar odor and other properties to that derived from the latter substance.

Woorara, of which corroval and vao may with propriety be considered as constituting species, has been analyzed by Roulin and Boussingault.* Pelletier and Petroz† and Heintz.‡

Roulin and Boussingault experimented with woorara which had been obtained from the Rio Negro. It was a solid extract of a black color, but brown when reduced to powder, of a resinous appearance, and exceedingly bitter taste. It burned with difficulty, and gave off no odor of organic nitrogenous substances. It was soluble in water, alcohol and in sulphuric ether, though not to any considerable extent. The aqueous infusion was of slight acid reaction; no strychnine was discovered by these chemists in woorara.

We may here state that two specimens of ordinary woorara, which we owe to the kindness of Major LeConte, of Philadelphia, and Prof. J. C. Dalton, of New York, agree in all essential particulars with that above described.

By the following process, Roulin and Boussingault obtained from woorara a new principle of an alkaloidal character, which they called curarin.

The woorara was reduced to fine powder and treated repeatedly with boiling alcohol. The extract thus obtained was evaporated, and the solid residue treated with water, which dissolved the active principle, leaving nothing but a little resinous matter. The aqueous solution was then decolorized by animal charcoal, and treated with infusion of galls. A beautiful whitish-yellow, flaky precipitate was then thrown down, having an exceedingly bitter taste. The supernatant liquid was almost entirely deprived of its bitterness; the precipitate thus obtained was well washed, heated to ebullition in water, and dissolved by the addition of oxalic acid. The acid liquor was then supersaturated by magnesia and filtered. It was again evaporated to dryness, and the residue dissolved in alcohol. This solution was concentrated and spontaneously evaporated to a syrupy consistency. It was subsequently further concentrated by evaporation *in vacuo*.

The analysis of Pelletier and Petroz yielded a similar product. These chemists extracted the woorara with alcohol, and treated the tincture thus obtained with ether, in order to remove the fatty and resinous substances present. The alcoholic extract was then evaporated, dissolved in water, and foreign matters precipitated from the solution by the acetate of lead, the excess of lead being removed by sulphuretted hydrogen. The solution was then decolorized by animal charcoal, filtered and evaporated; sul-

* Examen Chimique du Curare, Poison des Indiens de l'Orinoque, Annales de Chimie et de Physique, Tome xxxix, 1828, p. 24.

† Examen Chimique de Curare, Annales de Chimie et de Physique, Tome xl, 1829, p. 213.

‡ Reisen in British Guiana, Von Richard Schomburgk, Band i, S. 452, (note). 1860.]

phuric acid diluted with absolute alcohol was then added for the purpose of draining off the acetic acid. The alcohol was removed by evaporation, and the sulphuric acid precipitated by baryta. The excess of the latter was separated by carbonic acid, the liquid was next filtered and concentrated in the water bath, and the curarin thus obtained further dried *in vacuo*.

Obtained by either of these processes, curarin is a solid transparent resinoid substance, of a pale yellow color, very hygroscopic and soluble to almost any extent in water and alcohol. Its taste is exceedingly bitter. The solution in water restores the blue color to reddened litmus paper, neutralizes acids, and forms salts with them, easily soluble in water, but uncrystallizable.

Curarin gives with concentrated nitric acid, a blood red color, and with concentrated sulphuric acid a carmine tint.

Heintz proceeded as follows:—To the aqueous solution of the woorara, tannic acid was added, and an abundant precipitate soluble in boiling water was obtained. This was taken from the filter, boiled with magnesia, and then evaporated to dryness. The extract thus obtained was then treated with alcohol, to remove it from any insoluble salts of magnesia, and the solution again evaporated to dryness. By this means a yellowish brown extract was obtained, possessing no alkaline reaction, but endowed in a eminent degree with the toxic principle of the woorara. Heintz does not regard this extract as at all pure; subsequently he employed both the bichlorides of mercury and platinum, to effect the precipitation, but with no better success, a yellowish extract being still obtained.

Heintz ascertained by Lassaigne's method that the extract contained nitrogen; he also found sugar, gum, resin, extractive matter and tannic and gallic acids; traces of saline combinations with organic acids, probably the tartaric and oxalic were also detected. He was unable to discern the least trace of strychnia.

We think it highly probable, that the woorara examined by Heintz was very far from being of identical character with that analysed by Roulin and Boussingault and Pelletier and Petroz. The difference in the process employed is not sufficient to account for the very dissimilar product obtained by Heintz. His method was certainly such as to have separated any alkaloidal principle present. The substance he did obtain was probably nothing but a purified and more highly concentrated woorara, deprived of its woody fibre, starch, silica, &c.

We now proceed to detail the several steps in a qualitative analysis, made of the corroval and vao.

A few grains of corroval were subjected to the action of ether. From the solution thus obtained, oil-globules were deposited on evaporation, together with a number of minute acicular crystals, insoluble in water, but completely dissolved by hot alcohol and ether. Globular masses of a supposed resin were also present.

To another portion, water was added till it was completely extracted of all its bitter principle. The residue was perceived to contain several masses apparently of a fatty character. On subjecting this substance to the action of hot ether, it was entirely dissolved, and on evaporating the solution from a slip of glass, and viewing the residue with the microscope, numerous delicate acicular crystals collected in groups and radiating from a central nucleus were perceived. These were soluble in hot alcohol. The remaining portion was in the form of oil-globules.

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After thus separating the fatty substances as above, the portion insoluble in water was placed in a small retort with a little water; a receiver surrounded with ice was luted to the retort, and heat applied to the latter. On the surface of the distillate a small portion of essential oil floated. This had an odor somewhat resembling that of mustard, but much less pungent.

The substance remaining in the retort was next dried at a low temperature, and subjected to the action of alcohol. A yellowish-brown solution resulted, from which, on evaporation, a resinoid substance was obtained, having an odor very similar to that of a true essential oil.

The residue was next calcined in a platinum crucible. By this process the woody fibre, &c., was consumed, hydrochloric acid was added to the ash, and the silica thus separated. To a portion of this solution in hydrochloric acid diluted with water, ferrocyanide of potassium was added, and distinct evidence of the presence of iron obtained. Another portion treated with bichloride of platinum gave after a lapse of several hours a reddish crystalline precipitate, indicating the presence of soda.

We were prevented by an accident continuing the analysis of the above portion.

The aqueous solution was found by the addition of gelatin in excess, to yield a flaky, yellowish white precipitate of tannate of gelatine. It was filtered, and to the filtrate perchloride of iron added. A black precipitate of gallate of iron was thrown down.

From the foregoing analysis we conceive that we have ascertained the existence in corroval, besides, the active principle, of the following substances:—Olein, Margarin, Essential Oil, Resin, Starch, Silica, Iron, Soda, Woody Fibre, Tannic Acid, Gallic Acid.

The small quantity of corroval in our possession, prevented us from extending our analysis further in this direction, and for the same reason we are the less disposed to insist upon the absolute accuracy in all its steps of the foregoing investigation. Several of the above named substances were detected by the microscope alone, and this instrument was constantly employed throughout the whole analysis.

In the separation of the active principle of the corroval, we made use of the following processes:

1st. Ten grains of the substance were extracted by repeated portions of boiling water, till a bitter taste was no longer afforded. The solutions were now mixed and boiled with magnesia. It was next filtered, and the filtrate filtered repeatedly through animal charcoal, till all the bitterness and coloring matter were entirely absorbed. The charcoal was then treated with boiling alcohol in fresh portions till all bitterness was extracted from it. The alcohol was then evaporated to dryness. By this means a very bitter substance of a greenish white color was obtained, possessed in a high degree of the toxic properties of the corroval.

2d. The process employed in this instance was that first used by Roulin and Boussingault, but modified by employing water to extract with, instead of alcohol.

Ten grains of the corroval were reduced to fine powder and extracted with water, as in the first described process. To the solution, tannic acid was added in excess, a voluminous flaky precipitate of a yellowish-white color was thrown down. This was well washed on a filter to remove the tannic acid, mixed with water and heated to boiling, a few crystals of oxalic acid being added till it was entirely dissolved. The acid liquor was next treated with magnesia, in excess, and filtered. The filtrate was
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evaporated to dryness, and the extract thus obtained, dissolved in hot alcohol. This solution, evaporated to dryness, furnished a substance similar to that obtained by the first process, but more highly colored.

For the principle thus obtained, possessing as it does the properties of an alkaloid, and in a high degree the toxic properties of the corroval, we propose, in accordance with the principles of the United States Pharmacopœia, the name of *corrovalia*.

Corrovalia* is, when pure a greenish-white substance, of low specific gravity, and, upon the whole, similar to tannic acid in general appearance. It is soluble in alcohol, ether and chloroform, and, contrary to the statement in our original memoirs, to a slight extent in water. Heated upon platinum foil, in the flame of a spirit-lamp, it is entirely volatilized. With concentrated nitric acid it gives an emerald green color, which deepens in tint if a small piece of bichlorate of potassa be added. With sulphuric acid, a reddish-brown color is formed, which, with the further addition of bichromate of potassa, changes in a few minutes to a deep olive green; with ammonia it gives a deep yellow color, but no precipitate; with potassa in solution, the result is much the same; with tannic acid, it gave a white precipitate.

With iodide of potassium in solution, corrovalia yielded no precipitate or change of tint, nor did it give rise to any reaction in the presence of bichloride of platinum.

Corrovalia is uncrystallizable from all its solutions, except from that in chloroform. A drop of the chloroformic solution evaporated to dryness on a slip of glass, and subjected to microscopic examination, exhibits numerous acicular crystals, mostly collected in groups, and radiating from common centres.

Corrovalia neutralizes the sulphuric chlorhydric and acetic acids, and in all probability others, the quantity in our possession being too small for us to investigate its properties further in this direction. The salts formed with the above mentioned acids, as far as we have been able to ascertain, are uncrystallizable.

Introduced into the blood, corrovalia exerts a toxic power, equalled by few if any substances hitherto known to man. A grain was dissolved in one hundred minims of water. One minim of this solution killed a small mouse in five minutes, when inserted under the skin, and five minims in four and a half minutes produced the same result in a medium sized rabbit. With frogs it is especially active.

The amount of alkaloid obtained by us from corroval; amounted to about ten per cent.; from vao, the proportion did not exceed four or five per cent.

Vao is therefore much weaker than corroval, its physiological action is very similar to the latter substance. The amount of resin contained in it is considerably greater than that found in the corroval, as is also the woody fibre. For the physiological effects produced by these new and curious poisons, we must refer to the memoir to which we have already alluded.

Owing to the small quantity of these substances in our possession, we have been unable to make an ultimate analysis of them, and consequently cannot at present give formulas of their composition. In other respects we have from the same cause been unable to carry our investigations as

*Experimental researches relative to Corroval and Vao, &c., American Journal of the Medical Sciences, No. lxxv, N. S., July, 1859.

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