Return to

LIBRARY OF MARINE BIOLOGICAL LABORATORY

WOODS HOLE, MASS.

LOANED BY AMERICAN MUSEUM OF NATURAL HISTORY
PROCEEDINGS
OF THE
ACADEMY OF NATURAL SCIENCES
OF
PHILADELPHIA.

1864.

PHILADELPHIA:
PRINTED FOR THE ACADEMY.
1864.
LIST OF CONTRIBUTORS,

With reference to the several Articles contributed by each.

Canby, W. M.  Notes of Botanical Visits to the lower part of Delaware and the Eastern Shore of Maryland ........................................ 16

Cassin, J.  Notes of an examination of the Birds of the Group Coerebinae, 265
Fasti Ornithologiae. Part I .................................................. 234
Notes on some species of Birds from South America ................... 286

Cooper, J. G.  On a new Cormorant from the Farralone Islands, Cal...... 258

Conrad, T. A.  Notes on Shells, with Descriptions of new fossil Genera and Species ......................................................... 211

Cope, E. D.  Contributions to the Herpetology of Tropical America .... 166
On the Limits and Relations of the Raniformes .......................... 181
On a Blind Silurid from Pennsylvania .................................... 231
On the Characters of the higher groups of Reptilia Squamata, and especially of the Diploglossa ......................................... 224
Partial Catalogue of the Cold-blooded Vertebrae of Michigan ......... 276

Coues, E.  The Crania of Colymbus torquatus and C. Adamsii compared, 21
A Critical Review of the Family Procellaridae. Part I ................... 72
Part II .................................................................................. 116

Elliot, D. G.  Remarks upon a Proposed Arrangement of the Family of Grouse, and New Genera added .............................................. 23

Ennis, J.  Additions to the Catalogue of Stars which have changed their Colors ................................................................. 51
On the Influence of the Earth’s Atmosphere on the Color of Stars .... 161

Gill, Theo.  Notes on the Nomenclature of Genera and Species of Eche-neidoideæ ......................................................... 59
Description of a new Labroid Genus allied to Trochocopus ............. 57
Critical remarks on the Genera Sebastes and Sebastodes ............... 145
LIST OF CONTRIBUTORS.

Second Contribution to the Selachology of California.......................... 147
Synopsis of the Pleuronectoids of the eastern coast of North America... 214
Synopsis of the Cyclopteroids of eastern North America...................... 189
Notes on the Paralepidoids and Microstomatoids, and on some peculiarities of Arctic Ichthyology............................................ 187
Synopsis of the Pleuronectoids of California and North-western America, 194
Descriptions of new generic types of Pleuronectoids.......................... 198
On the affinities of several doubtful British Fishes.......................... 199
Notes on the Family of Stichaeoids............................................ 208
Descriptions of new genera and species of Eastern American Pleuro-
nectoids...................................................................................... 220

Helmuth, C. A., M.D. New species of Mordellestina collected in Illinois, 105

Lawrence, G. N. Descriptions of New Species of Birds of the Families
Corcorbidae, Tanagridae, Icteridae and Scolopacidae......................... 106

Lea, I. Description of a new Genus of the Family Melanidae.................. 2
Description of eleven new species of Indigenous Melanidae................... 3
Description of Planorbis Newberryi............................................. 5
Descriptions of six new species of Unionidae from Lake Nyassa, Central
Africa....................................................................................... 108
Descriptions of six new species of Succinea..................................... 109
Descriptions of thirteen new species of Melanidae.............................. 111
Description of a new species of Planorbis....................................... 111
Descriptions of five new species of Lymnaea.................................... 113
Descriptions of two new species of Unionidae from South Africa........... 113
Descriptions of twenty-four new species of Physa of the United State's
and Canada.................................................................................. 114
New Unionidae, Melanidae, &c., chiefly from the United States............ 145
Descriptions of six new Western Asiatic Unionidae............................ 285

March, W. T. Notes on the Birds of Jamaica. Part III.......................... 62

Stimpson, Dr. Wm. Descriptions of new marine Invertebrata from Pu-
get's Sound ................................................................. 153

Tryon, Geo. W., Jr. Synonymy of the species of Strepomatidae. Part 2, 24
Part 3.................................................................................... 92

Wincbell, Alex. Description of a Gar-Pike, supposed to be new.............. 183
Wood, Dr. H. C. Descriptions of new species of North American Poly-
desmidae.................................................................................... 5
Descriptions of new species of North American Iulidae........................ 10
Description of new Genera and Species of North American Myriapoda.. 186
January 5th.
Vice-President Vaux in the Chair.

Twenty members present.
A letter was read from Thomas B. Wilson, M. D., Newark, Del., January 1, 1864, acknowledging his election as President of the Academy.

The following was presented for publication: "The Crania of Columbus torquatus and C. Adamsii compared." By Elliott Coues, M. D.

January 12th.
Vice-President Vaux in the Chair.

Thirty members present.
The following were presented for publication:
"Description of a New Genus of the Family Melanidæ." "Description of Eleven New Species of Melanidæ," and "Description of Planorbis Newberryi." By Isaac Lea.

"Thoughts on the Influence of Ether in the Solar System," etc. By Alexander Wilcocks, M. D.

"Descriptions of New Polydesmidæ," and "Descriptions of New Iulidæ." By Dr. H. C. Wood, Jr.

On leave granted, Mr. Cassin presented the following preamble and resolutions, which were unanimously adopted:

Whereas, our eminent and highly-esteemed associate and President, Isaac Lea, LL. D., having declined being a candidate for re-election to the position of chief officer of this Academy, has retired therefrom:

Resolved, That the Academy does hereby express its most grateful

1864.]
sense of the entire faithfulness, impartiality, and eminent ability with which Dr. Lea performed the duties of President during the lengthened term of his incumbency.

Resolved, That the thanks of this Academy be hereby tendered to Dr. Lea for his most valuable and important services in the capacity of President, and for his many other judicious and liberal favors and continued and successful exertions for the benefit of this Academy and for the advancement of the interests of Science in the United States.

January 19th.

Vice-President Vaux in the Chair.

Eighteen members present.

The following was presented for publication:—"Notes of Botanical Visits to the lower part of Delaware and the Eastern Shore of Maryland." By Wm. M. Canby.

January 26th.

Vice-President Bridges in the Chair.

Twenty-one members present.

On report of the respective committees, the following were ordered to be published:—

**Description of a new Genus of the Family MELANIDÆ.**

*BY ISAAC LEA.*

Genus MESESCHIZA.*


When I described the genus Trypanostoma,† I mentioned the importance of eliminating as many species as possible from the enormously-extended genus Melania. The little shell which I now propose as a new genus has so distinct a character in the incision of the middle of the outer lip, as to mark perfectly its place in the Melanidæ of the United States. It differs entirely in the character of the cut from that in Schizostoma, which has, in all the many species I have seen, a more or less deep incision immediately under the suture. The living soft parts have not yet been observed. They may, when examined, prove to have some characteristics quite different from Schizostoma.

Meseschiza Grosvenorii.—Testa laevi, fusiformi, tenue, obtusē conicā, vel purpureā vel vittatā; spirā obtusē conicā; suturis leviter impressis; anfractibus instar septenis, vix convexis; apertura magnā, rhomboideā, intus plerumque vittatā; labro acuto, in medio leviter exciso; columellā parum incurvatā et contortā.

* Mer, εγίς, central fissure.

[Jan.]
Operculum ovate, light-brown, rather thin, having several volutions, and with the polar point well removed from the left margin.

_Hab._—Wabash River, Indiana, H. C. Grosevanor.

*Remarks._—I have thirteen specimens of this remarkable shell. Eight of them have a well-defined though delicate notch on the edge at or near to the periphery of the last whorl. Five of the specimens have no notch, which probably arises in four of them from not being full grown, and in one from having the thin, delicate edge broken off. In all the specimens there is a light line under the sutures, and some have six or seven brown bands, which are distinctly seen on the inside. The channel at the base is small but well defined. In outline, this species reminds one of _Goniobasis Vanuxenii_ (nobis) and _Melania (Goniobasis) germana_, Anth. It is a thinner shell than either, and the notch in the lip removes it from that genus. The aperture is about one-half the length of the shell. I have great pleasure in naming this species after Mr. Grosvenor, to whom I am greatly indebted for many of our Western Molluscs.

Descriptions of eleven new Species of Indigenous _Melanidæ._

 BY ISAAC LEA.

_Goniobasis Erythreus._—Testa plicata, subfusiformi, subtequei, tenebroso-olivâ, evittatâ; spirâ obtusâ conoidceâ; suturis irregulariter impressis; annufractibus instar senis, planulatis, supernâ plicatis; apertura grandisculâ, subovata, intus caruleo-albâ; labro acuto, leviter sinuoso; columellâ inferior parum incrassâtâ et conforâtâ.

_Hab._—Rocky Creek, head branch of Emery Run, E. Tennessee, Mayor S. S. Lyon, U. S. E.

_Goniobasis umbonata._—Testa nodulatâ, subfusiformi, subcrassâ, obsoleté vittatâ, tenebroso-olivâ; spirâ valdè obtusâ; suturis valdè impressis; annufractibus irregulariter umbonatis, subsuturis tumidis, ultimo pergrandi; apertura pergrandi, subelliptica; labro acuto, leviter sinuoso; columellâ superne incrassâtâ, internâ subsinuosâ.

_Hab._—Smith's Shoals, Cumberland River, E. Tennessee, Mayor S. S. Lyon, U. S. E.

*Remarks._—This is the fourth species of a natural group which I have described, and which have a large ear-shaped aperture,—viz.: _Melania (Goniobasis) basalis, Midas, gibberosa and umbonata_. If they be not entitled to a generic place, they may at least be considered a subgenus, for which I propose the name of _Euryceleon_, from _Eurus_, amplus, and _Kaes_, cavitas,—the aperture being larger than in the _Melanidæ_ generally. All the species of _Euryceleon_ have a callus on the columella above, but not below, as in _Lithasia_, and the base is more or less angular, which is not the case with _Anculosa_. Those which we have considered as varieties of _Anculosa prerana_, Say, which have an angular base, properly belong, I think, to _Euryceleon_ as well also _Anthonyi_, _Redfieldi_, _turbinata_, and _tintinnabulum_ (nobis), and some others. When the

* In my paper on _New Melanides_ of the United States, published in the Proceedings of the Academy, in 1861, and more at large in the _Journal_, vol. v. and in my Observations, vol. ix. I used the names of _blanda_ and _Vanuxemii_ for two new _Goniobasi_. Having used both names before as _Melania_, which now come under the genus _Goniobasis_, I propose to change _blanda_ into _mesa_ and _Vanuxemii_ into _Presbionana_, the former, _Vanuxemii_, having been found at Col. Preston's salt works in Western Virginia.

Mr. Reeve having published in his "Conchologia Tennesse" _Melania (Goniobasis) Canbyi_ (nobis) under the name of "_Elyrahuensis_, Lea," prior to my publication of it, the name of _Elyrahuensis_ must be retained for that species. I therefore transfer the name of _Canbyi_ to the species which I subsequently published as _Elyrahuensis_ in the _Journal_, vol. v. and "Observations," vol. ix. p. 37, fig. 133.

1864.\]
soft parts of the four species mentioned first shall be examined, they will, I think, be found to differ from Goniobasis, Trypanostoma and Lithasia, to which genera they seem nearest allied. The operculum of the only one I have seen, gibberosa,—is the same as Goniobasis and the Melanide generally.

Gonioasis ALABANYENSI.—Testa granulata, conicâ, subtenui, luteo-olivacea; spirà subelevatà; suturis irregulariter impressis; anfractibus instar senis, planulatis, superne iuterdum plicatis, inferne striatis; aperturà grandiscula, ovatâ, intus albidâ; labro acuto, vix sinuoso; columellà aliquanto inflecttâ et contortâ.

Operculum subrotund, light-brown, very thin, polar point on the left, near the middle.

_Hab._—Near Albany and Blue Springs, Baker County, Georgia, Rev. G. White.

Trypanostoma SUBROBUSTUM.—Testâ levî, pyramidata, tenebroso-corneâ, crassa; spirà pyramidatà, elevatà; suturis impressis; anfractibus instar quinsis, convexiusculis, superne granulatâ, inferne striatis; aperturâ parviusculâ, ovatâ, intus vittatâ; labro acuto, vix sinuoso; columellâ aliquanto inflecttâ et contortâ.

Operculum ovate, dark-brown, with polar point near the base of the left side.

_Hab._—Holston River at Knoxville, E. Tennessee, Major S. S. Lyon, U. S. E.

Trypanostoma ROANENSE.—Testâ levî, obtuso-conicâ, crasseâ, vittatâ vel evittata; spirâ obtusâ; suturis impressis; anfractibus planulatis, subsuburis tumidis; aperturâ parviusculâ, rhomboideâ; labro acuto, valde sinuoso; columellâ albidâ, incrassatâ et valde contortâ.

_Hab._—Roane County, E. Tennessee, Major S. S. Lyon, U. S. E.

Trypanostoma LESLEY.—Testâ tuberculatâ, pyramidata, tenebroso-corneâ; spirâ elevatâ; suturis irregulariter impressis; anfractibus instar octonis, sub-impressis; aperturâ parviusculâ, rhomboideâ, intus albidâ, interdum vittatâ; labro acuto, valde sinuoso; columellâ incrassatâ.

Operculum ovate, dark-brown, rather thin, with the polar point near the base.

_Hab._—East Tennessee, Prof. Troost. Smith’s Shoals, Cumberland River, E. Tennessee, Major S. S. Lyon, U. S. E.; and Pulaski Co., Kentucky, Joseph Lesley, C. E.

Trypanostoma AFFINE.—Testâ canaliculatâ, pyramidata, cornéâ; spirâ valdè elevatâ; suturis irregulariter impressis; anfractibus instar novenis, canaliculatis, superne planulatis; aperturâ rhomboideâ, intus albidâ vel vittatâ; labro acuto, sigmoideâ; columellâ incrassatâ et valdè contortâ.

_Hab._—Smith’s Shoals, Cumberland River, E. Tennessee, Major S. S. Lyon, U. S. E.

Trypanostoma CYLINDRACEUM.—Testâ levî, cylindraceâ, subcarrass, vittatâ vel evittata; spirà subelevatâ; suturis irregulariter impressis; anfractibus planulatis, leviter impressis, subsuburis tumidis; aperturâ parviusculâ, rhomboideâ; labro acuto, aliquanto sinuoso; columellâ incrassatâ, incurvatâ et contortâ.

_Hab._—Roane County, E. Tennessee, Major S. S. Lyon, U. S. E.

Trypanostoma CARINATUM.—Testâ carinatâ, acuto-conicâ, rufo-corneâ, tenui
Description of and Remarks on PLANORBIS NEWBERRYI.

BY ISAAC LEA.

**Planorbis Newberryi.**—Testa pallido-corneâ; depresso-turritâ, minutissimâ striatâ, superne et inferne acuto-carinata, latet et profunditate umbilicatatâ; anfractibus quinis, superne planulatis; apertura magna, pallido-cornea, subtriangulari.

Shell pale horn-color, slightly turrited, very finely striate, sharply carinate above and below, widely and deeply umbilicate, whorls five, flattened above; aperture large, pale horn-color and subtriangular.

**Hab.**—Klamath Lake and Canoe Creek, California, J. S. Newberry, M. D. My cabinet and cabinets of Smithsonian Institution and Dr. Newberry.

**Diam.** 55,

**Length.** 42 of an inch.

**Remarks.**—This is a very remarkable shell, and I have placed it among the Planorbes until the soft parts may be observed in a living state; they may be found to differ from the true Planorbes.* Some specimens preserved in alcohol have been carefully examined, but the parts are so rigid that it could not be satisfactorily done. The tentacula do not, however, seem to be so long as is usual in the Planorbes. The epidermis is very thin on the upper part of the whorls, and the striae there are backwards in curves, and on the lower part slightly forwards. The upper carina forms an acute angle, the edge being cord-like; the lower one is still more acute. In most of the specimens there are two obscure carinations on the whorls between the acute ones. The umbilical region is very remarkable, the perforation extending to the apex of the slightly elevated spire, the apex itself being frequently wanting, owing to corrosion occasioned by the attacks of some small enemy eating into the substance of the hard part. The upper angle of the whorls is elevated slightly above the plane of the whorls, thus forming a Babylonic appearance. This gives the shell the appearance of some forms of the Trochi.

This very curious and interesting species is among the Mollusca brought by J. S. Newberry, M. D., attached to the Pacific Railroad Survey under the command of Lieut. R. S. Williamson, U. S. A., and I have great pleasure in dedicating it to Dr. Newberry, who has done so much to elucidate the Natural History of California and Oregon, when on these expeditions so creditable to the Government.

---

* Provisionally it may be called Megasytropha, from Mrâ, magnus, and vortex,—the umbilicus being large and vortex like.

1864.]
Descriptions of New Species of NORTH AMERICAN POLYDESMIDÆ.

BY DR. H. C. WOOD, JR.

Genus POLYDESMUS.

Subgenus FONTARIA.

P. trimaculatus.

P. saturate rubro-brunneus; scutis postice fulvo trimaculatis, corrugatis; antennæ ultimis pilosis; pedibus dilute fulvis; appendicibus genitalibus masculis maximis, crassibus, ultimis obtuse rotundatis, spina terminali gracillima, enorniter convoluta.

The color of this species is a dark reddish brown. Each scutum has on the posterior portion of its lateral lamina a bright yellow or orange spot, and a blotch of the same tint on the median portion of its posterior border. Occasionally this is so prolonged as almost to give the idea of a continuous transverse band. The first scutum has two central markings, situated the one on its anterior, and the other on its posterior border. These are so shaped and joined together as to suggest the idea of an hour-glass. The anal scutum is triangular and somewhat elongate. It is yellow, but has a dark spot on each side, and its truncate apex is tipped with brown. The head is chestnut brown. Its vertex is deeply canalicate, and its inferior lip distinctly emarginate, and fringed with hairs. The antennae are light brown, slender, and not at all clavate. The feet are light yellow, with their distal portion somewhat pilose and occasionally tipped with brown. The male genital appendages are very large and robust. Their terminal spine is simple, long, slender, and irregularly bent upon itself. They are also furnished with a small nearly straight spineule, placed proximally as to the terminal. The female genitalia are very short, thick and bulbous. On one side of each there is an opening, with two projecting plates separated from one another by a linear orifice. I have seen a male and female, which were collected by Mr. E. D. Cope in Susquehanna Co., Pennsylvania. They are about two inches long.

P. corrugatus.

P. atro-castaneus, scutis fulvo postice marginatis; laminis lateribus fulvis, latissimis, angulis anticis rotundatis, posticis modice acutis; scuto anali triangulare, elongato, postico fulvo, apice truncato; appendicibus genitalibus masculis maximis, spinulo laterale robusto subbreve vix curvato armatis; spina terminali maxima, robusta, compressa, tortuosâ, spinulo basale armata.

The color of the perfect animal is a chestnut black, rarely reddish chestnut, with a moderately broad margin of fulvous [in alcoholic specimens] on each scutum. This band may be red during life. The scute beautifully polished to the naked eye, the microscope shows to be absolutely wrinkled. Very many of these wrinkles are longitudinal. The head is of the same color as the body; medianly it is distinctly sulcate; inferiorly it is broadly and rather deeply emarginate. The scutal side plates are fulvous above and below. Their anterior angles are rounded, their posterior more or less acute, and in the hinder ones prolonged. The under surface of the body is of a light yellow. The male genital appendages are very large and robust. They have a short, slightly crooked spineule attached and lying close to their side. The terminal spine is irregularly spiral, and has near its base a curved spineule. At the point of its origin is a tuft of bristly hairs. Each female genital appendage is chiefly composed of a short, almost globular, process, in one side of which there exists a large opening. This process is scarcely at all pilose. Through the side opening projects a pair of large, thick plates, fitting together somewhat in the manner of bivalve shells. These nearly equal in height the main process. The spine on the second joint of the feet is robust, but acute. The whole animal is about one and a half inches in length.
Hab.—Michigan; Prof. Miles. Trenton Falls, New York; Mus. Comp. Zoology, D. Mack.

P. bifidus.

P. rubro castaneus, segmentis et antice et postice late fulvo-marginatis, laminis lateribus dilute fulvis; scuto analie triangulare, apice truncato et decurvato; appendicibus genitalibus masculis elongatis, pilosis; spina terminale gracillima, proxima cylindracea, ultima bifida et nonnulli abrupte curvata, spinulo basale gracillimo parvo armata.

All of my specimens have been preserved for a length of time in alcohol, so that the description of color is not as accurate as it should be. The anterior aspect of the head is much lighter than the vertex, which is medianly strongly canaliculate. The antennae are dilute fulvous, are rather longer than in P. virginensis, and are distally, sparsely and shortly pilose. The spinae on the distal ends of the first and second joints of the long and slender feet are robust, but are often obsolete anteriorly. The terminal scutum has several punctae closely resembling pores. The preanal scale is triangular; it has two little elevations surmounted by a punctum. The male genital appendages are elongate. Their terminal spine is very slender and cylindrical in its proximal portion; distally it is bifid and strongly curved. It is ornated with a very slender curved basal spine.

Hab.—Georgia; Museum of Comp. Zoology, Dr. LeConte. Texas; Collection of Smithsonian, G. Wurdeman.

P. crassicutis.

P. maximus, robustus; scutis enormiter subrude punctatis; appendicibus genitalibus masculis, singula spinis quatuor armata; duobus magnis, parvis dubus.

The color of all the specimens is light testaceous; with, in many, a dark dorsal line. It is very possible that the alcohol, in which they have been long preserved, may have destroyed the original color. The animal is very large and robust, and has its outer armor and side plates very heavy. The head on its upper surface has a distinct median furrow, and on its lower a broadly linear, oblique depression on each side. The inferior margin is rather broadly and deeply emarginate. The lateral laminae are rather short. The female genital appendages are a pair of small, pyramidal, pilose bodies, whose apices are split into three or four very minute mameloid processes. The male organs are large, and distally very hairy. They are each armed with two large and two small spines. The longer and more slender of the former at its proximal portion is bent rather abruptly at right angles to itself, but is nearly straight afterwards. The more robust is pretty straight, save at its distal extremity, where it is abruptly bent at right angles to itself. It is armed with several very slender spinules, and has one edge distantly and obsoletely denticate. Of the smaller spines, one is short and blunt; the other much longer, sharp, slender and falciform. The last scutum is triangular, and has its apex truncate and very slightly decurvate. The preanal scale is semicircular.

Length, 2 to 3 inches.

Hab.—Mississippi. Museum of Smithsonian.

Subgenus POLYDESMUS.

P. hispidipes.

P. saturate olivaceo-brunneus, immaculatus; dorso nonnulli convexo; scuto analie triangulare longe pilose, apice truncato et decurvato; pedibus hispidis; appendicibus masculis genitalibus brevibus, robustis, spina terminale modica, ultima abrupte curvata, dense pilosa.

The color is darker than in P. erythropygus. The side plates are rather
short, with their edges much thickened. The head has its vertex strongly canaliculate. Its anterior face is marked with two small punctiform impressions. The lower border is not very strongly emarginate, and is set with a fringe of short thick hairs. The antennae are mostly dark colored, scarcely at all clavate and coarsely pubescent. The feet are rough, with closely set, stiff hairs. The anal scutum is prolonged posteriorly, so as to come almost to a blunt point. The genital appendages in the male are short and thick. Their terminal spine is slightly curved at its base, thence is nearly straight, save at its distal extremity, where it is abruptly curved, becoming nearly horizontal. It is beset with very numerous long hairs. We have examined them in eighteen specimens, and found them to agree perfectly. The female genital appendages consist of a pair of short, conoidal, very pilose processes, which have an opening along their inner edge.

Length one inch and an eighth.

**Hab.**—Illinois. Smithsonian Coll. R. Kennicott.

**Var.**? *P. laete castaneus, fulvo vel rubro maculatus, linea nigra dorsali ornatus; laminis lateralibus marginibus rubris vel fulvis.* This is possibly a distinct species, but as I have seen but a very few individuals, and the male genital appendages do not differ from those of *P. hispidipes*, I prefer not risking a synonym. Whether the spots are yellowish or red in the living animal, the length of time our individuals have been preserved in alcohol precludes me from deciding.

The spots are sometimes arranged regularly—two large ones on each side of the mesial line, and a row of small ones on the posterior border.

**Hab.**—Illinois. Smithsonian Coll. R. Kennicott.

**Subgenus STENONIA.**

**P. cerasinus.**

*P. dilute cerasinus; dorso complanato; antennis modicis pubescentibus, nonnihil clavatis, nonnihil brevibus; scutis squamis obsoletis ornatis, marginibus lateralibus serratis; appendicis genitalis masculis spina terminale lata, oblique truncata, utrinque processu longo setaceo curvato instructa.*

The head has the median furrow on its vertex slightly pronounced. The anterior face is sparsely pilose, and has its lower margin broadly but shallowly emarginate. The scuta have a double row of scales, obsolete but otherwise similar to those of the following species. Sometimes these are entirely lost. The lateral margins of the side plates are rounded slightly and minutely serrulately. They seldom have more than three serratures on each side. The terminal scutum is triangular, with its obtuse apex bent downwards. It is sparsely pilose. The legs are quite hairy, and light colored. Their second joint is turgid. The genital appendages in the male are peculiar. The terminal spines are broad and short, and superiorly very obliquely truncated, with two small hamular processes. On each side a long, seta-like process springs from the base. The outer, much the longer of the two, throws an arch entirely over the short spines. The inner is straighter. They both have one or two thorn-like excrescences.

**Hab.**—Oregon. Museum of Smithsonian Institution.

**Subgenus STRONGYLOSOMA.**

**P. eruca.**

*P. bruneus? robustus; antennis brevibus, pilosis, haud clavatis; scutis subrude punctatis; pedibus parvis, gracillibus, modice hirsutis.*

Judging from our badly preserved alcoholic specimens, the color of this species is reddish brown, with the side plates a lighter color. The body is very robust. The head has a median furrow on its vertex, and its lower border emarginate. The side plates have but the posterior angles, which are acute.
The scuta appear to have a narrow edging of black posteriorly. The terminal scutum is subtriangular, very prolonged and very thick posteriorly. We have never had an opportunity of examining the male genital organs. Those of the female are very pilose, and are formed of two portions. They are contracted at their bases, and expanded above, somewhat as a reversed flattened cone. The basal piece is thicker, and less hairy than the other. The distal piece is set into it, and has along the free extremity an opening.

_Hab._—Oregon. Museum of the Smithsonian.

**Subgenus LEPTODESMUS.**

**P. placidus.**

_P. olivaceo-brunneus, scutis plerumque nigro vittatis; laminis lateralisibus parvis, dilute brunneis; pedibus saturate olivaceis; sternis dilute brunneis; appendicibus genitalibus masculis, valde elongatis; spina terminale magna, in spiram ducta et spinulo basali longissimo falciforme et altero laterale breve robusto instructa, margine partim acutis serratis, partim integro._

The head is dark colored. Besides its median furrow, it is also ornamented with a pair of sometimes illly pronounced punctae on each side of the vertex. Its inferior border is rather broadly emarginate. The antennae are elongate, dark brown, and tipped with black. The anal scutum agrees with the others in color. It is triangular, with its apex truncate, obscurely emarginate and decurved. The male genital appendages are strikingly elongate. The terminal spine is nearly black. It is bent spirally on itself, but after performing a little more than an entire turn is nearly horizontal for some length. It is flattened, with its superior surface somewhat umhonate. It ends in a thick, blunt, spine-like process. The proximal portion of the anterior margin is acutely serrate. From the edge projects a short horn-like spine, and from the base a long, slender falciform spine.

Length, one and a quarter inches.

_Hab._—Michigan. Prof. Miles.

**P. floridus, var.?**

_P. atro-castaneus; scutis postice rubro-aurantiaco marginatis; laminis lateralisibus parvis, lacte rubro-aurantiaco; appendicibus genitalibus, masculis P. placidi illis similibus._

The head is lighter colored than the body. It is medianly canalicate, with a pair of punctations on each side of its vertex. Its inferior border is broadly emarginate. The antennae are rather long and slender, very slightly clavate, light brown, and distally tipped with black. The scuta are smooth, beautifully polished, and not corrugate. The side plates are distant, quite small, and nearly horizontal. Their anterior angles are rounded. The anal scutum is prolonged, and is sometimes wholly, sometimes partially orange. It is triangular, with its apex truncate and slightly emarginate, and its sides curved. It projects posteriorly, and is bent downwards. The feet are cylindrical, yellow, and somewhat pilose. The male genital appendages resemble those of _P. placidus_, except in color. They are yellowish. Those of the female consist of a pair of short, blunt processes. Each of these has a basal portion into which is set a short somewhat flattened body, with an obscure linear opening traversing its distal surface. From the junction of these two parts springs a heavy fringe of long, coarse hair. _P. floridus_ is very possibly a distinct species from _P. placidus_. I have seen but a single individual of the latter. The general appearance of the two is so dissimilar, as to incline me to the belief of their distinctness. But they agree well as to their genitalia, and a suite of specimens might show their identity.

Length one and a quarter inches. _Hab._—Michigan. Prof. Miles.

1864.]
P. haydenianus.

P. olivaceo-castaneus; antennis modicis, sparse pilosis, ultimis nigris; laminiis lateralibus luteis; appendicibus genitalibus masculis hirsutis et processu late breve et spinis duobus armatis; spina terminale modice robusta, valde curvata.

Judging from an alcholic specimen, the color of this animal is an olive chestnut, with the side plates yellowish, and the posterior portions of the scuta much lighter than the anterior. The head is bright chestnut, and is ornamented with a median furrow on its vertex, and a pair of impressed dots on each side of its face. Its inferior border is medianly moderately emarginate. The margins of the side plates are somewhat thickened. The anal scutum is yellowish, small, subtriangular, and distinctly emarginate posteriorly. The feet are very slender, and are shortly pilose. The femora of the hinder ones are armed with a small spine on their distal extremity. The male genital appendages are small, and are hairy at the base. They are armed with a broad, obtuse, spinous process, and a slender curved spine besides the terminal. The latter is robust, and is bent with a double curve, that is anteriorly and laterally. I have dedicated this species to my friend, Dr. Hayden, whose name is inseparably connected with the far West.

Hab.—Oregon. Museum of the Smithsonian.

Descriptions of New Species of North American Iuliide.

BY DR. H. C. WOOD, JR.

GêNûS IULUS.

I. venustus.

I. rubro-castaneus, linea dorsale nigra et macule nigrae seriebus lateralibus (interdum obsoletis) ornatus; antennis longis, filiformibus, pilosis, hand clavatis; sentorum lateribus canaliculatis; segmentis 52; muceone parvo.

The general color of this species is reddish chestnut; frequently the red predominates so much that the individual is really flesh-colored, but occasionally the chestnut overcomes the other tint. The dorsal stripe is generally very distinct, especially on the posterior portion of the scuta. The eyes are triangular, and are connected by a dark band, which is often rather obscure. The anterior cephalic aspect is long and narrow, with its sides converging inferiory. Its inferior border is fringed with a double row of short, distant hairs, and is medianly deeply emarginate and 2—4 dentate. The scuta are ornamented, rarely with a white blotch on each side of the mesial line, but generally with two lateral black dots. The first scutum in the female has the anterior margin oblique as to the main axis of the body, and is prolonged laterally so as to form processes, mostly canaliculate, with a rounded border. In the male the anterior margin is at right angles to the axis of the body, and the lateral parallel to it, so that there are no processes. The male genital appendages consist of two main portions on each side. The outer and more conspicuous of these is formed of a thin, very irregular plate, from whose base springs a short, clavate, cylindrical, distally pilose process. The inner portion is composed of a long, very slender, almost setiform process, and a shorter straighter one. The former at its base is bent at right angles to itself; and distally it is somewhat spirally arched over the other.

The female genital appendages consist of two broad, robust, pilose processes, with a pair of very slender, almost filiform, feet like bodies, springing from their conjunction and equaling them in length. The major portion of each appendage is composed of a single plate. This is folded on itself, so as to constitute an irregular, flattened cylinder, which is open at its end, and along

[Jan.]
the outer edge. It presents on one aspect an unbroken, tolerably regular surface, but on the other is proximally abbreviated. Through the opening thus afforded projects a pair of subcircular, somewhat globose plates, fitting together much as the shells of a bivalve.

Length, 2 inches.

Hab.—Illinois, Smithsonian Institution. R. Kennicott.

In the same collection we have seen a male *Iulus* very closely resembling the former, but differing so much in its genital appendages, that it probably represents a distinct species. The outer of the two parts, forming each genital appendages, consists of a thin, flat, crooked, very irregular process, and a shorter, robust, pilose and strongly clavate one. The former, proximally, is quite broad, and narrows from the base, but distally is but at a right angle to itself, and is rapidly contracted, so as to terminate in a nearly cylindrical crooked point. The main process of the inner portion is somewhat cylindrical proximally, but is distally expanded. At first bent at a right angle to itself, it next has the swan-neck curve, and is then bent at an acute angle to itself to be straight the remainder of its length. At this angle there is a minute sharp spine. Shielded, as it were, by this process, there is another, very slender and acute.

I. PILOSICUTA.

I. castaneo-brunneus maculac nigrae (interdum obsolete) seriisbus lateralisbus ornatus; antennis longe pubescentibus; capitis margine antico modice emarginato, denticulato; segmentis 58; mucrone parvissimo; scutis pilosis singulis punctis sejunctis serie impresso.

The color of this species is a chestnut brown, sometimes mottled with light brown. The anterior aspect is beautifully but irregularly areolated with the latter color. The antennae are moderately long, and have their dark joints tipped with white. Their is a pair of coarse punctations on the vertex. Each scutum has a series of distinct punctations extending entirely around it; from these dots proceed little channels, obsolete on the fore-part of the body, but gradually becoming strongly pronounced. The anterior portion of the body is sparsely, but the posterior densely, pilose. The anal scales are very rough. We have never seen a male. Neither can we give a detailed account of the female genital appendages, but one portion of them consists of a pair of short, subcylindrical, rather robust and distally clavate processes.

Hab.—Susquehanna Co., Pennsylvania. E. D. Cope, Esq.

I. OREGONENSIS.

I. late castanens, albido-brunneo annulatus, et linea dorsale nigra et macula nigrae seriisbus lateralisbus ornatus; antennis filiformibus, longis, pilosis, sub-clavatis; capitis margine antico valde emarginato, denticulato; segmentis 44—46; scutorum lateribus canaliculatis; mucrone parvo, robusto; squama preanali triangulare.

The color of this elegant species is a bright chestnut, ornamented with rings of a very light brown and a dorsal black line, as well as a black spot on the side of each scutum. In some individuals there is on the anterior portion of the first scutum, a black crescentic blotch, and on the posterior a border of the same tint. The anterior aspect of the vertex is long and narrow and deeply emarginate inferiorly, where it is denticulate and fringed with two rows of distant hairs. The eyes are somewhat elliptical, and are connected by an ill-defined black band. The posterior portion of the body is not pubescent. The outer piece of the male genital appendages is rather long, straight and somewhat clavate, and distally pilose. The inner process is large, and is formed of a plate so folded longitudinally as to form a groove on the inner edge. From the base of the genital appendage springs

[Jan.
a slender process, which soon bifurcates; the more slender of the division is the longer. They both soon enter the groove, before spoken of, the shorter and more robust being distal as to the other, and emerging from the groove on the other side of the main process, whilst the longer comes out on the side it enters. The female genital appendages are composed of a broad, thin piece, from which arises a pair of filiform, feet-like processes, besides two other very robust ones. These last are sparsely pilose, and about as long as broad. They reach about to the base of the filiform bodies, and have a slit-like orifice in their summit.

Length of body, two and a half inches.

Hab.—Oregon. Smithsonian Museum.

I. immaculatus.

I. saturate rubido-brunneus, haud maculatus; antennis modice longis, filiformibus, vix subclavatis, pilosis; capitis margine antico modice emarginato; segmentis 48—51: scutis infra canaliculatis; mucrone modice, uncinato, robusto, acuto.

The color of all our specimens is a very dark reddish brown, unrelieved by any other tint. On the vertex is a pair of coarse punctations, as in I. Canadensis. The lateral processes of the first scutum in the female, although small, are somewhat canaliculate. The mucro is certainly smaller than that of I. Canadensis. The male genital appendages are composed of two parts. The outer of these consists of a somewhat clavate and pilose process, with a curiously folded and contorted plate on its inner side. The other portion is formed of a straight process, which has several minute, spine-like bodies on its free extremity, and is proximally suddenly contracted, and then expand somewhat, so as to give an appearance of emargination. From the base of this springs another, almost filamentous process.

The female genital appendages consist of two bodies conjoined at their bases, and blunt at their free extremity. When viewed from one aspect, they appear cylindrical, but from the other, flattened or even concave; opposite to the latter face there is a broad, irregular piece, which has its free extremity scollopied.

Hab.—Catfish Mountains, N. Y. Dr. H. C. Wood, Jr.

I. canaliculatus.

I. brunneus, interdum ceruleo tinctus; antennis filiformibus, pilosis, non-nihil clavatis; segmentis 51; scutis supra et infra acete canaliculatis, singulo pilorum longorum distantium serie unica instructo; mucrone longo, recto; squamis anabulis longe pilosis; squama preanalii triangula, acuminata.

The color of this species is a dark brown, with sometimes a bluish tint, and very gradually mottled with light brown. The triangular eyes are connected by an obscure black band. The labial margin is broadly emarginate, and is furnished with two or three denticules, as well as a double row of distant rigid hairs. The joints of the antennae are tipped with white. The first scutum is, in the female, slightly prolonged laterally, where it is rounded off; on its anterior surface there is a dark somewhat crescentic blotch. The anterior of the two subscuta, forming each scutum, is closely and deeply canaliculate through its whole circumference; it is broader than the posterior, and very slightly elevated, so as to give the body somewhat of a moniliform appearance. The ring of hairs surrounding each scutum is frequently imperfect; it may be from the handling of the specimen. The posterior subscutum is smooth above, and distantly and shallowly canaliculate below. The posterior portion of the body is very pilose. I have never seen a male.

Length, one and a half inches.

Hab.—Chester Co., Pennsylvania. Dr. H. C. Wood, Jr.
I. LAQUEATUS.

I. brunneus, interdum caeruleo tinctus; antennis filiformibus, pilosis, nonnihil clavatis; segmentis 49; scutis et supra et infra valde arcteque canaliculatis; mucrone longe et recto; squama preanali triangula, vix acuminata.

The color of this species is brown, sometimes bluish, mottled, almost areolated, with light brown. The eyes are triangular, and are united by a dark band. The head has its anterior margin broadly emarginate, denticulate and furnished with two rows of distant rigid hairs. The antennae have their proximal joints nearly cylindrical, and are light colored, with their articles indistinctly tipped with white. The first scutum has rather small lateral processes, and is ornamented on its anterior border with a dark band. The anterior subscutum is deeply and closely canaliculate over the whole of its surface. The anal scales are furnished with a series of long hairs along their valvular margin. The posterior portion is generally adorned with a very few scattered hairs, but I have never seen it pilose.

Length, three-quarters of an inch.

This species differs from I. canaliculatus in its smaller size—the absence of hairs on the anterior, and their paucity on the posterior portion of the body, and in the mucro being larger in proportion to the rest of the animal. Yet they may possibly prove to be the young of that species.

_Hab._—Chester Co., Pennsylvania. Dr. H. C. Wood, Jr.

I. MILESII.

I. saturate brunneus; antennis filiformibus, longis, pilosis, clavatis; scutis infra arce et valde, supra interdum obsolete, canaliculatis; segmentis 33; mucrone nullo.

The color of this species is a very dark, almost black brown; but the anterior portion of the body, and especially the head, is lighter. The antennae are very pilose, and quite strongly clavate. The eyes are connected together by a black band. The anterior scuta have their lateral surfaces closely and deeply canaliculate, but are almost smooth on their upper surface. The posterior are everywhere deeply channeled, although more so below than above. There are a few hairs on the anal scales. The anal scutum is not mucronate. It affords me pleasure to dedicate this species to Prof. Miles, who is laboring so assiduously and successfully to develop the zoology of Michigan.


I. CINEREFRONIS.

I. brunneus, cinereo annulatus; capitis superficies antica cinerea; mucrone nullo, squama preanali triangula, haud acuminata.

The color of this species is dark brown. The anterior surface of the head is an obscure gray color, with a dark band inferiorly. There is between the upper and anterior surface of the head a well marked angle, almost an elevated ridge. The lower margin is fringed with a few hairs, and is emarginate and armed with a few denticules. The triangular eyes are connected by a distinct, impressed line. On the upper portion of the anterior surface of the head are two round, light dots surrounded by a darker tint. The antennae are wanting in the only specimen, a female, that I have seen, which is so mutilated that I cannot say certainly of how many segments it was composed; the number, however, was probably either 34 or 45. The first scutum has very small, lateral processes. It is light brown, bordered with a dark band, edged with a grayish tint. The anterior portion of the body is of a lighter shade than the posterior, and has the grayish annuli more distinctly pronounced. The anal scutum is not mucronate. The anal scales are not pilose.

_Hab._—Oregon. Smithsonian Institution.

1864.]
PROCEEDINGS OF THE ACADEMY OF

I. CAERULEO-CINCTUS.

I. brumneus, saturate caeruleo annulatus; segmentis 42; antennis parvis; scutis infra et supra modice canaliculatis; mucrone nullo.

The color of this species is brown, with a dark, sometimes obsolete ring of blue to each segment, except the most anterior. The lower portion of the anterior surface of the head is light brown. The labial margin is scarcely emarginate, but is rounded and fringed with rigid hairs. The eyes are arranged in subtriangular patches, with their transverse diameter much the greater. They are connected by a black band, which is much broader in the middle than at the ends. The first scutum is large, with very small lateral processes even in the female. There is on its anterior edge a very obscure light border, and a little posterior to this a black, more or less obsolete, band. The scuta are regularly, although rather lightly and distantly canaliculate over their whole surface. The last scutum is distinctly but minutely punctate, has its edge whitish, and is not at all mucronate. The anal scales are not at all pilose. The specimens from which this description are taken are in so bad a condition that I have hesitated to notice them. But probably the description will be found to be sufficiently accurate for the identification of the species.

Length of body, about one and a half inches.

I. HORTENSIS.

I. brumneus, lateribus maculis nigris ornatis; antennis modico brevibus, pilosis, filiformibus, clavatis; segmentis 42; scutis arcte canaliculatis et infra et supra; mucrone nullo; squama preanalii triangula, apice rotundato.

The general color of this species is rather dark brown in the adult. But when an individual is examined with a magnifier, it is seen to be beautifully areolated with light brown. In young specimens and adults, which have recently shed their exuviae, the color often verges on white, whilst the side spots are black, contrasting strongly with the general tint. The head is rather broad inferiorly, and has its lower margin shallowly emarginate, and distinctly though minutely denticate. The triangular eyes are connected by a broad, dark band. The first scutum is ornamented on its anterior portion by a dark, transverse band. The lateral processes are almost wanting, even in the female. There is on each side a series of large, black dots, one to a scutum, commencing rather abruptly at about the 5th or 6th segment, and ending in the same way at about the 39th. The subscutum on which they are situated are scarcely canaliculate. The anal scutum is about equal in length to the two preceding it.

Length half to 1 inch.

Philadelphia. Dr. H. C. Wood, Jr.

I. VIRGATUS.

I. saturate brumneus, dorso luteolo, medio linea nigra instructo, antennis modice longis, pilosis, clavatis; segmentis 35; scutis copiose distincte canaliculatis; mucrone subnullo; squamis analibus sparse pilosis; squama preeanali lata, subtriangularia, apice rotundato.

The sides of the body are deep brown, almost black, whilst the dorsal approaches a yelowish fawn color, and has a strongly pronounced, black, median line. The lower margin of the head is broadly emarginate, denticate, and fringed with a series of hairs. The anterior surface is mottled with light brown, and has a dark median band, terminating in a transverse one low down. The under surface of the body is light-colored, and is often somewhat areolated. There are some specimens whose pattern of coloration is light brown or fawn colored, with two lateral and one median dark stripe. Are these, individuals which have recently cast off their exuviae? The eye-patches are somewhat parabolic. The joints of the antennae are obconical, dark co-
lored, and tipped with white. The lateral processes are small. The grooving of the scuta is in some specimens somewhat obsolete on the dorsum. The posterior scutum is light colored. I have never identified a male.

Length, \( \frac{1}{3} \) to \( \frac{2}{3} \) of an inch.


Genus SPIROBOLUS.

S. spinigerus.

S. fulvus, maculis saturate viridis maximis ornatus; capite minute punctato, infra puncturato magnorum serie instructo; oculis suborbiculatis; antennis longis; segmentis 45; scutis leviter sparse punctatis; squamae preanalí triangula.

The color of this species is fulvous, often varying towards orange. On each scutum there is a large dark-green transverse crescentic blotch. This is often so wide superiorly as to involve the whole of the dorsum. In some individuals there are lateral series of white blotches, and occasionally a black line on each side. These are, however, not common. The head has a strongly pronounced median furrow, and is greenish superiorly. The eye spots are somewhat orbicular, with occasionally a tendency to become tetra- or polygonal. The antennae are longer than in S. marginatus. The scuta are not rough, and are very lightly or even obsoletely furrowed beneath. The spines on the inferior surface of legs are very numerous and acute. The male genital appendages are formed of two main portions joined together, as in S. marginatus. The large plate of the main process is broad. The upper border of its face has a wavy outline. Externally it is produced into an alar portion, which ends in a blunt process at right angles to it. The inner piece is composed of a basilar and superior joint. The basilar is very long. The other is curved, and presents on one aspect a strongly convex, on the other a strongly concave surface. It ends in a blunt point, and is armed with a large blunt process and an acute spine. The female genital appendages appear to consist on each side of a process deeply placed within the body—this is thin on its free margin, which is rounded, though somewhat acuminate—below it is contracted and thickened. The three pairs of feet immediately in front of the genital aperture in the male have their coxae produced into long processes. These are often of a curious form, but do not seem constant in this. The fourth and even fifth coxae have small processes.

Hab.—Florida. South Carolina. Smithsonian Institution.

S. uncigerus.

S. lete brunneus, saturate-rubido-brunneo annulatus; capite sparse minute punctato et corrugato, antico puncturum maximorum serie instructo; segmentis 50—53; scutis supra et copiose punctatis et corrugatis; squamae anale triangula.

The color of this species is a bright brown, with an annulus of dark reddish brown on the posterior border of each segment. The head is distinctly mediately canalicate, except in the centre, and has the row of dots on its anterior face as in S. marginatus, but is not as decidedly punctate elsewhere as in that species. The eyes are triangular. The antennae closely resemble those of S. marginatus, but are, perhaps, rather shorter and more compressed. The first scutum is banded, both anteriorly and posteriorly. The lateral processes, even the female, are almost wanting. The second scutum is produced forwards as in S. marginatus. The male genital appendages are composed of a yoke-like piece and two outer parts, which it connects. The central piece may be described as formed by two plates (although but really one) meeting at 1864.]
an angle in the centre and attached to the outer parts at their other extremities. These outer articles are formed each as follows: First, There is a large plate which is bent around an inner basal piece, and is deeply notched laterally, but is produced anteriorly into a broad almost rudely punctate plate, and posteriorly into a short, slender process, terminating in an imperfect hook. This last process is sometimes obsolete. Second, Articulating with the inner basal piece, alluded to, there exists a large, strongly-curved, acute hook or claw, whose distal extremity is subcylinidrical. The female genital appendages are small, and are composed on each side of a very thin plate and a process about a line in length, irregularly prismatic in shape proximally; but distally excavated suddenly, so as to be flattened for the remainder of its course.

_Hab._—California. Smithsonian Institution.

**S. angusticeps.**

*S. niger*, lateribus brunneo maculatis; capitis superficie antica angusta, longa, supra nigra, infra albido-brunnea; antennis ? ; segmentis 75; scutis et infra et supra distincte canaliculatis; squama anali triangula.

The color of this species is black, with a brown band on the sides, in which is a black dot marking the position of the lateral pores. The lower portion of the head is very light-brown, and has its margin rather deeply emarginate. Along the posterior cephalic border is a somewhat crescentic area, which is nearly smooth and is medially canaliculate, adjoining this the surface suddenly is rudely punctate, but gradually becomes smoother. The eyes are arranged in three transverse rows, the posterior being much the longer. The first setum is copiously coarsely punctate, and is posteriorly slightly canaliculate on the dorsum, but distinctly so on the sides. The lateral processes, even in the female, are very small, the second setum being produced forwards so as to abut on the head. The posterior subscuta are on the dorsum closely, rather deeply, and more or less obliquely canaliculate, but on the sides less distinctly and more distantly so. The anterior subscuta are very distantly and much more lightly and obliquely canaliculate, and are also more closely channeled below than above. The surface of the anal setum is irregularly and minutely corrugate. We have seen but one specimen,—a female. The female genital appendages appear to consist of two conoidal bodies coalescing at their bases and united together towards their apices by a broad plate, so placed as to present towards them an inclined surface. Into the base of these pyramidal processes fit other somewhat inclined processes, with their thin edge formed of several pieces.

Length 4½ inches.

_Hab._—San Francisco. Smithsonian Institution. R. D. Cutts.

---

**Notes of Botanical Visits to the Lower Part of Delaware and the Eastern Shore of Maryland.**

BY WM. M. CANBY.

The peninsula lying between Delaware and Chesapeake Bays has been almost a _terra incognita_ to botanists; although, from its geographical position, and from the varied character of the country, embracing great variety of soil, salt and fresh water marshes and rivers, large swamps, and a considerable extent of coast, it might well be supposed to be a fine botanical district.

In this expectation, the writer, (sometimes accompanied by botanical friends,) made short visits to a few places in the counties of Sussex, in Delaware, and Worcester and Somerset, in Maryland, during the months of September and October last. Taking into account the lateness of the season and the limited

[Jan.]
extent of country looked over, the result, as shown in the list below, is encouraging, and leads to the belief that a more extensive exploration would yield further additions to the Northern Flora.

When our knowledge of the botany of this peninsula becomes more perfect, an interesting comparison might be made of its Flora with that of the lower part of Illinois; the plants of the Southern Mississippi Valley would probably be found creeping up into the latter, as those of the Southern coast, and Pine Barren region, do into the former.

Of a considerable number of rare and interesting plants collected, only those not described in the "Manual" of Prof. Gray are given in the list below, with some observations on rare allied species. One or two, detected in localities not in the district under consideration, are also given.

**Desmodium ochroleucum, M. A. Curtis, in Herb. Gray. (Hedysarum humifusum, Ell. in Herb. Muhl.): canne procumbente tereti hirsuto elongato; foliolis ovatis aliquanto rhomboidis reticulatis; stipulis et bractis ovatis acuminiatis striatis; floribus ochroleucis; lomentorum articulis, \( \frac{1}{4}; - \frac{1}{2} \) pollicaribus; reticulatis sepius contortis.


Stems many (6 to 10), 18 inches to 3 ft. long, spreading in every direction from the root, and, with the petioles and pedicels, quite hirsute with spreading hairs, as well as pubescent with shorter hooked ones. Flowers ochroleucis! Legume (always?) much contorted.

There is a specimen of this plant without flowers in Muhlenberg's herbarium, sent by Elliott from South Carolina under the name of *Hedysarum humifusum*. The fruit on this presents the same twisted appearance as in all the Maryland specimens. This specimen is not in the general collection, but is contained in a special collection of the genus *Hedysarum*, which is accompanied by a numbered list. In this, Elliott's plant is placed in a distinct paper, and far separated from Muhlenberg's *humifusum*; the former being No. 19, the latter (in full), "No. 43—— humifusum, Aug. 25, 27, 12"—(the latter number probably intended for the year 1812). Thus it would appear, that Muhlenberg, at the time of making up this monographic collection, considered them distinct, as they certainly are. But afterwards, in his description in the MSS., Plant. Amer. Sept., and in the printed work, he confounds them, and in the latter the locality of *Hedysarum humifusum* is given, "Mass. to Penna. and Carolina." The last is to be excluded, as the species has been found only near* Waltham, Mass. (Bigelow) and Lancaster, Penna.

**Hydrocotyle vulgaris, L.?—In a swamp one mile east of Snow Hill, Maryland. Umbels, or rather verticils, two to five. Sept. to Oct.**

**Hydrocotyle repanda, Pers.—A glabrate form, found in meadows bordering Chingoteague Bay, Worcester county, Maryland. Oct.**

* The Mass. locality is now supposed to be destroyed. In Muhlenberg's MSS. in the library of the Academy, he gives the date of collection and locality of his plant,—viz. "Aug. 28, 12, (1812), upon Montgomery Island." This may be in the River Susquehanna. The attention of botanists in the neighborhood is requested to this point. The plant may yet be identified and specimens furnished from the original locality. The descriptions in Torrey and Gray, Gray's Manual, &c, appear to be sufficient, except that the character,—stem angled or striated,—should be added to distinguish it from the usual stem of *D. ochroleucum*.

The three allied species may be thus compared:

**D. repens:** Stem hirsute and angled; leaflets orbicular; bracts and stipules brownly ovate; flowers purple; joints of the legume large.

**D. humifusum:** Stem angled, nearly smooth; leaflets ovate; stipules and bracts lanceolate; flowers purple; joints of the legume small.

**D. ochroleucum:** Stem terete, hirsute; leaflets ovate reticulated; stipules and bracts ovate acuminate; flowers ochroleucis; joints of the twisted pod large.

1864.] 2


MENTHA AQUATICA, L.—Shores of Nanticoke River near Seaford, Delaware. Sept. Stems 3 to 4 feet long, decumbent, sending up erect flowering branches. Probably naturalized.

MYOSOTIS VERSICOLOR, Pers.—Naturalized near Wilmington, Delaware. June.

HELIOTROPUM CURASSAVICUM, L.—Shores of Chingoteague Bay. Doubtless indigenous.

ALNUS MARITIMA, Muhl. in Herb. et Plant. Amer. Sept., MSS., vol. i. p. 193; Nutt., Sylva, vol. i. p. 34. Frequent in Sussex county, Delaware, and southward in Maryland. Flowering in September! Specimens of this plant, consisting of small branches with leaves only, exist in the herbarium of Mumden. In the Academy's herbarium there are specimens, collected by Dr. Pickering, with leaves and fruit. By last season's collections, the anomaly of a fall-flowering alder is brought to light. So singular a departure from the habit of the genus may well excite a doubt as to whether it is not a mere sport, or the precocious blooming of an ordinarily spring-flowering plant. Yet the observations made seem to preclude this idea. The plant was noticed at several stations over a range of fifty miles, and in the beginning of September was everywhere found in blossom. In going over much the same ground about the middle of the month, the sterile catkins had all fallen or withered; and when again observed in the beginning of October, no preparation for spring flowering could be seen, although on A. serrulata the young catkins were already an inch long. Next season's observations will probably decide the question. This shrub, or small tree, attains the height of 16 to 18 feet, growing much like A. serrulata, but with a more open habit, and with the bark lighter colored. The leaves are smooth and glossy, on longish petioles, not furrowed above, thick, and strongly veined beneath. Sterile catkins resembling those of A. incana, but the scales more glutinous. The glossy foliage and handsome sterile catkins (should they prove to be regularly produced in the fall), would make this a desirable shrub in lawns, &c.

CEPHALOPSIS FLABELLATA, Desv., (Juncus repens, Michx.)—Low grounds near Salisbury and Snow Hill, Md. Sept.

ELTHROCHARIS SIMPLEX, Torr.—Common in low grounds in Sussex county, Delaware and in Maryland.

SCRIPUS CANNY, Gray, n. sp.*—In a small stream and mill-pond east of Salis-

* Dr. Gray has kindly furnished the following:

'SCRIPUS CANNY, sp. nov.—Culmo elato (3-6-pedali) folio praelongo canaliculato-briquetro striato infra-rune obtuso trigono superne triquetro apice in involucrum monophyllum pseudo-umbellum pluriflorum longe superans desinentem; umbella sessili dichotomia-compesita; umbellulae sepinside biradiatis involucellatiis, radice omnibus elongatis plerique monostachyis; spiciis oblongis; squamis laxibus imbricatis oblongo-ovalis acutiusculis dorso viridibus nervosis marginibus late scariosis palidis; setis perigonii 6 potentim barbellatis achenio chlorato-briquetrum subito custellatum paullo superanibus.

"So distinct is this species that there is no other known to me with which it may be particularly compared. By its mode of growth, triangular stem and erect one-leaved involucrure, appearing like a continuation of the naked stem, it would have to be referred to the section which contains S. punctata. But the radical leaf is remarkably developed; the greenish spikes (half an inch long) of a very different aspect, all on long and slender rays, which come off in pairs (the first pair closely sessile at the base of the involure) from the nodes of a zigzag phalaxis, in the axil of a bract or involucel (the lowest of which resembles the involucral leaf only on a smaller scale, the others more reduced and scariosos), and mostly acco-

[Jan.]
The Librarian read his annual report for 1863, as follows:

REPORT OF THE LIBRARIAN FOR 1863.

The Librarian begs leave to report that, during the year just past, the following additions have been made to the Library, viz.:

- Folio 15; Quarto 282; Octavo 638; Duodecimo 16; Maps, &c., 15; Total 966. Of which there were Volumes 101; Tracts 850; Maps 15; Total 966.

These have been received from the following sources:

- Editors 157; Authors 82; Societies 449; Maclure Fund 43; Library Fund 81; Dr. Wilson 124; Smithsonian Institution 4; J. P. Hall, 1; J. W. Dawson 1; A. D. Bache 1; Secretary of the Treasury 1; Asa Gray 1; R. L. Barnes 1; S. S. Garrigues 1; Dr. Hammond, U. S. A., 1; Geol. Survey of India 1; J. L. Darlington 1; New York State Library 10; New York State University 3; W. I. Kintzing 1; Isaac Lea 1; P. A. Dare 1; Total 966.

These belong to the following departments, viz.:

- Journals 694; Bibliography 24; Agriculture 1; Languages 2; Geology 56; Ornithology 28; Botany 20; Physical Science 13; Conchology 19; Mammalogy 3; Biography 3; Gen. Nat. History 36; Mineralogy 2; Anatomy and Physiology 19; Entomology 29; Voyages and Travels 2; Herpetology 2; Medicine 3; Religion 1; Antiquities 2; Ichthyology 1; Helminthology 1; Chemistry 5; Total 966.

All of which is respectfully submitted.

J. D. SERGEANT, Librarian.

Pursuant to the By-Laws, an election of members of the Standing Committees for 1864 was held, as follows:

ETHNOLOGY.

J. A. Meigs,  
S. S. HALDEMAN,  
I. I. HAYES,

BOTANY.

E. DURAND,  
JOSEPH CARSON,  
AUBREY H. SMITH.

Panied by an internal scarios bract; and the scales of the spike are thin-membraneous and greenish. Stamens 3. Bristles of the perigynium stout, beset with widely spreading or somewhat retrorse, weak, short hairs rather than barbs. Style 3-cleft. Achenium smooth, a line and a half long, triangular, with the inner face broadest; the broad and even retuse summit tipped with a conspicuous, very abrupt and narrow beak. At my especial request, I am permitted to characterize this species and to name it in honor of the collector, my valued correspondent, Mr. Canby. I leave it to him to give an account of its mode of growth and general character.

A. Gray.

1864.]
February 2d.

Vice-President Vaux in the Chair.

Twenty-one members present.

The following were presented for publication:


"Synonymy of the Species of Strepomatidae, No. 2." By Geo. W. Tryon, Jr.

February 9th.

Vice-President Bridges in the Chair.

Seventeen members present.

February 16th.

Vice-President Bridges in the Chair.

Twenty-two members present.
The Committee on Proceedings announced the publication of the Proceedings for December, 1863.

Dr. Wilcox presented for publication a continuation of his paper for January 12th.

**February 23d.**

Vice-President BRIDGES in the Chair.

Twenty-two members present.

The following was presented and unanimously adopted:

Resolved, That the specimens of antique art belonging to the Academy be deposited in the Museum of the American Philosophical Society, provided that they shall be returned on demand, and that the Curators of the Society shall give a receipt for the same to the Curators of the Academy.

On report of the respective committees, the following were ordered to be published:

**The Crania of COLUMBUS TORQUATUS and C. ADAMSII compared.**

**BY ELLIOTT COUES, M. D.**

I have already, in a previous paper,* presented the external characters of size, form, and color by which the C. Adamsii may be distinguished from the common C. torquatus. To more completely substantiate the claims of the former to specific distinction, which I understand is denied it by some ornithologists, I have taken advantage of an opportunity of comparing the crania of the two species, to present the marked points of difference, as regards size and shape, which an examination of the skulls shows to exist. It is perfectly easy to diagnose either species from the characters of their crania alone.

As might be expected from the relative dimensions of the two birds, the cranium of C. Adamsii is considerably larger than that of C. torquatus. The difference is particularly striking in the length of the skull, taken as a whole, as well as in the longitudinal dimensions of its individual elements. The total length exceeds that of C. torquatus by fully an inch; and the difference in the length of particular bones, as the intermaxillary, palatals, malar, vomer, etc., is proportionately as much. In connection with this increase in the length of skull, there is to be taken into consideration another point, which confers upon the cranium of C. Adamsii a marked difference in general contour,—viz., its remarkable narrowness. In width at the several points, the cranium by no means preponderates over that of C. torquatus in proportion to its marked difference in length. Thus, its diameter across the fronto-maxillary suture, or across the anterior or posterior orbital process, is, both absolutely and relatively, but little greater than that of C. torquatus, while across the mastoid processes the width is absolutely the same, and therefore relatively less in C. Adamsii.

The external character, which is perhaps the most distinctive feature of C. Adamsii—viz., the size and shape of the bill, corresponds, of course, to a like modification of the proportions of the intermaxillary and inferior maxillary bones. In fact, the difference in the relative proportions of the crania of the

---


1864.]
two birds is produced, in great measure, by the greater development and somewhat different shape of these two bones. The discrepancies in length have already been adverted to. Those of shape consist chiefly in the greater elevation of the apices of the inter- and infero-maxillary bones. The line formed by the mandibular ramus of the intermaxillary and the malar bone, is in *torquatus* a gentle curve, the concavity of which looks downwards; in *Adamsii* it is a straight line. The commissural edge of the inferior maxillary of *torquatus* is about straight as far as the angle of the jaw; in *Adamsii* it is a gentle curve, whose concavity looks upwards. The greater production of the inter- and infero-maxillary bones makes their apices much more acute in *Adamsii* than in *torquatus*, while, at the same time, in consequence of the comparative narrowness of the skull of the former, the angle of divergence of the rami of these two bones is not greater, and the bill on this account no wider. The symphysis of the mandibular rami is longer in *Adamsii* than in *torquatus*, and the prominence at the angle of the jaw is more marked.

In addition to the above, it may be said, in general terms, that the various ridges and depressions of the skull of *Adamsii* are more strongly marked than those of *torquatus*, corresponding to the superior size and muscularity of the former. The occipital protuberance and crest, the interparietal and the median frontal ridge are exceedingly prominent, while at the same time, the crotaphyte depression, the temporal and digastric fossa and the supra-orbital fossa for the lodgement of the nasal glands are deep and well defined. The frontal bone of *Adamsii* rises more rapidly than that of *torquatus*, leaving a deeper fossa at the fronto-maxillary suture, and also producing chiefly the difference which exists in the absolute height of the two crania.

I append the detailed comparative measurements of the most important dimensions of the skulls of the two birds, which will show at a coup d'oeil the absolute and relative difference in size and shape. Notice particularly the great discrepancies in the longitudinal dimensions as compared with the slight difference in the several transverse measurements.

**Comparative Measurements.**

<table>
<thead>
<tr>
<th>Measurement</th>
<th><em>G. torquatus</em></th>
<th><em>G. Adamsii</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length from apex of internasal maxillary to occipital protuberance</td>
<td>5.80&quot;</td>
<td>6.80&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>fronto-maxillary suture</td>
<td>3.25&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>anterior orbital process</td>
<td>2.65&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>posterior do.</td>
<td>4.85&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>apex of os lachrym</td>
<td>3.05&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>nasal foramen</td>
<td>1.65&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>maxillo-malar suture</td>
<td>2.90&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>tympano-malar artic</td>
<td>5.90&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>apex of vomer</td>
<td>2.60&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>posterior end of palatals</td>
<td>4.50&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>of inferior maxillary</td>
<td>6.60&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>of symphys of inferior maxillary</td>
<td>1.10&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>from apex of inferior maxillary to angle of jaw</td>
<td>4.20&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>of nasal foramen</td>
<td>1.20&quot;</td>
</tr>
<tr>
<td>Width of skull across fronto maxillary suture</td>
<td>8.00&quot;</td>
<td>9.00&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>anterior orbital process</td>
<td>1.08&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>posterior do.</td>
<td>1.95&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>mastoid processes</td>
<td>1.35&quot;</td>
</tr>
<tr>
<td>Greatest height of skull (without lower jaw)</td>
<td>1.50&quot;</td>
<td>1.70&quot;</td>
</tr>
<tr>
<td>&quot;</td>
<td>depth of inferior maxillary</td>
<td>0.70&quot;</td>
</tr>
</tbody>
</table>

* English inches and hundredths.
Remarks upon a Proposed Arrangement of the Family of GROUSE, and New Genera added.

BY D. G. ELLIOT.

It has seemed to me advisable to give in a condensed form, before treating the subject in a more elaborate manner in my forthcoming Monograph, the results of my investigations, and the arrangement I would propose for the Grouse Family.

Tetrao, than which no generic term has been more abused in its application, for it appears to have been indiscriminately given to any gallinaceous bird, strictly belongs only to Urogallus and Urogalloides. The former is the typical Tetrao, as instituted by Linnaeus, and possesses the beard-like appendage observed, save in its near ally, in no other bird of this family.

America has no representative of this genus, the nearest approach to it perhaps, in the form of the tail and general appearance, being the bird commonly known as Tetrao obscurus; but it would seem that, excepting the single species of Bonasa sylvestris, no European grouse can be considered as included even in the same genus with those inhabiting the New World.

I would state here, that I am not now speaking of the Lagopidae, for I do not consider them as strictly grouse. The synoptical list that I would, therefore, propose for this portion of the Tetronidae, is as follows:—

1st. The Genus Tetrao—confined to Europe and Asia; comprising T. urogallus and T. urogalloides.

2d. Centrocercus—confined to America; comprising C. urophasianus.

3d. Lyrurus—confined to Europe; comprising L. tetrix.

For the next group, as its members appear to possess sufficient characters to distinguish the species from the commonly known T. Canadensis, in having gular sacks, the extraordinary number of twenty feathers in the tail, instead of sixteen, I would propose the term—

4th. Dendragapus—confined to America; comprising D. obscurus and Richardsonii.

5th. Canace—confined to America; comprising C. Canadensis and C. Franklinitii.

6th. I would propose, as a generic term, founded upon the peculiar formation of its primary feathers, the specific appellation Fulcipennis—confined to Asia, and in compliment to its discoverer Hartlaubii.

7th. Cupidonia—confined to America; comprising C. cupido.

8th. Pedioecetes—confined to America; comprising P. columbianus and P. phasianellus.

9th. Bonasa—Europe and America; comprising B. umbellus, B. umbelloides, B. sylvestris, and B. sabini.

Tetrao derbianus (Gould), appears to be identical with the common tetrix. This opinion is formed upon a specimen, kindly sent to me by Mr. Gould, which he thinks is the same as the type. The latter is now in the Liverpool Museum.

I can discover no difference between this example and the usual style of T. tetrix, except that the tail is a trifle longer; but as this varies considerably among the Black Grouse, I have deemed it advisable to consider the genus Lyrurus as possessed of but one species.

1864.]
Synconymy of the Species of STREPOMATIDÆ, a Family of Fluviatile Mollusca inhabiting North America.

Part 2.

BY GEORGE W. TRYON, JR.

Goniobasic Section.

Genus GONIOBASIS, Lea.


Chenu, Man. de Conchyl. i. p. 290, 1859.


Chenu, Man. de Conchyl. i. p. 290, 1859.


Melania, (sp.) Auct.*

Species.

A. Shell spirally ridged.


B. Shell tuberculate or nodulous.


Brot, List, p. 32.


* Mr. Lea is the first naturalist who has properly defined this genus, and his name Goniobasis must therefore stand, in preference to any of the prior names given to artificial sections by the Messrs. Adams.

† Of course these gentlemen are wrong in including species of this genus in the genera Pachycheilus, Ceriphasia, Potadoma and Hemisinus, which are all intended to embrace very different groups of species. Prof. Haldeman is also mistaken in placing here the Fleurocera of Rafinesque, a genus which undoubtedly = Trypanosoma, Lea.

‡ This may be only an elevated form of Anculosa canalifera, Anthony.
4. G. nubila, Lea.*


Obs. ix. p. 57.

5. G. varians, Lea.†


Melania Hydei, Conrad, New Fresh-Water Shells, p. 50, t. 8, f. 1, 1834.


Hanley, Conch. Misc. t. 1, f. 3.


7. G. decorata, Anthony.


8. G. caelatura, Conrad.


Goniobasis Tryoniana, Lea, Description in part.

9. G. occata, Hinds.


Juga occata, Hinds, Chenu, Man. de Cohohyl. i. f. 2016.

Melania Shastaensis,‖ Lea, Reeve, Monog. Melania, sp. 318.

10. G. catenaria, Say.


* Closely allied to G. oliva, Lea, but is larger, longer and tuberculate.
† Nearly always tuberculate, and shouldered below the sutures.
‡ G. decorata is a young shell, and, as is usual in this group, is sharply angulated at the periphery. G. granata represents a half grown shell, and here the angle is almost obsolete, while G. Tryoniana is the mature form. The entire identity of these several descriptions is proved by a series of over two hundred specimens before me.
§ Mr. Lea's figure of Tryoniana belongs here, but his description of that species is made to include the next species, caelatura, Conr. The green variety of granata is a shell of much heavier texture, and may prove distinct.
‖ The Shastaensis of Mr. Lea is a very different shell, and certainly ought never to have been confounded with this species, which it does not resemble in any particular.

1864.]

Melania Floridensis,† Reeve, Monog. Melania, sp. 334. Brot, List, p. 34.

11. G. catenoides,‡ Lea.


Elimia catusaria, Lea, Chenu, Man. de Conchyl. i. f. 1982.

12. G. Etoehensis, Lea.§


13. G. Hallenbergckii, Lea.¶


Melania Hallenbergckii, Lea, Reeve, Monog. Melania, sp. 332.


Elimia Boykiniana, Lea, Chenu, Man. de Conchyl. i. f. 1978.

15. G. Bentoniensis, Lea.¶


Melania papillosa, Anthony, Reeve, Monog. Melania, sp. 467, May, 1861. Brot, List, p. 34.


17. G. Couperii, Lea.


* I have seen several author's examples of catusaria, and they uniformly represent shells not adult. As I have not seen specimens of sublirata and Floridensis, I rely on the figures and descriptions only, in considering them to be the adults of the same species.

† G. catenoides may prove to be a variety only of catusaria and I at first united them, but I have recently come to the conclusion that they are distinct species, though nearly allied.

‡ I presume it was Mr. Lea's first intention to describe this species under the name of Etohensis, as a specimen is before me which that gentlemen sent to Mr. Anthony under that name. This very specimen was sent to Mr. Reeve and published by him, prior to the publication of Canby by Mr. Lea.

¶ Doubtfully distinct from papillosa, Anth.

* Dr. Brot considers this a synonym of Boykiniana, but it is very different.

[Feb.]
Melania Portellii, Lea, Reeve, Monog. Melania, sp. 427.

20. G. arachnoidea, Anthony.

21. G. Conradi, Brot†
Melania Conradi, Brot, List, p. 36.

22. G. carinifera, Lam.

C. Shell plicate.

23. G. obesa, Anthony.

24. G. blanda, Lea.§

* Half grown shell.
† Dr. Brot proposed the name Conradi for this species, as symmetrica is preoccupied by Prof. Haldeman. I doubt whether it is distinct from G. carinifera, Lam.
‡ That all the species here quoted are synonyms of carinifera does not admit of doubt. The species is rather a variable one in respect of proportions and ornamentation.
§ The name of this species must be changed because preoccupied by Mr. Lea himself, 1864.]
25. G. substricta, Haldeman.*


26. G. aequalis, Haldeman,t


27. G. semigradata, Reeve.


28. G. carinocostata,† Lea.


Melania scabrella, Anthony, Reeve, Monog. Melania, sp. 388.

Melania scabriuscula, Brot, List, p. 36.

29. G. Lecontiana,‡ Lea.


30. G. cadus, Lea.†


31. G. obtusa, Lea.‡


32. G. amoena, Lea.


33. G. Tuomeyi, Lea.


* Somewhat like gracilis, Lea, but is a stouter, more ponderous species.
† Allied to carinocostata, Lea, but in that species the plicae are terminated by an acute angle or rib on the body whorl and the spire is angled or carinate.
‡ A very variable species. The M. scabrella of Anthony is a half-grown shell; in which state the plicae and carinae are more distinct than in the adult form. Scabrella being preoccupied by an European author, M. Brot changed the name to scabriuscula.
† Mr. Reeve's figure 404 does not represent this species; it is nearer to decorata, Anthony. This shell is closely allied to carinocostata and equalis.
‡ Allied to G. obtusa, but appears to differ in not being so closely plicate as that species. It may possibly = Lecontiana.
¶ Is this the young shell of cadus or carinocostata? [Feb.
34. G. Christyi, Lea.

35. G. interveniens, Lea.*

36. G. olivella, Lea.

37. G. interrupta, Haldeman.

38. G. crispa, Lea.†

39. G. formosa, Conrad.‡

40. G. mediocris, Lea.

41. G. vesicula, Lea.

42. G. Duttonii, Lea.§

43. G. laqueata, Say.

* Very like Curroyana, Lea, in the piece, but differs in form.
† Close to G. nassula, Conrad, but is striate, and the aperture is more rounded.
‡ Differs from G. Turoneyi, Lea, in the form of the aperture. The specimens before me are not all two-banded, some of them being without bands, and of a light yellowish color.

1864.]

44. G. Pybasi, Lea.

45. G. indusa, Lea.

46. G. versipellis, Anthony.

47. G. gracilis, Lea.

48. G. paucicosta, Anthony.

49. G. tenebrosa, Lea.

50. G. coracina, Anthony.

51. G. intersita, Haldeman.

52. G. columella, Lea.

*A This is only a rather wide, young specimen of laqueata, as I have ascertained by the inspection of some hundreds of specimens of that species.
† Versipellis resembles a young laqueata, but its texture is quite heavy although small.
‡ Described by Mr. Lea as a smooth species, but among a hundred perfect specimens before me, over eighty are more or less plicate on the spire.
53. G. blanda, Lea.


54. G. nitens, Lea.


55. G. mutata, Brot.


56. G. suturalis, Haldeman.


57. G. mutabilis,‡ Lea.


58. G. Viennaensis, Lea.


60. G. costifera,§ Haldeman.


61. G. Deshayesiana, Lea.


* Preoccupied.
† Preoccupied by Mr. Lea, and the name changed to mutata by M. Brot.
‡ Very closely allied to suturalis, but differs in the form of the aperture.
§ Differs from Curreyana by its more numerous plicae, more acuminate spire, and by the mouth being more rounded at base.
∥ Preoccupied, and changed to Deshayesiana.

1864.}


63. G. Doolyensis, Lea.

64. G. inconstans,† Lea.

65. G. continens, Lea.

66. G. viridicata, Lea.

67. G. purpurella, Lea.

68. semicostata, Conrad.

69. G. dislocata, Ravenel.

70. G. paupercola,§ Lea.

71. G. corneola, Anthony.

72. G. nassula, Conrad.

73. G. perstriata, Lea.

† I doubt whether this is more than the young of Doolyensis.
§ = dislocata, young?
74. G. rugosa, Lea.

75. G. costulata, Lea.

76. G. cinerella, Lea.

77. G. Edgariana, Lea.

Melasma Edgariana, Lea, Chenu, Man, de Conchyl, i. f. 1997.

78. G. caliginosa, Lea.

79. G. nodulosa, Lea.

80. G. glauca, Anthony.


81. G. diffuselis,† Lea.

82. G. sparsus, Lea.


* Preoccupied.
† Resembles G. glauca, but the whorls are more convex. G. baculum is more cylindrical than this species.

1864.]
83. G. Thorntonii, Lea.


84. G. cancellata, Say.


85. G. cincta, Lea.


Melania circinata, Lea, Binney, Check List, No. 54.

Juga circinata, Lea, Chenu, Man. de Conchyl., i. f. 2015.

86. G. athleta, Anthony.


87. G. curvicostata, Anthony.


88. G. striatula, Lea.


89. G. tripartita, Reeve.


90. G. decora, Lea.


91. G. crebricostata, Lea.


Melanema crebricostata, Lea, Chenu, Man. de Conchyl. i. f. 1999.

* I am unable to find specimens of this shell in any of our cabinets, and as it has never been figured, I assign it the position it occupies in this catalogue from the description only.

† Name preoccupied.

[Feb.
NATURAL SCIENCES OF PHILADELPHIA.

92. G. comma, Conrad.


93. G. acuta, Lea.


94. G. subcylindracea, Lea.


95. G. baculum, Anthony.


96. G. concinna,* Lea.


97. G. eliminata, Anthony.


98. G. teres, Lea.


100. G. Clarkii, Lea.


101. G. De Campii, Lea.


*Extensively distributed by Mr. Anthony as M. comma, Conrad, variety.
†Half grown shell of G. teres.

1864.]
102. G. abbreviata, Anthony.


Melania chalybena, Anthony, Brot, List, p. 37.

103. G. plicifera, Lea.


Melasma plicifera, Lea, Chenu, Manuel, i. f. 2001.

104. G. silicula, Gould.


105. G. nigrina, Lea.


106. G. rubiginosa, Lea.


D. Shell angulate.

108. G. trochiformis,† Conrad.


109. G. cristata,‡ Anthony.


110. G. cruda, Lea.


* Differ from silicula in being more cylindrical, with the apical whorls carinate.
† The figure of this species in Mr. Conrad's work is not recognizable, but it will probably be found to = cristata, Anth., young.
‡ = protea, Lea.
111. G. Whitei, Lea.  
Obs. ix. p. 132.

112. G. casta, Anthony.  
March, 1854.  
Binney, Check List, No. 50.  
Brot, List, p. 32.  
Reeve, Monog. Melania, sp. 381.

113. G. rhombica, Anthony.  
March, 1854.  
Binney, Check List, No. 228.  
Brot, List, p. 38.  
Reeve, Monog. Melania, sp. 347.

114. G. angulata, Anthony.  
March, 1854.  
Binney, Check List, No. 14.  
Brot, List, p. 37.  
Reeve, Monog. Melania, sp. 386.  
Brot, List, p. 35.

115. G. Bridgesiana, Lea.  
Obs. ix. p. 127.

116. G. cubicoides, Anthony.  
Binney, Check List, No. 78.  
Brot, List, p. 39.  
Reeve, Monog. Melania, sp. 445.

117. G. Spillmani, Lea.  
Obs. ix. p. 124.

118. G. plebeius, Anthony.  
Reeve, Monog. Melania, sp. 414.  

119. G. opaca, Anthony.  
Binney, Check List, No. 189.  
Brot, List, p. 38.  
Reeve, Monog. Melania, sp. 384.

Binney, Check List, No. 152.  
Brot, List, p. 31.  
Reeve, Monog. Melania, sp. 351.

Brot, List, p. 38.

120. G. pallidula, Anthony.  
March, 1854.  
Binney, Check List, No. 197.  
Brot, List, p. 38.  
Reeve, Monog. Melania, sp. 417.

* Juvenile shell. The adult is described under the names of *cinnamomea* and *intercedens*.  
† The longitudinal ribs attributed to this species by Mr. Anthony are very faint on the type shell, and do not exist at all on other specimens.  
‡ = ovoides, Lea.  
§ G. ebenum of Lea appears to be more rounded in the base of the aperture,  
and the periphery not angulated; still it may be the same.  
* Young specimens.

1864.]
121. G. vicina, Anthony.


122. G. Spartenburgensis,† Lea.


123. G. modesta, Lea.


*E. Whorls very strongly carinated.*

124. G. pagodiformis, Anthony.


125. G. Gerhardtii, Lea.


126. G. oblitera, Lea.‡


127. G. acutocarinata,§ Lea.


*F. Body whorl bi-multiangularated.*

128. G. tabulata, Anthony.


129. G. Ctauwbæa,|| Haldeman. (MSS.)

130. G. viittata, Anthony.


* Described as from Alabama, but all the specimens before me are labelled "Kentucky" by Mr. Anthony, and I think the latter habitat is correct.

† I fear the Northern specimens of this species are not distinct from *depygis*, Say.

‡ Differs from *symmetria* in being striate.

§ This shell is believed by Prof. Haldeman to = *simplex*, Say, but I doubt it. *Acutocarinata*, it is true, is not always carinate, but, it appears to me, is always narrowly lengthened.

|| A wider species than others of the group; none of the specimens are banded.
Binney, Check List, No. 222. Brot, List, p. 37. Reeve, Monog. Melani-
131. G. sub angulata,† Anthony. 
Monog. Melania, sp. 242. 
132. G. symmetrica,‡ Haldeman. 
Melania symmetrica, Haldeman, Monog. Lim., No. 4, p. 3 of Cover, October 5, 
List, p. 35. Reeve, Monog. Melania, sp. 328. 
March, 1854. Binney, Check List, No. 142. Brot, List, p. 36. Reeve, 
Monog. Melania, sp. 259. 
Melania assimilis, Lea, (mistake,) Binney, Check List, No. 22. 
133. G. i o t a, Anthony. 
134. G. nigrocin c e ta, Anthony. 
Melania nigrocin c e ta, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 90, t. 2, f. 8, 
135. G. t e c t a, Anthony. 
Melania, sp. 253. 
136. G. h y b r i d a,‡ Anthony. 
Check List, No. 140. Brot, List, p. 36. 
Melania subcarinata, Anthony, Reeve, Monog. Melania, sp. 282. 
137. G. fuscocin c e ta, Anthony. 
Melania fuscocin c e ta, Anthony, Ann. N. Y. Lyc. Nat. Hist. vi. p. 120, t. 3, f. 20, 
Monog. Melania, sp. 415. 
138. G. cong e s t a,|| Conrad. 

* G. pulcherrima is the juvenile form. 
† The various synonyms of this species, inhabiting North and South Carolina, Alabama and 
Tennessee, are all characterized by an identical form, although varying somewhat in color. Having 
examined several hundred specimens, I find them to vary so much in that respect that I 
cannot unite any of the so-called species. 
‡ Differs from symmetrica in being more cylindrical, with the whorls more flattened. 
|| I can obtain no information regarding this species except the meagre description. It has 
ever been figured, and I cannot find specimens in our cabinets. 
1864.]

G. Short clavate, smooth species.

139. G. auriculæformis, Lea.*

140. G. Nickliniana, Lea.

Leptoixis Nickliniana, Lea, Binney, Check List, No. 371.

141. G. aterina, Lea.†

142. G. Binneyana, Lea.

143. G. ebenum, Lea.‡

Ancolotus ebenum, Lea, Reeve, Monog. Ancolotus t. 4, f. 31.

Melania Paula, Anthony, Brot, List, p. 40.

144. G. Vauxiana, Lea.

145. G. larvæformis, Lea.

146. G. auricoma, Lea.

147. G. glabra, Lea.‡

148. G. gramínea, Haldeman, MSS.

149. G. gibbosa, Lea.

* This shell reminds us of a young olivula, Con., but differs from that species in texture.
† Differs from ebenum, Lea, in being smaller, narrower, and more angulate at the periphery.
‡ Lighter colored and more rounded than losbona, Anthony. Mr. Lea considers that species to be identical with ebenum.
§ = Simplex, Say.

150. G. Vanuxemii, Lea.

151. G. cognata, Anthony.

152. G. Georgiana, Lea.


154. G. depygis, Say.


155. G. livescens, Menke.


Melania correcta, Brot, List, p. 39.

156. G. Milesii, Lea.†

157. G. simplex, Say.

*In considering this species to be the same as livescens, I am sustained by the opinion of almost every American Conchologist.
† Larger, more convex, and of thinner texture than livescens.

1864.]


Melania Wardiana, Lea, Wheatley, Cat. Shells U. S., p. 27. 


158. G. Potosiensis, Lea,† 


159. G. torta, Lea. 


160. G. Saffordi, Lea. 


162. G. bulbosa,‡ Gould. 


163. G. Lithasiodides, Lea. 


164. G. infantula, Lea. 


165. G. Louisvillensis, Lea. 


H. Smooth, elevated species.

166. G. pulchella,Anthony. 


---

* I am much indebted to Prof. Haldeman for the opportunity of studying the excellent suite of specimens collected by himself in Holston River, which conclusively proves the identity of these species. 
† Were it not for the wide difference of habitat, I should suspect this to be the same as simplex of Say. 
‡ This species is exactly similar in outline to Mr. Lea's Newberryi, but none of the specimens of bulbosa that I have seen, (including Dr. Gould's types), exhibit the slightest indication of bands, while Mr. Lea declares his species to be always banded. 
§ Shell more elevated than depygis, which it resembles in color and ornamentation.

[Feb.

168. G. gracilis, Anthony.
   Melania gracilis, Lea, Reeve, Monog. Melania, sp. 369.

169. G. Etohahensis,† Lea.

170. G. translucens, Anthony, (MSS.)

171. G. ovoides,‡ Lea.

172. G. grata, Anthony.


174. G. flav a, Lea.

175. G. tenebrovittata, Lea.

176. G. tenera, Anthony.

177. G. spurca,‡ Lea.


* Preoccupied by Mr. Lea.
† Preoccupied for a nodose species, also from Georgia.
‡ Mr. Reeve's figure 465, intended for this species, represents a species of Lithasia.
§ Mr. Lea described this species under the misapprehension that the wider shell, which he now proposes to call quadricincta, was the species described as grata by Mr. Anthony, whereas, Mr. Anthony's types are of the narrow form.
|| G. tenera is the young shell.
‡ Mr. Reeve's figure 340 does not represent this species.

1864.]
179. *G. pallescens,* Lea.


180. *G. parva,* Lea.


181. *G. Ocoensis,* Lea.


*Melania Oocensis,* Lea, Binney, Check List, No. 186.


186. *G. subsolida,* Lea.


*Potadoma sordida,* Lea, Chenu, Manuel de Conchyl. i. f. 1971.


*I regard this as the half grown shell of *pallescens.*

†Mr. Reeve's figure 323 does not represent this species.

‡An extensive suite of specimens before me, furnished through the kindness of Messrs. Gould and Haldeman, convinces me that the above descriptions all apply to one variable species.

[Feb.]


191. G. adusta, Anthony.


193. G. dubiosa, Lea.


194. G. laevigata, Lea.


195. G. interlineata, Anthony, (MSS.)

196. G. Ohioensis, Lea.


197. G. brevispira, Anthony.


198. S. semicarinata, Say.


* Narrower and more lengthened than the nearly allied *G. adusta*. It has not the pale yellowish sutural band of that species.

† Preoccupied.

‡ Doubt whether this is more than an immature stage of *dubiosa*.

§ Proposed by Mr. Brot, because *laevigata* is preoccupied in *Melania*; but that name must stand, as it is not preoccupied in *Goniobasis*.

| **The shells included in the above extensive synonymy present some variation in form and coloration, but in an examination of several thousand specimens I was unable to separate the so-called species satisfactorily. G. semicarinata, Say, is the young shell, which, when old, varies in form, being narrow in *angustispira* and *exilis*, and broader in the other synonyms. The species inhabits an extensive range of country.** |

1864.]

Melania angusta, Anthony, Reeve, Monog. Melania, sp. 359.


Melania Kirtlandia, Lea, Philippi, Beschreib, Neuer Conchyl. Melania, t. 3. f. 8.


Melania bicolor, Anthony, Reeve, Monog. Melania, sp. 265.


199. G. Haldeman, Tryon, (MSS.)


Melania exits, Haldeman, Adams, Moll. Vermont.

200. G. curvilabris, Anthony.


201. G. informis, Lea.


204. G. Haleiana, Lea.


205. G. rubella, Lea.


* A scalariform monstrosity.

207. *G. Draytonii*, Lea.  


Melania *alzecta*, † Haldeman, Reeve, Monog. Melania, sp. 341. Brot, List, p. 34.


I. Striate species, spire elevated.


*Limnea Virginica*, Say, Short and Eaton, Notices, p. 82.


---

*I* make this a synonym on the authority of Dr. Jay.

† I doubt whether this shell really came from Arkansas, although the *established geographical distribution of proxima* is very great.

1864.]

Melania aurisculpitum, Menke.
Melania striigillata, Muhlfeldt, in Litt.

210. G. sulcosa, Lea.? 
Cerithia sulcosa, Lea, Chenu, Mon. de Conchyl. i. f. 1857.

211. G. Buddii, Lea.

212. G. Troostiana, Lea.

213. G. latitans, Anthony.

214. G. porrecta, Lea.


216. G. crenatella, Lea.

* Prof. Haldeman was the first naturalist who identified the various descriptions of Menke with Virginia. Philippi has since figured some of these as varieties of that species.
† This shell has been referred both to Virginia and to decky by American Authors. I do not give a confident opinion as to its proper place. About bizonalis of DeKay there can be no doubt.
‡ Testa Philippi, Neuer Conchyl.
§ When perfect specimens of this shell are obtained, it may prove to be a Pleurocera instead of a Conchylidea.

[Feb.]
March 1st.
Vice-President Vaux in the Chair.

Eleven members present.
The following were presented for publication:

"Synonymy of the Strepomatidae of North America." By Geo. W. Tryon, Jr.
"Thoughts on the Influence of Ether upon the Solar System." By A. Wilcocks, M. D. Part III.

March 8th.
Vice-President Bridges in the Chair.

Thirty members present.
The following was presented for publication:

"Additions to the Catalogue of Stars which have changed their colors." By Jacob Ennis.

March 15th.
Vice-President Vaux in the Chair.

Twenty members present.
The following were presented for publication:

"Note on the Nomenclature of Genera and Species of Echeneididae," and "Description of a new labroid Genus allied to Trochocopus." By Theo. Gill.

"New Species of Mordellestina collected in Illinois." By C. A. Helmuth, M. D.

Notes on the Birds of Jamaica." By W. T. March, with remarks by S. F. Baird. Part III.

Dr. Leconte remarked, that his attention had been called to the following passage in the Report on the progress of Entomology, by Dr. Gerstäcker, in the last number of Troschel's Archiv für Naturgeschichte, in which he refers to the Classification of the Coleoptera of North America, Part 1, by Dr. Leconte.

"Die Stylopiden setzt der Verf. unter die Heteromeren, bemerkt aber das die Tarsen nicht heteromeren seien, was richtig ist. Früher habe man sie als eigne Ordnung betrachtet, aber die Kenntniss ihrer Verwandlungen, und eine genaue, [more rigid!] Interpretation ihrer äusseren Baues habe fast alle [nearly all!] Systematiker dazu bestimmt, sie unter die Köfer zu bringen. (Welche Charactere hat ein Strepsipteron mit einem Köfer gemein? — Keinen! Wo sind die Übereinstimmungen der Larven und ihrer Lebensweise? Die Strepsipteren Larven leben parasitisch in Hinterleibe von Hymenopteren, die Meloiden Larven nähren sich von Honig; beide haben also in der Lebensweise nichts untereinander gemein."

"In Elementarbüchern soltite man Absurditäten am Wenigsten für baare Münze ausgeben!"

I do not propose here to enter into a discussion of the views which have induced Lacordaire, Burmeister, Newman and Schaum to consider Stylopidae as a family of Coleoptera, an opinion which many others have silently acquiesced in. The subject was considered nearly exhausted, until reopened by Duval, in 1864."

4
his note on the order Rhipiptera, (Gen. Col. Europe, 3,419), published subsequently to my work on Classification.

I will, however, answer briefly the questions asked by Dr. Gerstaeccker in the passage above cited.

The characters common to a Strepsipteron and various Coleoptera are these: 1. Hypermetamorphosis of the larva, (Meloidae); 2. Parasitism, (Ichthiidus); 3. Retention of the Pupa within the skin of the larva, (Lampyridae, tribe Lycini, genus Calopteron); 4. Unfitness of anterior wings for flight, (a character also found in Orthoptera and Hemiptera, which, however, have no metamorphosis); 5. Large development of metathoracic segment.

Even if the Stylopidae are considered as a distinct order—Strepsiptera—it will be necessary to place them immediately after the Coleoptera.

In view of the great variation of characters found in Coleoptera, it would seem rational to consider Stylopidae as an extreme and degraded form of that order, rather than to regard such a small number of objects, closely related in form, structure and habits, as an equivalent to the great orders Coleoptera, Orthoptera and Hemiptera, with which alone they can be morphologically compared, (characters 4 and 5).

The information given by Dr. Gerstaeccker regarding the difference in food and manner of life between the larvae of Meloidae and Stylopidae, though not original, is doubtless quite interesting, but seems to imply that I had compared them together, which is not correct.

Mr. Cassin called the attention of the Academy to the collection of birds presented this evening by the Smithsonian Institution, and particularly referred to several species of great rarity and scientific value. The Didunculus strigirostris is one of two species of birds now known to be approaching extinction, the other species being Alca impennis, which is also in the Academy Museum. This bird is the most nearly allied to the extinct Dodo, formerly of the Isle of France, and inhabits the Samoan or Navigator Islands. Its extinction or approach to it is said to be owing to the introduction into those islands of the domestic cat. Not more than four or five specimens are known to be extant.

Other little known types were pointed out and exhibited to the Academy, such as Carpophaga Aurorae, Carpophaga latrans, Artamus mentalis and others. This interesting series is from the collection of the United States Exploring Expedition of the Vincennes and Peacock, and is presented to the Academy by the Smithsonian Institution.

March 22d.

Vice-President Bridges in the Chair.

Seventeen members present.

The following were presented for publication:


"A Critical review of the Family Procellaridae; Part I." By E. Coues, M. D.

"Thoughts on the Influence of Ether on the Solar System; Part IV." By Alex. Willcocks, M. D.

March 29th.

Vice-President Bridges in the Chair.

Seventeen members present.
On report of the respective committees, the following were ordered to be published:—

Additions to the Catalogue of STARS which have Changed their Colors; or which have appeared with different Colors at different times.*

BY JACOB ENNIS.

Sirius.—On the re-appearance of this star during the months of November and December, 1863, I very carefully watched its color. Its decided change of appearance since the early part of the year greatly interested me. Instead of a full bright green, it was of a pale yellowish green. During those two months the atmosphere passed through the extremes of variability, but the pale yellowish green of Sirius remained constant. On the 29th of December I asked Dr. Wilcocks, the discoverer of its being purple three years ago, how Sirius appeared to him now? Without knowing my opinion, and without any hesitation, he answered, "It is not as green as it was when visible last winter." This coincidence of his views with my own confirms the idea that he was not mistaken three years ago, as he since supposed, when he regarded the color of Sirius to be violet. According to these evidences this great star has had five distinct colors: red during the ancient times; white in 1850, and subsequently; violet in 1861; full green in the autumn and winter of 1862—3; pale yellowish green in November and December of 1863.

Note of April 19th, 1864. The above observations were written early in January. For the last three or four weeks the green color of Sirius has again been tinged with blue; but this evening no blue is visible, and the yellow mingled with the green is conspicuous. In this I am confirmed by a member of the Academy whose powers of observation are remarkably good. The clearness of the atmosphere is perfect, but the moon is large and bright, and I have a suspicion that the yellow of Sirius, though in a different quarter of the heavens, may be due to the moon's reflected rays. The following portions of this paper, except that on No. 21, were written previous to the 10th of November, 1863, at which date they were presented.

Altair and Deneb, or Alpha Cygni.—The former of these stars was described by Humboldt in 1850 as yellow and the latter as white. They were numbered 18 and 19 in this Catalogue, and announced to be blue in June, 1863. I had watched them for several months nearly every clear night, and, on the 29th of August, I first noticed that they were green. On all good nights since then they have appeared to myself and to others, whose opinions I have solicited, to be conspicuously green; but on damp, slightly hazy nights, from the effects of the atmosphere, they appear blue. It is rather oppressive for me to make this announcement, for I have been obliged already, in a former communication, to say that two other large stars, Sirius and Vega, had changed from blue to green. Certainly this change does not arise from any peculiarities of vision, for I have in all cases carefully consulted the views of others and found them to accord with my own. I know not how to attribute the change to atmospheric causes, for I had observed them all, except Sirius, to be blue several months before, in all weathers.

Vega.—For the last four or five weeks, this star has not appeared to me as green as during last summer. Its rather bluish appearance may, perhaps, be attributed to greater haziness of the atmosphere.

Castor.—See No. 10 of this Catalogue. In addition to the colors already given, the two companions of this double star have been described as follows: Yellow and yellowish by Sestini; greenish yellow and green by Dembowski;
bright and pale white by Webb; yellow and warm yellow by Miss Maria Mitchell.

20. Arcturus.—This is one of the stars denominated red by the ancients. In modern times, according to reliable observations, it has changed its color. J. F. Julius Schmidt, formerly of Ulmutz, recently made Director of the Astronomical Observatory at Athens, and distinguished for his observations on variable stars, which he communicated to the Astr. Nach., says, that for eleven years he had considered Arcturus to be one of the reddest of the stars, and, especially in 1841, he had ranked it in color with Mars. To his surprise in 1852 he saw it to be yellow, and entirely destitute of any reddish hue. It then appeared to him by the naked eye lighter than Capella. Capella two years before had been described by Humboldt as yellow, with scarcely a tinge of red; since then Capella has become blue. During the present year, 1863, I have observed times and in all weathers observed Arcturus to be decidedly orange, and of a clear, beautiful color. In this I have been confirmed by other observers. The colors of Arcturus may therefore be stated as having been red, yellow and orange.

References have already been made in this Catalogue to the changes of color in double and multiple stars. The numbers, such as 3 : 7½, immediately after the names of the following double stars, indicate the magnitudes of the companions. The authorities are given after the colors. Some of these I have taken from the original papers, and some I have not so verified, but presume them all to be correct.

21. 95 Herculis, 5 : 5.—Hitherto catalogued as a diversely colored pair of stars to an extreme degree: one being described as apple green and the other as cherry red, and also as an astonishing yellow green and an egregious red. In 1856—58 they were nearly colorless and without any diversity of tint, and in this latter manner they were described by Struve in 1852—3, and by Sestini in 1844—5. Hence a probability of their being colorless once in about twelve years. —C. Piazzi Smyth.*

In the November number, 1863, of the Monthly Notices of the Royal Astronomical Society, a suggestion is made, from very high authority, that because the changes in the two companions have in all these cases been simultaneous, they are liable to the suspicion of having been produced by instrumental causes. But this apparent simultaneousness of change may have been produced by a real change in only one of them. If the two stars were white and one of them to change to an "egregious red," then by contrast in close proximity, from the well known principle of complementary colors, the other would necessarily appear green. The operation of this principle has been very conspicuous in this city during political demonstrations and celebrations, when bright red lights have been kept burning in the streets. The ordinary gas-lights all around them have appeared strongly green. It is submitted that this cause for the simultaneous change in both stars is more probable by far than that these different instruments, in the hands of three different men, in three different countries and at as many different periods, should all, from some unknown cause, fall into the same error; and this not when directed at the stars generally, but only when pointed to a particular one.

   White and pale green. Webb.
   Both yellow, the 4 has the deeper hue. Mitchell, 1860, April 30.†

23. Xi Bootis, 3½ : 6½.—Orange and purple. Webb.‡

* See the Proceedings of the British Scientific Association for 1863.
† See American Journal of Science and Art, July, 1863, for Miss Mitchell's observations.
‡ For several valuable popular papers on the double stars, by the Rev. Mr. Webb, see the first four volumes of the Intellectual Observer, London.

[March}


26. 35 Piscium, 6 : 8.—White and purplish. Webb. The 6 is light yellow. The 8 is peculiar; there is a brown mingling with its reddish light. Mitchell, 1860, Jan. 2.


28. 39 Ophiuchi, 5 : 7.—Pale orange and blue. 1838. The 7 is yellow. Sestini, 1846. The 8 is peculiar; there is a brown mingling with its reddish light. Mitchell, 1860, Jan. 2.

29. Polaris, Alpha Ursae Minoris, 2 1/2 : 9 1/2.—Yellow and dull white. Struve. Yellow and blue. Sestini, Dawes, Webb.

30. Iota Cancri, 5 : 8.—The 8 deep garnet, Feb. 8, 1782; bluish Dec. 28, 1782; and blue, Mar. 12, 1785. Herschel, Sr. Pale orange and clear blue. Webb.


32. Delta Corvi, 3 : 8 1/2.—The 8 1/2 white. Sestini. Pale yellow and purple. Webb.

33. Pi Bootis, 3 1/2 : 6.—Both white; a ruddy tinge sometimes in 6. Webb.

34. Alpha Herculis, 3 1/2 : 5 1/2.—“Intense cerulea.” Struve. Orange and emerald. Webb.


38. 39 Bootis, 5 1/2 : 6 1/2.—White and lilac. Some writers ascribe a bluish and some a ruddy tint to 6 1/2. Webb.

39. Epsilon Lyrae.—The two companions of this double star are designated. Epsilon 1 and Epsilon 2. Each of these again are double. Epsilon 1, 5 : 6 1/2. Yellow and ruddy. Webb. During five years the 5 was bluish. Struve, Dembowski.


42. Gamma Lyrae, of 3d magnitude.—Both these stars, Beta Lyrae and Gamma Lyrae, seem to be changing their colors. Herschel, Sr., and South gave Beta as white. Next, Smyth, in 1834, gave the general impression as white; the four companions being in the following order: very white and splendid, pale grey, faint yellow, light blue. He gave Gamma Lyrae then as being bright yellow. Schmidt regarded the colors of both Beta and Gamma the same—yellowish white—from 1844 to 1855. Webb, in 1849—50, regarded Gamma as much less yellow than Beta, if not white. In 1862, the latter observer found Gamma the paler in tint, though the difference was not considerable. According to these statements Beta changed from white to yellow and Gamma from yellow to white. Both were of the same color,—yellowish white,—according to Schmidt, about 1844. The only discrepancy is Schmidt, for the latter portion of his time, the former portion being remarkably confirmative.

43. Eta Lyrae, 5 : 9.—Carulca. Struve, during five years, about 1830.
   Sky blue and violet. Webb, 1834.
   The 5, yellow. " 1849—50.
   " pale yellow. " 1862.

   The 5¾ is double, and the colors of the two latter have been given as follows:
   Subviridia et violacea. Secchi, 1856.
   Yellow and blue. Sir W. K. Murray, 1857.
   " " Dawes, Jacob.

45. Gamma Arietis, 4½ : 5.—Both " egregie alba." Struve, 1830.
   White. Dembowski, 1852, 1854, 1856.
   The same, either white or light yellow. Piazzi Smyth, 1856.
   Full white and faint blue. Webb, 1862.

46. Iota Trianguli, 5½ : 7.—White or yellow and blue. Secchi.
   Topaz yellow and green. Webb, 1862.

47. Gamma Ceti, 3 : 7.—The 7 tawny. Webb, 1850.
   Pale yellow and lucid blue. Webb, 1863.

48. Gamma Leonis, 2 : 4.—White and reddish white. Herschel, Sr.
   Bright orange and greenish yellow. Webb.

49. 72 P. II. Cassiopeæ, 4½ : 7 : 9.—White, blue, ruddy violet. Dembowski.
   1854—6.
   Pale yellow, lilac, blue. Webb, 1863.

50. Kappa Cephei, 4½ : 8¾.—The 4½ greenish. Struve.
   Pale yellow and blue. Webb, 1863.

   Both bluish. Smyth, 1839.
   White and tawny or ruddy. Webb, 1850.
   Flushed white and pale lilac. " 1851.

52. 40 Dracoæ, 5½ : 6.—Both white. Struve, 1832.
   Both white. Webb, 1839.
   Both white or yellowish. Webb, 1850.
   Both yellow, the 5½ deeper. " 1856 and 1863.

53. 12 Canum Venaticorum, 2½ : 6¾.—White and red. Herschel, Sr.
   " With all attention I could perceive no contrast of colors in the two stars." Herschel, Jr., 1830.
Both white. Struve, 1830.
Yellow and blue. Sestini, 1844.
Full white and very pale white. Smyth, 1850.
White or a little yellowish, and tawny or lilac. Webb, 1850.
Pale reddish white and lilac. Smyth, 1855.
White and pale olive blue. Dembowski, 1856.
Same as in 1850, but with very little contrast. Webb, 1862.
Flushed white and pale lilac. Webb, 1862.

54. Sigma Corone, 6 : 6½.—Creamy white and small blue. Webb, 1862.
The 6½ has had many changes, as follows; certainly not blue and
differing very little from the other. South, 1825.
White. Struve, 1836.
A yellow ashy and doubtful blue. Dembowski, 1854—57.
Sometimes blue, sometimes yellow. Secchi, 1855—57.
"At one time ruddy, at another time bluish, apparently changing
white being looked at; a versatility of hue which I have re-
marked in other stars similarly circumstanced." Webb, 1850—5.

55. Mu Cygni, 5 : 6.—White and pale blue, Struve, 1831.
Yellow and more yellow. Sestini, 1844.
Reddish yellow and olive. Dembowski, 1853—4.
Clear light yellow and ashy yellow. Dembowski, 1855.
"The 5 yellow, while the 6 showed the curious effect of an unde-
cided and changeable hue—blue and tawny." Webb, 1850—1.
The 5 yellow. Webb, 1862.
"Secchi’s colors are here uncertain and variable."

56. Alpha Piscium, 5 : 6.—Greenish and pale blue. "There seems to be
something peculiar in the color of the smaller star, as to which
observers are strongly at variance with each other, and even
with themselves. Some see no contrast, some agree with Smyth,
some find it tawny and ruddy. The details are curious but too
long for insertion here. Other small stars show a similar uncer-
tainty." Webb.

The frequent changes in some of these stars,—the last three or four of this
Catalogue especially,—are remarkable, and seem inexplicable to astronomers. I
presume the difficulty arises, not as is supposed from the atmosphere, or from the
instruments, or from personal peculiarities, but chiefly from the frequency of the
real changes in the stars. If, for instance, it be complained that "Secchi’s
colors are uncertain and variable," it is because in such instances the colors
of the stars are uncertain and variable.

An addition has been made to the title of this Catalogue to obviate the ob-
jection that possibly some of the apparent changes of color of the stars may
be merely the errors of observation, or the effects of the atmosphere, and not
real changes in the celestial bodies. Nevertheless, an apparent change is a
fact in the constitution of the world, and deserves a notice and an explaina-
tion. From whatever causes these changes may arise, there is needed a faithful
collection of all the facts in this department of astronomy. They are scattered
about in many volumes and many various scientific depositories, and no one,
as far as I am aware, has brought them together or made them a special study.
But in making such a collection, or catalogue, no changes should be omitted.
Whether we regard them as apparent or real, whether they be small or great,
whether they may have been slow or sudden, none should be suppressed by
the compiler in his catalogue. To admit some and reject others because in
his opinion some are right and others are wrong, would be making his work a
confused medley of facts and opinions unworthy of reliance. If, as appears
undeniable, there be changes in the colors of the stars, then, from the nature
of things, there may be small changes as well as great ones. To reject a re-
1864.]
corded change simply because it is small, would therefore be a real misrepres-
sentation of the case, and a virtual falsification of the records. Moreover, the
colors as they stand recorded are from experienced observers,—men whose
lives have been devoted to an accurate representation of facts, who do nothing
without care and deliberation, and whose common and avowed practice is not
to record any color when the atmosphere is not favorable for such observ-
vations.

As already stated, there are difficulties in deciding on colors by the naked
eye when the star is not large, and when the departure from white is small. But
this difficulty is not in the way of large stars, as Arcturus and Sirius; nor
does it apply to the telescope, except in the very smallest magnitudes. To
decide between two different colors, such as red and blue, is never difficult;
and when two colors are blended, it is the custom to name them both, as bluish
green, reddish yellow, and the like. The disturbing effects of the atmosphere,
or of the instrument, may be detected either immediately or after several nights
of observation. The atmosphere cannot color one star and leave all the other
stars in the same neighborhood uncolored. The telescope cannot act pecu-
liarily on any one star; it must treat all alike, especially of the same magni-
tude and color. Simple comparison is therefore an admirable test; and another
important test is time—watchfulness every night through different changes of
weather. If hereafter even this shall not be found satisfactory in any one locality,
then simultaneous observations at widely distant places will most certainly
eliminate all suspicion of mistake. For instance, observations may be made
at Australia, the Cape of Good Hope, and Chili in the southern hemisphere;
and in the northern hemisphere both on the Pacific and Atlantic coasts of
America, on the Atlantic coast of Europe, in Russia, and in Hindoostan.
If the star shall prove of the same color at all these different regions at the
same time in favorable weather, then that color may be regarded as unquestionable.
Even by using one locality alone absolute certainty may be acquired,—as the
red colors of Aldebaran, Betelguese, and Antares. The same certainty may
be looked for in this as in other departments of astronomy, and even greater
certainty than in many. There is an uncertainty, in opinions of wise men, of
three millions of miles in the distance of the earth from the sun; and yet this
uncertain distance is used as a measuring line to fathom other and far greater
distances. But this uncertainty so large a degree does not take away from
the supreme value of the determinations nevertheless. These determinations,
with all their known reservations, are held as of the highest importance. So
in the colors of the stars; mistakes may be made, the intermixtures of
eror may certainly exist, though we cannot tell exactly where they are, and
yet the present recorded observations are precious beyond estimation. And a
time is coming when simultaneous observations from various positions in both
hemispheres will render them beyond suspicion. To hasten on this time we have
only to make good use of the materials already on hand.

Why the changes in the colors of the stars are not more frequently observed,
was pointed out in a former communication. Why the belief in their real oc-
currence is hard to be admitted, and why their observed changes are ascribed
to supposable errors from the instruments, from the atmosphere, and from per-
sonal deficiencies, seems to arise from the opinion that such vast bodies cannot
possibly undergo great changes in a short time. But this opinion rests on no
known scientific grounds. When fairly viewed, the fixedness of the colors of
the stars should not seem more likely than the fixedness of their positions.
Indeed the two ideas are very much alike. In ancient phrase, the stars were
said to be "rivetted" to the vault of heaven. Now we know from observations
more refined that many of them move, and we have a conviction, from the na-
ture of attraction, that they must all move. In like manner, in a universe
where every known object is subject to change in various ways, our first ideas
should be that the colors of all the stars must change. Hence we should ap-
proach the recorded changes with favorable judgments. If we are to have any

[March}
prepossessions in the case, they should be that the changes are real in the stars themselves. And when we reflect on the habitual caution of long experienced observers, men whose very existence is devoted to the accurate delineation of fact, we should place a high reliance on their recorded observations, and not think that they have lightly allowed themselves to be imposed upon by optical illusions.

I cannot hope to be able to add anything to the knowledge of practised observers respecting the sources of error and the rules to be observed in making observations; but as these have never, that I am aware, been embodied in print, I offer the following, chiefly for the assistance of the many who may be disposed so observe the larger stars with the naked eyes. Such stars are indeed very few, but the observations may be the more useful from being made frequently and by many persons.

1. Damp and slightly hazy atmospheres make a green star appear blue. This may be from the same principle that the deep ocean, the clear sky, and the distant mountains appear blue. Damp nights that are perfectly clear do not have this effect.

2. Moonlight greatly obscures the colors of the stars, giving them a yellowish hue.

3. Before the daybreak makes its appearance in the east, the rays of the sun refracted through the higher regions of the atmosphere, may cause a general whiteness of the stars.

4. Artificial lights reaching the eye obscure the colors of the stars.

5. On account of the faintness of the light of the stars, the eye often requires to be fixed upon them for a considerable time before their impressions take full effect.

6. Comparisons between neighboring stars, and some practice in star observations, are often necessary to decide on the real colors of the stars.

7. The atmosphere must have like effects upon similar stars in the same neighborhood. Hence a peculiarity observed in any star may be brought to a determination.

8. Observations on the same star during a considerable interval of time and through different changes of weather, may aid in giving confidence to a determination.

9. Perfect independence and candor are necessary. Our previous judgments are apt to warp these delicate impressions on the retina, and whether we have derived these judgments from ourselves or others, we must be careful to lay them completely aside. For want of doing this we may not notice a change of color, although such a change may have been before our vision.

10. Personal peculiarities of vision may be ascertained by consultation with others.

11. Discrepancies between the accounts of two observers may arise from differences of dates; hence, in apprehension of sudden and frequent changes in the stars, the dates of observations should be carefully given.

Description of a new Labroid Genus allied to Trochodopus Gthr.

BY THEODORE GILL.

Dr. Ayres has indicated, under the name Labrus pulcher, a Californian representative of the family of Labroids. That species was subsequently referred by Dr. Günther to his genus Semicosyphus, in which it was retained by myself with the proviso that "its generic position remains to be confirmed, although there is little doubt that it really is a Semicosyphus." Having since received, through the kindness of Dr. Cooper, a specimen of the species, I find that it has not the "lateral teeth distinct," as in Semicosyphus, but an "obtuse osseous ridge round the edge of the jaws, without distinct lateral teeth," as in Trochodopus Gthr., to which Günther should have referred it. I am not acquainted with his reasons for considering the species closely 1861.]
related to the type of *Semicossyphus*, but previously followed him, as he was acquainted with *Semicossyphus* and *Trochoecopus* through autopsy, while I was not.

**Genus PIMELOMETOPON Gill.**

*Synonymy.*

Labrus sp. *Ayres.*

*Semicossyphus* sp. *Günther, Gill.*

Body oblong, moderately compressed, with the caudal peduncle little oblong and not constricted: anus subcentral.

Scales generally rather small, in about fifty-five to sixty-five transverse rows; on the breast smallest; each scale is oblong, subangulated behind, little convex or truncated at base, corrugated at the centre, with numerous lines radiating backwards towards the base and sides; and in front with generally undulated lines parallel with the sides; exposed surface vertically rhomboid.

Lateral line continuous, simply tubular, parallel with the dorsal outline, little deviated backwards, and not at all deflected.

Head nearly equally long and high, with the snout elongated and deviated.

Eyes submedian between the snout and opercular margin or little anterior, rather small. Cheeks covered with small scales; larger ones on all the opercular bones, except the preoperculum, whose limbs are naked. Opercular bones unarmed; suboperculum with no membranaceous extension. Nostrils minute, simple, in front of the upper portion of the eye.

Mouth little protractile, with the cleft oblique. Lips thick and plicated.

Intermaxillaries and supramaxillary bones connected by arthroial articulation; intermaxillaries with the ascending processes about as long as the horizontal and extending nearly to the eyes, little curved and oblong cuneiform in profile for two-thirds of their length, oblong subtriangular behind; the horizontal limbs uniformly wide, thick but compressed, and with a prominent articulation behind. Supramaxillars divided into two parts; an anterior laminar behind and within the posterior part, widening towards the front into a somewhat concave or channelled process arthroially articulated with the outer surface of the intermaxillaries, and thence recurrent in a nearly parabolic curve backwards and thence downwards to the front to articulate with the inner surface of the intermaxillaries; the posterior portion of the supramaxillars is flat and expanded backwards to its inferior angle, and ceases nearly under the front of the eye. Dextar rapidly increasing in height towards the angle.

Teeth on the crest of the jaws cylindro-conic and obtuse, completely isolated; four in front of the jaws developed as large curved blunt canines; the hindermost one in jaw above sometimes little larger than the preceding; in others a true canine:* on the inner surface of the jaws, granular and pluriserial.

Branchiostegal rays seven (in *Pimelometopon Darwinii* fide Val.)

Dorsal fin with no scales, entire, commencing rather behind the bases of the pectoral fins; typically with twelve spines and ten rays; the spinous portion nearly uniform, rather low, and with each spine enveloped in a membranaceous produced sheath; the soft portion falciform, produced at its anterior portion.

Anal fin with three graduated spines, and with its soft portion opposite and similar to that of the dorsal.

Caudal fin typically lunate and with prolonged pointed lobes.

Pectoral fins rather narrow, obliquely truncated behind.

Ventral fins inserted beneath or scarcely behind the pectoral and angulated.


Scales 58—62.

The lower pharyngeal bone is T-shaped, divided into two parts; the body

*Is the development of a posterior canine tooth a sexual distinction in this genus?*

[March]
transversely triangular, scarcely sinuous behind and uniformly high, with its ends scarcely curved backwards to its posterior facets, which are narrow, little prominent above and separated from the dentigerous area by a con-
traction; the shaft is laminar, expanded obliquely downwards and forwards. 
The teeth on the body are nearly uniform, moderate, and paved, and on the crest 
of the shaft obtusely cylindro-conic. The upper pharyngeal bones are 
high, curved in front, on which is a tessellated pavement and which is nearly 
rectangular to the inferior surface, which is paved towards the inner side with 
moderate and towards the outer with minute teeth.

The gill rakers on the outer surface of the first branchial arch are 
short compressed, parallel with the arch, bi- or multidentate; the others are 
oblige and more or less compressed at right angle to the arches.

_Type Pimelometopon pulcher Gill._

This genus is very closely related to _Trochocopus_ (Günther), but differs in 
the possession of a greater number of scales and the form of the head. It is 
also solely represented by species found along the western coasts of America 
and the appending islands, while _Trochocopus_ is a peculiar African type, 
so far as yet known.

Of the two known species of this genus, one—the type—was originally 
described as a _Labris_ by Ayres in San Francisco; the other was first made 
known by Jenyns under the generic name _Cosyphus_ and was afterwards, by 
Valenciennes, described as a new species of _Labris_. Dr. Günther subse-
quently referred the Californian species to his genus _Semicossyphus_ and the 
Species of Jenyns and Valenciennes to _Trochocopus_; he was acquainted 
with neither through autopsy. Finally, the writer, following Günther and 
unacquainted with either _Semicossyphus_ or _Trochocopus_, retained the Cali-
ifornian species in the former genus.

_Pimelometopon_ belongs to the subfamily of _Chryslerinæ_ as understood by 
me. It is proper to here remark that, by an evident inadvertent, the sub-
family _Pseudolabroiformes_ of Bleeker was formerly* enumerated among those 
considered valid by myself, instead of among those requiring revision.

There are two known species of the genus _Pimelometopon_:

_Pimelometopon pulcher_ Gill = _Labris pulcher_ Ayres = _Semicossyphus_ 
pulcher Günther, Gill.

Califonia.

_Pimelometopon Darwinii_ Gill = _Cosyphus Darwinii_ Jenyns = _Labris_ 
aper Val.

_Galalopagos Islands._

N. B. In anticipation of a special paper, I may here state that the _Sebastos_! 
helvomaculatus of Ayres is the true _Sebastos rosaceus_ of Girard, (_Sebastomus_† 
rosac; Gill.) widely different from the _Sebastodes_! rosaceus of Ayres. The latter 
may be named _Sebastosomus_ pinniger.

---

**Note on the Nomenclature of Genera and Species of the Family **

**ECHENEIDIDÆ.**

**BY THEODORE GILL.**

In order to correct the nomenclature of two of the genera of the family 
Echeneidæ, the following paper is submitted. I also embrace the oppor-
tunity of restoring to proper rank, as the true names of peculiar species, two 
which have been connected with forms to which they do not truly belong.

M. Auguste Duménil, in a "Prodrome" of a projected Monograph of the 
family, (Comptes Rendus, tome 47, 1858, pp. 374–375.) has proposed to 
distribute the species among two groups, one typified by _Echeneis nucrates_, 
and named _Nucrates_, and the other, represented by _E. remora_ and called 
_Remores_. Elevating these types with others to independent generic rank, I

* Proc. A. N. S. 1833, p. 221.
† _Sebastosomus_, n. g. Type _Sebastosomus melanops_ = _Sebastes melanops_ Girard.

1861.]
have restricted *Echeneis* to the genus typified by *E. naucrates* and called that one typified by *E. remora*, *Remora*, which name Dr. Bleeker has since accepted. On examining the works of Linnaeus and Artedi, I find, however, that *E. remora* was the only species referred to that genus by Linnaeus in the earlier editions of the *Systema Naturae*, and by Artedi; and that in the later editions, Linnaeus placed that species at the head of the genus. The *E. remora* must consequently be regarded as the type of the genus, and a new name (*Leptecheneis*) conferred on *E. naucrates*. The genera of Echeneididae will then be known by the following names:

**REMORAS.**

*Echeneis Remora* L.


**LEPTECHENEIDES.**

5. *Leptecheneis Gill*. Type, *Echeneis naucrates* L.

In a *Synopsis* given in the *Proceedings of the Academy of Natural Sciences of Philadelphia*, for April, 1862, (p. 239), an analytical table is given, in which the genera are distributed as follows:

Echeneides (Echeneis = Leptecheneis, Phtheirichthys.)

Remora (Remora = Echeneis, Remilegia.)

Subsequently, (op. cit., 1863, p. 88,) the genera *Remoropsis* and *Rhombochirus* were added.

The genus *Remilegia* is known to me chiefly through the excellent figure accompanying Günther's valuable account of the family in the "*Annals and Magazine of Natural History,*" (vol. v. 1860, pp. 386-402.) On the other hand, I have enjoyed the opportunity of examining two types,—*Rhombochirus* and *Phtheirichthys*,—not seen by that gentleman.

While fully appreciating the great service rendered to science by Dr. Günther in reducing the synonymy of the present family, and in many respects agreeing with him in his views regarding the limits of the species and their synonymy, I am compelled to differ from him, especially regarding the nomenclature of the species called by him *Echeneis Holbrookii* Gthr., and *E. scutata* Gthr., believing that both had long previously received names known, indeed, to him, but referred to species which they did not really represent.

*Echeneis Holbrookii* of Günther, Cat., should have been called *Echeneis albicauda*, as it is the *Echeneis albicauda* of Mitchell. Mitchell's name is, indeed, included, with special emphasis, in the synonymy of Günther's *Echeneis naucrates* (*Leptecheneis naucrates*), but the following juxtaposition of all essential characters given by both authors will show the incorrectness of this view:

"*E. naucrates.***

<table>
<thead>
<tr>
<th>Disk &quot;(21) 22—25 (26)&quot;</th>
<th>&quot;The length of the disk 4½—4 3/8 in the total or twice the width of the body between the pectorals.&quot; Gthr., ii. p. 384.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width to length (= 1: 4½ — 4 3/8 × 2) = 1: 9</td>
<td>(3 3/8 × 2) 7 5/8.</td>
</tr>
</tbody>
</table>

"*E. Holbrookii.***

<table>
<thead>
<tr>
<th>Disk &quot;21.&quot;</th>
<th>&quot;The length of the disk is 3 1/2 in the total, or twice the width of the body between the pectorals.&quot; Gthr., ii. 383.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length to width = 1:</td>
<td></td>
</tr>
<tr>
<td>(20½ ÷ 3) = 6 1/3.</td>
<td></td>
</tr>
</tbody>
</table>

"*E. albicauda.***

<table>
<thead>
<tr>
<th>Disk &quot;21.&quot;</th>
<th>&quot;Length twenty inches and a half; breadth almost three.&quot; Mitchell.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length to width = 1:</td>
<td></td>
</tr>
<tr>
<td>(20½ ÷ 3) = 6 1/3.</td>
<td></td>
</tr>
</tbody>
</table>
As Mitchell’s notice of *Echeneis albicauda* gives a relative width, to the body even greater than that attributed by Günther to his *E. Holbrookii*, and far greater than that assigned by him to *E. naucrates*, and as *Echeneis albicauda* has “twenty-one bars across the shield,” also in *E. Holbrookii* “the number of laminæ has been constantly found to be twenty-one—a number of very rare occurrence in *E. naucrates*,”—the reasons for Günther’s insistence on the reference of Mitchell’s name to *E. naucrates* and bestowal of a new one on his species are not evident. I cannot appreciate the force of his remark that Mitchell’s “is an imaginary species,” and that the name, “as is quite clear, was originally not intended for the fish afterwards described by Holbrook as *E. lineata*, but merely for specimens of *E. naucrates* with a white margin to the fins.”

Long before the communications of Mitchell, and as early as the year 1788, a species of the genus *Leptecheilis* was made known by Zuluw in a special article (*Echeneis nova species*) in the Nova Acta Academiae Scientiarum Imperialis Petropolitanae (iv. 279—283, tab. VI.) The species was well and elaborately described and illustrated, and was especially distinguished from *E. naucrates* by the much longer lower jaw and the longer disk, which nevertheless had a smaller number of laminæ (20). The species thus introduced was named *Echeneis neucratoideos*; its habitat was unknown.

While it is thus seen that two forms with a comparatively small number of laminæ had been early made known, and that the proportions assigned to one agreed nearly with those attributed to *E. Holbrookii* by Günther, it is necessary to add that none of the specimens examined by myself had so long a disk or so wide a body as the individuals noticed by Günther, although I have had the opportunity of examining specimens of the genus exhibiting every gradation between eighteen and twenty-five laminæ. I shall not, however, offer any decided opinion at present, but close with the assertion that DeKay’s and Holbrook’s specimens had not the proportions of the *E. Holbrookii* of the Acanthopterygian Fishes, but agreed with those seen by myself. As Günther’s *E. Holbrookii* was *entirely* founded on the *E. lineata* of Holbrook in the first instance, that name must of course be considered as a synonym.

The *Echeneis scutata* of Günther had first received a name from F. D. Bennett in his “Narrative of a Whaling Voyage round the Globe, from the year 1833 to 1836.” In that work, Bennett gave a very recognizable description of it under the name *Echeneis australis*. Bennett’s name has been referred by Günther to the synonymy of *Leptecheilis neucratoidea*, like *E. albicauda*, but, as will be shown, erroneously. Bennett has stated that the *E. australis* exceeds the *E. remora*—especially recognized by Günther as that species—in size. “One individual captured, and which was by no means the largest one observed, measured one foot five inches in length, and was proportionally broad.” This statement at once would render the identity of the species with *E. naucrates* extremely improbable, as the latter species has an incomparably more slender body. The further statement that the dorsal has “21” rays, and the anal “24”, completes the evidence of its difference from *L. neucratoidea*, that species having the formula D. “(21) 22—25 (26) 33—41. A 32—35,” (Günther). As Bennett’s formula (“D. 21. A. 24”) specially agrees with Günther’s formula of *E. scutata*—“(D. 27 | 22. A. 21—23),” and, as of three examples of Bennett’s species, “one only had 24 spines on the buckler, the other two had 28,” thus also specifically agreeing with *E. scutata* (“D. 27 | 24”), the identity of the two nominal species is almost certain, and Bennett’s name (*Remilegia australis*) as the prior one, must be accepted.

† The name of *Echeneis australis* was first introduced into Science by Bennett, as that of a new species. *Leptecheilis*—probably *L. neucratoidea*—had been previously figured in Griffith’s *Gazetteer* under the English name of “Australian remora,” but no attempt at identification of the two was made by Bennett, and the species belong to widely distinct genera.

1864.]
Notes on the BIRDS of Jamaica.

BY W. T. MARCH.

With remarks by S. F. Baird.

III.

ARDEIDÆ.

All the North American Ardeidæ are to be obtained in the Island of Jamaica. The Gaulins and Bitterns are of more frequent occurrence than the larger Herons, and are found at all seasons and in every part of the island where there is water,—at the cattle ponds, along the river courses, in the mangrove swamps, lagoons, and marshes, and in considerable numbers on the neighboring islets and keys during the breeding season. The Ardeidæ all build on trees; the nests are platforms, constructed of sticks filled in with leaves, trash, twigs and bark, forming a shallow bedding, on which the eggs are deposited. In the mangroves the nest is composed principally of the decaying pods of the black mangrove.

The eggs of all are emerald green, or rather, of the tint called aquamarine, varying in shade, and in dimensions according to the size of the bird; those of the Gaulins are four or five in number, measuring about 1 13\(^{1}/\text{6}\) by 1 5\(^{1}/\text{6}\) of an inch; the typical eggs rounded at both ends, though some are pointed at one end; a small kay off Old Harbor, known as Barebush Kay, is a favorite resort of all the Gaulins, Bitterns and Night Herons during the breeding season.

The larger Herons are not of so frequent occurrence as the Gaulins and other Ardeidæ during the late spring and summer months; but Ardea herodias and Herodias egretta are not uncommon during the autumn and winter; they are, however, more difficult of approach than the smaller species, being very wary and vigilant; their resort during the breeding season is usually to the deep recesses of the mangrove swamps and morasses. Their eggs are of similar form and color, but larger than those of the Night Heron. I have not often met with the nest of the larger Herons; but have notes of two,—one from Salt Island Creek, Herodias egretta, containing three eggs, and the other, Ardea herodias with four eggs from the Ferry Lagoon. On both occasions the nests were taken from the topmost branches of a Corkwood (Anona palustris). The Herons are generally in good condition from the fall of the year until the following spring, but, as with most of the fish-feeding birds, must be divested of the skin, which otherwise imparts a rank and unpleasant flavor to the flesh.

There are periods, but not of long continuance, in which the Egrets, particularly the White, are seen several together, in our marshes. The number may be twelve or twenty. They seem attracted by some prevalent living food on these occasions; ordinarily they feed singly, or at most in couples, in the shaded spots of our rivers above the water shoal. There are collected at the present time (January, 1864) at a sedgy pond near Spanish Town upwards of twenty, principally Garzetta candidissima, with a few of Herodias egretta, Florida caraëea and Demigeretta ludoviciana and nivea.

110. Florida caraëea.—The length of the Blue Gaulin or Florida Heron is about 22 inches, expanse 36\(^{1}/\text{2}\), flexure 11, leg 4, bill 3; occipital feathers lengthened, without a crest; prevailing color dark indigo blue, head and neck with a purplish tinge; dorsal plumes lengthened; wing feathers greyish beneath; iris yellow, orbits light blue, bill leaden blue; legs and feet black. The young are white with spots of blue about the wings and body;
orbits, plumes
chin bill crown bally chin breast no neck edge
yellowish, iris
Iris
be space
occurrence brown
cinnamon pale the comparison, expanse
space reddish the expanse dull legs
Iris
be
5^, tail.

105. *Demigirola nivea.*—Mr. Gosse’s Common Gaulin has been supposed to be the immature "Florida carnnea," but I think, on careful examination and comparison, it is quite distinct,—the color is always pure white, without any blue feathers about the body or wings, or any distinct crest. The tips of the first six wing quills only are edged on both webs with greyish black. Iris pale yellow; orbits, cheeks and legs bluish green; bill bluish black, with the base and larger portion of the lower mandible yellow. Length 24 inches, expanse 39, flexure 10\(\frac{1}{2}\), leg 4, bill 3\(\frac{1}{2}\), middle toe 3.

111. *Demigirola ludoviciana.*—The Red-necked Egret, or Gaulin, is one of the most common. The general color of the adult above is slatey blue, the feathers tipped with reddish; chin and a stripe down the throat and other under parts tawney white; breast and neck red, shaded into purplish. Iris yellowish white; space round the eye fulvous; bill brownish black, lower mandible clayish yellow beneath; legs yellowish green. Length 25\(\frac{1}{2}\) inches, expanse 37, flexure 10\(\frac{1}{2}\), bill and leg 4 each. The white occipital and colored dorsal plumes straight, fastigate, the latter generally longer than the tail. The immature bird has the upper plumage reddish, mixed with blue.

*Demigirola rufa.*—The Reddish Egret or Gaulin is scarce, as I have only seen two specimens; it appears to be only an occasional visitor. 

*Adult.*—General color greyish blue, paler beneath; head, neck and throat reddish chestnut. Dorsal plumes with yellowish tips, straight, fastigate, and longer than the tail. Iris greyish white, space round the eye and bill dull flesh-color; the terminal half of the bill black, legs and feet blue, with blackish scales; claws blackish. Length 30 inches, expanse 43, flexure 12\(\frac{3}{4}\), leg 5\(\frac{3}{4}\), bill 3\(\frac{1}{2}\).

116. *Herodias Egretta.*—The White Egret or Heron is the most common of the larger species. The dimensions are, length 38 inches, expanse 56, or more, flexure 16, tail 5, bill more than 5, and leg nearly 6 inches. Color pure white; no occipital crest. Dorsal plumes with stiffened shafts, longer than the tail and pendant. Iris yellow; bill yellowish to the point, dusky above, legs and feet black.

163. *Ardea occidentalis.*—The Great White Heron is rare in the island; it is readily distinguished from the preceding by the larger size, the lengthened occipital feathers, and an absence of the dorsal plumes and some other peculiarities. The color is also pure white. Iris yellow, orbits yellowish green, bill yellow, greenish at the base; legs yellow, with olive tinge in front, claws light brownish. Length 45 inches, expanse 68, or more, flexure nearly 20, leg nearly 9 inches, bill 5\(\frac{1}{2}\).

115. *Ardea herodias.*—The Great Blue Heron is more abundant in some years than in others. The prevailing color is ash blue, some feathers tinged reddish; crown feathers and scapulars elongated; chin and under tail coverts white; edge of wing and a patch on shoulder rufous and white; neck ash cinnamon brown; color of throat white, streaked with black and reddish brown; plumes of the breast ashly and white; belly streaked black and 1864.]
white; sides black. Wing quills blackish; thigh rufous; tail bluish. Iris yellowish, with hazel pupil; bill with lower mandible yellow, dark flesh-colored at the base; upper mandible reddish horn, lighter on the edges; tongue whitish, mouth deep rosy flesh-colored; leg, feet and claws black, scales with whitish edges; thighs, a short space from the knee, and a stripe back and front black, the rest tawny; palms dull clayish.

The dimensions of the adult male are, length 46 inches, expanse 74, flexure 19, bill 6½, leg 7, thigh 9, middle toe 4½.

This species is very variable, rarely agreeing exactly in the dimensions and in the coloring of the head and belly. The female and young male generally have the head black without the white center, and the breast and under tail coverts greyish, streaked with white and blackish. The sack or stomach of one shot at the river side near Spanish Town was filled with small river shrimps and water snails, intermixed with small pieces of river grass (Ceratophyllum demersum) evidently pulled up in taking the food; and in the gullet of another shot at Great Salt Pond was a mullet nearly eight inches in length.

275. Ardea Wurdemannii.—The White-crowned Heron is in the upper plumage very like the preceding, but has the crown and occipital elongated feathers white; the under parts white, streaked with black; the breast bluish black, with bluish grey or ashy on the sides. Length nearly 50 inches, expanse 75 or more, flexure 2½ to 5, bill and leg each nearly 2. The prevailing colors of this Bittern are dark glossy green and purplish cinnamon mixed with tawny. Iris and bill yellow, the latter darker at the tips, legs tawny. The head and back of the female are chestnut instead of green and cinnamon. The eggs are small.

113. Ardetta exilis.—The Tortoise-shell Bittern is not uncommon among the mangroves and along the banks of streams. It is generally found solitary. Length 13½ inches, expanse 17 to 18, flexure 4½ to 5, bill and leg each nearly 2. The prevailing colors of this Bittern are dark glossy green and purplish cinnamon mixed with tawny. Iris and bill yellow, the latter darker at the tips, legs tawny. The head and back of the female are chestnut instead of green and cinnamon. The eggs are small.

112. Butorides virescens.—The Crab Catcher is found as a solitary bird in almost every locality in which there is water. The dimensions are, length 17 to 20 inches, expanse 25 to 28, flexure 7 to 8, leg and bill 2 to 2½. Head with crest glossy green, upper parts of body green, wing coverts edged with tawny brown; neck and sides of throat chestnut; chin white; line down the centre of throat white, intermixed with greenish and chestnut; under parts and sides leaden ash. Iris yellow; upper mandible black, lower mandible yellow, with black edge; legs and feet dusky greenish yellow. The mature male has two stripes on the side of the head towards the ear, with a white stripe streaked with black between them. This species also builds on trees in the morasses and swamps, and on river banks overhanging the streams. The eggs are nearly as large as those of the Gaulins.

Butorides brunneircens.—A Cuban species is supposed to be found here, but I have not recognized it in any of my collections. From Gundlach’s description this differs from the preceding in having the tip of the lower mandible greenish white; skin of face olive black; round the eye yellowish green; legs olive brown; lesser wing coverts and small quills dark metallic green, with rusty edges; large quills without white; lesser under coverts grey; Throat yellowish brown, dark grey at base; foreneck blackish, with metallic green lustre, rusty tips and pale yellowish lateral edges. It also wants the white and black streaked line from the angle of the mouth towards the ear.

[March
and the white on the throat and forepart of the neck, which are uniform with the rest of the neck.

117. **Botaurus lentiginosus.**—This Bittern is occasionally met with about the river banks, lagoons and swamps. Iris yellow; feet grayish yellow; bill yellowish green, blackish at the points. Length 26 inches, expance 40, flexure 12. Prevailing color brownish yellow, mottled and shaded darker with reddish and brown and cinnamon brown; a black stripe on each side of the neck; chin and upper throat white, streaked with brown. I have not met with the nest.

114. **Nyctialdea gardeni.**—The Night Heron or Quok is often met with about the lagoons and swamps. Length 25 to 30 inches, expance 40 to 45, flexure 12 to 13, bill and leg a little more than 3 inches. Iris red, orbits green; bill black; legs and feet yellow, claws brown; head, crest, scapulars and back glossy metallic green; long feathers of occipital crest forehead and under parts white, passing into pale slaty blue; the wings and tail ash blue. The young differ in having the green of the upper parts replaced by dull chocolate; the coverts spotted white; the neck and under parts streaked with dusky; the quills tinge’d with reddish chocolate, and tipped whitish.

120. **Nycticorax nycticorax.**—The yellow-crowned Night Heron or Guineahen Quok, is also of frequent occurrence. Dimensions rather less than the preceding; the bill thicker and shorter. Iris reddish; bill dark or blackish green; legs greenish yellow above, greenish black below; the prevailing color greyish leaden blue, lighter below; top of the head and occipital feathers yellowish white, surrounded with bluish black; quills and tail dull lead color; the young has the upper parts greenish olive, with central streaks and terminal spots of brownish yellow; the under parts whitish, with yellowish brown streaks. The night Herons build lower than the other species of Ardeidae. The eggs of the two species are alike, rounded at both ends.

121. **Ibis alba.** The White Curlew. **Ibis**, the Black Curlew.—The haunts of these two (?) species of Ibis appear to be almost confined to the morass borders of the islets off South Island and Bushy Park Lands, formed by the growth of mangroves, and intersected by natural channels flowing between; the Curlews breed; and are to be found there at all seasons, only visiting the mainland in August and sometimes in September. The first species is pure white, with the first five wing quills tipped with greenish black. The other is also white, with the head, neck, wings, and tail of a glossy greenish black. The flesh is equal to that of the wild goose.

119. **Ibis rictra.**—The red Curlew is a rare visitor on the south midland coast; but has been more frequently seen at the western end of the island. I have never met with it.

118. **Platalea ajaja.**—The roseate Spoonbill is of very rare occurrence. I have only seen portions of one, shot by Mr. Maxwell in Saint Elizabeth, many years ago.

143. **Phoenicopterus ruber.**—The red Flamingo was formerly a frequent visitor at the west end of the island, but rarely seen on the south midland or eastern coast.

---

* (Note by Mr. Richard Hill.) It has not been mentioned by naturalists that the Curlew has the power of inflexing the upper bill, so as to run it along the groove of the lower mandible, and clean out whatever may be adhering there.

† (Note by Mr. Hill.) Occasionally specimens have been procured from the salinas of Old Harbour. Twice, specimens have been brought me, but so badly skinned as to be worthless for the cabinet.

‡ (Note by Mr. Hill.) In 1844 a fine rose-tinted bird was shot at Passage Fort. The bird was forwarded by Mr. Kirkpatrick, but never came to hand. Some of the feathers were separately, sent and received.

1864.]
Many species of Plovers and Snipes are regular annual visitors, they come in considerable numbers with the autumnal rains, in the early part of October, (some are rather earlier in their advent,) and depart, many, before the end of the year; whilst others remain until February, or later in the succeeding year. On the arrival of the migratory flocks in autumn, they range all over the island where water is to be found. Some species are found during the entire year, the number depending apparently on the signs of the coming seasons; during the dry summer of 1865 they were more abundant than in 1861 or 1862; some of the summer residents breed in the high lands, but the greater number of them are found on the plains and near the coast.

**CHARADRIIDÆ.**

*Aegialites melodus.*—The Piping Plover is, according to Josse, an annual visitor, but I have not met it in any of my collections. Mr. Josse may possibly have mistaken the following species for it.

103. 266 *Aegialites Wilsonii.*—The Thick-billed Plover is easily recognised by the bill: it is one of the permanent residents, and, I think, is more numerous during the summer than any of the other species of *Aegialites*; the migrants generally arrive in September, and depart in the early part of the following year, leaving, however, numbers widely distributed inland, as well as on the coast. It lays on the bare sand like the *Charadrius*, sometimes, but not often, near the cover of some low shrub. I have not met with more than three eggs in a nest: they are in form like the Quails, stone color, splashed all over with small spots of bistre and vandyke brown, and measuring 1½ by 1½. Several species of *Aegialites* are said to breed in Saint Elizabeth and Westmoreland. *A. recifensis* and *tenuirostris* may be among them.

102. 256. *Aegialites semipalmatus.*—The Ringed Plover is also a summer resident, but is not so numerous as the last species. I have collected specimens through the spring and summer months, but I have never met with the eggs, though they must certainly breed here, as one of my sons took from one spot in July last, at Great Salt Pond, a broken egg perfectly shelled; it was dark grey apparently without, or with only minute dots.

The other Plovers, visiting the island in autumn and winter, are—


90. *Aegialites vociferus.*—The Kildeer Plover.


182. Limosa?—The Horse-eyed Plover.

I have not met with any of these during the summer in the south midland district; the three first are constant annual visitors; the last is only obtained occasionally.

**HæMATOPODIDÆ.**

107. 257. *Strigisias interpres.*—The Turnstone is the most abundant of the Grallas found here at all seasons, and I have met with their eggs more frequently than those of any other species—at the seaside—on the plains—in the mountains. I have found eggs at Heathsville, Great Salt Pond, Passage Fort, and in St. John, St. Thomas in the Vale, and on the bank of the Rio Grande, near Hillbank in Porthend. The eggs are deposited on a few dried leaves under low growing shrubs, (on the coast generally under the *Sarriana Maritima*) they are yellowish, or olive green, coarsely marked and streaked with dark and light brown, and slate-grey grey spots intermixed.

[March]
141. Himantopus nigricollis.—I have found the Stilt Plover about the salinas along the coast from Port Royal to Old Harbour, during the entire year; they are often seen about the marshes made by the inroad of the Rio Cobre at Passage Port and the Salt Pans, and Salinas at Hanson's or Great Salt Pond, (and I make no doubt they breed throughout the island.) The eggs are generally found in a tussock of grass; from recollection they are stone color, splashed all over with vandyke brown and pale bistre spots.

RECURVIROSTRAE.

129, 131. Calidris arenaria.—The Sanderling is a regular annual visitor. I have a pair shot at Great Salt Pond on the 20th August, 1863.

205, 254. Micropalama himantopus.—The Stilt Sandpiper is not uncommon during the spring and summer. I have not met with the egg, though I am sure it must breed here, as I have specimens of birds collected in April, June and August of 1863.

130. Symphemia semipalmata.—The Willet, known here as the Spanish Plover, is not uncommon in some years during and after the autumnal rains. I have never seen it in summer, though it is said to breed in Saint Elizabeth.

124. Rhyacophillus solitarius.—The Solitary or Pond Snipe is never seen in company—a single bird or pair only is found usually about the cattle ponds. The eggs are laid on the bare ground. I have taken several nests, but have no certain recollection of the eggs.

133. Tringa canutus.—The Knot or White-bellied Snipe is also found in solitary loneliness on river banks, or marshy borders of ponds or fresh water streams, at all seasons of the year, but I have not yet met with the eggs.

137. Gallinago wilsoni.—The Jack Snipe is common from the end of September till December, and thence till April becomes almost solitary; in the latter months at early dawn, after a moonlight night, a single specimen is sometimes found, on the dry pastures of salt ponds, mistaking, no doubt, for water the glittering appearance caused by the moonlight on patches of parched, low grass. In some years they are abundant, in others scarce; for the last two or three years, 1861, 1862, 1863, they have been the latter in the south midland plains, but have been abundant in the highlands. When they first arrive they lie in considerable numbers along the borders of ponds, or margins of marshy lands, in every part of the island. Many years ago, early in October, in company with the late Captain St. John, then island Engineer, we shot more than seventy brace in three days over a small Guinea cornfield of about six acres; the land had been previously burnt off, and the corn was then only a few inches high; the water from the then recent heavy rains lying in the intervals and in puddles about the field, which adjoined woodland on two sides.

Actitis nantus?—The Short billed Snipe is an occasional visitor. [1864.]
have a specimen shot in October, 1863, from the ridge of a house top at Reed's Pen;—the dimensions are, length 12 inches, expanse nearly 24, flex-
ure 6/; tail, graduated, 3½; bill 1½; thigh 2½; leg not quite 2; middle toe with claws ½ of an inch, hind toe small. Bill dark brown, lower mandible yellow, except at the point; legs greenish yellow; upper plumage dark brown, feathers edged with tawny, lower part of the back and rump without the edging; central tail feathers same as the upper plumage; side feathers tawny, with blackish transverse bars, and irregular subterminal blotches; chin and stripe over the eye white; throat with blackish marblings, under parts yellowish white, clearer on the belly; breast and sides with transverse bars of brownish black; wing quills blackish brown, banded on the inner webs with dull white; shaft of the first quill white, under wing covers white, with narrow bands of brownish black.

Mr. Gosse gives *Tringoides macularius* as found on the island.

125. Gambetta melanoleuca.—The Tall-tale.

125. " Flavipes.—The Yellow-shanks.

122, 123. Eremites petrigatus. (*E. pusillus*)—The Sandpiper.—These three Snipes are also annual visitors, arriving in considerable numbers in the autumn, but I have not met with any during the summer.

120. Numenius longirostris.—The brown Curlew is often found in pairs among the mangrove swamps on the coast during the entire year, but more frequently on the small sandy keys to the west of Healthshire and near Old Harbour, where is also the common haunt of the two species of the Ibis. They breed in the reeds, rushes and tall marsh grass on the borders of the creeks and swamps; the eggs are four, larger at one end and obtusely pointed at the other, measuring 2½ by 1½; they are greenish or olive green, with blotches and splashes of darkumber and greenish brown.*

There is another bird found in the mountains, which I take to be a Curlew; it is much smaller than the preceding, and has a short bill; the upper plumage is also darker, and the under parts rusty white. It is prevalent in the north eastern parishes, about the mountain streams. *(Perhaps *N. borealis.)*

In November, 1826, I had a specimen of a Woodcock, shot on the race-
course near Spanish Town, but I have not since met with it. It was supposed to be *Philokela minor*. I have only a slight recollection, and the following note of it:—Length not quite 12 inches; wing rounded; bill straight, enlarged at the end; general color pale rufous, shaded ashy and darker rufous.

**RALLIDÆ.**

The Coot, in common with the two Gallinules, is found abundant in the lagoons, marshes and ponds in all parts of the island, highlands as well as lowlands; particularly where there is a thick growth of reeds, rushes and water plants to afford them cover. The nidification of the three is very similar; a platform of sticks, filled in and lined with decaying leaves, rushes, water grass (*ceratophyllum*) and other water weeds, constructed in the tall reeds and vegetable growth on the margin of the water. In the lagoons the platform is often built on the interwoven roots of the black mangrove, and composed principally of the decaying pods of the same tree; they breed twice and probably oftener in the year, commencing in March; the eggs of all vary considerably in size, but are pretty regular in form and measure, from 2 to 2½, by 1½ to 1¾ of an inch. *(The flesh of all makes excellent game soup, if dis-
vested of the skin, which, when left on, gives the dish a rank or fishy flavor).*
140. **Fulica americana.**—The Ivory-billed Coot lays from six to eight or more eggs, oval, pointed at one end, greyish stone color, splashed all over with small bistre brown spots and dots; the ground color, when first laid, is very pale, but becomes darker by contact with the damp nest.

139. **Gallinula galeata.**—The Scarlet-fronted or Florida Gallinule lays five to eight eggs, at first clayish white, splashed sparsely with small spots of sepia brown. By contact with the damp nest, the ground color of these eggs often changes to different shades of drab. I have now, February, 1863, unfledged young of this species in a pond near Spanish Town.

210. **Gallinula martinica.**—The Purple Gallinule, Sultana or Plantain Coot, lays six to eight eggs, which are of a pale burnt sienna or yellowish drab, splashed all over with small spots and dots of burnt umbre.*

138. The Carpenter Coot is supposed to be the immature Plantain Coot: but I am inclined to think that, on a more careful observation, it will be found distinct; the nestlings, so far as I have been able to examine them, are quite different.

133. **Rallus elegans.**—The Mangrove, or Marsh Hen, is very common in its usual haunt in the mangrove swamps. It is considered the highest game-flavored bird in the island, and makes excellent game soup; it builds a platform of sticks, lined with softer materials, on low mangrove trees, sometimes just on the surface of the water. I have never found more than two eggs in any nest, but they are said to lay seven or eight: the eggs are clear white, measuring $1\frac{1}{2}$ by $1\frac{15}{16}$ths.

**Rallus? violaceus.**—I have often seen this species in the ferry lagoon, but never succeeded in procuring a specimen. The habits appear to be very similar to those of the preceding. In February, 1863, Mr. Colchester obtained one, a female, from the same locality. The dimensions and description given by the collector are, length 11$\frac{1}{2}$ inches, expanse 15$\frac{3}{8}$; bill 1$\frac{3}{4}$; middle toe 1$\frac{15}{16}$. The general plumage olive black, with olive brown wing coverts and spotted all over with white; iris red; bill pea green, orange at the base; legs rosy pink; gizzard muscular, and contained water snails with their shells.

134. **Rallus concolor.**—I have never found the Red Rail or Water Partridge in the salt swamps, but always near fresh water at the foot of the hills, or more commonly at the sedgy mountain ponds and streams. The eggs are white, and rather smaller than those of the Mangrove Hen.

135. **Porzana carolina.**—The common Rail is very variable in plumage; it is found at all seasons and in all waters, fresh or salt. I have never met with the eggs of this or either of the two next species.

137. **Porzana Jamaicensis.**—The Jamaica, or Little Black Rail, is also of frequent occurrence about marshy lands, and on the savannahs and open pastures in the vicinity of water. The cry of this species is chi-chi-croo-croo several times repeated in sharp, high-toned notes, and heard at a considerable distance.

136. **Porzana minuta.**—This little Rail is not uncommon in the savannahs and open pastures, and it has the same habits as the *P. Jamaicensis*; but I have never heard it cry. The two last build in savannahs and open pastures, forming a chamber in a tussock of grass, with galleries on opposite sides.

* (By Mr. Hill) The brilliancy of the plumage varies with the year, the more or less presence of the iridescent bronze, with the cerulean and purple, being the variation.

† This can hardly be the *Rallus elegans* of American authors, the eggs being entirely different.—E. R. Buse.

1864.
184. Podilymbus podiceps.—The Black Gorgut Grebe is often met with on Rio Cobre in its entire course, and is sometimes, though rarely, seen on the Cattle Ponds in the lowlands; it, however, abounds in the highland lakes, ponds and seedy portions of mountain streams.

I have not had the same opportunities of observing the habits of this species as I have had with the common Diver; but their general habits and nidification appear to be much alike. The nest of both species is a floating platform or mass of sticks, leaves and water weeds 15 to 20 inches wide, and the same in height, flattened at the top, with a slight depression in the middle, on which three or four oval eggs are deposited. These are chalky white, with a glaucous tinge beneath, though usually discolored by the damp materials of the nest. The dimensions are 1 3 by 1 3.

185. Podiceps dominicus.—The Diver frequents the ponds on the Cattle Ponds, in all parts of the island. The nest is similar in construction and materials, but rather smaller than that of the Grebe. The eggs are usually four, oval, or oval-elongated, and measure 1 3 to 1 3 by rather less than an inch. This species breeds from April to December, rearing several broods. Soon after they are hatched, the young leave the nest and are carried about the pond under the wings of the parent birds, where they are securely held in swimming and diving. I once shot an old bird passing on the wing from one pond to another, and found a young bird with it, which must have been carried on its back. The same nest is used during the season, with slight additions after each brood; and is always pulled to pieces by the old birds when they have done with it.

ANATIDAE.

Anser hyperboreus and Branta canadensis are occasional visitors in connection with a severe winter on the continent.

144. Dendrocygna arborea.—The Whistling Duck is a permanent resident, breeding in the lagoons and morasses on mangrove stumps and in clumps of reeds and rushes, laying ten or twelve eggs. It is easily domesticated, but it is necessary to take off the first pinion of one wing to prevent it joining the passing wild flocks. They breed more than once during the year, as numbers of them are taken before they become fully fledged, and brought into the towns for sale from May to December. In 1834 and 1835, at a pen on the St. John's Road, where there is a large pond, some Whistling Ducks were kept among the domestic poultry; they frequently brought into the poultry yard, in the early dawn, small parties of the Wild Duck, which accompanied the tame ones without any shyness or alarm into the poultry house, and were thus secured. They feed by night as well as by day. Their whistling cry is often heard passing over head at night. I have frequently, on moonlight nights in January and February, shot them in numbers, whilst feeding in the guinea cornfields.

I have had the eggs from Passage Fort, but I find no note of them, and my recollection of them is too uncertain to venture upon their description.

145. Dendrocygna autumnalis.—I have been told that the Red-legged Whistling Duck is sometimes met with in some of the eastern parishes, but I have never met with any others than those imported into Kingston from the Spanish Main; and I have not seen any of these for several years.

146. Anas maxima.—The Green-back Mallard, whether a hybrid or a variety of A. leckel, is apparently a permanent resident in the island, almost restricted to the deep recesses of the morasses and lagoons at the west end of the island. I have never seen a specimen of this duck, but there have been [March
several well authenticated specimens of it, besides Gossé's and those referred to by Robinson, obtained, however, from the same vicinage. In the summer of 1863, a nest of eleven eggs, taken from a platform of rushes floating in the large lake at Rio Hío near Walton, in the Monroe District of St. Ann's, were brought to the Rev. Mr. Mias, master of Walton School. These eggs are supposed to belong to the Mallard; they are oily white, and measure $\frac{2}{3}$ by $\frac{1}{2}$ of an inch.

Many years ago I saw some eggs supposed to be one of the large migratory ducks; they were taken from the lake near Dry Harbor: they were yellowish oily green, very like some eggs of the English Duck, but I could not obtain any information respecting them; they may have belonged to the Shoveller, which I was told had been found in those waters during the same summer; or, possibly, an English Duck from Dry Harbor, or one of the neighboring pens.

148. QUERQUEDULA INORNATA.—The plain Blue-winged Teal is also a permanent inhabitant of Jamaica, breeding in the interior lagoons and morasses. It is, I think, quite distinct from Q. discors. During the months of May and June individuals are sometimes shot at the Cattle Ponds in the lowlands, but they come down in September in flocks of considerable numbers, and are common a month or more before the arrival of the Lunate Teal; and in no instance have I ever seen or heard of a specimen with the white crescent having been found here in the summer, or previous to the month of November. The eggs are bluish chalky white.

147. QUERQUEDULA DISCORS.—I have never seen the Lunate Blue-wing earlier than the month of November; the usual period of their arrival is towards the end of the month, and they again appear in March and April on their return to the continent, when they are usually in full summer livery. The other species of Anatidae which are constant in their annual visits to the island are—

159, 158. SPATULA CLYPEATA.—The Shoveller—always in considerable numbers.

155. MARICA AMERICANA.—The American Widgeon—in all its forms and variety of plumage.

164, 165. FULIC AFFINIS.—The little Black-head also comes in considerable numbers and varied forms.

153. DAPILA ACUTA.—The Pintail, in numbers and in varied plumage. The occasional visitors are—

PECOLONETTA BALAMINENSIS.—Iathera Duck (rare.)

(Note by Mr. Richard Hill.)—In the October season of 1863 there had been with stormy rains. The winl had blown from the west with that breadth, steady force which renders our tempests in the latter season as fierce as hurricanes, though not rotatory storms; prodigious numbers of ducks were blown before the winds from the continent to the islands—that is, from the Mexican Gulf to the Caribbean Sea. The birds arrived at the west end of Jamaica so exhausted and beaten by the rain that in attempting to alight they fell, and many were picked up in the streets of Montego Bay. Among several ducks that reached our garden just out of the town, was what seemed a Mallard of extraordinary size. In bulk of body it appeared as large as a Muscovy Duck, (Cycridia moschata,) but its shape was essentially a Mallard, (Anas barnesii.) It was taken up helpless from fatigue. Teal had been taken up at the same time in the same state of exhaustion. My sister, Mrs. Clementson, caged the extraordinary duck, and had it for two seasons. It was a female. I saw it in the spring of 1864, and directed that it should be shipped to London for the Zoological Society. Before it could be dispatched, it died in full plumage, and full flesh. It had laid infertile eggs in the previous spring, and was again laying infertile eggs, the sexual instinct, being intensely strong; and something like uterine inflammation, if we may so speak, had supervened, and the bird perished in the act of egg-laying. The duck exactly resembled in plumage Mr. Gossé's Ocean Duck.

† Scaredly the Shoveller—eggs of which are creamy white.—S. P. B.

1864.]
Aix sponsa.—The Summer Duck (very rare.)

157. Nettion Carolinensis.—The Green Wing Teal; sometimes in autumn, but generally in the spring.

156. Chaulelasmus streperus.—The Gadwall; sometimes abundant, but not annual.

Anas obscura.—The Dusky Duck (rare.)

263. Anas boschas.—The Mallard (rare.)

OEdemia perspicillata.—Sift Duck (very rare.)

161. Aythya americana.—The Pochard (not uncommon.)

Fulica collaris.—The Tufted Duck (rare.)

Nyroca leucoptalmus.—White-eyed Duck (very rare.)

160. Aythya valisneria.—The Cannass Duck is sometimes found in company with the Pintail.

The Muscovy is the species commonly kept in poultry yards, and in some localities the English Duck is also kept. The two are often crossed. The mongrels are held in higher estimation, as the young have the advantage of arriving at maturity much earlier than those of either parent, and are considered of superior flavor to either, particularly when raised on the duck ant and guinea corn.

Note by Mr. Hill.—The habitat of the Muscovy Duck is the Lake of Nicaragua. There all travellers see them at all times, either in small breeding coteries or large flocks. In the wild state their plumage is dark without any admixture of white. They were originally procured from the Mosquito shore, the country of the Muysca Indians, (see Humboldt's researches,) and hence is derived the name of Musco Duck, corrupted into Muscovy Duck. The West Indian Islanders had early naturalized them, for, on the discovery of Columbus, they speak of "ducks as large as geese," that they found among the Indians.

A critical Review of the Family Procellariidae: Part I., embracing the Procellaridae, or Stormy Petrels.

(Based principally on specimens in the Museum of the Smithsonian Institution.)

BY ELLIOTT COUES, M. D.

Having occasion to publish descriptions of several new species of Procellaridae, which I find in the museum of the Smithsonian Institution, the present seems a fitting opportunity to embody in a review of the family the results arrived at in an investigation in which I have been for some time engaged. The present paper is the first of a series in which will be considered the entire family. It embraces the section Procellaria, an interesting and somewhat extensive group of which the common "Mother Carey's Chicken"—Procellaria pelagica—may be considered as typical. I have attempted to elucidate the specific characters of the components of the group, as well as their most natural generic disposition; and to discuss fairly such questions of synonymy as may arise. It will be perceived that in my generic arrangement, I have closely followed Prince C. L. Bonaparte, whose ideas of a genus, as set forth in his later writings, agree most nearly with my own. I have derived most assistance, as regards specific characters, from the very valuable monograph recently published by Dr. Il. Schlegel, though of course it is quite impossible for me to agree with him on any points of systematic
arrangement and nomenclature. A comparison of the respective mono-
graphs on this subject, by the two distinguished authors just mentioned,
affords a striking illustration of the widely diverse results which may be
arrived at on any investigation, when two co-workers entertain radically
opposite views concerning generic or specific relations. The endeavor to
harmonize such conflicting opinions is a matter of no little difficulty; but
as the truth probably lies somewhere between the two, it is perhaps worth
while to make the attempt. With every facility in the way of books and
specimens which the Philadelphia Academy and the Smithsonian Institution
afford, I may perhaps have been so fortunate as to have fixed the quite
numerous species with some degree of precision, and to have settled some
points of synonymy. Concerning the genera adopted, each one must judge
of their agreement with nature, or the reverse, according to his own opinion
upon the question of what constitutes a generic group.

The family Procellaricae is naturally divisible into three subfamilies:—the
Diomedinae, the Procellarinae, and the Halodrominae. These are readily
characterizable, aside from any consideration of other features, by the posi-
tion and shape of the nasal tubes. In the Diomedinae these tubes are
entirely disconnected, and placed one on each side of the bill. In the Pro-
cellarinae they are united, situated at the base of the culmen, and open more
or less horizontally forwards. In the Halodrominae their position is as in
the Procellarinae, but their apertures are directed vertically upwards.

The subfamily Procellarinae is composed of several groups, or assemblages
of genera and species, which constitute the "sections" of Prince Bonaparte's
arrangements. These divisions are the Fulmaræ, the Daptioncæ, the Pri-
ioneæ, the Puffinæ, and the Procellaræ. The genera composing each of
these are more intimately allied to each other than they are to the genera of
any other section: and we have consequently an exceedingly convenient
and perhaps not unnatural means of dividing the very extensive subfamily into
readily characterizable lesser groups. That section which forms the subject
of the present article—the Procellaræ—is the largest and at the same time
the most marked of these groups. It may readily be distinguished from the
other groups by the following peculiarities:

Section PROCELLARIAE.

The species are all uniformly of small size, there being found in this
section the very smallest of natatores, and none of the species exceeding
eight or nine inches in total length. In form, most of the genera are delicate
and graceful, none being as robust as is usual in most of the genera of other
sections. The colors of the group vary exceedingly. A large proportion of
the species are fuliginous black, varied more or less with white; but in some
genera there is seen some variety in the pattern of coloration. Bright
colors, however, are never found. The bill is of moderate or very small
size, always shorter than the head or tarsus, rather wide at the base, its sides
rapidly converging towards an attenuated compressed decurved tip. The
nasal tubes are long, elevated, and conspicuous; subcylindrical in shape,
inclined forwards and somewhat obliquely upwards; the septum between the
nares thin, delicate, and quite perpendicular; the nasal aperture circular;
the tubes in length always at least nearly half as long as the culmen. The
wings are long: the first primary, contrary to the general rule in this family,
always shorter than the second, sometimes only as long as the fourth. The
second primary is always longest, the third intermediate between the fourth
and second. The primaries are acutely pointed, a little falcate, and strong,
though very flexible and elastic. The tail is very long, but is exceedingly
variable in shape, being even, forked, emarginate, rounded, or cuneate. The
legs are exceedingly slender, delicate, compressed usually, much elongated.

1864.]
The tibiae are denuded for some portion of their length. The tarsal scutellae are usually distinct, though fused in one genus. The toes are very long and slender, the outer nearly or quite as long as the middle, the inner considerably shorter. The hallux is exceedingly minute, almost rudimental in character, having a short, straight, acute claw. The interdigital membranes are rather narrow, but extend quite to the claws.

In examining collectively the species of the section thus characterized, we find that they arrange themselves very naturally into two very trenchantly defined groups. In the first of these, the legs are short; the tibiae almost wholly feathered; the tarsus scarcely longer than the middle toe; the claws small, compressed and acute; the colors uniformly dark, or only relieved by white on the rump and crissum. In the second of these groups, the species are all high, the legs being unusually elongated; the tibiae are naked for an inch or more; the tarsi are very much longer than the middle toe and claw; the claws are all broad, depressed, obtuse, rounded. The tail is rounded or forked; never culminate.

§ 2. The first of these groups is composed of four genera: — *Oceanodroma* (type *Proc. furcata*, Gm.), comprehending two species; *Cypnoclora*, Mihi, equal to *Thalassidroma* of authors, containing some four or five species; *Halocephala*, Mihi, a hitherto unknown genus, with a single species; and *Procellaria* of Linnaeus (as restricted by Bonaparte), whose type is the *P. pelagicus*, and which comprised several species closely allied to the last named.

§ 3. The second group is represented by three genera: — *Oceanites* of Keyserling and Blasius, with *Thal. Wilsoni* of Bonaparte as type, and comprising besides its type three other species; *Fregata*, Bonaparte, comprising some four species congeneric with *tropica* of Gould, and *Pelagodroma*, whose type and single species is the *Procellaria fregata* of Linnaeus.

I shall review these genera and their respective species in the order in which they are mentioned above, discussing the various questions concerning which there exists doubt or confusion, and then present a synopsis of the whole subject, in accordance with the results which may be by this means arrived at.

§ 1. OCEANODROMA, Reichenbach.

This genus was founded by Prof. Reichenbach upon the old *Procellaria furcata* of Gmelin. Its distinctive characters lie in its small, much compressed, rather weak bill; in its comparatively very short wings, of which the first primary is unusually abbreviated, (being intermediate between the fourth and fifth), while the third is fully as long as the second; in its very long, deeply-forked tail, with its broad central and attenuated exterior rectrices. In the proportions of the naked space of the tibia, and of the tarsi and toes it does not differ from several other genera of the section. The middle toe with the claw is about as long as the tarsus. The colors are peculiar, and only found in this genus.

Two species of this genus are known to exist; both inhabiting the North Pacific Ocean.

1. OCEANODROMA FURCATA, Bp. ex Gmel.

This long and well known species has quite a profusion of names, generic as well as specific. First indicated by Gmelin, Syst. Nat. i. p. 561, in 1788, under the name of *Procellaria furcata*, it was renamed *Procellaria orientalis* by Pallas. Zoog. Rosso — As. ii. p. 315 (1811), and afterwards called *Thalassidroma cinerea* by Gould. It is the *Thalassidroma orientalis* of Gray, Genera of Birds, iii. 1849, p. 178; the *Oceanodroma orientalis* of Reichenbach, Syst. Av. xviii. 1849, p. 245; and the *Oceanodroma furcata* of Bonaparte, Conspectus Avium, ii., 1859, p. 194; which latter is, I believe, its proper designation.

The characters of the species are too well known to require notice in this connection.
2. Oceanodroma Hornbyi, Bp. ex Gray.

This, the second species of the genus, was first introduced by G. R. Gray, in the proceedings of the Zoological Society for 1853, p. 62, under the name of Thalassidroma Hornbyi. Judging from Mr. Gray’s descriptions—for I am autoptically unacquainted with the species—it is entirely conspecific with the O. fuscata, though differing greatly from it in colors. This generic disposition has been made by Bonaparte, on page 195 of the second volume of his Conspectus. It appears as yet to be an exceedingly rare bird in collections: none are contained in the Philadelphia Academy or Smithsonian Institution, or, in fact, so far as I am aware, in any American collection. It has the front, cheeks, throat, collar round the neck, breast, and abdomen pure white; crown, hind head, a broad band in front of neck, bend of wing and lesser wing coverts sooty gray; upper part of back gray; lower part of back and tail ash gray; greater wing coverts brownish gray; tertiaries and quills deep black.

"Length 8.25 inches, tail 3.75, tarsus 1.00, middle toe about the same. Bill along culmen 8½ lines, along rectus 10½ lines."

§ II. Cymochorea. Cones.

This, the second genus of the short-legged aenta-clawed group of Procellaridea, is most nearly allied to Oceanodromus, having like it a long deeply-forked tail. It is the genus of which the well known Leach’s Petrel is typical; and one to which M. leucurus, Bonaparte, and a new species, about to be described, also belong. With the forked tail and short legs of Oceanodromus, it is distinguished from that genus by its comparatively very much longer wings; by its larger, longer, much more robust bill, with shorter and straighter nasal tubules; by its radically different pattern of coloration, &c.

The name "Thalassidroma" is the one under which this genus is generally presented. Founded by Vigors in 1825, upon the Procellaria pelagica, Linnaeus, the name has been employed by ornithologists, in a most unaccountably loose and vague way, to designate any and all the species of Procellaridea, without the slightest regard to their natural generic affinities. In 1855, Bonaparte first restricted Thalassidroma to a single genus, that of which Leachii, Temminck, is the type. But if used at all, it must be, of course, for that genus of birds upon which it was founded, viz., the one of which pelagica is the type; for it is contrary to all rule to use a synonym of one genus as the tenable name of another. As will be demonstrated further on, "Thalassidroma, Vigors," is a complete synonym of Procellaria proper of Linnaeus, as is also Hydrolates of Boie, both being based upon the P. pelagica, Linnaeus. This being the case, it is evident that the present well known genus has yet to receive a tenable distinctive appellation.

In supplying a name, I take Leachii, Temm., or rather leucorhous, Vieill., as my type; and in the following diagnosis so define the genus as to exclude all forms not entirely congeneric with it.

Cymochorea,* Cones. (=Thalassidroma, Bp. nee Vigors. Type Procellaria leucorhous, Vieill.) Bill much shorter than the head, about two-thirds the tarsus, or middle toe with the claw, rather stout, as high or higher than broad at the base, the nighus strong, much decurved; the nasal tubes less than half as long as the culmen. Wings moderately long, not much surpassing the tail when folded; first primary longer than the fourth, second longest. Tail exceedingly long, deeply forked, the feathers all broad, their tips obtusely rounded. Legs short; bare space of tibiae brief. Tarsus equal to middle toe and claw. of rather large size, and stout form. Colors unicolor, or nearly so.

Three species are at present known to constitute this genus. These are the following:

* Etym. from Gr. κυμάς, "wave," and χέδος, "a dance".

1864.
1. Cymochorea leucorrhoa, Cates ex Vieillot.
   The specific characters of this, the common and abundant "Leach's Petrel," being so well known, need not detain us. Its synonymy, however, is sufficiently extensive and complicated to require attention.

   There can be no doubt, I think, that the Procellaria leucorrhoa, Vieillot, Nouveaux Dictionaire d'Histoire Naturelle, tome xxv. 1817, page 422, was based upon this species. Vieillot's description is:—"Sept ponces et demi de longueur totale; la queue fourchue; le bec, les pieds, les penes alaires et caudales, noires; la reste du plumage couleur de suie, a l'exception des convettes superieures de la queue qui sont blanches, et d'un lisere gris-blanc qui est a l'extremite des penes secondaires de l'aile." Our author further remarks that this Petrel "se tient sur l'Ocean"—Atlantic—"jusqu'au Brézil, et peutêtre encore au delà." In every respect the description so clearly and completely applies to the present species, that no argument is needed to prove the propriety of the reference.

   The next notice of the species that I have met with is by Tomminck, Manuel d'ornithologie, 1820, il. page 812, under the name of Procellaria Leachii. The description is pertinent and complete, and the indication of the species so unmistakable, that the name Leachii has always remained the one in common use among ornithologists.

   In 1828, Dr. Fleming, in his "History of British Animals," page 136, describes this species under the name of Procellaria Bullockii.

   The citation "Procellaria pelagica, Pallas nec Linneaus," is given by Bonaparte as referring to this species. From what is now known of the range of habitat of the latter, it would seem at best but a doubtful citation.

   In addition to the above, the species has been placed in numerous genera. It is the Thalassidroma Leachii of Bonaparte. Conspp. av. ii. 195; the Thalassidroma Bullockii of Selby, Ornith. ii. page 537; and the Hydrobates Leachii of Boie, Isis von Oken, 1822, p. 562.

2. Cymochorea melania, Cates ex Bonap.

   This, the second species of the genus, was first introduced by Bonaparte in his Not. Orn. Delattre. in the Compt. Rend. 1854, xxviii. p. 662, under the name of Procellaria melania. The following is his diagnosis. "Negro-coracina, vel in uropygio; subatus fuliginosa; alis longissimis; caudâ brevi, sed profundâ fuscata; tectricibus omnibus omnino nigris." Unfortunately, however, as it afterwards proved, he neglected to give any measurements; as a consequence, the succeeding species, homooskroen, about to be described, has appeared in the ix. vol. of the Pacific Railroad Reports as the true melania, when it is in reality a very different bird, though, like melania, it wants a white rump. Prof. Baird has been enabled to obtain from M. Puchean the measurements of the true melania, and these agree perfectly with a skin in the Smithsonian from Cape St. Lucas, Lower California. As the species is yet rare in collections, and one with which comparatively few ornithologists are autoptically acquainted, a full description, taken from a typical example now before me, may not be out of place here.

   Form.—The bill is large and robust, the mandibular rami of the internasal especially strong and prominent. The nasal tubes, as in T. Leachii, measure a little less than half the length of bill. The bill is about two-thirds the length of the skull; about half that of the tarsus. The wings are moderately long for this group, reaching only a little beyond the tail. The point of the wing is formed by the second primary alone; the third being intermediate between the second and the first; and the first intermediate between the third and fourth. The tail seems rather long for this group and is deeply forked, all the rectrices being quite broad to their obtusely rounded tips. The tibia is bare for a longer space than is that of T. Leachii. The legs are short. The tarsi are slightly longer than the middle toe and claw. The outer [Mar.
toe alone is absolutely longer than the middle one, but its claw is much smaller. The apex of the inner claw reaches to the base of the middle one.

Colors.—The entire plumage is of a deep sooty brownish black, deepest on the sides of the head about the eyes and on the upper parts generally, including the rump, changing gradually to a lighter, more fuliginous and more brownish black on the belly, under tail coverts and crissum. The major alar rectrices are lighter than the rest of the plumage, though not very conspicuously so. The remiges and rectrices are wholly pure black, as are the bill, feet, claws and interdigital membranes. Iris light brown.

Dimensions.—Length 8-00 inches, extent of wings 18-50 (on authority of collector's label). Bill along culmen 3-60, along rictus 3-55; height at base 2-25, width 2-25; length of nasal tubes 3-30. Wing from the carpal joint 6-70. Tail—external feather 3-90, internal 2-70, depth of fork 1-20. Tibies bare 5-50; tarsus 1-20, the middle toe and claw 1-10, (inches and hundredths.)

(Description from No. 13,023, Smithsonian Register—3; Cape St. Lucas, Lower California. J. Xantus.)

It is somewhat a question whether this species be not the Procellaria fuliginosa of Latham, Ind. Orn. ii. 1790, p. 825. The following is his diagnosis: "Pr. fuliginosus-fusca, capite, collo, remigibus rectricibusque nigris cauda emarginata. * * * Habitat in insula Otaheite; precedentis\' magnitudine."

This description applies pretty well, but the dimensions are far too large, the preceding species—desolata—being described as eleven inches in length.

This same "Procellaria fuliginosa, Lath."

is more fully described by Vieillot, Nouv. Dict. d'Hist. Nat. xxv. p. 418, (1817,) under the name of "Petrel fuliginous d'Otaill." Vieillot's description, however, only applies approximately. The species is there said to be "dix pouces" long; to have the tail only "un peu fourchue;" and it is stated that the interdigital membrane "a des taches jaunes çà et là."—In view of the uncertainty, I do not see any cause to supersede Bonaparte's name.

I am unable to discuss the relationships of a certain "Procellaria scapulata, Brandt;" referred with a query to this species by Bonaparte.

The third species of the genus is the one already adverted to, as that one figured and described in the Birds of North America, under the name and with the synonymy of the melanias, Bp.

3. Cymochorea homochroa, Cates.

Diag. C. Cymochorex melanias nec perdissimilis; sed multo minor, rostro laevi, brevi, compresso, tarso nec longiore digito medio cum ungue; plumbo-vel achistaceo-nigre vel in uropygio crissosae; subtus sensim fuliginosus-nigra; alis caudisque fusco-nigris, tectricibus alarum majoribus dilutioribus. Long. rostri 5-50; tarsi 9-90; polli aug. ale 5-10.

Petrel not very unlike T. melanias, but much smaller, with a short, light, much compressed bill, and the tarsus equal to the middle toe and claw. General color a dull plumbeous or slaty black, growing more or less fuliginous on the abdomen; the crissum and rump concolor with the rest of the plumage; the wings and tail dull black, the greater wing coverts light greyish brown.

Habitat. Farallone Islands, Pacific coast of North America.

Form.—The bill of this species is not quite half as long as the skull, rather more than half the length of the quite short tarsus, is much compressed and not very robust. The folded wings reach a little beyond the tail. The second primary is a little the longest, the third is nearly equal, the first considerably longer than the fourth. The tail is of about the same comparative length as in Leachii or melanias; the depth of the fork being as great as in the latter species.

* * * c. desolata.
† Eym. Gr. ιματες, "like, same;" μενος, "color;" in reference to the uniformity of its plumage.

1864]
The tarsi are comparatively a little shorter than in this species, being no longer than the toe and claw.

Color.—The plumage, although agreeing with that of melanis in its general characters, of its uniformity and the want of a white rump or crissum, &c., is yet quite different in tint, being of a decided plumbeous or dull deep blueish black, rather than the smoky brownish black of melanis. Indeed the tint calls faintly to mind the plumage of focalis. This plumbeous tint is most palpable on the head and upper part of the back; it deepens about the eye so as to almost form an antecocular spot; and on the breast gradually changes to more of a fuliginous hue, which prevails over the whole abdomen and under tail coverts. The color of the wings and tail is not different from that which obtains with nearly all the species of the section, and there is also the same dull greyish brown band along the greater coverts, and invading the outer edges of most of the tertials, as well as their apices. A further character of the species, wherein its coloration differs from that of melanis, is found in the inferior alar tertiaries, and axillary feathers, many of which are wholly or in part dull whitish. The feet are wholly black.

Independently of any differences in plumage the following measurements, compared with those already given of the melanis, serve at once to separate the two species:

Dimensions.—Length (approximately correct only) 7.25 inches. Wing, from the corapal joint, 5.00 or a little more. Bill, along culmen, .59; along rictus .75; height at base .21; width .20; length of nasal tubes .24. Tarsus .90; middle toe and claw about the same. Tail—outer feather 3.25; inner 2.60.

Three fine specimens of this interesting species are in the Smithsonian Museum, all procured at the Farallone Islands, Pacific coast of North America. I have taken No. 21,444 as the type of my species. No. 13,725, received from Mr. F. Gruber, is the original of the figure of "Melania, Bip.," given in the atlas of the general report. All three are quite identical in every respect.

§ III. HALOCYPTENA,* Cones, nov. gen.

The third genus of the group is one as yet undescribed, and which I have now the pleasure of introducing to the notice of ornithologists. It differs most remarkably from all other genera of the Procellariae in the possession of a cuneate tail. In most other respects it comes nearest to Procellaria proper, with pelagicus as type; but it nevertheless differs from that genus in addition to the peculiar shape of its tail, in its exceedingly long and acutewings. The following are its distinctive characters.

Char. Gen.—Bill much shorter than the head, about half the tarsus, weak, slender, compressed, the convexity of the culmen beyond the nostrils very great. Nasal tubes as in other Procellariee. Wings very long, reaching much beyond the tail, acutely pointed; second primary longest, third nearly equal, first about as long as the fourth. Tibiae naked for a very short space. Tarsus a little longer than the middle toe or claw. Outer toe without claw, absolutely as long as the middle; but its claw very short and weak. Tip of inner claw reaching to the base of the middle one. Hallux exceedingly minute. Webs moderately full; their margins incised. Claws compressed, curved, acute. Tail rather long, wedge-shaped; the central rectrices projecting somewhat beyond the rest; the lateral all regularly graduated; the tips of all narrow, acutely rounded. Unicolor; of very small size, and exceedingly delicate form.

The only known species of the genus is the following:

*From. name from Gr. ὠς "ocean," ὶφες "swift," ὀνωπιός "winged," "having the power of flight." Halocyptena, "the swift ocean-flyer."
1. Halocyptena microsoma, Cates, nov. sp.

Description.—Form typical of the genus, as above characterized. Entire plumage deep lustrous brownish black, darkest on the head, neck, back, and upper parts generally; changing gradually on the abdomen to a fuliginous brown, which is the prevailing tint of the under parts, from the breast backwards including the under tail coverts. The lesser and medium wing coverts are as dark as the back; as are also the inferiorahir teetrices. The greater coverts are considerably lighter; being with the external borders of some of the tertial dull brownish, with a cast of gray. The remiges and rectrices are pure black. There is no indication of white on the rump or crissum. The bill, feet, and claws are black, as are also the interdigital membranes.

Dimensions.—Total length from tip of bill to end of tail 5.75 inches and hundredths. Wing from front along culmen .48 hundredths; along rectus .62; height at base .19; width .21; length of nasal tubes .22. Bare portion of tibia .30; tarsus .90; middle toe and claw .32; inner do. .63; outer do. .80. Tail to end of central rectrices 2.50; to end of outer do. 2.15. Difference between central and next pair .15 hundredths.

Habitat.—South Pacific coast of North America.

Typical and unique specimen No. 11,420 of Smithsonian Museum Register. Adult female, taken in May, 1861, by John Xantus, at San José del Caba, Lower California.

This diminutive species hardly exceeds in size the little G. pelagica, and is at the same time much slenderer and more delicate in form than that species. The combination of the small size; peculiar form and uniform colors widely separate it from any other known Petrel.

§ IV. PROCELLARIA, Linn. emend.

The genus of which the little pelagica L. is the type constitutes the fifth and the last one of this short-legged group of Procellaridæ. It is readily recognizable among all its allies by the combination of its short legs, acute claws, and square or slightly rounded tail. As to size, it comprehends the very smallest of known nataores; with hardly the exception of my diminutive little Halocyptena microsoma. The bill is small, short compressed, the sides rapidly converging to the narrow tip; less than half as long as the skull, a little more than half the tarsus. The wings in length are typical of the section; reaching beyond the tail. The second primary is longest; the third a little shorter; the first less than the fourth. The bare proportion of the tibia is short; the tarsus is just equal to the middle toe and claw. The proportions of the toes to each other are as in other genera, already described. The tail is moderately long, full, the feathers broad; a little rounded in shape. In color this genus is usually dark with a white rump and crissum; though this color does not obtain throughout the genus, if such species as nereis, Gould, and Juscolate, Tschudi, really belong here.

The genus Procellaria first appears in 1746, in the sixth edition of the Systema Naturae, having as its type the P. pelagica, Linnæus. Throughout successive editions the same species is invariably made typical; as it also is in the Edition of Gmelin (1788), and in Latham's Index Ornithologicus (1790). I am, therefore, quite at a loss to discover the grounds upon which modern ornithologists have been justifiable in assigning the name Procellaria to such a genus e. g. as that of which glaciale, or eatareleus, or Cooki, are respectively typical. If with Dr. Schlegel we admit but a single genus of Procellaridæ, that will of course be Procellaria; and we shall employ it in its original Linnæan acceptance. If, however, with almost all ornithologists, we make 1864.]
family Procellaride of Linnaeus' genus *Procellaria*, and proceed to separate
the component genera according to the now generally received definition of a
"genus;" then *Procellaria* must be restricted to *pelagica* and its congeners,
and other names be found for the remaining generic groups; there are few
points of synonymy, involving a Linnaean name, more clearly demonstrated
than this.

The first synonym of *Procellaria* that I have met with is *Hydrobates*, Boie,
Isis Von Oken, 1822, p. 562. This has *pelagica* as its type. This is not,
however, to be confounded with *Hydrobates*, Vigors, 1816, which is a genus
of Turdide, with *Sturnus cinclus*, L. as type.

The second synonym of the genus is *Thallassidroma*, Vigors, Zoological
Journal, Vol. ii. for October, 1825, page 405. Although based upon *pelagica*,
and therefore an entire synonym of *Procellaria*, Linna., this name has become
most firmly established, not only as an appellation for this genus, but also
for all the Stormy Petrels indiscriminately. It will be evident, I hope, from
what has just been said, that not only is the name quite untenable for the
present genus, but that it cannot be used with propriety in any connection.

The number of species composing this genus is a little uncertain; partly
in consequence of unusual variations to which *pelagica* seems subject; and
partly because the indications of many comparatively recently described
species are not explicit enough as regards proportions, etc., to admit of a
definite reference to their proper genus. I will first notice *pelagica* and its
kindred species, and then consider those species which seem to fall most
naturally in this genus.


i., 1825, p. 405, et anctorum fere omnium post. A. D. MDCCXXV. Above
glossy brownish black, below more fuliginous—the under tail coverts, however,
of the former color, and very long, reaching sometimes to beyond the tips of
the rectrices themselves. The superior caudal rectrices are pure white, ter-
minated, however, with equally well defined black tips. The white of the
caudal is less pure and well defined; and that of the under tail coverts is
much interrupted with blackish. The inferior alar rectrices and the axillary
feathers are variegated with light touches of dull white.

This species apparently varies to an unusual extent in size, especially as
regards length of wing. Specimens before me measure about 4½ inches from
the carpal joint. Dr. Schlegel says, "aile 4 pouces à 4 pouces 6 lignes." Mr.
Lawrence says "wing five inches." These variations, and doubtless cor-
responding discrepancies in other dimensions, have been the cause of the
founding of several species; either entirely nominal, or at most constituting
races of the same parent stock. Omitting entirely to notice Brehm's multi-
various "species" [*sic*] those most entitled to consideration are the fol-
lowing:—


i., 1856, p. 197. From the Galapagos Islands. This typical *Procellaria*
is exceedingly closely allied to *pelagica*; but differs from it in wanting the
black tips of the superior caudal rectrices, which are always found in the
latter. It is also said to be somewhat smaller, and to have less markedly
the transal fascia.


Acta Ital. Mediol., 1844. "Ex oceano Mered." This species (if it be really
one), differs from the typical *pelagica* in being somewhat larger, and in having
a more robust bill. It would appear also that there is less of whitish upon
either surface of the wing, and upon the under tail coverts. The upper tail

[March
coverts have the same black tips. Without a typical example professing to be this species, I am unable to decide definitely concerning it, but I am much inclined to doubt its validity.

"Thalassidroma melitensis, Schembri, Catal. Ornith. del. Grupp. di Malta, p. 118." This is a species placed by Bonaparte as a synonym of a pelagica, but by Gray considered as distinct. I have no means of judging of its validity. The name is employed by Reichenbach to designate the true pelagica.

I have had the pleasure of examining Mr. Gould’s types of this species from Bass’ Straits, Australia, now in the collection of the Philadelphia Academy. It is a beautiful little species, quite unlike any other known Stormy Petrel. In form it comes nearer to Procellaria pelagica than to any other species, and it is probably congeneric with it, though it differs somewhat in the proportions of the tarsus and toes, and very widely in its pattern of coloration.

The bill is very small, short, and compressed. The wings reach just beyond the tail; the second primary is the longest; the third and first nearly equal; the fourth much shorter. The tail is long, slightly rounded; the rectrices broad to their very tips. The tibiae are denuded for from half to two-thirds of an inch. The proportions of the tarsus and toes differ from those of pelagica, in the greater comparative length of the former.

The bill, legs, and feet are black. The head all round, the upper part of the neck and the nape are fuliginous brown with a cinereous hue. This bluish ashen tint becomes the prevailing color on the lower part of the back, the wing and tail coverts, and the tertials; these feathers being edged more or less conspicuously with grayish white. The primaries are brownish black, lighter on their inner webs, the more inner ones with an ashen tinge. The caudal rectrices are light ashen blue, gradually deepening towards their tips into pure black. The entire under parts from the breast backwards, and the under surfaces of the wings, except just along their edges, are pure white. There are a few longitudinal shaft lines of bluish gray on the sides and crissum, which became still more obvious on the under tail coverts.

This species inhabits the Australian seas.

7. Procellaria fasciolata, Cones ex Tsch.

The above is the reference to and a copy of the description of a species recently introduced by Dr. Tschudi, and by him supposed to be new. If all the characters mentioned in the description really obtain, the species is certainly a valid one, for it is not at all like any known species of Stormy Petrel. My reference of it to the genus Procellaria is upon supposition; for the description affords not the slightest clue to its proper position. I would have preferred to have allowed it to remain under Dr. Tschudi’s designation, but as Thalassidroma is an untenable name, I have seen fit to substitute the proper appellation of the genus. It is to be hoped that we may before long know 1864.]
more concerning the validity, and in that event, regarding the generic relations, of this supposed species.

78. On the same page where *fasciolata* is described, Dr. Tschudi goes on to speak of a Petrel of which he saw several examples some degrees further south, but of which he was unable to procure specimens. The mantle was dark gray, the head blackish, the neck somewhat darker; the feet and bill black, the wing feathers blackish, the abdomen grayish white. In size it hardly equalled *peliogica*. "Ich wage daher nicht mit Bestimmtheit zu entscheiden, ob diese Vögel zu einer Species gehören, noch dem von mir beobachteten einen Namen zu gaben." A few pages further on (p. 190), the supposed species is named *Thal. dubia*. As from the circumstances of observation there is extreme liability to error, and, at all events, great uncertainty, *Thal. dubia* had better quietly await more reliable data before claiming recognition.

The remaining species constitute the second group of *Procellariea*, separable from the preceding group by exceedingly trenchant characters. In the first place, the species all stand high: the lengthened tarsi much exceed in dimensions the long toes, while at the same time the tibie are greatly elongated, and bare of feathers for the greater part of their extent. The claws are very different from those of the first section, being broader than high, depressed, not compressed, and always more or less rounded and obtuse. The tail varies, being either rounded, square or forked; but when the latter, it is never so deeply forked as in *oceanodroma*, etc., of the first group. The wings are very long, much surpassing the tail.

Three distinct genera constitute this section.

§ VI. OCEANITES, Keys. et Blas.

This is the genus of which our common "Wilson's Petrel" is the type,—first named *Oceanites* by Keyserling and Blasius Wirbelth. Europ. ii., 1864, p. 238. It is in many respects the most distinct and remarkable genus of the *Procellariea*, being widely diverse in all its characters from all others. It may be well here to define its limits with precision.

*Oceanites*, Keys. et Bl. (Type *Proc. pelagicus*, Wils. nec Linn.) The bill is short, weak, compressed, its sides a little concave, its tip attenuated, the convexity of the culmen along the unguis comparatively little; it is less than half as long as the head, about half as long as the middle toe without the claw, about two-fifths the tarsus. The nasal tubes, instead of rising obliquely upwards and forwards, as in the genera of the first section, have their dorsal outline perfectly straight and horizontal. The wings are exceedingly long and acute, and the proportions of the primaries different from that which obtains in any genus hitherto considered; the second primary very much the longest; the first fully equal to the third; the fourth very greatly shorter than the first. The tail is of moderate length and nearly square, being neither much forked nor much rounded, large and full, the feathers broad to their very tips. The legs are the most peculiar. The elongated tibie are bare for an inch or more. The very long tarsi present the remarkable feature of having their anterior and lateral aspects covered with one smooth unbroken podotheca or "boot," resulting from the fusion together of the ordinary plates and scutellae. Posteriorly the plates remain pretty distinct. The toes, though very long, are, without the claws, only two-thirds the tarsus. The hallux is so extremely minute as to be discernible only on close inspection, when it is apparent as an exceedingly short, acute claw. The anterior claws are flattened and broad, and scarcely at all curved. The species of the genus are among the larger in size, with much the colors of *Procellaria* proper.

Of the genus as thus constituted, the following species are known to me:—

1. *Oceanites oceanica*, (Kuhl).


The first notice of the species is in 1808, when it was accurately described and figured by Wilson, as above, under the erroneous name of Procellaria pelagicus, Linn. This error was first noticed and corrected by Bonaparte in the Journal of the Philadelphia Academy for 1823, and the species named Thalassidroma Wilsoni. This is the appellation by which it has been most usually known to ornithologists.

In the year 1820 there appeared in Kuhl’s Beiträge zur Kenntniss der Procellarien,” a description accompanied with a figure of the head, of the present species, under the name of “Procellaria oceanica Banks.” The figure is poor, and difficult to recognize, but the full description is pertinent in every respect, and unequivocally refers to the present species. This name should consequently receive that precedence over Wilsoni to which its priority clearly entitles. Indeed, Bonaparte himself, in his Conspectus Generum Avium, p. 199, and also in his Conspectus Gavieaeum in the Comptes Rendus for April 28, 1856, admits that the two names refer to the same species.

The only question appears to be this:—Banks had, before the appearance of Kuhl’s Monograph, applied the name oceanica to specimens of this species from the Southern Oceans. This Australian form Bonaparte considers as a variety of the Atlantic bird, in the fasciculus of his Conspectus bearing date of Jan. 1st, 1856; and shortly afterwards, in the Comptes Rendus for April 28, 1856, he accords to it full specific rank. If the Australian form be really a distinct species, then, of course, it would bear Bank’s and Kuhl’s name of oceanica, and Wilsoni could be retained for the Atlantic species. Such, however, I am confident, is not the case. I have carefully examined specimens of the species from Australia (among them the types of Mr. Gould’s work, “The Bird’s of Australia”), and I have failed to detect the slightest differences which could even mark the southern bird as a distinct variety. They appear to me absolutely identical, as indeed they are considered by the majority of writers. Such being the case, then, “Wilsoni, Bp.,” must become a synonym of oceanica, Kuhl, and the species be known as Oceanites oceanica.

2. Oceanites lineata, Bonap. ex Peale.

Thalassidroma lineata, Peale, Ornith. U. S. Expl. Exped. Oceanites lineata, Bonaparte, Consp. av. ii. 1856, p. 200.—Several good examples of this well marked species are in the Smithsonian Museum, being those collected by Mr. Peale himself. It is very different in most of its characters from the preceding species. It is a much larger bird. The wing measures 6½ inches from the flexure, the tail a little more than 3 inches. The tarsus is 1½ inches long; the middle toe and claw 1½. The bill is larger and stouter, though of the same relative proportions. The tarsi, however, absolutely but little if any longer, and are, therefore, relatively shorter, as lineata is a larger bird. The general pattern of coloration is the same as in oceanica; but lineata may be readily distinguished by the white streaks which variegate the under surface of the body and wings. On the anterior portions of the belly, the black and white are in about equal amount, but more posteriorly and on the crissum, under wing and tail coverts, the white is by far the predominant color. The black appears only along the centre of each feather as a shaft line, producing an appearance which renders the name “lineata” exceedingly pertinent. This species wants the yellow spaces on the interdigital mem-

1864.]
branes, so conspicuous in oceanica. The most important difference in form between the two species lies in the much greater flatness and obtuseness of the claws of lineata.

With the following two species I am autoptically unacquainted, and can only judge of their specific validity, and of their generic relations, from the descriptions of their authors. They evidently, however, belong to the long-legged, depressed-clawed group of Stormy Petrel, and I think there can be little or no doubt that they both are species of Oceanites. Such indeed is certainly the case with the Thal. segethi of Phillippi and Landbeck, the description of which is so complete and perfect in every respect, that I have no difficulty in assigning it to its proper genus.—Would that all birds could be as thoroughly described on their first introduction to ornithologists! The Thal. gracilis, Elliot, seems so closely allied to both lineata and segethi; that it can hardly but be an Oceanites; though I cannot speak concerning it with the same degree of certainty as I do regarding the former species.

3. Oceanites segethi, Copes. ex Ph. et Ldbk.

Thalassidroma segethi, Phillippi and Landbeck, Wiegmans's Archiv, 1860, p. 282.—The following description of this species is condensed from the one originally given by its discoverers:

The bill and feet are glossy black. The head, neck, back, throat and breast, as well as the upper wing coverts, dark blackish gray, the latter, however, tending somewhat towards brownish. Wing and tail feathers deep black. The feathers of the upper parts have white borders, which, however, are worn away in the course of the summer. The inner web of the four outer tail feathers is white at the base. The upper tail coverts, the abdomen, the flanks, and the circumanal region are white. Under tail coverts are black, with white bases and tips. The lesser inferior wing coverts, and the whole border of the wings are black, the rest of the inferior coverts white.

Length 7½ inches (French). Bill 6 lines; tail 2 inches 11 lines; wing 5½ inches. Tarsus 1 inch 5 lines; middle toe 10 lines. Naked portion of the tibia 7 lines: Wings when folded reaching an inch beyond the tail.

Habitat.—The coast of Chili.

This species is compared by its describers with the lineata as follows: "It comes nearest to the species described by Titian Peale, in the United States Exploring Expedition, which was found breeding on the Island of Upolu. This species agrees with ours in size, in the form of the feet, and in the colors generally, but differ from it in this respect, that, while in lineata the feathers of the neck are white with black tips, and those of the breast, belly and flanks are white in the middle and black at the tips, in segethi the feathers of the neck and breast are uniformly slatey black, and those of the abdomen and flanks are entirely white; moreover, in segethi the outermost of the superior tail coverts are wholly white, while in lineata they have black shaft lines."

This species, however, requires very careful comparison with the succeeding, before its claims to specific distinction can be fully substantiated. I do not hesitate to express my decided opinion, that they will be found to be identical; for, so far as I can judge of the colors from the descriptions, they are quite similar, and certain discrepancies in the measurements of the two may result from the difference between the French and English inch. The habitat of the two birds is precisely the same; still, in view of some points, in the descriptions which do not entirely accord, and especially because it

---

*These authors themselves remark (p. 284) "on account of the long legs, and the much abbreviated hallux, our bird should be referred to Bonaparte's new genus Oceanites; but it appears that a generic separation can hardly be made with propriety upon such inconsiderable differences." May I be allowed to ask, with propriety, if shape of bill, peculiar proportions of tarsus and toes, length of wings and tail, and above all, the fusion of the tarsal plate can be accounted as "inconsiderable differences?"
seems useless to exchange one doubtful opinion for another, I have preferred to consider both species as valid, until an opportunity be afforded of determining the question with certainty.

4. Oceanites gracilis, Coues ex Elliot.

_Thalassidroma gracilis_, D. G. Elliot, Selater's Ibis, 1859, p. 391.—"Plumage sooty black. Quill feathers brown. Secondary coverts margined with light brown. Rump, upper tail coverts and middle of abdomen, white. Tail black, the two outer feathers with a white mark on the lower half of the inner web, growing narrower as it descends; lower half of the shafts white, the rest black. Under tail coverts white margined with black. Breast sooty. Bill black. Tarsi and feet very long and slender, black. Length 5-90 inches; wing 5-22; tail 2-40; bill .40; tarsus 1.20."

_Habitat._—Coast of Chili.

In general characters this species seems closely allied to _Oceanites lineata_, and the pattern of coloration is, in many respects, very similar. The dimensions of the bird, however, will at once separate it from that species; for the wing is more than half an inch shorter, the tail fully as much less, and the bill, tarsus and toes are proportionally as much smaller in dimensions. As already remarked, it comes much nearer to the _O. segothi_, and is very possibly the same bird. In the event of this proving to be the case, _gracilis_, Elliot, has priority over _segothi_, Ph. et L., and must be retained as the name of the species.

§ VII. FREGETTA, Bp.

This well marked genus, as limited by its author, Bonaparte, contains several species, all more or less closely allied to each other, and agreeing in the possession of the following generic characters: The bill is small and short, measuring in length hardly half that of the skull; about as high as broad at the base, the sides converging rapidly toward a somewhat compressed, attenuated and decurved tip. The nasal tubes are stout, short and elevated towards their extremities. The culmen and commissure are both much decurved. The wings are rather elongated, reaching a little beyond the tail; the second primary is longest, the third nearly equal; the first generally between the third and fourth. The tail is long, nearly square, but sometimes more or less emarginate; the rectrices all exceedingly broad to their very tips, which are subruncinated. The legs are long and stout; the tibio-naked for a considerable space; the tarsi much exceed in length the toes, which latter are very short, unusually stout, and connected by rather narrow webs. The species are all of rather large size, and stout form, and are _bioleu_, the dark and light colors occupying distinct areas. The type of the genus is the _Thalassidroma tropica_, Gould, which, with the other species, chiefly inhabit the intertropical and southern seas.

The genus is so well marked as to require special comparison with no other. The following are the species composing it with which I am acquainted:


First described by Gould, Ann. et Magaz. Nat. Hist. vol. xiii. p 366, under the name of _Thalassidroma tropica_, this species is referred to its proper genus by Bonaparte, in his Conspectus Generum Avium, p. 197, and also in his Conspectus Gaviarium, p. 797 of the Comptes Rendus for 1856. If there be other synonyms of the species, I have not met with them.

It is the largest species of the genus, measuring 8-75 to 9-00 inches in length. The tail is more forked than in the other representatives of the genus, the depth of the emargination being 3 of an inch. The bill measures a little more than ¾ the length of the tarsus and it is rather stout, especially at the base, where it is broader than high. The tarsus varies from 1¾ to 1½ of an inch in length; the middle toe with its claw 1¼ inches, or a little more.

1864.]
The plumage is fuliginous black; the lower part of the breast, the belly, the sides under the wings, both tail coverts, the throat, and a nuchal collar, white.

The species inhabits the intertropical portions of both the Atlantic and Pacific Oceans.

In the shape of the bill, emargination of the tail, length of wing, and peculiar proportions of the tarsus and toes, this species differs somewhat from the other representatives of the genus *Fregattia*, as here adopted,—so much so, that ornithologists may perhaps hereafter find it expedient to restrict the genus to this single type, and present the remaining species under a different generic appellation.


This long known species has, in spite of its well marked characters, been presented under so numerous and diverse designations, that its synonymy requires careful consideration.

The first unequivocal indication of this species that I have met with is that given by Vieillot, on page 418 of vol. xxvi of the Nouveau Dictionnaire, (1817,) under the name of "Le pétrél échasse, *Procellaria grallaria.*" The accompanying description, though brief, is entirely pertinent to the present species; and Vieillot's name is, therefore, entitled to priority over subsequent designations.

Prof. Lichtenstein has, in the Catalogue of the Duplicates of the Berlin Museum, page 83, (1823), conferred the name *grallaria* upon a different species, viz:—the *melanogastra* of Gould.

In 1820 the species was presented by Kuhl, Monogr. Proc., p. 138, pl. x. fig. 3, under the name of " *Procellaria fregatta*, Banks." This author's description is very full and quite accurate, but he erroneously adds the name " *P. viquorea*" as a synonym, whereas the latter really is a synonym of quite another species, viz:—the *Procellaria marina* of Latham.

Bonaparte acknowledges, in his Conspectus, p. 198, the error he committed in 1828, of referring to this species under the name of *Thalassidroma oceanica*, he having in his synopsis of the Birds of North America confounded Vieillot's *grallaria* with the *Oceanites oceanica* of this paper.

Finally, in the Annals and Magazine of Natural History, Mr. Gould describes this species as new under the name of *Thalassidroma leucogastra*.

A fine suite of specimens are before me, among which are some of Mr. Gould's typical examples, received by the Philadelphia Academy from him. They vary more than is usual among the *Procellaria*, in the color of the upper parts, which ranges from a deep fuliginous brownish black to a much lighter plumbeous or ashen hue. Some—the lightest colored ones—have all the dorsal feathers edged with greyish white. The circumocular region is usually the darkest colored. The white of the under parts varies exceedingly in extent; it sometimes reaches far up on the throat, including nearly all the under surface of the bird; while in other examples it is nearly as much restricted, that is to say, descends as low on the breast as is usual in examples of *melanogastra*. The lightest colored birds are apparently the most immature.

The bill is stout, nearly as high as broad at the base, measuring from the front to apex, about half the length of the skull. The nasal tubes are long and elevated. The wings are moderately long, reaching just beyond the very slightly emarginate tail. The second primary is longest; the third nearly equal; the first intermediate between the third and fourth. The rectrices are exceedingly broad to their very tips, which are subtruncated. The tibiae are denuded for the space of one inch. The tarsus measures 1 5/0 to 1 60 inches, the middle toe and claw 1 05 to 1 10. The wing from the flexure measures 6 1/2 inches.

The species inhabits the tropical portions of both oceans.

[March,


I have had an opportunity of examining Mr. Gould's typical specimens of this species, now in the collection of the Philadelphia Academy. Although it is very closely allied to the preceding, both in form and colors, yet it constantly differs as follows: While a somewhat smaller bird, it has yet considerablv longer tarsi and toes; the bill is longer, slenderer, with a more attenuated and gradually decurved unguis. The wing is nearly an inch shorter; the proportions of the primaries about the same as in grallaria. The tail is about a third of an inch less. With the same general distribution of colors as in grallaria, this species differs in the presence of a central longitudinal brownish black streak, which divides the white of the abdomen into two symmetrical lateral halves. This ray is not always perfect, being sometimes only indicated by a few disconnected, black feathers. I have never, however, in a large number of specimens seen it entirely wanting, but even if this be ever the case, the species may be readily diagnosed by its peculiarities of size and form above detailed.

The species inhabits the tropical regions of the Pacific Ocean.

This is, in all probability, the species indicated by Forster, Descriptiones Animalium, Edit. Lichtenstein, 1844, p. 180, under the name of "Procellaria fregata, Linn."

It is exceedingly to be regretted that the typical and only known specimen of this species has been lost, so that there is no opportunity of comparing it with leuogastria, to which it is so very closely allied. I can, therefore, do no more than simply present Mr. Lawrence's description, from which ornithologists must judge for themselves regarding its specific validity.

"Head and wings black; neck, breast and back dark plumbeous, or dull bluish ash; wing coverts brown; the tail white at the base, with the terminal half and the two central feathers black; abdomen, inside of wings and rump, white; bill and legs black. Tail even; claws flattened and of an ovate form. Length about 8 inches; wing 6; tail 3; tarsus 1 3/4. (Gen. Rep. Birds N. A., p. 832).

§ VII. PELAGODROMA, Reichenbach.

A very peculiar genus of Procellaridae, readily recognizable by the following characters:—

Bill very long, but little less than the head, exceedingly slender, much compressed, higher than broad at the base, the nasal tubes very short, less than half the culmen, the unguis attenuated only slightly and very gradually decurved. Wings of moderate length, reaching just beyond the tail; second primary longest, third nearly equal, first about equal to the fourth. Tail very long, nearly square or but slightly emarginated, the feathers all exceedingly broad to their truncated apices. Legs very long, somewhat stout, only moderately compressed. Tibie denuded for an inch or more. Tarsus of ordinary length for this group; toes all unusually long, the middle with its claw being but little less than the tarsus. Iinterdigital membranes all very full and broad. Of large size, rather stout form, and variegated colors.

This genus agrees with Fregetta in many respects, but differs markedly from 1864.]

NATURAL SCIENCES OF PHILADELPHIA.

87
it in the length, straightness and attenuation of the bill; and in the very unusually long toes, with their broad, full, interdigital membranes. The pattern of coloration is very dissimilar from that of most of the species of Fregetta or indeed of any other genus of Procellariæ.

The long and well known Procellaria fregetta of Linnaeus is its typical and only species.

1. Pelagodroma fregata, Bp. ex Linn.*

The history of the synonymy of this species is somewhat involved, since, as demonstrated in the annexed foot-note, the Procellaria fregata of Linnaeus has been very variously interpreted by different writers. Some authors have considered it as referring to the tropica of Gould, others to the grallaria of Vieillot, others again to the melanogastra of Gould; while one author has applied the name to a new species, afterwards dedicated to him by Bonaparte. (Fregata Lawrencei.) But I entirely agree with Prof. Lichenstein, (foot-note on page 180 of Forster's "Descriptions Animalium") and with Bonaparte (Conspectus, p. 198) that the Pro. fregata, Linn., was based upon the bird first described by Barrère, and which Latham subsequently more definitely characterized as Procellaria marina.

With this view of the case, the following is an exposition of the synonymy of the species in question:


This large and beautiful species, so peculiar both in form and colors, is too well known to require any description in this connection.

There is in the Philadelphia Academy a very young individual of this species which has not yet wholly emerged from the downy state of plumage. Yet, although so very immature, the peculiar color and markings of the adults are already entirely apparent. This is ample evidence that the birds of this group are subject to no changes of plumage of any consequence in their progress towards maturity. I have fortunately been able to extend the same observation to other species. A fledgling of Gymnoglaeni leucocorypha, now before me, has exactly the pattern of coloration of the adults, and the uralopigous white is already discernable, the only difference being that the black is rather of a slaty than of a fuliginous tint. The chief variations of plumage to which, at least, the fuliginous species are subject, will all be found, I think, to depend upon season. After the moult, when the feathers are fresh and new, they are much darker, and more uniformly so, than after they have become old and worn. Their tips then assume a somewhat lighter brown color, and the dull brown alar fascia, common to so many of the species, becomes much more conspicuous. This is readily demonstrable by examining any of the fuliginous species during the moult, when the old and new feathers will be found to be quite different in the precise shade of the fuliginous brown.

The preceding pages contain notices of all the known species of Procellariæ.

* Among the Procellariæ no name has been so indiscriminately used by authors for so many different species as "fregata, Linn." variously spelled fregata, fregetta, fregetta, etc. That this may occur less frequently in future, and for convenience of reference, the following synopsis view of the various applications of the word is given:


Thal. melanogastra, Gould.=Fregetta grallaria, Bp. ex Vieill., of this paper.

[March,
with which I am acquainted, as well as references to and criticisms upon the more or less doubtfullly valid ones. I have purposely, however, omitted all consideration of the Procellaria Bulweri of Jardine and Selby in this connection, because I cannot regard it as belonging to this group at all. This species—the Thalassidroma Bulweri of some authors—the Puffinus columbinus, Webb et Berth.—the Procellaria anjinko, Heine—is by Bonaparte made the type of a genus Bulweria, which its author places among the Procellarieæ. But I assert most confidently that the bird in question is not a "Stormy Petrel" at all, but a species of the section Fulmarae, closely allied to, and entirely congeneric with, the P. atlantica, Gould, and the P. aterrima, Verreaux, which compose Bonaparte's genus Pterodroma. The most constant and uniformly diagnostic character of the Stormy Petrels proper is found in the shortness of the first primary, compared with the second and third, and in a certain peculiar flexibility and elasticity of all the remiges. The P. Bulweri has none of these characteristics. The general contour of the bill, and especially the size and shape of the nasal tubes are very different from what obtains throughout the Procellarieæ; while the feet and tail disagree to a scarcely less marked extent. The fact of its small size seems to me no argument for its introduction into this section, for it is scarcely smaller than several species of Puffinææ, e. g., muggæ, Solander, or yelknnæ, Acerbi. In my mind there is no doubt that Dr. Schlegel has correctly indicated its affinities in placing it in intimate connection with the Pterodroma aterrima, Verreaux, and atlantica, Gould.

The following is a brief synopsis of the genera and species of the section, prepared according to the views expressed in the preceding pages. It is made as brief as is consistent with perspicuity, only the more important features being presented.

Synopsis of the genera and species of the Procellarieæ.

Family PROCELLARIDEÆ:—The Petrels.

Chs. Longipennis natatores, with tubular nostrils, and free, imperfect, or rudimentary halluces.

Subfamily PROCELLARINEÆ:—The True Petrels.

Chs. Nasal tubes united, placed on the culmen, opening horizontally forwards.

Section PROCELLARIEÆ:—The Stormy Petrels.

Chs. Nasal tubes long, elevated, the nostrils separated by a thin partition. Bill shorter than the head. Wings long, the second primary always longer than the first; all the primaries elastic and flexible. Tail very variable in shape, always long. Legs and feet more or less elongated, always slender and compressed. Tibiae more or less denuded of feathers. Tarsi as long or longer than the middle toe and claw. Outer toe nearly as long as the middle. Hallux minute. Of small size, and very slender form.

Group A. Legs short (for this section). Tarsus but little, if any, exceeding the middle toe and claw. Tibiae denuded for but a short space. Claws compressed, acute. Generally of dark and nearly uniform colors.

I. Tail forked.

1. Genus Oceanodroma, Reich. Bill small, weak, compressed. Third primary nearly as long as the second; first intermediate between fourth and fifth; colors variegated.

Bluish gray, lighter beneath, passing into black around the eyes and on the primaries.

_4. Hornbyi_, Bp. ex Gray. (Thalassidroma, Auct. sed non Vig.) Bill comparatively large and strong. Wings much longer than in preceding genus; second primary much the longest; first longer than fourth. Colors uniform or nearly so.

2. Genus Cymochorea, Coues. (= Thalassidroma, Auct. sed non Vig.) Bill comparatively large and strong. Wings much longer than in preceding genus; second primary much the longest; first longer than fourth. Colors uniform or nearly so.

C leucorrhoea, Coues ex Vieill. (Proc. leucorrhoea, Vieill. Thal. Leachii, Temm. et Auct.) Fuliginous, with a white rump and crissum.

C. melanica, Coues ex Bp. (Thal. melanica, Bp. nec Lawr.) Entirely fuliginous brownish black. Total length about 9.00 inches; wing 6.75; tail 3.90; bill .60; tarsus 1.20.

C homochroa, Coues. (Thal. melanica, Lawr. nec Bp.) Entirely brownish black, with a cinereous tinge. Length about 7.25 inches; wing 5.00; tail 3.25; bill .50; tarsus .90.

II. Tail cuneate.

3. Genus Halocyprena, Coues, nov. gen. Bill about half the tarsus' Wings exceedingly long; second primary longest; third nearly equal; fourth about equal to first. Tail very long.

H. microsoma, Coues, nov. sp. Smallest known Petrel. Entirely fuliginous black. Length 5.75 inches; wing 4.75; tail 2.50; bill .48; tarsus .90; middle toe and claw .82.

III. Tail square, or slightly rounded.

4. Genus Procellaria, Linn. [Emend.] (Thalassidroma, Vig.) Bill very small and short, robust; wings and tail moderately long; third primary nearly equal to the second; first shorter than fourth. Middle toe a little less than tarsus.

_P. pelagica_, L. nec Wils. (Hydrobatas pelagicae, Boie. Thalassidroma pelagica, Vigors et Auct.) The white upper tail coverts tipped with black.

P. tethys, Bp. The upper tail coverts entirely white.

P. lugubris, Natterer. Somewhat larger, with a more robust bill.

P. melitensis, (Schembri).

P. nereis, Bp. ex Gould. (Thal. nereis, Gould.) Head, neck, upper part of back, fuliginous brown with a cinereous hue, which, on the back, wing, and tail coverts, lightens into a clear bluish ash. Primaries brownish black; tail feathers light ashen blue, deepening into black towards their tips. Beneath white, with some bluish shaft lines.

_P. fuscicollata_, Coues ex Tschudi. (Thal. fuscicollata, Tsch.) Bill, feet, head, slightly rounded tail, and underparts to the vent black. Circumanal region pure white; the back rusty brown, as are the superior surfaces of the wings. A whitish brown streak from the back to the bases of the primaries half an inch broad.

Group B. Legs extremely long and slender. Tarsus much exceeding the middle toe and claw. Tibiae naked for a great portion of their length. Claws depressed, obtuse, rounded. More or less variegated in colors.

I. Tail slightly rounded. Tarsal scutella fused together.

VI. Genus Oceanites, Keys et Blas. Bill small and weak. Nasal tubes perfectly horizontal. Wing exceedingly long; second primary much the longest; first fully equal to the third; fourth much shorter. Toes very long, but only two-thirds the tarsus. Hallux exceedingly minute.

Fuliginons brownish black, the rump and crissum white, the interdigital membranes mostly yellow.

*Oceanites lineata*, Bp. ex Peale. (*Thal. lineata*, Peale.) Much larger than *O. oceanica*; the colors generally similar; but the entire abdomen streaked with black and white. Interdigital membranes wholly black. Wing 6.50; tarsus 1.40.

*Oceanites Segethi*, Coues ex Ph. et Ldbk. (*Thal. Segethi*, Ph. et Ldbk.) With the form and general colors of *O. lineata*; but the feathers of the neck and breast uniformly slaty black, and those of the abdomen and crissum entirely white, as are also the upper tail coverts, including the outermost row.

*Oceanites gracilis*, Coues ex Elliott. (*Thalassidroma gracilis*, Elliott.) Much smaller than *lineata*; “wing 5.22; tarsus 1.20.” Sooty black; the rump, upper tail coverts, and middle of abdomen white. Secondary coverts margined with light brown. Tail black; two outer feathers partially white.

II. Tail more or less emarginate, sometimes nearly even. Tarsal scutellae distinct.

A. Toes exceedingly short and stout; their webs small and narrow.

VII. Genus *Fregetta*, Bp. Bill small, short, stout at the base. Third primary nearly equal to second, first longer than fourth. Fuliginous and white in color.

*F. tropica*, Bp. ex Gould. (*Thalassidroma tropica*, Gould.) Very large, nearly nine inches in length; the tail more deeply forked than in other species of the genus (½ inch). Fuliginous black; the abdomen, sides, under surface of wings, throat and a nuchal collar white.


*F. Lawrencii*, Bp. ex Lawr. (*Thal. fregetta*, Lawr. nec anct.) From the South Atlantic coast of North America. Length about eight inches. Wing 6.00. Tail white at the base; its terminal half and the whole of the median rectrices black.

B. Toes exceedingly long and slender, their webs broad and full.

VIII. Genus *Pelagodroma*, Reich. Bill unusually long, weak, and compressed; the nasal tubes short, obliquely elevated. Proportions of primaries about as in *Fregetta*. Tail very long, scarcely emarginate, the rectrices exceedingly broad to their truncated tips.


The present paper will be followed as soon as possible by a similar review of the section Puffineæ.

---

*April 5th.*

MR. CASSIN in the Chair.

Eight members present.

1864.]
April 12th.

Dr. Bridges, Vice-President, in the Chair.

Twenty-two members present.

The following were presented for publication:

"Descriptions of six new species of Unionidae from Lake Nyassa, Central Africa;" "Descriptions of six new species of Succinea," and "Descriptions of thirteen new species of Melanidae." By Isaac Lea.

"A Critical Review of the Procellaridae, Pt. II." By E. Coues, M. D.

The death was announced of Samuel Ashmead and William J. Taylor, late members of the Academy.

April 19th.

Dr. Bridges, Vice-President, in the Chair.

Eighteen members present.

The following were presented for publication:

"Description of a new species of Planorbis;" "Descriptions of five new species of Lymnaea;" "Description of two new species of Unionidae from South Africa," and "Descriptions of twenty-four new species of Physa." By Isaac Lea.


April 25th.

Dr. Bridges, Vice-President, in the Chair.

Nineteen members present.

The following, on favorable report of the respective committees, were ordered to be published:

Synonymy of the Species of STREPOMATIDÆ, a Family of Fluviatilis Mollusca inhabiting North America.

Part 3.

By George W. Tryon, Jr.

Genus SCHIZOSTOMA, Lea.


**SYNOPTICAL TABLE OF SPECIES.**

<table>
<thead>
<tr>
<th>Fissure direct, narrow, and deep.</th>
<th>Fissure oblique, short, and wide.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shell striate or ridged.</td>
<td></td>
</tr>
<tr>
<td>a. Shell conical, spire lengthened, sharply carinate.</td>
<td></td>
</tr>
<tr>
<td>1. S. Cariniferum, Anthony.</td>
<td>15. S. pagodum, Lea.</td>
</tr>
<tr>
<td>S. Showalterii, Lea.</td>
<td>16. S. pyramidatum, Shutt.</td>
</tr>
<tr>
<td></td>
<td>S. orvata, Anth.</td>
</tr>
<tr>
<td></td>
<td>S. pagoda, Lea, of Reeve.</td>
</tr>
<tr>
<td>b. Shell conic-cylindrical; spire obtuse, not carinate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>20. S. babylonicum, Lea.</td>
</tr>
<tr>
<td></td>
<td>Spillmanii, Lea.</td>
</tr>
<tr>
<td>c. Shell globose-ovate, spire moderate.</td>
<td></td>
</tr>
<tr>
<td>Alabamense, Lea, of Reeve.</td>
<td>S. pagodum, Lea, of Reeve.</td>
</tr>
<tr>
<td>Showalterii, Lea, of Reeve.</td>
<td></td>
</tr>
<tr>
<td>2. Shell smooth.</td>
<td></td>
</tr>
<tr>
<td>d. Shell elliptic.</td>
<td></td>
</tr>
<tr>
<td>6. S. ellipticum, Anthony.</td>
<td></td>
</tr>
<tr>
<td>7. S. laciniatum, Lea.</td>
<td></td>
</tr>
<tr>
<td>e. Shell quadrately cylindrical.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S. rectum, Anth.</td>
</tr>
<tr>
<td></td>
<td>24. S. salebrosum, Anth.</td>
</tr>
<tr>
<td></td>
<td>S. robustum, Anth.</td>
</tr>
<tr>
<td></td>
<td>S. rectum, Anth., of Reeve.</td>
</tr>
<tr>
<td>f. Shell ovate, whorls obliquely flattened, spire obtuse.</td>
<td></td>
</tr>
<tr>
<td>12. S. curtum, Mighels.†</td>
<td>S. vicens, Lea.</td>
</tr>
<tr>
<td></td>
<td>S. quadratum, Anthony.</td>
</tr>
<tr>
<td></td>
<td>S. obliquum, Anthony.</td>
</tr>
<tr>
<td>13. S. glans, Lea.</td>
<td></td>
</tr>
<tr>
<td>g. Shell globose.</td>
<td></td>
</tr>
<tr>
<td><strong>SPECIES.</strong></td>
<td></td>
</tr>
<tr>
<td>1. S. cariniferum, Anthony.</td>
<td></td>
</tr>
</tbody>
</table>

*The Schizostomx contain two nearly equal groups, characterized respectively by a narrow direct, and an oblique, short, wide slit. In the above table the opposite species in the two groups are generally exactly similar except in the character of the slit!
†Synonym of bulbosum*


2. S. castaneum, Lea.


Gyrotoma castaneum, Lea, Binney, Check List, No. 311. Brot, List, p. 27.

3. S. ovoidesum, Shuttleworth.


4. S. excisum, Lea.#


Schizostoma excisa, Lea, Wheatley, Cat. Shells U. S. p. 28.

Gyrotoma excisa, Lea, Binney, Check List, No. 317. Brot, List, p. 27.

Melatoma excisum, Lea, Reeve, Monog. sp. 2.

5. S. pumilum, Lea.


Gyrotoma pumila, Lea, Binney, Check List, No. 328. Brot, List, p. 27.


Melatoma globosum, Lea, Reeve, Monog. t. 3, f. 18. Melatoma Alabamense, Lea, of Reeve, Monog. sp. 20.

Melatoma Showalterii, Lea, of Reeve, Monog. sp. 23?

6. S. ellipticum, Lea.2

Melatoma ellipticum, Anthony, MSS. Reeve, Monog., t. 3, f. 21, Apr. 1861.

Gyrotoma elliptica, Anthony, Brot, List, p. 27.

7. S. laciniatum, Lea.


Gyrotoma laciniata, Lea, Binney, Check List, No. 324. Brot, List, p. 27.

8. S. amplum, Anthony.


Melatoma amplum, Anthony, Reeve, Monog. t. 3, sp. 16.

9. S. nuculum, Anthony.

Melatoma nucula, Anthony, MSS. Reeve, Monog. t. 3, f. 19, Apr., 1861.

Gyrotoma nucula, Anthony, Brot, List, p. 27.

10. S. cylindracea, Mighels.


* Mr. Reeve's figure 23 of Melatoma Showalterii does not represent this species, but S. pumilum, Lea.

† Mr. Reeve and Dr. Brot, place ovoidesum, Shutt., in the synonymy of this species. As I have no means of comparing specieum of the latter with Mr. Lea's species, I have preferred to separate them at present. & Bublotoniscum is a larger, wider, more robust species.

‡ The young of pumilum.

§ Distinguished from balthicaum, Anth., by its more lengthened form, and by the regularly convex outline of the body whorl and spire.

‡ I have not seen this species.

[April,
Gyrotoma cylindracea, Müll.* Binney, Check List, No. 315.
Gyrotoma cylindracea, Gould, Brot, List, p. 27.

11. S. bulbosum, † Anthony.
Melatoma bulbosum, Anthony, Reeve, Monog. sp. 22.

12. S. curatum, † Migels.
Gyrotoma curatum, Migels, Binney, Check List, No. 314.
Gyrotoma curatum, Gould, Brot, List, p. 27.

13. S. glans, ‡ Lea.
Gyrotoma glans, Lea, Binney, Check List, No. 320. Broten, List, p. 27.

Melatoma sphaericum, Anthony, MSS., Reeve, Monog. sp. 8, Apr., 1861.

15. S. pagoda, † Lea.

16. S. pyramidatum, † Shuttleworth.

17. S. Wetumpkaense, Lea.
Melatoma Wetumpkaense, Lea, Reeve, Monog. t. 3, f. 17.
Melatoma ornata,** Anthony, MSS., Reeve, Monog. fig. 11.
Melatoma pagoda, Lea, Reeve, Monog. fig. 1, a. (not 1 b).

18. S. Alabamense, †† Lea.
Gyrotoma Alabamensis, Lea, Binney, Check List, No. 363. Broten, List, No. 27.

19. S. Anthonyi, Reeve.

* Typographical error.
† Having examined many specimens of bulbosum and ovalis, I find no difference of specific weight.
‡ I have not seen this species.
§ More inflated, heavier, much lighter in color, not so strongly striated, and with narrower bands than S. globosum, Anth. In a very fine specimen before me, the body whorl is disposed to be tuberculate below the suture.
¶ Mr. Reeve accepts two distinct species for this shell; his fig. 1 a, is S. Wetumpkaense, Lea, and fig. 1 b, is S. Buddii, Lea.
¶† I have seen no authentic specimens of this species.
** Never published by Mr. Anthony, who sent a specimen with label attached, marked "Proc. A. N. S." to Mr. Reeve. Mr. Reeve, misled by this reference, refers to his description to Alc. ornata, Anthony, and consequently assigns North Carolina as the habitat. No species of Schizostoma is known to exist out of Coosa River, Alabama. S. ornata is the young of Wetumpkaense.
†† Mr. Reeve's figure 20, intended for this species, I refer to S. babylonicum, Lea. Alabamense is distinguished from babylonicum by the regularity of its striae.

1864.]
PROCEEDINGS OF THE ACADEMY OF

Melatoma Anthonyi, Reeve, Monog. sp. 12, Apr., 1861.
Gyrotoma Anthonyi, Reeve, Brot, List, p. 27.

20. S. babylonicum, Lea.
* Melatoma babylonicum, Lea, Reeve, Monog. sp. 6.

21. S. Buddi, Lea.*
Gyrotoma Buddi, Lea, Binney, Check List, No. 308. Brot, List, p. 27.
Gyrotoma funiculatum, Lea, Binney, Check List, No. 313. Brot, List, p. 27.
Melatoma funiculatum,† Lea, of Reeve, Monog., sp. 5.
Melatoma pagoda, Lea, of Reeve, Monog., sp. 1, b.

22. S. demissum,‡ Anthony.
Melatoma demissum, Anthony, Reeve, Monog., sp. 9.
Gyrotoma Hartmannii, Lea, Binney, Check List, No. 322. Brot, List, p. 27.

23. S. constrictum,§ Lea.
Gyrotoma constricta, Lea, Binney, Check List, No. 302. Brot, List, p. 27.
Melatoma rectum, Anthony, Reeve, Monog. sp. 10, not sp. 7, a.

24. S. salebrosum,∥ Anthony.
Melatoma salebrosum, Anthony, Reeve, Monog. sp. 8 and 15.
Melatoma robustum, Anthony, Reeve, Monog. sp. 14, a, b.
Melatoma rectum, Anthony, of Reeve, Monog. sp. 7, a.

25. S. glandula,¶ Lea.
Gyrotoma glandula, Lea, Binney, Check List, No. 319. Brot, List, p. 27.

* Mr. Reeve’s figure (3) of this species is a Goniobasis lata, Jay.
† This figure does not so well represent funiculatum as fig. 1, 6, intended for S. pagoda.
‡ Mr. Lea, (Jour. Acad. Nat. Sci., v. pt. 3), makes this species to equal his S. constrictum. I do not consider them the same; constrictum is longer and narrower.
§ Mr. Reeve’s figure 7, a, represents rather a smooth variety of salebrosum, Anth.
∥ In a large number of specimens before me, the distinctive features of salebrosum and robustum become so completely and insensibly merged together that I cannot separate them, and believe them to be identical.
¶ Closely allied to S. incisum, but may be distinguished by being heavier, of different color, higher spire, and more convex outline.
Philos. Trans. ix. p. ——.  
Schizostoma incisa, Lea, Wheatley, Cat. Shells, U. S. p. 28.  
Hanley, Conch.  
Misc. McLanu, t. 5, f. 44, 45.  
Gyrotona incisa, Lea, Binnny, Check List, No. 323.  
Brot, List, p. 27.  
Melatoma incisum, Lea, Reeve, Monog. sp. 4.  
Leptozis incisa, Lea, Binney, Check List, No. 363.  
Binnny, Check List, No. 330.  
Melatoma quadratum, Anthony, Reeve, Monog. fig. 7, b, (not 7 a, or 8).  
Jour. Acad.  
Obs. ix. p. 75.  
Gyrotona virens, Lea, Binney, Check List, No. 335.  
Brot, List, p. 28.  
Gyrotona obtigua, Anthony, MSS.  
Species unknown to me.  
Gyrotona conica, Shuttleworth, (ubi) Brot, List, p. 27.  
3d Section: aperture entire and rounded below.  
Genus ANCULOSA, Say.  
Conrad, Am. Jour.  
Sci. xxv. p. 342, 1834.  
Swainson, Manual Malacol. 1840.  
Wheatley, Cat. Shells U. S. p. 27, 1845.  
Conrad, New Fresh Water Shells, p. 62, 1834.  
Jay, Cat. 4th Edit., p. 276, 1852.  
??Leptozis, Rafinesque, Jour. de Phys. lxxxvii. p. 424, 1819.  
Chenu, Man. de Conchyl. i. p. 294, 1859.  
Binney, Check List, p. 10, June, 1860.  
Brot, List, p. 23, 1862.  
1. Nodulous species.  
1. A. Anthonyi, Budd.  
Anculosa Anthonyi, Budd, Redfield, Ann. Lyc. N. Hist., vi. p. 130, t. 1, f. 6,  
Apr., 1854.  
Leptozis Anthonyi, (Budd) Redfield, Brot, List, p. 23.  
Binney, Check List, No. 541.  
Anculotus Anthonyi, (Budd) Redfield, Reeve, Monog. Anc. t. 2, f. 17.  
2. A. plicata, Conrad.  
Anculotus plicatus, Conrad, New Fresh water Shells, p. 61, t. 8, f. 18, 1834.  

* Mr. Lea, (Obs. ix. p. 67), considers quadratum, Anth., to be a synonym of his *S. incisum*, in which decision I entirely agree with him. To these I unite *S. virens*, Lea, which I find to be the young shell of the same species.  

1864.] 7
Anculotus Smaragdinus, Reeve, Monog. t. 3, f. 23, Apr., 1860.

2. Sulcata species.
A. Shovalterii, Lea.
Anculotus sulcosus, Anthony, MSS., Reeve, Monog. Anculotus, t. 6, f. 44, Apr., 1861.
A. canaliculata, Anthony.

A. littorina, Haldeman.

A. costata, Anthony.
Leptozia costata, Anthony, Binney, Check List, No. 349.

A. rubiginosa, Lea.

* H. occidentalis, Lea, is the mature form, and costata the young, of this species. They are not identical with trilinata, Say, as supposed by Prof. Haldeman. The latter species is not found in the upper Ohio, where costata abounds.


Leptoxis Griffithiana, Lea, Binney, Check List, No. 362.

4. Angulated species.

8. Varieties dissimilis, Say.


Helix subcarinata, Wood, Index, Test. Lister, t. 111, f. 5.


Anculotus carinatus, DeKay, Wheatley, Cat. Shells U. S., p. 28.


Variety a.


Leptoxis carinata, Lea, Binney, Check List, No. 344.


Variety b.

Anculotus nigrescens, Conrad, New Fresh Water Shells, p. 64, t. 8, f. 17, 1834.


Leptoxis nigrescens, Conrad, Binney, Check List, No. 372.

Anculotus trivittatus, DeKay, Moll. N. Y., p. 102, t. 7, f. 137, 1843.

Leptoxis trivittata, DeKay, Binney, Check List, No. 390.

Variety c.


Mudalia monodontoides, Conrad, Chenu, Manuel, i. f. 2046—8.


Anculota dentata, Couthuoy, Wheatley, Cat. Shells U. S., p. 28.

Leptoxis dentata, Couthuoy, Binney, Check List, No. 352.


Leptoxis dentata, Lea, Binney, Check List, No. 353.

Anculota (Mudalia) affinis, Haldeman, Monog. Limnides, Cover of No. 3, Mar. 13th, 1841.

Anculota affinis, Haldeman, Reeve, Monog. Anculotus, t. 6, f. 55.


1864.]
A. dilatatata,* Conrad.
Melania dilatatata, Conrad, New Fresh-Water Shells, Appendix. p. 6, t. 9, f. 5, 1834.
Modalia dilatata, Conrad, Chenu, Manuel de Conchyli. i. f. 2043—5.
Leptoxis Rogersii, Conrad, Binney, Check List, No. 382.
Leptoxis carinata, Anthony, Binney, Check List, t. No. 342.
Anculosa Kirtlandiana, Haldeman, Wheatley, Cat. Shells U. S., p. 28.

10. A. corpulenta,‡ Anthony.

11. A. melanoides, Conrad.

5. Shell smooth, globose, or flattened above.

12. A. trilineata, Say.

* I had at first united this to dissimilis, and I am yet doubtful whether it is really distinct from that protoan species.
‡ Most nearly allied to the heavy, obsolescent angulated form of dissimilis.

[April,
Variety.


13. A. subglobosa, Say.


Variety.


* In treating viridis as a synonym of trilinatus, I agree with the opinions expressed by Messrs. Haldeman, Brod, Binney and Anth. The two former gentlemen, together with Dr. Jay, consider costatus, Anthony, and occidentalis, Lea, as synonyms also. In this opinion I cannot coincide. The two species appear to me to be well separated by the cast of Mr. Anthony's species, and the uniformly smooth surface of trilinatus. Mr. Reeve's figure of trilinatus is very poor; the bands are so represented as to appear like ribs.

It is by no means certain that trilinatus is an Anculosa. Its general appearance suggests affinities with the Amnicola, to which family several small species, hitherto considered to be Anculosa, have been recently removed. It differs from all the Amnicola, however, in its colored bands.

Mr. Lea's M. viridis is the Var. B. of Mr. Say's description of trilinata.

‡ Juvenile shell.

§ Young shell of var. tintinnabulum.

1861]


Leptoxis angulata, Conrad, Binney, Check List, No. 340.


Anculotus Cincinnaliensis, Lea, DeKay, Moll. N. Y., p. 95. Troost, Cat. Shells Tenn.

Leptoxis Cincinnaliensis, Lea, Binney, Check List, No. 346.

15. A. erassa, Haldeman.

Anculosa erassa, Haldeman, Monog. Limniades, No. 4, p. 3 of Cover, Oct. 5, 1841.


17. A. Troostiana, Lea.


18. A. pinguis, Lea.


* The various descriptions by Menke and Deshayes all certainly belong to this species, as Messrs. Haldeman and Anthony long ago decide.
† This is a half grown shell which still retains the angle on the periphery in Alabama, while, in specimens of more northern location, it is only visible in the young.
‡ Undoubtedly the quite young shell of prerosa.
§ Intermediate in form between rubiginosa and prerosa and distinguished by its elongated body whorl, concavely flattened around its upper half.
† Young Shell.

[April,
19. A. p. s. u. m, Haldeman.


20. A. c. o. n. t. r. t. a, Lea.


21. A. v. i. t. t. a, Lea.


22. A. p. l. a. n. o. s. p. i. r. a, Anthony.


Anculosa planospira, Anthony, Reeve, Monog. Anculotus, t. 2, f. 11.

23. A. a. m. p. l. a, Anthony.


Variety a.


Anculotus elegans, Anthony, Reeve, Monog. Anculotus, t. 6, f. 43.


Variety b.


24. A. z. e. b. r. a, Anthony.


Anculotus zebra, Anthony, Reeve, Monog. t. 6, f. 52.


25. A. p. i. c. t. a, Conrad.


Leptoxis Foremani, Lea, Binney, Check List, No. 359.


Leptoxis flavunata, Lea, Binney, Check List, No. 357.

* Differs in form from picta, Con., but so much resembles in coloring the variety flaminata, described by Mr. Lea, that I doubt whether it is distinct.

1864.]
26. A. ornata, Anthony,  
Leptoxis ornata, Anthony, Binney, Check List, No. 375.

27. A. Lewisii, Lea,  
Obs. ix. p. 79.

28. A. squalida, Lea,  
Philos. Trans. x. p. 66, t. 9, f. 50.  
Anculotus squalidus, Lea, Reeve, Monog. Anculotus, t. 3, f. 26?  
Leptoxis squalida, Lea, Binney, Check List, No. 386.  
Brot, List, p. 25.

29. A. patula, Anthony,  
Anculotus patalus, Anthony, Reeve, Monog. Anculotus, t. 4, f. 32.  
Leptoxis patula, Anthony, Binney, Check List, No. 376.  
Brot, List, p. 25.

30. A. viridula, Anthony,  
Leptoxis viridula, Anthony, Binney, Check List, No. 396.

31. A. humerosa, Anthony,  

32. A. ligata, Anthony,  
Leptoxis ligata, Anthony, Binney, Check List, No. 367.  

33. A. turbinata, Lea,  
Obs. ix. p. 76.

Doubtful and Spurious Species.

A. (Paludina) nucleus, Lea, = Amnicola.
A. (Paludina) virium, Lea, = Amnicola.
A. Spiciana, Lea, Reeve and Brot, = Angitrema.
A. incisa, Lea, Haleman, Monog., = Schizostoma.
A. cingenda, Anthony, MSS., = young of carinata, Lea, a variety of dissimilis.
A. planulata, Lea, Wheatley, Cat. Shells, p. 28, Alabama, (desc. not published.) = ampla, Anth. ?
? M.4. carinata, Ravenel, Cat. p. 11, Yadkin River, N. C.  
? Mel. costata, Ravenel, Cat. p. 11, Dan River, Va. = dissimilis.?  
? A. subcarinata, Ravenel, Cat. p. 11, Susqueannah, = dissimilis.?  
? A. integra, Sap, = Somatogyra.
A. subglobosa, Say, = Somatogyra.
A. (Paludina) altilis, Lea, = Somatogyra.
Paludina altilis, Ravenel, = Somatogyra.

* Mr. Reeve thinks this = Rogersii, Conr., and Dr. Brot believes it to be dilatata, Conr. Although it approaches very closely to dilatata, it is a distinct species. It occurs also in North Carolina.
† Close to Connesis, Lea, (Connesis, Conr.) but is more constricted, has three bands only, and is not maculate. It is stouter and more conical. [April,
New Species of MORDELLISTENA collected in Illinois.

BY CHAS. A. HELMUTH, M. D.

A. Hind tibiae with two oblique, parallel, equal ridges.
   a. First joint of hind-tarsi with two, second with one ridge.

M. nigricollis. Body black, head rufous, thorax entirely black; anterior feet and middle tibiae and tarsi testaceous; posterior feet and abdomen tinged with testaceous; elytra with two yellow bands, the anterior one interrupted at the suture; '08. (An Var. M. trifasciata?)

M. dimidiata. Fuscous, linear; head, thorax, antennæ, anus, anterior and middle feet, and posterior tibiae and tarsi reddish-yellow, ridges black; elytra fuscous, with light-brown pubescence, suture and lateral margin very narrowly piceous; '09.

M. biplagiata. Black; elytra with a reddish-yellow oval humeral spot; basal joints of antennæ, palpi, tibiae, tarsi and abdomen reddish, ridges black; '13.
   b. First and second joints of hind-tarsi each with two ridges.

M. ripesutulata. Black, mouth, front, two small spots on the apical margin of the thorax and anterior feet reddish-yellow; pubescence light-brown seri- ceous; '09.
   c. First joint of hind-tarsi with three, second with two ridges.

M. ruerilabris. Black; linear; mouth rufous, '13.

B. Hind tibiae with two parallel ridges, the anterior one extending almost across the outer face of the tibiae.
   a. First joint of hind-tarsi with two, second with one ridge.

M. pikilabris. Black; pubescence grayish; mouth and basal joints of antennæ piceous; '08.
   b. First joint of hind tarsi with three, second with two ridges.

M. guttulata. Black; mouth piceous; elytra with numerous spots of cine- reous pubescence; '11.

C. Hind tibiae with three short, oblique, parallel ridges, and a rudiment of a fourth one.
   a. First joint of hind tarsi with three, second with two ridges.

M. scalaris. Black; mouth, anterior feet, and four basal joints of antennæ piceous; pubescence grayish-brown; thorax with three black clouds, each elytron with a very undulated band before the middle, beginning near the lateral margin and joining that of the other side at the scutellum, and a large oblong spot near the apex fuscous; '17.

D. Hind tibiae with four ridges.
   a. First joint of hind tarsi with four, second and third each with three ridges.

M. fusco-atra. Very slender; dark fuscous; four basal joints of antennæ, anterior and middle feet piceous; pubescence brown-sericeous; '14.
   b. First joint of hind tarsi with five, second with three ridges.

M. suturrella. Black; pubescence of head and thorax brownish, of elytra black, with the suture narrowly gray; '17.
   c. First joint of hind tarsi with five, second with three, third with two ridges.

M. rupiventris. Black; pubescence of head and thorax brownish, of elytra black, with the suture narrowly gray; abdomen rufous, varied with black; '20.

1864.]
Descriptions of New Species of Birds of the Families CÆREBIDÆ, TANAGRIDÆ, ICTERIDÆ, and SCOLOPACIDÆ.

BY GEO. N. LAWRENCE.

Fam. CÆREBIDÆ.

Dacnis ultramarina.


Male. General color ultramarine blue, lores, chin, throat, middle of back, wings and tail black; the black on the throat dull in color; the wing coverts, quills and central tail feathers margined with ultramarine blue; bill black, the base of the under mandible below flesh color; iris brown; tarsi and toes reddish yellow.

Length 4 8 in.; wing 2 3; tail 1 2; bill ½; tarsi 9-16.

The female is yellowish green, with the front, part of the crown and sides of the head bluish; throat ashy; the under plumage lighter green, the middle of the abdomen yellowish.

Habitat. New Granada, Isthmus of Panama.

In distribution of colors this species closely resembles cacereicolor Sel., and cayana; it is, however, lighter in color than the first, and darker than the last; it differs from both in the black not extending behind the eye, in the dull color of the black spot on the throat, which in the others is of a deep black and more clearly defined; cacereicolor is purple blue, and cayana greenish or verditer blue.

Fam. TANAGRIDÆ.

Saltator intermedius.


Male. Upper plumage yellowish olive green; the front and top of the head intermixed with bluish cinereous; a white stripe from the bill over the eye; sides of the head bluish cinereous; tail of the same color as the upper plumage; quills brownish black, the outer webs same color as the back; chin white; on the throat is a tawny or fulvous spot entirely surrounded by a narrow band of black, which runs down on each side of the throat and assumes a rounding form on the upper part of the breast; breast and abdomen cinereous tinged with pale tawny; under tail coverts bright fulvous; bill black; iris brown; legs reddish brown.

Length 8 in.; wing 4 3; tail 4; bill ¾; tarsi 1.

The female differs only in the black not extending across the breast below the fulvous spot.

Habitat. New Granada, Isthmus of Panama.

At the time of referring this species to S. magnus, I had but a single example, a female, which much resembles that species, and I, would not have inclined to separate them, but since then receiving other specimens of both sexes, and finding the fulvous spot on the throat of the male to be encircled with black, as in S. magnoides, I have not hesitated to pronounce it a distinct species. It differs from magnus in the fulvous spot not only being brighter and deeper in color, but of three times the extent; in having a black band on the breast, and in the color of the under tail coverts being much darker, more Rufous. From magnoides it differs in the head above being mixed with olive green, in the white on the chin extending to the bill, whereas, in magnoides the black lines on the sides of the throat come together on the chin; the fulvous on the throat is not quite so bright, but is of twice the extent of that of magnoides, and the black band on the breast of only about one-third the breadth of it in that species; the breast of magnoides is of a clear cinereous and the crissum lighter than in the new bird.

In color and markings it seems to be intermediate between magnus and magnoides, the crissum, however, in my species is darker than in either of the others.

[April,
Cassicus vitellinus.


Male. Deep velvety black, with the lower part of the back, a broad mark on the wing coverts next the back, upper and under tail coverts, basal half of tail feathers and crissum, deep yellow or yolk-of-egg color; the upper middle tail coverts are tipped with black; upper mandible yellowish white, lower pale plumbeous white; iris blue; tarsi and toes black.

Length 12 in.; wing 7½; tail 4½; bill 9-16; tarsi 1½.

The female differs only in being smaller, and measures in length 9½ in.; wing 5½; tail 4; bill 1½; tarsi 1-16.

*Habitat.*—New Granada, Isthmus of Panama, where it is very abundant; I have also seen it from Nicaragua.

This species, which I mistook for *C. persicus*, Liun., (*iteronotus*, Vieill.), at first sight appears much like it, but differs in being larger, in the yellow being much deeper in color, the upper mandible much stronger, with the culmeu more curved, and the base of the upper mandible in front much broader; but the most marked difference is in the extent of the yellow on the tail feathers, on the central feathers reaching two inches from the base, and decreasing a little on the outer ones, giving a rounding form to the mark of this color on the tail; but in *C. persicus*, the yellow, although reaching about the same distance from the base on the central feathers, extends rapidly towards the end of the tail on the outer ones, on the second and third lateral feathers coming within one and a quarter inches of the end; in other words, in looking towards the end of the tail, the yellow mark in my species is rounding in form, whereas, in *persicus*, the mark of this color is very deeply hollowed out.

Fam. SCOLOPACIDÆ.

Breunetes occidentalis.

Adult in spring. Upper plumage varied with black, bright chestnut, ashy brown and white, each feather having a black centre, with bright chestnut margins and tipped with greyish white; the central upper tail coverts browish black, the outer coverts white spotted with black near their ends, central tail feathers blackish brown, the other tail feathers light ash; primaries and secondaries blackish brown on their outer webs and tips, and dark ash on their inner webs; outer tertials dark ash, the inner black in the centre with bright chestnut margins; scapulars bright chestnut in the centre, broadly black near the end, and terminating with white; wing coverts ashy brown with greyish edgings; front sides of the crown to eye and under plumage white; a dusky line tinged with rufous extends from the bill to the eye; ear coverts rufous; front, sides of the head and throat marked with minute spots of ashy brown, breast and sides conspicuously marked with much larger spots of dark brown; under tail coverts white, a few with central dark brown spots; iris brown; bill and feet jet black.

Length 6½ in.; wing 3½; tail 1½; bills from ½ to 1 1-16; tarsi ½.

*Habitat.*—Pacific coast; California, Oregon.

This species differs from *pusillus* in the greater amount and brightness of the chestnut coloring of the upper plumage, but most conspicuously in the more decided character of the spots on the breast and sides, these being very much larger than those of *pusillus*; the bills also appear to average longer, and the tarsi and toes are jet black, which in the other are yellowish green.

The tertials are very long, reaching nearly to the end of the longest primary; the feet are semipalmated about the same as those of *pusillus*. Eleven specimens from the Pacific coast are now before me, four of my own and the 1864.]
others belonging to the Smithsonian Institution, kindly sent me by Prof. Baird for examination; three have their bills 1 1-16 in. in length—all have the bright chestnut coloring above and are conspicuously spotted below, with the legs uniformly deep black. Those killed even towards the end of July retain the chestnut color above and the spots on the under plumage, whereas at that time *E. pusillus* has scarcely any rufous coloring above, and is below entirely destitute of spots, with a wash of a light tawny color on the upper part of the breast.

Mr. E. Cones suspected probably that more than one species existed in North America, for in his able Monograph of the Tringa, published in the Proc. of the Phil. Acad. of Sci., 1861, p. 177, in a note on *E. pusillus*, he says, "I am by no means satisfied that but a single species of *Ereunetes* exists in N. A. The difference in size, in length and proportions of the tarsus even, and especially in the bill, cause it to seem almost impossible that all the specimens before me are specifically the same," &c.

He however made no positive determination of there being more than one species. See his remarks in the note referred to above.

I have had specimens of the so-called *E. mauri* sent me from Cuba by Dr. Gundlach for examination, and have found it to agree precisely with examples of *pusillus* from the Atlantic coast.

**Descriptions of six New Species of UNIONIDÆ from Lake Nyassa, Central Africa, &c.**

**By Isaac Lea.**

The specimens herein described are of unusual interest. They are the first which I have seen from Central Africa, and I am greatly indebted to them for the liberality of John Kirk, M. D., of Edinburgh, who accompanied the Zambezi Expedition, under the British Government, as Medical Officer and Botanist. There are six in number, all of which I believe to be undescribed. The three *Spathe* have the peculiar African type, and probably were furnished with syphon. In one of the species we have, for the first time, an *albic* type. The three *Unio* differ from any type I have heretofore seen from Africa, and they take more of that of India in the subtriangular form—*Rajahensi*, (nobis,) for instance—and in the subplicate character of some of our southern species—inclining to nodulous. It is greatly to be regretted that none of the soft parts were preserved, that we might compare their anatomy with those from America. Lake Nyassa is one of the three great central lakes of Africa, and has a southern drainage in the Zambezi River. It is, in extent, as Dr. Kirk informs me by letter, "exceeding two hundred miles north and south, and from fifteen to sixty miles wide, and is fifteen hundred feet above the sea. It lies between the parallels of 14° and 18° south latitude.

*Unio Kirkii.*—Testa plicata, triangulares, subinflata, ad lateere planulata, inaequilaterali, antice rotundata, postice angulata; valvula crassis, antice cris- sioribus; natibus valde prominentibus, solidis, ad apices undulatis; epidermide viridi, radias capillary indutä; dentibus cardinalisibus crassis, sulcatis; laterali- bus subrectis, curtis, crassis, in valvulo sinistro tripartitibus; marginalită argenteâ et iridescente.


*Unio Nyassaensis.*—Testa plicata, triangulares, subinflata, ad lateere planulata, inaequilaterali, antice rotundata, postice angulata; valvula subcrassis, antice crassioribus; natibus prominentibus, solidis, ad apices undulatis; epidermide luteo-corneâ, obsoletâ radiâ; dentibus cardinalisibus parvisculis, sulcatis; laterali- bus subrectis, curtis, crassis, in utroque valvulo duplicibus; marginalită salmonis colore tinctâ et iridescente.

[April,
Hab.—Lake Nyassa, Central Africa. John Kirk, M. D., of the Zambezi Expedition.

Unio Aferula.—Testa valde plicata, obliquâ, subcompressâ, valdê inaequilaterali, antîcê rotundâ, postîcê subtriangularitâ; valvulis crassiusculis, antîcê crassîrioribus; natîbus subprominentibus, solidis, ad apices undulatis; epidermide luteo-corneâ; dentibus cardinalibus parviusculis, sulcatis; lateralius subrectis, curitis, in utroque valvulo duplicibus; margaritâ dilutê salmosis colore tincta et valdê iridescente.

Hab.—Lake Nyassa, Central Africa. John Kirk, M. D., of the Zambezi Expedition.

Spatha Alata.—Testa alata, sulcata, triangulâ, compressâ, valdê inaequilaterali, antîcê obliquê rotundâ, postîcê obtusê angulatâ; valvulis crassiusculis; natîbus parvis, vix prominulis; epidermide olivaceâ, nitidâ, obsoletê radiatê; margaritâ purpureâ et valdê iridescente.

Hab.—Lake Nyassa, Central Africa. John Kirk, M. D., of the Zambezi Expedition.

Spatha Nyassensis.—Testa subsulcata, ellipticâ, lenticulârî, compressâ, valdê inaequilaterali, antîcê rotundâ, postîcê obtusê angulatâ; valvulis crassiusculis; natîbus parvis, vix prominulis, ad apices minutê undulâtis; epidermide rufo castanea, velutinae, valde radiatâ; margaritâ purpureâ et valdê iridescente.

Hab.—Lake Nyassa, Central Africa. John Kirk, M. D., of the Zambezi Expedition.

Spatha Modesta.—Testa subsulcata, transversâ, subcompressâ, inaequilaterali, posticê et antîcê rotundâ; valvulis tenuibus; natîbus parvis, prominulis, ad apices minutê undulâtis; epidermide tenubroso-olivaceâ, crassiusculis, nitidâ; margaritâ cyanulo-albâ et valdê iridescente.

Hab.—Fresh-waters near Mozambique, Africa. John Kirk, M. D., of the Zambezi Expedition.

Description of six new species of Succinea of the United States.

BY ISAAC LEA.

S. Haleana.—Testâ obliquo-ovatâ, nitidâ, subdiaphanâ, aureâ, tenui; spirâ brevi; suturis impressis; anfractibus ternis, convexis; aperturâ grandi, lato-ovatâ; labro regulariter expanso; columnellâ incurvâ.

Hab.—Alexandria, Louisiana, J. Hale, M. D.

S. Grovenorii.—Testâ obliquo-ovatâ, striatâ, subdiaphanâ, straminea, tenui; spirâ exsertâ; suturis valdê impressis; anfractibus quaternis, convexis; aperturâ subrotundâ, grandiusculâ; labro expanso; columnellâ incurvâ et contorta.

Hab.—Santa Rita Valley, Kansas? Mr. H. C. Grovenor; and Alexandria, Louisiana, J. Hale, M. D.

S. Mooresiana.—Testâ obliquo-ovatâ, minutê striatâ, opacâ, albidâ, subtenui; spirâ exsertâ; suturis impressis; anfractibus ternis, convexiusculis; aperturâ subrotundâ; labro subexpanso; columnellâ incurvâ et contorta.

Hab.—Court House Rock, on Platte River, California route, Mr. H. Moores.

S. Wilsonii.—Testâ elongato-obliquâ, valdê striatâ, diaphanâ, perauraeâ, subnuditâ, tenui; spirâ valdê exsertâ; suturis valdê impressis; anfractibus quaternis, convexiusculis; aperturâ grandiusculâ, ovatâ; labro subexpanso; columnellâ, tenui, incurvâ et contorta.

Hab.—Near Durien, Georgia, S. W. Wilson, M. D.

S. Forsheyi.—Testâ elongato-obliquâ, tenui, nitidâ, diaphanâ, subauraeâ, pertenui; spirâ exsertâ, acuminatâ; suturis impressis; anfractibus ternis, 1864.]
Since I published, in 1841 and previously, a number of new species of Succinea, Dr. Binney's Terrestrial Shells of the United States has appeared. In vol. 2d, pages 65 and 66, he gives eight of my species with the Latin diagnoses, and says he had seen Wardiana, Totteniana, Nuttaliana and aurea, but has no knowledge of the others, except what he derived from descriptions and figures. He says that, "on a careful examination, it appears to us that S. aperta and S. aurea are well established species; that Wardiana is synonymous with avara, Say; Totteniana with ovalis, Say; Nuttaliana with ovalis, Gould; infusa with campstria, Say; that retusa is probably synonymous with ovalis, Gould; and that Oregonensis cannot be at present ascertained." All naturalists must regret introducing this kind of confusion in a difficult branch of science, and had Dr. Binney given more time to the subject,—my types being always open to his inspection,—I cannot doubt but that he would have avoided this attack upon my species. His editor, Dr. Gould, has in part corrected his synonymy, and Mr. W. G. Binney, in the continuation of his father's beautiful work (vol. 4), makes further correction of these hasty and erroneous criticisms. Dr. Gould says that Nuttaliana "no doubt is a well marked species;" of course it is not ovalis, Gould; that Oregonensis is "decidedly a well marked species." Totteniana, Dr. Gould says, differs from ovalis, Say, that "it is a thinner and more fragile shell, proportionally more ventricose in form, with a shorter spire, a larger aperture," &c. Mr. W. G. Binney says, in vol. 4, p. 34, that in regard to infusa he "is inclined to doubt its specific weight." On a careful examination and comparison of specimens with campstria, sent to me as such by Dr. Ravenel, from Sullivan's island, South Carolina, I find these agree with the description of Mr. Say and Dr. Binney, except that the full-grown specimens show a fourth whorl, and not three, as both authors state in their description. This, I think, arises from their mode of counting. If a fourth whorl can be seen on a specimen, even if it be not complete, I always count as four whors, as fractions cannot conveniently and correctly be enumerated in small shells. My infusa has but three whorls, is smoother, more inflated and more obtuse in the spire. With these differences it ought not to be made a synonym until more observations, under better circumstances, should prove it to be such. As regards Totteniana, Mr. W. G. Binney says he "agrees entirely with Mr. Lea and Dr. Gould in separating it from obliqua, Say."

After a careful examination of the original specimens, with the addition of subsequent acquisitions, I am perfectly satisfied of the correctness of my first convictions, as to there being eight species, which Dr. Binney would reduce to two, and they may be stated as follows:

S. aperta, Dr. Binney allows to be established.
S. aurea, Dr. Binney allows to be established.
S. retusa, Dr. Binney says is probably ovalis, Gould. It differs, nevertheless, in being retuse at the base and in being less inflated.
S. Wardiana, Dr. Binney says is synonymous with avara, Say. But Wardiana is a more slender species, and is more oblique. It is evident that Dr. B. figures two species under this name, pl. 57c.
S. TOTTENIANA.—Dr. Binney says this is synonymous with ovatis, Say.* But Dr. Gould properly says it differs in being more fragile, and has a shorter spine. It also differs in color. The interior of all my specimens is iridescent, a character I have never seen in ovatis. Mr. W. G. Binney says (v. 4.) he "agrees entirely with Lea and Gould in separating it from obliqua, Say."

S. NUTTALLIANA.—Dr. Binney says this is synonymous with ovatis, Gould. Dr. G., however, says this "no doubt is a well-marked species." It certainly is very different from ovatis, Gould, being much more slender, more oblique, and different in color. In fact I believe that Dr. Gould has described the same shell as rusticana, in his volume of "Expedition Shells, p. 28."

S. OREGONENSIS.—Dr. Binney makes this "cannot at present be ascertained." Dr. Gould says that the specimens furnished by Mr. Lea "leave no doubt of being decidedly a well-marked species." Oregonensis is perhaps nearest to Wardiana, but that shell has a smoother surface, is greenish, while Oregonensis is yellowish, and in the turns of the spire they differ entirely.

S. INFLATA.—Dr. Binney makes this synonymous with campestris, Say. Mr. W. G. Binney says he "is inclined to doubt its specific weight." Inflata is smoother, more inflated and more obtuse in the spire, as well as in really having one whorl less. It ought to be retained until more specimens could be examined. This species was founded on a single specimen sent by Dr. Ravenel, who also sent me the true campestris.

Description of a new Species of PLANORBIS.

BY ISAAC LEA.

PLANORBIS BILLINGSII.—Testa laevi, planulata, superna plano-convexa, sub-tus lato umbilicata, estriata; anfractibus quaternis; labro acuto; aperturâ grandiscula, subtortu, obliqua.

Hab.—Ottawa River, Canada West, E. Billings, Esq.

Descriptions of Thirteen New Species of MELANIDE of the United States.

BY ISAAC LEA.

GONIOBASIS SUBRHOMBICA.—Testa subcarinata, sub fusiformi, subtenui, tenebroso-olivâ, estriata, evitata; spîra obtusâ; suturis impressâs; anfractibus quinis, planulatis, supernar carinatis; aperturâ grandis, rhomboideâ, intus albidâ: labro acuto, vix sino, columnâ tenui et aequali contorta.

Hab.—Hog Creek, North Georgia, J. Clark.

GONIOBASIS FRATERNA.—Testa carinata, fusiformi, subtenui, luteâ, evitata vel quadrivita; spîra obtusa-concavâ; suturis valde impressâs; anfractibus instar senis, planulatis, supernâ acuto carinatis; aperturâ parviusculâ, ovato-rhomboideâ, intus alba; labro acuto, vix sino; columnâ tenui, internâ contorta.

Hab.—Bibb Co. and Cahawba River, Alabama. E. B. Showalter, M. D.

GONIOBASIS ROM.E.—Testa subcarinata, conoidê, subcrassâ, tenebroso-coneâ, evitata; spîra subelevata, aliqua obtusâ elevata; suturis impressis; anfractibus septenis, planulatis, supernâ carinatis; aperturâ grandisculâ, ovâtâ, intus albidâ: labro acuto, subsinuoso; columnâ tenui et contorciâ.

Hab.—Rome, North Georgia, Rev. G. White.

* At p. 72, v 2, Dr. B. says that TOTTENIANA is "unquestionably the same with obliqua, say," considering obliqua = ovatis, but the figures of the two last species are very different.

1864.]
Goniobasis quadrinicta.—Testa lati vel obsoletè plicatà, subfusiformi, subcassà, luteà, quadrivittatà; spirà conoideà; suturis regulariter impressis; anfractibus instar octonis, planulatis, superne angulatìs; apertura grandiusculà, ovatà, intus quadrivittatà; labro acuto, aliquantò sinusoso; columellà tenui et aliquantò contorta.


Goniobasis Smithonianana.—Testa plicatà, fusiformi, tenebroso-corneà, subcassà, mucronatà, evittatà; spirà obtuso-conicà; suturis impressis; anfractibus instar septenis, planulatis, in medio angulatìs; apertura subgrandi, ovato-rhomboidèa, intus albidà; labro acuto, subrecto; columella subcassà et aliquantò contorta.

_Hab._—North Georgia, Smithsonian Institution, and East Tennessee, Bishop Elliott.

Goniobasis pulla.—Testa lati, exsertà, subtenui, tenebroso-fuscà, nitudà; spirà elevatà; suturis regulariter impressis; anfractibus instar septenis, curvatis; apertura parvisculà, ovato-rhomboidèa, intus dilutè purpurèa; labro acuto, subsinuosò; columellà tenui, purpurescenti, aliquantò contorta.

_Hab._—Cumberland Gap, East Tennessee, Major S. S. Lyon, U. S. Engineers.

Goniobasis pupeiformis.—Testa lati, pupaeformi, crassiusculà, tenebroso-melleà, obsoletè quinque vittatà; spirà obtuseà; suturis impressis, inferne tumidis; anfractibus instar senis, convexiusculà; apertura subgrandi, elongato-pyramidis, intus vittatà; labro acuto, recto; columella superne increasatà.

_Hab._—Coosa River, Alabama, E. R. Showalter, M. D.

Trypanostoma venustum.—Testa lati, acuminatà, luteo-corneà, tenui, mucronatà, evittatà; spirà subelevatà; suturis impressis; anfractibus novenis, planulatis; apertura parvisculà, subconstrictà, ellipticà; labro acuto, subsinuosò; columellà tenui, subcontorta.

_Hab._—Big Prairie Creek, Alabama, Dr. Showalter.

Trypanostoma cinctum.—Testa carinatà, subcassà, tenebroso-corneà; spirà subelevatà; suturis regulariter impressis; anfractibus instar septenis, planulatis; apertura parvisculà, rhomboidèa, intus albidà; labro acuto, sinusoso; columella inferne increasatà et contorta.

_Hab._—North Alabama, Professor Tuoney.

Trypanostoma univittata.—Testa obtuso-carinatà, pyramidatà; subcassà, dilutè olivaceà, nitudì, univittatà; spirà elevatà; suturis impressis; anfractibus, planulatis; apertura parvisculà, rhomboidèa, intus albidà, obsoletè univittatà; labro acuto, sigmoideo; columella inferne increasatà et valde contorta.

_Hab._—Cahawba River, Alabama, E. R. Showalter, M. D.

Trypanostoma cornenum.—Testa striatà, exsertà, tenui, subdiaphanà, dilutè corneà; spirà elevatà; suturis regulariter impressis; anfractibus octonis, sub-convexis; apertura elongatà, constricto-ellipticà, intus albidà; labro acuto, valde sinusoso; columella tenui et contorta.

_Hab._—Tennessee, J. G. Anthony.

Trypanostoma napioidenum.—Testa lati, obtuso-conoideà, subcassà, corneà, evittatà; spirà curta, mucronatà; suturis impressis; anfractibus septenis, superne convexiusculis, ultimo infatato; apertura grandi, subrhomboidèa, intus alba; labro acuto, sinusosò; columella inferne increasatà et valde contorta.

_Hab._—Tennessee, Prof. Troost.

Schizostoma showalteri.—Testa lati, cylindraceà, productà, crassà, mel- leà, evittatà; spirà exsertà; suturis valde impressis, infra funiculo instructis;
anfractibus subplanulatis; fissurâ parviusculâ; apertura parvâ, ellipticâ, intus albâ; labro acute, aliquantè sinuoso; columella inferne et superne incrassatâ.

Hub.—Coosa River, Alabama, E. R. Showalter, M. D.

Description of five new Species of Lymnæa of North America.

By Isaac Lea.

Lymnæa Smithsoniana.—Testâ fusiformi, rufo-fuscescente, subdiaphanâ, parum perforatâ, excellissimâ transversâ striatâ; spirâ obtusâ; suturis impressis; anfractibus senis, convexis; apertura grandiusculâ, ovatâ, submarginem fuscâ; labro expanso; columella parum incrassatâ et vix plicatâ.


Lymnæa Traskii.—Testâ fusiformi, tenui, delè dusçâ, subdiaphanâ, parum perforatâ, minutissimâ striatâ, nitudâ; spirâ conoidê; suturis impressis; anfractibus quinis, convexiusculis; apertura parviusculâ, ovatâ; sub marginem fuscâ; labro subexpanso; columella incrassatâ et plicatâ.

Hub.—San Antonio Arroya, John B. Trask, M. D.

Lymnæa Jamesii.—Testâ subturritâ, tenuissimâ, albidâ, diaphanâ, perforatâ, striis rectis indutis; spirâ exsertâ; suturis valde impressis; anfractibus quinis, convexis; apertura grandiusculâ, subtornatâ; labro expanso; columella aliquanto plicatâ.


Lymnæa Leontii.—Testâ infaâtâ, subcrassâ, perforatâ, excellissimâ transversê striatâ; spirâ obtusâ; suturis valde impressis; anfractibus valde convexis; apertura subtornatâ, grandiusculâ; labro expanso; columella medio incrassatâ et impressâ.

Hub.—Georgia, Major John LeConte.

Lymnæa Arctica.—Testâ ellipticâ, subinflatâ, subcrassâ, imperforatâ, minutè striatâ, diluè corneâ; spirâ obtusâ; suturis impressis: anfractibus convexis; apertura lato-ellipticâ, subgrandi; labro regulariter expanso; columella medio incrassatâ et magnâ plicâ indutâ.

Hub.—Moose River of Hudson's Bay, Arctic America, Smithsonian Institution.

Descriptions of two new Species of Unionidæ from South Africa.

By Isaac Lea.

Spatha Natalensis.—Testâ subsulcâtâ, oblongâ, compressâ, subnittidâ, valde inequilaterali, ad laterè planulatâ, antice rotundâ, postice rotundatâ; valvulis crassiusculis, antice aliquid crassioribus; natibus vix prominulis, ad spicès minute undulatīs; epidermide tenebrōso-rufö-fuscī, eradiatâ; margaritâ purpureâ et valde iridescentâ.

Hub.—Umpingavæ River, Port Natal, South Africa, Rev. J. McKen.

Unio Natalensis.—Testâ plicatâ, antice sulcâtâ, oblongâ, ad laterè planulatâ, valde inequilaterali, antice rotundatâ, postice obtuse angularitâ; valvulis subcrassis, antice aliquid crassioribus; natibus subprominentiibus, acuminatīs, ad spices undulatis; epidermide luteolâ, eradiatâ; dentibus cardinalibus compressis, obliquis corrugatiqué; lateribus longis, lamellatis subrectis; margaritâ dilatè salmonis colore tinctorâ et valde iridescentce.

Hub.—Umpingavæ River, Port Natal, South Africa, Rev. J. McKen.

1864.]

8
Descriptions of Twenty-four new Species of \textbf{Physa} of the United States and Canada.

\textbf{By Isaac Lea.}

\textbf{Physa Niagarensis.}—Testä suborbiculari, inltà, subdiaphanà, nitidà, subcrassà, albìdà; spirà obtusà; suturis impressis; anfractibus quaternis, ultimo pergrandi; aperturà ovatà, grandi; labro expanso, submargine albo et incrassato; columellà medio valde incassatà, impressà et plicà indutà.

\textit{Hab.}—Niagara River, New York.

\textbf{Physa Altonensis.}—Testä ellipticà, subcrassà, leaviusculà, pallido-castaneà; spirà breviusculà; suturis impressis; anfractibus quinis, ultimo grandi; aperturà ovatà, subgrandi; labro acuto, subtèr margine incassato et crocato-vittatà; columellà inferne magnà plicà indutà.

\textit{Hab.}—Alton, Illinois, Henry Lea.

\textbf{Physa Crocata.}—Testä ellipticà, subtenui, nitidà, crocata; spirà obtusà; suturis impressis; anfractibus quaternis, ultimo grandi et subinflatò; aperturà ellipticà; labro acuto, subtèr margine crocato-vittatà, columellà medio incassatà, impressà et contortà.

\textit{Hab.}—Near Rutersville, Texas, Prof. C. G. Forshay.

\textbf{Physa Tenuissima.}—Testä subfusiformi, subcrassà, subopaca, luteo-cornèa; spirà exsertà, acuminatà; suturis valde impressis; anfractibus semiis, ultimo subgrandi; aperturà parviusculà, ovatà, subconstricticò; labro subtèr margine incassato et fusco-vittato; columellà incassatà et medio impressà contortàque.

\textit{Hab.}—Near Rutersville, Texas, Prof. C. G. Forshay.

\textbf{Physa Halei.}—Testä latè ovatà, inltà, diaphanà, tenui, albìdà; spirà obtusà; suturis impressis; anfractibus quinis, ultimo grandi, aperturà rotundatà; labro regulariter expanso, subtèr margine albo et incrassato; columellà medio incassatà, impressà et plicà indutà.

\textit{Hab.}—Alexandria, Louisiana, J. Hale, M. D.

\textbf{Physa Febigeri.}—Testä ellipticà, bellucidà, polità, pallidà; spirà obtusà, curtà; suturis vix impressis; anfractibus quinis, ultimo grandi et subconstricticò; aperturà ovatà, subter angulatà; labro acuto, intus incassato, columellà vix impressà.

\textit{Hab.}—Logan Co., Ohio, Major G. L. Febiger, U. S. A.

\textbf{Physa Nicklinii.}—Testä ellipticà, subcompressà, diaphanà, polità, tenuissimà, margaritaceà; spirà obtusà; anfractibus quaternis, subconstrictis, convexiusculis, ultimo magnò; aperturà elongato-ovatà; labro arquato; columellà medio parum impressà, contortà et parvà plicà induà.

\textit{Hab.}—Callaghan’s, Alleghany Co., Va., P. H. Nicklin, Esq.

\textbf{Physa Grosvenorii.}—Testä ovato-fusiformi, subrectà, subinflatà, vel albìdà vel dilutè stramineà, polità; spirà aliquanto exsertà; suturis impressis; anfractibus quinis; ultimo grandi; aperturà ovatà, subgrandi; labro subexpanso, subtèr margine incassato; columellà incassatà; valde, impressà; plicatà et valde contortà.

\textit{Hab.}—Santa Rita Valley, Kansas? Mr. H. C. Grosvenor.

\textbf{Physa Whitei.}—Testä subinflatà, tenui, subdiaphanà, parum nitidà, albìdà;
NATURAL SCIENCES OF PHILADELPHIA.

spirà subacutâ; suturis valdè impressis; anfractibus quaternis, convexis, ultimo grandi et parum inflato; apertura ellipticâ, subîr marginem incrassatâ et pallido-salmoniâ; labro incrassato, subconstricto; columellâ impressâ et contortâ.


_Physa Saffordi._—Testâ fusiformi, subcompressâ, opacâ, albida, politâ, crassiusculâ; spirâ parum productâ, acuminatâ; suturis impressis; anfractibus quinis, ultimo grandi; apertura ovatâ, grandiusculâ; labro parum expanso, subîr marginem incrassatâ et diluî fusco; columellâ parum incrassatâ et vix plicatâ.

_Hab._—Lebanon, Wilson Co., Tenn., J. M. Safford; Verdigris River, Kansas, F. Hawn; Nashville, Prof. Troost.

_Physa Hawnii._—Testâ fusiformi, subcompressâ, crassâ, albida; spirâ exsertâ, subobtusa; suturis impressis, ultimo inflecto; anfractibus sensis, convexis, ultimo grandi; labro parum expanso, subîr marginem incrassatâ et rufo-fuscescente; columellâ valdè incrassatâ vix plicatâ.

_Hab._—Verdigris River, Kansas, F. Hawn.

_Physa Anatina._—Testâ subsfusiformi, subinflata; diaphanâ, tenui, albida; spirâ exsertâ, acuminatâ; suturis valdè impressis; anfractibus sensis, convexusculis, ultimo grandi; apertura parviusculâ, subconstrictâ; labro subexpanso, subîr marginem incrassato et crocato; columellâ medio impressâ, et contortâ.

_Hab._—Northern Tributary of the Arkansas River, Kansas, F. Hawn.

_Physa Parva._—Testâ fusiformi, subconstrictâ, diaphanâ, politâ, pertenui, tenebroso-corneâ; spirâ exsertâ, acuminatâ; suturis impressis; anfractibus quaternis, convexusculis, ultimo grandi; apertura parviusculâ, subconstrictâ; labro subexpanso, margine acuto; columellâ impressis, vix plicatâ.

_Hab._—Verdigris River and Rock Creek, Kansas, F. Hawn.

_Physa Showalterii._—Testâ subsfusiformi, subinflata, subdiaphanâ, subtenui, pallido-corneâ; spirâ parum productâ, acuminatâ; suturis valdè impressis; anfractibus quinis, convexis, ultimo grandi; apertura magnâ, ellipticâ; labro regulariter expanso, subîr marginem latâ incrassato et crocato; columellâ medio valdè impressâ, incrassatâ, contortâ, et plicâ indutâ.

_Hab._—Uniontown, Alabama, E. R. Showalter, M. D.

_Physa Smithsoniana._—Testâ ellipticâ, subtenui, subdiaphanâ, nitidâ, pallido-fusca, fere olivaceâ; spirâ subacutâ; suturis impressis; anfractibus quinis, convexusculis, ultimo grandi et parum constricteâ; apertura elongato-ellipticâ; labro parum incrassato, subîr marginem tenebroso-fuscâ; columellâ impressâ et contortâ.

_Hab._—Loup Fork of the Platte River, F. V. Hayden, M. D.

_Physa Warreniana._—Testâ inflata, tenui, diaphanâ, nitidâ, albida; spirâ obtusa; suturis impressis; anfractibus quinis, ultimo pergrandi et valdè inflato; apertura latâ ellipticâ; labro acuto subîr marginem fusco et albidâ vittatâ; columellâ medio impressâ et contortâ.

_Hab._—Loup Fork of the Platte River, F. V. Hayden, M. D.; Milwaukee, Wisconsin, H. C. Grosvenor; and Grand Rapids, Michigan, A. O. Currier.

_Physa Traskii._—Testâ valdè inflata, parum obliquâ, striatâ, subdiaphanâ, tenuissimâ, pallido-castaneâ; spirâ parum productâ; apice acuto; suturis impressis; anfractibus sensis, ultimo pergrandi et valdè inflata; apertura latâ expansâ; labro acuto, subîr marginem fusco-vittatâ; columellâ medio impressâ et magnâ plicâ indutâ.

_Hab._—Rio Los Angeles, California, J. B. Trask, M. D.

_Physa striata._—Testâ latê ovatê, obliquê inflatê, latê striatê, subdiaphanâ, 1864.]
pertenui, color columbae; spirá subobtusá; anfractibus quinis, convexis, ultium pergrandi; apertura magná, laté ellipticá; labro regulariter expanso, subter marginem parum incrassato et crocato; columellá medio impressá, parum incrassata et plicatá indutá.

*Hub.*—Salt Lagoon, near Monterey, California, J. B. Trask, M. D.

*Physa Blandii.*—Testá ovato-subfusiformi, subobliquá, inflatá, diluté striaté vel albiá; spirá obtusá; suturis impressis; anfractibus quaternis, ultimo inflato et pergrandi; apertura ováta, subgrandi; labro expanso, subter margine incrassato et pallido crocato; columellá incrassata, impressá, plicatá et contortá.

*Hub.*—California, Mr. Thomas Bland.

*Physa Nuttalli.*—Testá inflatá, subdiaphaná, parum nitidá albidá; spirá obtusá, curta; suturis impressis; anfractibus quaternis, convexis, ultimo pergrandi et inflato; apertura grandi, subrotundá, subterr margine pallido-fuscá; labro acuto, valde expanso; columellá leviter incrassata, et contorta.

*Hub.*—Lewis River, Oregon, Prof. Thomas Nuttall.

*Physa venusta.*—Testá subcilindraceá, tenuissimá, diaphaná, nitidá, albá; spirá curta, acuminatá; suturis leviter impressis; anfractibus quaternis, convexis, ultimó pergrandi, ultimó per inflato; apertura magná, elongato-ovatá, subterr margine fuscá; labro acuto et sinuoso, vix expanso; columellá parum impressá.

*Hub.*—Near Fort Vancouver, Oregon, Sir George Simpson.

*Physa horrida.*—Testá subcilindraceá, pellucida, politá; dilutó rufá; spirá sublevatá subacutá; suturis subimpressis; anfractibus quiniquinis, ultimo grandi et conscriptá; labro acuto, margine rufó lineato; apertura ováta, superné acutá angulatá; columellá aliquot parum impressa et incrassata.

*Hub.*—Vancouver Island, Oregon, Sir George Simpson.

*Physa brevispira.*—Testá leví, lato-elliptica, albidá, diaphaná, inflatá; spirá brevis-imá, obtusá, vix exserta; anfractibus terquis, ultimo grandi et inflato; labro acuto, margine intus incrassato; apertura pergrandi et dilatatá; columnellá incrassata, impressa et contorta.

*Hub.*—Ottowa River, Canada West, E. Billings, Esq.

---

A Critical Review of the Family PROCELLARIDEÆ:—Part II; Embracing the PUFFINÉE.

BY ELLIOTT COUES, M. D.; U. S. A.

The present paper is the second of a series in which it is proposed to consider the entire family of Petrels. The first fasciculus in which the Procellariæ or "Stormy Petrels" are reviewed, has already appeared in these Proceedings; in the present continuation of the subject are embraced the Puffines, or "Shearwaters."

In writing upon the Procellariæ I had regard more particularly to the generic disposition of the species; for most of them were so well known as to require comparatively little comment upon their specific distinctions. With the Puffines, however, the case is exactly the reverse. While the generic groups are very plainly indicated, the species comprised in each are for the most part quite numerous, and their relations to each other, generally so very intimate, as regards size, form, and color, that it requires careful and discriminating comparison to separate them. I have, therefore, given this part of the subject in hand special attention; and have gone considerably into details in my examination of the specific characters and relationships of the numerous components of the group, believing that in no other way can the desirable degree of information on the subject be attained. At

April,
the same time the many intricate questions of synonymy involved have necessitated somewhat lengthy discussions.

In my arrangement of the genera and species I have closely followed that given by Bonaparte in his Conspectus; except that I place among the Puffinece the genus Adamastor, which Bonaparte considers as belonging to the Fulmaræ. The position of this genus is, indeed, a little uncertain, the characters of the bill approximating to those of the Fulmaræ. Its bill, however, is almost identical with that of Majacues; and it agrees so closely in other respects that the two genera cannot be placed in different groups; while the possession by each of twelve, instead of fourteen or sixteen rectrices, plainly indicates that they belong to the Puffinece rather than to the Fulmaræ.

The Puffinece, as I regard them, are composed of five genera, viz.:—Majacues, Adamastor, Thiellus, Nectris and Puffinus. The two first of these are very different from the three last in many respects; and warrant a subdivision of the section into two groups. The first, or the "Fulmar-Puffins," have the bill stouter than ordinary; the nasal tubes longer, more elevated, more decidedly tubular, vertically truncated at their apices, and the nasal septum thinner; the wings and tail shorter. The three latter of the above-named genera constitute the "Puffins proper." The bill is very long and slender; the nasal tubes short, broad, depressed, obliquely truncated; the nasal septum thick; the wings and tail very long, the latter much rounded; and the feet very large. As for the genera themselves, they are hardly worth retaining, except it be for convenience's sake. Thiellus is merely Nectris with a longer and more decidedly cuneiform tail; while Nectris hardly differs from Puffinus, except in its rather slenderer bill, and entirely fuliginous color. The subdivision of Puffinus into "Ardenna," "Puffinus," and "Puffinus" seems quite unwarrantable.

I shall consider the species of the five genera in the order in which they are named above, and conclude with a brief synopsis of the section in accordance with the results arrived at in the investigation.

Majacues, Reich.

Gen. char.—Bill a little shorter than the head, about equal to the tarsus, stout, compressed, higher than broad at the base, the culmen rising immediately from the nostrils, the unguis large, very convex, much hooked. Commissure unusually curved from feathers to unguis, the concavity looking up wards; outline of inferior mandibular rami quite straight to the unguis. Nasal tubes long, (nearly a third the length of the culmen), elevated, laterally obliquely flattened, carinated along the median line, apically vertically truncated, with a considerable emargination; nostrils quite circular; the septum narrow for this section. Wings very short for this family. Tail also exceedingly short, and subtruncated, the graduation of the lateral feathers being slight. Feet stout, the tarsus greatly abbreviated, being much shorter than the middle toe without its claw. Outer toe without claw longer than the middle. Tip of the inner claw reaching the base of the middle one. Of large size, dark color, and exceeding robust form.

The preceding paragraph characterizes a marked and very peculiar genus of Procellaridae. It is at once distinguished from all its allies by the combination of the large size, extreme robustness of bill and feet, as well of the whole body, the unusually short wings and tail, the dark colors, etc. It is most nearly allied to Adamastor, the bills of the types of the two genera being almost identical; but other characters readily distinguish the two.

Two species of this genus are recognized by ornithologists. Dr. Schlegel has well shown that it is rather by peculiarities of form and size that conspicilatus is to be distinguished, if at all, from aequinoctialis.

1864.]
Majaqueus aequinoctialis, Reich ex Linn.


Habitat. — "In oceano Australi extra tropicam, (nunquam visa ad lineam aequinocitialium, unde patet, in ipsam nomen 'aequinoctialis' non quadrare."

(Forster).

It is unnecessary to give any description of this long and well known species.

The white spots on the throat and cheeks appear to vary much with age. In the perfectly adult bird the triangular gular spot is alone left; that on the cheeks, which is connected with it in immature birds, having disappeared. Very young birds have the under parts almost wholly whitish, which afterwards deepens into fuliginous.

The present is one of the three species of Procellariae, (pelagica, aequinocitalis, capensis), known to Linnæus in 1758, and given in the sixth edition of his Systema Naturæ. The name aequinoctialis appears, according to the observations of most naturalists, to be geographically erroneous; and probably on this account it was changed to nigra by Forster in 1772. But as it is impossible to say exactly what are the limits of a Procellarian's wanderings, it would be hardly warrantable, I think, to change Linnæus' appellation.

There are no points of synonymy which require discussion here.

Majaqueus conspicillatus, Bp. ex Gould.


Procellaria laretta, Lesson.

Habitat. — Australian Seas.

This species, despite the peculiar markings of the head, which usually characterize it, is, nevertheless, exceedingly closely allied to the preceding. Examination of the large series in the Philadelphia Academy collection shows the markings to be very variable as to their extent, and that they are sometimes hardly traceable at all. (Consult on this point Dr. Schlegel's monograph, where the point is fully elucidated.) In the majority of specimens the submental white patch is more or less perfectly connected with a broad white stripe, which, passing from the feathers on the side of the lower mandible, runs backwards on the side of the head, below the eye, curving upwards on the occiput, so as nearly to meet its fellow of the opposite side. In addition to this, a broad somewhat crescentic patch occupies the anterior portion of the vertex, and descends on the cheeks in front of the eyes nearly or quite to the commissure of the bil, leaving the features of the extreme front black. The colors in every other respect are those of aequinoctialis.

More constant and reliable, though not so conspicuous, diagnostic features are to be found in other characters. The bill is larger than aequinoctialis; its bill is a little longer and considerably more robust, and has the unguis of both mandibles bluish black instead of bright yellow. The sides of the mandibles are also usually much darker in color. The wings and tail, on an average, exceed those of aequinoctialis by an inch or so, but the variation with individuals of both species amounts to more than this. A corresponding relative difference exists in the average length of the tarsus and toes.

[April,
There are no points of synonymy connected with this species which require notice.

**ADAMASTOR, Bon.**

*Char. Gen.—* Of large size and robust form. Bill a little shorter than the head, about three-fourths the tarsus, broad and stout at the base, narrowing regularly to the strong, very convex compressed unguis. Nasal tubes longer than ordinary (for the Puffineæ) very broad, depressed, but vertically truncated at their extremity, and with an unusually thin septum, somewhat as in the Fulmaræ, to which the genus bears considerable analogy. Wings rather short for this section; the primaries broad and stout, the second quite as long as the first. Tail rather short, of twelve feathers; the central rectrices projecting and a little acuminate; the lateral more rounded, and rapidly graduated. Feet of the usual size, moderately compressed and stout. Tarsus shorter than the middle toe without its claw. Outer toe longer than the middle. Tip of outer claw about reaching base of middle.

The genus *Adamastor* was founded in 1856 by Bonaparte to accommodate certain Procællariidians, which seem to combine in a remarkable manner the characteristics of both the Fulmaræ and the Puffineæ. The species resemble most the Fulmaræ in the length, vertical truncation and thin septum of the nasal tubes; and also less markedly in the shape of the wings and tail. In all other respects they are, however, true Puffineæ. The bill, in shape and comparative size, can hardly be distinguished from that of *Majaques meganotus*, which is one of the Puffineæ. The most essential character of the bill of the Fulmaræ is that the outline of the unguis of the lower mandible is about straight and ascending; that of the Puffineæ is very concave and decurved. *Adamastor* possesses the latter character. Again the tail of the Fulmaræ has fourteen (Fulmarus) or sixteen (ossifraga) rectrices; the tail of *Adamastor* but twelve. The large stout feet, too, are those of Shearwaters, and not of Fulmars. From these manifold considerations I think that it is manifest that the proper affinities of the somewhat anomalous genus are decided with the Puffineæ, rather than with the Fulmaræ, among which Bonaparte has located it.

It is not a little surprising that so great confusion and uncertainty should have reigned concerning so marked a species as *P. cinereus*, Gmel, the type of this peculiar genus. On my remarks, infra, upon *A. cinereus*, and also upon *Puffinus Kuhlii*, I hope I have elucidated several vexed questions of synonymy satisfactorily.

Three species are known to me to compose this genus.

**Adamastor cinereus** Comes ex Gmel.


*Puffinus cinereus*, (GM.) Lawrence, Birds N. A., 1858, p. 835; ex Californiâ. (Homonymaaccuratéenumerata;descriptio prestantes; et observationes pertinentes.)


(Specimen a me visa.) Sed non Boie, nec anct.


Description.—Form typically that of the genus, which see, supra.

Color.—The nasal tubes, and culmen as far as the unguis, are black; the unguis is pale yellowish. The sides of the upper mandible, as far as the sulcus which separates them from the culmen, yellow, as are the sides of the lower mandible and its unguis; the sulcus of the lower mandible and its commissural edge being bluish black. [Compare Forster: Desc., p. 208.] Feet in the dried specimen dingy bluish or yellowish green, dusky exteriorly and posteriorly, the webs yellow, the claws light brown, with black tips. Above a uniform cinereous, of much the same shade over the whole upper parts; some of the feathers, especially the scapulars and tertials, with just appreciably lighter tips; the crown of the head and the circumocular region a little deeper cinereous than elsewhere. The wing coverts of the specimen in question are interspersed with feathers of a dull brownish rather than cinereous hue. These are evidently old worn ones, and doubtless indicate that in this species, as in others, the newer and freshier the feathers the clearer and more decided is the cinereus hue. The color of the upper parts has no line of demarcation with the white of the lower on the sides of the head and neck. Insensibly fading away, it extends quite around on the chin and throat, but is more restricted on the sides of the neck. The primaries are blackish cinereous on their outer webs and at their tips; light greyish cinereous internally and basally; their shafts are light brown. The inferior surfaces of the wings, together with the axillary feathers and some feathers on the sides of the body under the wings, are dull brownish cinereous. The tail feathers and the entire under tail coverts, from the anus backwards, are deep blackish or sooty cinereous, the rectrices the darkest. The rest of the under parts are white.

Dimensions.—Length about 19 inches. Bill along culmen 1-80; from feathers on side of lower mandible to its apex 1-50; height of bill at base .65; width of bill at base .60. Wing from the carpus 13-00; tail 5-75; exterior rectrices 1-25 shorter. Tarsus 2-40; middle toe and claw 2-90; outer do. 3-00; inner do. 2-50. Length of nasal tubes .45, inches and hundredths.

Bibliography.—As I have endeavored to prove, in my discussion of the synonyms of P. Kuhlii (which see), the Proc. cinerea, Gmelin, is really the present species, and not the common Atlantic bird to which the name cinerea has been generally applied by European authors. Bonaparte, indeed, was completely convinced of this; and it is the more singular that he does not adopt Gmelin’s name, but prefers to confer a new specific designation,—viz. tupidus, in direct violation of one of the most firmly established laws of nomenclature. To Mr. G. N. Lawrence is due the credit of restoring Gmelin’s name to the species to which it rightfully belongs.

The Proc. hestibata of Forster is most undoubtedly, I think, the present species. His description is pertinent in every respect; and his remarks concerning the form and color of the bill will apply to no other species. The hestibata of Gould’s Birds of Australia, and of Lawrence, (Ann. New York Lyc. Nat. Hist.,) is the same bird. The hestibata of Kuhl’s Monograph and of Temminck’s Planches Colorees is apparently, however, not this species, but the Astrelata diabolica, Bp. ex L’Hérm.

I quote "P. melanura, Bonn." on authority of Bonaparte, not having an opportunity of verifying the reference.

* The accompanying description was taken from a fully mature specimen from the coast of California, kindly furnished for examination by Mr. Lawrence. It is the example from which Mr. Lawrence’s description of P. hestibata, in the Annals of the New York Lyc., and of P. cinerea, in the Birds of North America, was taken; is not incompatible in any feature with P. cinerea, tupidus, Lath. Vieill.; agrees entirely with Forster’s P. hestibata, with Bonaparte’s Adelastor type, and Schlegel’s Proc. adelastor.
The following resume of the points under discussion is given for convenience of reference:


Dr. Lichtenstein, in his edition (1841) of Forster's Descriptiones Animallinum, says that the lenocephala of Forster (which is also the alba of Linn., Gm., Lath.) "vix nisi etate videtur differre a hesitata Forster." It is well known that the present species when young has the cinereous of the head much lighter than that of the adults; and Prof. Lichtenstein's surmise may therefore be correct. As, however, there are several points of form, etc., in which it seems to differ from hesitata, and especially as Bonaparte has considered it a valid species of Astrelata, I shall follow the latter authority until more definite data may be found upon the subject.

Adamastor gelides Coues ex Gmel.


Habitat.—Antarctic Ocean. Cape of Good Hope.

Sp. char.—"Feathers of the head and all the upper surface brown, with paler edges, fading into white on the tips of the upper tail coverts; wings and tail deep blackish brown; all the under surface pure white; the feathers of the under surfaces of the shoulders with a streak of brown down the centre; bill yellow, passing into dark horn color at the tip; tarsi and feet fleshy white."

"Length 19 inches; bill 2 1/2; wing 15 1/2; tail 6 1/2; tarsi 2 3/4; middle toe and claw 3 1/2."—[Gould.]

This is an exceedingly well marked species, liable to be confounded with no other with which I am acquainted. That it is a species of Adamastor, and entirely congeneric with A. cinereus, there can be, I think, no doubt. The general coloration and the proportions as indicated by the measurements, plainly evince this to be the case. Moreover, Mr. Gould himself remarks that "this bird so nearly approaches in form the members of the genus Puffius, that it is almost a question whether it should not be included in that genus." A bird which could be placed by so accurate an ornithologist as Mr. Gould in the genus Procellaria (i.e. among the Fulmarææ), and which yet exhibits such an affinity with the Puffinæ, cannot but belong to the genus Adamastor.

Discussion of synonymy.—I think there can be no reasonable doubt that the old P. gelida of Gmelin, Latham and Vieillot is really the present species. The habitat and the dimensions given by these authors is the same as that assigned to flavirostris by Mr. Gould; and their diagnoses are pertinent in almost every particular. The expression "pedibus carereis" is indeed quite inadmissible; but a misinterpretation of the color of the feet of birds of this family is extremely likely to occur when only dried skins are examined. Still I would hardly venture to supersede Gould's flavirostris by Gmelin's or Latham's gelida, were it not for the fuller and more perfect description of the species given by Vieillot in the work above quoted. An examination of his description will show that it differs in no single conse-
quential point.* In view of these facts, and deeming it of the utmost importance to identify as many of the names of the older authors as possible, I have thought it best to restore Gmelin's appellation.

Adamastor sericurus Bp. ex Less.


Habitat.—Southern Pacific Ocean.

Sp. char.—Bill black; feet flesh-colored, the margin of the webs blackish. Upper parts deep greyish ash, passing into blackish grey on the upper wing coverts. Head, neck and under parts white; the former variegated with some taches of clear greyish ash. Circumocural region blackish. Inferior surfaces of the wings of a lighter color than the superior. Tail rounded, its upper surface lightly washed with ashly.

Length 15 inches; extent of wings 36; wing from the carpus 11·50; tail 5; bill along gape 2·00; nasal tube 4·0; tarsus 1·75; middle toe 1·33.

The preceding description is compiled from Lesson's original notice. The indications are not as explicit as might be desired; but I think that there can be no doubt of the propriety of Bonaparte's referring the species to his genus Adamastor. The pattern of coloration is rather that of most of the species of Astrelata; but the proportions as indicated by Lesson's measurements indicate a bird conspecific with Adamastor cinereus.

I have met with no synonyms of this species requiring notice.

Thiellus Gloger.

Char.—Bill long and slender, about three-fourths the tarsus, compressed, the ungus much decurved, but at base broader than high. Nasal tubes very short, only a fifth of the culmen. Wings of moderate length, and ordinary shape. Tail unusually lengthened, being nearly or quite half as long as the wing from the carpus, very much graduated. Tarsus a fourth longer than the bill, moderately stout, compressed. Middle toe without a claw, a little longer than the tarsus. Of moderate size, rather slender form and uniformly fuliginous colors.

The most essential character of the genus is found in its unusually elongated and much graduated tail. In all other respects it hardly differs at all from Nectris; and its species have all the same fuliginous hue that characterizes the latter genus.

Two species are recognized by ornithologists as belonging to this genus. Though exceedingly closely allied to each other, yet they seem to constantly differ in some applicable points.

Thiellus sphenurus Bp. ex Gould.


Habitat.—Australian seas.

A fine series of these species is in the collection of the Philadelphia Academy. The general color of the plumage is a deep chocolate brown, or dark reddish black, most of the feathers of the upper parts with paler margins. The color of the back deepens into pure black on the wings and tail. Below, the general plumage is of a deep brown, with a wash of grey,—the brown tinge most palpable on the abdomen, the grey predominating on the throat.

* I may remark, en passant, that the expression "pris de haut pennes de longueur totale" is most probably a typographical error, or a lapsus calami. It was evidently intended to be "deix haut."
The bill is flesh color, tinged with brown; much darker along the culmen and on the unguis; the legs and feet are flesh colored, with a tinge of yellow.

This species measures from 15 to 16 inches in total length; the wing from the carpus 10.50 to 11.25. The tail varies somewhat in length, from nearly five to quite six inches; the graduation of the lateral feathers usually being about 2 inches. Bill about 1.60; height at base 35, width .50; length of nasal tubes .25. Tarsus 1.90; middle toe and claw 2.55.

This species can be confounded with no other, (except, perhaps, T. chlororhynchos, which see;) and there are no involved points of synonymy.

**Thiellus chlororhynchos** Bp. ex Less.


**Habitat.** —“Western Australia,” Bp. Dr. Schlegel has specimens from the Bourbon Islands and the Cape of Good Hope.

Almost identical with *T. sphenurus* in the color of the plumage; and with much the same dimensions. The main diagnostic points seem to be the following: The bill is of a greenish orange color, except along the culmen and at the tip, where it is black. The bill is longer than that of *sphenurus* by about a fourth of an inch on the average, and appears a little larger at the base, though quite slender in its continuity. While *chlororhynchos* is, upon the whole, a larger bird than *sphenurus*, nevertheless the wings are absolutely shorter (½ an inch or more) on an average. The feet are slightly longer and stouter. In color the present species differs slightly in being rather more cinereous below; but the difference is not well marked.

The species not as yet a well known one, nor contained in many museums.

**NECTRIS** Bp. (emend. ex Forst.)

**Char.** — Generally similar to *Puffinus*; colors uniformly fuliginous; bill and feet wholly or partially light colored. Bill long and slender, much looked at the tip; nasal tubes short, broad, depressed, very obliquely truncated, the septum broad, the nostrils narrowly oval. Wings reaching a little beyond the tail, which varies in length, but is always more or less rounded. Feet moderate; tarsus about equal to middle toe without claw; outer toe without claw equal to middle; tip of inner claw not reaching base of middle one.

This genus comprises five, perhaps six, species, all agreeing in the uniform fuliginous of their plumage, and in the partial or entire paleness of the bill and feet. In form it hardly differs from *Puffinus*, and its retention as a valid genus is perhaps questionable, except as a matter of convenience in a group where it is of importance to distribute the numerous closely-allied species in as many groups as may be at all characteristic.

**NECTRIS fuliginosus**, Keys. et Blas. ex Strickl.


**Habitat.** — *N. major* from northern portions of the Atlantic Ocean; especially numerous on the coast of Newfoundland; more rarely on the European coast.

*Sp. ch.* — Upper parts a uniform fuliginous brownish black, the primaries and tail feathers of a deeper color; under parts a much lighter fuliginous 1864.}
brown, passing into greyish on the throat. Bill entirely brownish black. Feet brownish black, the internal face of the tarsus and the interdigital membranes dusky yellowish. Length, 18 inches; wing, from the carpus, about 12. Bill along culmen, 1 72 to 2.00; along commissure, 2.50; tarsus 2.20 to 2.30; middle toe about 2.50.

This species is too well known to require further characterization.

Discussion of synonymy.—The name “fuliginosus” has unfortunately been almost as badly handled about as cinereus, Gn. Thus the fuliginosus, Gn., Lath., apparently (and it is so looked upon by most ornithologists) belongs to a species of the genus Thalassidroma, Vig., from Otaheite, probably not very widely differing from the Cypnochorea melania, mihi, ex Bp. Fuliginosa, Banks, (tab. 10) Kuhl, (sp. 12, pl. x. fig. 6,) is a species subsequently called atlantica by Gould, now the Pterodroma atlantica, Bp. Exactly what is the fuliginosa, Forster, (Deser. p. 23, sp. 18), is a little doubtful. His editor, Lichtenstein, says that it is the same as fuliginosa, Kuhl, sp. 12: and this opinion is also maintained by Bonaparte, which would make it the Pterodroma atlantica. But then, on the contrary, Dr Kuhl asserts positively that his species 12 is “omino diversa a Nectri fuliginosa, Forst.” For my own part, after carefully studying Forster’s description, I am inclined to coincide with Dr. Kuhl, and to hold that Forster’s fuliginosa is not the Pterodroma atlantica, but rather a pacific species of the genus Nectris.

Species 27 of Kuhl’s monograph, also called fuliginosa (after Banks, tab. 23,) is too indefinite for me to make anything of it.

No other synonyms of this species seem to require notice. The confounding of this species with carneipes, Gould, by Dr. Schlegel, will be noticed under the head of the latter.

Nectris amadrosoma, Coues, nov. sp.

Diagnosis.—Nectris media quoad staturam inter fuliginosam vel carneipedom et tenuirostrom vel brevicaudam; corpore brunneo-fuliginoso, subitus valde dilutioe, in culis fusco-cinerascemento; tectaribus alarum inferioribus albidos fere meris; rostro ex toto fusco; pedibus interne palamisque carneis; externo brunneo-albis. Long. alae 11-00. Ang. Rostri à fronte ad apicem 1.70. Tarsi 2.00. Digitii medii cum ungue 2.40. Caude, 4.25.


Description.—Form. Bill about as long as the head, a little shorter than the tarsus, about two-thirds the middle toe and claw; rather slender, attenuated, compressed, except at base, where it is as wide as high; the unguis large, and much hooked; commissure much curved from base to unguis; outline of rami of inferior mandible quite straight. Nasal tubae rather more than a fourth the length of the culmen, broad, but much depressed, with an indistinct median longitudinal groove; terminally exceedingly obliquely truncated; the nostrils oval. The feathers of the front form a very obtuse angle on the culmen, but instead of immediately retreating on either side, they extend forwards again on the sides of the upper mandible, nearly as far as on the culmen. Wings of ordinary length and shape. Tail rather long, contained only 2½ times in the wing from the carpus; much rounded, as usual in the genus. Feet moderately stout; tarsus just equal to the middle toe without its claw; outer toe without its claw longer than the middle; inner toe unusually abbreviated, the tip of its claw falling 4 of an inch short of the base of the middle claw.

Color.—The bill is wholly deep brownish black; somewhat lighter on the sides of the lower mandible; the extremity of both unguis horn colored. The inner aspect of the tarsus, the middle and inner toes, the whole of the webs, and the bases of the claws, clear light yellowish flesh color; the outer aspect of the tarsus, the outer toe, and tips of the claws, the same color, but much tinged with brown. The shade of the upper parts is a pure deep chocolate [April,
brown, without the slightest tinge of ashy; a little darker on the rump, so dark as to be brownish black on the wing coverts and tertials; the extreme tips of which latter are somewhat paler. The primaries are lustrous brownish black on their outer webs and at their tips; and their inner webs are but little paler; their shafts are on their superior aspect black, becoming brownish basally; their inferior aspects also black, but with a delicate white line running mediately two-thirds their whole length. The rectrices are colored like the primaries; their shafts are brownish black. The entire under wing coverts are white; the purity and continuity of which is, however, interrupted by some grayish brown marbling. The under parts generally are much lighter than the upper, and of a grayish rather than brownish fuliginous, this color passing on the throat and chin gradually into a somewhat grayish cheonous hue. The short anterior under tail coverts are light grayish brown; the long posterior ones are more of a brownish fuliginous. There is a delicate touch of white on the under eyelid.

**Dimensions.**—Length of bill along culmen 1·70; from feathers on side of lower mandible to its top, 1·60; length of nasal tubes, 4·5; height of bill at base, 4·5; width about the same. Wing, from the carpus, 11·00; tail, 4·25; graduation of lateral rectrices, 90; tarsus, 2·00; middle toe and claw, 2·40; outer do., 2·30; inner do., 1·90.

It may seem somewhat improbable that a species of *Nectris* has remained to this late day undescribed; but the subject of the present article differs in so many particulars from any known bird of the genus, that I have not the slightest hesitation in presenting it as new. It is most closely allied to *fuliginosus*, Sticke., but differs from it, as well as from *carneipes* and *tenuirostris*, in many very tangible points. The combination of the wholly dark bill, with the coloration of the feet, as above described, the white on the under surfaces of the wings, together with its own particular dimensions, readily characterize it among its congeners. The following detailed comparison of it with each may serve to define its relationships more explicitly.

With the general colors of *fuliginosus*, especially as regards the wholly dark bill, it differs in the conspicuous white under wing coverts, only a little obscured by grayish brown, and in the different tints and pattern of the feet. (Compare original descriptions of each species.) It is much smaller than that species.—to wit: the length about fifteen inches, (as near as I can judge from the skin,) instead of eighteen; the tarsus barely two inches, instead of two and a quarter; the toes less in proportion; and the wing eleven, instead of twelve inches.

It is more nearly of the same size as *carneipes*, but in that species the “whole of the plumage is chocolate black;” the bill is flesh colored, except on the culmen and at the tip, whereas in my bird it is wholly dark. The feet of *carneipes* are wholly “yellowish flesh color,” while in *amaurosoma* the external aspect of the tarsus and the outer toe are brownish white.

The species hardly requires any comparison with *tenuirostris* or *brevicula*, the notable differences of color alone, or of dimensions alone, at once separating them. The bill of *amaurosoma* measures about 1·70 inches; that of *tenuirostris* 1·20; the wing 11, instead of 10 inches; the tail 4·75 to 5·00, instead of 3·50, etc. The general color of *tenuirostris* is a deep smoky black, with a tinge of ashy; that of *amaurosoma* brownish fuliginous. Compare also the descriptions given in this paper of the colors of the bill and feet. There is just about the same amount of whiteness on the under surfaces of the wings of the two species.

The type of this species, now in the Smithsonian collection, was procured by Mr. John Xantus at Cape St. Lucas, Lower California, August 18th, 1860. It is there apparently the representative of *fuliginosus*, as my *opisthomelas* is of *obscurus.*

1864.]
Nectris carneipes, Bp. ex Gould.


Habitat.—"Numerous in all the seas bounding the western coast of Australia; and breeding on the small islands off Cape Leeuwin." [Gould.]

This species is quite closely allied to fuliginosus, but differs from it by exceedingly well marked characters. The plumage is much the same in both species, but the bill of carneipes is "fleshy white, the culmen and tips of the mandibles brown; the legs, feet, and membranes, yellowish flesh-color." Besides these differences in color, there appear to be equally marked discrepancies in proportions; thus, while fuliginosus is eighteen inches long, and carneipes only fifteen, the absolute lengths of the bill, feet, and wings is very nearly the same. (Compare original descriptions by Strickland and Gould.) I have never seen any example so small as the one whose measurements are given by Dr. Schlegel, p. 26 of his monograph, but the limits within which any species of this family may vary are very great. But even granting for a moment the identity of the two species, I do not see upon what authority Dr. Schlegel has given the name carneipes of 1844 priority over fuliginosus of 1832.

Bonaparte, in his Conspectus, has a species N. gama, from South Africa, with which he considers Puff: cinereus, juv., Smith, as synonymous. I have never had an opportunity of examining a specimen professing to be of this species; but as the diagnosis scarcely shows tangible points of difference, and as Dr. Schlegel is convinced of its identity with carneipes, I shall, for the present at least, follow his authority in assigning it as a synonym of that species.

An excellent suite of specimens of carneipes is in the collection of the Philadelphia Academy.

Nectris tenuirostris Bp. ex Temm.


"Puff: tristis, Mus. Parisiensis."

Habitat—Japan, and neighboring seas.

I have before me a typical example of this marked species, from Niphon, agreeing in every respect with the types of the species as described by Schlegel.

The most peculiar character of form of this species is found in the shape of the bill. It is stout at the base, where it is a little broader than high, but rapidly becomes both compressed and depressed, tapering to a small, weak, only moderately hooked unguis. This unusually weak bill is also short, being much less than the head, and only about two-thirds the tarsus. The nostrils measure about a third the length of the culmen. The commissure and outline of the inferior mandibular rami are both nearly perfectly straight. The wings are very long, reaching much beyond the rest; the primaries are all tapering and acute. The tail is exceedingly short, its length being contained nearly three times in the wing from the carpus, the central rectrices projecting a little, the lateral rapidly graduated. The feet are moderately large and

[April,
stout; the tarsus is about equal to the middle toe without its claw; the outer toe and claw are equal in length to the middle toe and claw; the tip of the inner claw falls short of the base of the middle.

Bill mostly dusky greenish yellow, brighter along the commissure and at tip. Feet yellowish on the anterior, exterior and internal aspect of the tarsus and toes, and the superior surfaces of the webs, the posterior edge of the tarsus, and the under surface of the webs blackish. Above very deep sooty black, becoming pure black on the rectrices and outer webs of the primaries, with a just appreciable ashy nuance on the wing coverts. Inner webs of primaries (except at their tips) and the under surfaces of the wings generally light dull grayish brown. Shaft of primaries black, except along a groove on their under surfaces, which is yellowish. Beneath, the whole body is of a rather light fuliginous or brownish grey, fading, on the throat, (especially in more immature birds) almost into greyish white. The under tail coverts, however, are nearly as dark as the upper parts, only rather more fuliginous.

Dimensions. Wing from the carpus 10·00 inches; central tail feathers 3·50; lateral 2·75; bill along culmen 1·20; depth at base 30; width at base 40; tarsus 1·90; middle toe and claw 2·25; outer toe and claw the same; inner toe and claw just equal to the tarsus.

This strongly marked species is distinguished from all its congeners by its small size, weak, peculiarly shaped bill, very short tail, and peculiarly colored feet. The difference in intensity between the colors of upper and under parts are quite appreciable.

Synonymy. The proper name of this species is a matter of no uncertainty, but what designations are to be referred to it as synonym is more doubtful. Both Bonaparte and Schlegel place "carilicus, Pennant," of the museums of Europe, as a synonym, which is merely, however, saying that certain museums have called tenurostris, "carilicus," and does not in the least affect the question as to whether carilicus be properly a synonym. I am inclined to think that it is not, but that it is rather to be referred to another and larger species of this fuliginous genus.

Bonaparte and Schlegel both consider "tristis, Forster, Descr. p. 205," as synonymous with this species. It is difficult to say whether such is or is not the case; but my own impression, derived from a careful study of the characters laid down by Forster, is that his tristis refers to a species much larger, and with a stouter bill than the present; possibly the true carilicus, Penn.

**Nectris brevicauda** Bp. ex Brandt.


Habitat. "Found in all the Australia seas, and breeds in the greatest abundance on several of the islands in Bass's straits." [Gould.]

"Blackish fuliginous, lighter beneath; bill black, yellowish at the base; feet cinereons, their webs yellow." [Bonaparte.]

This is a species with which I am autoptically unacquainted, nor have I access to the original description and figure of Brandt, and I am therefore unable to discuss its characters and relationships. By Dr. Schlegel it is placed as a synonym, with a query of *N. tenurostris*, but other authors all agree in considering it as a valid species.

**PUFFINUS** Brisson.

Bill about as long as the head, or a little less, about three-fourths the tarsus, rather stout, a little higher than broad at the base, compressed for the 1864.]
rest of its length; the unguis strong, much hooked; nasal tubes about a fourth the length of the culmen, broad, depressed, obliquely truncated, the septum thick, the nostrils oval; wings long, pointed, first primary longest, surpassing the tail, which is lengthened and more or less rounded, of twelve rectrices.

Feet very large and stout; tarsus compressed, as long as the middle toe and claw; outer toe about as long as the middle, but its claw much shorter and weaker; tip of inner claw not reaching the base of the middle one; claws strong, little curved, moderately acute, somewhat depressed, the middle one with its inner edge dilated; halluc extremely abbreviated, only apparent as a short, stout, conical, rather obtuse claw. Of moderate and small size. Bicolor: bill and a portion of the feet usually dark colored.

The genus *Puffinus*, as characterized in the above paragraph, comprises numerous bicolor species, spread all over the world. They form two groups. Those of the first group are large, with robust bills, and have the upper plumage brown or cinereous. They are *major*, *laeviculas*, *Kuhlii* and *eretopous*, which compose the "genus" *Ardenna*, Reich. The species of the second group are all much smaller, with very slender, weak bills, and the upper parts blackish or greyish black. They are *anglicorum*, *galenicums*, *obscurus*, *opisthomelas* and *niger*, forming the restricted "subgenus" *Puffinus*.

**Puffinus Kuhlii**, (Boie.)


**Discussion of Synonymy.**—There is in the Atlantic Ocean a very common and well known Procellarian, to wit, the "cinereus Shearwater," a bird about the size of *Puffinus major*, Faber, but otherwise quite distinct from it in form, color, etc. This bird was named *Procellaria Kuhlii* by Prof. Boie, in 1833. (Isis von Oken, p. 237, sp. 25, which consult.) From Boie's excellent characterization, and from the very marked distinctive features of the bird itself, there need have been no confusion or uncertainty regarding it. But before 1835, so common and well known was the bird, that it had been noticed by numerous other writers, and unfortunately most of them had erroneously applied to it Gmelin's name *cinerea*; while others had with equal inaccuracy called it *P. puffinus*, Linnæus. When more recently C. L. Bonaparte attempted to show that "cinerea, Gm., Lath.," was not the common Atlantic bird at all, but a Pacific species, (described as *P. haecitata* by F. ster) and properly the type of a genus (viz., *Adamastor*, Bp.) distinct from *Puffinus*; the assertion was illy received by ornithologists, and the general confusion rather augmented than diminished. To the following attempt to unravel the knotty points of synonymy involved, I would invite the particular attention of ornithologists, as I hope to be able to sustain the position assumed by Bonaparte. [April]
The following is Gmelin's diagnosis, in copying which the italics are my own: S. N. i. pars ii. p. 563, sp. 17. "Pr. cinerea, subus alba, cauda nigra, rostro flavicans; pedibus carnososculitis. "Cinereous Fulmar," Latham, Syn. iii. p. 405, No. 10. Habitat intra circulum antarcticum; glacialis magnitudine: 20½ pollices longa." It will be noticed that Gmelin's bird is one from the Antarctic seas, as large as the common Fulmar, and with exactly the characters of the bird afterwards designated as Adamastor typus by Bonaparte. Gmelin's further description will be found to confirm this opinion by each of its sentences. I do not see, therefore, how it is possible to consider it as referring to a North Atlantic species, with characters so very different as are those presented by P. Kuhlil, Boie.

The Proc. cinea, Lath., Jud. Ornith., ii. 1790, p. 824, and the Proc. cinea, Vieillot, Nouv. Dict. d'H. N. 1817, xxv, p. 418, are both exactly the same as Gmelin's cinea, and so is the Puffinus cinereus of Lawrence, Bds. N. A., 1858, p. 855, from the Pacific Ocean, under which head the synonyms of Adamastor typus are accurately enumerated.

The above is all that is necessary to be said, I think, to substantiate Bonaparte's position, that P. cinea, Gm., is not the Atlantic bird afterwards named Kuhlil by Boie. The subject will be resumed and the generic and specific characters of Adamastor typus, as distinguished from those of Puffinus Kuhlil, will be enlarged upon in another place. It now only remains to discuss the various synonyms of Kuhlil.

The first instance of the misapplication of Gmelin's name, cinea, which I have been able to find, is that by Cuvier, when he calls P. Kuhlil "P. cinea."


Yet another improper reference of Gmelin's cinea is found in Degland's Ornithologie Europene, where it is placed as a synonym (with a query, however,) of P. major, Faber. This is just the mistake which has been generally committed by American Authors.

I am enabled to state positively, from autoptical examination of the specimens themselves, that the bird referred to by Cassin, in the Proceedings of the Philadelphia Academy for June, 1862, page 327, as Puffinus Kuhlil, is really the Adamastor cinereus, Mihi. The specimens, three in number, collected by the North Pacific Exploring Expedition, are lying before me, and agree in the minutest particulars with the type specimen of Lawrence's Pacific, (Ann. N. Y., Lye. N. H., 1853) which is also Lawrence's P. cinea (Birds Amer., 1858, p. 835,) which is Adamastor typus, Bp.

Description. In general form not unlike P. major, but rather more graceful, with slightly slenderer and weaker bill, comparatively longer wings and tail, etc. Bill scarcely if at all shorter than the head, just equal to the tur- sus, moderately stout, compressed, higher than broad at the base; unguis only moderately strong and hooked; commisure and outline of inferior mandibular rami a little curved, the former most so; nasal tubes unusually abbreviated, measuring not over a fifth of the culmen, elevated, inflated, medianly subarcuate, apically obliquely truncate, the nostrils subcircular in outline; wings moderately long, a little exceeding the tail; tail quite long, so much rounded as to be almost cuneiform, the central rectrices much elongated.
ated; feet rather weak and slender, moderately compressed; tarsus shorter than the middle toe without the claw; outer toe and claw longer than the middle with its claw, tip of inner claw about reaching base of middle one; claws obtuse, little arched, more or less dilated on their inner edge.

Colors. The upper parts are of a light smoky gray, or very light brownish ash color, this color uniform on the crown and nape, interrupted on the back by the pure or grayish white margins of all the feathers, which margins are broadest on the scapulars, deepening on the wing coverts and tertials into deep grayish brown, and also losing the white margins. The rump is concolor with the rest of the back, but the upper tail coverts have successively more and more white until the longest and most posterior ones are almost wholly of this color, with only some central tinges of grayish brown. The primaries are deep grayish or brownish black, with, however, large white spaces which occupy the basal half or two-thirds of their inner webs. The outer webs, and apices of the secondaries are deep grayish plumbeous; the greater part of their inner webs white. The entire parts of the bird, from the chin to the extreme tips of the under tail coverts are pure white, except some slight soungens of grayish on the flanks. The under surfaces of the wings, except just along the edges, and the axillary feathers are pure white. The connection of the color of the upper parts with the white of the under, on the sides of the head and neck, is peculiar; there is no line of demarcation whatever, but as the color of the upper parts becomes lighter in tint, so it becomes gradually more and more nebulated and undulated with white, the admixture of the two having a marked and beautiful effect. The under eyelid is wholly white, the upper less completely so. The bill is yellowish, darker along the culmen, the auris light horn color. The legs and feet are yellowish, the webs still clearer yellow; the claws flesh colored.

Dimensions.—Length of bill along culmen 1-90, along gape 2-60, from feathers on side of lower mandible to its apex 1-75; height at base .70; width .60; tarsus 1-90; middle toe and claw 2-50, outer do. 2-55, inner do. 2-50; wing from the carpus 12-75; central rectrices 5-50, exterior do 4-75.

The variations in size to which this species is subject, are entirely parallel with those of P. major, detailed further on. The color of adult birds does not vary much, and that chiefly in the slightly different degree of clearness or obscurity of the upper parts. Younger birds, however, have the bill rather dusky than yellowish, and somewhat of a greenish or bluish tinge in the color of the feet. The upper parts are considerably darker than those of the adults, being rather more of a brownish plumbeous than of an ashy grayish tint.

*Puffinus leucomelas* Bp. ex Temm.


With this species I am autoptically unacquainted, and therefore compile the following brief account from Dr. Schlegel's excellent Monograph, above quoted.

It is in general similar to *P. Kuklitii*, which it appears to replace in the Pacific Ocean. It is smaller, however, than that species, slenderer in general proportions, and with a weaker bill. In color it is principally distinguished by having the feathers of the upper parts generally, and of the sides of the head and neck white, each with a brown longitudinal shaft line.

Length of wing from the carpus from 11½ to 12 inches. Middle tail feathers 4½ to 4¾ inches, external 3½ to 3¾ inches. Bill 22 to 23 lines; height at base 5 to 6 lines; width about the same. Nasal tubes 3½ lines. Tarsus 21 lines; middle toe 23 to 25 lines.

Habitat.—Pacific ocean, particularly in vicinity of Japan.

[April,
Puffinus creatopus Cooper (MSS.) Nov. Sp.

Diagnosis. P. Puffi majoris staturia, nec ei coloribus perdissimilis; sed rostro multo breviore, crassiore, tubulis nasali bus inflatis; ferè omnino nisi ungue flavescente-carneoe; pedibus brevioribus, gracilioribus, carneis; tectricibus caudâ superioribus et inferioribus ex tuto brunneo-nigris; remigibus primaris spatio albo basin versus interni pogonii carentibus.

Habitat.—South Pacific Coast of North America.


Description.—Form.—Bill a little shorter than the head or tarsus, about two-thirds the middle toe and claw; the most robust of the Puffineæ, being especially large and swollen at the base, where it is as wide as high. The culmen rises rapidly from the end of the nasal tubes to the strong, very convex and much curved unguis; the sides of the bill are considerably compressed beyond the nostrils. Commissure curved from the feathers to the unguis, the convexity looking downwards; outline of the inferior mandibular rami about straight. The basal tubes are very short, being hardly a fourth of the length of culmen; they are unusually elevated, turgid, and with a slight median furrow; very obliquely terminated; the nares are elliptical in outline. The feathers of the forhead run forward to form an acute angle on the median line. The tarsi are unusually weak and slender, though not very much compressed, and are shorter than the middle toe without the claw. The outer toe just barely exceeds the middle, but its claw is much shorter and weaker. The tip of the inner claw falls short of the base of the middle one. The wings are of the ordinary shape and dimensions, and have the usual proportionate length of the primaries. The tail is of much the same length and has the same amount of graduation of its lateral rectrices as in P. major.

Color.—The upper parts are of about the same shade of brown as in P. major, and the feathers have similar lighter margins, the head, however, having more decidedly a plumbeous cast. The upper tail coverts are entirely deep brownish-black, darker even than the rest of the upper parts, with no vestige of white. The inner webs of the primaries are entirely brownish-black to their very bases, with no indication of the white spaces which exist in P. major. On the sides of the head and neck, the color of the upper parts extends entirely round on to the chin and throat, having no distinct line of demarcation, but very gradually and insensibly becoming more and more mottled with white, until the latter becomes the predominating color; on the chin the plumbeous-black and the white are about equal in amount. The dark color does not extend further nor indeed so far on the sides of the breast as on the sides of the neck. The lower eyelid is pure white. The sides under the wings and the inferior surfaces of the wings are mottled with grayish-black and white in about equal amount. The long axillary feathers are entirely grayish-black, except just at their bases. The middle of the abdomen and the circuman al region are variegated with grayish-black and white. The under tail coverts are entirely fuliginous black, with somewhat of a grayish cast. The nasal tubes, the culmen and unguis of the bill are brownish-black; the rest of the bill light—yellowish flesh color. The legs and feet are entirely light flesh color. The claws are whitish with brown tips.

Dimensions.—"Length 19·00; extent of wings 45·00" (collector's label.)

Bill along culmen 1·60; along gape 2·30; from feathers on side of lower mandible 1·50; height at base, 60; width about the same; length of nasal tubes 40. Wing from the flexure 12·50. Tail: exterior feathers 4·00, median 5·00; tarsus 2·10; middle toe and claw 2·65; outer do 2·50, inner do 2·10.

Comparison with allied species.—The present species is so very peculiar in 1864.]
most of its features, that it intimately resembles no other with which I am
acquainted. It may be well, however, to notice the points of difference be-
tween it and *P. major* which is the most nearly allied species. There is but
little difference in size between the two birds, *creatopus* being only slightly
smaller, and the color of the upper parts is about the same in each. *Creatopus*
may be at once recognized as follows: by its much shorter, stouter bill, usu-
ally turgid and thick at the base, with its very short swollen nasal tubes, and
light flesh-color, except along the culmen and unguis; by its shorter, slen-
derer flesh-colored feet; by its entirely brownish-black upper tail coverts; by
the extension of the dark color of the sides of the head and neck, far round on
the chin and throat without any distinct line of demarcation; by the absence
of any white at the bases of the primaries, and by the unusual amount of gray-
ish-black mottling on the sides, the under surfaces of the wings, the axillary
feathers, and circumanal region.

The shape of the bill is more like that of the common Atlantic *Kublii*; and
the nasal tubes are quite as short. But the bill of *creatopus* is much stouter,
 wider and more turgid at the base, and the unguis is much more rapidly
decurved. The color is quite different, (compare descriptions.) The legs of
*cinereus* are yellow; of *creatopus* light flesh-color. The differences in plum-
age are too obvious to require comparison; e. g. *cinereus* has pure white
under tail coverts; *creatopus* brownish-black, etc.

I have been unable to find any description which can be considered as in-
dicative of this species, which I believe to be hitherto quite unknown. It is
exceedingly interesting, from its many peculiarities of form and color. It is
particularly to be noted, that it is the only "bicolor" species, that is, dark
colored above and mostly white beneath, which has flesh-colored legs; this
coloration of the legs being hitherto only known to its extent among the fullig-
nous species composing the subgenus *Nectris*.

The type and only known specimen of the species was taken by Dr. J. G.
Cooper, at San Nicholas Island, off the coast of California. Its precise range
of habitat is as yet unknown. Accompanying the specimen was a note from
Dr. Cooper, stating that it was a species unknown to him and probably new,
and suggesting, in the latter event, the exceedingly appropriate name by which
I have designated it.

**Puffinus major** Faber.

10; et auct. al. aliq.; sed non Linn., Gmel., Lath., quæ *Puffinus* anglorum
Ray; nec Temm. quæ *Procellaria* Cuv. (*Kublii* Boie.)

ni. p. 203.—Lawrence, Birds N. A. 1858, p. 833.—*Procellaria major*,
Schlegel, Mon. Proc. Mus. Pays-Bas, 1862, p. 27.—*Ardenna major*,
Reichenbach, Syst. av. t. xiv, fig. 770.

Birds Amer. 1844, vii. p. 212, pl. 456; et al. script. Americ; sed non
Gmel.

Habitat.—Atlantic Ocean, especially its northern and temperate portion.
Mediterranean Sea. Atlantic coast of Africa. Cape of Good Hope. Terra
del Fuego. Not the Pacific Ocean?

Synonymy.—This species has been presented under a variety of designa-
tions. Some authors have thought with Kuhl, that it is the one referred to
by Linnaeus, Gmelin and Latham, under the name of *Procellaria puffinus*. Else-
where, however, I have proven, I think, that such is not the case, but that
*P. puffinus*, Linn., is a synonym of *P. anglorum* Ray.

The *Procellaria puffinus* of Temminck (loc. cit.) is not this species, nor yet
the *anglorum* (although he presents it as the real Linnaeus *P. puffinus*;) but
on the contrary, it is the *P. Kublii*, Boie, as is evident from the description and
the synonyms quoted. I am quite at a loss, however, to discover upon what

[April,
grounds Temminck asserts that the *P. puffinus*, Kuhl, and the *P. cinerea* Kuhl, are "le vieux et le jeune de la même espèce." Kuhl's descriptions certainly indicate the two different species; and his passable figures of their heads are distinct enough from each other. But if Temminck could stoutly maintain to the last that *P. fuliginosus*, Strickl., was the female of *P. major*, Fab. (1), it is the less to be wondered at that he should commit the error we are now discussing.

It is a little doubtful what species is referred to by Vieillot, Nouv. Dict. d'H. N. xxv, 1817, p. 421, under the name of " Le Pétrél-puffin, Procellaria puffinus, Lath." The dimensions given ("vingnez pouces") appertain best to the *angulorum*; but the description is entirely that of the *P. Kuhlii*, which it is doubtless best to consider it. The *Procellaria puffinus* of Vieillot's Fauna Franç. 1828, p. 404, is undoubtedly the true *cinereus*.

Dr. DeGland in his Ornithologie Europ'one, p. 363, gives a good description of this species under its proper name of *Puffinus major*, but he is in error in citing as synonyms the *Puffinus cinereus*, Brisson, or the *Procellaria cinerea* Gmelin and Latham.

**Description.**—Form: Bill but very little shorter than the head or tarsus, stout and suberetere at the base, then gradually more and more compressed to the strong, deep, much curved unguis. Nasal tubes straight, about a fourth the length of the culmen, somewhat dilated, the apertures widely separated, sub-elliptical. The culmen rises gradually with a slight but continuous concavity from the nostrils to the summit of the unguis. The commissure from the insertion of the feathers to the declination of the unguis is a long regular curve, whose convexity looks downwards. The outline of the inferior mandibular rami is nearly straight. The bill is about three times as long as it is high at the base, considerably less wide than high. The primaries are long, somewhat narrow, rather acutely pointed, the first longest, the second nearly equal, the rest rapidly graduated. The tail is long; being contained only about two and a third times in the wing from the carpus; so much rounded as to be almost cuneiform; the central rectrices projecting considerably, and the lateral being much abbreviated. The tarsus is as long as the middle toe alone, compressed as usual, but very stout and strong. The outer toe is as long or slightly longer than the middle, but the small size of its claw makes it fall short of the tip of the middle claw. The inner toe is unusually abbreviated, the tip of its claw falling far short of the base of the middle one.

**Color.**—Upper parts dark bistre brown; on the head inclining a little to plumbeous or grayish brown; on the tertials and rump the deepest; each feather of the back, rump, and wing coverts with a margin of lighter brown, which in freshly plumaged birds is so light as to be almost ashy white; on the head the color is uniform without any lighter margins, and it extends considerably below the eyes, just to the level of the gape, having a clear and distinct line of demarcation with the white of the throat. Posteriorly on the side of the neck the white reaches further round on the nape, and has a more indistinct outline. Backwards still on the sides of the breast, the dark color reaches farther down, encroaching on the white of that region. The upper tail coverts, especially the longest and most posterior ones, are mostly white, but with transverse rays or central spaces of brown. The primaries are brownish black, deepest on their outer webs; on their inner webs, towards their bases, gradually lightening till they become brownish white, or even nearly pure white, in freshly plumaged birds, especially on the innermost primaries. The under parts from chin to anus are white; this color interrupted on flanks by the more or less numerous, large, isolated, dark brown patches, which coalesce just over the flanks. The under surfaces of the wings are white, except just along their edges where they are mottled with brown; and the apices of the long axillary feathers are brownish. The under tail coverts are deep grayish

1864.]
brown, more or less conspicuously tipped with whitish. The tail feathers are like the outer primaries. The bill is deep blackish horn. The outside of the tibia and the exterior toe are brownish; the rest of the feet including the webs yellowish flesh color.

**Dimensions.**—Total length 18.00 to 20.00 inches and hundredths; expanse of wings 43.00 to 45.00. Bill along culmen 2.00; from feathers on side of lower mandible to tip 1.75; depth at base .65, width .00; wing from the carpus 13.00; tail: central feathers 5.75; exterior do. 4.75; difference 1.00; tarsus 2.40; middle toe and claw 2.00; outer do. 2.75; inner do. 2.30.

**Variations.**—The differences in dimensions which this large species presents are so great that the above measurements can only be considered as an average; and individuals will be found considerably above and below the standard. The bills of various specimens, as well as the tarsus and toes, differ to the amount of two or even three tenths of an inch; the wings from the carpus three-fourths of an inch, or more, and the tail proportionally. The relative proportions, however, and the shape of these several parts appear to be pretty constant.

There also exist greater variations in color than are found in most of the species. The difference appears to depend chiefly upon age, or rather upon the age of the feathers themselves. Just after the moult, when the feathers are fresh and new, they are of a clear deep brown with a considerable of a plumbeous tinge, and their margins are exceedingly light colored, in fact almost white on the tertiaries, etc. With advancing age the feathers become more and more of a duller brown, much like that given by Audubon in his plate; the margins are broader, less deeply defined, and simply of a dull grayish brown. Constant characters, however, seem to be the uniformity in color of the feathers of the head, there being no light margins to them; the peculiar line of demarcation on the sides of the head and neck, and the partially white upper, and almost wholly dark under tail coverts. Audubon’s plate of this species, otherwise excellent, is very wrongly colored as regards the bill and feet. The bright tints he gives them rather appertain to another species.

Notwithstanding these variations, the present species is so marked a one that it is not readily to be confounded with any other. Some small and light colored specimens look something like examples of *P. Kuhlii*: the exact differences between the two will be given under the head of the latter. From *P. ungarum*, its size and the color of the upper parts at once distinguish it.

*P. obscurus* and its allies are too different to require comparison. *P. major* may always be recognized by the peculiar size and shape of the bill (carefully examine preceding description); by the lighter margins of the feathers of the upper parts; by the line of demarcation of the white and brown on the sides of the head, as above given; and by the colors of the under tail coverts and flanks, which are the reverse of those of *Kuhlii*, its nearest ally. However light the color of the upper parts may be, they never acquire the real ash tint which is a distinguishing characteristic of the latter species; and the colors of the bill and feet are always conspicuously different.

This species has an exceedingly extensive range. It apparently inhabits the entire Atlantic Ocean, up to exceedingly high latitudes. Dr. Schlegel has specimens from points on the west coast of Africa and from the Cape of Good Hope. A specimen before me from Terra del Fuego, collected by Mr. T. B. Peale, Naturalist of the U. S. Exploring Expedition, is identical with the common north Atlantic bird.

**Puffinus angolorum**, Temm. ex Ray.


[April]


**Habitat.**—North Atlantic Ocean, at large.

This species, though so long known and so common, yet requires very careful investigation; both because its bibliography is somewhat extensive, and on account of its variations in size and color, which are so considerable that there has been much confusion concerning it. I will first examine into its synonymy, and then proceed to characterize the species beyond the probability of any further difficulty with its specific characters.

The *Procellaria puffinus* of Linnaeus, Gmelin, and Latham, has been variously interpreted by modern authors. Most writers, including Kuhl and others, consider it as the bird which was afterwards named *P. major* by Faber. Temminck makes it equal to the *cinereus* of Gmelin. Bonaparte and Schlegel regard it as undoubtedly referring to the present species. An examination of the diagnoses of Linnaeus, or Gmelin, or Latham,—particularly the latter,—will, I think, make it quite patent that the last is the only tenable view to take of the name. Such expressions as are found in e. g. Latham’s notice, as “Pr. corpore supra nigro, subitus albo” *§* *§* "15 pollis longa," etc., can only be considered as referring to the *anglorum*; for they are totally at variance with the essential characters of the *P. major*. Moreover, Latham cites “*P. anglorum*, Raii, Syn.” as a synonym of the species. Such being the case, I unhesitatingly accord with Bonaparte and Schlegel in their identification of the Linnaean *P. puffinus*. I am quite at a loss to understand upon what grounds M. Temminck makes the remark that “ni Linna ni Latham non commen est oisean.”

The first recognized classical notice of this species is that given in 1713 by Mr. Ray, under the name of *Proc. anglorum*. Brisson calls it *Puffinus anglo- rum*; it is indicated by Linnaeus, Gmelin, and Latham as *Proc. puffinus*, with "anglorum, Ray," as a synonym. Temminck was, I believe, the first binomialist who adopted Ray’s designation; he calling it in 1820 *Procellaria anglo- rum*; in 1840 *Puffinus anglorum*.

This species is also the *Puffinus arcticus*, Faber (i. e.), as is evident from his diagnosis. The reference of Faber’s name *arcticus* to the *P. major*, as has been occasionally done, is quite erroneous. I have an indistinct recollection of having seen this species cited as *Procellaria* or *Puffinus* "manksii," but I cannot at present call to mind the reference.

A certain "*Puffinus Baroli*, Bonelli," is admitted as distinct by Bonaparte in his Conspectus, p. 204, and also in his Tab. Longip. in the Comptes Rendus. It is said to be somewhat smaller, lighter colored, and with a slenderer bill. Well acquainted as I am, however, with the variations in just these features which the *anglorum* frequently presents, I cannot discover sufficient grounds upon which to separate *P. Baroli* even as a distinct variety; but rather entirely agree with Dr. Schlegel in considering it as an undoubted synonym of *anglorum*, or at least of *P. geleanus*, which is the representative species in the Mediterranean Sea.

Bonaparte (Conspr. ii. p. 203) inquires "quid Dor. *puffinus*, Kuhl, Mon. Proc. p. 146, sp. 22, t. xi., f. 10, ex Mediterraneo?" to which I would reply unhesitatingly that it is the *Puffinus major*, Faber. The description is entirely pertinent, and the figure much more readily recognizable as representing the head and bill of this species, than are many of the delineations of the work.

1864.]
Description.—Form:—The bill, measured from the frontal feathers, is about three-fourths as long as the skull, rather more than two-thirds the tarsus. Its height at the base is just about equal to the width. Its height at the point of greatest convexity of the unguis hardly exceeds that at the middle of the culmen. The unguis is not very strong, its convexity only moderate. The commissure at first curves gently upwards, then still more gradually downwards for the whole length of the bill, and then is pretty strongly deflected along the edge of the unguis. The outline of the lower mandible is about straight to the unguis, a little concave thence to the tip. The length of the nasal tubes is a little less than a fourth that of the culmen. The outline of the feathers on the upper mandible is the segment of a perfect circle. The folded wings just about reach to the end of the tail. The second primary is nearly as long as the first, the rest successively more and more rapidly graduated. The tail is contained about two and a third times in the wing from the carpal joint. It is much rounded, the lateral rectrices all regularly graduated; the exterior just three fourths of an inch shorter than the central pair. The tarsus is just as long as the middle toe without its claw. The external toe and claw is a little longer than the middle toe and claw. The tip of the inner claw falls short of the base of the middle one. The claws are all nearly or quite as broad as high, being much dilated on their inner edges.

Color:—The entire upper parts are of a deep lustrous black, with a soupçon of brownish, especially when the feathers are old and worn. On the front and sides of the head and neck the black has a grayish or plumbeous cast. This color extends on the sides of the head much below the eyes, in fact quite to the throat, but it is more or less marbled with white. The under eyelid is pure white, in marked contrast with the surrounding black. On the sides of the neck the white extends further round towards the nape; on the sides of the breast, on the contrary, the color of the back extends a considerable distance, it being of a decided greyish plumbeous hue, and gradually becoming more and more marbled with white till it entirely disappears. The primary quills are black, as are their shafts, their inner webs fading into dull grayish brown. The entire under parts, from chin to under tail coverts, are pure white, with the single exception of a few feathers just on the flanks, and of the outer webs of the exterior row of under tail coverts, which are plumbeous black. The under surfaces of the wings and the axillary feathers are pure white, with a slight marbling of blackish just along the bend of the wing. The caudal rectrices are like the primary quills; the inferior surfaces of their shafts grayish white. Bill deep greenish black, some part of the lower mandible yellowish. Part of outer side of tarsus, whole of outer side of exterior toe and the claws brownish black; rest of feet light yellowish, including the webs.

Average dimensions:—Bill along culmen 1.40; height at base .45; width about the same; along rictus 2.10; from feathers on side of lower mandible to its tip 1.40; wing from the carpal joint 9.25; tail: exterior feathers 3.25, middle 4.00; amount of graduation .75; tarsus 1.80; middle toe and claw 1.90; outer do. 2.00; inner do. 1.55. Total length about 14.00; extent of wings about 33.00.

Variations.—As to dimensions, these are quite considerable. As usual among Perissodactyla, the bill differs a good deal in absolute size, as well as in robustness, generally preserving its shape, however, quite contantly. The longest bill before me measured 1.50; the shortest 1.30, along culmen, with a corresponding difference in other dimensions. The wing from the carpal joint varies nearly half an inch, and the tail to a corresponding degree. The total length of tarsus and toes varies about a third of an inch. In color the species is more constant, the chief variation being in the greater intensity or more decided brownish tint of the black of the upper parts. Younger specimens have more marbling of the plumbeous black and white on the sides of the breast, the color sometimes reaching nearly or quite across the breast, or
even invading the throat. In immature individuals, also, the lateral inferior caudal tectrices may be more extensively hued with plumbeous black. They are never, however, so much darkened as is usual in obscurus or opisthomelas.

This species may be always recognized among its congeners by the following combination of characters; its peculiar dimensions (see above), joined to the very dark upper parts, this color descending far on the sides of the head and breast, leaving a conspicuously white under eyelid; the almost entirely white under tail coverts and the comparative shortness and characteristic degree of roundness of the tail.

This is so very distinct, and at the same time so well known a species, that it hardly requires comparison with any other. The features in which the P. yelkouan differs from it will be pointed out under the head of the latter.


Habitat.—More eastern portions of the Mediterranean Sea; especially in the Black Sea, and in the vicinity of the Bosphorus.

With this species, admitted by the majority of modern authors, I am acquainted only through descriptions. This is specially to be regretted, since authors are at variance regarding its characters and affinities, and are not even entirely agreed upon its specific validity. Bonaparte considers it to be the representative of obscurus in the Black Sea and vicinity, and says that it is smaller than that species (being only 10 inches in length) and has a slenderer bill. Dr. Schlegel, on the contrary, considers it as most intimately allied to anglorum, which it replaces in that locality. As far as I can judge from a careful study of published descriptions, I entirely agree with Dr. Schlegel in opinion. On comparing it with anglorum, Dr. Schlegel has found it to differ as follows: In the greater elongation of the point of the wing; in the color of the upper parts being lighter and rather tending to grey than black, as is also the color of the dark feathers of the crissum; and in the uniform deep gray of the lateral under tail coverts, these latter being, in anglorum, black on their outer, and white on their inner webs.

The following detailed measurements are given by the same author, taken from individuals coming from the Bosphorus, near Constantinople. They are to be compared with those of anglorum, already given on a previous page. Wing (from the carpus), 8-33 to 8-66 inches and hundredths. Tail, 2-40 to 2-60. Bill along culmen, 1-20 to 1-50; height, 23 to 33; width, .40. Nasal tubes, .16 to .20. Tarsus, 1-60 to 1-80; middle toe, 1-58.


Habitat.—The warmer portions of the Atlantic Ocean, especially the Gulf of Mexico, and the coasts of the Southern United States; abundant in the Bahamas and Bermudas. Wanders as far north as New Jersey, and is accidentally found in Europe. Apparently replaced in the corresponding latitudes of the Pacific Ocean by my Puffinus opisthomelas.

For so long known a species, the present has remarkably few synonyms,

* I find this barbarous name variously spelled yelkouan, yelkuan, yelkoun, etc. I have seen fit to modify it somewhat, that it may present somewhat of a classical aspect.

1864.]
and its bibliography is as explicit as that of almost any of the eighteenth century species of the family. First indicated with tolerable accuracy in Linnaean times, the species has almost invariably been presented under its original and proper specific title, though referred successively to the genera Puffinus, Nec- tris, and Cymolomus. The names "Temminieri" of Lesson, and "floridanus" of the Berlin Museum, which I quote upon the authority of Bouaparte, are the only specific synonyms which I have met with.

There is an unusual and remarkable discrepancy in the statements of various authors concerning the length of the species, different writers giving the dimension from as little as 93 inches to over 13. It is impossible that it should vary to this extent. I believe the average length is a little over eleven inches.

Audubon's description of this species is sufficiently pertinent, but the plate he gives is unusually poor, and by no means true to nature. The outline of the bill is exceedingly faulty; the line of demarcation of the dark and light colors along the side of the head and neck is by no means accurate, and the lower tail coverts are represented as entirely white. The exact insertion of the right tibia of the individual figured has always been to me, anatomically speaking, a puzzle.

Dr. Kuhl informs us, in the text, that figure 11 of plate ix. of his Mono- graphie der Procellarien was intended as a representation of the bill of this species; which is fortunate, as otherwise it would be quite impossible so to identify it.

I am much surprised at the statement by Dr. Degland, (Ornithologie Еuro- péene, ii. page 396, published in 1849!) that "cette espèce est peu connue, et il n'est pas certain qu'elle est distincte de la précédente"—P. angolorum! This author's indication of the habitat of this species is vague, and leaves much to be desired.

M. Temminck (Mau. Ornith., ii. p. 805) gives, under head of P. obscurus, an excellent description of this species, except that the dimensions are inaccurate, being far too small. The exact measurements of both of Temminck's typical examples are given by Dr. Schlegel in his recent monograph of the Procellaridae, (Mns. Pays-Bas, p. 30.) This author finds that one of the types is an example of angolorum, from the Mediterranean Sea, afterwards labelled by Temminck himself a P. Baroli, Bonelli; and that the other is a small, weak-billed specimen of the true obscurus, from the Atlantic Ocean. These facts, supported by the authority of one so well known for diagnostic acumen as Dr. Schlegel, are indicative of an imperfect acquaintance on the part of Tem- minck with the species he treats of under the name obscurus.

The species of Puffinus spoken of in a paper published by Dr. D. W. Prentiss and myself in the Annual Smithsonian Report for 1861, (p. 418), as having occurred at Washington, D. C., and doubtfully referred to as the obscurus, has since been definitely ascertained to be this species.

Description.—Form: The bill is rather small and weak, and considerably compressed, except just at the base. In length along the culmen it measures just about two-thirds the skull, and about three-fourths the tarsus. It is quite stout at the base, where the height very decidedly surpasses the width. The unguis rises rapidly and a little suddenly above the rest of the culmen, and is strongly convex in outline. The commissure, from the insertion of the feathers to the unguis, as well as the outline of the lower mandible as far as the unguis, is almost perfectly straight. The nasal tubes are short, being much less than a fourth the length of the culmen, but they are elevated and quite conspicuous, much more so than in angolorum. The wings barely reach, when folded, to the end of the long tail. The proportionate lengths of the primaries are the same as in most other species. The tarsus is just as long as the middle toe without its claw. The outer toe with its claw is just as long as the middle one with its claw. The top of the inner claw about reaches the

* "Longueur, à peu près 10 pouces,"

[April,}
base of the middle. The tail is very long, exceeding that of anglorum, which is a much larger species. It is also so very much graduated as to be almost conical, the lateral feathers being relatively shorter than in any other species. The under tail coverts are very long, fully equalizing the central rectrices.

Color.—The upper parts are of a hue quite different from that of anglorum, the black having every where a quite appreciable grayish or plumbeous tinge, and the borders of the feathers being still notably lighter, especially on the scapulars and tertials. The color is deepest on the rump and upper tail coverts; it is much restricted on the sides of the head and neck, not extending below the level of the eyes, and even there its borders are marbled with white. On the sides of the breast the dark color extends considerably more towards the median line, but it is of a very light plumbeous tint, and much variegated with white. Both eyelids are more or less white, and there is, moreover, an indication of a white superciliary streak. The remiges and rectrices are colored, as in anglorum. The under parts, from the chin to the under tail coverts, are white, as are the axillary feathers and inferior alar rectrices, the white only interfered with over the flanks by leaden black. The longest posterior under tail coverts are brownish black, as are also one or two rows of the exterior ones, the rest being white, with or without a plumbeous tint. Notice that in amount of white on the under tail coverts, obscurus is just intermediate between anglorum and my new opisthomelas. The bill is deep leaden blue, darker at the apex; the legs and feet colored, as in anglorum.

Dimensions.—Length of bill along culmen, 1-25; along rictus, 1-70; from end of nostrils to tip, 1-90; from feathers on side of lower mandible to its apex, 1-20; its depth at base, 1/40; width, 1/55; depth at convexity of unguis, 1-25. Wing, from the carpal joint, 8-00; Tarsus, 1-60; middle toe and claw, 1-50; outer do., 1-55. Central tail feathers, 4-25; exterior feathers nearly an inch shorter. Total length from tip of bill to end of tail about 11-00; expanse of wings about 25-50.

Variations.—I find the differences in size to be about the same, relatively to its dimensions, as in the other smaller Puffini, while, as usual, the general form and the proportion of parts are pretty constantly preserved. The characteristic hue of the upper parts is always recognizable, but the precise tint varies with the age of the feathers. The margins of the dorsal feathers are frequently very conspicuously lighter. The limit of the extent of the dark color on the sides of the head, neck, and breast, hardly differs notably, even with age, and is a strong specific character. The relative amount of the black and white on the under tail coverts is also pretty constant, being intermediate between anglorum and opisthomelas, as before stated. The unusual graduation of the tail is, I believe, always preserved in mature birds.

The combination in this species of its small size, the tint of the upper parts, and its characteristic line of demarcation with the white on the sides of the head, neck, and breast, together with the color of the under tail coverts, and the length and shape of the tail, renders it readily diagnosticable. As with anglorum, I have taken it as the standard in treating of the other closely allied; and the peculiar points wherein each differs from it will be found detailed under their respective headings.

Puffinus opisthomelas Cones, nov. sp.,

Diag.—P. Puffino obscurae nec perdiffimilis; sed major, rostro longiore, robustiore, alis pedibusque longioribus, caudâ breviore, minus rotundata; et tecticibus caudâ inferioribus fere omnino fuliginoso-nigris.

Habitat.—South Pacific coast of North America.

Description.—Form: The bill is rather long, about four-fifths the tarsus, stout, moderately compressed, a very little higher than broad at the base, the unguis large and strong, its convexity great, and rising much above the level of the rest of the culmen, the depth of the bill at the point of the greatest 1864.]
convexity of the ungus being much more than in its middle. The outline of the inferior mandibular rami is almost straight as far as the ungus; the line of the commissure is considerably curved. The nasal tubes are large and prominent, and rather long for this group, being more than a fourth of the culmen; and the nasal apertures are much elongated, being very elliptical rather than circular. The frontal feathers extend forwards to a point on the median line instead of being the segment of a perfect circle, as in anglorum and obscurus. The folded wings reach beyond the tail. The tail is comparatively and absolutely much shorter than in obscurus and very decidedly less rounded, the difference between the middle and exterior rectrices being only about half an inch. The feet are as much longer than those of obscurus as is proportional to the greater size of the bird; the tarsus is as long as the middle toe and half its claw. The outer toe and claw equals the middle; the tip of the inner claw falls short of the base of the middle one.

Color.—The nasal tubes and culmen are blackish, the sides of the bill yellowish or reddish brown, the ungus mostly light bluish white. "The iris is dark brown," (collector's label.) The internal aspect, and part of the outer side of the tarsus, the middle and inner toes and the webs are light yellowish flesh color. The rest of the tarsus, the outer toe and the very margin of the webs is brownish black. The claws are brown. The entire upper parts, the wings and tail are of exactly the same shade of sooty black as obtains in obscurus, but with the following notable difference in the line of demarcation of the white on the sides of the head, neck and breast: the dark color is much more extensive, reaching as far below the eyes as it does in anglorum, and there is no definite union of the two colors; but as the dark takes on more and more of a lighter plumbeous hue, it insensibly becomes more and more nebulated with white. There is no white on either eyelid, nor any indication of a white superciliary line. The under wing coverts are white, as in obscurus; the bend of the wing rather more decidedly mottled with the color of the back. The axillary feathers are more or less blackish towards their ends instead of being pure white. The flanks are more extensively and decidedly fuliginous black than in obscurus. It is in the color of the under tail coverts, however, that the difference from obscurus is most apparent. These feathers are entirely of a deep fuliginous black, except a few of the shortest ones just posterior to the fundament, which are whitish.

Dimensions.—Bill along culmen 1.40, along commissure 2.00, from end of nasal tubes to tip 1.05, from feathers on side of lower mandible to its tip 1.40; height at base .32, width a little less; height at convexity of ungus .32. Wing from the carpus about 9.00. Tarsus 1.80; middle toe and claw 2.10. Tail 3.75; outer feathers .60 shorter; (in obscurus tail 4.25; outer feathers nearly 1.00 shorter.)

Variations.—With but two specimens before me, I cannot speak so fully on this point as I could wish; but the variations are doubtless quite parallel in all respects with those of anglorum or obscurus. The above measurements indicate the average of the two specimens. They are precisely similar in colors.

Comparison with allied species.—This new species differs from obscurus as follows, briefly: In its larger size, as will be palpable from the measurements given of the bill, wings and feet.* In its both relatively and absolutely shorter tail, which is also much less rounded. In the different outline of the frontal feathers on the bill. In the different coloration, insomuch that there is no white about the eye; that the dark color extends much further on the sides of the head and neck; and that the under tail coverts are almost entirely fuliginous black, instead of being for the most part white.

It is distinguishable at a glance from anglorum by its greatly inferior size,—

* The collector's label gives, "Total length 15 inches; expanse of wing 32;" but these cannot be implicitly relied on.
Puffinus Nuqax (Solander.)


"Procellaria australis, Eyton, " (Bp.)

Habitat.—Australian seas.

A fine suite of this well marked species is in the collection of the Philadelphia Academy. Its relationships are closest with P. obscurus, but the differences are sufficiently obvious on comparison. It is the very smallest known species of Puffinus, being appreciably less than the obscurus. It is hardly 10 to 50 inches in length; the wings from the carpus only about 6½; the tail averages 2½; the bill about one inch; the tarsus 1½; the middle toe about the same. The color of the upper parts is about the same as in P. obscurus, or a very little lighter; the feathers generally with appreciably darker tips. A striking diagnostic feature is found in the extent to which the white of the under parts mounts up on the sides of the head and neck, which is greater than in any other species. The inferior caudal tectrices are usually entirely pure white. The under surfaces of the wings are pure white, and the inferior aspect of the inner webs of the primaries are dull whitish, being much lighter than are these parts in obscurus. The bill is dusky horn color. The tarsi are greenish yellow; the webs bright chrome yellow.

The preceding paragraph shows the points in which the species differs from obscurus. It is too distinct from anglorum or yeucanus to require comparison. It cannot be confounded with my P. opisthomelas, since the latter is nearly as much larger than obscurus as nuqax is smaller; has the coloration of the sides of the head and neck very different, (compare descriptions;) has black instead of white under tail coverts, etc.

I have not an opportunity of examining the original description of nuqax by Solander, but all authors agree that it is the species subsequently named assimilis by Gould. I do not know where the species is called australis by Eyton, but quote the name on the authority of Bonaparte.

Analytical Synopsis of the Genera and Species of Puffinae.

Family PROCELLARIDÆ.
Subfamily PROCELLARINÆ.
Section Puffinae.

Char.—Tail of twelve much graduated feathers. Bill long, compressed, 1864.]
much hooked, the outline of the unguis of the lower mandible concave, de- 
curved. Nasal tubes short, broad, flattened, apically usually very obliquely 
truncated; in length usually a fourth of culmen; the internasal septum 
broad. In color either entirely fuliginous, or cinereous, or brown above and 
white beneath; never glaucous or bluish, or with parti-colored primaries. 
"Shearwaters."

I. MAJAQUEUS Reich.
The very short tail only a fifth of the total length. Bill unusually stout 
for this section; nasal tubes approaching in character those of Fulmareæ. 
Very large; fuliginous, with peculiar facial markings.

1. M. æquinocitialis Reich. 
capitâ bona-spei, Briss.
Tarsus 2½ inches; unguis of bill yellow; a submental white spot.

Larger; bill more robust; its unguis bluish black; tarsus 2½; usually a 
white submental spot; a lateral stripe on sides of head, and a transverse one 
across the vertex before the eyes.

II. ADAMASTOR Bp.
Bill and nasal tubes identical with those of MAJAQUEUS. Tarsus much less 
than middle toe without claw. Tail very short, much graduated. Bi-color; 
avove cinereous, below white.

Proc. cinerea, Gm. (non Cuv., Kuhl., Temm., Schleg., Degl., Schinz., 
Kevs. et Blas. qua Puff. Kuhlii, Boie; nec And., Mitt. qua Puff. major, 
Fab.) Puff. cinereus, Lawrence, 1858. ADAMASTOR CINEREUS, Coues, 
1864. Proc. hasitata, Forst., Gould, Reich. (non Kuhl, Temm., New-
ton, qua Astrelata diabolicum = Puffinus hasitata, Lawr., 1853. Puff. 
Kuhlii, Cass. [1862] nec Boie. Proc. adamastor, Schleg. ADAM. TYPUS, 
Bp.
Bill yellow, nasal tubes, culmen and sulcus on lower mandible black; above 
with under surface of wings and tail cinereous; below white; 19 inches long; 
bill 1·80, wing 13·00, tail 5·75, tarsus 2·40, middle toe and claw 2·90.

FLAVIS, Bp.
Above brown, with paler edges to the feathers; wings and tail deep black-
ish brown; below, including the under surfaces of wing and tail, white, the 
feathers of the former with a brown longitudinal streak; bill yellow, its tip 
dark; 19 inches long, wing 15, tail 6·50, middle toe and claw 3·15.

Puff. sericus, Lesson.
Bill black; above grayish ash, deeper on the wing coverts; below white; 
15 inches long, wing 11·50, tail 5, tarsus 1·75, middle toe 1·33.

III. THIELLUS Gloger.
Generally like Nectris, but tail unusually long and cuneiform, being nearly 
or quite half as long as the wing from the carpus.

Bill flesh color, tinged with brown, darker on culmen and unguis. Length 
15 to 16 inches, wings about 11, bill 1·60.

Bill greenish orange, black on culmen and at tip. Bill 1·85; stouter than 
in sphenurus, a little larger than that species, but the wing usually shorter, 
(¼ inch or more.)
IV. NECTRIS Bp. (emend. Forst.)

Size moderate; unicolor, fuliginous; feet pale; bill long, slender, much hooked; nasal tubes short, flat, very obliquely truncated; tail long, rounded; tarsus about equal to middle toe without claw, (vix nisi colore fuliginoso generæ Puffino differre videtur!)

8. N. fuliginosus Keys. et Blas.


Bill concord with plumage; feet brownish black, internal face of tarsus and the webs dusky yellowish. Length 18 inches, wing 12, bill 2-00. North Atlantic.

9. N. amaurosoma Coues, nov. sp.

Bill concord with plumage; feet fleshy white, outer side of tarsus and outer toe tinged with dusky; inferior wing coverts mostly white; wing 11 inches, tail 4-25, bill 1-70. Pacific coast of N. Amer.

10. N. carneipes Bp.


Bill fleshy white, culmen and tips dusky; legs, feet and membranes yellowish flesh color. Length 15 inches; length of bill, feet, wings, tail, much the same as *fuliginosus*. Australian seas.

11. N. tenuirostris Bp.


Very small; bill excessively weak and slender; wing 10 inches, tail 3-50, bill 1-20, tarsus 1-90. Bill dusky greenish yellow; feet yellowish; posterior edge of tarsus and under surface of webs blackish. White under wings as in *amaurosoma*. Japan.


"Blackish fuliginous, lighter beneath; bill black, yellowish at base; feet cinereous, webs yellow." (Bp.) "Australian seas." Gould, [species mihi ignota.]

V. PUFFINUS Briss.

Moderate and small in size, bicolor, above brown or cinereus, below white. Wings very long and pointed; tail long, rounded. Feet very large; tarsus shorter than middle toe and claw; bill long, rather slender, compressed, hooked; nasal tubes short, flat, obliquely truncated; nasal septum broad, nostrils oval.


Bill yellow, its nasal tubes more elevated, compressed and vertically truncated than usual in this genus. Above light brownish ash or cinereous, each feather with a lighter margin, nebulated and undulate with pure white on sides of head and neck; posterior upper tail coverts and whole under parts, including under surfaces of wings and all the under tail coverts, pure white. Tail almost cuneiform; feet weak and slender, yellowish; outer toe and claw longer than middle do. North Atlantic Ocean only.

1861.]

Proc. leucomelas, Temm.

Smaller than P. Kuhlii; weaker bill. Feathers of the upper parts and sides of head and neck grayish white, each with a longitudinal shaft line of brown.

15. P. creatorpus Cooper, n. sp. [in epistolis.]

With the general aspect of P. major. Bill short, usually swollen and stout at the base, nasal tubes elevated, turgid, short. Bill yellowish flesh color. Nasal tubes, culmen and tip blackish. Feet light flesh color! Upper parts generally as in P. major, but no white on upper tail coverts; no white at bases of primaries; the color of sides of head extending round on the throat, with no dividing line; and the under tail coverts entirely fuliginous black. Bill along culmen 1½0; height at base ½0.

16. P. major Fab.


Above smoky brown, the feathers with lighter edges. Posterior upper tail coverts mostly white. A definite line of demarcation between the brown and white on the sides of the head and neck. Length 18 to 20 inches; bill 2, wing 13, tarsus 2½.

17. P. anglorum Temm.


Tarsus equal to middle toe without claw. Bill about two-thirds the tarsus, along culmen 1½0 inches; wing 9½. Above very deep lustrous brownish black,—darker than in any other species.


Proc. yeliganes, Acerbi.

From the Mediterranean Sea. Like P. anglorum, but lighter colored above, the point of the wing more elongated, and lateral under tail coverts uniformly deep grey.


Bill three-fourths as long as the tarsus. Tail very long, much graduated. Above grayish, or plumbeous black, not extending on the sides of the head below the eyes. Axillary feathers white. Longest posterior under tail coverts brownish black, rest white. Bill 1½, wing 8, tail 4½, exterior rectrices an inch shorter. Tarsus 1½; middle toe and claw 1½—inch and hundredths.

20. P. ophistomelas Coues, nov. sp.

From Cape St. Lucas. Generally like P. obscurus, but larger, with a longer bill and wings, a shorter, less graduated tail; almost all the under tail coverts and axillary feathers fuliginous black, and a different line of demarcation between the color of the upper and under parts on the sides of the head and neck. Bill 1½, wing 9, tarsus 1½, middle toe and claw 2½, tail 3½, outer rectrices only ½0 hundredths of an inch shorter.


From the Australian seas. Smallest of all; wing only ½ inches, tail 2½, bill one inch, tarsus 1½. The white of the under parts mounts high up on the sides of the head. Under tail coverts entirely white. Under surfaces of inner webs of primaries dull whitish.

[April,
May 3d.

Vice-President VAUX in the Chair.

Fourteen members present.

Mr. Cassin informed the Academy that our late fellow member, Mr. Samuel Ashmead, had bequeathed to the Academy his entire collection of Algae, together with the privilege of selecting from his mineralogical cabinet such specimens as may be desirable.

May 10th.

Vice-President VAUX in the Chair.

Thirteen members present.

May 17th.

Mr. Lea in the Chair.

Twenty-two members present.

A paper was presented for publication entitled "New Unionidæ, Melanidæ, &c., chiefly of the United States." By Isaac Lea.

May 24th.

Vice-President Bridges in the Chair.

Eighteen members present.

A paper was presented for publication entitled "Descriptions of new marine Invertebrata from Puget's Sound, &c." By Dr. Wm. Stimpson.

May 31st.

Vice-President VAUX in the Chair.

Sixteen members present.

On Report of the respective Committees, the paper of Mr. Lea, read May 17th, was ordered to be published in the Journal, and the following papers in the Proceedings:

Critical Remarks on the Genera SEBASTES and SEBASTODES of Ayres.

BY THEODORE GILL.

In the Proceedings of the California Academy of Natural Sciences, "Remarks in relation to the Fishes of California, which are included in Cuvier's genus Sebastes," and subsequently, in the Proceedings of the Zoological Society of London, "Notes on the Sebastoid Fishes occurring on the coast of California, U. S. A.,"* have been published by Wm. O. Ayres, M. D., C. M. Z. S.

* I have been favored by Prof. Baird with the advance sheets of these Proceedings.

1864.]
The object of these memoirs is to show that there are eleven species of Sebastoid fishes in the Californian waters, distributable among two genera, distinguished only by the prominence or little development of spinous ridges on "the top of the head." For those with ridges he reserves the name Sebastodes; for those with "little developed" ones, he accepts the name Sebastodes, proposed for a natural genus of which S. paucispinis is the only known species.

Rehearsing the history of Sebastodes, Dr. Ayres admits that the "grouping of characters" assigned to it "belongs only to the single species S. paucispinis;" and also in his final paper, that "the minute scales" belong only to S. paucispinis," and then proceeds to show that species of other genera have some of the characters attributed to it! He finally dismisses Sebastodes immediately after the remark that "the minute scales" belong only to S. paucispinis," with the conclusion that "it does not seem possible, therefore, (!!)) that Sebastodes can be retained with such limits as were assigned to it by Mr. Gill"! The logical character of the inference is rather dubious, after the admission of the truth of a principal proposition. But for the benefit of Dr. Ayres, who may doubt the value of the character, the opinion of Dr. Günther, whose authority he will scarcely gainsay, is adduced. That gentleman attributes to Sebastodes "scales of moderate or small size," and not minute ones like those of S. paucispinis, which, although admitted in the genus by him, he had never seen. Günther has, however, shown his appreciation of the value of the size of the scales in all his diagnoses of the Scorpaenidae, and has separated the Triglae of Europe into two genera solely on account of the size of the scales. Therefore the single character admitted by Ayres as peculiar to Sebastodes paucispinis would alone, in the opinion of some, entirely separate it from his other species, but when it is stated that it also differs remarkably in the form of the head, the skull, the preoperculum, the connection of the vomer and palatine bones, the direction of the anterior teeth of the jaws, the palatine rows, &c., the unnatural character of the association in one genus of it and species of the ordinary Sebastoid form will be obvious. Sebastodes paucispinis is decidedly the only known species of the genus.

Dr. Ayres "refers without hesitation to the genus of which the common species of Massachusetts Bay, S. viviparus,† is a member," the species of Sebastoids with the frontal and coronal spines moderately or extremely developed, stating that the difference in the number of dorsal spines, when "un-supported, does not appear sufficient." In this respect also he differs widely from Günther: that author distinguishes Sebastes by the number of spines, assigning to it twelve or thirteen, and emphatically insists upon its value in his remarks on the Centropogon australis,—a species with fifteen spines,—remarking, that "this species approaches in general habit the genera Sebastes and Scorpaena, from which it must be separated on account of the number of the dorsal spines,—a much more certain generic character than the presence or absence of a preorbital spine, which is found in fishes that cannot be separated from Sebastes (S. nematophthalmus.)"‡ Dr. Ayres will doubtless admit the justness of the denial of the pertinence of any Californian species to the same genus as Sebastes with fifteen dorsal spines, when acquainted with this emphatic endorsement of the value of the number of dorsal spines and the depression of the importance of the cephalic spines. It is true that Dr. Günther admits, as the first two species of Sebastes, S. norvegicus

---

* Dr. Ayres has in his first article insisted that "the little 'accessory scales' mentioned by Girard are not confined to the three species stated by him, but are common to all," but in his final paper, he has admitted the truth of Girard's and my own descriptions.

† Dr. Ayres has omitted to state that I was responsible for the identification of the Massachusetts Sebastes with S. viviparus, and that his knowledge of that identity was solely derived from me.

‡ "One dorsal separated by a notch in a spinous and soft portion, with twelve or thirteen spines."—Girard, ii. 95.

§ Günther, ii. 129.
and \textit{S. viviparus}, which have "fifteen" dorsal spines, and which are indeed the types of the genus, but that gentleman has shown his appreciation of the value of the character, and has only been unhappy in its application: he should have given a new name to the genus defined by him. Dr. Ayres has omitted to inform his readers that the difference in the number of dorsal spines is also supported by a corresponding difference in the number of vertebrae, the species of \textit{"Sebastichthys"} having, as far as known, only ten abdominal and fourteen caudal vertebrae;\footnote{Gill, \textit{Proc. Acad. Nat. Sci., Phila.}, 1862, p. 278.} while \textit{Sebastes} has about twelve abdominal and nineteen caudal vertebrae.\footnote{The increase in the number of vertebrae in the species of \textit{Sebastes}, a genus peculiar to the Northern Sea, affords an excellent example of the truth of the generalization claiming an increased number of vertebrae for the cold-water representatives of the families of \textit{Acanthopterygiana}.}

The value of the characters used to distinguish the genera \textit{Sebastes}, \textit{Sebastichthys} and \textit{Sebastodes} is now indeed so generally conceded by scientific men, that it is unnecessary to further argue in their favor. I shall only remark that the combinations and distinctions of forms by Dr. Ayres are alike unnatural and violate all natural affinities, and that the distinctions used by him to separate his genera \textit{Sebastes} and \textit{Sebastodes} are only of secondary value. More acquaintance with the species of the family would undoubtedly convince him of the justness of this assertion.

Dr. Ayres has been unfortunate in at least one of his identifications, connecting Girard's name \textit{Sebastes rosaceus} with a species of "\textit{Sebastodes,}" with the remark that "this is the species originally described by Girard under the name \textit{rosaceus}; and again, quite correctly, in the tenth volume of the 'Pacific Railroad Reports.'" Yet \textit{S. rosaceus} is said to have "the upper surface of the head with horizontal and acute ridges," and is figured with such armature as well as with the second, instead of the third, anal spine longest, the pectoral and ventrals ceasing before the vent, &c.\footnote{Dr. Ayres, \textit{Proc. Acad. Nat. Sci., Phila.}, 1862, p. 483—501.} Girard's \textit{Sebastes rosaceus} is indeed a typical \textit{Sebastes} of Ayres, and entirely identical with the \textit{S. helvomaculatus} of the latter, as the examination of the two specimens known to Girard has convinced me. The specimens are in poor condition, but the spots are still visible. The \textit{Sebastodes rosaceus} of Ayres is therefore deprived of a name, and may receive that of \textit{Sebastosomus} \textit{piniger}.

It is also proper to here remark that two species are apparently confounded by Girard under the name \textit{Sebastes melanops}, one with, "a small spine upon the suprascapular bone, two others upon the edge of the opercle," and another from Cape Flattery with the lower opercular spine as well as the suprarorbital ridges obsolete, and the forehead between the eyes perfectly arched. The latter may be named \textit{Sebastosomus simulans}.

In conclusion, the genus \textit{Sebastichthys} includes at least three genera. The \textit{Sebastichthys nigricrenclus} is somewhat related to \textit{Scorpena}, and distinguished by elevated, serrated coronal crests. Other Californian species represented by the \textit{Sebastes melanops}, seen by me, differ so much that they may be separated and combined for the present under a genus \textit{Sebastosomus}, of which the \textit{Sebastes melanops} of Girard may be taken as the type. Still others, distinguished by the texture of the bones of the skull, armed orbital ridges, prefrontals, &c., and represented by \textit{Sebastes rosaceus}, Grd., may be named \textit{Sebastosomus}. In a contemplated Monograph of the \textit{Scorpenoids} of California, the relations of the species will be more fully discussed.

\textbf{Second Contribution to the SELACHOLOGY of California.}

\textbf{BY THEODORE GILL.}

Since the publication of the article "On the Classification of the Families and Genera of the Squali of California,"\footnote{\textit{Proc. Acad. Nat. Sciences, Phila.}, 1862, pp. 483—501.} \textit{\S} additional information has been

\[1864.\]
given in the "Bulletin of the Museum of Comparative Zoology," by Mr. F. W. Putnam, in a "List of Specimens sent by the Museum to different Institutions," and in the Proceedings of the California Academy of Natural Sciences by Dr. W. O. Ayres.* The former enumerates the Triakis semifasciata, Girard, Triakis Henleii, Putnam (= Rhinotriakis Henleii, Gill) and Acanthias Suckleyi, Girard (= Squalus Suckleyi, Gill.) Dr. Ayres has in one article announced, very modestly and with scarcely a due appreciation of its bearings, a startling discovery regarding the range of variation of dentition in the Notidanoids, and in a subsequent communication, has informed us of the discovery of a representative of the genus Alopia in the Bay of San Francisco.

Family ALOPECOIDÆ.

Genus ALOPIAS, Raf.

We are indebted to Dr. Ayres for the "Notice of the acquisition of a specimen of Thrasher," taken in the Bay of San Francisco. The species is a very close representative of the Atlantic form Alopia vulpes, differing, however, in the proportions of the dorsal and anal fins, and in the position of the branchial apertures; the tail constitutes decidedly more than half of the entire length. The specimen is about five feet in length."—(Ayres, op. cit., vol. iii. p. 66.)

Dr. Ayres has abstained from naming this species, and it may be hoped that the true differences between it and the Atlantic species will be exhibited by the future nomenclator. The announcement of any difference in the position of the branchial apertures from one not acquainted with the type, will be viewed with much skepticism by selachologists.

Family GALEORHINOIDÆ, Gill.

Subfamily MUSTELINÆ, Gill.

Genus MUSTELUS, Cuv.

This name may be reserved for the species distinguished by the anterior position of the first dorsal fin and the unicuspid teeth of the jaws. The Mustelus levis of Müller and Henle is consequently excluded, the first dorsal fin being nearly midways between the pectoral and ventral fins, and the teeth provided with a lateral cusp in addition to the usual median one; the fetus is also intimately connected with the uterus by means of a vitelline placenta, according to Müller and Henle, and is thus essentially distinguished from the typical Mustelich which resemble the other Galeorhiniolds. That species is therefore a peculiar generic type, and may hereafter be called Pleuracromylon levis.

If the rule now adopted by many of invariably retaining a generic name for the first species mentioned is adopted, Galeorhinus will supplant Mustelius. I am not yet, however, prepared to adopt that rule, and shall for the present retain the name Mustelius. Galeus cannot be used for the genus typified by the Squalus galeus of Linneus, and if Galeorhinus, which has been retained for it, should be shifted to Mustelius, a new name will be demanded for the former; as it is desirable that the change should be as slight as possible, that of Eugaleus may be accepted.

MUSTELUS CALIFORNICUS, Gill.

The first dorsal fin commences over the terminal third of the inner free margin of the pectoral fin, and its posterior point, though acutely prolonged, ceases considerably in advance of the ventral fins. The anterior angle is blunt, but not rounded. The second dorsal is similar in form to the first,

but smaller, and its hinder half is over the anterior two-thirds of the anal, with the posterior angle of which its own is co-terminal. (The caudal fin, from the front of the lower lobe to its point, equals the distance between the snout and the interval between the third and fourth branchial apertures; its terminal lobe little exceeds a fourth of its length, and is squarely truncated behind?) The ventral fin has its outer margin, from the base to the angle, about as wide as the width from that angle to the posterior point. The length of the rostral plateau in front of the jaw equals the width between the outer margins of the nostrils and the interval between the corner folds of the upper jaw.


This species is distinguished by the proportions of the snout, the more acutely prolonged posterior angles of the dorsal and anal fins, and perhaps the form of the terminal lobe of the caudal; but it is probable that the latter is worn, and consequently the statement of the length of the fin and the form of the posterior lobe must be accepted with reserve. The number of cartilaginous rays found after dissection of the skin is less than in the European species.

A single adult specimen was obtained by Dr. Stimpson at San Francisco, during his visit to that city as a member of the Scientific Corps of the North Pacific Exploring Expedition.

From Panama, the Institution has received several specimens of a closely-related species, distinguished by the projection of the posterior angle of the first dorsal fin to the vertical of the origin of the ventrals, although the anterior fourth of the base of the fin is above the pectoral. The caudal fin equals the distance between the snout and third branchial aperture, and its terminal lobe nearly equals a third of the length, and is obliquely truncated behind. The species may be named Mustelus dorsalis.

These species are interesting as being the first species of the genus found in the Pacific waters of America. The Mustelus felis of Ayres is a species of Triakis!}

Family NOTIDANOIDEAE, Owen.

Genus NOTORHYNCHUS, Gill (ex Ayres).

In the year 1855, and in the first volume of the Proceedings of the "California Academy of Natural Sciences" (p. 73), "Dr. Wm. O. Ayres exhibited a specimen of a shark of a new generic type, with the following description" of the genus

"NOTORHYNCHUS, Ayres.

"Dorsal fin single. Branchial apertures seven on each side. Spiracles two. Nostrils double, subterminal. Snout broad, depressed. Tail much elongated, with the fin beneath. Teeth in several rows, those of the lower jaw flattened, arched, serrated; those of the upper jaw of diverse forms, the middle ones slender, the outer ones approximating those of the lower jaw in form."

He remarked, that "the shark here described presents, certainly, a very singular grouping of characters. The only genus with which it can be compared is Cuvier's Notidanus, previously separated by Rafinesque under the name of Hoptranchias, both founded on Lacépède's Squalus cinereus. With this our type agrees in the remarkable feature of a single dorsal fin and seven branchial apertures. But in Notidanus the teeth of both jaws are represented as similar in form, and the muzzle pointed, the existence of spiracles being asserted by the one author and denied by the other. We have also in our fish the tail almost as much elongated as in Alopias."

The characters attributed to the genus Notorhynchus are common to all the 1864.]
Such, the jaws of the latter of the Upper jaw of diverse forms, the middle one slender, the outer ones approximating those of the lower jaw in form, the "snout broad, depressed;" the "spiracles two," the invariable number when developed in all fishes—and the "tail much elongated, with the fin beneath." Notorhynchus is therefore not distinguished by any character whatever from Heptanchias, either in the generic or specific descriptions of Ayres.

Such being the case, Girard and myself referred the species to the genus Heptanchus or Heptanchias, Raf., and the justness of that reference, under the circumstances, will be unhesitatingly admitted by every logical mind.

The causes of Dr. Ayres' manifold errors in the case are unknown; the peculiarity of the dentition of the Notidanoids is described in every text-book of ichthyology, and if Dr. Ayres had even consulted the Animal Kingdom, of Cuvier,—accessible to English students through a number of translations, his error would not have been committed.

Subsequently, I discovered the jaws of a Notidanoid taken at Nisqually, Oregon, by one of the gentlemen attached to Wilke's Exploring Expedition. Finding that the teeth were generically similar to those of Heptanchus indicus of Müller and Henle, and resembled them rather than those of the typical Heptanchi or Hestrachi, and, further, that the teeth of both more nearly resembled those of Hexanchus than Heptanchus, I felt compelled to combine the two species in a peculiar genus. I thus connected the views of Müller and Henle and others regarding the generic value of the number of branchial apertures with those of Bonaparte as to the generic value of the dentition. As the Heptanchus indicus was known to be "dark bluish grey above, with numerous small, irregular, black blotches, lighter beneath," the coloration attributed by Ayres to his Notorhynchus maculatus, I ventured to refer the jaws of the Nisqually shark to that species, since color is generally coincident with structure; the limited number of species of Notidanoids, the absence, so far as known, of two closely-related representatives in a single fauna, and the occurrence of Ayres' species in the same faunal region as the Nisqually shark, appeared to warrant this identification, the necessity of confirmation of which, however, I did then, as I now do, emphatically insist upon. I therefore perfectly agree with Dr. Ayres as to the impossibility of certainty "when [his] description is so extremely indefinite," and, in order that further cavil at the identification of the Nisqually shark with Notorhynchus maculatus may be avoided, suggest that the former may be named Notorhynchus borealis.

Having previously identified the Nisqually shark with the Californian Notidanoid—erroneously it may be—I felt compelled to retain Ayres' name, and did not detail the history of the genus, as such would have involved the necessity of criticism, but simply remarked that the name "was proposed by Dr. Ayres under a misapprehension."

Immediately after the publication of my article, Dr. Ayres* insinuated that his name was not given under a misapprehension, and asserted that his "misapprehension was, that (he) regarded the species as the type of a new genus." Such misapprehension is of course evident, but I cannot perceive why the name should be considered apart from the idea of the genus. I indeed think that the name itself, considered in the abstract, is objectionable and rather unmeaning if not, indeed, more censurable. The etymology of the name is not obvious; its formation would indicate that it meant "back snout, or beak," but it is possible that it is composed of νερος and πυχρακτα, in allusion to the protuberant snout.


[May]
Dr. Ayres then implies that it is only after several changes that I have arrived at the conclusion regarding the generic distinction of Notorhynchus. I have had two opinions, one, before seeing the species, that it was a Heptraknchias of Rafinesque or Heptraknchus of Müller,—accepting the views of Müller and Henle, Gray, Girard, &c., —and the final one, after study of the Nisqually jaw, that it was the representative of a distinct genus. For that genus I have adopted Ayres' name, but by no means the ideas connected with it by him.

One statement of Dr. Ayres is especially entitled to attention, as, if corroborated, it must effect an entire revolution in our views respecting the value of dentition, and is entirely opposed to the experience of Müller and Henle, Bonaparte, Agassiz, and all others. He remarks that my description of the dentition "represents the individual specimen on which it was founded; but the species is quite common here, and I find that the number and the forms of the teeth vary so much that my original description, which Mr. Gill says is 'equally applicable to any species of the family,' is fully as close as nature will allow us to draw." It is certainly rather unfortunate for science, as well as himself, that Dr. Ayres has omitted to produce proof of so remarkable a discovery, as, on account of the respectability and number of the gentlemen alluded to who have adopted other views, and in deference to whom reasons might be assigned, it will be regarded with at least some doubt and skepticism, notwithstanding even Dr. Ayres' assertion. It is scarcely necessary to remark, that if this discovery is confirmed, Notorhynchus must be suppressed and its species referred to Heptraknchias; but until such is done, it may, without any imputation on the perfect reliability of Dr. Ayres, be retained, since that learned gentleman has himself done so, notwithstanding his discovery and the admission of a misapprehension in regarding its representative as the type of a new genus.

June 7th.

Mr. JEANES in the Chair.

Seven members present.

Mr. Gill called the attention of the members to several points in Ichthyology and Conchology. He exhibited from the collection of the Academy a specimen of a species of Percopis obtained by Surgeon General Hammond in Kansas. The differences between it and the Percopis guttatus, Ag., of Lake Superior, also exhibited, were strong; the head is larger, (contained 3 1/2 times in the length, exclusive of caudal;) the dorsal is higher, (the longest ray equal to 4 3/4 of length;) the anal is also higher, (the longest ray contained six times in length;) the pectoral equals the height of the dorsal (=4 3/8;) the ventral especially is longest, contained 5 3/4 times in the length, and its extremity covers the anus, which is nearer the snout than the margin of the caudal fin. The species may be named, in honor of its distinguished discoverer, Percopis Hammondii.

Mr. Gill remarked that, after an examination of the species of Sodis, Raf., and Paralepis, Cuv., in the collection of the Academy, he was convinced that the families of Paralepidoids and Alepidosauroids were most closely allied.

Mr. Gill next referred to the history of the name Gymnotus, showing that it had been originally founded solely on the Gymnotus carapus, and that even after the introduction of the Gymnotus electricus into the system, the G. carapus was retained as the first of the genus. The retention of the name Gymnotus for the G. electricus and the bestowal of a new one on G. carapus are therefore obvious infractions of the laws of nomenclature. The name Gymnotus must be retained for G. carapus, and a new one given to the Gymnotus electricus, Linn.

1864.]
That of *Electrophorus* will be appropriate. This change is the least to be regretted, as the nomenclature of *carapus* is in a confused state, that name having been previously applied by Rafinesque to a species of the genus *Fierasfer*. Mr. Gill gave an enumeration of the genera of Gymnotoids, admitting the genera *Electrophorus, Gymnotus, Gill, (Gymnotus aequihabitos, Humb.), Gymnotus, Art., (—Carapus,) Sternopygus, M.T., Hypopomus, Gill, (Rhamphichthys Mulleri, Kaup,) Rhamphichthys, M. T., Sternarchus, Schneid., and Sternarchorynchus, Cast. Mr. Gill concluded by suggesting that the Gymnotoids were perhaps related to the Nematognathi, and remarked that he knew several undescribed species. Mr. Gill next called attention to the fact that the genus for which the name *Melantho* had been recently accepted from Bowdich, had long before been characterized under the name *Campeloma* by Rafinesque. In June, 1819, in the 88th volume of the Journal de Physique, (p. 423,) that type is introduced in the following terms:


This diagnosis is evidently only applicable to a Viviparoid, and was doubtless founded on a reversed specimen of the *Paludina ponderosa* of Say, or a closely related species. The name has indeed been referred, by the erudite Herrmannsen, to the synonymy of *Melanopsis*, and in this he has been followed by the brothers Adams, but the diagnosis, as well as the habitat, cannot support such a reference. In advance of the publication of the generic name *Campeloma*, Rafinesque had proposed a new genus—*Ambloësis*—in the third volume of the "American Monthly Magazine and Critical Review," (p. 355, Sept., 1818,) which was also doubtless intended for the *Paludina ponderosa* and its congener,* but the insufficiency of his generic diagnosis, as well as the want of connection with any described species, will prevent its adoption.

The speaker remarked that he would not attempt to enumerate the species of *Campeloma*, as he could not agree with previous authors regarding their limits, and had not the material to arrive at a satisfactory opinion himself; he could therefore only refer to the genus an assemblage of forms represented by the same specific names as were formerly placed under *Melantho*, after the exclusion of *Paludina Elliottii* of Lea, which probably belongs to the genus *Lioplax*. The names referred to the synonymy of the other species mentioned under that genus appear to represent forms of the genus, with the exceptions of *Paludina cornea*, Val., and *Lymnula ventricosa*, Raf. The former name was doubtless proposed for the *Lioplax subcarinata*, having the "sutures deeply impressed," and the "rampe" around the spire being especially characteristic of that shell. The *Lymnula ventricosa* was probably founded on *Aneulosa praesosa*, or an allied species.

---

*June 14th.*

**Vice-President BRIDGES in the Chair.**

Twelve members present.

A paper was presented for publication entitled "On the Influence of the Earth’s Atmosphere on the Color of the Stars." By Jacob Ennis.

---


[June,
June 21st.
Vice-President Bridges in the Chair.

Fourteen members present.

June 28th.

Dr. Carson in the Chair.

Eleven members present.
A letter was read from Thos. B. Wilson, M. D., of date June 28th, 1864, tendering his resignation as President 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 Marine INVERTEBRATA from Puget Sound, collected by the Naturalists of the North-west Boundary Commission, A. H. Campbell, Esq., Commissioner.

By Dr. Wm. Stimpson.

The following descriptions are extracted, by permission, from the Zoological Report of the Boundary Commission. They were written in the year 1860, and accompanied by illustrative drawings of all the species, which, it may be hoped, will soon be published.

CRUSTACEA.

Eupagurus Kennerlyi.

Carapax smooth, except where the setæ are attached. Median tooth of the front nearly obsolete; lateral teeth small but sharp and well-marked. Eyes moderately long and slender, but not longer than the peduncle of the outer antennæ; cornea little dilated, with a tuft of hair at the apex. Acicules small, pilose, not reaching the tips of the eyes. Feet all very hairy. Chelipeds short and stout, both falling considerably short of the extremities of the ambulatory feet, and strongly but not very thickly armed with short spines. In the greater cheliped the carpus is about as long as the palm of the hand; fingers shorter than the palm; two distinct rows of sharp tubercles on the dactylus. Smaller cheliped hardly reaching to the middle of the dactylus of the greater one, convex, or with an obtuse median carina armed with strong spines. There are no prominent spines or tubercles on the inferior surface of the merus and carpus in either cheliped. Color of hands in alcoholic specimens light red.

Length 2 inches; length of carapax, 0.4; of right carpus and hand together 0.51 inch.

An orthodactyle species, near E. pubescens, but with shorter and strongly spinous chelipeds. We have named it after the late lamented naturalist who discovered it.

Hippolyte prionota.

A short, plump species. Carapax with a high, compressed back, crested nearly the whole length, somewhat channelled longitudinally on each side near the crest, and armed with three spines in a longitudinal row above and behind the eyes; also with a strong antennal and a pterygostomian spine. Dorsal crest not sharp and lamelliform, but armed with four strong teeth, the front edges of which are beset with aculei, which, especially in the posterior teeth, form a transverse row when viewed from above. Rostrum more than half as long as the carapax, lamelliform, very broad, though not as broad as 1864.]
long; its front outline blunt, triangular or rounded; whole upper front and end margin minutely serrated with hispidiform teeth; lower margin with four small simple ones near the end. Eye with a spine at the inner apex; squamiform appendix to the antenna elongate-triangular in shape, with pointed end, not reaching beyond the rostrum. External maxillipeds reaching nearly to extremity of rostrum, and provided with both exognath and epignath; antepenult joint broad, with a strong spine at the external apex. Feet of the first, second and third pairs provided with an epipod. Abdomen with the dorsum rounded; third joint a little prominent, with an obtusely triangular, not conspicuous tooth at the posterior margin; lower margins of the segments smooth and obtuse, except the fourth and fifth, which form teeth. Four pairs of dorsal aculei on the terminal joint. Length about one inch.

Easily distinguished from the other North Pacific lamelli-rostral species by the serrated margins of the dorsal teeth and rostrum. It approaches nearest to *H. spina* (Sowerby), but has three supra-orbital spines instead of two. From *H. pectenifera* it differs in the non-pectinated margins of the abdomen.

Seven specimens of this fine species were dredged in February and March, by Lieut. White, in different parts of the Sound, viz., in Hale's Passage, 10 fathoms, soft bottom; off Lummi I., in 8—12 fathoms, shelly; near San Juan I., in 2—4 fathoms, mud.

**Hippolyte Suckley.**

Carapax with the anterior half of the dorsum crested and sloping forward; no supra-orbital spines; a strong antennal and pterygostomian spine present. Fourth joint of abdomen acute below. Rostrum large, but scarcely as long as the carapax, curved, rather broad and lamelliform, with a slender acute tip; lower margin four-toothed; upper margin including crest of carapax six-toothed, beginning at the anterior third of the length of the rostrum. External maxillipeds of moderate size, reaching nearly to extremity of antennary appendix, and provided with both exognath and epignath. Feet long, the last pair reaching nearly to the tip of the rostrum; first pair only provided with an epipod; dactyli of the last three pairs elongated, with only one terminal unguliculus. Abdominal segments with smooth edges; superior margin of third segment obtuse. Length 1\(\frac{1}{4}\) inches.

In the characters of the dorsal crest and rostrum it is much like *H. Gaianardi*, but it has no spine over the eye. From *H. Fabricii* it differs in having more numerous teeth on the superior margin of the rostrum, some of which are placed nearer to its extremity. It has less numerous superior teeth than occur in *H. Layi*.

Dredged in the circumlittoral zone. We have conferred upon this species the name of our friend Dr. Suckley, one of the earliest and most successful investigators of Pugettian Zoology.

**Hippolyte stylus.**

Body slender; abdomen strongly genticulated. Carapax smooth; back not crested except for a short distance anteriorly. There is an antennal spine, but neither supra-orbital nor pterygostomian. Rostrum slender, somewhat styloform, perfectly straight, and equal to the carapax in length; it is armed above with four or five teeth near the base, while the anterior two-thirds is edentulous; below there are five or six teeth. Antennary appendix oblong, scarcely shorter than the rostrum, and obliquely truncate at the end. External maxillipeds very small, reaching only to the extremity of the peduncle of the antenna; or to the basal third of the rostrum; they are provided with an epignath, but no exognath. None of the feet have an epipod. Terminal joint of the abdomen with four pairs of dorsal aculei. Length 1\(\frac{1}{4}\) inches.

Taken in the Straits of De Fuca by the U. S. Exploring Expedition. [June,
Hippolyte gracilis.

This is the most slender species which has come under our notice. The carapax is crested at the anterior third; there are no supra-orbital spines, but the antennal and pterygostomian spines are present, the latter spine being high in position from the narrowness or little height of the carapax. Rostrum exceedingly slender, scarce higher than wide, curved, a little longer than the carapax, and armed with four teeth over the eye; elsewhere smooth to the tip; below there are four minute distant teeth. The antennae are rather long, the thick flagellum reaching to the extremity of the rostrum. Antennary appendage a little longer than the rostrum. The external maxillipeds reach to the middle of the rostrum and have no exognath; the epignath perhaps exists, but we have been unable to discover it in our specimens. The feet are very slender, and none of them have an epipod. The abdomen is very long and strongly geniculated. Third segment compressed and prominent, as in Pandalus; penult joint much elongated. Length 1 1/4 inches.

Found in deep water.

Idothea Whitei.

Body slender; sides slightly convex; head large. Outer antennæ nearly two-thirds as long as the body; the flagellum equaling the peduncle in length and composed of from sixteen to eighteen joints. First thoracic segment short, less than two-thirds as long as the second. Abdomen segmented as in I. Wosnessenskii and the others of this group; it is one-half longer than broad, slightly narrowing posteriorly, with the extremity rounded, truncate, and bluntly acuminated at the middle. Feet moderately stout. Color yellowish, minutely punctate with dark gray. Length of body 0·81; length of abdomen 0·27 inches.

It is allied to I. Wosnessenskii, but is very much more elongated. It differs from I. media, following Dana's description, in its much longer antennæ.

We have dedicated this species to Lieut. J. W. White, who commanded the Revenue Cutter in the Sound while the Boundary Survey was in progress, and who rendered essential aid to the Naturalists of the Survey, by dredging many of the most interesting novelties which were obtained.

Idothea urotoma.

Body nearly linear, nearly five times as long as broad, broadest at the sixth thoracic segment. External antennæ a little more than one-half as long as the body; last two joints of the peduncle subequal; flagellum a little shorter than the peduncle and ten-jointed. Abdomen consisting, as in the others of the group, of three joints, with the partial separation of a fourth; subrectangular with convex extremities, and scarcely less broad at its truncate posterior extremity than at the anterior. The posterior extremity is peculiar in shape, the angle on either side projecting strongly, and separated by a notch from the convex or subtriangular middle portion, which bears a small tooth at the middle. The opercular abdominal feet which cover the branchial or swimming feet are large, nearly covering the entire under side of the abdomen. Thoracic feet slender. Length of the body 0·75; greatest breadth 0·17; length of the abdomen 0·20 inch.

We find no note of the depth of water in which this species was dredged.

Aega bellicaeps.

Smooth, subelliptical, and pointed anteriorly. Head with a small, short, blunt, rostriform process over the base of the superior antennæ. Eyes ovate, very large, but distant, and beautifully granulated (facetted). Thorax rather broad; segments each marked with scattered impressed puncte, mostly in a transverse row. Abdominal segments five in number, the terminal one scuti-
form, with its margin entire; apex obtuse. In the alcoholic specimens the color of the body is yellowish-gray, clouded; lateral margins with a series of black spots or blotches; base of abdomen black; caudal segments edged with blackish; eyes blue. Length of the body 0·76; greatest breadth 0·37; length of caudal segments 0·20 inch.

Two specimens are in the collection. It is perhaps an *Acherusia*, but we have access to no figure or description of that genus of Lucas.

**Bopyroides acutimarginatus**, nov. gen. et sp.

We propose this name for a new parasitic anisopod which we are unable to refer to any genus hitherto established, though it approaches very closely to *Bopyrus* in form, and indeed in all its characters, except that the abdominal branchiae of the female are rudimentary, being merely transverse fleshy ridges, instead of laminae. The upper surface, except the somewhat convex head, is flat and smooth, with the segments sharply defined. The margins of the body are very acute and somewhat recurved, especially at the head. The abdomen is distinctly six-articulated, the joints being indicated by deep incisions around the entire margin, dividing it into eleven subequal parts, so that the terminal joint is very small, no larger than a lateral extremity of one of the preceding ones. It is 0·29 inch in length, and 0·21 in greatest breadth.

It is found in the branchial cavity of *Hippolyte brevirostris*.

*Bopyrus hippolytes* Kroyer, belongs properly to the same genus. From this species ours differs in the acuteness of the margins and in the sharply square-cut lateral extremities of the abdominal segments.

**Caprella Kennerlyi.**

A large, pellucid species. Head armed with two small slender spines above, in a transverse line over the eyes. No spines on the first thoracic segment, and scarcely any on the second. The remaining segments, however, are armed with strong sharp tubercles on the sides, and a few smaller ones above. These tubercles become progressively sharper posteriorly. Superior antennae about one-half as long as the body; peduncle very thick and strong, with the first joint shorter than the second, and the last joint two-thirds as long as the second; flagellum very thin, filiform, equalling in length the last joint of the peduncle, and consisting of twenty joints. Inferior antennae small, reaching the middle of the second joint of the superior antennae, subpediform, and setose below. Branchial vesicles subovate, one-half longer than broad. Hand of the second pair of feet elongated, nearly three times as long as broad, thick and armed with two or three small slender teeth on the concave palm. Feet of the three posterior pairs short.

Length of the body 1·1; of the superior antennae 0·52; of the first and second thoracic segments taken together 0·44 inch. The description is that of a male.

Found on the bottom of the Revenue Cutter at Port Townsend.

**Amphithoe humeralsis.**

Body robust, entire; dorsum rounded, smooth and unarmed. Eye of moderate size, rounded, situated on a short projection of the head between the bases of the superior and inferior antennae. Superior antenna nearly as long as the body, the peduncle constituting less than one-third of its length; flagellum tapering to an exceedingly fine extremity. Inferior antenna half as long as the body, with its flagellum not longer than the antepenult joint of the peduncle. Epimera of the fifth pair large. Gnathopoda, or feet of the first two pairs, with rather small, weak, subpediform hands in both sexes; those of the third and fourth pairs with the basal joint very large and much expanded, nearly as broad as their epimera; meros-joint in the same pair small, com-

[June,
pressed, with a sharp arcuated anterior margin. Caudal stylets all with equal rami; last pair with the rami very short and flattened, the outer one armed with small hooks at its extremity. Telson small, obtuse-triangular.

Length of the body in a female, 1.2; height at the fifth thoracic segment, epimera included, 0.25 inch.

Found about low-water mark.

**Aonyx filiger.**

Head with a strong triangular process on each side beneath the base of the superior antennæ; extremity of this process not acute. Superior antennæ very short, about as long as the head, with a long, thick pencil of hair on the inner side of each; basal joint large, with a strong protuberance above, forming a prominent angle at its anterior extremity; flagellum seven-jointed, the first joint constituting one-third of its length; accessory flagellum three-jointed. Inferior antennæ longer than the body; the peduncle, however, constitutes but a small part of their length, being but little larger than the superior antennæ; the very slender filiform flagellum appears as if serrated above, but is not provided with calceolus. The first pair of feet in our single specimen appear to be pointed and simple, the dactylus not being retracted against the manus, which has no palm; second pair with a minute truncate hand, supporting a small tuft of hair at the base of the dactylus.

The dorsum in this species is sharp, or carinated, but not dentated, being entire and smooth in outline for the greater part of its length, and similar in the thoracic and first three abdominal segments. There is, however, a deep, triangular sinus between the third and fourth abdominal segments, the latter being strongly protuberant, projecting over the very small fifth segment. The second abdominal segment is subtruncated below, and has a deep semicircular sinus on the anterior lateral margin, near its lower extremity. Rami of the last pair of caudal stylets shorter than those of the second pair, and telson rather elongated and slit in two down the middle.

Length about one-third of an inch.

It resembles an English species of which a figure has been privately circu-
lated by C. Spence Bate, Esq., under the name of "Lysianassa chausica M. Edw."

Dredged in deep water, by Lieut. White.

**Gammarus sibtenren.**

A small, compressed species of rather soft and delicate structure. Dorsum rounded. Epimera moderately large. Eye broad-oval, nearly round. Antennæ of both pairs very slender; superior ones as long as the body. Basal joint more than twice as thick as the next, but shorter; third joint less than half as long as the second; flagellum with about thirty articulations; accessory flagellum nearly twice as long as the last joint of the peduncle.

Inferior antennæ nearly three-fourths as long as the superior ones; first joint of the peduncle armed beneath with a sharp process, which nearly reaches the end of the second; third joint more than twice as long as the first; fourth shorter than third; flagellum two-thirds as long as the peduncle.

Second gnathopod with merus and carpus acute below; hand subovate, twice as long as broad; palm oblique, with a small, sharp tooth at its pos-
terior extremity, reached by the tip of the finger when closed. First, second and third joints of the abdomen armed above with a sharp central spine on the posterior margin, and with four or five minute spines, or sharp comb-like teeth on each side of the middle spine, the margin bearing these latter spines being a little concave. At the corresponding part of the fourth and fifth ab-
dominal segments, there are also two or three spines similar to the central
spine of the other segments, though not quite so large. Telson bifid, the forks rather elongated. Color of the alcoholic specimens greenish-grey, mottled with paler and darker patches. Length about two-fifths of an inch.

Although we have not seen the posterior pair of caudal styles in this species, which are lost in both our specimens, we have little doubt that it is closely allied to G. longicauuda Brandt, which inhabits the Asiatic coast of the North Pacific, in which these styles are very long. It differs from the Asiatic species in having a spine at the extremity of the palm in the greater gnathopod, in the shorter terminal joint of the peduncle of the superior antenna, in the basal spine of the inferior antennae, and in the arrangement of the dorsal spines of the abdomen.

This species inhabits the circumlittoral zone.

**Amphithonus Septemdentatus.**

Strongly compressed and carinated, like A. carinata; carina dentated posteriorly, the last two thoracic, and first five abdominal segments terminating posteriorly in teeth; last two teeth very much projecting and sharp. Head with a deep notch or sinus on the front margin, near the inferior angle, at the insertion of the inferior antennae. Rostrum rather slender, sharp, a little curving downward, and reaching a little beyond the middle of the first joint of the superior antenna. Eye moderately large, oval, and oblique in position. Antennae about one-third as long as the body; the superior ones with flagellum of eleven joints; inferior ones about as long as the superior, with a forward-pointing spine at the base below, and a seven-jointed flagellum.

Gnathopoda with small but well-formed subcheliform hands; remaining feet as usual in A. carinatus and the other species of the group. Length half an inch.

Found at and below low-water mark.

**Amphithonus Occidentalis.**

Closely allied to the arctic A. panopla Kr., and the east-coast species, A. cataphractus Stm., but differing from both in being more elongated, having less height and breadth. It also differs from the latter species in being less strongly carinated and dentated; but the carinae are sharper than in A. panopla, and the two teeth on the second abdominal segment are especially prominent. The integuments are rather less indurated than in the allied species. The superior antennae are a little longer than the inferior, but scarcely more than one-fourth as long as the body.

Length from tip of rostrum to tip of telson, 0.76; greatest breadth, 0.21; height, 0.24 inch.

Two specimens were brought home by the Boundary Commission.

**Amphelisca Pugetica.**

Head not much produced. Antennae of both pairs very slender; superior ones less than half as long as the inferior ones, with the basal joint very thick, twice as thick, though only half as long, as the next joint. Superior antennae four-fifths as long as the body; peduncle long, smooth above. Dorsum of the thorax and abdomen for the most part smooth and rounded, but the last three joints of the abdomen are separated from the preceding ones by a deep notch, and project into two sharp teeth. Terminal joint in the third and fourth pairs of feet, one-half longer than the two preceding joints together. In the seventh pair of feet the meso-joint is expanded posteriorly into an ovate lamina, fringed with plumose setae, as in A. taenigata. Posterior margin of the third abdominal segment with a small notch just above the inferior angle. Last pair of caudal styles large, with rami much

[June,
longer than those of the two preceding pairs. Telson oblong, narrower and less tapering than in most species of the genus.

Length 0·45 inch.

Dredged in ten fathoms, on a muddy bottom, in Hale's Passage, by Lieut. White.

**AMMOTHAEA LONCAUDA DATA.**

Body broad, robust, hispid above. Eye placed on a high papilla, and double, or divided in two longitudinally. Chelate "antennæ" much shorter than the proboscis; their slender lower branch, however, is much longer, nine jointed, not tapering, and with blunt extremity. Proboscis large, very stout, elliptical in outline. Feet rather thick, fourth joint stoutest; upper surfaces sparsely hispid; basal joints armed with slight dentiform protuberances, ovigerous feet of moderate length. Abdomen large, half as long as the body. Diameter nearly three-fourths of an inch.

We know the genus *Ammothaea* of Leach only by the short diagnosis of Dana, in the U. S. Exploring Expedition, Crust. ii., p. 1390 ("Nympho affinis. Ramus antennæ longior, 9-articulatus,") and may be wrong in referring this species to it. One specimen occurs in the collection.

**GEPHYREA.**

**PHASCOLOSUM EXASPERATUM.**

Body brownish, curved in the form of an arc, and thickest near the posterior extremity. Surface wrinkled transversely and covered with small blackish grains, about one-sixtieth of an inch in diameter, rather larger and less crowded posteriorly, and smaller and less numerous on the concave than on the convex side. Proboscis bluish-white, with numerous irregular transverse blackish bands, interrupted on the concave side. The proboscis being partially retracted in our single specimen, we are unable to see its extremity distinctly, but it seems to have a series of six or eight crowded rings of minute blackish echinulations next the mouth, as in the allied forms.

Length 2 inches; thickness of the body, 0·46; thickness of proboscis, 0·2 inch.

**STERNASPIS AFFINIS.**

Almost identical with *S. fossor* Stm., from Massachusetts Bay, but with the body smoother about the middle, where there is no trace of the echinated annuli, which may be discerned even on the middle segments in *S. fossor*.

Found in muddy bottoms in from ten to twenty fathoms.

Dredged by Lieut. J. W. White.

**TUNICATA.**

**CYNTHIA HAUSTOR.**

Body globular, strongly and coarsely corrugated in an irregularly reticulating manner, with the interstices deep and the prominent parts covered with coarse sand, strongly agglutinated. Apertures at the extremities of long cylindrical tubes, nearly equalling in length the diameter of the body. These tubes are wrinkled transversely, and are from one-third to one-half as thick as they are long. The branchial tube is considerably longer than the anal.

Diameter about two inches.

With the next species, this forms masses which are found somewhat abundantly on shelly bottoms in the circumlittoral zone in Puget Sound.

**CYNTHIA GIBBISH.**

Body elongated, attached at one end, more or less cylindrical, or somewhat appressed end, when contracted, half as thick as long. Surface free from 1864.]
encrusting matters, corrugated both longitudinally and transversely; the longitudinal plications are frequently strongest and most regular, but often they are rendered irregular or nearly obliterated by the transverse ones. The apertures are placed near together at the extremity of the body on slight protuberances, which are probably produced in life into short tubes. Branchial sac with ten slight longitudinal folds, not lamelliform; filaments at its summit numerous, small, slender and simple.

The largest specimen is 1\(^\frac{1}{4}\) inch in length, and 0\(\cdot\)6 in breadth.

According to Dr. Kenney's notes, this species was dredged by Lieut. White at the following places: Port Townsend, in 4 fathoms, shelly bottom, and also on a muddy bottom in 10 fathoms. Off the N. W. end of Lummi Island, in 15 fathoms, shelly bottom.

The dedication of this fine species to one so well known upon the survey as Mr. George Gibbs, is scarcely necessary to indicate the great interest he has taken in its scientific results.

**Cynthia coriacea.**

A tough, unornamental species, with no very strongly marked characters. It is irregularly egg-shaped, and attached by a broad surface on the right side of the body. The test is free from agglutinated matters, smooth, and scarcely at all wrinkled, except about the apertures, which are on rather large protuberances, probably extensible in life into short tubes. The branchial aperture is largest, and situated at the extremity of the body; the anal a little behind the middle of the upper side. Branchial sac with about the same number of folds as in the preceding species, which are, however, very prominent and lamelliform, being broader than half the width of the interspaces. The filaments at the summit of the branchial sac appear to be few, and shaped like the palp of the bivalve acephala.

From the slight indications yet observable in the specimen, it would seem to have been of a reddish color when alive.

It was found upon the "shore of Island No. 2, off Salt Spring Island, March 9, 1859," by Lieut. White, of the Revenue Cutter.

**Cynthia villosa.**

Of similar size, and allied to the *C. echinata* of the North Atlantic, of which this is the analogue or representative species on the west coast. It is, however, easily to be distinguished from that species by the character of the villosity or short, hair-like processes with which the test is covered. These are shorter, more numerous than in *C. echinata*, and not provided with radiating hairs at the summit, being simply tapering to a fine extremity, and sparsely pubescent on their sides.

The base of attachment in this species is very small, and the test at that point is produced into a peduncle, which is sometimes as long as the body is thick. This peduncle is, however, entirely similar to the test in character, and not at all like that of *Boltenia*. Our largest specimen is about 0\(\cdot\)6 inch in diameter.

Dredged by Lieut. White in "Port Townsend, 10 fathoms, muddy bottom," and "off the N. W. end of Lummi Island, in from 8 to 15 fathoms, on shelly bottoms, March 2d and Feb. 22d, 1859."

**Genus CHELYSOMA, Brod. and Sow.**

The "tortoise-shell" Ascidians, which form the curious arctic genus *Chelysoma*, have the posterior extremity of the body flattened, forming an oval disk with a raised margin, and the surface divided into polygonal plates. But two species have been hitherto known, the *C. Macleayana* from Greenland, and *C. geometrica* (*Ascidia geometrica* Stm., Mar. Invert. of Gr. Manan.)
from the Bay of Fundy. We have a third species from Behring’s Straits, and that described below makes a fourth.

**CHELYSOMA PRODUCTA.**

All other known species of this genus are remarkable among Ascidians for their depressed form, the body being very short, sessile, attached by their flattened anterior extremity, to which the broad disk is parallel, and forms nearly the whole of the part of the body which is exposed to view. In *C. producta*, on the contrary, the anterior part of the body is much produced, laterally compressed, and longer than the disk is broad, while its attachment is inferior and usually very narrow. In well-formed specimens the dorsum is compressed and arched with a well-marked carina, beneath and parallel with which the rectum may be seen through the translucent test. The disk is obliquely placed, and its margin projects strongly beyond the sides of the body. Its surface is divided into 14 polygons, 4—5 sided, beside the two which contain the apertures, each of which latter is again subdivided into six triangular valves.

In our largest specimens the body is 1·5 inch in length, and 0·5 broad at the middle; the disk is 1·08 high and 0·81 broad.

It is usually attached to Sertularians.

Dredged by Lieut. White in “8 to 12 fathoms, shelly, off the N. W. point of Lummi Island.”

**HOLOTHURIADAE.**

**PENTACTA PIPERATA.**

Allied to *P. frondosa*. Body ovate, smooth and glabrous, of a yellowish color, speckled and spotted with black. Sucking feet retracted in our specimens, not numerous, and arranged in five irregular rows. Tentacula short and broad, ramose. Length (contracted) 1½ inches; breadth, 0·8 inch.

We find three or four specimens in the collection, none of them with protruded tentacles.

**PENTACTA POPULIFER.**

Body thick-fusiform in shape. Surface entirely covered with minute, perforated, polygonal, calcareous plates, each plate having from twenty-five to forty holes, and being armed with a sharp umbo or spine at the centre of its outer surface. Sucking-feet small, of moderate length, very numerous, and arranged in five regular double rows, extending from one extremity of the body to the other. Tentacula ten, eight large and two small; the large ones of elongated form, and shaped like Lombardy poplar trees, (*Populus dilatata*), branching nearly from the base; branches short. The small tentacles are placed together, and are minute, not a tenth part as long as the others.

Length of the largest specimen 2 inches; usual length from 1 to 1½ inches.

From the number of specimens collected we judge this species to be common in the Sound. It is found in the circumlittoral zone.

---

**The Influence of the Earth’s Atmosphere on the Color of the STARS.**

**BY JACOB ENNIS.**

From the small amount of attention paid to the colors of the stars as a distinct branch of physical research, a vague and indefinite impression has been somewhat prevalent that the atmosphere of our earth has great power in producing the apparent colors and the changes of colors of the fixed stars. The subject is highly important. During the last two or three years it has occupied much of my attention, and I propose in this paper to present my 1864.]
method of investigation and the results to which I have been led. To ascertain what the influence of the atmosphere might be, I selected for special observation a few of the larger stars, taking some of the red, some of the blue, some of the green, some of the yellow, and some of the white. So many different classes of stars watched carefully during the various changing conditions of the atmosphere, seemed most likely to yield valuable conclusions.

1. The red stars were Aldebaran, Antares, and Betelgeuse. These are all of different shades and intensities of red. In proportion as the atmosphere loses its transparency by the condensation of moisture, these stars lose their distinctive peculiarities. Their redness gradually becomes obscured, and they at last appear of a dull, unsatisfactory white.

2. The blue stars were Capella, Rigel, Bellatrix, Procyon and Spica. Some of these, as first Procyon, and then Rigel, are far more intensely blue than the others. But as the atmosphere becomes thick and more impervious to distinct vision, their different intensities of blue fade away, and the observer is at length puzzled to decide of what color these stars really are. He feels safest in announcing that they seem white, though not of a clear, decided whiteness.

3. The green stars were Sirius, Vega, Altair and Deneb, or the largest star in the Swan. These stars were observed to be green by myself, in the following order: Sirius in the autumn of 1862, Vega in June, 1863, and Altair and Deneb in August, 1863. It is remarkable that a very slight haziness in the sky completely hides their green color, and causes them to appear unmistakably blue. A still thicker haziness has the same effect on them as it has on all the blue stars already described, gradually obscuring their blue color, and ruffling them among the many hundreds of stars which the naked eye cannot decide to be colored.

4. The yellow star was Arcturus; this being the only one which appears decidedly yellow to my vision, unaided by instruments. Several others incline the naked eye to regard them as yellow, such as Polaris and the larger stars of Ursa Major and of Cassiopeia, but not sufficiently so to produce a firm belief. Arcturus, in a clear sky, has a fine light orange yellow; but as the sky becomes less and less clear, the yellow fades away, and ultimately the color of this star turns to a dim white, and becomes undistinguishable from that of the larger stars of Ursa Major, with which, from their position, it may be handily compared.

5. The white stars were Regulus, Denebola, Fomalhaut, Polaris, the constellation of the Wagon, and several others of the second and third magnitudes. They may be called white stars with reference to their appearance to the naked eye, to mine at least, but we are not bound on that account to believe them to be really white. As they are not first magnitude stars, they probably seem white to the unaided eye only because their light is not sufficiently great in amount, or intense in color, to appear colored. There may be persons with unaided vision acute enough to perceive their true colors. But whatever may have been the conditions of the atmosphere, I have never observed them to be other than white. No changes of the air have had the power of presenting them in any shade as colored stars.

Thus the influence of the atmosphere of our earth upon the stars of all the different colors, according to these observations, is the same. Whether the stars be red, blue, green or yellow, the effect of changes in the atmosphere is to rob them of their peculiar shades and intensities, and to reduce them all to a dull colorless condition,—a dim whiteness, in which their indistinctness produces a feeling of uncertainty and doubt in the beholder. Nor in any case have I seen any change in the atmosphere turn a star from one color to another, except from green to blue, and this is simply reducing one shade to another; for green, like purple, is but one of the modifications of blue. I have never seen a red star become blue, nor a blue star become yellow, nor
any other similar change by any change in the atmosphere. If such an occurrence were possible, I believe I would have observed it during the past two or three years. The effect of moonlight in obscuring the colors of the stars, and giving them a yellowish shade, can hardly be called an atmospheric action. Neither can the effect of the rays of the sun in the earliest daybreak of the morning or in the latest twilight of the evening, be called an atmospheric operation. Such an effect tends to impart a general whiteness to the stars, obliterating their colors in part or in whole, the same as in the end it obliterates all their light.

The question now arises, how is it that the atmosphere, when hazy and imperfectly transparent, has the power of depriving the stars of their colors, whatever their colors may be, and reducing them all alike to a dull whiteness? The reason may be seen in the simple fact of the obstruction of their light. Their light becomes diminished in amount to such a degree that it no longer has the power to produce the sensation of color on the retina. Nearly all the stars, when viewed through a telescope, are colored; they are of some hues other than white. Of this I adduced evidences in my communication for these Proceedings in June, 1863. They appear colored through the telescope because their light is collected by the instrument in a comparatively large mass; so large that it can make their colors readily perceived. Take away the instrument from all except the larger stars, and the pencil of light becomes so small as to be without the power of imparting the sensation of color. In the same manner the pencil of light from the larger stars may be reduced by haziness in the atmosphere to so small an amount as to be incapable of imparting the sensation of color, except a dull whiteness, whatever their real colors may be.

But how does it happen that a green star is changed by haziness to blue? I once thought that possibly this effect might be due to the same cause which makes the deep ocean, the distant mountains, and even the atmosphere, appear blue. After further observation and reflection I cannot adopt that explanation; for then all the stars, like the distant mountains, would be colored blue. Then there would be no such contrasts of all colors among the stars as we now behold. The true explanation seems to be that the mists of the atmosphere, in acting on the light of a green star, first obstructs the yellow rays, and after these are all absorbed then the blue rays alone will be visible, and the star must appear blue. Ultimately the mist may become so imperious that the attenuated ray of light can no more excite the sensation of color and the star must appear dimly white.

Before it can be admitted as a scientific truth that the atmosphere of our earth has the power of changing the color of a fixed star from one hue of the rainbow to another totally different, there must be brought forward a number of well authenticated facts as grounds for such a belief. We must have the specifications of certain stars which have been seen to change, and the dates of such changes, and the conditions of the atmosphere by which such changes have been produced, and also the numbers and the names of the persons by whom such phenomena have been witnessed. Such evidences of the changes of the colors of the fixed stars by our atmosphere have never been seen nor heard, and for my part, judging by my own observations, I never expect to see them, nor to hear of them. An exception to this remark may be the case of a green star turning to blue, as already explained. Perhaps another exception may yet be found, as indicated in the following passage from Humboldt. The italics are not in the original: "We do not here allude to the change of color which accompanies scintillation, even in the whitest stars, and still less to the transient and generally red color exhibited by stellar light near the horizon, a phenomenon owing to the character of the atmospheric medium through which we see it, but to the white or colored stellar light radiated by each cosmical body, in consequence of its peculiar luminous process, and the dif-
ferent constitution of its surface. The Greek astronomers were acquainted with red stars only, while modern science has discovered, by the aid of the telescope, in the radiant fields of the starry heavens, as in the blossoms of flowering plants and in the metallic colors, almost all the gradations of the prismatic spectrum." The turn of the expression "still less" shows that he regarded the matter as inconspicuous and unimportant, and the remark is made only in a casual manner. Nevertheless, incidental as the remark may seem, it is the most precise and circumstantial I have found in any author on the influence of the atmosphere on the colors of the stars. But is it really true that the atmosphere can impart a transient and generally red color to stellar light when near the horizon? In the absence of all confirmation to the above remark of the distinguished philosopher, I selected as test stars Vega and Capella, both first magnitude stars, the former green and the latter blue, and the one or the other is grazing the northern horizon nearly all the year. But I have been unable to detect the changes he mentions. May not his remark have arisen from observations on the planetary bodies, and have been inadvertently extended to the fixed stars? The planets, especially Jupiter, according to my observations, are sometimes, though rarely, sensibly reddened like the sun and moon by the atmosphere. But whether Humboldt's assertion be confirmed or not, it cannot effect our decision about the real changes of the colors of the stars. No one would pretend to announce a change in the color of a star simply because of a "transient" appearance of a change while near the horizon. In the same manner, probably, the idea has got afloat in a vague manner that, because the atmosphere of our earth has the capability of giving occasionally a red color to the sun, moon and the planets, it must therefore have not only the same effect on the fixed stars, but even the power to turn them to all the hues of the spectrum between red and blue. But this rapid generalization is no more warranted by sound reasoning than by observation. The sun, the moon and the planets have sensible disks, which the fixed stars have not. Hence the optical phenomena of these two classes of bodies differ widely. The fixed stars, under the influence of our atmosphere, are made to scintillate; they then twinkle with an unsteady light, and to good eyes they flash out rapidly and fitfully all the varieties of colors. This shows the difference, in an optical point of view, between the fixed stars and the other celestial bodies, and the impropriety of a hasty generalization from one class to the other. Because the atmosphere can redden one class it by no means follows that it can redden the other, much less that it can impart to the other all imaginable hues.

Another cause for the belief that the atmosphere can impart different colors to the stars, may be found in the necessity for some explanation of their changes of color. It is assumed, though without any known reason, that the intrinsic colors of the stars cannot change, at least in the space of two thousand years, and hence there is a necessity for an explanation of their apparent changes in some other way; and as the handiest method these changes are attributed to the atmosphere of our earth. That the various colors of the stars are not produced by our atmosphere, nor by optical instruments, nor by personal peculiarities of vision, becomes perfectly evident from the following simple consideration. If their colors were produced by any one of these causes, then there would not be that beautiful contrast of colors which we now behold; then it could never have been said of the cluster Kappa Crucis, that the various bright contrasted colors of its different members give it all "the effect of a superb piece of fancy jewelry." Instead of this there would be in that cluster, and in every other region, a dull monotonous color in all the stars alike. It has happened that travellers, in coming from Europe to America, have expressed their surprise at the beauty of our sky, when noticing for the first time in their lives the different colors of the stars. This has been supposed to be the work of our atmosphere, the natural operation of the
gaseous envelope of our earth. The true explanation is this. The stars appear colored to the naked eye in Europe as well as in America. Astronomical observers see them colored the same in all countries. But in some countries their colors are slightly dimmed by the more habitual haziness of the atmosphere, so much dimmed that they are not noticed by unprofessional gazers. When these latter persons arrive in a more cloudless region, they notice the colors of the stars simply because a slight veil is withdrawn, and not because new colors have been added.

The evidences of changes of color are now most abundant among the double and multiple stars. This is because the colors of these have been more generally recorded. Hence the importance of having records made, as frequently as possible, of the colors of all the stars, as they appear both to the aided and the unaided vision. Of course no careful observer will decide on the color of a star from its appearance in an unfavorable atmosphere, nor will he neglect the influence of the sun and moon, nor other means for correcting and confirming his observations, as presented in the rules of my last paper.*

---

**July 5th.**

**Dr. Coates in the Chair.**

Eight members present.

---

**July 12th.**

**Vice-President Bridges in the Chair.**

Eleven members present.

A paper was offered for publication entitled "Description of a Gar- Pike, supposed to be new." By Alexander Winchell.

---

**July 19th.**

**Vice-President Bridges in the Chair.**

Ten members present.

A paper was offered for publication entitled "Contributions to the Herpetology of Tropical America." By E. D. Cope.

The death of Thomas Dunlap, member of the Academy, on the 11th instant, was announced.

---

**July 26th.**

**Vice-President Bridges in the Chair.**

Six members present.

---

* Page 57 of this volume.

1864.]
August 23d.

DR. McEuen in the Chair.

Seven members present.

A paper was presented for publication entitled "On the Limits and Relations of the Raniformes." By E. D. Cope.

August 30th.

DR. McEuen in the Chair.

Twelve members present.

On report of the respective Committees, the following papers were ordered to be published:

 Contributions to the Herpetology of Tropical America.

BY E. D. COPE.

Caudisona basilisca.

Two pairs of symmetrical muzzle plates in contact; third or posterior pair subdivided. Rostral subtriangular, higher than wide, in immediate contact with nasals and frontals. Oblique length of postnasal equal horizontal length of prenasal; latter separated by small scales from the anterior labials. Fourteen superior labials, separated from the suborbital series by two and three rows of scales. Three flat plates between the elongate, flat supercilia- ries. Temporals smooth. Scales in twenty-nine rows, external largest, and with two next on each side smooth. Tail stout, surrounded by thirteen longitudinal rows at the middle. Rattle very acuminate, with a lateral groove. Gastrosteges 193; urosteges 20 single, four terminal divided. End of muzzle to rictus 1 in. 10 l., to vent 44 in. 8 l.; vent to base of rattle 3 in. 1 l.

Ground color pale yellowish brown, much replaced by the following markings, which are on entire scales, not parts: about thirty dorsal rhombs from a short distance posterior to head to opposite vent, of a bright chestnut red, browner medially and white bordered; five scales long and fourteen wide inside the white border, on the median part of the body, where they are in contact. Posteriorly they are separated, anteriorly elongate. Laterally, between each rhomb, a spot of bright chestnut. Belly and inferior scales yellow, every second or third lateral the base of a short oblique chestnut band. Head dark brown; two elongate occipital spots. Superior labials yellowish. A narrow yellowish line from the small eye to the rictus. No lines on the neck. Tail dark grey, with five obscure rings.

Hab.—Near Colima, Mexico. From Consul John Xantus' collections. Mus. Smithsonian, No. 6118.

This species belongs in the section embracing the South American species, and the C. molossus, from all which it is quickly distinguishable. It has fewer labials and more scales below the eye than molossus, and possesses a different pattern of coloration, though the tints are nearly the same. The affinities with adamanteus and atrox are not distant; the plates of the muzzle and coloration are different.

Crotalus triseriatus Wagler (Uropsophus Wagl., Crot. lugubris Jan,) is not rare on the Mexican Table land. It is allied to C. lucifer, but especially to C. scutulata Kenn.

Tomodon nasutus.

Body cylindrical, stout; neck but little constricted; head acuminate oval.

[Aug.
Muzzle produced beyond the labial margin, oblique-truncate in profile. Rosstral plate flat, not turned backward above. Both pre- and postfrontals longer than wide, the latter a little bent down laterally. Vertical more than twice as long as wide, lateral outlines not straight. Superciliaries broad; occipitals rather short, longer than broad; two postoculars, in contact with one temporal. One preocular just touching vertical; one longitudinal loreal, higher behind; one elongate nasal, the nostril anterior to its middle and connected by a suture to the margin below. Superior labials eight, third, fourth and fifth entering orbit; inferior ten; post-lower than prefrontals. Anterior maxillary and mandibular teeth longer than median. Pupil round. Scales broad, thin, poreless, in nineteen rows. Tail rather slender. Gastrosteges 186; one divided anal; urosteges 67. End of muzzle to rictus oris 7 lines, to vent 6 in. 2 l.; tail 4 in. 5 l.

General color light brown, punctulate with dark brown, especially thickly on head and sides. A darker brown band three and two half scales wide from occiput to end of tail, which is nearly broken into spots on the nape. Ends of scuta and first two rows of scales darker, especially anteriorly, where the band is sooty and spreads over the lips and chin; a faint longitudinal band above the shade; a short yellow streak from postorbitals to penultimate labial. Abdomen with many short punctulate streaks.

_Hab._—Colima, Mexico. _Xantus_ coll. No. 1341. Besides the preceding, this very fine collection contained _Spilotes auribundus_ (=_salvini_ Gthr.), _S. erebennus_ (oboletus Holbr.) _Conophis lineatus_, _Phimothyra mexicana_ (_Zamenis D. & B._) and the following:

_Toluca frontalis._

Muzzle prominent, acuminate, slightly recurved. Rostral separating prefrontals very slightly. Nasal long; postfrontal in contact with second superior labial. One narrow low preocular, two postoculars, the lower barely in contact with one temporal. Seven superior labials; eye over third and fourth. Occipitals longer than vertical, truncate, rounded behind; anterior suture of vertical a little longer than straight lateral. Seventeen rows of equal thin scales. Seven inferior labials; geniels very short, posterior pair reduced to scales. Urosteges 44; one double anal; gastrosteges 141. End of muzzle to canthus oris 8 lin.; to vent 8 in. 10 lín. Length of tail 1 in. 10 lín. Color below uniform pale yellow. Above grayish brown, becoming more rufous medially, with about thirty-six rhombic, dark edged, brown spots, six scales wide and four long, whose angles are produced as vertical lateral bars. Together they become nearly cross-bands posteriorly, when they are separated by a pale spot on the vertebral line. A brown cross-band across postfrontals and vertical; a longitudinal band on each occipital and side of nape.

_Hab._—Colima. _Xantus_ coll., No. 1363.

In this genus and _Tomodon_ the hypapophyses of the vertebrae are, as usual among the _Asinea_, not developed behind the anterior fifth or sixth of the column. A group of genera partly coinciding with that forming _Jan's_ family Potamophilidae, I find to possess these processes even to the vent, offering a new character of definition to the subfamily of the Homalopinae, as they may be called. The genera in which this structure exists are _Eurostus D. & B._, _Gerarda Gr._, _Hypirhina Wagl._, _Cerberus Cuv._, _Homalopsis Kuhl._, _Heliocops Wagl._, _Atretium Cope_; _Tachynectes Fitz._, (this genus is coryphodont in dentition; _T. chrysostictus_ is a Helicops); _Tropidonotus Kuhl._, _Thamnophis Fitz._, _Xenochrophis Gthr._, (=_Thamnosophae Jan._), _Prymnomiodon Cope_, _Ninia B. and G._, _Storeria B. and G._, _Haldea B. and G._, _Tropidoclonium Cope_, _Amastridium Cope_. In _Herpeton_ the processes are present, but very weak for a short distance posteriorly. In _Tretanorhinus_, otherwise similar to this group, there are only strong keels, as in a few Colubrine genera. Glaniolastes and _Heterodon_ do not belong here; the processes are wanting; so also with _Xenodon_ and _Thamnodynastes_. _Hydrops_ and _Calopisma_ belong to another section.

1864.]
Psuedaspis cana (Coronella Auct.) differs widely from the Coronelline genera in the strong posterior development of these hypapophyses, resembling Lamprophis aurora, which separates itself by this from the Lycodonta, where it erroneously placed.

Chamaeleolis porcus.

Height from superciliary margin to mandibular edge enters two and two-third times in length from end of muzzle to end of casque, (3½ times in fernandina); width of muzzle at middle 2½ times in length from its end to the posterior border of orbit; (3 times in fernandina). Casque rather abruptly turned upwards. Labials nearly square, separated by but one row of large scales, from orbit. Inferior labials short, in contact below throughout with a row of ten more or less quadrangular infralabials, which are again margined by another row of longitudinal infralabials. Thickened margin of fan prolonged to symphysis, bearing a double row of long beard-like appendages. Scales of throat and fan minute, uniform, smaller than abdominal; the last tuberculare, larger than in fernandina. Dorsal scales large, subquadrate, in seventeen transverse rows from axilla to groin; (28 in fernandina); in nine larger, and six very narrow dorsal series, separated by narrow, granular interspaces. Dorsal and caudal median fold well developed. End of muzzle to ear 2 in.; ear to vent 4 in. 2½; vent to end of tail 6 in. 10½; anterior limb 2½ in. 3½; posterior limb 3 in. 11½.

Color of a ♀ specimen long preserved in alcohol: A general yellowish gray, with five pairs of faint brown bands across the dorsal crest, and a large brown patch, on the anterior half of each side. Head with numerous black spots.

Cuba. Mus. Acad. Nat. Sci. Phila. One specimen from Dr. Gavin Watson. This species is stouter and shorter than the fernandina,* and differs much in the scutellation. It agrees with it in some minor points, as the temporal ridge, the process above the auricular opening, etc.

Eupristis balaetus

Scales all keeled, but little larger than smooth abdominals, separated and surrounded by granulations anteriorly. Scales of nuchal crest narrow, conic; of dorsal weak posteriorly. Very faint ridges on goitre, but every where a clothing of fine scales. Convergent ridges of occiput not distinct. Front tuberculare, two parallel lines running down the middle to end of muzzle, slightly concave between superciliary ridges. Canthus rostralis tuberculare; no occipital or supra temporal tubercles. Seven loreal rows; brachials larger than dorsals; antebrachials and many femorals two and three keeled. Four infralabials larger, the anterior not the largest. Below yellowish, posterior extremities and tail much marbled with brown. Above brown, with three greenish white cross-bands, which are broadest and turned backward on the median line; traces of intermediate bands are seen on the inferior part of the sides. The anterior is broken into spots, and two spots on the nape are opposite to two longitudinal pale shades on each side the neck. Head uniform brown; a light spot on lower scapular region. Brachium with two, antebrachium with four, femur and tibia each with three cross-bands of greenish white. Tail with numerous broad bands. Toes cross-banded. From end of muzzle to tympanic orifice (French measure) 4½ 5/½; from tympanum to opposite vent 11½ 4/½; vent to end of tail (broken) 26½. Anterior extremity 6½ 3/½; posterior 10½ 3/½.

Hab.—St. Domingo. Mus. Brittann.; (from Sallé's collection.)

Xiphosurus ferreus.

A double nuchal crest. Dorsal and lateral scales large, keeled. Supra temporal swelling covered with large tuberculiform scales. Superiariarv

---

* For a beautiful specimen of this animal I am again indebted to my friend Prof. Ph. Poey.
in contact; frontals large, smooth. Canthus rostralis higher than frontal ridge, sharp, elevated, bordered by four scales, the three anterior of which are in close contact with those of the frontal ridges, which are three, and are separated by two rows of large flat scales. Superciliaries five on each side, all transverse except the anterior, but one on each side in contact. Occipital large, oval, separated from superciliaries by one row, in a deep depression. Supraocular patch of four or five transverse scales of an inner series, and two or three round of an outer. Loreal rows five. Goitre small, covered with close series of produced appendiciform scales. Symphysals produced posteriorly. Two large anterior infralabials. Femoral scales larger; brachials, tibials and antibrachials equal to ventral, all weakly keeled. Dorsal little, lateral much smaller, strongly keeled. Scales of caudal crest larger than those of sides of tail. Muzzle to ear 3'/4'; ear to vent 8'/2'; vent to end of tail 19'/'.

Above dark brown, blackish on sides of head; below metallic green shaded with brown; under surfaces of tail and extremities pale brown.

_Hab._—"Guadaloupe," Mus. Britt.

_Xiphosurus homolechis._

Noneuchal crest, a slight fold. Four larger dorsal rows of keeled scales—fold none, or indistinct. Supra temporal and lateral scales minute. Super-
ciliaries separate; frontals equal, keeled. Supraorbital patch separated by a row of small scales from superciliaries. Canthus rostralis lower than frontal ridge.

Head short, muzzle acuminate; canthus rostralis sharp, a little decurved, its scales separated from those of the frontal ridge by one row of scales. Scales of front and muzzle nearly equal, as broad as long, keeled. Six super-
ciliaries on each side, longer than broad. Occipital small, not in a depression, separated from superciliaries by many rows of scales. Goitre large. Three rows of subhexagonal scales in supraorbital disc, separated from supercili-
aries by one row of small scales. Lateral scales granular. Scales of caudal crest equal, lateral caudal; those of extremities larger than ventrals. Muzzle to ear 1'/4''; ear to vent 3'/3''/. Anterior extremity 2''/; posterior 3'/6''.

General color brown, darker on nape and temporal region; below whitish, with green metallic shades, and indistinct brown variations posteriorly. Tail and extremities pale brown beneath.

_Hab._—West Indies—the island unknown. One specimen, Mus. Britt.

_Anolis Section.* Tail compressed, or with a median larger series of scales; ventrals smooth.

_Anolis damulus._

Six superciliaries, nearly equilateral, except the anterior, which is very large, separated by one row of smaller scales; four rows between the anterior of the facial ridges, weakly keeled. Supraorbital disk of about 14 keeled scales, isolated. Occipital small, separated by many rows of small scales. Rostral plate emarginate above; nostril quite terminal, lateral. Five loreal rows. Symphysals broader than long; three larger anterior infralabials—two an-
terior broader than inferior labials. Dorsal scales very small, equal; ventrals larger than brachials, which are keeled; infrabrachials smooth. Ear much smaller than fissure of eye, larger than nostril. Anterior extremity reaching beyond groin; posterior to anterior border of orbit. Tail nearly cylindrical, of moderate length; all its scales strongly keeled. A shoulder fold. End of muzzle to anterior border of orbit 6'/'; between the latter points 5'/'; muzzle to ear 1'/3''/; ear to vent 3''/; tail 7'/5''. Anterior extremity 2''/; posterior 3'/3''/.

Above metallic light reddish brown, with some minute glistening white points on the sides. Head above paler, lips varied with darker, a pale streak from below eye to ear. Limbs spotted, behind marbled with silvery, dark 1864.]
and light colors abruptly separated on posterior face of femur, which with the abdomen are pale golden below; gular region faintly greenish; chin brown, variegated. Tail brown, cross-banded near the end.

Anolis gi ng i vi nus.

Head elongate; from end of muzzle to auricular opening twice in length from posterior margin ear to posterior face femur. Muzzle rather narrow, end rounded and truncate in profile. Canthus rostralis straight, acute. Loral region a little concave, with five (4) rows of scales, its greatest height half frontal width between last scales of canthus rostralis; latter distance equal from same point to top of rostral plate. Two pronounced frontal ridges not continued on anterior part of muzzle; concavity pronounced, elongate, enclosing two rows of smooth scales at middle portion, bordered by two large subequal scales in front of last superciliary; between anterior of these are three rows of scales, of which the median is often large. Posterior scales of canthus rostralis much larger than second. Superciliaries four or five, in contact, sometimes nearly separated by a row of granules. Supraorbital disc separated by only one row of granules from superciliaries. Occipital well developed, surrounded by numerous flat scales, in a strong depression. Supratherals large, first infralabial a little smaller, like the second larger than any labials, and preceding an infralabial series of oblique scales. Ear equals half eye. A faint nuchal fold; two rows of larger median dorsal scales, less than bra-chials; laterals very minute. Ventral oval, much larger than dorsals or bra-chials, smaller than supraorbitals. Tail moderate, moderately developed. Tail moderate, strongly compressed, with a strong crest of scales, of which every third is larger and the summit of a cross series. Ramus mandibuli in most specimens thickened in a vertical direction, forming a strong inferior ridge. Posterior limbs short. From end of muzzle to ear opening 1" 9/16; from latter to vent 4" 4/16; anterior limb 2" 7/16; posterior to heel 2" 7/16; foot 2".

Above greyish or rusty brown, with darker, rather close vermiculations on the sides, which form a dark superior border to a broad pale band from above axilla to groin. This is bordered below by brown, below which are other dark vermiculations. Inferior surfaces, including fan, immaculate. © is similar, except in the absence of the dark markiugs not bordering the lateral band.

Six specimens from Anguilla Rock, near Trinidad; presented by W. J. Cooper to the British Museum.

Anolis ci trinellus.

Muzzle of medium outline, slightly depressed and rounded at extremity, less than twice as wide between lachrymal angles than loral height, but twice as long from same point. Canthus rostralis straight, the posterior scale largest, the fourth under the lateral nostril. Facial ridges not strong, higher than canthus, each with two large scales in front of first and large superciliary, and enclosing three rows of smaller, flat, smooth scales, which are broad as long, the two outer larger than the median. Superciliaries large, four on each side, in contact, nearly separated by a row of minute scales, and separated from the round occipital by three rows of scales. Supraorbital disc touching or not touching supraorbitals, two larger and six smaller, the inner anterior longer than broad, three times the size of second. Five rows of loreals. Three anterior infralabials larger than labials, the anterior less than symphysal. Auricular opening two-thirds of ocular. Fan elongate, rather closely scaled. Abdominal scales about equal middle Interrugal and brachial; some of the thoracic keeled. Anterior femoral larger, very weakly keeled; inferior tibials and antebrauchials more strongly. Two median dorsal rows larger keeled, much less than abdominals; other dorsals and laterals minute, but rather coarse and tuberculiform. Tail but moderately com-
pressed, with a low crest. End of muzzle to ear 1" 1'/"; ear to vent 3'; vent to end of tail 7" 5'/". Anterior extremity 1" 5'/". Posteriors to heel 1" 6'/"; hind foot 1" 4'/".

Above dark brown, nape, vertebral, and about five broad transverse cross bars on each side darker, the space between tinged with yellowish. Below bright yellow, gular region greyish, with some faint longitudinal brown lines; chin, labial and rostral shields yellow, or tinged with it. Extremities dark, with a few very faint cross bars.

**Hab.**—Hayti. Mus. Britt.

**Tail cylindrical, or with vertebral and lateral scales equal; ventrals keeled.**

*Anolis carneus.*

Scales everywhere flat and smaller than frontal. Head short, broad, especially occipit. Front narrow, concave, superciliaries rows separated by two or three rows of scales. Superciliaries nine or ten, not wider than long, not continued as a large row on facial ridges, which are high, rounded, enclosing deep concavity, which is filled with equal subhexagonal scales, smooth or slightly one-keeled. Canthus rostralis sharp, short, descending steeply; nos-tills lateral, eight or ten rows of narrow scales between. Occipital small, surrounded by nearly equal scales, which a little exceed the smooth dorsal. Eye large; eight loreal rows. Many rows of keeled infralabials, scarcely larger than gulars. No wholets among tail scales, which are very weakly keeled. Ear nearly as large as eye slit. Supraorbitals weakly keeled, in five rows, not forming an isolated disc. From ear to end of muzzle 33 times from latter point to vent, in an old ♀ specimen, four times in a young ♀. No dermal dorsal fold. 9" 5'/" from muzzle to vent; tail 16'; groin to heel 5'/"; hind foot 3" 5'/"; anterior limb 4"—all from ♀, which is light yellowish brown above; a pink shaded median dorsal band, on each side of which is a narrow brown band, which commence by two convergent portions on occiput, and are interrupted behind opposite axilla; two or three other more or less interrupted paler brown streaks on each side. Brown band between eyes. Beneath immaculate. Young ♀ everywhere rose colored, with some blackish markings on posterior part of sides, and faint bands across hind and fore limbs. Goitre very small.

Two specimens in Mus. Britt. Lower Vera Paz Forest. Obtained from Osbert Salvin, a thorough explorer of that region.

*A. semilineatus.*

Near to *cyanopleurus,* agreeing in most points in squamation; but instead of six or seven there are 10—12 rows of larger dorsals; 2—3 larger smooth infralabials; front scales broad as long, smooth, six rows from canthus row to canthus row at half way to nare. A triangular patch of scales as large as loreals behind the eye, which are abruptly surrounded by the minute lateral.

A brown shade from lores to middle of side; yellow band from supralabial line to middle of side or groin, which is bounded above and below by a dark shade. *Size, that of cyanopleurus.*

**Hab.**—Hayti. Mus. Britt.

*Anolis bitectus.*

Muzzle acuminate, with scales broad as long, 1—3 keeled, those between ridge rows much smaller, minute, yet flat, one row between the double rowed superciliaries. Occiput oval, surrounded by small scales. Two rows of rather broad keeled supraorbitals. Ear 3/4 of eye; seven loreal rows; canthus rostralis short, nearly straight. Infra-maxillary small, equal, keeled. Minute scales from eye along side; nine larger dorsal rows, then two median size each side, then lateral. About eighteen rows of ventrals. Male with well developed goitre. Tail rather short. From end of muzzle to ear 1" 3'/"; to vent 5'/" 2'/"; hind foot 2"; heel to groin 2" 7'/".

1864.]
Above light brown, below and on upper tip yellowish, abruptly separated from color of upper surfaces, which is on sides a dark band from eye, extending in Q only to groin, and is bordered below with distinctly paler to middle of side.

Two specimens. West Equador. From Fraser's collection.

Anolis scyphicus,
Lateral scales minutely granular, graduating into larger, many rowed, keeled dorsals, which are very much less than ventrals, and less than frontals. Superciliary row not continued as larger scales to canthus, composed of nine scales, separated by three rows of keeled scales; twelve rows at middle of muzzle between canthus rows, as broad as long, obtusely one-keeled. Canthus rostralis descending steeply, nearly straight, from lachrymal processes to same, equal from same to end of muzzle, and longitudinal diameter of orbit. No prefrontal concavity. Frontal and occipital region elevated. Eight loreal rows. Supraorbitals very small, on inner part of the region, in longitudinal series, keeled; rest of surface granular. Occipital not large, surrounded by many flat scales, and between two bony crests, which unite posteriorly to it, send off a posterior median crest, which after 2" length, sends off a nearly transverse branch on each side. Ear ½ size of eye opening. Infralabials small, longitudinally keeled. Keeled scales of limbs much smaller than abdominal; caudals very small, equal at root of tail. Trace of goitre in Q. Digital dilatations very narrow. From end of muzzle to ear 1½ 6"; to vent 6½ 8"; vent to end of tail 11½ 2¾; hind foot 2½ 6½; groin to heel 3½ 8½. Bright green; brown band across muzzle and eyelids, and some small white specks. Narrow blackish cross-bands directed forward on sides, and longitudinal reticulations from axilla. Femur? twice, tibia once brown cross-banded. Immaculate below; throat bluish.

Anolis ustus.
Resembles superficially alutaceus and damulus. Head flattened; muzzle acuminate; greatest width between posterior scales of canthus rostralis from same point to anterior margin of nostril, which is lateral, and near end of muzzle. Ridges scarcely perceptible; concavity shallow, broad, three scales wide. Scales of front broad as long, slightly one-keeled, in six or seven rows between canthus; five rather large superciliaries which are in contact, or separated by one row of very small scales; occipital large, surrounded by flat scales; supraorbitals five or six; three broad, smooth on inner row, in contact with superciliaries, except on one side of one specimen. Dorsal scales smaller than caudal, ventral or prefrontal. Five loreal rows; canthus nearly straight; ear ½ of eye; dilatations well developed; goitre weak. Infralabials few, small, shorter anteriorly. Tail a trifle more than twice head and body; muzzle to ear 1½ 2½; ear to vent 2½ 9½. Yellowish brown, with several short, irregular, darker, lighter bordered, half-fascia above. Head darker above; streak across between eyes. Gular and lateral regions with ferruginous small spots and shades. Tail with transverse dark shades. Extremities darker, paler, few cross banded.

Two specimens. B. M. Belize.

Anolis heliatric.
Size small; head large, elongate, depressed; ridges weak; concavity shallow, short; fourteen more or less rows of narrow, keeled, not imbricate dorsal scales which graduate into the granular lateral, and are smaller than the imbricate ventral: the last about equal to those on the middle of the front. Interrugal scale shield-like, broad as long, faintly keeled; a little larger than those of the ridges: these are continued as a row to the middle of the canthus rostralis, and number nine scales from that point to posterior extremity behind orbit; they are separated by two rows of small scales, and two on each side from the round flat occipital; also by one row from supraorbital

[Aug.]
Anolis nannodes.

Very slight concavity on muzzle; ridges low; scales of front broad as long, smooth or slightly roughened. Superciliaries in contact; small flat scales round the occipital. Dorsal scales very much smaller than those of front, and equal abdominal; seven or nine rows in the middle a little larger. Infraorbitals numerous, little distinct, equal, keeled. Loreals four or five rows; canthus rostralis nearly straight from angle of eye; eight rows between canthal rows at middle muzzle. Ear ⅔ size of eye opening. Eye not prominent. Two rows supraorbitals; inner much larger; four or five transverse in curved series separated by granular scales from superciliaries. Tail and extremities short; digital dilatations broad. End of muzzle to tympanum ⅔ 2⅔; former to vent 4⅔ 5⅛; hind foot 1½ 1⅛; limb 2⅓ 5⅛; tail 7⅔.

Light reddish brown, with a brown cross band between eyes and across muzzle, and spot on each side of sacral region. The male with indistinct brown cross lines on back; female a darker median shade, and indistinct blackish line on each side.


Anolis crassulus.

Differs from sallei in larger ventral and dorsal scales; in smoother, broader scales of front, especially superciliaries and supraorbitals. More numerous supraorbitals; shorter muzzle, a few larger, smoother infraorbitals. Differs from nebulosus in number and separation of superciliaries and in supraorbitals, apparently.

Eyes rather small; muzzle not long, not short, rounded acuminate, a little depressed at tip. Frontal depression strong, containing five or six scales, counting across its anterior part. Superciliaries as broad as long, separated by one or two rows (in one specimen in contact, perhaps abnormally); eight from canthus rostralis to point nearest occipital; all scales of front smooth, thick, as broad as long. Two rows broad subhexagonal supraorbitals, four or five broader on inner row, forming a disc not surrounded by granules. Two or three outer infraorbitals equal inferior labials. Goitre well developed. Four loreal rows: 13–14 rows of dorsals graduating rather suddenly into laterals; a little smaller than ventrals and prefrontals. Tail stout at base. Ear ¾–⅔ eye slit. Pale reddish brown, below yellower; top of head darker; front loreal region through eye along each side of neck a brown indistinct band, bounded below by a narrow yellowish one from whole labial length, which is prolonged posteriorly. ♀ with a yellow dorsal band. End of muzzle to ear 1½ 4⅔; to vent 4½ 7½; hind foot 1½ 7½; heel to groin 2⅔; tail 9⅔.


Anolis cymbops.

Width of head between temporal ridges equal to its perpendicular diameter at occipital plate; muzzle rather short, acuminate; loreal region straight, 1864.]
high; canthus rostralis straight, steep; muzzle swollen between nostrils; no facial ridges, but a well marked, broad concavity. Eyes large; palpebra projecting upwards, with a supraocular disc of three rows of keeled scales, which are longer than broad. Seven rows of loreals; superciliaries six or seven, separated by one row of scales of nearly equal size; four rows between continuation of superciliary rows, but all of nearly equal size, broad as long, some keeled; eight scales across middle of muzzle; on end of muzzle smaller. Two rows of scales (suboculoiis divided) between orbit and superior labials. Labials 11. Symphyseal posteriorly convex in outlines, infralabial small, subequal, keeled. Occiput small, surrounded by numerous flat scales. Abdominal scales smaller than those of front, obtusely keeled. Laterals and dorsals granular, minute, gradually a little larger dorsally, but less than two median rows, which extend from nape to on tail, which are keeled and smaller than the abdominal. Exterior scales of extremities larger, keeled. Digital dilatations not broad. Hind limb extended, reaches to middle of lores. Tail slightly compressed; scales at base smaller, flat, keeled; two meridian rows larger. End of muzzle to ear 1" 1'/"; ear to vent 2" 9/"; vent to end of tail 6"; anterior extremity 1" 7'/"; posterior to heel 1" 9'/"; hind foot 1" 43'/".

Above brown, outer edges of the two median dorsal rows much darker; a cross band on tibia; below yellowish brown, rather closely shaded with reddish brown, especially posteriorly and on extremities. A dark shade in front of each inguinal region.

One sp. ♀. Vera Cruz.

*** Tail cylindrical, without crest, or covered above with equal scales: ventrals smooth.

Anolis impetigosus.

Muzzle elongate acuminate, depressed, rugae obsolete; concavity shallow, elongate rhombic; nostrils terminal; canthus rostralis not prominent. Scales of front large, smooth, polygonal, as long as broad, anteriorly a middle series separated by smaller ones from those of the canthus rostralis. Two large broad plates between canthus rostralis and end of superciliary series. Latter in contact medially, separated from the small occipital, which is surrounded by flat subhexagonal scales, where they can be seen. Two bony ridges, converging from the posterior part of the superciliaries, meet on the median line, and project a short micro, which is a little behind above the auricular opening. Between these, as far as the narrow frontal region, the head is roughened by minute exostoses. Supraorbital disc small, in contact with the superciliaries, composed of three large inner and one small outer scales. Loreal rows two; auricular opening little more than half ocular. Abdominal scales larger than dorsal, considerably larger than those of the front. Dorsal, lateral and longest extremital equal, smooth, flat, not regularly arranged; epidermis minute, scales of tail smaller than dorsal, except four median inferior rows, which are keeled and nearly as large as those of front. Symphyseals longer than broad, slightly divaricating posteriorly. Eight inferior labials bounded below by one row of infralabials anteriorly, and two rows posteriorly; the former larger than the labials, longitudinal. Gular fan large. Extremities short; tail a little longer than head and body, terminally compressed. End of muzzle to ear 1" 3'/"; ear to vent 3" 10'/"; tail 6". Anterior limb 1" 5'/"; posterior 2" 3'/".

Above and laterally very pale brown, with numerous short, darker, longitudinally arranged streaks; tail with a reddish tint. Below pale yellow; gular fan with many large black spots.

Habitat.—Unknown. One specimen. B. M.

Anolis gibbiceps.

Short and stout; head broad and square posteriorly, short acuminate ante-

[Aug.
riorily; canthus rostralis elevated, little concave; frontal concavity well-marked, not contracted anteriorly. Eyes and ears large, orifice of latter one-half that of former. Nostrils lateral terminal. Loral scales small, eight-rowed; muzzle and front scales longer than broad, striate, and sometimes one-keeled, of equal size, in nine longitudinal rows across middle of muzzle; superciliaries eight, a little broader than long, separated by three rows of scales. Supraorbital disc surrounded by smaller scales, and composed of six or seven elongate, keeled scales. Occipital small, surrounded by small, equal, rough scales. Infralabials small, equal, numerous, keeled; antebraclial and prefrontal keeled scales larger than abdominals. Lateral and dorsals small, graniform or carinate; two or three median rows a little larger, less than abdominals, strongly keeled. Scales round base of tail equal, keeled, as large as antebraclial. Muzzle to ear 1'/4"; between temporal ridges 9/"; muzzle to vent 3'/4". Anterior extremity 2'/4". Groin to heel 2'' 6'; heel to end digit 2''. Above brown bronze, the head browner, the tail redder; below pale metallic ferruginous with green reflections; no regular or distinct lines or spots.

One ♀ specimen from Caraccas, with trace of gular fan, in Mus. Brit.

**** Tail compressed, or with a crest of compressed vertebral scales; ventrals carinate.

Anolis ordi nat us.

Head broad, subcaminate, depressed at end of muzzle, from which point to middle of marginal supraorbitalis equal between two latter points. Canthus rostralis a little convex. Only one large scale on frontal ruga in front of last superciliar. Front and muzzle scales longer than broad, one-keeled, in regular longitudinal series, not imbricate; six rows between nares, (lateral subterminal) of which the four middle are equal; five loreal rows, labials five or six. Only one large infralabial. Occipital surrounded by small scales. Supraorbital disc nearly or quite isolated, each scale keeled, as broad as long; three larger in inner series. Auricular opening half ocular; fan well developed. A slight dorsal nuchal fold. Scales of the extremities keeled; of femur largest, larger than abdominal. A few dorsal scales gradually larger, especially two median, which are weakly keeled. Tail much compressed; scales at base minute. Trace of rhombic occipital depression. End of muzzle to ear 1'/4''; ear to vent 4'' 3''. Anterior limb 2''; posterior to heel 2'' 2''; foot 1'' 8''.

Yellowish brown, or a series of light small spots on each side of back, bordered with dark brown; and some vertical series of larger confluent similar spots, dark bordered. ♀ with a pale greenish median dorsal band not laterally defined, but bounded between femora and on base of tail by two large brown spots on each side.

Two specimens, ♀ ♀. "W. Indies."

Anolis allia ceus.

Near leachii, but with larger frontal plates and weaker face ridges, etc.

Four rows in the almost flat front cavity smaller than three or four polygonals between terminal scales of front ridge rows; of these there are three—two lying along canthus. Six rows between lateral nostrils. One row between superciliares, which are broader than long, and one row of granules between lateral and supraorbital disc. Some swollen scales occipital, four (five) loreal rows; between posterior scales of canthus rostralis equal from same to end of muzzle. Ear two-thirds of eye. Symphysals very large, larger than first infralabial, second larger than inferior labials; third infralabial large. Lateral scales minute, rough, scarcely smaller than dorsals, except two median rows of larger keeled, which are less than the keeled equal brachials, which are less than weakly keeled oval abdominals, which are less than keeled prefemorals. A slight fold on nape. Four large inferior caudals. Dilatations not narrow. Fan not very extensive, elongate. End of muzzle to ear 2½ times in from ear to groin. Large row of equal caudal crest scales. Lateralis small, keeled; four inferior rows large.

1864.]
Bright dark bluish-green, with coarser or finer black vermiculations on neck, nape, gular and scapular regions. An elongate, black, light-edged spot above axilla, on each side interscapular region, and one or two each side of nape. Head above, anterior to line connecting angles of mouth, pale brown. End of muzzle to ear 1" 9/16"; ear to vent 4" 7/16". Anterior limb 3" 3/16"; posterior to heel 3"; heel to end digit 2" 4/16".

Hab.  Segment Museums.

Of the preceding species of Anolis, sixteen have been derived from the British Museum collection. My particular acknowledgments are due to Drs. Gray and Günther, the directors, for the ample facilities afforded me in the examination of these and of other objects of interest under their care.

Laemanctus serratus. Occipital prominence shorter and more elevated than in L. longipes, its border serrated with six prominent angular scales. Front with three pairs of large plates, the two posterior bounded exteriorly by two others. Seven superior labials to beneath orbit; infra-labials smaller, lateral scales larger than in longipes. Scales everywhere keeled; dorsals a little smaller than abdominals. Collar not very distinct. Dorsal crest not elevated on the posterior half of the back.

A yellow band from loreal region to groin, brown bordered above from orbit to ear. A broader pale lateral band and six brown cross bars on the back.

This species is said to be found in the Orizaba Valley, Mexico. It is figured by Prof. Duméril in the Archives du Musée, 1856, pl. xxi. Specimens are also in the Museums of London and Leyden, the latter of which, through the liberality of Prof. Hermann Schlegel, have served as the types of my description.

The Laemancti fitzingeri, obtusirostris undulatus of Wiegmann, belong to the genus Urostrophus, while the L. acutirostris is a true Polychrys. The type specimens of Wiegmann are preserved, under the direction of Prof. Peters, in the museum of the Friederich Wilhelm's University in Berlin. My thanks are due to the Professor for the many facilities which he kindly placed at my disposal, during investigations among these and his own numerous types.

Uta nigricauda.

Series of large dorsal scales narrow, embracing seven rows of uniform size; the scales smaller than the smooth abdominals, keeled, those posterior larger than those in the anterior part of each row. Laterals minute, flat; caudals largest of all, very strongly keeled; antibrachials and prefemorals larger than dorsals, keeled. Two dermal folds on each side, and a strong one in front of gular fold, beside a few cross folds in front of shoulder. Ear large, with three small fringe scales. Lateral occipitals small; frontal long, undivided, preceeding by five large scales, of which the posterior pair is in contact on the median line. Five rather broad supraorbitalis, separated from marginal row by minute scales. Infracarpals five on each side, large, separated by one row of smaller scales from labials; the anterior pair in contact. Eleven and twelve femoral pores. End of muzzle to ear 5 lin.; ear to vent 1 in. 5 1/16; vent to end of tail 3 in. 2 1/16; anterior limb 9 1/4; posterior 1 in. 2 1/4; hind foot 6 1/4.

Brown above, sometimes very dark, with seven short lateral black crossbands, sometimes light edged behind, on each side; never confluent across the median line. Tail black or blackish brown. Head above lighter, with a few superciliiary brown specks or cross lines. Each side of abdomen blue from axilla to groin, deepest and nearly meeting other side on the median line. Throat in males orange.


This species is nearest U. graciosa, of the Colorado region, but has a shorter muzzle, broader front, and other distinguishing traits. It was found [Aug
in considerable abundance with U. stansburiana and thalassina. U. bicarinata has been described by Prof. Duméril as typical of his genus Phrymatolepis; it cannot be separated from Uta. His Sauromalus is also Euphyne of Baird.

Sceloporus utiformis.
Ten longitudinal rows of large, highly keeled, shortly mucronate dorsal scales, separated by many lateral series of minute flat scales, from the smaller entire edged abdominals. From axilla to ear the laterals are granular; a dermal fold extends to temporal from scapular region, and sends branches to a V-shaped fold, which extends downwards and backwards from the posterior border of the large auricular opening. Six (seven) rows of shortly highly keeled scales on nape; from which point to rump are about 26 transverse series. Dorsal scales entire; three moderate infralabials. Six rather short supraorbitals, separated from marginals by three rows of small scales. Interparietal as broad as long, subrectangular, with two parietales on each side. Frontoparietales not subdivided transversely, as is usual, but subdivided longitudinally to frontal; latter a little longer than broad; first row between canthi of three broad plates fully in contact. Profile arched, muzzle prominent, narrow. Thirteen femoral pores. Tail cylindrical, long. From end of muzzle to ear 7½ in.; from ear to vent 2 in. 1 l.; vent to end of tail 5 in. 7 l.; anterior limb 1 in. 2 l.; posterior limb 2 in.; hind foot 11 l.

General color blackish, with numerous indistinct lighter cross bars. Below pale greenish grey; gular region greenish, with narrow light cross lines.

Hab.—Near Colima, Mexico. Obtained by John Xantus, U. S. Consul at Manzanillo.

A species technically nearest to the S. couchii, which exhibits much smaller dorsal scales, and approaching the genus Uta in its scutellation.

Sceloporus pyrocephalus.
Dorsal scales much larger than ventral, strongly keeled, unimucronate; in about twenty-five transverse oblique series from nape to crural region. Lateral scales larger than abdominal; of the latter a portion only slightly emarginate. Scales from ear to shoulder squamous; those of ear fringe a little larger than those anterior to them. Tail much compressed. Femoral pores twelve. Supraorbitals five, transverse, in immediate contact with narrow marginals, not touching superciliaries. Frontoparietal narrow; frontal broader than long, not divided. Parietales exceedingly small; interparietal large, much broader than long. Frontonasals two each side broader than long; posterior in contact; anterior embracing broad hexagonal internasal. Infraciliaries small, except the anterior pair, which is large and extensively in contact. From end of muzzle to ear 6 lines; ear to vent 1 inch 9 lines; length of anterior limb 11 lines; of hinder limb 1 inch 5 lines; of hinder foot 7 lines.

Greenish brown, with a broad black band from the scapular region to the groin, light bordered above. Below yellowish, sides bluish ash to near the median line, on each side of which is a series of from seven to nine transverse blue bars. Upper labial and gular region striped with a series of black or bluish lines, which converge posteriorly on a paler or deeper yellow ground. Top of the head bright chestnut red; the fontanelle white or pink, surrounded by a pale area. In many specimens, especially females, the head is brown above, except the parietal spot.

Hab.—Near Colima, Mexico; obtained by Jno. Xantus, U. S. Consul at Manzanillo, where it is abundant. Collection Nos. 1223, 1311. This small species may be known from the thayeri by the extension outward of its supraorbitals, and small size of its parietales, as well as by coloration, and its remarkably compressed tail.

Sceloporus oligoporus.
Dorsal scales large, mucronate, in twenty rows from interscapular to sacral 1864.] 12
regions, larger than laterals, which are larger than ventrals; last with a sharp mucron, and one or two emarginations. Tail cylindrical; femoral pores only two or three. Parietals large; interparietal longer than broad. Frontal and frontoparietal broad; former longer, undivided. Divided frontonasals and internasals in contact; supraorbitals in contact with both marginals and supraciliary ridge, four on each side. Three pairs infralabials, transverse, the anterior barely in contact. Three bordering scales of ear, not larger than those preceding. End of muzzle to ear 11 lines; ear to vent 3 inches, 5 lines; length of tail 3 inches; length of anterior extremity 8 lines; posterior 2 inches 7 lines; hind foot 1 inch. Males, above brown, with a yellowish dorsolateral band and seven or eight pairs of yellowish, anteriorly black edged spots on the back. Top of head red; below whitish; sides faintly blue tinged. Females brown-olive, with a paler dorsolateral band. Throat, a broad band to shoulders, and sides of abdomen, blue.

_Hab._—Near Colima, Mexico; from the Xantus coll.

A species to be compared with _clarki, zosteromus_ and _spinosus_, and differing from them and all other species in the fewness of the femoral pores, thus approaching the genus Proctotretus. The frontal is not narrow as in _zosteromus_, nor the ventrals rounded emarginate as in it and the other species. The supraorbitals are bordered by small scales in _spinosus_.

_Sceloporus malachiticus._

Dorsal scales larger than lateral which are larger than ventral, strongly mucronate, in 25 to 28 rows from interscapular to sacral region, fourteen rows between axilla and eight to ten between femora. Scales before shoulder squamous; marginal ear scales very small; supraorbitals five, broad, short, separated by small scales from supraciliary ridge, and larger scales from narrow marginals. Parietals small, subtriangular; interparietal with parallel lateral borders, longer or as long as broad. Internasal broad; its anterior surface nearly straight. Infracilia small; anterior little or not in contact. Abdominal and gular scales not mucronate, and apparently not emarginate. Lateral scales, even to axilla, strongly mucronate, four times emarginate to serrate. End of muzzle to ear 8½ lines; ear to vent 2 inches 5 lines; anterior limb 1 inch, 5 lines; posterior limb 2 inches; tail ?; sixteen femoral pores.

General color bright green, with angular dark cross-bars, five or six on each side. Sides of abdomen and throat blue; the latter extending to nape.

_Habitat._—Costa Rica, near Arriba, whence the Smithsonian Institution has received specimens, 6492, through Chas. N. Riote.

This animal is the tropical representative of our _S. undulatus_, though in general appearance not unlike the _formosus_. The much stronger mucronation and emargination of the scales, especially on the sides, as well as the color, are distinguishing traits.

_Phrynosoma a s i o._

Nostrils lateral, in the line of the canthus rostralis. Three or four series of lateral gular scales on each side, which are short and subequal. Rostral present, flat semi-discoid. Eight scales on sharp infralabial ridge. Superior labials nine, subequal, not produced into horns continuous with temporoopticall crest. Horns of latter, two diverging temporal, separated from two vertical occipital, which are separated by a depression. One high acute posterior supraciliary on each side. Auricular opening large, bounded below and behind each by a bunch of spines. Two lateral series, superior large. Pectoral and abdominal scales large, keeled; femoral pores 7 to 9. A dorsolateral series of very thick spinous processes, and two median dorsal rows of flat mucronate scales, which become four rows of spines on the tail; one median nuchal row. Femur and tibia with two rows of spines each; three rows of very strongly keeled plates on the humerus. Tail of as long as from shoulder to vent; i. e., inches 4 lines. End of muzzle to ear 1 inch; to shoulder 1 inch 6 lines; to
end of temporal horn 1 inch 4 lines; to end of superciliary do. 1 inch. Width of front between middle of superciliary ridges 8 lines. Width of body (exclusive of lateral spines) 3 inches 4 lines.

General color ashy; the head pale; the body brownish: from occiput to groin between dorso-lateral and lateral rows of spines, deep brown, leaving a narrow pale space on nape. Four broad brown cross-bands anterior to sacral region, pale bordered posteriorly; nearly obsolete in \( \mathcal{C} \); tail with many brown, pale-edged cross-bands; below unspotted.

**Habitat.**—Colima, Mexico; from consul John Xantus.

This is the largest species of horned frog, and very distinct. Its affinities are between *cornutum* and *coronatum*.

**Gerrhonotus gramineus.**

Two pairs supranasals; the posterior longitudinal, elongate; internasal smaller from frontonasals. Four short supraorbitals; four marginals. Eleven supralabials. Two frenonasals, the smaller above the larger; one frenal and one very large freno-ocular. Six in first, five in second row of infralabials. Muzzle not produced; plates of head thickened and roughened, especially enlarged on the temporal region. Dorsal scales in twenty-three longitudinal series from nape to opposite groin, and in fourteen longitudinal rows; in form twice as long as wide, thick, with an obtuse keel, roughened in old specimens. Abdominal scales in twelve and fourteen series; lateral fold very weak. Extended limbs touching, or the posterior reaching wrist. Muzzle to ear 1 inch; to vent 4 inches 4 lines; vent to axilla 2 inches 11 lines: to end of tail 6 in. 3 lines; anterior limb 1 inch 2 lines; posterior 1 inch 7 lines.

Above bright pea green, each transverse series of scales blackish at the base, and yellowish at the tips. Below pale green, with a reddish tint in some, gular region and lower jaw yellow, abruptly separated from the green of the neck.

**Habitat.**—Orizaba, Mexico. Mus. Smithsonian. From a fine collection (No. 50), made by Prof. Sumichrast, which contained also *Spilotes poecilonotus* and *Atropus undulatus*. The Professor has recently published some interesting observations on the habits of certain Mexican reptiles in the *Ann. Mag. N. Hist.*, 1864, p. 497.

**Diploglossus steindachneri.**

Tail cycloctetragonal. Scales in thirty-two longitudinal rows, (ten dorsal), without central keel, eight and ten striate. Limbs weak, not meeting when pressed to side by the length of the hind foot; digits much compressed, claws acute. Five supraorbitals; frontal longer than broad, subparallelogrammic. No frontonasals; internasal broader than frontal. Supranasals very large. Two frenonasals, one above the other; one very high prefrontal; two postfrenals, one above the other; one freno-orbital. Nine supralabials. Interparietal triangular, longer than broad, separating the short parietals, whose posterior outline is emarginate and embraces the broader than long postparietals; frontoparietals very small. End of muzzle to shoulder 1 in. 1 1/2 l.; shoulder to vent 2 in. 6 l.; vent to end of tail 5 in. 2 1/2 l.; posterior limb 1 in. 2 l.

Olivaceous, the sides tessellated with small black spots, which become bands on the axillary and postauricular regions; lips greenish, black spotted; below uniform pale greenish.

**Hab.**—Orizaba, Mexico. Sent to the Mus. Smithsonian, (No. 6342), by Prof. F. Sumichrast. Dedicated to Dr. Franz Steindachner, of the Imperial Museum of Vienna.

**Lampropholis assimatus.**

Scales small, entirely equal, in thirty longitudinal rows. Body subcylindrical; head short, not depressed. Tymanum large, in a deep depression, which is not fringed. Nasals and frontonasals respectively not in contact. In 1864.]
ternasal little broader than long; frontal much produced anteriorly, very acu-
minate posteriorly. Single frontoparietal broad as long, with transverse pos-
terior suture. Four rather large supraorbitals. Interparietal longer than 
broad; parietals narrow, in contact posteriorly, not succeeded by a double row 
of transverse scales. One high frenonasal, one frontal, two freno-orbitars, one 
above the other. Superior labials seven. Palatine maxillary laminae over-
lapping their whole length. From end of muzzle to axilla \(\frac{7}{2}\) lines; axilla to 
vent 1 in. 1 l. Length of tail 2 in. 5 l.; of hind limb \(\frac{6}{2}\) lines.

Above brown fulvous; below pale fulvous; a faint dark line from eye across 
scapular region.

**Hab.**—Guatemala. Taken by Capt. J. M. Dow near the Volcano of Isalco, 
and presented by him to the Mus. Acad. Nat. Sciences.

The genus Lampropholis was first established by Dr. J. E. Gray, and called 
by him Mocoa. I prefer using the more classic and prior name of Fitzinger, 
though the genus is not to be attributed to this author. The present species 
is the first which has been found on the American continent. **The American 
**species placed in it by Gray belong to the genus **Oligosoma** Grd., under which 
**Lytosomella** Grd., **Leptosoma** Fitz., and perhaps **Hombronia** Grd., may be placed 
as synonyms.

**Oligosoma gemmingeri.**

Scales in twenty-seven longitudinal rows; the two median nuchal scarcely 
larger. Body stout, cylindrical, limbs short, weak, the anterior reaching the 
anterior margin of ear anteriorly, posteriorly not touching extremity of ap-
pressed hind limb by its length. Seven upper labials; one frenonasal, frontal, 
and freno-orbitar each; parietals short; interparietal nearly broad as long. 
End of muzzle to axilla 10 lines; axilla to vent 1 in. 8 l.; posterior limb 8 l.

Above fulvous or brown; beneath yellowish white. A dark dorso-lateral 
streak extends from the nostril to a distance on the tail, which is light bordered 
above on the body, and borders above a dark lateral shade.

**Hab.**—Orizaba, Mexico. From Prof. F. Sumichrast. Mus. Smithsonian, 
No. 6331.

This Mexican representative of our **O. laterale** differs in its stouter body 
and shorter limbs, its nearly equal dorsal and nuchal scales, its much shorter 
posterior cephalic and labial plates, and in color. Named in pleasant recollec-
tion of Dr. Max. Gemminger, of Munich, author of Fauna Boica and other works.

**Paludicola pustulosa.**

Muzzle compressed, narrow, plane above, produced beyond labial margin; 
canthus rostralis rounded. Nares nearly terminal; eyes rather large, each lid 
equaling the frontal width. Tymanum concealed; a large vocal sac. Skin 
above covered with small warts, some of which are linear and curved. No 
skin folds. Toes elongate, free, knobbed at extremities and under each joint; 
two metatarsal and one median inner tarsal spur; no tarsal fold. Below, on 
the breast, smooth, minutely rugose posteriorly. Two large metacarpal warts. 
Heel reaching middle of orbit. From end of muzzle to shoulder 7 l.; to vent 
1 in. 3 l.; width across angle of jaws 5 l.; length of anterior limb 10 l.; of pos-
terior 1 in. 9 l.; of hind foot 7 l.

Above blackish brown; elbow, tarsus and foot broadly banded with pink 
grey; below and on inner surfaces of limbs yellow, marbled with black, the 
latter color predominating anteriorly, but divided by a median yellow line to 
symphysis mandibuli.

**Hab.**—New Grenada, on the River Truando. Obtained by W. S. Wood, of 
Michler's Surveying Expedition. No. 4339.

**Paludicola** is a genus of Wagler's which has been latterly overlooked. It 
is the only one beside Schismaderma among the Bufonide which lacks the pa-
rotoids; from this genus it differs in its manubrium sterni, free toes, and tarsal 
spur, in this last respect resembling Gomphobates biligonigerus. It 

**[Aug.]**
agrees with Bufo in the fully developed frontoparietal bones, differing from Epidalea (Bufo calamita Auct.) and Pseudophryne in this respect.

Phyllomedusa dacnicolor.

Parotoids exceedingly weak, if present. Fingers very slightly, toes one-third webbed. Labial margin projecting, profile sloping. Tympanum one-half orbit. Eyes not very prominent, transparent, inferior palpebra reticulated with white veins. Mandibular outlines straight. Tongue long, pyriform, openly emarginate posteriorly. Skin above smooth; inferior areolations not extending on pectoral or gular regions. Vomerine teeth in two straight transverse rows between anterior margin of inner nares. A few small pustules on anterior part of sides, which are yellow, like the inferior surfaces. Superior surfaces (narrowly on femur,) violet blue. Upper lip not light bordered; gular region and posterior faces of femora immaculate. From end of muzzle to posterior border of tympanum 10 lines; from angle to angle of mandible 1 in. 1 l.; end of muzzle to vent 3 in. 6 l.; anterior extremity 2 in.; posterior limb 3 in. 10 l.

Hab.—Near Colima; from the large Xantusian Coll.

This species diverges widely from the type of Phyllomedusa in its webbed toes and almost absent glands, but the glands are only a little stronger in the P. azurea. It affords an easy passage to the true Hyla, whose family it enters, by the genus Agalychnis Cope. The type of the latter is Hyla calidryas Cope, and H. moreleti and holochora are the other species. They have the tongue long and extensively free, sometimes emarginate, and the transparent inferior palpebra reticulated with strong white veins. The inner toes are remarkably lengthened and free of movement.

On the Limits and Relations of the Raniformes.

BY E. D. COPE.

Similar relations to those which exist between the mammalia Implantentia and the remainder of the class, and vice-versa, are apparently repeated in other groups of greater or less rank in the animal kingdom. Among the tortoises, the Pleurodera separate themselves most strongly by the union of their ischia with the plastron, the absence of the arch of the o. prefrontale which elsewhere descends to the o. palatinum, or vomer, and their integular shield; while they present modifications among themselves characteristic of most of the other families, arranging themselves according to the development of the parieto-mastoid arch, in an ascending series, which terminates in Bothremys and Podocnemys, where the temporal fossa is entirely roofed in, as in the sea turtles. In the Lacertilia Acrodonta we have a group equally removed from others of the order. The acrodont dentition, the great development of the o. dentale and final extinction of the o. operculare, etc., and the exclusion of the premaxillare from contact with the vomer, are peculiarities not found associated in other lizards, while their parallel representation of the groups of the Iguanidae at least, among the Pleurodonta, is well known. In general these also form an ascending series to be measured by the gradual extinction of the o. premaxillare and o. columellum, which finally occurs in Chamæleo.

The Raniformes among Batrachia Salientia are in many respects comparable to the Acrodonta. They stand at the head of their order, possessing the most compact, powerful and complete organization, and in spite of the constant imitation of the many lower types, their is a certain homogeneity in important points. The structure of the sternum separates them at once, and

* This bone, said to be single in Lacertilia, is divided in all the true Scleridae, in Phyllurus among the Geocotidae, and, according to Owen, in Hatteria.
presents less variety than in the other suborders. The o. o. coracoïdea are distally much dilated horizontally, especially anteriorly, and in close contact on the median line; their axis is transverse. The o. o. epicoracoïdea are also transverse, and usually in contact medially, always resting against the ante-
or angles of the coracoïdea. The manubrial and xiphiplastial pieces are dilated proximally and become cylindrical or stylloid, terminating in a carti-
laginous disc. The only other cartilages of the sternum are the intersutural.

The Leptopelis, Arciferi, have Hylella, Cystignathus, and Hyperolius, hence Pseudis. f The Hyla, Polypedates, Rana. Among the transverse, genera form mer while coracoïdea and laginous dilated distally be ally diapophyses, Frogs in occur. R. type.

The Rainiformes embrace but one family, but this imitates well many genera of Arciferi. The metropolis of the former, as of the Acrodonta, is the Regio Palaeotropica, while the latter have but few representatives out of the R. R. Neotropica and Australis, where but one or two species of the former occur. In both we can trace a series in which the outer metatarsal is gradu-
ally liberated from the penultimate, to afford greater extension for the web in the most aquatic types, and among those where these bones are bound, from webless to webbed types. In both we have burrowing and arboreal genera.

In strict reference to the extension of the webs the following parallels may be drawn:

<table>
<thead>
<tr>
<th>Raniformes</th>
<th>Arciferi</th>
</tr>
</thead>
<tbody>
<tr>
<td>External metatarsal free.</td>
<td></td>
</tr>
<tr>
<td>Aquatic.</td>
<td>Rana</td>
</tr>
<tr>
<td>Subfossorial.</td>
<td>Hoplobatrachus</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>External metatarsal attached.</td>
<td></td>
</tr>
<tr>
<td>Feet webbed.</td>
<td></td>
</tr>
<tr>
<td>Burrowing.</td>
<td>Pyxicephalus</td>
</tr>
<tr>
<td>Arboreal.</td>
<td>Leptopelis</td>
</tr>
<tr>
<td>&quot;</td>
<td>Hyperolius</td>
</tr>
<tr>
<td>Subarboreal.</td>
<td>Hylambates</td>
</tr>
<tr>
<td>Feet not webbed.</td>
<td></td>
</tr>
<tr>
<td>Terrestrial.</td>
<td></td>
</tr>
<tr>
<td>&quot; spurred Hemimantis.</td>
<td>Cystignathus.</td>
</tr>
<tr>
<td></td>
<td>Gomphobates.</td>
</tr>
</tbody>
</table>

Comparing the genera in a general physiological sense, we may parallelize further—

| Aquatic, with digital dilatations,— | Acris.                  |
|                                    | (Trachycephalus.        |
| Arboreal.                          | Polypedates             |
| "                                  | Rhacophorus.            |

It is, however, remarkable that the Rainiform tree-frogs nearly always have the external metatarsal bone free, the Arciferous always bound; the terminal phalanges of the latter are constructed on a ball and claw type, in the former they are T-shaped or bifurcate, except in the single West African genus Leptopelis, where the South American type is repeated.

Evidently belonging to former times, as their present weak representation and generalized structure seem to indicate, are two families of Arciferi not
at all imitated among the Raniformia. These are the Discoglossidae and Aste-
rophyridae. In both the vertebrae are opisthocoelous instead of prococoelous,
and the sacral diapophyses are dilated. The latter approaches closest to the
ordinary type, having a simple coccyx with but one condyle, no ribs or fron-
to-parietal fontanelle, and a stylloid xiphi sternum. The genera are Megalo-
phys, Xenophys, Asterophys, Leptobrachium and Cryptotis, one Indian, one
Australian, the rest Malaysian. The former family is the most remarkable.
It has rudimentary ribs, a xiphi sternum divided into two long haemapophyses,
a coccyx with diapophyses and two condyles, and, in the recent types, a fronto-
parietal fontanelle. The genera are Latonia, Discoglossus, Alytes, and Bom-
binita, all European. There are no arboreal types in these two families,
and their terminal phalanges are straight, conic. They form the nearest living
approach to the Batrachia Gradientia.

The Batrachian which have been called Proteroglossa form, I believe, a
family—Rhinophrynida—among the Bufoniformes.

Description of a GAR-PIKE, supposed to be new—Lepidosteus (Cylindrosteus)
oculatus.

BY PROFESSOR ALEXANDER WINCHELL.

In the month of February, 1863, the Museum of the University of Michigan
received a specimen of an unknown gar-pike, from Duck Lake, Calhoun Co.,
Michigan. As Prof. Agassiz had made a special study of this genus, and had
declared that he was acquainted with twenty-two species, I transmitted to him
a brief description of the fish; but, for some reason, I received no reply. I
sent the same to Prof. Baird, but obtained no assistance; I then wrote Mr.
Putnam, at Cambridge, for references to all the published descriptions of
Lepidosteus, and, a few months ago, received the information sought; though
most of it was already within my reach. On Prof. Agassiz' visit to Ann
Arbor, last winter, during my absence this fish was shown to him by Dr. Sa-
ger. Prof. Agassiz thought it had been described by Dr. Kirtland, but he
could not say in what work the description had appeared. The impression
given was, that it had been published in some agricultural work, in Ohio, not
generally accessible, and not likely to be seen by ichthyologists. I wrote to
Dr. Kirtland on this point but received no reply. I am convinced that this
species, if ever described, has not been made known through such a medium
that the description can be said to be published to the scientific world. I am,
therefore, determined to run the slight risk of creating another synonym, by
offering the following name and detailed description.

Lepidosteus (Cylindrosteus) oculatus. Winchell.

General form elongate-spindle-shaped, laterally flattened toward the tail,
and vertically flattened from the nape forwards. Greatest height contained
10 1/2 times in the whole length; greatest width the same. Lower outline
nearly straight, slightly ascending at the throat, and more so from a point an-
terior to the anal to the base of the caudal fin; upper outline gently curved
along the back, anteriorly somewhat more rapidly curved to a point over the
angle of the mouth; lateral outline gently and equally curved from the ex-
tremity of the snout to the base of the tail; greatest vertical diameter through
a point about three scales in front of the abdominal fins; greatest transverse
diameter through a point about six scales in front of the abdominals.

Number of scales in a diagonal series (between the dorsal and ventral rows)
18, occasionally increased to 19, by the interpolation of an additional scale
near the ventral row; number of scales in the dorsal row, between the head
and the dorsal fin, 48; behind the dorsal fin, 8 or 9. The first diagonal series
of scales do not meet on the nape of the neck, being separated by the pair of
mutually equivalent scales of the dorsal row, which belong in the second di-
1864.]
agonal series; these two scales are pentangular. The scales of the dorsal row increase in width from the third to the sixth; the third is small, triangular; the fourth, rounded posteriorly and slightly curved on the four other sides; the fifth becomes emarginate posteriorly, convex on the two contiguous sides, and overlapped antero-laterally by the adjoining scales of the next anterior diagonal series; the sixth exhibits the same form with a greater transverse diameter; the seventh is small again, and the width gradually increases to the tenth; the eleventh in turn is small, and the size increases to the sixteenth, beyond which the size is rather variable. From the sixth to the twenty-second, the general form of the sixth is preserved, with a tendency to become less and less emarginate, and more elongate longitudinally. The lateral scales are rhomboidal, those which lie along the lateral line having the dimension which coincides with the direction of the diagonal series one and one-third times the other dimension. The longer sides are nearly straight; the shorter, sigmoidally curved by lines which first bend downwards and then upwards. This form of the scales is shown to some extent by nine or more lateral rows on each side. Generally, the scales nearer the head are less angulated behind; while those toward the other extremity are more drawn out. The surfaces of the scales, where not worn, are rough to the touch; and under a magnifier, and even to the naked eye, are seen to be covered with fine granules. The first diagonal series is sculptured by vernicular, intersecting furrows, which show a tendency to radiate from the central area. Similar sculpturing can be traced on the sides, as far back as the sixth series.

Head one fourth the total length of the fish, lanceolate in outline, laterally tapering, with slight curvature from the hinder border of the opercula to the extremity of the truncated rounded snout. Eyes large, situated less than the diameter of the orbit behind the extremity of the lower jaw. Projection of the upper jaw beyond the lower, equal to the distance between the nostrils, which, opening upwards, in oval apertures, are situated half the same distance behind the tip of the snout. Lower jaw a little more than half the whole length of the head. Angle of the mouth midway between the tip of the snout and the hinder margin of the operculum. Each ramus of the jaw presenting below a flat surface, with parallel borders extending directly back for a short distance, and then slightly arching outwards; on its lateral surface regularly increasing in vertical width to the small "angular piece;" through half its whole length projecting laterally beyond the maxillary; furnished with a principal row of strong conical teeth slightly bent backwards and inwards; the lips furnished with a smaller set, and the internal surface clothed with a multitude of dentelets. The principal and labial teeth of the maxillary and intermaxillary are similar to those of the lower jaw; the palatines are set with numerous fine teeth. The top of the head is somewhat flattened, becoming decidedly so on the snout. The suture bounding externally the frontal and parietal bones is a distinct, deep furrow, gently deflected outward at the base of the maxillary, behind which is a deep supra-orbital emargination of the frontal, which thence continues to widen regularly to its junction with the parietal. Opercular semicircular behind, nearly straight in front; interopercular lanceolate, widening backwards, somewhat pointed in front, abruptly round-cuneate behind, with a triangular projection between the opercular and preopercular. Operculum regularly concave behind, except a backward swell in the middle. Whole surface of the head handsomely sculptured, the vertex rather deeply so; on the snout and the sides and base of the head the embossed lines tend to become broken into granules.

Pectoral fins separated from the operculum by a single diagonal series of scales; the ventral fins midway between the extremities, situated on the diagonal series which embraces the 17th scale in the dorsal row; anal fin a little more than its width from the caudal, interrupting the 38th—42d diagonal series of scales; dorsal fin of the same width as the anal, and situated so that the last three rays fall in the rear of it; pectoral fins narrow, sharply rounded [Aug.
at the extremity, with the middle ray the longest; ventral fins relatively broader, rounded, with the second and third rays the longest, the last ray being the width of the fin shorter than the first; anal fin a little shorter than the ventral, but twice as broad, round-d, with the 3d and 4th rays the longest; caudal fin symmetrically and elliptically rounded at the extremity; the first (upper) ray reaching a little further back than the last; the first three rays considerably smaller than the last three, so that the sixth ray falls in the middle; skin terminating in a line stretching sigmoidally backwards from below to above, so that the base of the last ray is two-thirds the width of the tail anterior to the base of the first ray. A series of scales diminishing in size continues along the first and last rays of the caudal, and the first ray of all the other fins.

Ray formula: D. 8; C. 11; A. 8; V. 6; P. 9.

The ground color is pale yellowish-white, becoming deeper on the sides and back, and nearly white below. This is varied by a system of pale black maculation, which, along the back, conceals most of the ground color, and on the sides, about half of it, while the belly is almost spotless. On most parts of the body the macule are irregular, with a tendency on the sides to elongation beyond the length of one or two scales. On the top of the head and the operculum they become sharply defined circular spots, with intermediate blackish dots, while the throat is spotted in the style of the breast of a partridge. The fins are all maculated with oval, badly defined spots.

Measurements.—Total length 32.5 inches. Length of head from snout to occiput 6.8; to posterior margin of operculum 7.7; length of tail on the middle line 4; upper jaw to angle of mouth 4; width of snout one-fourth inch back from nostrils 0.62; width at angle of mouth 1.5; width of neck between posterior margins of opercula 2.2; greatest height of body 3; greatest width 3; height of head at occiput 2; at angle of mouth 0.8; length from tip of muzzle to insertion of pectoral 6.7; to insertion of ventral 9; to insertion of anal 17; diameter of orbit 0.57.

Comparisons.—In form, this species approximates most nearly to Cylindrostens latirostris, Girard, from Texas. It differs specifically in having a larger orbit, the operculum and cheek less elongated behind it, the muzzle tapering a little more rapidly, and two or three fewer scales in an oblique series. The color, besides, is much less uniform, and the habitat remote. From C. platostomus, Rafinesque, it differs in having the caudal fin more nearly symmetrical; rays of ventral fin not cartilaginous; pectoral longer, narrower and straighter. The caudal has one more ray, and the anal and pectoral each one less. The snout widens less rapidly, and the scales are more rhombic. The coloration, especially the sharply defined circular spots, is strikingly peculiar. No spots, however, exist on the median line behind the anal fin. There are no other described species with which the present one requires to be compared, unless it be C. albus and C. longirostris of Rafinesque, and L. gracilis, Agassiz. The two former are very doubtful species, and the description of the latter is not at present accessible to me.

The following is now a list of the described species of Lepidosteidae, arranged under three genera, discriminated according to information at hand. No attempt is made, at present, to exhibit the complicated synonymy, as the result would necessarily be too imperfect, from the want of adequate means of comparison.


1864.]}
September 6th.

Mr. Cassin in the Chair.

Twelve members present.
The following papers were presented for publication:
“Synopsis of the Pleuronectoids of the eastern coast of North America.”
“Synopsis of the Cyclopteroiids of eastern North America.”
“Note on the Paralepidoids and Microstomatoids, etc.” And “Synopsis of the Pleuronectoids of California, &c.” By Theo. Gill.
“Description of new Genera and Species of North American Myriapoda.” By Dr. H. C. Wood, Jr.

September 13th.

Dr. Hays in the Chair.

Thirteen members present.

September 20th.

Vice-President Bridges in the Chair.

Twenty members present.
The following papers were presented for publication:
“Descriptions of new Genera and species of Pleuronectoids.”
“On the affinities of several doubtful British Fishes;” and “Notes on the Family of Stichæoids.” By Theo. Gill.
“Notes on Shells, with Descriptions of new fossil Genera and Species.” By T. A. Conrad.

September 27th.

Vice-President Bridges in the Chair.

Twelve members present.
On report of the respective Committees, the following papers were ordered to be published:

Description of New Genera and Species of North American MYRIAPODA.

BY DR. H. C. WOOD, JR.

Family POLYZONIDÆ.

Genus OCTOGLENA,* Wood.

Oculi octo, in seriebus duobus simplicibus dispositi.
The eyes in this genus are very prominent, and are arranged in two straight rows, which are so placed, one on each side, near the base of the antennæ as to be convergent inferiorly.

O. BIVIRGATA.

O. brunneus, utrinque virga fusca ornatus; segmentis fere 45.
The head of this species is very small, and is pilose. The antennæ are rather

* Afterculus.
heavy, and are very pilose. The eyes are large and very prominent. The dorsum is slightly convex, and is ornamented on each side by a broad fuscous stripe, which is intersected by numerous, indistinct, dark lines.

The scuta are very smooth, and have no distinct lateral plates, but their edges are rather thin and strongly elevated. The penultimate scutum is much broader than its neighbors. The last scutum is very small. The feet are dark colored. There are two or three specimens in the possession of the Academy, which, I believe, were collected by Dr. John L. Le Conte, U.S.A., in the mountains of Georgia.

**Family Siphonophoridae.**

**Genus BRACHYCYBE.**

Rostrum acutum, brevissimum, antennis multo breviore.
I have never studied the allied genus *Siphonophora* of Brandt, but, if the characters relied on by that author are at all generic, there can be no doubt that the American species belongs to a distinct genus. In the *Siphonophora* the rostrum or mouth is very much elongated, and approaches the antennae in length. In *Brachycebe* the latter are several times the longer.

**B. leontii,** Wood.

Fulvo-brunneus? dorso modice convexo, medio leviter canaliculato; antennis parvis, filiformibus, pilosis; scutorum superficie asperata, obscure transverse canaliculata; scuto postremo postice spine obtusa serie instructo; laminis lateralisibus longis, angustis, vix sejunctis; segmentis 4?; pedibus breve pilosis.

In our specimens, which have been preserved for a long time in alcohol, the color is a light yellowish-brown. The anterior scuta are tuberculate, the posterior merely roughened. Each has a more or less obsolete transverse groove extending along the lateral lamina. The latter are very long and narrow; they are placed very close together, and are often bent slightly backwards. Their external margin is somewhat oblique, and is furnished in all except, perhaps, the most anterior, with a pore. The small feet are entirely concealed beneath the broad body. The male genital appendages consist of two pairs of acute feet-like processes. It affords me much pleasure to dedicate this species to Surgeon John L. Le Conte, U.S.A., as an acknowledgement of the many assistance which he has afforded me in the prosecution of my studies.


---

**Note on the Paralepidoids and Microstomatoids, and on some Peculiarities of Arctic Ichthyology.**

**BY THEODORE GILL.**

My attention having been attracted to the resemblance between the Alepidosaurids and Paralepidoids, shortly after my article on new species of the former family, I embraced the opportunity, when in Philadelphia, to examine the specimens of the two genera, *Paralepis* and *Studis*, in the Bonaparte collection, secured by the liberality of Dr. Wilson. The suspicions of the close affinity of the two families were fully confirmed, and the same logic that would prove the Alepidosaurids to be Siluroids, would cover the Paralepidoids. Nearly equally erroneous would be the reference of those families to the Scambroid group, near which I formerly retained it with Lowe. The Paralepidoids are, indeed, chiefly distinguished from the Alepidosaurids by the small dorsal fin, and the more posterior ventrals, and wherever one is placed, the other must be approximated next to it.

The species of this family of Paralepidoids are divisible among three groups, 1864.]
whose relations and differential characters are expressed in the following table:

I. Head acutely conic; snout pointed, and oral cleft nearly rectilinear. Teeth of lower jaw part enlarged, slender and pointed, part small and slender. Paralepis.
   b. Dorsal fins opposed to ventrals. Paralepis.

II. Head blunt, and oral cleft curved upwards towards the end. Teeth of lower jaw partially erect, compressed, dagger-shaped, partially directed forwards. Sudis.

The distribution of these three groups is most remarkable. Paralepis and Sudis are types as yet only known to be represented in the Mediterranean Sea, while Arctozenus is represented by a single species, hitherto only found in the waters of Greenland, and yet there is the closest affinity between Paralepis and the Arctic type, so close, indeed, that only since the opportunity afforded to examine the detailed figures of Kroyer, have we been able to fully appreciate their distinctive characters. In order to assist less fortunate naturalists, the following diagnosis of the newly named subgenus is given.

**ARCTOZENUS, Gill.**

Head elongated conical, attenuated towards the snout, with the snout quasi-pointed, the jaws straight, the lower behind mostly covered by the upper, and little exposed along the sides; the teeth of the lower jaw, along the anterior half, enlarged, but slender, recurved and distant; along the posterior half, minute, acute and approximated; the dorsal fin behind the middle, but considerably in front of the ventrals.

*Type.* Paralepis borealis, Rean.

In the family of Microstomatoïdes,* which is related to the Paralepidoida, we find the same peculiarity in geographical distribution; the genus Microstomus† being confined to the Mediterranean, while in the Greenland seas a closely related representative is found.

Still another case of similar, or rather even more remarkable character, is exhibited by the Stomioida. This family, distinguished by the combination of an enormous mouth, and the opposition of the dorsal and anal fins, is composed of two genera, Stomias and Malacosteus. The former is represented by apparently closely related species, respectively inhabiting the Mediterranean and Greenland Seas, while of Malacosteus, a single species discovered south of the Newfoundland Bank has been described. As, on account of the misconceptions of the author of the last named genus, it has been involved in considerable mystery, a diagnosis of it, with reference to its ally, may be useful; but I desire expressly to add, that I do not hold myself responsible for any of the facts, not having seen the original specimen, and that the statement of the absence of scales, &c., requires to be confirmed, although it is quite probable that none exist. The original describer has denied to the genus branchiostegal rays!

**MALACOSTEUS, Ayres.**


Body elongated claviform, constricted only at the caudal peduncle; without scales; with the head very convex, and protuberant in front of the eyes; the opercular and tympanic regions very oblique, the opercular bones reduced, the

---

* Although the adipose fin has been denied to Microstomus by such skilful observers as Müller and Valenciennes, I think that I am able to distinguish it in specimens of the *M. rotundatum*, preserved in the collection of the Academy.
† Microstomus, Cuv., R. A. 1817, ii., 154; Rissos, 1829, ii.; Cuv. et Val. xvi., 355. Reinhardt appears to have first introduced the modification Microstomus.
oral cleft rectilinear; teeth of the upper jaw minute; of the lower, in front, enlarged, but unequal, elongated, recurved and acute; behind minute; at the symphysis directed forwards; small, acute and hooked, and in a double row on the tongue; palate smooth; caudal very small, convex; pectorals inserted very low, linear, of few rays closely connected; ventrals scarcely behind the middle, with about six rays, the external (except the outermost) of which are produced. Intestine with a flexure.

Type.—Malacosteus niger, Ayres.

"The principal points on which" Mr. Ayres would "particularly insist, as characteristic of the species and the genus, are the remarkable small size of the head, and, in contrast with this, the immense development of the whole facial and branchial apparatus, and all that pertains to the mouth and throat, the singular and but partially explained organ on the cheek; and, most of all, the embryonic condition of the entire osseous system." In all respects—perhaps even the last—the genus resembles Stomias. Sir John Richardson has suggested that the want of ossification may be due to the preservation of the fish in weak alcohol, but I am scarcely disposed to accept that hypothesis, and would even believe that Stomias itself may be found to have an imperfectly ossified skeleton, but not, perhaps, in so marked degree as Malacosteus.

In the consideration of the faunistic anomalies here enumerated, we may be aided in a solution of the causes by the consideration of nearly similar peculiarities in the Ichthyology of the Scandinavian seas. There alone in the more northern seas, species of the genera Beryx and Batrachus, closely allied to or undistinguishable from Mediterranean or tropical species, are found, and there also has been discovered Pterycombus, a genus whose affinities are with the tropical Pteraclides. No representatives are found at intermediate places along the European coasts. Again, along the Rhode Island and neighboring coasts have already been found Sarothrodus, Priacanthus, and Hyporthodus, the last closely related to Serranus. All the places enumerated are near the borders of the Gulf Stream. How far the distribution of these genera is thereby affected it is not my intention to now discuss, my desire being simply to draw attention to the facts. Further details regarding their bathymetrical, as well as geographical, distribution are desirable.

Synopsis of the CYCLOPTEROIDS of Eastern North America.

BY THEODORE GILL.

The description of a new species of Liparis, from the Arctic seas, is here submitted, and attention is called to some points in the synonymy of other species of the genus which require elucidation. To complete a view of the family to which they belong, I enumerate the Cyclopterine. The family is restricted, with Günther, to those fishes whose suctorial disk is formed by the union of the ventral fins, and which have numerous pyloric cæca, as it is not evident that there is any close relation between such and the Gobiesocoids.

Cyclopterinae, Bon.

Cyclopteroids with a ventricose body and two dorsal fins, the first of which is small, and composed of spines; the second, as well as anal, short, and obliquely opposed to each other; and with the caudal vertebrae in scarcely increased number, (Vert. 12+16 pm.)

Genus CYCLOPTERUS, L.

Lumpus, Cuv.

Cyclopterinae with dorsal region elevated in front, larger plates disposed in an unpaired dorsal row and two lateral and one abdominal on each side; the eyes small and anterior; the branchial apertures just above the pectoral fins; the spinous dorsal almost concealed, and the ventral disk small.

1864.]
Cyclopterus lumpus, L.

Cyclopterus minutus, Pall. (Young).
Cyclopterus ceruleus, Mitch. (New York).
Lumpus vulgaris, Storer.
Lumpus anglorum, Dekay.

Hab.—Greenland to New York.

Is the American Cyclopterus identical with the European? The latter has not been examined by myself.

Genus EUMICROTREMUS, Gill.

Cyclopteriæ with the back gibbous; the large plates less regularly disposed, and obsolete on abdomen; the eyes large and submedian; the branchial apertures elevated, and behind the ocular region; the spinous dorsal well developed, provided with 6 or 7 spines; and the ventral disk large.

EUMICROTREMUS SPINOSUS, Gill.

Cyclopterus spinosus, Fab. et al.

Hab.—Greenland.

Subfamily LIPARIDINÆ.

Liparinae Gill Cat.
Liparidina Gthr. Cat. iii.

Cyclopertoidæ with an elongated body, and long, uninterrupted dorsal and anal fins, the anterior rays of which, especially of the dorsal, are spinous, and with caudal vertebrae in greatly increased number, (Vert. 10—12+25—59.

Genus LIPARIS, (Art.) Linn.

Cyclogaster Gron.

LIPARIDINÆ with a nearly or quite horizontal oral cleft; longer upper jaw; pluriserial tricuspid teeth; a well developed ventral disk on the breast, below or partially behind the posterior half of the head; the anus little in advance of the anterior third of the length, and the origin of the anal fin not far behind it.

Type.—Cyclopterus liparis L.

This genus, even after the elimination of the L. tunicata of Kroyer, exhibits considerable variation, especially in the relations of the dorsal and anal fins to the caudal, these fins being, in some species, completely isolated, while in others they are coalescent, and united in an almost anguilliform posterior fin. In the latter, the nostrils also appear to be simple, while in the former the posterior ones are tubular. These differences appear still further to be coincident with a disparity in the number of caudal vertebrae, and of the rays of the vertical fins. Nevertheless, it is not deemed advisable to generically separate the types so distinguished.

But the differences between the Liparis tunicata of Kroyer, (Tidskrift, ser. 3, B. i., 236), and the typical Liparides, appear to indicate a more decided demarcation, and the morphological differences mentioned in the analytical table are apparently coincident with difference in size; it is, therefore, probable that the species is the type of a distinct genus, for which the name of Actinochir would be appropriate. For the present, however, it is retained in the genus Liparis.

The increase of our knowledge of the Greenland Liparidæ, since the publication of the "Catalogue of the Fishes of the Eastern Coast," is chiefly due to Dr. Kroyer, who, appreciating the imperfection of our information, has favored us with a monograph of those species. This has chiefly served as the basis of the present article.

I omit, for the present, references to the Liparides of the British northern travellers.

[Sept.]
Synopsis.


** D. and A. connate with C. Posterior nostrils tubular or subtubular.


** D. and A. disconected with C. Posterior nostrils simple.


Liparis lineata, Kroyer.

Liparis lineata, Kroyer, Naturhistorisk Tidsskrift, ser. 2, b. ii., p. 284. 1847.

" " Kroyer, Voyage en Scandinavie, &c., tab. 13, fig. 2, a—g.


" " Kroyer, Naturhistorisk Tidsskrift, ser. 3, B. i., pp. 244—251.

" " Lidken, op. cit., 1861, pp. 243—265, pl. 7, fig. 1.

" " Kroyer, op. cit., ser. 3, B. i., pp. 539—553.

In the synonymy of Liparis lineata, I have only included the references to the Greenland fish, without, by any means, entertaining to decide between Drs. Kroyer and Lidken, the former of whom considers the Greenland fish entirely distinct from the Cyclopterus lineatus of Lepechin, while the latter considers it the same, and also identical with the Liparis vulgaris of Europe, but still retains the name Liparis lineata, as Lepechin first gave the distinctive appellation. As, therefore, the nomenclature is not affected, Dr. Kroyer retaining the name Liparis lineata for the Greenland fish, I am glad to be able to leave the controversy in statu quo.

The discrepancies between the radial formula, especially of the caudal fin, of Liparis vulgaris of authors and Liparis lineata deserves attention. Thus Günther assigns to his Liparis vulgaris D. 35—36, A. 27—28, C. 10; Lepechin, to his Cyclopterus lineatus, D. 36, P. 26, A. 28, C. 13?; Kroyer, to his Liparis lineatus, D. 13—21, A. 2—29, C. 13, P. 34; and Lidken, to his, D. 36, A. 30, C. 14? P. 33, and with the results of the latter two my own observations agree.

Of thirteen English specimens of the so-called Liparis vulgaris of Yarrell, eleven exhibited little distinct coloration on the body, but the dorsal and anal fins were densely dotted, so as to give to those fins, especially when folded, a blackish-blue hue. The pectorals of some, especially towards the superior margin, were also clouded. In one specimen, the head and body were distinctly marmorated, and delineations like those represented on the head, body and pectorals of Liparis lineatus by Kroyer, and L. lineata by Lidken, were observed, but the dorsal and anal were simply dotted as in the ordinary variety, and the delineations themselves were dark lilac on a yellowish ground. The last one, consequently, represented the L. lineatus of Lepechin and Lidken, and the others the L. barbatus of Ekstrom and Lidken.

Liparis arctica, Gill.

The greatest height exceeds a third of the total length, while the greatest width is rather less than a seventh; the height at the end of the caudal pe-
dunce equals about a fourth of the length of the caudal fin. The head, from
the snout to the margin of the auriform projection, almost or quite equals a
fourth of the length, while its breadth enters nearly 6\(\frac{1}{4}\) times in the same, and
is little greater than the height; the forehead is depressed, and the snout mod-
erately high and decurved. The eyes are just within the anterior half of the
head; the width of the forehead between them equals a third of the head’s
length. The anterior nostrils are simple; the posterior tubular. The dorsal
and anal are connate with the caudal; the former united for about a fourth of
the length of the caudal, the latter two-fifths. The caudal is convex behind,
and forms a seventh of the length. The pectoral enters about 5\(\frac{1}{4}\) times in the
length, and the ventral disk ten times.

The color is uniform reddish-brown or dark chestnut, without spots or bands.
This species, in general form as well as color, resembles the *L. Montagu*, but
is in other respects widely different. Its relations to the other Greenland
species is exhibited in the analytical synopsis; it is well distinguished by its
rusty color.

Specimens were obtained by the Arctic navigator, Dr. Hayes, at Port Foulke,
Greenland, and are preserved in the Academy of Natural Sciences of Philadel-
phia, and the Smithsonian Institution. In the Museum of the latter, there is
only a single specimen.

**Liparis Fabricii.**

*Doublet Synonymy.*

Cyclopterus liparis, altera minor, *Abopokitok*, Fab., Fauna Greenlandica, p. 135,
1780.

Cyclopterus liparis, minor Walbaum in Artedi, Genera Piscium, p. 489, 1792.
Cyclopterus liparis, *a Bonnaterre*, Tableau Encyclopédique et Methodique.—
Ichetihyologie, p. 28, 1788.

Liparis tunicata, pp. *Reinhardt*, Oversigt over det kongelige Danske Viden-
skabernes Selskabs Forhandlinger. vii., p. cxxi., (tr. Archiv für Naturges-
cichte, Jarh. iii., B. i., p. 267, 1836).

Vix Liparis tunicatus *Reinhardt*, op. cit., p. 78. (Isis von Oken, 1844, 819),
1842.

*Determined Synonymy.*

Liparis Fabricii, pp. *Reinhardt*, in Naturhistoriske Bidrag til en Beskrivelse of
Grønland, 1857.

Liparis tunicatus, (Fabricii, Kr.) *Lütken* Vindiskabelige Meddelelser fra den
Naturhistoriske Forening i Kjøbenhavn, 1860, p. 173.


Fabricius, in the Fauna Greenlandica, refers to the *Cyclopterus liparis* of
Linnæus, two forms of *Liparis* found by him in Greenland. To the first vari-
ty—"(1) Altera minor, *Abopokitok*"—were attributed 39 dorsal, 33 anal, 30
pectoral, and 14 caudal rays; 4 tubular nostrils; a union of the dorsal and
anal fins wi h the caudal, which latter is nearly cuneate, and a fuscous color;
the jaws externally, the inferior ocular region and the opercula have rather
indistinct white dots, and the tips of the upper pectoral rays being likewise
white. This combination does not entirely agree with any of the Greenland
species, as described by Kroyer, but most approximates to the *I. Fabricii*; from
that species the number of caudal rays, (14) if correctly stated, would separ-
ate it, and the color is also, perhaps, inconsistent. I am thus, then, to leave
the identity of this species in doubt, trusting that future material may enable
us to arrive at a certain decision.

[Sept.]
In 1835 or 1836, Reinhardt offered to the Danish Academy a Contribution on new Greenland Fishes, closing this contribution with the remark that "there also exists in the Greenland seas the Cyclopterus liparis, Fab., which is named Liparis tunicata, on account of the peculiar loose adherence of the skin, and which, in its characters, has much similarity with the European species illustrated by Yarrell, in his British Fishes; but, as the Museum had in its possession only one badly preserved specimen, no certain identification could be made."

The name L. tunicata is thus solely based on the C. liparis of Fabricius, and as the first variety is the one fully described by that author, and consequently the type of his species, and, as Reinhardt's remarks on the similarity of the species to the European are only correct for that variety, the name L. tunicata must be connected with it.

But, in a subsequent communication on "Liparis glutinosus," Reinhardt's ambiguous language might lead one to suppose that he connected the name L. tunicatus with only the large variety of Cyclopterus liparis of Fabricius, he remarking that "Fabricius considered that the large Greenland species, the Liparis tunicatus (sic.) of the Museum, might well be the Stellerian L. glutinosus." However this may be, the name proposed by Reinhardt must be accepted with its first limitation, and share with the variety of Fabricius the doubts concerning its proper application.

The name Liparis Fabricii was subsequently proposed by Kroyer for the species under consideration, and being the first known to be applicable to it, is provisionally accepted.

The radial formula given by Gjætter differs considerably from that assigned by Kroyer, (B. 5, D. 42, A. 33—35, C. 12, Gthr.) and approximates to that of Fabricius, especially in the number of caudal rays.

**Liparis Montagui, Don.**

Liparis Montagui Kroyer, Voyage en Scandinavie, &c., tab. 13, p. 1, a—f.


Only the references to the Greenland form have been given. It may be remarked that while Kroyer, both in his Deamark's Fiske, (ii. 519) and the Naturhistorisk Tidskrift, has assigned 18 caudal rays to this species, Yarrell, Nilsson and Gjætter have only attributed to it 13 or 14. There are also some slight discrepancies between the proportions assigned to the species by different authors.

**Liparis major, Gill.**


Cyclopterus liparis, major, Walbaum, Artedi Genera Piscium, p. 489, 1792.

Cyclopterus liparis, B. Bonnaterre, Tableau Encyclopédique et Methodique Ichthyologie, p. 28, 1788.


Liparis tunicata, Kroyer, Naturhistorisk Tidskrift, ser. 3, B. i., p. 236, 1862.

This species appears to be the second variety of Fabricius' Cyclopterus liparis, to which were attributed a much larger size, (long. 10 unc. et lat. 4 unc.) and the formula D. 44, P. 40, V. 8, A. 35, C. 14. Subsequently, it was fully described by Kroyer, under the name Liparis tunicata, originally based, by

* "Endelig sluttedes dette Bidrag med den Bemærkning, at der gives i det grønlandske hav foruden Fabricius Cyclopterus liparis, som man kunde kalde Liparis tunicata formedelet Hudens sædetes føde Vedhængen, endnu en anden Art, der i sin Tegning har mægen Lighed med den af Yarrell i hans British fishes afgengne europæiske Art, men da Museet kun er i Bestand af et eneste ikke fuldtstandigt Exemplar kan en sikker Bestemmelse endnu ikke finde Sted."

1864.] 13
Reinhardt, on the *Cyclopterus liparis of Fabricius as a whole*. Fabricius having only fully described his first variety, it appears advisable for that reason, as well as on account of its precedence, to identify the name with that one. The name given to the present species as a variety, by Walbaum, may, in that case, be accepted as its specific appellation.

**Genus CAREPROCTUS**, Kroyer.

*Liparis* with the oral cleft oblique, the lower jaw advanced; teeth simple and hooked; a rudimentary suctorial disk situated far forwards, under the anterior part of the eye, and little distant from it the anus, far behind which is the anal fin.

*Type.*—Liparis Reinhardi *Kr.*—*L.* gelatinosus *R*.

This very distinct genus is especially distinguished from *Liparis* by the characters mentioned in the generic diagnosis. We owe its establishment to Dr. Kroyer, its species having been previously confounded with *Liparis*. There are probably two species, one found in Kantschatka, and the other, long confounded with it, a native of the Greenland waters.

**CAREPROCTUS REINHARDI**, Kr.


*Liparis gelatinosus, Gill*, Cat. p. 47.


*Careproctus Reinhardi, Kroyer*, op. cit. 1., p. 257.

---

**Synopsis of the PLEURONECTOIDES of California and North-western America.**

**BY THEODORE GILL.**

In conformity with a promise some time since made,* I now offer a Synopsis of the Pleuronecoides of California, and add descriptions of a new species, which is at the same time the type of a distinct genus, contained in a collection made by Dr. Cooper, of the Geological Survey of California, and kindly submitted to me for examination.

One of the genera admitted—*Uropsetta*—is known to me only through the description and outline figure of its type published by Dr. Ayres. That species was originally described as *Hippoglossus californicus*, but as it evidently did not belong to *Hippoglossus*, it was withdrawn by me from that genus, and taken as the type of a peculiar one. It has since been referred to the genus *Pseudocephalus* by Günther, but the Californian naturalist, in approximating it to *Hippoglossus*, appears to have interpreted nature more truly than the English one. *Uropsetta*, indeed, is apparently more closely related to *Reinharditus* than to any other.

Four other species are only known through descriptions that are not sufficient to positively decide their true affinities. One is the *Platessa bilineata* of Ayres;† of this the "mouth, of moderate dimensions, the tip of the upper maxillary scarcely reaching the plane of the pupil of the lower eye;" the "single, even row of strong, blunt, conical teeth;" the dextral eyes; the "scales larger and more conspicuous than in any other fish of this tribe yet found on our coast;" and the recurrent lateral line appears to indicate that it is allied to *Lepidopsetta*; but the statement that "the scales of the anterior portion of the body are nearly smooth; further back they become gradually more and more

---

* Proc. Ac. N. S., Phila., 1862.

[Sept.]
ciliate, though none of them are so rough as in most Flatsfishes. Those of the head cover the entire opercular region and cheeks, and in part also the innerocular ridge; those of the cheeks are strongly ciliate, forbidding us to associate it in the same genus as L. umbrosa. If, however, tuberculated scales should be substituted for ciliated ones, nothing else in the description would militate against such a reference. Dr. Ayres, indeed, considers this species to be "allied to P. dentata, Mitch," but as his ideas of affinity are extremely crude and unreliable, nothing may be learned from them.

The second has been named by Dr. Günther Parophrys Ayresii. The "broad band of villiform teeth on the blind side, and with a few on the colored one," approximates it to the same group as Hypsopsetta and Pleuronichthys. The mere statement that "the dorsal fin commences somewhat before the middle of the eye," and the neglect to describe the lips furnish us negative evidence of some weight that it is not congeneric with Pleuronichthys canosus* in which the dorsal is decurrent in front on the blind side, and the lips are plicated as in Labroids,—characters which would not be overlooked by an observant naturalist. As in Hypsopsetta, the normal characters of those parts are presented, and as Parophrys Ayresii otherwise exhibits a concordance with that genus, it may be provisionally referred to it.

The third species—native of the seas between Kamtschatka and America—has been named by Pallas Pleuronectes quadrituberculatus, and has recently been referred by Dr. Günther to the genus Parophrys. The description of Pallas is perhaps insufficient to enable us to form a certain conclusion regarding its affinities, but the characters given—smooth body with rudimentary scales, lateral line very little decurrent anteriorly, and four tubercles on the head continuous with the lateral line—are characters found in Pleuronectes rather than in Parophrys. The cause of its reference by Günther to the latter genus is unknown, but whatever it may be, he has evidently entirely misunderstood that genus. Until we are better acquainted with the Pallasian species, it may be advisable to retain it in Pleuronectes, since no advantage would be gained by exchanging one doubt for another far greater.

A fourth species—Pleuronectes cistaticus Pallas—is also apparently a true Pleuronectes.

1. Mouth small, the supramaxillary ending before under front of eye. Pleuronectinae.

A. Teeth well developed, straight, blunt, and producing an incisorial edge, chiefly confined to the blind side; anterior nostril on eye side tubular; on blind with a posterior lingualiform flap; posterior patulous, or nearly so.

a. Eyes dextral.

b. Lateral line with no recurrent or dorsal branch. Pleuronectes.

β. Lateral line with recurrent or dorsal branch.

a. Cheeks with cycloid, imbricated scales. Parophrys.

α. Cheeks with stellated or tuberculated scales. Lepidopsetta.

[x]. Eyes sinistral: scales scattered, stellated, or tuberculated, only unarmed cycloid behind. Platicthys.

AA. Teeth slender, acute, pluriserial. Anterior nostril on eye as well as blind side with flap behind; posterior patulous. Lateral line recurrent.

a. Lips simple; dorsal continuous in front on dorsal ridge. Hypsopsetta.

α. Lips plicated; dorsal in front decurved on blind side Pleuronichthys.

* Dr. Günther has referred Pleuronichthys canosus, Grd., to Pleuronectes, and P. guttulatus to Parophrys. His reasons for thus widely separating them have not been given, and are not obvious from a simple acquaintance with the literature or the species themselves. His characters of Parophrys are applicable to both species, but not to those of Parophrys.

1864.]
II. Mouth large and continued more or less under the eye.
   Ventral fins inserted laterally.......................... Hippoglossinae

A. Caudal entire, or produced behind.
   2. Lateral line straight................................. Psettichthys,
   2x. Lateral line arched in front........................ Paralichthys.

AA. Caudal fin emarginated behind.
   Dorsal and anal fins regularly arched............... Uropsetta.
   Dorsal and anal elevated towards middle............. Hippoglossus.

III. Mouth large. Ventral of dark side inserted on the ridge
   of abdomen............................................ Rhombiniae.
   2. Interorbital area sharp.............................. Orthopsetta.
   2. Interorbital ridge prominent, channelled......... Metoponops.

Subfamily PLEURONECTINAE Bon.

PLEURONECTES (L.) Blkr.

PLEURONECTES FRANKLINII Gthr.

Pleuronectes (Rhombus) glacialis Rich, F. B. 258. (not Pallas.)
Pleuronectes glacialis DeKay, N. Y. 302.
Pleuronectes Franklinii Gthr.
   HAB.—North-western America.

PLEURONECTES QUADRITUBERCULATUS Pallas.

Pleuronectes quadriruberculata Pallas, Zool. Ross. As. iii. 423.
Parophrys quadriruberculata Gthr., iv. 456.
   HAB.—Sea between Kamtschatka and America.

PLEURONECTES CICATRICOUS Pallas.

Pleuronectes cicatricosus Pallas, Ross. As. iii. 424.
   HAB. "Specimina e mari inter Camtschatcam et Americam lecta mihi retu-
   lit D. D. Merk."—Pall.

PAROPHRYS Grd.

PAROPHRYS VETULA Grd.

Parophrys vetulus Grd.
Pleuronectes digrammus Gthr., iv. 445.
Parophrys vetula Gthr., iv. 455.
   HAB.—California.

PAROPHRYS HUBBARDII Gill.

Parophrys Hubbardii Gill, Pa., 1862, 281.
   HAB.—San Francisco.

LEPIDOPSETTA Gill.

LEPIDOPSETTA UMBROSA Gill.

Platichthys umbrosus Grd., Pa., viii., 136, 1856.
Lepidopsetta umbrosa Gill, Pa., 1862, 326.
Pleuronectes umbrosus Gthr., iv. 454.
   HAB.—California.

Allied and perhaps congeneric is the following species:

Platea bilineata Ayres, Cal. i. 40.
Pleuronectes bilineatus Gthr., iv. 444.
   HAB.—San Francisco.
PLATICHTHYS Girard.

PLATICHTHYS stellatus Girard.

Pleuronectes stellatus Pallas, Nova Acta, i. 347.
Platessa (stellata) Cuv., R. A.
Pleuronectes (Platessa) stellatus Rich.
Platichthys rugosus Grd.
" (stellatus) Grd.
Hab.—Western coast generally.

HYPSOPSETTA Gill, 1862.

HYPSOPSETTA guttulata Gill.

Pleuronichthys guttulatus Grd., Pa., viii. 137.
Pleuronectes guttulatus Gill., iv. 445.
Hyposetra guttulata Gill, Pa., 1862, 330.
Hab.—Oregon and California.

Parophrys Ayresii Gill., iv. 456.
Hab.—California.

"The height of the body is rather more than one-half of the total length" (in H. guttulata, 1: 2 1/2—1: 2 1/2); "the length of the head rather more than one-fifth," (H. gut. 1/4 in young—1: 4 1/4 in old); "the distance between the dorsal and caudal is about one-third of the depth of the fore portion of the tail" (more); "the length of the pectoral equals the distance of the lower eye from the end of the operculum" (less).

Is it distinct from H. gutulata? The color of the latter in the adult is "uniform brownish lead colored."

PLEURONICHTHYS Grd.

PLEURONICHTHYS oenosus Grd.

Pleuronichthys oenosus Grd., Pa., vi. 139.
Parophrys oenosus Grd., iv. 456.
Hab.—California.

Subfamily HIPPOGLOSSINÆ Gill.

PSETTICHTHYS Grd.

PSETTICHTHYS melanostictus Grd.
Grd., Pa., vii. 140.
Hab.—California.

PARALICHHTHYS* Grd.

PARALICHHTHYS maculosus* Grd.

Pleuronectes maculosus Grd., Pa., vii. 155.
Paralichthys maculosus Grd., Exp., &c, x. 147.
Hab.—California.

* Paralichthys would appear to be normally sinistral from two specimens collected by the Californian Geological Survey. One of these cannot be distinguished from P. maculosus, the proportions, number and arrangement of the blue dots being similar; the spots are normally—six dorsal, the first under eighth dorsal ray; the second above the axil of pectoral; the sixth under sixth ray from last, and the intervening equidistant, but the fourth lower; four and correspond to the last four dorsal ones. In the sinistral specimen, there is also one behind the eye. In the second specimen in the collections, these spots are obsolete. Paralichthys is distinguished from Cheyropsalta by its larger ctenoid scales, and small supernumerary linear cycloid ones.

1864.]
UROPSETTA Gill.

UROPSETTA CALIFORNIA Gill.

Hippoglossus californicus Ayres, Cal. ii. 29, f. 10.
Pseudorhombus californicus Gthr., iv. 426.
Uropsetta californica Gill., Pa., 1862, 330.

Hab.—California.

HIPPOGLOSSUS Cuv., Gill.

HIPPOGLOSSUS ——— ———.

Pleuronectes hippoglossus Pallas, Ros. As. iii. 421.
Hippoglossus vulgaris Ayres, Cal., i. 40; ii. 30.

Hab.—California northwards.

Subfamily RHOMBINAÆ (Bon.) Gill.

ORTHOPSETTA Gill.

ORTHOPSETTA SORDIDA Gill.

Psettichthys sordidus Grd., Pa., vii. 142.
Uthicarichthys sordidus Gthr. iv. 421.
Orthopsetta sordida Gill., Pa., 1862, 330.

Hab.—California.

METOPONOPS Gill.

METOPONOPS COOPERI Gill.

Metomonops Cooperi Gill., infra.

Hab.—California.

Description of a new Generic type of PLEURONECTOIDS in the Collection of the Geological Survey of California.

Genus METOPONOPS Gill.

Body rather elongated rhomboid, with the dorso-nasal outline nearly rectilinear, and with the caudal peduncle moderate, somewhat constricted.

Scales moderate, cycloid, oblong, or oval, imbricated, with smaller supernumerary scales. Lateral line perfectly straight, but slightly decurrent anteriorly, continuous in simple tubes on each scale.

Head scaly, moderate, conic, with the oblique profile rectilinear; the snout somewhat elevated and subtruncated, and the interorbital ridge prominent sideways. Eyes sinistral, oval, rather large, situated almost entirely in the anterior half of the head, the lower lateral; the upper directed obliquely upwards: the interorbital area narrow, scaly, channelled between the eyes, and bordered by two ridges which converge above behind. Nostrils narrow, between snout and eyes and parallel with the former; the anterior with a long flap or bridge in front; the posterior simple. Opercula normal.

Mouth large and very oblique; the supramaxillary ceasing under the pupil of the eye, extended obliquely downwards behind, and with a semicircular arch at its upper angle. Lower jaw truncated in front, with a tubercle below. Lips very thin and simple. Tongue elongated, narrow and free.

Teeth equally developed on both sides, uniserial, approximated, subequal, rather small, curved conic and acute. Palate unarmcd.

Branchiostegal rays seven. Branchial membrane deeply emarginated below.

Dorsal fin with its origin considerably behind the right posterior nostril, above or rather behind the anterior margin of the orbit, regularly arched, with its rays simple. Anal with its origin under or behind the inferior axil of the pectoral, and similar to the dorsal.

[Sept.
Caudal fin convex behind.
Pectoral fins pointed.
Ventral fins subjugular, inserted obliquely, with its rays approximated, and its innermost attached to the breast by a membrane.

The lower pharyngeal bones are entirely separated, compressed and laminar, with the body emarginated below and the posterior processes directed upwards, attenuated towards their ends; with the teeth pauciserial; of the inner row slender, elongated and acute, curved outwards in front and erect behind; of the outer much smaller, but similar in form. Upper pharyngeals three on each side laminar, each with a row of large, slender, curved teeth.

The branchial arches have compressed, pointed rakers, progressively decreasing in length from the first to the fourth arch, on which last they are short and triangular; each armed with small, slender teeth on their internal margins.

Metoponops is readily distinguishable by the characters above given, especially the prominence of the interorbital ridge and the consequent oblique position on the forehead of the upper eye, whose line of vision is upwards; the scaly channel of the ridge itself; straight lateral line; dentition, and the form of the lower pharyngeal bones, especially the parabolid emargination below in front. It is apparently as closely related to its cohabitant of California, Orthopsetta, as any other, but that genus is at once distinguished by its compressed head and little prominent, narrow interorbital ridge.

Metoponops Cooperi Gill.

The height of the body is contained about three times in the total length; the head about four times, and the caudal six times and a half. The longitudinal diameter of either orbit equals about a third of the head's length. The snout is rhomboid, decurved in front, and its length from the lower orbit to the symphisis equals about a fifth of the head's length. The supramaxillary ends under the front of the pupil, and from the symphisis to its end enters twice in the distance between the chin and preopercular margin. The greatest height of the dorsal equals the length of the upper jaw, as well as does that of the anal. The pectoral fin equals about a sixth of the total length.


The color is uniform brownish.

A single adult specimen of this species is in the collection formed by the Californian Geological Survey, of which Prof. Whitney is the superintendent, and was obtained by Dr. Cooper, the naturalist of the Survey, at Santa Barbara, in May, 1863. This specimen is in poor condition, having been apparently obtained only after exposure for some time to the sun; the fins have been dried, and the pectorals and ventrals are more or less broken, especially the latter, while the abdomen is much injured. I am consequently compelled to omit some desirable details. The species itself is a very interesting one, and I give myself the pleasure of dedicating it to my friend, Dr. Cooper.

On the Affinities of several doubtful British Fishes.

By Theodore Gill.

Among the few still uncertain species of British fishes, none are involved in greater obscurity than those presented under the name of Ophidium imberbe by Pennant and Montague, and those referred by Hoy to the Linnaean Trichiurus lepturna. A detailed investigation into the literature and history of the former has enabled me to demonstrate its relations, and the discovery of a recent type in the Caribbean Sea permits me to at least suggest the affinities of the latter,* concerning which I had long been perplexed. These con-

tributions to British Ichthyology are, with this introduction, especially submitted to the naturalists of Britain, to whom it remains to verify or disprove the validity of the conclusions arrived at. I shall only remark that the failure, after so long a period, to find any species more conformable to the notice of Ophidium imberbe than the one herewith identified with it, is itself most suggestive.

1. OPHIDION IMBERBE L., Montag.

For half a century a nominal species of fish has been retained in the catalogues of the British fishes under the name of "Ophidium imberbe L.," and in later times under that of "Gymnias imberbis." As no critical investigation into the history of this species has yet been given, it is thought that such will not now be superfluous, since thereby a name symbolic of no distinct organism may be eliminated from the systematic and faunistic works, and the false ideas connected in recent times by means of it with the geographical distribution of two remarkable genera be dissolved.

Commencing with the general introduction of the binomial nomenclature, Linnaeus, in the tenth edition of the Systema Nature, defined anew the genus Ophidion, then placed by him at the end of the Juguilares, and assigned to it five branchiostegal rays, and ventral fins with two rays, the external of which is spinous. In the genus thus defined, he respectively placed, 1. O. barbatum. 2. O. imberbe. 3. O. macroptophalmauin. The first has articulated bifid ventral fins modified as barbels; situated below the chin, and is the type of a family closely related to the Brotiloids and Gadoiids. The third is evidently the species afterwards described as Cepola rubescens by Linnaeus, as was subsequently shown by Linnaeus and Cuvier. Thus, neither of these species answered to the terms of the diagnosis. The Ophidium imberbe was noticed in the words "O. maxillis imberbibus, cauda obtusiuscula, D. 79. P. 11. V. 2. A. 41. C. 18. Hab. in Europa." This diagnosis, in connection with the notice of the ventrals in the generic diagnosis, enables us at once to identify the species with the common gunnell of Europe, no other having even approximately such a radial formula. But references are made to the O. cirrhis coraes of Artedi and the fauna Sueciae. Artedi based his species in the "S synonymia" on, 1st, the Ophidion flavum vel Ophidion imberbe of Rondelet, and the notices of the same derived from Rondelet by Willoughby and Ray; and, 2d, the Ophidion flavum & imberbe of Schonevelde and Ophidion of

† "Cepola nudiscnsulm.
‡ "Membr. branch. patula radiis V.
‡ I have already shown that the so-called barbels of Ophidion barbatum are true ventral fins on account of their articulation and attachment, and not homologues with the barbels of the Muloids and Polymyxioids.
§ The Brotiloids form a very natural family, but its distinctive characters have hitherto been only hinted at. Among the most trenchant are the closure of the cranial cavity in front and the consequent development of a more or less complete bony septum; the compression downwards of the sides of the cranium and angularity below, and the great development of the exoccipital, which unite and extend obliquely upwards behind the suprorniptal; the forms of the supraoculars already described by me, and the development of a genal papilla in the males.
‡ Cuvier et Valenciennes, Hist. Nat. des Poissons, xi. 389.
|| Linnaeus, Faun. Suec., 259.
|| Schonevelde, Ichthyologia, &c., quam in florentissimis ductibus Suevic & Holstein, &c., 1524, p. 55.

[Sept.]
Schelhammer.* The first is a fish of the Mediterranean, closely resembling the Ophidium barbatum, according to Rondelet, but distinguished by its want of barbels and its yellow color; it has been identified by Cuvier† with his "Donzelle imberbe"—the Fierasfer aevs Kaup. The second was evidently based on the Myxnoidea gunnellus of authors, as Brousseonet‡ and Cuvier.§ have shown. The Ophidion cirrus careus of the "Synonymia" is therefore a compound; that of the "Genera" is only based on the Ophidion flavum § imberbe Auctorum," (Schonevelde,) and said to inhabit the Baltic Sea; it is thus primarily the Myxnoidea gunnellus. Artedi was apparently not acquainted through autopsy with any of his Ophidia.

The Ophidion of the Fauna Suecica, placed among the Jugulares, is also, without doubt, the Myxnoidea gunnellus, of which Linneüs had not then mentioned the ventral fins. The formula of the fins in the tenth edition of the Systema is similar, but with the addition of the rays of the ventrals.

Subsequently, Gronovius, in the Zoophylacium,∥ connected this name with a fish which appears to be nothing more than an Ophidium barbatum, of which the barbels had been destroyed, as Cuvier¶ suggests, or concealed within the limbs of the lower jaw and overlooked, as may readily be the case. We might have hoped to have had this question solved by Dr. Günther, as, according to Dr. Gray,** the Gronovian fish was in the collection purchased for the British Museum; Dr. Günther has, however, not referred to the specimen in his Catalogue.

Penanti∥∥ next affixed the same name to a fish found near Weymouth, and communicated to him by the Duchess of Portland, giving a figure of it in the fourth volume of his British Zoology, but no description. This fish is apparently a common eel, as Brousseonet∥∥ and Cuvier∥∥∥ have suggested; probably Pennant and his friends were deceived by some anomalous appearance of the fish itself, as it appears to have been shorter than usual. There is, at least, nothing but the eel found in European or, indeed, any other waters, which at all resembles the fish figured by Pennant.|||

In a subsequent edition of the British Zoology, this figure was replaced by one in the meanwhile published by Montague under the name of Ophidium imberbe.

Such is the essential history of the applications of the name of Ophidium imberbe down to the year 1777. The age of compilers, commencing with Hauy and culminating in Lacépède, Bloch, Schneider and Shaw, soon after commenced. These authors variously combined the notices of their predecessors, and finally succeeded in involving a species, concerning which there was no reasonable room for doubt, in such mystery that almost all memory of the original type was eventually lost.

Hauy, in 1788, in the Encyclopédie Méthodique,‡‡ adopted in his descrip-

---

* Schelhammer, De Anatomie Xiphias piscis uti Lumipi et Ophidii, p. 23.
† Cuvier, Mem. du Muscum. l. 1815, pp. 312, 313.
§ Cuvier, op. cit. i. pp. 315, 316.
∥ Gronovius, Zoophylacium. 1763, No. 401.
¶ Cuvier, Mem. du Muscum. l. 1815, p. 316.
∥∥ Catalogue of Fish Collected and Described by Lawrence Theodore Gronovius, now in the British Museum, London, 1854, (Ophidion congrus, B. M., p. 164.)
∥∥∥∥ Brousseonet, Phil. Trans. lxxi. 1781, p. 438, note.
‡‡ Cuvier, Mem. du Mus, i. 1815, p. 316.
|| Mr. Templ ton in 1857, announced that "the only specimen (of O. imberbe) I have observed, was thrown on the shores of Belfast Lough, near the White Horse Point, on January 9, 1809. It was a large specimen, not less than a foot long, and agreed so exactly with the figure in the British Zoology, and differed so much from that of Mr. Montague (Wern. Mem., p. 96, pl. 4), that I am led to believe there are two distinct species, of which Pennant has described one and Montague the other."—Mag. Nat. Hist., N. S. i. 412. Mr. Thompson (N. H. Ireland, iv. 1856, p. 265), was unable to gain further information. If the specimen was not a thick eel, it may have been a Zoarcites viviparus.

1864.]
tion of the “Imberbe”—Ophidion imberbe,—the colors as well as very low dor-
sal fin from Rondelet, but at the same time described the dorsal with Schone-
velde as a very stiff, rigid one—still considering it a Malacoptyrgian! Also
stating that, according to Gronovius, there were 147 dorsal rays and 101 anal,
among which the caudal were included, he recalled that Linnaeus distin-
guishes the three fins, assigning to the dorsal 79 rays, to the anal 41 and to
the caudal 18, and the combination of these, according to our author, forms
238 (sic!) rays, 10 less than that which results from the enumeration of Gro-
novius! He concludes by giving with Gronovius quite large, lanceolate pec-
torals with 26 rays; and, finally, with r-marks on its habitat from Rondelet.
The description is thus based only on three species belonging certainly to as
many very distinct families; but, in his synonymy, he includes references to
the Sea anail of Petiver* and the Congres of Aldrovandi;† the one represent-
ing a Lepis, and the other a true Conger, representatives of two more fami-
lies. It must, however, be added, somewhat in extenuation for Haüy, that
the last two, singularly enough, originated with Gronovius, perhaps the most
sagacious and learned ichthyologist of the past century.
Bonnaterre,** engaged on the same great work, followed Haüy, and con-
cluded his notice with the radial formula B. 7. D. 238. P. 26. V. O. A.
0. C. 0., which is evidently the result for the dorsal of the sum so singular-
ly obtained by Haüy from the combination of the numbers attributed by
Linnaeus to the dorsal, anal and caudal fins, while the numbers of the pectoral
and branchiostegal rays are derived from Gronovius; the negation of the
anal and caudal fins is peculiar to the author himself.
Gmelin§ included in the synonymy of the Linnaean species the references to
the Ophidion of Gronovius,—placing the radial formula of the latter im-
mediately under that of Linnaeus,—as if to draw attention to the remarkable
difference between the two which he could not himself appreciate,—and also
referred to Pennant’s figure.
Walbaum,‖ in his edition of the “Genera of Arredi,” simply added the
notices from the Fauna Svecica and Schonevelde, as well as a reference to the
figure of Pennant, with the opinion of Brousset concerning the same.
Lacepede‖‖, obtained from Linnaeus, for his notice, the rounded caudal fin
and radial formula, and from Rondelet the yellow color and its Mediterranean
habitat, while his information regarding the delicacy of its flesh in common
with that of the O. barbatum is original, and serves well to open a paragraph.
Shaw*** copied his notice from Gronovius.
Bloch, or his editor, Schneider, gave to the species the name Ophidium
“Chinense”! at the same time depending entirely on the Fauna Svecica of Lin-
naeus for information relative to its habitat,— (“Habitat in mari baltico et oceano,
repertur supra intra ostrearum testis”); and, while also deriving his knowledge
of his characters for his text from the same source, copied Pennant’s figure
as illustrative at once of the species and the genus.‖‖
Cuvier arising, dispelled the obscurity which involved the history of so
many of the most common European Fishes in his remarkable series of Mem-
oirs on the Fishes of the Mediterranean. In that on the Ophidium imberbe,
(De la Donzelle imberbe,) he demonstrated that the Ophidium imberbe of Ron-
dele, and his copyist Willoughby, was distinct from that of Schonevelde,
Schelhammer and Linnaeus; that the first was related to Ophidium barbatum,
and the second identical or very closely allied with the Blennius gannellus of
Linnaeus; that the O. imberbe of Gronovius was a true Ophidium deprived of

* Petiver, Gazophylacium, tab. 51, fig. 3.
† Aldrovandi, Pisc., lib. iii. cap. 26, fig. p. 319.
‡ Bonnaterre, Tab. Enchy, et Meth. Ichthy., 1783, p. 41.
barbels, and that Pennant's fish was an eu. * He was unable to determine a fish noticed by Montague under the same name. While therefore the Ophidium imberbe was eliminated from the Catalogues of Fishes of Continental Europe as a distinct species, it still held a position among those of England. To the consideration of this English fish we now proceed.

In 1811, in the Memoirs of the Wernerian Society, Montague † described and figured the fish identified by him with the Ophidium imberbe. It was "taken on the south coast of Devon," and in "length was about three inches;" the body "censiform;" "the dorsal fin commences immediately above the base of the pectoral, and is at first not so broad, and usually not so erect as the other part," and the caudal is cuneiform and obtusely pointed. "The color is purplish-brown, disposed in minute speckles; and along the base of the anal fin are about ten small bluish-white spots regularly placed, but scarcely discernible without a lens, possibly peculiar to younger fishes." The rays were respectively—pectoral 11; dorsal about 74; anal 44; caudal 18 or 20. Such was the first detailed account of Ophidium imberbe, based on a British fish, and such the authority on which the subsequent British faunists have preserved the species in their catalogues. By Turton, ‡ Fleming, § Jenyns, ‡ Yarrell, ‡ Gray, ‡ &c., it has been retained in the genus Ophidium (‡ Fierasfer), while more recently, Kaup, ‡ ‡ ‡ and Günther ‡ ‡ have transferred it to the genus Gymnelis; the first originally under the name of Cepolophis. ‡ ‡ It remains to examine into the grounds for such approximations.

It is not probable that a fish whose dorsal arrested the attention of Montague on account of its being so "erect," could have been a Malacopterygian, and this character as well as the distinctness of all the rays, the development of the caudal, whose rays are longer than those of the dorsal and anal, the relations of the various parts, and even the gill-membranes inflated beneath, render it evident that the fish in question could have been in no wise related to either Ophidium, Fierasfer, or Gymnelis, all of which are Malacopterygians, with caudal rays shortest and not developed as a distinct fin. Its affinities are then to be sought for in another direction. The general form, the "erect" dorsal fin and the number of rays, agree with Muranoidea gymnelus. The color is in that species sometimes simply "purplish-brown," the dorsal spots becoming obsolete, and, in a single specimen from England in the Smithsonian collection, several anal spots are barely discernible. ‡ The failure to observe the ventrals was shared with Schonevelde, Schelhammer, Linneæus, &c., and we are more prepared for their non-observance by Montague when we

---

* Cuvier, Mem. du Museum, l. 1815, 312—324.
† Montague, Mem. Wern. Soc., l. 1811, p. 95, pl. 4. fig. 2.
§ Jenyns, Mem., l. 1855, p. 281.
¶ Yarrell, Br. Fishes, ii. 1841, p. 412.
†† Kaup, Cat. A. P. Fishes, 1856, p. 156.
‡‡ Br. Fishes, Richardson's ed., l. p. 79 (jide Gunther).
‡‡‡ Gunther, Cat. Fishes, iv. 1862, p. 325.
¶¶ Kaup, Arch. für Nat., 1856, i. p. 97.
1 Fierasfer Cuv., is the type of a peculiar family related to the Ophidiidae, but with the anal thoracic or angular, the body much attenuated backwards, and the anal fin longer and higher than the dorsal; it embraces four genera.—Fierasfer Cuv., or CareFacing Raf., (not Cuv.), Enchelophis J. Muell.,—Echidna Thompson,—the latter of which is the only British type, and Helminthodes Gill, (type Oxybelus laudriculoides Blkr.), distinguished by its very slender form.
2 Gymnelis Reinb., is the representative of a peculiar family (Lycoideidae), allied to the Brotonoids, but with the branchial apertures more or less restricted, the ventrals rudimentary or obsolete, the skull oblique behind, the supraocular bone being deflected downwards, wedged between the exocipitals, and with its point and low crest continued almost or quire to the foramen magnum; the cranial cavity is open in front, no osseous septum being developed. This family is only represented by the genus Enchelyopus or Zares in the European seas, which, as J. Müller (Arch. für Nat., 1843, l. 294) has shown, is truly Malacopterygian.
3 These light spots are accidental, none being developed in other specimens from England, Denmark and the German Ocean.

1864.]
remember his peculiar views concerning the ventral fins.\* Objections may be urged against this identification, that Montague would have recognized the *Murenoideus gunnellus*; that the proportions represented in his figure are not precisely equivalent to those of that species, and that the critical Cuvier and all succeeding naturalists have failed to notice the identity. I shall only recall the admission that Linnaeus himself, after autopy, referred one specimen of the same species to *Biennius* (*gunnellus*) and another to *Ophidion* (*imberbe*); that Montague wrote, in the year 1812, and in the infancy of ichthyology, when the importance of attention to minutiae was less generally appreciated than now, and that the identification of his fish with *Murenoideus gunnellus* was probably stayed by the improbability of his failure to recognize that common species.

As Dr. Günther, in the synonymy of "Gymnelis imberbis,"† has represented the ideas of the English naturalists; and, as his work is the last authority referring to it, an analysis and reduction of that synonymy to its proper elements will form a fitting conclusion to these remarks.

1. **Murenoideus**‡ *gunnellus* ex L.

*Ophidium imberbe* L.; *Montag. Turton, 88; Fleming, 201; Jenyns, 481; Yarrell, ed. 1, ii.; ed. 2, ii. 412.

Cepholophis Montagni *Kaup.*

*Gymnelis imberbis* *Kaup.* Ap. Rich. in *Yarrell*, ed. 3 (fide Gthr.)

2. **Carapetus**§ *acus* Raf. ex Brun.

*Ophidium imberbe* Lac., pt. (Radial formula and caudal fin of *Murenoideus gunnellus*.)

3. **Murena**{angulla} L. or allied sp.


\* The reference by Dr. Shaw of *Vandellius basifrons* (= *Lepidopus caudatus*) to the thoracic order, "caused the obscurity of *Vandellius basifrons*, as no one could have expected to have found an Apodal fish placed in that division. How that naturalist could have fallen into such an error, I cannot conceive, unless he considered the pair of ventral scales as rudiments of those fins, or what is commonly attached to the base of the ventral fins of some fishes, as may be observed in many Sparids." "I am aware that it has been contended that these abdominal scales are lamel-lated ventral fins. If so, we have yet to learn the definition of a fin in the modern revolution of science. Those who contend for the continuance of *Vandellius* of Shaw or for the *Lepidopus* of Risso being continued in the Thoracic order, must also constitute a new order for many fishes that have such lamel-lated appendages, independent of two ventral fins. But I cannot admit of a simple corneous scale, destitute of motion, being a ventral fin."—Montague, in *Mem. Zool. Soc.*, ii. 1818, pp. 432, 433.

† Dr. Günther remarks, that the *Gymnelis stigma* and *G. imberbis* "probably do not belong to the genus." *Gymnelis stigma*—Ophidium stigma *Lay and Bern.* (sic)—is probably congeneric with and perhaps even closely related to *G. viridis*; and it at least greatly resembles some varieties of that variable species. The poor figure and the assignment of "very small" scales to it led me, on a former occasion, to think, otherwise, like Dr. Günther; but we must remember that the notes and illustrations of *Ophidium stigma* were made by an inexperienced naturalist, and that he may have been deceived as to the presence of scales. However, we may also recall that there is a great variation in spination in a genus representing a closely related subfamily,—(Lycodini.)

‡ The question will naturally arise among those who contend that we should date our nomen- clature from the tenth edition of the Systema Naturae—that being the first in which the binomial system is introduced—whether we should not replace the name *Murenoideus*, *Centromus*, or *Gunnellus* by *Ophidion*. Perhaps this will eventually be done, since the genus was well defined and its diagnostic signs applicable to the *O. imberbe*. Others may contend that the name must be retained for the first species—(*O. karlatus*)—in spite of its total disagreement. The decision of this question may be suspended till the publication of the new rules of the British Association.

§ The name *Carapetus* was first connected with the *Gymnopus acus* by Linnæus (Ind., 1819, p. 57, 57), who only referred to that species, although he doubtless intended his genus to correspond with *Lepidopleurinae*'s anonymous second subgenus of *Gymnotus*, which included the *Gymnosoma carpa* *pus* L., *G. acus* L. (= *Flamerac acus* *Kaup*) and *G. reclusus* L. (= *Rhamphichthys reclusus* M., T.) A strict adherence to the laws will, however, necessitate the retention of the name for the only species mentioned—(*C. acus*).

Bloch is doubtless correct in retaining the name *Murena* for the *M. angulla*. The name was restricted to the type represented by that species by Bloch, who first subdivided the genus, and the *M. angulla* is evidently the one on which Artedi and Linnaeus based their diagnoses.

[Sept.]
2. "TRICHIURUS LEPTURUS."

The question which we shall next consider relates to the specimens identified by Mr. James Hoy* with the Trichiurus lepturus of Linnaeus.

In the Transactions of the Linnean Society, Mr. Hoy has published an account of two fishes stranded at considerable intervals of time upon the shore of the Moray Frith, near the fishing village of Port Gordon. The first specimen was found on the 2d of November, 1810, after a high wind from the north; "its head was much broken; "the extremity of the upper jaw, or upper part of the mouth, was entire; upon either side of which was an operculum;" "the body, from the gills to the point of the tail, was three feet two inches long; its greatest breadth six inches and a quarter, and its greatest thickness only an inch;" "both sides of the fish were wholly white, without a spot upon them;" "the dorsal fin was the only part of a different color, being a blackish-green; this ran all the way back from the gills to the tail;" "the tail ended in a point, consisting of three or four soft spines or bristles of different lengths, not exceeding two inches. The body was nearly of the same breadth for one half of its length, and then its breadth diminished gradually till within three inches of the tail, when the diminution became more quick. The lateral line was straight, and strongly marked along the middle of the two sides,"

The second specimen was obtained on the 12th of November, 1812; "its head had been broken off and was quite gone; a small bit of the gills only remained about the upper part of the throat, from whence to the extremity of the tail its length was twelve feet nine inches; its breadth, eleven inches and a quarter, was nearly equal for the first six feet in length from the gills, diminishing gradually from thence to the tail, which ended in a blunt point; without any of those kind of bristles which projected from the tail of the one found formerly; its greatest thickness was two inches and a half; the distance from the gills to the anus forty-six inches. The dorsal fin extended from the head to the tail, &c. "There were no ventral nor anal fins; but the thin edge of the belly was closely muri cated with small hard points, which, although scarcely visible through the skin, were very plainly felt all along it. Both sides of the fish were white, with four longitudinal bars of a darker color; the one immediately below the dorsal fin was about two inches broad, each of the other three about three-fourths of an inch. The side line straight along the middle.""

On the authority of these specimens, the Trichiurus lepturus was admitted by the British Fannists in the Catalogues of their fishes.

Dr. Fleming† considered that the two specimens belonged to different species. "The differences in the position of the vent, the structure of the tail, and the condition of the edge of the belly, seem too great to justify the inference of their being only varieties. The latter fish appears identical with the Lepturus of Artedi, and consequently of Linnaeus."

Subsequently, Dr. Fleming‡ considered that "the position assigned to the vent, the absence of ventral fins, and the white color of the sides, (of Hoy's first specimen) all accord with the Deal-fish, (Trachypeterus.) The color of the dorsal fin, however, which was of blackish-green, seems to oppose this view, though the dead state of the fish may probably serve to explain this difference, if duly considered."

Repugnant as must be such perversions of names, consideration for the uniformity of nomenclature, which may best be attained by strict adherence to the laws, seems to require assent to them. The genus Anguilla is generally attributed to Thunberg, but a search instituted among his various memoirs has failed to reveal any mention of it, and it is to be remarked, that no naturalist has referred to any precise work. Prof. Agassiz, indeed, refers to "Anguilla Thunb. Nov. Mem. Stock., 1799—" but no such generic name is to be found in the series referred to under that title.

* Hoy Trans. Linn. Soc. xi. p. 210,

1864.]
Mr. Jenyns* was inclined to adopt Dr. Fleming's opinion—"that the first specimen of Hoy was a distinct species, if not belonging to a different genus. There can be no doubt that the one described above (Hoy's second specimen) was a true Trichiurus, and probably T. Lepturus of Linneus and other authors; but as the description is rather imperfect, and the species of this genus ill determined, it is impossible to speak with certainty on this last point."

Yarrell† especially alluded to the median lateral line and lateral bands, and remarked that "it is evident that more information on the subject is required; the result of it may be the establishment of Mr. Hoy's second fish as a new species of Trichiurus, and of his first fish, which is evidently distinct from the second, as the type of a new genus, if, as Dr. Fleming has suggested, it was not a mutilated example of the Deal-fish of the Arcadians, Gymnetrus arcticus."

With enlarged opportunities for arriving at a possible decision concerning at least the second specimen, I proceed to institute inquiries into the nature of these materials. The form and approximately the proportions noticed by Hoy, the "operculum on each side" of the mouth, simulated by the supra-maxillars, the soft dorsal rays, the bristles at the end of the tail, the strongly marked straight lateral line appear to indicate, as Fleming has suggested, that Hoy had before him, in his first specimen, a much injured example of Trachypterus with most of its fins destroyed, and it is probable that a hole, caused by the caducous ventral fins, might have been mistaken for the anus;‡ this may seem very remarkable, but it is evident that Mr. Hoy has not the slightest claim to scientific consideration, and the hole so created in Trachypterus would correspond in space to the "anus" discovered by that gentleman. A thoracic anus is incompatible with the structure of the Trachypteroids or any related forms. The "blackish-green" color of the portion of the dorsal remaining might have been due to discoloration, and we need not be much astonished that the lateral dorsal spots were overlooked in such a specimen.

The second specimen of Hoy evidently belonged to an entirely different type. The form and "closely muricated" belly indicate that it was related to the family of Lepturoids or Truchtiuroids, but the "blunt point" in which the tail terminates, as well as the median lateral line, forbid us, on morphological grounds alone, from referring it to Trichiurus lepturus. It might have been supposed to have been a specimen of Lepidopus caudatus, were it not for the color, but that, sustained by the superior height, forbids us to refer it to that species. What then can it have been?

In the summer of 1863, I received from the learned Cuban naturalist, Prof. Poey, of the University of Havana, a fish, concerning whose systematic position he was unable to satisfy himself. This fish was found to resemble Lepidopus caudatus in all essential characters except the remarkable form of the head, which was exceedingly compressed, trenchant and obliquely curved above, with the forehead elevated above the eyes, and the chin obtuse. Notwithstanding such characters, its affinity to Lepidopus was evidently so great, the form, structure of the fins, especially the anomalous form of the pectorals, and the development of the opercular bones coinciding, that I felt compelled to retain it in the same subfamily, in contradistinction to one containing Trichiurus (= Lepturus Art.) and Euplecturogrammus.§ The color

---

† Yarrell, Br. Fishes, i, 1841, p. 204 (207.)
‡ This same mistake, indeed, was made in the communication by Dr. Duguid to Dr. Fleming, concerning the same fish, (see Loudon's Mag. iv., 1831, pp. 216, 216.) and Dr. Fleming, himself, so far from correcting the error, alluded to the similarity of the so-called vent as evidence of the porthole of Hoy's fish to the same species, (op. cit. iv., 219). By a somewhat singular coincidence, the same error in identification of the Trachypterus with the Trichiurus lepturus was made by Olsén (Voyage to Iceland, p. 592.)
arrested my attention, there being six or seven narrow bands, the lateral line running through the fourth; the interval between the two dorsal bands was more indistinct, and the two could readily be confounded; the width of the two would equal about a sixth of the height, while the width of the single ones was contained about fifteen or sixteen times in the height. The two lower bands were more indistinct. I was therefore at once reminded of the *Trichurus lepturus* of Hoy, and the similar development of the bars, as well as the approximation in proportions, compel me to believe that the second specimen of Hoy is in reality a species of the genus *Eooxymetopon*, if not indeed identical with the Cuban fish itself, (*Eooxymetopon tenuissimus* Poey.). The greatest height of the latter, at the scapular region, is contained scarcely more than twelve times (12.1-5th) in the extreme length, while a short distance behind, and for a considerable distance, it is contained from thirteen and a half to fourteen times. The head enters eight times and a half, and the caudal, at its longest rays, twenty-nine times and a half in the same. The anus is midways between the snout and root of caudal. In this last respect it disagrees with the specimen signalized by Hoy, according to whom the anus was very considerably within the limits of the first third of the length (46 : 153 + x). Such a position is extremely improbable in a representative of the subfamily of Lepidopodinae, to which the specimen doubtless belongs. The true anus, on account of its small size, was probably overlooked, and a rupture of the skin mistaken for it. May we not hope that some British naturalist will soon release us from our doubts, and verify the systematic position of Hoy's fish?

**POLYPROSOPUS** Couch.

Having provisionally adopted the generic name *Polyprosopus*, proposed by Couch, in the "Analytical Synopsis of the Order of Squali," remarking at the same time that the genus was "not yet well established," it seems advisable now to express my conviction that it belongs to the genus *Cetorhinus* or *Selache*, and that the differences observed are probably due to distortion or defective observation. I have already stated that "the absence of caudal carinae or spiracles is quite improbable," and certainly no scientist could believe in the absence of the anal fin in such a type.

I may finally be permitted to add, in anticipation of a more extended memoir, remarks on the Lemnisletes of Richardson, and more especially the *Leptocephalus Morrisii* Gm. The recent exposition of the character of such fishes, by Professor V. Carus,† will excuse this anticipation. I am happy to be able to express my unqualified belief in the conclusion as to their being simply larval forms, which that learned naturalist has enunciated. As long as the known hyaline fishes conformed to a single type, naturalists might be excused for regarding them as fully developed forms, but the doubt this group was first subjected to by the failure of Köllicker‡ to find organs of generation was increased by the addition by Kaup of the genus *Esunculus*,‡ and subsequently of *Stomiasunculus*.§ Carus was therefore, I think, fully justified in his "conclusion that all these fishes are nothing but larval forms of others," but he was not so happy in looking for the adults "among the Ophidians, or other compressed forms, (Cepola, and so on).") I am almost certain that the typical *Leptocephali*, at least, are the young of Congers, and that *Leptocephalus Morrisii* is the young of *Conger vulgaris*. I am aware, indeed, that Yarrell has discovered that small congers, "about the size (length?) of a man's

---

‡ Kaup, Apodali Fishes, 1856, p. 145, fig. 3.

1864.]
The *Hyrophorus Mesenensis* appears, likewise, to be merely the larval form of the Congroid *Nettastoma melanura*. The resemblance between those two forms will be readily appreciated, by reference to Dr. Kaup’s figures of the two. Perhaps the affinities of those Leptocephali with an expanded caudal, are to be sought for elsewhere. As to *Esunculus costat*, it resembles the young of a Clupeoid, but the high insertion of the pectoral fins, if existent in nature, forbids for the present its positive identification with such. *Stomiasunculus* resembles, in general features, a less advanced larval Clupeoid, about three days old, in which the ventral fins have not yet appeared. Suspicion, however, may be entertained that it may, perhaps, be the young of some other type, (possibly Stomioides) on account of the backward position of the dorsal fin. I have myself, in company with a friend, seen the young of Clupeoids, which would have either been referred to *Esunculus*, or considered as the type of a closely allied new one, on account of the inferior insertion of the pectoral fins, and so transparent were they, that their eyes alone indicated their position in the water. Although entertaining no doubts concerning the larval nature of *Esunculus* and *Stomiasunculus*, I only venture to suggest the possible relations with much reserve. As to *Porobronchus*, Kaup, if it is, perhaps, related to *Fierasfer*, but the character of the first elongated dorsal ray requires to be known, before a decision can be arrived at.

Smithsonian Institution, Washington.

**Note on the family of STICHEOIDS.**

**BY THEODORE GILL.**

There have been referred to the family of Blennioids a number of more or less elongated fishes, somewhat recalling to mind the *Gunnellus*, but with the body more tapering backwards and covered with scales; the head comparatively elongated and produced towards the snout; the skull depressed behind the eyes; the branchial apertures produced forwards; the dorsal fin composed of spines; and the stomach caecal, and also distinguished by the development of caeca around the pylorus. This combination of characters seems to indicate the necessity of the separation of the fishes so distinguished from the family of Blennioids, one of the principal characters assigned to which, by authors of even the most recent date, has been the want of caeca. The named genera known are *Leptoollenius* Gill, *Lampenius* Reinh., *Leptobrachium* Gill, *Stichaeus* Reinh., and *Chirolophis* Sw. (*Careolophus* Kr. = *Blenniops Nils.*). For this assemblage the name Stichaeidae may be appropriated.

Nearly related to this family is that of Cryptacanthidae, proposed in the "Catalogue of the Fishes of the Eastern Coast." As there is, however, considerable difference in the form and development of the head, and the ventrals are likewise obsolete, it would scarcely be advisable to combine them and the Stichaeidae in one family. There are five pyloric appendages in Cryptacanthodes. The genus has none of the peculiar characters of the

† Hof. Caratteri, Ac., 1810, p. 66, tav. 16, f. 1.

[Sept.]
Cataphracti, nor has it any resemblance to any genus of that group. It evidently is closely related to the Blennioids, and has even been referred to that family by Dr. Günther, who was unacquainted with its anatomy.

Also allied to the Stichaeoids is the genus Cebeliichthys, a herbivorous fish with a very long intestinal canal, and well developed ceca, inhabiting the Pacific waters of the United States. The structure of the dorsal fin, the want of ventral fins, and the form of the head, for the present detain us from referring it to the family.

Such are, in brief, the characters and relations of the family of Stichaeoids. It is now proposed to submit a corrected list of the species found in the north-eastern American seas, and to give the distinguishing characters by which the various genera may be recognized.

Synopsis.

   a. Pectoral fins ovate, regularly convex behind.
      * Teeth on the jaws alone.
      † V. I. 4. Body robust. D. 60—65 (63); A. I. 42;
      anterior dorsal rays graduated and united. Centroblennius.
      †† V. I. 3 (—2) Body extremely elongated. D.
      69—89; A. 48—55; Anterior dorsal short
      and nearly free.............................. ..... Leptoblennius.
   ** Teeth on the jaws and vomer.
      †† B. 6. Anal at its anterior half depressed.
      Caudal rounded......................... .................. Anisarchus.
   β. Pectoral fins with the upper rays abbreviated.
      Caudal subtruncated.
      *** Teeth on the jaws, vomer and palatines...... Leptoclinus.

2. Body moderately elongated. Lateral line more or less developed.
   * Lateral line single, superior.......................... Stichæus.
   ** Lateral line with superior and median branches
      united in front, the median longest............. Eumesogrammus.

   CENTROBLENNIUS Gill.
   CENTROBLENNIUS nubilus Gill.
   Centroblennius nubilus Gill, Cat. 45.
   Hab.—Wellington Sound.

   LEPTOBLENNIUS Gill.
   LEPTOBLENNIUS serpentinus Gill ex St.
   Leptoblennius serpentinus Gill, Proc. Phila. Cat. 44.
   Hab.—Massachusetts, Maine.

   This species, originally founded on a specimen in which a couple of the middle dorsal rays were broken, and the scales rubbed off, was referred to Blennius, from which I subsequently separated it, as it evidently did not belong to that genus. A specimen obtained by Dr. Stimpson, off the coast of Maine, appears to be identical with Dr. Storer's species, notwithstanding the disparity in the number of rays. It has enabled me to recognize its true affinities with the Lumpenus gracilis of Reinhardt, near which I had long suspected that it belongs. The Maine specimen is colored like the Massachusetts one, and has a caudal like L. gracilis, and only seventy-six dorsal spines, fifty-five anal rays, the first of which is nearly under the twenty-fifth of the 1864.]
dorsal, and in the ventrals there are three articulate and one spinous rays. Storer's specimen is said to have, and is figured with eighty-seven dorsal rays; there are sixty-six anal and two ventral. I cannot but suspect, however, that on account of the poor condition of the specimen, some misapprehension may have resulted.

Leptoblennius gracilis Gill ex St.
Bliennius gracilis Stuvitz.
Centroblennius nebulosus Gill, Cat. 45.

On the authority of Prof. Nilsson, this species was presented in the Catalogue of the Fishes of the Eastern Coast under the name of Fries, but according to Kroyer it is distinct.

Lumpenus Reinhardt.

Lumpenus Fabricii Reinhardt.
Bliennius lumpenus Fab., Fauna Gr. sp. 109.
Gunnellus Fabricii Storer, Syn. 121.

Hab.—Greenland.

Anisarchus Gill.

Anisarchus medius Gill ex. R.

Hab.—Greenland.

Leptoclinus Gill.

Ctenodon Nilsson (not Swainson.)

Leptoclinus aculeatus Gill ex. R.
Lumpenus aculeatus Reinh.
Leptoclinus aculeatus Gill, Cat. 45.

Hab.—Greenland.

In this case, also, Nilsson was my guide in the identification with Lumpenus aculeatus, but, as shown by Kroyer, such is undoubtedly erroneous.

Stichæus Reinhardt.

Stichæus punctatus Reinh. ex. Fab.
Bliennius punctatus Fab., F. G. No. 110.

Hab.—Greenland.

Eumesogrammus Gill.

Eumesogrammus præcisus Gill ex Kr.
Clinus præcisus Kroger, Nat. Tid. i., 25, Aug. 1836, (fide Kr.)
Stichæus præcisus Kroger, Nat. Tid. i., 372; Voyage en Scand., &c., tab. 20, f. 1, a—f; Nat. Tid. (3) i., 295, 1862.

Hab.—Greenland.

[Sept.
Natural Sciences of Philadelphia.

Eumesogrammus sub-bifurcatus Gill ex St.

Pholis sub-bifurcatus Storer, Rep. 63; Syn. 118.
Stichaeus sub-bifurcatus Gill, Cat. 45. (Storer, Putnam, &c.)

Hab.—Massachusetts, Maine, Nova Scotia, &c., and Newfoundland.
Especially distinguished from E. preciseus by the absence of the abdominal lines, and the continuance of the median lateral one to the base of the caudal fin.

Notes on Shells, with descriptions of new fossil Genera and Species.

By T. A. Conrad.

Noetia, Gray.

N. ponderosa, Say, occurs abundantly in the Post-Pliocene of the Southern States, and lives on the southern coast of Florida. Specimens have lately been received from Pensacola, and are in the cabinet of the Academy. It is unknown in the Mioene, the shell I refered to as a variety being a distinct species.

Turritella, Lam.

T. precincta. Turrited, broad at base; sides straight, a profoundly elevated, thick, angular carina revolves at the summit of each volutin, gradually disappearing at the fourth whorl; carina slightly channelled above, and having a single revolving line beneath near its junction with the whorls, which have each three revolving lines, the inferior one most prominent. Length 3\frac{2}{5} inches; width of body whorl, independent of carina, \frac{3}{4} inch.


This large species differs from T. Mortonii in having a larger and more abruptly elevated carina, larger and fewer revolving striae, &c. It is allied to T. roifera, Lam. The specimen described was loaned for the purpose by Mr. R. P. Whitfield. Other specimens are in Barnum's Museum, N. Y.

Protocardia, Beyrich.

P. Virginiana. Cordate, subtriangular, inequilateral, ventricose, thin; radiating lines minute; anterior upper margin very oblique, slightly emarginate, posterior side slightly produced, the margin obliquely truncated; postuminal area densely tuberculated on closely arranged striae; posterior cardinal tooth small, tubercular. Height 1\frac{1}{2} inch; length 1 2-5ths inch.


This species is smaller and proportionally longer than P. Nicolleti, with a smaller umbo, &c. This is the third Eocene species of Protocardia found in the United States. There are two species in the American Cretaceous rocks. The genus did not survive the Eocene fauna.

Ephora 4-costata, Say.

Lister's figure 1059, fig. 2, represents a rare variety of this species, without umbilicus. I found one such specimen. Dillwyn erroneously refers Lister's figure to a variety of Buccinum scuta. The shell is very peculiar in substance, resembling horn. The umbilicus, though generally enormously large, is sometimes moderate. The range of this species is from New Jersey to South Carolina, inclusive.

Fasciolaria, Lam.

F. Subtenta. Fusiform; volutions 7; body whorl ventricose, penultimate subangulated, the others angular below the middle, tuberculato-costate; surface rugoso-striate; lines alternate on the spire, irregular on the body whorl, many of them thick and prominent; minute, rugose, longitudinal lines ornament the whorls; outer lip ribbed within, the ribs divided towards the 1864.]
interior; plait on the columella acute, bounded on either side by a furrow.

Length 5½ inches; width 2½ inches.

Locality. Natural Well, Dauphin Co., N. C.

FASCIOLARIDÆ?

LIROSOMA, Conrad.

L. curvirostra. Subfusiform; volutions 6; spire prominent; ribs rounded, revolving, six on the sides of the two larger whorls of the spire, and one on the flat upper surface; about 21 on the body whorl with a fine intermediate line; surface of the shell finely wrinkled longitudinally; aperture patulous; base of columella rounded; fold obsolete; beak long and twisted.

Locality. North Carolina?

A larger species than L. sulcosa, and differing in having a longer and twisted beak, more prominent and acute spire, and in wanting the longitudinal furrow or coarse lines, &c.

ERYCINELLA, Conrad.

E. ovalis, Conrad. Having obtained several specimens of this Miocene fossil since the description was first published, I find, on comparison with the English shell sent me by S. V. Wood, that it is a distinct species from the latter.

Mr. Stimpson also made the comparison in my presence, and came to the same conclusion. The error, therefore, in the Monograph of the Crag Mollusca is mine.

CYPRINIDÆ.

CYPRIMERIA.

Lentiform; hinge of right valve broad, with a bifid oblique cardinal tooth under the apex, and two oblique acute anterior teeth, with an intermediate pit for the reception of the tooth in the opposite valve.

Cytherea excavata, Morton.

Only one valve has been obtained showing the hinge, and the exterior markings, which consist of very fine concentric lines on the umbo and wrinkled lines of growth on the other parts. There is no cartilage pit. Behind the bifid tooth is a slightly raised plate rugoso-striate. The muscular impression unknown. Found at Arneytown, N. J., in Cretaceous marl.

Cyprimeria excavata.
DOSINIOPSIS.

Equivalve, lentiform; hinge with three cardinal teeth in each valve; posterior tooth of right valve bifid; in the left valve a thick rugose lateral tooth fitting into a cavity in the opposite valve; under the apex is a pit or cavity; cartilage plate granulated; pallial sinus deep and angular.

Exteriorly the shells of this genus resemble Dosinia; and the pit under the apex and the form of the pallial impression are similar, but the anterior, thick, rugose cardinal tooth, the posterior hinge channel and tooth-like plate, and the muscular impressions ally it most nearly to Venilia and Cyprina.

Venus lineolatus, Sowerby, has a hinge character nearly allied to, if not identical with, this genus.

D. meekii. Short ovate, ventricose, moderately thick, inequilateral; anterior margin regularly rounded; posterior dorsal margin elongated, rounded, very oblique, the extremity subangulated; apex prominent; basal margin profoundly curved; lunule obsolete, or defined by an obscure line; surface without other lines than those of growth. Height 1½ inch; length 1¾ inch.

Locality. Six miles east of Washington, D. C. Meek.

Proportionally more elevated and convex than D. (Cytherea) lenticularis, Rogers.

A singular feature of this shell is a tuberculated callus under the anterior cardinal plate, which occurring in 4 valves must be characteristic of the species. It has the appearance of having grown up from the inner surface of the valve and folded over the under side of the hinge plate.

Mr. Meek found this species abundantly in a dark grey quartzose sand, six miles east of Washington, D. C., in company with other new univalves and bivalves. Cytherea lenticularis, Rogers, belongs to the genus Dosiniopsis, and more closely resembles Dosinia exteriorly. Both characterize the oldest portion of the American Eocene which has yet been observed.

This genus, like the preceding, is remarkable for uniting the characters of two families, Cyprinidae and Veneridae, which are obviously distinct in the recent shells.

Dosiniopsis Meekii.

1864.
PROCEEDINGS OF THE ACADEMY OF

RADIOLITES, Lam.
Subgenus Tamiosoma, Conrad.

R. Gregaria, Conrad. Explorations and Surveys for Rail-road route to Pacific, vi. 72, iv. 18. This fossil is characteristic of the Cretaceous formation in California.

October 4th.

MR. LEA in the Chair.

Eighteen members present.
The following papers were presented for publication:
"On a blind Silurid from Pennsylvania," and "On the Characters of the higher groups of Reptilia squamata, &c." By E. D. Cope.

October 11th.

DR. BRIDGES, Vice-President, in the Chair.

Fifteen members present.

October 18th.

DR. MCPAUVN in the Chair.

Nineteen members present.
The following paper was presented for publication: "Fasti Ornithologiarum." No. 1. By John Cassin.

October 25th.

DR. BRIDGES, Vice-President, in the Chair.

Fourteen members present.
On report of the respective committees, the following papers were ordered to be published:

Synopsis of the PLEURONECTOIDS of the Eastern Coast of North America.

BY THEODORE GILL.

In the present brief article, an analytical synopsis distinguishing the genera of east coast Pleuronectoids, already named, is submitted, and the different names under which the species have been described are referred to the synonymy of the species to which they are supposed to belong; and, in one case, (Reinhardtius hippoglossoides) where the decision of the synonymy would involve the nomenclature and geographical distribution of two widely distinct forms, the synonymy has been quite fully discussed. If the premises taken are correct, the genera herewith enumerated are the only known forms as yet entitled to a place in the Fauna of the East Coast. If, on the other hand, that view against which I have contended is the true one, the genus Glyptotrephalus, an ally of Pleuronectes, must be added, and the name Reinhardtius hippoglossoides replaced by another.
Family **SOLEOIDÆ**, Bon.

Subfamily **SOLEINÆ**, (Bon.)

**ACHIRUS**, Lac.

--

Grannichthys *Kau*.<br>Trinectus *Raf*.

**ACHIRUS LINEATUS**, Cuv.


Subfamily **PLAGUSINÆ**.

**PLAGUSIA**, Brown.

--

Aphoristia *Kau*.<br>Glossichthys *Gill*.

**PLAGUSIA PLAGIUSA**, Gill.

Pleuronectes plagiusa *Linn*.<br>Plagusia fasciata *Dek*.<br>Glossichthys plagiusa *Gill*.

**Hab.**—North and South Carolina.

Family **PLEURONECTOIDÆ**, Bon.

We owe to Cuvier the first natural subdivision of the genus *Pleuronectes*, as restricted by Quensel. That great philosopher distributed the representatives of the genus thus limited, which is equivalent to a family in the modern acception of the word, among three subgenera:—*Platessa*, in which the teeth of the jaws are uniserial, trenchant and obtuse, and those of the pharyngeal bones blunt; *Hippoglossus*, in which all the teeth are strong and acute, and *Rhombus*, similar to the latter, but with the dorsal advanced towards the edge of the upper jaw. The species respectively referred to these several groups are evidently closely related, and all possess characters coincident with those assigned by Cuvier, and apparently of greater value.

The *Platessa* have a small oblique mouth in front of the eyes; the *Hippoglossi*, a large one extending below the eye; and in the *Rhombi*, the ventral fins are very broad at their bases, the rays distant, and the fin of the colored side on the ridge of the abdomen. These groups correspond to the subfamilies Pleuronectinae, Hippoglossinae and Rhombinae as now limited, and thus have different elements from the subfamilies of Bonaparte. The natural character of these groups was first destroyed by the reference to the *Platessae* of the *Pleuronectes limandeides* of Bloch. This fish was referred by Cuvier to the genus *Hippoglossus*, but was subsequently transferred by all naturalists to the genus *Platessa*, with which it neither agrees in technical characters nor in natural ones. Subsequent modifications of the subgenera of Cuvier rendered them still less natural, and the American species, especially, were grouped little in accordance with their affinities. In the following synopsis of the *Pleuronectoids* of Eastern North America, I have distributed the species in accordance with the Cuvierian ideas.

I. Mouth small, the supramaxillary ending before or under front of eye........................................... **PLEURONECTINÆ**.

A. Body with scattered ciliated scales. Teeth movable........................................... *Euchalarodus*.

1864.]
AA. Body with well developed scales. Teeth fixed.

a. Lateral line with no arch in front. Scales regularly imbricated ........................................... Pseudopleuronectes.

aa. Lateral line with a semicircular arch in front.

β. Snout conic; mouth moderately oblique... Myzopsetta.

βδ. Snout retuse; mouth very oblique.......... Limanda.

AAA. Body perfectly smooth.......................... Hippoglossinae.

II. Mouth large, the supramaxillars extending more or less under eye. Ventral fins lateral.................... Hippoglossus.

A. Caudal entire and produced behind.

β. Eyes on the right side.

Scales cttenoid........................................... Pomatopsetta.

Scales mostly cycloid................................... Chcenopsetta.

AA. Caudal emarginated, produced laterally.

Lateral line straight; dorsal and anal rays elevated at middle of fins............... Reinhardtius.

Lateral line arched in front; dorsal and anal rays

equalized at middle of fins.................. Hippoglossus.

III. Mouth large. Ventral fin of the dark side inserted on the ridge of the abdomen.................... Rhombinae.

a. Ventral fins very broad; dorsal fin with its

anteroiur rays branched.................................. Lophopsetta.

β. Ventral fins narrow; dorsal fin with all rays

simple...................................................... Citharichthys.

Subfamily PLEURONECTINAE, Bon.

PSEUDOPLEURONECTES, Blkr.


Pleuronectes planus Mitch. Flounder, Schn. 163.

Platessa plana Storer.

Platessa pusilla Dek.

Pseudopleuronectes planus Blkr.

Hab.—Eastern Coast.

EUCHALARODUS, Gill, n. g.

Euchalarodus Putammi, Gill.


Alt.: Long.—1; 2 4-5ths—2⅝.—Cap. 1: 4½—4⅜.

Hab.—Salem, Mass.

In a small collection of desired fishes, which I owe to the kindness of my friend, Mr. F. W. Putnam, of Salem, Mass., were two specimens of this undescribed representative of the Pleuronectine. The new species is generically distinct from any representative of the family hitherto found, not only of the eastern American seas, but from any yet known, although it shares some characters with a Russian fish, the Platessa dwinensis of Liljeborg,* (Pleuronectes dwinensis Gthr. [Oct.

* Bidrag till Norra Ryslands och Norges fauna, &c., af W. Liljeborg in Kongl. Vetenskaps-Akademiens Handlingar, for aar 1850 (Stockholm, 1851) p. 397; (1855) pl. xx., figs. 1, 2.

“Maxilla utraque serie simplei dentium, forma ibidem Pl. vulgaris acut. similitum, contiguorum apiceque equaliter truncataurus.—Spina analis adest.—Subutus altibus, lacavis.” The italicized portion is repeated from Liljeborg’s diagnosis. The relations of Pl. dwinensis, consequently, appear to be with the true Pleuronectes.
MYZOPSETTA, Gill.

**MYZOPSETTA FERRUGINEA**, Gill.

Platea ferruginea *St*. Rep. 41, pl. 2.

Pleuronectes ferrugineus *Gthr.*, Cat. iv., 447.

*Hab.*—Massachusetts to New York.

**LIMANDA**, Gottsche.

**LIMANDA ROSTRATA**, Gill.


Myzopsetta rostrata *Gill*, Cat. 51.

This species, referred with doubt to *Myzopsetta* in the "Catalogue of the Fishes of the Eastern Coast," belongs probably to *Limanda*.

*Hab.*—Labrador.

**LIOPSETTA**, Gill.

This genus is proposed for the reception of the *Platessa glabra* of Storer, well distinguished by its form and details of structure, as well as its "perfectly smooth body," an almost anomalous character in the group of genera to which it belongs.

**LIOPSETTA GLABRA**, Gill.

Platessa glabra *St.*, Boston Proc. i., 130; *ib*, Mem. Am. Ac. viii., 393, pl. 31, f. 1.

*Hab.*—Massachusetts.

Subfamily **HIPPOGLOSSINÆ** Gill.

**HIPPOGLOSSOIDES**, Gottsche.

Citharus *Reinhardt*.

Drepanopsetta *Gill*.

Misled by the ambiguity of the description by Fabricius of the lateral line of *Pleuronectes platessoides*,—"Linea lateralis humilior, recta medietatem oculorum spectat, ventriculum tamen arcu ambiens angulo aperture branchialis summo terminata,"—I proposed for it the generic designation *Drepanopsetta*. That species, however, possessing, like *Hipposlossoides limandoides*, a straight lateral line, and otherwise agreeing so far as known, *Drepanopsetta* must be considered as a mere synonyme of the latter.

**HIPPOGLOSSOIDES PLATESSOIDES** Gill.

Pleuronectes platessoides *Fabr.*, F. G. 164.

Platessa platessoides *St.*, Syn.

Citharus platessoides *Reinh.*, *Kr*.

Drepanopsetta platessoides *Gill*, Cat.

*Hab.*—Greenland and Newfoundland, (Gill.)

**POMATOPSETTA** Gill.

**POMATOPSETTA DENTATA** Gill.

Platea dentata *Storer*, Rep.

Hippoglossides dentatus *Gill*, Günther.

This species has been erroneously identified with the *Pleuronectes dentatus* of Mitchill, who described under that name a species of *Chenopsetta*, distinct from the one so named by Linnaeus. I propose, however, to retain as its name *Pomatopsetta dentata*, since the *Pleuronectes dentatus* of Mitchill belongs to a widely different genus.

This is stated by Dekay to be "the summer flounder," and to be "extremely 1864."
common in the markets of New York." I doubt whether it inhabits the waters near the city. The specimens brought to the New York market are caught "down east," according to the fishermen. Dekay's description is evidently copied from Storer; erroneous proportions assigned by the latter being reproduced, and no figure is given.

CHÆNOPSETTA Gill.

CHÆNOPSETTA ocellaris Gill.

Pleuronectes dentatus Mitch., Trans. t. 390, (not L.)
Rhombus aquosus St. (not Pl. aquosus Mitch.).
Platessa oblonga Dekay.
Platessa ocellaris Dekay.
Chænopsetta oblonga Gill.
Pseudorhombus oblongus Gthr., iv. 426.
" ocellaris Gthr., iv. 430.
Monst. Pleuronectes melanogaster Mitch.
Hab.—Maine to North Carolina.

The verification on six individuals of the number of rays furnished the following results:

2. New York. 89. 66.
3. Norfolk, Va. 91. 66.
4. Beesley's Point. 91. 67.
5. Old Point, Va. 92. 70.
6. Beesley's Point 94. 70.

The correctness of Günther's very wide separation of the Platessa oblonga and P. ocellaris of Dekay, after their union by his successors and countrymen, is, therefore, not evident.

CHÆNOPSETTA dentata Gill.

Pleuronectes dentatus L., i. 458.
Pseudorhombus dentatus Gthr., iv. 425.
Hab.—Charleston, S. C., Gordon, Giraud.

CHÆNOPSETTA oblonga Gill.

Pleuronectes oblonga Mitch., Trans. i. 391.
Platessa quadrocellata Storer, Boston Pr. ii., 242, 1847. Mem. A. A. S. viii. 397, pl. 31, f. 3.

Mitchill well describes the coloration. "The uniformity of color is interrupted by four dark spots on the back, two on each side of the lateral line. One of the two on each side is about midway of the length, and the other near the tail. The former are about three-quarters of an inch in diameter [in a specimen 15 × 6]; the latter not so considerable." This description, therefore, cannot be referrible to a variety of the common species.

The radial formula of Mitchill, (D. 79. A. 59), is not applicable to this Chænopsetta, nor C. ocellaris, and is probably either the result of a typographical error, or carelessness in enumeration. The Chænopsetta dentata exhibits no trace of spots.

REINHARDTIUS Gill, 1860.

Platysomaticthys Bllr., 1862.

REINHARDTIUS hippglossoides Gill.

Pleuronectes cynoglossus Fab., F. G. 163, sp. 118, 1780.
" pinguis Fab., 1821.
Hippoglossus pinguis Reinh.
Reinharttius hippoglossoides Gill, Cat. 50, 1860.
Platysomaticthys pinguis Blkr., 1862.
Hippoglossus greelandicus Gthr., Cat. iv. 404.

This species had by common consent been identified with the Pleuronectes cynoglossus of the Fauna Grœnlandica—afterwards named by Walbaum P. hippoglossoides and by Fabricius P. pinguis—until the year 1862. In that year, Dr. Günther* contended that the "Pleonectes cynoglossus, Fabr. Faun. Gronl. p. 163, or Pl. pinguis, Fabr. Vidensk. Selsks. Naturv. Math. Afhandl. i. p. 43, tab. 2, f. 1, is probably identical with Pl. cynoglossus Gronov. and Linn., as the only difference of any importance appears to be that the Greenland fish is said to have 72—74 rays in the anal fin. It is evident, however, from a single glance at the figure, that it is generally different from Hippoglossus."

The following characters are the most distinctive respectively assigned to the Pleuronectes cynoglossus by Fabricius, and the species of the same name by Günther. It is necessary, however, to first premise that the true Hippoglossus vulgaris, as acknowledged by Reinhardt, &c., is first described, after which follows the description of "P. cynoglossus," Fabr., which is said to be allied to the P. Hippoglossus, but to be smaller and more oblong.

Pleuranectes cynoglossus Fab.

"Vix 26 unc. longitudinem et 8 unc. latitudinem superamus."

Height : Length = 1 : 3½.

"Utraque maxilla dentata, dentibus curvis, acuti; rariusibus tamen ac in hippoglosso, &c."

"[Hoc nota differre præsertim videatur a cynoglosso Gronovii in systemate Linnæano citato, cui tribunnuir dentes obtusi et cauda subrotunda, quod non ita se habet in pisce grœnlandico: haec, itaigitur, an idem, quod musei grœnoviani possessor determinare valet."

"Cauda subintegra."

"Linea lateralis corpori concolor a servicio ad caudam oblique progres situated."

"Cetera ut in præcedente (Hippoglossus)"

As negative evidence, the absence, so far as known, of the true Pleuronectes or Glyptocephalus cynoglossus in the Greenland seas, whose Ichthyology is so well known, is one of the strongest, especially as Fabricius states that his species is comparatively abundant and readily caught.

Equally explicit also is the description of the same species by Fabricius under the new name of Pleuronectes pinguis, in the Transactions of the Royal Danish Academy:

"That description is indeed the amplification of the one in the "Fauna Grœnlandica." The fins are described, the caudal as emarginated, the rays

* Gthr. Cat. iv. 450, under Pleuronectes cynoglossus.
† In P. hippoglossus, "catha fere integra," in P. plateusoides (Hippoglossoides plateusoides) "magna, lata, perram rotundata."
§ Sporfiissen er bred, smaest ved Roden og bredest i yderste Rand, hvor den Hippoglossus roset roset

1864.]
D. 96—98, A. 72—74, P. 14—15, and the proportions and dentition are made known in essentially the same terms. Furthermore, the scales are said to be very small, and imbedded in the skin, which appears smooth and slimy to the touch;* one of the eyes is nearly on the crown of the head,† and the branchial arches have large and robust rakers, each with eight pectinations, themselves divided at the tip.‡

As to the figure, it cannot assist identification, being a worthless caricature, and, like that of the Hippoglossoides platessoides, representing a small mouth. It might equally well serve as the representation of any Pleuronectoid, and is as unlike the Glyptocephalus cynoglossus as any other species.

From these remarks, it will be evident that I feel compelled to agree with the several excellent naturalists who have identified the Fabrician fish with a Pleuronectoid closely related to Hippoglossus, since every character which distinguishes it from Glyptocephalus cynoglossus is shared with the species under consideration.

HIPPOGLOSSUS Cuv.

Hippoglossus americanus Gill.

Pleuronectes hippoglossus Mit.

Hippoglossus vulgaris Storer.

This species is distinguished from its European congener, with which it has hitherto been confounded, by all but Günther, by its higher body, more oblique mouth, &c. It is not clear why Dr. Günther should consider it, even with doubt, as identical with Reinhardtius hippoglossoides. The figure given by Dekay represents the form and fins of a Hippoglossus, and the lateral line is expressly said to be "arched over the pectorals." The species is, therefore, a typical Hippoglossus.

Subfamily RHOMBINÆ, Bon.

LOPHOPSETTA Gill.

LOPHOPSETTA MACULATA Gill.


" aquosus Mit. Phil. Tr. i. 389.

Rhombus aquosus Cuv. R. A.

Hab.—Eastern coast generally.

CITHARICHTHYS Blkr.

CITHARICHTHYS MICROSTOMUS Gill.

D. 81. A. 58. C. 4. 6. 5. 3.

Scales 42\frac{1}{4}.

Hab.—New Jersey to North Carolina.

Descriptions of new Genera and species of Eastern American PLEURONEC-TIDS.

In a collection of rare fishes recently received through the kindness of Mr. F. W. Putnam and from the Salem Institute, was a fine new generic type of Pleuronectoids, distinguished by some remarkable characters. To make this known, and also especially a new species of Citharichthys, obtained by Prof.

* Overfaden har vel paa begge Sider mange smaa Skjal; men de sidde sna fast i Huden, at de neppe lades sig Skjulde derfra, saa den er ghat at føle paa fuld af Skim.
† Tjenevæ i delte begge paa højre Side, det ene af dem næsten paa Hovedets Ishe.
‡ Opførelse ere i med store og stærke itilde Klinger og mærkede Frynder; bag til har hver Klinge 8 Kamakter, hvilke atter for Enden have hver 2 smaa skarpe Tænder.
Baird and Dr. Stimpson at Beesley's Point, and by the latter and the author at Beaufort, North Carolina, the present article is submitted.

EUCHALARODUS,* Gill.

Body oblong, ovate-rhombic, with the caudal peduncle moderate and uniform.

Scales minute, distant, immersed, each one on the colored side with several slender teeth behind directed outwards; on the light side smooth or uniciliate.

Lateral line straight, simple, continuous through a series of short tubes, channelled along their posterior half.

Hood moderate, rhombic, depressed above the eye, with the snout nearly rectilinear and the rostral area rhombic; covered with minute scattered scales extending along the interorbital area, and with an osseous ridge below the upper eye, and continued from its hinder angle backwards, where it is expanded, and separated from an oblique bony tubercle on the scapula. Eyes moderate, approximated, even, chiefly in the anterior third of the head. Nostrils of the dark side even longitudinally, the anterior next to the border of the snout; the posterior between orbits in front; of the left side, on the left side of the ridge, approximated; the hinder close in front of the dorsal fin at its inner angle; anterior nostrils tabular and nearly blind, minutely perforated near the end; posterior transversely fissured, with lips. Opercula well developed.

Mouth moderately small, with the cleft oblique (c. 45°) in front of eye; the jaws of the respective sides nearly equal; the lower scarcely prominent, and with a very obtuse, rounded chin.

Lips moderate and simple; the latter attached by a fraenum at the left side of the symphysis.

Tongue slender, but well developed and free.

Teeth uniserial, in an imperfect row on the dark side, moderate, moveable, reclinin ing inwards, compressed, capitulate or constricted near the apex, and with the apex itself blunt and emarginate, especially towards the symphysis; palate smooth.

Branchial apertures free below, closed above the operculum.

Branchiostegal rays seven, exceptionally six.

Dorsal fin with its rays simple, in moderate number; its origin above the upper eye, rapidly increasing, and with its rays converging towards the posterior third.

Anal fin with its middle rays highest, but directed obliquely forwards, and with no true spine in front.

Caudal convex behind.

Pectoral fins moderate, obliquely rounded behind.

Ventral subbrachial, normally developed.

The interior pharyngeal bones are united, oblong, triangular, with the sides rectilinear; the posterior margin broadly emarginate, (without sinus at the junction) bent upwards and trenchant; behind and beneath sloping forwards, and with a wide trihedral enlargement expanded downwards below at the middle. The teeth are blunt, paved, and on all the upper surface, except the deflected posterior marginal area. The lower pharyngeals are oblique, the middle largest; the first and second with two rows of molar teeth; the third with one.

The branchial arches are provided on their external surfaces with soft, compressed, unarmed, subunguiform rakers, decreasing from the first to the fourth, oblong on the first, very short on the fourth, which alone has rudimentary rakers on the internal surface.

Such is the combination of characters, which distinguishes this remarkable

* Eο, well; χαλασμός, loose; ἕδως, tooth.

1864.]
newly-discovered type among the genera of Pleuronectoids. From the American genera Pseudopleuronectes, Blkr.; Liopsetta, Gill, Myzopsetta, Gill, and Lippesia, Gottshe, it is at least distinguished by its squamation, oculo-scapular ridge, nostrils, dentition and structure of the dorsal and anal fins. It is most nearly related to Pleuronectes, with which it agrees in the free tongue, but the more perfect union and the triangular form of the wholly united lower pharyngeal bones, the want of an anal spine, and above all the moveable teeth and scarcely perforate anterior nasal tubes will especially distinguish it, not only from that genus, but from any other known one. So anomalous indeed are the characters of dentition and nostrils, that only after I had felt each tooth could I be convinced that they were really normally moveable, and that the condition was not the effect of disease, an idea which, improbable as it was, occurred to me. The remaining genera of the subfamily of Pleuronectinae—Platichthys, Grd., Paraphryx, Grd., Lepidopsetta, Gill, Glyptocophalus, Gottshe, Microtomus, Gottshe, Pleuronichthys, Grd., Hypopsetta, Gill, Heteroprosopon, Blkr., and Clidoderma, Blkr.—are equally or still more distinct than those already mentioned.‡

EUCHALARODUS PUTNAMI, Gill.

The height of the body enters between 2$\frac{1}{4}$ and 2$\frac{3}{4}$ times in the extreme length. The head enters about 4$\frac{1}{3}$—4$\frac{1}{5}$ times in the same, and is not much longer than the caudal fin. There are about 19—20 teeth in the upper jaw, on the white side, and 9 or 10 on the dark; in the lower 11 to 13 on the white, and about 5 on the dark side. The height of the dorsal fin, at its highest portion, which is at or near the thirty-second ray, is little less than a seventh of the total length; the longest anal rays, from the thirteenth to fifteenth, equal or exceed those of the dorsal. The pectoral fin enters about 6$\frac{1}{3}$—6$\frac{1}{4}$ times in the length, and attains to the vertical from the twenty-third to twenty-seventh dorsal ray and eighth or ninth anal one. The ventral fin is inserted with its axil at the vertical of the upper axil of the pectoral, and reaches to the second or third ray of the anal; its length enters 9$\frac{1}{3}$—9$\frac{2}{3}$ times in the total.


The color is dark brown; sometimes (in the younger) the vertical fins are clouded with darker.

Two specimens, presented by F. W. Putnam, Esq., the Secretary of the Essex Institute, of Salem, Mass., have furnished the material for this description. Both

‡ Microtomus, Gottshe, 1835=Cynicoglossus, Bon, Fauna Italiae Fasc., xix. 1857. (sub Pl. passim)—Cynoglossus, Bon, 1816. &c. Microtomus is perhaps sufficiently distinct from Microtomus; if not, can Cynoglossus be used? Bonaparte, in his enumeration of the subgenera of Pleuronectes, after the definition of Platessa, gave that of Cynoglossus. "Secondo di Cynoglossus nob. che come il Pl. cynoglossus L. ha la linea latare retta, la bocca piccola, le denti come quello di sopra [Platessa] ma la mascella squillata, con labbra turgida e l' uno senza spina." Bonaparte has simply followed Nilsson in the erroneous identification of Pleuronectes microglossus with Pl. cynoglossus, L. As the definition of his genus does not, however, apply to the latter and does to the former, it may perhaps be connected with it, notwithstanding the specific mention of the type. I am aware that an anal spine has been recently denied to Glyptocophalus cynoglossus, but it is quite distinct in the specimen seen by me, and its presence has been admitted by other naturalists. On the other hand, a prominent spine has been attributed in one place to Microtomus, and denied in another; the latter view is sustained by naturalists generally. I am also aware that the lateral line has been said to be strongly curved, but a very slight curvature only seems to be evident in nature.

‡ Dr. Günther has referred to the group of narrow-mouthed Pleuronectoids with "the upper eye not in advance of the lower," four very well marked generic types—Paenmodiscus, Acanthodiscus, Rhombosolea, and Peltorhampus—which evidently have no affinity with Euchalarodus. Their systematic position even is for me doubtful, and some of them at least—especially Peltorhampus—appear to belong to the family of Soleidae. As however the form, the distinction or not externally of the opercular bones, the structure of the mouth, the development of the branchial apertures, &c., have not been made known with sufficient precision, no definite opinion can be formed.
were caught, with others, by C. A. Putnam, Esq., in the harbor of Salem, in
the month of January, 1858. To the able ichthyologist to whom we are in-
debted for our knowledge of the species, we dedicate it in token of friendly
and scientific appreciation.

The next species appears to belong to a genus already established by Dr. P.
Vou Bleeker, but differs very decidedly from the known species.

**CITHERARICHTHYS Blkr., Gthr.**

Citherarichthys microstomus, Gill.

The height of the body enters about 2 $\frac{3}{5}$ times (36—37) in the extreme
length; that of the caudal peduncle about eleven times. The head forms a
fifth of the length, is rather abbreviated, scarcely sinuous above the eyes, blunt
at the snout, which scarcely exceeds a seventh of the head's length, and the
rostral area is rhombic, and not higher than long. The eyes are even; the
longitudinal diameter contained about 3 $\frac{3}{5}$ times (.05 $\frac{1}{2}$ in the head's length.
The mouth is rather small, the length of the upper jaw only equaling a quar-
ter of the length, and that of the lower two-fifths of the head's length. The
teeth are very small, and close together; larger in front. The dorsal com-
ences above the front of the orbit, and is highest, and convergent near the
fortieth ray, which equals about the tenth of the total length; the anal is
highest at about the twenty-fifth ray, and is high or even higher than the dorr-
sal. The caudal is rounded behind, and forms about a sixth of the length.
The pectoral fins are unequally developed, that of the dark side being pro-
longed, and contained only 6 $\frac{2}{3}$ times in the total length, while that of the white
side only equals a tenth of the same; the rays are all simple. The ventral fins
are also unequally developed, the right being on the abdominal ridge at its
origin, rather in advance of the opercular margin, and with its longest rays
contained about fourteen times in the total length; stretched backwards, it ex-
tends to the second anal ray; the fin on the white side is more advanced,
widens, and its rays longer, contained less than twelve times in the length, and
extends backward to nearly the third anal ray.


The scales are large, angular behind, covered with smaller ones, especially
near the point of junction of contiguous ones, where alone they are developed
on the blind side; the scales of the eyed side are mostly minutely ciliated be-
hind, unarmed however near the lateral line, the scales of which last are quad-
rate and mostly covered; the scales of the blind side are less angular behind and
unarmed. The lateral line runs through about forty-two scales, while of lon-
gitudinal rows there are ten above and fourteen below the lateral line.

The color is uniform reddish brown.

A single specimen, little more than three inches long, was first obtained by
Prof. Baird at Beesley's Point. It is especially distinguished from its California
relative, O. sordida, by the short snout, small mouth and large scales; O. sor-
dida having about fifty-eight scales pierced by the lateral line, and eighteen
rows above the lateral line. Notwithstanding this great disparity in the size
of the scales and mouth, C. microstomus appears to agree in most respects with
the Californian fish, as well as generically with Citherarichthys spilopterus of Güm-
ther, species inhabiting the Gulf of Mexico. As the name Citherarichthys was
introduced a short time before that of Orthopsetta, proposed for the Psettrichthys
sordidus, and was framed for a species related to that type, that name must be
adopted if the O. sordida is not regarded as generically distinct.

I may here remark, that, although I have referred the Platessa quadrocularis
of Storer to the genus Chelonopsetta, (C. oblonga), it is possible that it may not
truly belong to that genus, as the dorsal and anal fins are represented as in-
1864.]
creasing backwards till near their ends, and the anterior dorsal rays are free at their ends; but as the species agrees so closely in other external characters, I feel compelled to retain it in that genus for the present at least.

In this connection, I may also mention a species found at Pensacola, which exhibits several characters in common with the species referred to, but represents a distinct genus closely related to *Chenopsetta*, *Paralichthys* and *Pseudorhambus*; the naso-dorsal side of the rhombic outline is very convex; the supraocular region depressed; the interorbital area formed by a narrow, scaleless ridge; the caudal peduncle short; the scales ctenoid, and the dorsal and anal fins respectively highest, and convergent far behind and at nearly the same vertical. The species has a height of little less than half the extreme length; the head almost a fourth, and the caudal almost a fifth. The first fin rays are the longest and filiform, progressively increasing, and the fin itself commences at a vertical between the orbit and pupil. The rays of the dorsal (70) converge towards the fifteenth; those of the anal (56) towards the thirtieth.

The color is reddish brown, with four ocellated spots larger than the eye; the first above the longer declining portion of the falciform arch of the lateral line; the three posterior forming the angles of a triangle; the anterior two midway between the snout and caudal margin, and the posterior on the lateral line. It may be named *Aneplopetta quadricellatus*.

**On the Characters of the higher Groups of REPTILIA SQUAMATA—and especially of the DIPLOGLOSSA.**

**BY E. D. COPE.**

Since it is only by an attentive consideration of the peculiarities of organized beings that their relationships in time present and past can be determined, the more complete that examination the more certain will our conclusions be. In the course of preparation of systematic work, the great need of well established bases is often felt, and nowhere more urgently than among the Reptiles. The following abstract, presenting some new views in this department, have been taken from my MSS., as exhibiting some of the stronger points among the multitudinous variations of the reptilian skeleton.

Prof. Johannes Müller has given us the best characters for distinguishing the Ophidia and Lacertilia, viz. — The former having the all- and orbito-sphenoid regions osseous—the latter membranous; there being one suspensorium for the quadratum in the first, two in the second. It is true he says Acontias forms an exception, having but one suspensorium, but I have seen the second in a specimen prepared by Herr Will, of Munich, and Prof. Peters showed it to me in a Berlin specimen. Anodytrops, a genus nearly allied to Typhlosaurus, possesses both, well developed. Aniella, however, appears to constitute a real exception to the rule, having but one suspensorium, thus resembling the Ophiosauri or Amphibians; it resembles the latter so in its elongate temporal, continuous with the parietal, the downward prolongation of the latter bone and its close union with the occipital sclerotic, as to connect them closely with the Lacertilia. The true hiatus in the series of Squamata is, in my opinion, to be found between the Ophiosauri and Tortricina. The characters of the skeleton remaining up to the present time, by which Lacertilia and Ophidia may be distinguished, are as follows:

**Lacertilia.**

Continuity of the parietal and sphenoid walls interrupted.

**Ophidia.**

Continuity of parietal and sphenoid walls complete.

Rami of the mandible united by suture. Rami united by ligament.

From the centre of multiplicity of forms of typical Lacertilia, we can pursue
three series—one toward the serpents by Amphisbienia, one to the partially degraded type of the Geccos, and lastly through the highest or acrodont series, to Chameleoo on the one hand and Hatteria on the other.

In the first case the prolonged development of the superior temporal is followed by a decurving of the parietal border, the closer attachment of the occipital sclerotome, and shortening of the squamosal and mastoid. Finally, the temporal, with the pieces adjoined anteriorly, begin to restrict a foramen ovale, the orbito-sphenoid is developed, and the articular and angular pieces of the mandible are represented by but one piece: the columella disappears. In the last direction, the temporal is not elongate, nor is there any tendency toward a more complete closure of the cranial cavity. The inferior or petrous wing of the temporal is directed inwards instead of forwards; the parietal fontanelle does not diminish, and the premaxillary bone is seen to form a regularly decreasing series. The mesosternum and columella diminish in length and disappear, and the splenial appears smaller and smaller to extinction. The subarticular strengthens the inner rather than the outer wall of the mandible, and the external direction of the coronoid is reversed. The type of Hatteria doubles the premaxillary, and exhibits the vertebrae amphicoelian.

In approaching the Geccos, the bones of the palate are seen to be thinner and more expanded, and the articular piece of the mandible is lost. In the full type the ossification is of the lightest description, and the fascial and basement membranes often present incomplete deposits of bony tissue; thus the parietal and sternal fontanelles disappear. The parietals are not, as usual, united, and there is a dimunition (in Uroplates nearly obliteration), of the median or basilar segment of the occipital condyle. There is a temporal ala peculiar to this suborder.

The following is a synopsis of the prevailing characters of the suborders:*

**ACRODONTA.**

Shanks of teeth compressed, most always between two alveolar walls.
Coronoid bone produced posteriorly, on outside of ramus.
Articular present separate from angular. Splenial reduced, more frequently wanting.
Subarticular small on outer, much prolonged on inner face of ramus.
Groove from splenial to mental foramina not closed over Meckel’s cartilage.
Premaxillary nearly always separated from vomer by maxillaries.
Pterygoids not touching body of sphenoid.
Frontal not arching over the olfactory lobes.
Parietal single, receiving the gomphosis of loosely attached occipital segment internally.
Temporal with longitudinal wing only; superior plate not produced beyond the arched body.
Orbitosphenoid wanting.
Suspensoria two, arches complete.
*Rhipitoglossa* and *Pachyglossa*.

**NYCTISAURA.**

Shanks of teeth cylindrical, attached to the inner side of an alveolar wall.
Coronoid bone produced anteriorly and posteriorly.
Articular wanting.
Subarticular largely developed exteriorly, not interiorly.
Splenial elongate; Meckel’s cartilage covered between the splenial and mental foramina.
Premaxillary broad, in contact with vomer.

* Not a few of the characters here noted are pointed out in special cases in Stannius’ most excellent *Zoologic der Amphibien.*
Pterygoids not touching sphenoid.
Frontal arching under olfactory lobes.
Parietal double; attachment of occipital segment very open; gomphosis internal.
Temporal with anterior vertico-oblique wing; superior plate produced beyond arched body, forming abutment for columella.
Orbitosphenoid wanting. Arches incomplete. Suspensoria two.
Vertebrae usually ampicoelain.
Tongue papillose.
_Nyctisaura._

**PLEURODONTA.**

Shanks of teeth cylindrical, attached to inner side of one alveolar wall.
Coronoid bone produced anteriorly, not posteriorly.
Articular, when present, separate from angular, (except in one tribe.)
Subarticular little developed on inner, usually much on outer face of ramus.
Groove for Meckel's cartilage nearly always more or less completely closed.
Splenial nearly always elongate.
Premaxillary in contact with vomers, (with two or three exceptions.)
Pterygoids not touching sphenoid.
Parietal single, receiving gomphosis of the usually slightly attached occipital internally.
Temporal with inferior longitudinal wing only, columella abutting on parietal or incomplete. Suspensoria nearly always two.
Orbitosphenoid wanting; vertebrae procoelian.
_Iguania, Diploglossa, Thecaglossa, Leptoglossa, Typhlophtalmi._

**OPHIOSAURI.**

Coronoid bone little developed externally, covering articular internally.
Articular united with angular.
Subarticular little visible externally; elongate internally.
Splenial small; Meckel's cartilage covered on the inner side.
Premaxillary well developed, in contact with vomer.
Pterygoids in close contact with sphenoid.
Frontal under-arching olfactory lobes.
Orbitosphenoid present.
Parietal single, with a close articulation to occipital by external gomphosis.
Temporal without wing, continuous with parietal. No columella.
Arches wanting. Suspensorium, one.
Vertebrae procoelian; tongue scaly.
_Amphibiania._

The characters of the tribes and the families embraced by them are as follows:

**ACRODONTA.**

**RHPTOGLOSSA.**

Parietal arch elevated, formed of squamosal and parietal; latter not extending to mastoid.
Vertebrae procoelian.
Clavicle wanting.
Clavicular and mesosternum wanting. Xiphisternal without fontanelle.
No angular process of mandible. Splenial none.
Tongue papillose; terminal portion projectile on glosso-hyoideum.
Toes short, opposable in two and three. _Chamaeleontidae._

**PACHYGLOSSA.**

Parietal arch not elevated, composed of mastoid and parietal in contact.
Clavicle present. (sometimes very short.)

_Oct._
Clavicle proximally simple; mesosternum anchor-shaped. Xiphisternum with two, sometimes one fontanelle. Mandible with angular process. Tongue papillose, simple. Toes not opposable, all directed forwards.

Agamidæ, Hatteriidae.

PLEURODONTA.

Iguania.


Anolidae, Iguanidae.

Diploglossa.


Mesosternum cruciform or rarely simple. No Xiphisternal fontanelle. Tongue papillose, sheathed at tip. Supranasal plates numerous.

Anguidæ, Gerrhonotidæ, Helodermaidæ.

Thecaglossa.


Varanidæ.

Leptoglossa.

Temporal bone superior plate developed beyond arched body. Frontal with a larger or smaller ridge on each side of olfactory lobes; no arch. Lateral arches complete. Articular and angular separate. Dentary, lower posterior process often short, often long. Groove for Meckel’s cartilage mostly overarched. Suspensoria two. Premaxillary single or double, without exterior marginal foramen. Clavicles proximally much dilated, usually perforate or enclosing a foramen. Mesosternum cruciform; not more than one pair of supranasal plates. Tongue squamous or obliquely plicate.

* The transverse limb of the mesosternum, extending to the angle of the clavicle, gives an appearance in some of the Basiliscinae of a proximal foramen.

1864.]
Temporal bone superior plate elongate.
Arches incomplete or wanting.
Articular and angular confluent. Suspensoria one or two.
Dentary, inferior process elongate.
Premaxillary single or double.
Clavicles very slender, transverse rudimentary or wanting.
Mesosternum and other sternal pieces wanting.
Tongue squamous or papillose, simple.—Anelytropidae, Anantiidae,

\textbf{A}n\textbf{i}ellidae.

Of the families here proposed or adopted, the Anolidae deserves first mention.
Its peculiarities are—want of articular bone; absence of xiphisternal fontanelle; presence of abdominal ribs; in these points agreeing with the Nictisaura or Gecomoidea, and differing from the mass of the Iguanidae. Still, among the latter Polychirus forms a close connection, wanting the xiphisternal fontanelle, and having the abdominal ribs.

\textbf{A}nguidae.—This family I have constructed from fragments of the old Zonuridae and Scincidae; agreeing with Peters in referring the Old World representatives of the former to the Lacertidae, and those of the New to the neighborhood of Heloderma. From the Scincidae I have taken the New World Diploglossinae, finding them possessed of the same peculiar characters which associate the Psuedopus with Gerrhonotus and Heloderma. The families represented by these types differ as follows. None of them have the dilated maxillary laminae of the Scincidae:

A foramen (often large) from nasal meatus to palate on each side of premaxillary. Internasal plate large, transverse. Two or more pairs of supranasals.*

Head shielded behind. Mesosternum cruciform... Anguidae.

No premaxillary foramen. Two or more pairs of supranasals. Internasal plate small or wanting. Head scaled behind. Mesosternum cruciform,... Gerrhonotidae.

No premaxillary foramen. Head tubercularly scaled.

Mesosternum simple................................. Helodermidae.

There are four sub-groups among the genera of Anguidae, viz.: Ophiosaurus, with the anterior limb of the mesosternum very short or wanting; the dorsal scales in cross rows and a lateral fold; genera Dopsia, Psuedopus, Ophiosaurus and Opheodes: Ophиемorinae without side fold, and with transverse dorsal rows, Ophiomorus: Anguinae with shortened mesosternum, quincuncial dorsal scales and no lateral fold—Anguis: Diploglossinae without lateral fold, with elongate anterior limb of mesosternum and quincuncial dorsal scales, containing Onida, Panolopus, Sauresia, (= Embryopus Weinl.) Diploglossus, Microlepis and Camilia: (in C. \textit{monotropis} Pet. I have observed an apparent exception to the rule of the retractility of the end of the tongue in this tribe.†)

Of the Gerrhonotidae I know but the two genera, Barissia and Gerrhonotus. Xenosaurus Pet. resembles the succeeding family rather than this; I have not had the opportunity of seeing its sternum.

Among the Leptoglossae with a simple premaxillary, the Teidae only have

\* Except Opheomorus.
†Vid. Proc. A N. S. 1862, 188.
not the temporal fossæ roofed over by ossified, or much thickened dermal plates. The families may be thus compared:

a. Premaxillary single.
Temporal fossæ not roofed; tongue squamous papillose in oblique series, or squamous. Nostril in plate or suture: always a xiphisternal fontanelle.

b. Premaxillary double.
Temporal fossæ roofed. Tongue squamous. Nostril in a single plate; palatine maxillary lamina diluted; rarely a xiphisternal fontanelle.

Temporal fossà roofed; tongue squamous. Nostril in notch of rostral; palatine maxillary lamina often dilated.

I do not know the complete characters of the Chaleide, but they are very near the Lacertide. The American Lepidophyza, Xantusia and Cricoasa are enter the Lacertide, as here defined, as I have failed to find characters which separate them from this Old World family. The affinity to Zonurus, pointed out by Duméril, is manifested in the double parietals of the first two. Mancus and Gerrhosaurus enter the same family in all points—though the tongue is partially scaly—but in Zonurus there are two important exceptions in which it approaches Gerrhonotus, viz: the tongue is papillose, and the posterior limb bounding the clavicular foramen is wanting. Tretioscincus* enters the Ecpleopidae, but presents the peculiarity of a simple clavicle. In a species of Brachyus I find the clavicle not always perforate, and in Trachysaurus the foramen is also wanting, although the dilatation is extensive. All these families, except the first, are known to possess serpentiform types; such are among the true Scincs, Siphus, Hemiergis, Campsodactylus, etc. The last is a degraded form of Mabua: in the second the articular and subarticular bones appear to be united: the first is, in all respects, typical of the family in its proper characters, as illustrated by the species at hand, S. simplex mili.

Pygopus and Lialis, with simple premaxillary, enter this tribe and are perhaps types of separate families. Whether Aprasia belongs in this or the next is as yet a question; it has some points of resemblance to Aniella.†

* T. bifasciatus, Heteropus Dun. T. castaneiculris Cope.
† S. simplex. Nasals as high as broad, not meeting above rostral; internasal much broader than long, in contact with prefrontal. Frontonasals longest transversely, with an acute inner angle, not touching in front of frontalis. Latter elongate cubiciform, three-sided in front. Supraorbital five, posterior small; frontoparietals large, extensively in contact, occipitals large, long, nearly entirely separated by the interoccipital (which is long as the frontal) and bounded externally by a long occipital. 6 superior labials. Transverse symphysial and mental; 1st pair infralabials in contact, and two following pairs very elongate transversely. Twenty rows scales round the middle of the body, dorsal larger; four rows broader on nape. Three toes on anterior, none on posterior extremity. Color above steel brown, below dirty yellow; a yellowish occipitomental collar.

From end of muzzle to vent 3 in. 6 l. Vent to end of tail 4 in. 6 l. Hab. Australia.

† An allied genus, which will compel the union of the Phrynoside with the Pygonidae, is Plesothax mili, with the subjoined characters:—Posterior extremities, no preanal pores. Two pair of supraoculars, nare between the anterior and first superior labial; one transverse frontonasal. Rostral oval, prominent. All the scales imbricated, with two keels and a groove between; no larger abdominal series. P. gracilis is Pygopus gracilis, Schlegel (Mus. Leyden) to whom I am indebted for the opportunity of making this description. Occipitals broad, acuminate, as long as frontal and frontonasal. Three supraoculars, posterior largest. Temporal scales large, keeled. Gulars keeled; one very large symphysial followed on each side by two transverse labials, and these by two longitudinal narrow labials and two large infralabials. Sixteen rows of scales. Pale brown, a paler median dorsal band, two scales wide, bordered with dark brown. From South West Australia.

1864.}
The families of the last tribe differ as follows:

a. Two suspensoria; nostril in the rostral shield. Tongue squamous.

Eye concealed by epidermis; occipital segment loosely attached. No frontal under-arch. A n e l y t r o p i d æ. *

Eye distinct; occipital closely articulated; two premaxillaries. A c o n t i d æ. 

b. One suspensorium; nostril in a nasolabial plate; tongue papilllose.

Eye distinct; occipital closely articulated; one premaxillary; an inferior frontal arch. A n i e l l i d æ. 

In the first family enter Typhlosaurus, Feylinia, (much the same is Typhlo- scines) and Anelytrops. In these the columella is well developed. In Anelytrops there is a long squamosal articulated to the side of the parietal, as in Rhineura and Cephalopeltis, the premaxillary is single, and palatine laminae of the maxillary are dilated. The splenial groove is open. There are two slender clavicles united medially and giving insertion to the thoracic hæmopophyses. These, according to Rathke, are present, but not in contact in Acontias, and Peters and Stannius failed to find them in Typhlosaurus. The pelvis I find to be represented by an oblique bone at the extremities of two pairs of ribs on each side of the vent.

The remarkable genus Aniella lacks the squamosal and columella, and has a single premaxillary. The parietal is continuous with the superior plate of the temporal, and is much decurved toward the sphenoid; the frontal encloses the olfactory lobes below; these characters are the most amphibian in the order. There are small pre- and postfrontal bones, and a slender ligamentous postorbital arch. I have as yet found no sternal pieces, and the splenial-mental groove is closed, as in Acontias.

The Ophidian suborders may be briefly summed up as follows:

α. Mastoid part of cranial walls: coronoid bone present.

I. No ectopterygoid. No prefrontal. Maxillary without alveolar ridges or malar process. Rudiments of pelvis without pubis. S c o l e c o p h i d i a. 

II. No ectopterygoid. Prefrontal present. Maxillary with alveolar ridge and malar process. Rudiments of pelvis with pubis. C a t o d o n t a. †

III. An ectopterygoid, and prefrontal. Maxillary with alveolar ridges and teeth, horizontal, in contact with prefrontal. T o r t r i c i n a. 

β. Rudimentary posterior extremities. T o r t r i c i d æ. 

ββ. No rudiments of extremities. U r o p e l t i d æ. 

αα. Mastoid not entering cranial walls, projecting. Ectopterygoid present.

IV. O. maxillare horizontal, produced to premaxillare, provided with solid teeth. No rudiments of pelvis. A s i n e a. 

α. Coronoid present; rudimental posterior extremities.

Coronoid and articular very elongate-sleender. No postorbital or supraorbital; premaxillary teeth. X e n o p e l t i d æ. 

Coronoid and articular short; post- and supraorbital teeth. P y t h o n i d æ. ‡

Coronoid and articular short; postorbital; no supraorbital or premaxillary teeth. B o i d æ. 

β. Coronoid bone wanting; no rudimental extremities.

* Typhlinae Gray. The same Typhline is preoccupied.
† Vid. the important discovery of the pelvis by Peters, Monatsbe, Berlin Ac., 1853, 270.
‡ Loxocemos enters this family rather than the next. Günther is right in assigning premaxillary teeth; posterior extremities, absent in his young specimen, are present in adults.

[Oct.]
NATURAL SCIENCES OF PHILADELPHIA.

b. O. postorbitale produced over the superciliary region........................................... Acrochordidae.*

bb. Postorbitale forming the hinder border of the orbit only. The families of this group have not yet been defined.

V. 0. maxillare horizontal, thickened, and not reaching premaxillare anteriorly, in contact with prefrontale, bearing a perforate and usually grooved tooth Proteroglypha.


Postorbitals present................................ Naiidæ.


VI. 0. maxillare vertical, attached to prefrontale by a gingival process, and to the ectopterygoid without imbrication. Fang very seldom grooved...................... Solenoglypha.


On a Blind SILURID, from Pennsylvania.

BY E. D. COPE.

Animals deprived of the sense of sight are generally known inhabitants of subterranean areas of earth or water, although representing by their general structure, zoological groups most diverse. Among fish, two blind species of the Cod family are found in the caves of Cuba. The blind fish of the Mammoth Cave, with its sightless relative, the Typhlichthys, belong to a family represented by an eyed genus in the ditches of Carolina. Among the Catfish or Siluridae there are sundry genera of a variety of form, in which the eyes are wanting or concealed by the skin. These are mostly South American or East Indian species, those of the latter country, of the Akysis type, approach nearest to our eyed Catfish of North America, according to the system of Bleeker. For a knowledge of the first genus of blind Silurid from our country, I am indebted to my friend Jacob Stauffer, Secretary of the Linnean Society of Lancaster, an ardent explorer of the Zoology and Botany of Southern Pennsylvania, and who has furnished me with many valuable notes and specimens. This fish, of which specimens have been taken in the Conestoga creek, a tributary of the Susquehannah, is simply a blind representative of the ordinary type of Silurids, characteristic of North America, and is not to be arranged with the exotic groups. It, therefore, enters the group Ictaluridæ, of Gill, with our genera Ameirus, Hopladèles, Naturus and Ictalurus, possessing especially the characters of the first. The genus may be called Gronias, and be explained by the following diagnosis:—Head broad, depressed. Supraoccipital bone posteriorly free. Branchiostegal membrane with ten rays. Anterior dorsal spine stout, posterior fin separated from caudal. Ventral with eight rays. Eyes rudimental, covered by the corium. Natatory bladder present.

The species has the head broader posteriorly, and the anal fin shorter than in the allied species of Ameirus. It may be called G. nigrilabris. The muzzle is flat and the jaws equal; the width across the occipital region is equal to the length from the end of the muzzle to the apex of the occipital crest; width below equal from the axilla of the pectoral to the base of the ventral fin. From end of muzzle to dorsal spine equal from latter to middle of adipose. Length of head four and one-fifth times in total length. Max-

* Vid. Pr. A. N. S., 1800, 75.
illary barbels extend three-fourths the distance to the opercular border; outer (longer) mentals scarcely beyond middle branchiostegal angle. Height of body at base of dorsal equal three-fourths length of head. End of pectoral opposite posterior border of first dorsal, its spiny ray serrate; ventrals not reaching anal. Basis of anal terminating a little behind base of adipose; length of caudal peduncle below, equal length of pectoral spine. Rays D. 1-7; P. 1-9; V. 8; A. 18; C. 16. Spine of dorsal smooth. Caudal openly emarginate, the emargination much above the middle rays, giving the highest a short lobate outline. Lateral line straight to scapular angle, mouth of axillary mackous duct distinct. Length of head 2 in. 8 1/; width below 2 in. 2 1/; from muzzle to base of ventrals 4 in. 3 1/; to base of caudal 7 in. 9 1/; length of caudal 1 in. 7 1/; another specimen is about ten inches in length. The color of the upper surfaces, tail, fins, barbels and under jaw is black; sides varied with dirty yellow, abdomen and thorax yellowish-white. J. Stauffer informs me that the dark pigment of the skin of this animal comes off upon the hands in handling it. A specimen died in twenty minutes after capture, when put in water, though uninjured; the Ameirii, like other Catfish, will live for many hours after complete removal from their element. It is occasionally caught by fishermen, and is supposed to issue from a subter- ranean stream, said to traverse the Silurian limestone in that part of Lancaster county, and discharge into the Conestoga.

Two specimens of this fish present an interesting condition of the rudimen-
tal eyes. On the left side of both a small perforation exists in the cori-
um, which is closed by the epidermis, representing a rudimental cornea; on the other the corium is complete. Here the eyeball exists as a very small cartilaginous sphere with thick walls, concealed by the muscles and fibrous tissue attached, and filled by a minute nucleus of pigment. On the other the sphere is larger and thinner walled, the thinnest portion adherent to the cori-
num spot above mentioned; there is a lining of pigment. It is scarcely col-
lapsed in one, in the other so closely as to give a tripod section. Here we have an interesting transitional condition in one and the same animal, with regard to a peculiarity which has at the same time physiological and systematic sig-
nificance, and is one of the comparatively few cases where the physiological appropriateness of a generic modification can be demonstrated. It is there-
fore not subject to the difficulty under which the advocates of natural selection labor, when necessitated to explain a structure as being a step in the advance towards, or in the recession from, any unknown modification needful to the exist-
ence of the species. In the present case observation on the species in a state of nature may furnish interesting results. In no specimen has a trace of anything representing the lens been found.

I am indebted to the same enterprising Society and its Secretary for another inhab-
tant of the Conestoga, which has hitherto escaped the notice of zoolo-
gists. This species, which has been distinguished by Jacob Stauffer in corres-
pondence, is an Etheostoma, A species of the allied genus Pecichthyidae in the Mus. Academy Nat. Sci., from the Platte River, near Fort Kearney, Nebraska, presented by Dr. Hammond, appears to have been as yet un-
described. It may be called P. meseuus. A stout, little compressed species, with large scales. Dorsals not in contact. Eye entering five times into length of head, more than once in muzzle anterior to its border; head 4 1/ times in total length. Caudal very rounded; first scarcely as high as second dorsal. Pectorals longer than ventrals, not reaching vent. Scales 46. Fin rays

---

D. ix—13: P. 10: V. 1—4: A. 9; C. 2—14—1. Outline of back rather elevated. Length 2 1/ inches. Beside the large size of the scales, the proportionally longer head and four soft ventral rays distinguish it from other species. The color in spirits is pale brown, with four dorsal blotches, and a few groups of zigzags on the sides. Second dorsal and caudal barred.

The collections also contain a series of species of Hololepis, which differ as follows, one being apparently undescribed:

[Oct.]
higher degree than does the best known type, the \textit{E. blennioides}. This is, especially, the existence of a median abdominal series of thick shield-like scales, with short mucrones radiating from the free margins. In the type of the genus these scales are little larger than those of the ordinary form; in the present species they are four times the size of the largest on the body. The following description will express the general characters:—\textit{Etheostoma peltatum} Stauffer; body and head more compressed and elevated, and the muzzle longer than in \textit{E. blennioides}. Four times the length of the head (from below the opercular spine) extends a little beyond the base of the caudal fin, commencing at the end of the muzzle. Pectoral as long as head, and a little less than equal base of first dorsal. Greatest height equal from end of maxillary to edge of operculum. Eye $3\frac{3}{4}$ times into length of head, measured below opercular spine. Breadth of body through scapular re-

\textit{region} much greater than elsewhere. Scales 53, two rows on each side the \textit{lateral} line longest. No scales in front of the first dorsal or on the head, except a very few on the operculum. A shield in the clavicular angle, one between the ventral fins, and six in a series commencing opposite the middle of the ventrals, and extending to vent; the last double. Dorsal fins well separated xiii—13. Caudal deeply lunate 17; A. 11; V. 6; P. 14. Total length three inches. All the fins are finely barred, the ventrals but little, except the first dorsal, where a series of lunate black spots occupies the middle of the interradial membrane. The dorsal region is bright olive, with a series of short brown cross-bars. The lateral region is occupied by a longitudinal series of broad brownish shades; between these and on the belly and jaws orange and yellow. From spinous dorsal to occiput; from hinder frontal region to end of muzzle extending round front of orbits; a broad perpendicular bar from orbit downwards, and blotch on the operculum—black.

Jacob Stauffer informs me that its movements are quick and lively, and that it presents a striking appearance in its native waters.

\begin{itemize}
  \item Lateral line to middle of first dorsal, on about 12 scales.
  \item Head $3\frac{3}{4}$ times in total length. D. viii—9; A. 9. Scales 52.
  \item Lateral line on 12—16 scales, to middle of first dorsal. Scales 42—4
  \item Head four times in total length. Rays D. ix—10; A. 9.
  \item Lateral line on 23—8 scales to origin of second dorsal. Scales 56
  \item Head four times in total length. Rays D. x, xi—10, 11; A. 9.
\end{itemize}

\textit{Hololepis e r o c h r o û s} is found in streams and dams, particularly near Brown's Mill in the eastern part of New Jersey, opposite Philadelphia. Its length is about two inches. The eye enters the length of the head five times, from end of muzzle to edge of orbit being one diameter of eye. Pectoral and ventral fins equal; rays of latter 1—4. A broad blackish band extends from the end of the muzzle to base of tail, covering one-third the height laterally and interrupted by reddish-yellow punctuations. Above the band pulverulent with reddish and Rufous shades; below pale yellow in spots, rarely with specks: color similar on the head below the band, except a vertical black streak below the eye. This very pretty fish was found, and specimens presented to me, by my friend Jesse Burk, of this city.

1864.]
FASTI ORNITHOLOGiae.
BY JOHN CASSIN.

"There is no antidote against the opium of time, which temporarily considereth all things; our fathers find their graves in our short memories, and sadly tell us how we may be buried in our survivors."

"Oblivion is not to be hired. The greater part must be content to be as though they had not been; to be found in the register of God, not in the records of men. Twenty-seven names make up the first story before the flood, and the recorded names, ever since, contain not one living century. The number of the dead long exceedeth the living. The night of time far surpasseth the day, and who knows when was the equinox?"—Sir Thomas Browne.

No. 1.

PHILIPP LUDWIG STATIUS MÜLLER,

Of this author I am acquainted with the following works which in part relate to Ornithology:


2. Same work, 2 vols., Folio, Dordrecht, 1771, (edition in Dutch.)

3. Des Ritters Carl von Linne vollständiges Natursystem, nach der zwölften lateinischen Ausgabe, &c., an edition of the Systema Natura of Linnaeus in German, of which the Kingdom Animalia is by this author, in 9 vols., Octavo, 158 plates, Nürnberg, 1773 to 1776.

There are also numerous memoirs, translations and other works, the most extended and apparently the most complete enumeration of which is in Englemann's Bibliotheca Historico-Naturalis. I have seen none other than the above relating to Ornithology.

In a series of papers, of which this is the first, I propose to bring to the notice of ornithologists, a very considerable number of authors, the works of whom have been either wholly or partially overlooked, or at least have not received that degree of attention to which they seem to have been, and in most instances are, surely entitled. All of those, whom I propose to notice, have written since the era of the Linnean binomial nomenclature. Facilities unusually favorable for this description of investigation exist in the library of the Academy of Natural Sciences of Philadelphia, which is very rich in Zoology, especially of the older authors, owing mainly to the scientific taste and great liberality of the late Mr. William Maclure, of Dr. Thomas B. Wilson, and of Mr. Edward Wilson. Many of the most remarkable and rarest works were collected in Europe and presented to the Academy by the last named gentleman.

There are also in the library of the Smithsonian Institution at Washington, in that of the American Philosophical Society at Philadelphia, and in that of the Library Company of Philadelphia, valuable and but imperfectly known works, which are included within the objects of my proposed series, and to all of which, by virtue of their rules and through the courtesy of the officers of those institutions, I have unrestricted access. I propose to notice works, or parts of works, only which relate to Ornithology, and in a few instances to present notices of well known authors, for the purpose of giving condensed accounts of their works.

The bibliography of Ornithology is so extensive that no naturalist has yet mastered it, nor has been able to entirely appreciate and avail himself of the labors of his predecessors. There is, of course, much diversity of acquire-
ment in this description of knowledge, and very generally an unqualified desire to attain the utmost possible proficiency. Instances occur, however, of exceeding ignorance and carelessness, and, in fact, it is not quite certain that the general disposition to, and respect for, research and erudition has not declined in Ornithology within the last quarter of a century, in a degree perhaps unusual in the Sciences. There is no reason that erudition in the literature of the Natural Sciences, through knowledge of books and the fullest research, should be less respectable than in any other department of Human Knowledge, nor that in those Sciences this description of acquirement should not be more respectable than ignorance. Here, too, as everywhere else, the great principles of Ethics, founded in the clear truths of Religion and Nature, should be allowed the most extended jurisdiction and control, without qualification. The morals of the Natural Sciences, most certainly, are not peculiar in any particular, nor involve principles different in any respect from those universally recognized in the practical pursuits of mankind, and which have elicited the most cordial assent and approbation of all civilized men. Justice, Honesty, Industry,—in fact, all the great practical and household virtues are as indispensable in the relations of cultivators of the Sciences past and present as elsewhere; possibly, it might be ventured to be suggested, ought to be rather, the more devotedly practised by men aspiring to be authors, and assuming somewhat to be teachers of mankind.

One prominent article of any code of zoological ethics that I might propose would be, that every author should be cited, and otherwise and in all respects treated justly and respectfully, so long as he can be found in print. It is perhaps safely to be assumed, also, that all authors ought to be treated courteously as well as justly, without reference to the extent of their publications, whether great or small. If belonging to that useful and laborious class of naturalists who are essentially describers of species—that class which possesses real knowledge, even if without hypotheses—their descriptions should be cited, and themselves too, as authorities, so long as such descriptions are known to exist. There is not, evidently, any other course consistent with Justice and the plainest principles of right and morality, and, in fact, no alternative, unless, indeed, an operator is disposed to set himself up for the first of all history, as is said of an early Chinese Emperor. The latter course, in a degree, singular as it may appear, is not entirely unknown to naturalists, especially to those who regard Science rather as a Milch Cow than as a transcendent Goddess—a distinction in classification first made by the great poet Schiller.

Persons addicted to hypotheses, otherwise sometimes rather loosely called Systematists and Generalizers, cannot be too careful in this description of respectful treatment, especially in view of the fact that the descriptive naturalists and students of species possess the great fund of real knowledge; and although describers of species may be nothing else, without the knowledge of such, no one can be anything else.* It is the descriptive naturalist, too, cooperating nowadays with the Anatomist and Chemist, who has brought forward the material so sharply testing the systems, that very few, in fact nearly none, have stood it! The tide of time is strewed with the wrecks of Systems and Generalizations, gone to a death worse than that of the dry bones of the Prophet, for they can never again live. The descriptive naturalists are the true rank and file, with many outriding skirmishers, and quasi great functionaries in attendance, garrulous, perhaps, and imperious, but of little real account; the true officers are from the ranks, and have worked their way.

* Linnaeus says: "Botanice Tyro novit Classes, Canditatus omnia Genera, Magister plurimas species. Quo plures Botanice noverit species, eo etiam praestantior est. Cognitio specierum instituit omnia scilicet eruditio Physica, Oeconomica, Medica: immo omnis vera cognitione humana." Philosophia Botanica, p. 202 (1731). These are the words of a right Sagamonn. 1864.]
The true Systematist is the greatest of them, and amongst the greatest of men, but comes, unfortunately, very rarely; scarcely more than one in a century. All men, or nearly so, seem capable of analysis, but true talent for generalization or synthesis is one of the rarest and most precious of the gifts of God. Inferences and occasional insights are accorded even to the most humble, but in all those beautiful and sublime Sciences which have their immediate origin in the observation of Nature, generalization of any considerable value, or the inference of laws, are not easy nor likely to be proclaimed with any flippant dogmatism. The true and faithful man of genius is too surely appalled by the immensity of attempting, as Goethe happily expresses it, "to think over again the great thoughts of the Creator."

The works of Prof. P. L. S. Müller seem to have been much overlooked in later times, though he was evidently well known, and is cited freely by his contemporaries. He is quite a voluminous author and translator, though few of his works relate to Ornithology, those being, so far as I know, only such as are cited at the head of this paper, and especially his edition of the Systema Naturae. His Supplemental Volume of this edition contains a large number of descriptions of species, generally abridged from other authors, and binomial names given for the first time. Throughout his edition Prof. Müller avails himself largely of Van Houtyn's fine edition of the Systema Naturae, from which he copies nearly all his plates, and also of Boddart's abridgment of the same, and from both of which (in the Dutch language) he freely translates. The latter is his main authority for his additional species. To the former I shall have occasion to allude in a future paper, but Boddart's abridgment I must here further mention, on account of its immed-iate connexion with Prof. Müller's Supplementary Volume.

In 1772, Dr. P. Boddart commenced in Holland the publication of an abridgment of the Systema Naturae of Linnaeus, under the title "Kortbegrip van het Zamenstel der Natuur, van der Heer C. Linnæus, met zeer veele zoorten vermeerderd door P. Boddart Med. Doct.", of which I have seen one volume only, of 550 pages, octavo, containing the classes Mammalia and Aves. In this work Dr. Boddart gives all of the species of Quadrupeds and Birds contained in the twelfth edition of the "Systema Naturae," with the scientific names of Linnaeus carefully stated, and with abridged descriptions in the Dutch language. He adds to those Linnean species many others, mainly from Edwards, Catesby and Buffon, but especially the last named, citing constantly "Buff. Hist. Nat. Ois;" the volume and page frequently, and always the plate of that distinguished author's great work universally known as "Planches Enluminees." The species added by him he does not (in this work) give scientific names, but contents himself with popular names only, which are generally translations into Dutch of those given by other authors, and especially of the French names of Buffon.

It may not be improper to state, though without immediate connexion here, that subsequently, in 1783, Dr. Boddart gave scientific names himself to many of the species described and figured by Buffon, and of which he had previously given condensed descriptions in his "Kortbegrip." The title of this subsequent work is "Table des Planches Enluminees d'Histoire Natur-elle de M. D'Aubenton. Avec les denonimations de MM. de Buffon, Brisson, Edwards, Linnaeus et Latham, precede d'une Notice des Principaux Ouvrages Zoologiques enluminées, par M. Boddart, Med. Doct." Utrecht, 1783, 1 vol., small folio, 83 pages. Many of the names proposed by him in this work, and which are now generally adopted, are anticipated by those of Prof. Müller.


[Oct.]
comenced at Nürnberg the publication of an edition in German of the "Systema Nature" of Linnaeus, under the following title:—"Des Ritters Carl von Linné, Königlich Schwedischen Leibarztes, &c., &c., vollständiges Natur- system, nach der zwölfsten lateinischen Ausgabe und nach Anleitung des holländischen Houttuynischen Werks, mit einer ausführlichen Erklärung ausgefertiget von Philipp Ludwig Statius Müller, Prof. der Naturgeschichte zu Erlang und Mitglied der Röm. Kais. Akademie der Naturforscher, &c." which was completed by him to the end of the Animal Kingdom. This work is contained in seven volumes, so styled, but bound in nine thick octavo volumes, including a "Supplements und Register Band," the date of publication of which is 1776, and of which it is especially the object of this paper to give some account.*

This edition of Prof. Müller contains all the species given in the twelfth edition of the "Systema Naturae," and in the Supplementary Volume he gives a large number of others, which are (as he states in the preface) from the "Addenda, Appendices und Mantissae des Ritters von Linné," and the works of "Buffon, Schreber, Boddaert, Pallas und andern." The numbering of species under each genus is continued from the twelfth edition of the "Systema Naturae."

In this volume Prof. Müller gives nearly all of the species of Birds described by Buffon, not previously given by Linnaeus, and generally translates the Dutch names and descriptions of Boddaert's "Kortbegrip" into German. To very nearly all of his additional species, and perhaps especially to those from Boddaert, he gives scientific and strictly binomial names, which are, for many species, the first ever given to birds described and figured in Buffon's "Planches Enluminées." As stated above, Boddaert gave names himself to many of the same birds in 1783, but the date of Müller's Supplement is 1776, thus having clear priority.

In his Supplemental Volume, Prof. Müller gives a large number of species in other classes, and names some species of Quadrupeds, Reptiles and Insects apparently for the first time. His "Register über sämliche sechs Theile des Linneischen Thierreichs," in the same volume, appears to be a complete catalogue of all the species of Animalia contained in the twelfth edition of the Systema Naturae of Linnaeus, and seems to have been prepared very carefully. It is superior to Gmelin's Indices, (Syst. Nat. i. pt. vii.)

The following are the species of Birds given in this Supplemental Volume, and regarded by Prof. Müller as additional to the species of the Systema Naturae. Those species which appear to be named for the first time are here given in small capitals.

The numbering of genera is the same as that of Linnaeus, and the numbering of species is continued in the order of the twelfth edition of the Systema Naturae. I have not attempted to give those species their places in modern genera, but quote only as synonymes the names of Boddaert, Gmelin and others.

Names of Birds given in the Supplementary Volume of Prof. Müller's edition of Linnaeus' Systema Naturae, and regarded by him as additional to those described in the twelfth original edition.

42. Genus FALCO, Linn.

33. Falco (Aquila) leucorypha, Pallas.
   Aquila icucorypha, Pall., Trav. i. p. 454 (1771.)

34. Falco regulus, Pallas, Trav. ii. p. 707 (1773.)

* There are two other volumes, of which Dr. Johann Wolf is author, Nürnberg, 1786 and 1805, avowedly supplemental to Prof. Müller's edition of the Systema Naturae. They contain Mammalia. There is also an abridgement of this edition in two volumes which I have not seen. Gauier mentions Müller's edition, quite unjustly, (Regné Animal iv. p. 144 (1817). 1864.)
43. Genus STRIX, Linn.

A. *Gehörnte Eulen.*

5a. Strix deminuta, Pallas, Trav. ii. p. 707 (1773.)

B. *Ungehörnte Eulen.*

13. Strix accipitrina, Pallas, Trav. i. p. 455 (1771.)
14. Strix uralensis, Pallas, Trav. i. p. 455 (1771.)
15. Strix pulchella, Pallas, Trav. i. p. 456 (1771.)

17. STRIX CAJENNENSIIS, Müller, Syst. Nat. Supp. p. 70 (1776.)
   Strix cayennensis, Gm., Syst. Nat. i. p. 296 (1788.) Buff. Pl. Enl. 442
18. STRIX DOMINICENSES, Müller, Syst. Nat. Supp. p. 70 (1776.)
   Strix dominicensis, Gm. Syst. Nat. i. p. 296 (1788.)

44. Genus LANIUS.

27. "Lanius leucorinus, Linneus."
   Lanius leucorhynchus, Linn., Mant. p. 524 (1771.)
28. Lanius bicolor, Linn., Mant. p. 524 (1771.)

This description is short, and, to me, not recognizable as relating to any species. It is as follows:
   "Man bringt aus den Westindien einen ganz weissen Neuntödtcr, welcher nur allein schwarze Schwungfedern hat, und von Herrn Boddäert mit ange-
   merkt worden." Boddäert's description is equally unsatisfactory, and with-
   out reference to any other author:
   "Klauwier, die geheel wit is, met zwarte slag pennen: Woond in West In-
   dien." Kortb. p. 118.

30. LANIUS AURICULATUS, Müller, Syst. Nat. Suppl. p. 71 (1776.)
   Lanius pomeranus, Sparrm., Mus. Carls. pl. i. (1786.)
   Lanius rufus, Briss., Orn. i. p. 147 (1760.)
   Lanius rutilus, Lath., Ind. Orn. i. p. 70 (1790.) Buff. Pl. Enl. 32, fig. 1.

Has priority of all names, except that of Brission, and is sufficiently de-
   scribed by Prof. Müller, and especially mentioned as "Buffon's Piegrieche
   rousse." Brission's name is generally adopted, but, in strict adhereuce to prori-
   ority in the binomial method, this name has the right.

   Lanius navius, Gm., Syst. Nat. i. p. 304 (1788.)

32. LANIUS VIRIDIS, Müller, Syst. Nat. Supp. p. 72 (1776.)
   Lanius leucocephalus, Gm., Syst. Nat. i. p. 306 (1788.)

33. LANIUS CORRIELEUS, Müller, Syst. Nat. Supp. p. 72 (1776.)
   298, fig. 1.

34. Lanius Angrajaen, Müller, Syst. Nat. Supp. p. 72 (1776.)
   Lanius leucorhynchus, Linn., Mant. p. 524 (1771.)
35. Lanius chari, Müller, Syst. Nat. Supp. p. 72 (1776.)
Lanius viridis, Gm., Syst. Nat. i. p. 306 (1788.) Buff. Pl. Enl. 32, fig. 2
Lanius violaceus, Bodd., Tab. Pl. Enl. p. 3 (1783.)

45. Genus PSITTACUS.
A. Langschwanze, mit keilformigem Schwanze.


6b. Psittacus hematodus, Linn., Mant. ii. p. 524 (1771.)

Psittacus luteus, Gm., Syst. Nat. i. p. 341 (1788.)
Psittacus luteus, Bodd., Tab. Pl. Enl. p. 30 (1783.)
Conurus maculatus, (Müller,) Buff., Pl. Enl. 525 !

6d. Psittacus purpureus, Müller, Syst. Nat. Supp. p. 74 (1776.)
Psittacus erythrocephalus, Gm., Syst. Nat. i. p. 325 (1788.) Buff., Pl. Enl. 264.
Psittacus gingianus, Lath., Ind. Orn. i. p. 99 (1790.)

6e. Psittacus carolinensis, Müller, Syst. Nat. Supp. p. 74 (1776.)

Psittacus pondicerianus, Gm., Syst. Nat. i. p. 325 (1788.)

6g. Psittacus ferrugineus, Müller, Syst. Nat. Supp. p. 75 (1776.)

6h. Psittacus leucophthalmus, Müller, Syst. Nat. Supp. p. 75 (1776.)
Psittacus guianaensis, Gm., Syst. Nat. i. p. 324 (1788.)

6i. Psittacus versicolorus, Müller, Syst. Nat. Supp. p. 75 (1776.)

6k. Psittacus notatus, Müller, Syst. Nat. Supp. p. 75 (1776.)

6l. Psittacus pictus, Müller, Syst. Nat. Supp. p. 75 (1776.)
Psittacus cyanopterus, Bodd., Tab. Pl. Enl. p. 9 (1783.)
Psittacus versicolor, Gm., Syst. Nat. i. p. 327 (1788.) Buff., Pl. Enl. 144.

6m. Psittacus histrio, Müller, Syst. Nat. Supp. p. 76 (1776.)

B. Kurzschwanze.

48. Psittacus Aurora, Linn., Mant. ii. p. 524 (1771.)

49. Psittacus mascarinus, Linn., Mant. ii. p. 524 (1771.)

Buff., Pl. Enl. 263. Psittacus cristatus, Linn.


1864.]
52. Psittacus roratus, Müller, Syst. Nat. Supp. p. 77 (1776.)
Psittacus ceylonensis, Bodd., Tab. Pl. Enl. p. 42 (1783.)
Psittacus grandis, Gm., Syst. Nat. i. p. 325 (1788.)

Psittacus ruber, Gm., Syst. Nat. i. p. 335 (1788.)
Buff., Pl. Enl. 519. P. borneus, Linn.

Psittacus marginatus, Gm., Syst. Nat. i. p. 324 (1788.)
Psittacus lucionensis, Linn.?

55. Psittacus fuscus, Müller, Syst. Nat. Supp. p. 78 (1776.)
Psittacus purpureus, Gm., Syst. Nat. i. p. 346 (1788.)

56. Psittacus versicolor, Müller, Syst. Nat. Supp. p. 78 (1776.)
Psittacus cyanorhynchus, Bodd., Tab. Pl. Enl. p. 22 (1783.)

57. Psittacus cajenneus, Müller, Syst. Nat. Supp. p. 78 (1776.)
Probably Buff., Pl. Enl. 312. P. aestivus, Linn.?

58. Psittacus pectoralis, Müller, Syst. Nat. Supp. p. 78 (1776.)
Psittacus polychloros, Scop., Flor. et Faun. Insub. ii. p. 87 (1786.)
Psittacus sinensis et magnus, Gm., Syst. Nat. i. pp. 337, 344 (1788.)
Buff., Pl. Enl. 514.

59. Psittacus gutturalis, Müller, Syst. Nat. Supp. p. 79 (1776.)
Buff., Pl. Enl. 549. Psittacus leucocephalus, Linn.?

60. Psittacus ventralis, Syst. Nat. Supp. p. 79 (1776.)

61. Psittacus varius, Müller, Syst. Nat. Supp. p. 79 (1776.)
Edwards, Birds, pl. 163. Psittacus erythracus, Linn.?
Prof. Müller's description of this species is unusually short, and is not recognizable. It is probably copied from Bodd., Kortb., p. 144, who cites "Edwards, Birds, iv. 163."

Edwards, Birds, pl. 174. P. ornatus, Linn.

63. Psittacus ardensius, Müller, Syst. Nat. Supp. p. 79 (1776.)
Psittacus cyaniceps, Vieill., Encyc. Meth. p. 137.

64. Psittacus aurantius, Müller, Syst. Nat. Supp. p. 80 (1776.)
Very probably same as No. 58, preceding.

65. Psittacus jugularis, Müller, Syst. Nat. Supp. p. 80 (1776.)
Psittacus Tovi, Gm., Syst. Nat. i. p. 351 (1788.) Buff., Pl. Enl. 190, fig. 1.
Psittacus flavigula, Bodd., Tab. Pl. Enl. p. 12 (1783.)


[Oct.}
Psittacus cyanopterus, Bodd., Tab. Pl. Enl. p. 27 (1783.)
Psittacus capensis, Gm., Syst. Nat. i. p. 350 (1788.) Buff., Pl. Enl. 455, fig. 1.

Psittacus taitianus, Gm., Syst. Nat. i. p. 329 (1788.) Buff., Pl. Enl. 455, fig. 2.
Prof. Müller's description of this species seems to be condensed from that of Buffon's "L'Arimanon," Pl. Enl. vii. p. 141, pl. 455, fig. 2, but he says: "Sein Vaterland ist Peru." Boddaert says the same, "Woond in Peru."

68. Psittacus philippensis, Müller, Syst. Nat. Supp. p. 80 (1776.)

69. Psittacus St. Thomas, Müller, Syst. Nat. Supp. p. 81 (1776.)
Buff., Pl. Enl. 456, fig. 1.

70. Psittacus Cajenneus, Müller, Syst. Nat. Supp. p. 81 (1776.)
Psittacus notatus, Bodd., Tab. Pl. Enl. p. 27 (1783.) Buff., Pl. Enl. 456, fig. 2.
Psittacus sosove, Gm., Syst. Nat. i. p. 352 (1788.)
This name is first and would be entitled to adoption, but was previously applied by Prof. Müller to a species that I cannot determine, from his description, No. 57 of this list.

Buff., Pl. Enl. 69. Psittacus pullarius, Linn.

46. Genus RAMPHASTOS.

Ramphastos Toco, Gm., Syst. Nat. i. p. 356 (1788.) Buff., Pl. Enl. 82.

Ramphastos albus, Gm., Syst. Nat. i. p. 357 (1788.)
Buceros albus, Gm., Syst. Nat. i. p. 361 (1788.)

Buff., Pl. Enl. 166. Ramphastos aracari, Linn.

Ramphastos erythrorhynchus, Gm., Syst. Nat. i. p. 355 (1788.) Buff., Pl. Enl. 263.


Ramphastos torquatus, Gm., Syst. Nat. i. p. 354 (1788.)
Tucana Mexicana torquata, Briss., Orn. iv. p. 421.

15. Ramphastos pulcher, Müller, Syst. Nat. Supp. p. 84 (1776.)
Ramphastos pavoninus, Gm., Syst. Nat. i. p. 353 (1788.)
Tucana Mexicana viridis, Briss., Orn. iv. p. 423.

16. Ramphastos flavus, Müller, Syst. Nat. Supp. p. 84 (1776.)
Ramphastos luteus, Gm., Syst. Nat. i. p. 356 (1788.)
Tucana lutea, Briss., Orn. iv. p. 432.

17. Ramphastos glaucus, Müller, Syst. Nat. Supp. p. 84 (1776.)
Ramphastos ceruleus, Gm., Syst. Nat. i. p. 357 (1788.)
Tucana coerulea, Briss., Orn. iv. p. 433.

1864.]
50. Genus CORVUS.


   Corvus leucogaster, Bodd., Tab. Pl. Enl. p. 15 (1783.)
   Corvus flavidus, Gm., Syst. Nat. i. p. 373 (1788.)
   Buff., Pl. Enl. 249. Lanius sulphuratus, Linn.


51. Genus CORACIAS.


52. Genus ORIOLUS.

   Buff., Pl. Enl. 501, fig. 2. Oriolus Baltimore, Linn.

22. Oriolus cucullatus, Müller, Syst. Nat. Supp. p. 87 (1776.)
   Buff., Pl. Enl., 375, 376. Loxia melanocephala, Linn.
   Oriolus textor, Gm., Syst. Nat. i. p. 390 (1788.)

23. Oriolus viridis, Müller, Syst. Nat. Supp. p. 87 (1776.)
   Cassicus viridis, Vieill., Nouv. Dict. v. p. 364 (1816.)

   Oriolus cristatus, Gm., Syst. Nat. i. p. 387 (1788.)

56. Genus BUCCO.

   Bucco elegans, Gm., Syst. Nat. i. p. 406 (1788.)

   Bucco flavigula, Bodd., Tab. Pl. Enl. p. 20 (1783.)

   Bucco cayennensis, Gm., Syst. Nat. i. p. 405 (1788.)

   Same as No. 4.? Capito navius, Vieill. Buff., Pl. Enl. 206, fig. 2.

[Oct.
The last two species are named from Buff., Pl. Enl. 206, fig. 1, 2, and are held to be the same by later ornithologists.

57. Genus CUCULUS.


   Cuculus ater, Bodd., Tab. Pl. Enl. p. 30 (1783.)
   Corvus australis, Gm., Syst. Nat. i. p. 377 (1788.)
   Bucco cinereus, Gm., Syst. Nat. i. p. 409.
   Cuculus tranquillus, Gm., Syst. Nat. i. p. 417.
   Monasa niger, (Müller), Buff., Pl. Enl. 512.!!

   Cuculus melanorhynchus, Bodd., Tab. Pl. Enl. p. 18 (1783.)
   Cuculus Tolu, Gm., Syst. Nat. i. p. 422 (1788.)
   Centropus Toulou, (Müller,) Buff., Pl. Enl. 295, fig. 1.!

59. Genus PICUS.

22. Picus senegalensis, Müller, Syst. Nat. Supp. p. 91 (1776.)
   Picus senegalensis, Gm., Syst. Nat. i. p. 430 (1788.) Buff., Pl. Enl. 345, fig. 2.


   Picus striatus, Bodd., Tab. Pl. Enl. p. 17 (1783.)

   Picus citrinus, Bodd., Tab. Pl. Enl. p. 30 (1783.)

   Picus cinnamomeus, Gm., Syst. Nat. i. p. 428 (1788.) Buff., Pl. Enl. 524.
   Picus fusco-fulvus, Bodd., Tab. Pl. Enl. p. 30 (1783.)

62. Genus ALCEDO.


17. Alcedo rubra, Müller, Syst. Nat. Supp. p. 93 (1776.)

18. Alcedo galerita, Müller, Syst. Nat. Supp. p. 94 (1776.)
   Alcedo nigra, Bodd., Tab. Pl. Enl. p. 22 (1783.)
   Alcedo ceruleocephala, Gm., Syst. Nat. i. p. 449 (1788.)
   Corythornis galerita, (Müller,) Buff., Pl. Enl. 356, fig. 1.

19. Alcedo leucocephala, Müller, Syst. Nat. Supp. p. 94 (1776.)
   Halcyon leucocephala (Müller,) Buff., Pl. Enl. 356, fig. 2.


63. Genus MEROPS.


1864.]
Merops badius, Gm., Syst. Nat. i. p. 462 (1758.)

The Professor seems to be incorrect in his geography in this instance. He gives the locality fairly enough: "Der Aufenthalt ist in Isle de France."

Musciaca bicolor, Bodd., Tab. Pl. Enl. p. 19 (1783.)

10. Merops giganteus, Müller, Syst. Nat. i. p. 95 (1776.)
Merops cayennensis, Gm., Syst. Nat. i. p. 464 (1788.)

11. Merops persica, Pallas, Trav. ii. p. 708 (1771.)

65. Genus CERTHIA.

Certhia capensis, Linn., Syst. Nat. i. p. 185 (1766.)?

This duplication of a name I do not understand, Professor Müller having previously given Certhia capensis, Linn., in his vol. ii. p. 255.

27. Certhia violacea, Linn., Mant. p. 525 (1771.)


This species I cannot distinguish. The description is "Diese seltene Art ist olivenfarbig grün, unten weiss, an der Brust mit schwarzen Flecken, wie manche Amsel oder Drossel, gefleckt. Die Ruderfedern laufen, wie ander Spechten, spitzig aus, der Schnabel aber, und die übrige Gestalt kommt mit den Baumläufern vollkommen überein. Das Vaterland ist Europa." Copied from Bodd. Kortb. p. 196, who cites no other author.

Buff., Pl. Enl. 246, fig. 1. C. sperata, Linn.

Buff., Pl. Enl. 576, fig. 2. C. currucria, Linn.

Buff., Pl. Enl. 576, fig. 4. C. zeylonica, Linn.

Buff., Pl. Enl. 575, fig. 2, 3. C. Lotentia, Linn.

66. Genus TROCHILUS.

1. Trochilus capensis, Linn., Mant. p. 525 (1771.)

2. Trochilus jugularis, Müller, Syst. Nat. Supp. p. 100 (1776.)
Buff., Pl. Enl. 227, fig. 3. T. ourissia, Linn.?

67. Genus ANAS.


39b. Anas hyperborea, (Pallas.)
Anser hyperboreus, Pall., Spic. Zool. vi. p. 25 (1769.)


46. Anas rufina, Pallas, Trav. ii. p. 713 (1773.)

47. Anas mersa, Pallas, Trav. ii. p. 713 (1773.)

69. Genus ALCA.

8. "Alca cristata, Pallas, Spicil. fasc. v. tab. iii." 
   Alca cristatella, Pallas, Spic. Zool. v. p. 18 (1769.)

72. Genus PELECANUS.
4a. Pelecanus pygmeus, Pallas, Trav. ii. p. 712 (1773.)

75. Genus COLYMBUS.
   Colymbus cristatus minor, Briss., Orn. vi. p. 42.
   Colymbus cornutus, Gm., Syst. Nat. i. p. 591 (1788.)
   Colymbus Thomensis, Gm., Syst. Nat. i. p. 592 (1788.)

76. Genus LARUS.
12. Larus Ichthyætus, Pallas, Trav. ii. p. 713 (1773.)
   Buff., Pl. Enl. 266.  L. marinus, Linn., (young.)
   Larus maculatus, Bodd., Tab. Pl. Enl. p. 16 (1783.)

84. Genus ARDEA.
6a. Ardea (Grus) leucogerana, Pallas.
   Grus leucogeranus, Pall., Trav. ii. p. 714 (1773.)
   Ardea gigantea, S. G. Gmelin, Trav. ii. p. 189.
6b. Ardea (Grus) mexicana, Müller, Syst. Nat. Supp. p. 110 (1776.)
   A. canadensis, Linnaeus.
6c. Ardea (Grus) japonensis, Müller, Syst. Nat. Supp. p. 110 (1776.)
   Grus leucogeranos, Pallas, juv. ?
6d. Ardea (Grus) Buccinator, Müller, Syst. Nat. Supp. p. 110 (1776.)
   C. Storche, Ciconie.
   D. Reiher, Ardeev.
   "Die Farbe ist aschgrau, der Hals und die Brust aber sind weiss und
   schwarz gefleckt. Der Aufenthalt ist in Italien, Boddart."  Kleine Reiger,
   Ardea cerulescens, Lath., Ind. Orn. ii. p. 690 (1790.)
   Buff., Pl. Enl. 349.
   Ardea leucogaster, Bodd., Tab. Pl. Enl. p. 21 (1783.)
   Ardea leucogaster, Gm., Syst. Nat. i. p. 628 (1788.)
30. Ardea comata, Pall., Trav. ii. p. 715 (1773.)

1864.]
85. Genus TANTALUS.

8. Tantalus Courly, Müller, Syst. Nat. Supp. p. 112 (1776.)
   Buff., Pl. Enl. 198. Scolopax madagascariensis, Linn.

   "Le Falcinellus de Gesner et D’Aldrovande, de couleur sombre." Marsigli,

87. Genus TRINGA.

24. Tringa Islandica, Linn., Syst. Nat. i. Addenda, (not paged, 1767.)

25. Tringa Senegallensis, Müller, Syst. Nat. Supp. p. 113 (1776.)

   Edwards, Birds, pl. 141. Tringa interpres, Linn.

   Buff., Pl. Enl. 300. Tringa littorea, Linn.

88. Genus CHARADRIUS.

13. Charadrius gregarius, Pall., Trav. i. p. 456 (1771.)

14. Charadrius Asiaticus, Pall., Trav. ii. p. 715 (1773.)

15. Charadrius Tataricus, Pall., Trav. ii. p. 715 (1773.)

   Pluvialis dominicensis aurea, Brisson, Orn. v. p. 48.
   Charadrius virginicus, Auct.?  *

   Birds, ii. pl. 63.

   Charadrius Jamaicensis, Gm., Syst. Nat. i. p. 685 (1788.)
   The larger grey Snipe, with a white neck. Brown, Nat. Hist. Jamaica,
   p. 477.


   Himantopus Mexicanus, Briss., Orn. v. p. 36.
   Himantopus nigricollis, Vieill., Nouv. Dict. x. p. 42 (1817.)

   Pluvialis Bengaleensis major, Briss., Orn. v. p. 82.
   Otis bengaleensis, Gm., Syst. Nat. ii. p. 724 (1788.) Edwards, Birds,
   pl. 250.

   Pluvialis aurea, Briss., Orn. v. p. 43.

91. Genus FULICA.

   352.
   Fulica major, Bodd., Tab. Pl. Enl. p. 21 (1783.)

* This work is rarely cited and apparently little known, even to European naturalists, though it is one of the most elaborate ever published. 6 vols., folio, with a large number of plates, in those of which devoted to Natural History nearly all the Birds of Europe are given.

[Oct.
Genus RALLUS.

11. Rallus capensis, Linn., Mant. p. 525 (1771.)
12. Rallus viridis, Müller, Syst. Nat. Supp. p. 120 (1776.)
   Rallus cayennensis, Bodd., Tab. Pl. Enl. p. 22 (1783.)

98. Genus PAVO.

101. Genus PHASIANUS.
7. Phasianus superbus, Linn., Mant. p. 526 (1771.)
   Phasianus cristatus, Gm., Syst. Nat. i. p. 740 (1788.) Buff., Pl. Enl. 337.

102. Genus NUMIDA.
3. "Numida coronata, Pallas, Miscell."
   Probably Numida mitrata, Pall., Spic. Zool. iv. p. 18. There is no such
   species described in Pallas' "Miscellanea Zoologica."

103. Genus TETRAO.
A. Federfüsse.
9a. Tetrao senegallus, Linn., Mant. p. 526 (1771.)
96. Tetrao paradoxa, Pall., Trav. ii. p. 712 (1773.)
B. Kahlfüsse.
   Tetrao montanus, Gm., Syst. Nat. i. p. 758 (1788.)
   Tetra rubicollis, Gm., Syst. Nat. i. p. 758 (1788.)

1864.]


104. Genus COLUMBA.


35b. Columba australis, Linn., Mant. p. 526 (1771.)


105. Genus ALAUDA.

12. Alauda Tatarica, Pall., Trav. ii. p. 707 (1773.)


   Alauda senegalensis, Gm., Syst. Nat. i. p. 797 (1788.) Buff., Pl. Enl. 504, fig. 1.
   Alauda senegalensis, Bodd., Tab. Pl. Enl. p. 29 (1783.)

   Edwards, Birds, pl. 268. A. calandra, Linn.

   Buff., Pl. Enl. 363, fig. 2. A. calandra, Linn.


106. Genus STURNUS.

6. **Sturnus militaris**, Linn., Mant. p. 527 (1771.)

107. Genus TURDUS.

   Turdus chrysochogaster, Gm., Syst. Nat. i. p. 835 (1788.)

   Buff., Pl. Enl. 558, fig. 1. Turdus dominicus, Linn.

   Buff., Pl. Enl. 558, fig. 2. T. hispaniolensis, Gm.? Muscicapaltiloqua, Vieill., Ois. d'Am. Sept. i. p. 67 (1807.)?

   Turdus Urovang, Gm., Syst. Nat. i. p. 836 (1788.) Buff., Pl. Enl. 557, fig. 2.
   Gmelin also has a Turdus madagascariensis, Syst. Nat. i. p. 823, which name is a synonyme for the next species now given.

   Turdus madagascariensis, Gm., Syst. Nat. i. p. 823 (1788.)

34. Turdus carolinus, Müller, Syst. Nat. Supp. p. 140 (1776.)
   The figure here cited is one of the few of Buffon's Pl. Enl. which for me is impossible to be recognized.

35. Turdus Canadensis, Müller, Syst. Nat. Supp. p. 140 (1776.)
   Buff., Pl. Enl. 556, fig. 1. Turdus migratorius, Linn.


   Dr. Boddaert gives two descriptions of the bird figured by Buffon, Pl. Enl. 515, citing the plate each time, (Kortb., pp. 341, 343.) Prof. Müller gives the two names on the faith of Boddaert's descriptions, which he copies.

   Buff., Pl. Enl. 398, fig. 2. Motacilla aurocapilla, Linn.

1864.]
   Buff., Pl. Enl. 51. Turdus iliacus, Linn.

40. Turdus maculatus, Müller, Syst. Nat. Supp. p. 141 (1776.)

41. Turdus ferrugineus, Müller, Syst. Nat. Supp. p. 141 (1776.)
   Turdus cinnamomeus, Gm., Syst. Nat. i. p. 825 (1788.) Buff., Pl. Enl.
   560.

42. Turdus superbus, Müller, Syst. Nat. Supp. p. 142 (1776.)

43. Turdus fuscus, Müller, Syst. Nat. Supp. p. 142 (1776.)
   Buff., Pl. Enl. 563, fig. 1. Turdus cafer, Linn.

44. Turdus senegalus, Müller, Syst. Nat. Supp. p. 142 (1776.)
   Turdus lugubris, Bodd., Tab. Pl. Enl. p. 33 (1783.) Buff., Pl. Enl. 563, 
   fig. 2.
   Turdus senegalensis, Gm., Syst. Nat. i. p. 823 (1788.)

45. Turdus viridis, Müller, Syst. Nat. Supp. p. 142 (1776.)
   Turdus olivaceus, Bodd., Tab. Pl. Enl. p. 33 (1783.) Buff., Pl. Enl. 564, 
   fig. 1.
   Turdus indicus, Gm., Syst. Nat. i. p. 819 (1788.)

46. Turdus solitarius, Müller, Syst. Nat. Supp. p. 142 (1776.)
   564, fig. 2.

47. Turdus purpureus, Müller, Syst. Nat. Supp. p. 143 (1776.)
   Turdus auratus, Gm., Syst. Nat. i. p. 819 (1788.)

   Buff., Pl. Enl. 539, fig. 1. Turdus palmarum, Linn.

49. Turdus castaneus, Müller, Syst. Nat. Supp. p. 143 (1776.)
   Turdus nigerrimus, Gm., Syst. Nat. i. p. 821 (1788.) Buff., Pl. Enl.
   539, fig. 2.
   Turdus Jala, Bodd., Tab. Pl. Enl. p. 31 (1783.)

50. Turdus europaeus, Müller, Syst. Nat. Supp. p. 143 (1776.)
   Buff. Pl. Enl. 182. Turdus torquatus, Linn. (juvenis.)

51. Turdus sordidus, Müller, Syst. Nat. Supp. p. 143 (1776.)
   Turdus brevicauda, Bodd. Tab. Pl. Enl. p. 6 (1783.)
   Corvus philippensis, Gm. Syst. Nat. 1 p. 375 (1788.)

52. Turdus caudatus, Müller, Syst. Nat. Supp. p. 144 (1776.)
   220.
   Turdus aeneus, Gm. Syst. Nat. 1. p. 818 (1788.)

   Corvus madagascariensis, Gen. Syst. Nat. 1 p. 376 (1788.)

54. Turdus coronatus, Müller, Syst. Nat. Supp. p. 144 (1776.)
   Corvus bengalensis, Gm. Syst. Nat. i. p. 376 (1788.)

55. Turdus gutturalis, Müller, Syst. Nat. Supp. p. 144 (1776.)
   L. Baebakiri, Shaw.

[Oct.]
This name has precedence of all others, except that of Linnæus, which is erroneous geographically.

Turdis orientalis, Gm. Syst. Nat. i. p. 821 (1788.)

Turdus virens hispaniolensis, Gm. Syst. Nat. i. p. 822 (1788.)
These two species, 56 and 57, are the birds represented in Buff. Pl. Enl. 273, but Professor Müller has reversed them. The "Merle des Indes Orientales" is his T. dominicus, and the "Merle de St. Domingo" his T. indicus. The reverse would have been correct, and his names applicable geographically.


Turdus eremita, Gm. Syst. Nat. i. p. 833 (1788.)

60. Turdus Podore, Müller, Syst. Nat. Supp. p. 145 (1776.)


Turdus cyanurus, Gm. Syst. Nat. i. p. 828 (1788.)
This name has priority, but is erroneous geographically, Prof. Müller having been misled by Buffon's name "Merle de la Guiane." Boddaert commits the same error following Buffon.

63. Turdus Rousserolle, Müller, Syst. Nat. Supp. p. 145 (1776.)

105. Genus AMPELIS.

Ampelis caerulea, Vieill.? Buff. Pl. Enl. 188.

109. Genus LOXIA.

49. Loxia orix, Linn. Mant. p. 527 (1771.)

50. Loxia sibirica, Pallas, Trav. ii. p. 711 (1773.)

51. Loxia cristata, Müller, Syst. Nat. Supp. p. 149 (1776.)

52. Loxia caudata, Müller, Syst. Nat. Supp. p. 149 (1776.)
Colius senegalensis, Gm. Syst. Nat. i. p. 842 (1788.) Buff. Pl. Enl. 282, fig. 2.

1864.]
53. Loxia melanocephala, Müller, Syst. Nat. Supp. p. 150 (1776.)
    Buff. Pl. Enl. 309, fig. 2. Loxia oryx, Linn.

54. Loxia maja, Müller, Syst. Nat. Supp. p. 150 (1776.)
    Buff. Pl. Enl. 109, fig. 1, 2. Loxia maja, Linn.

55. Loxia leucura, Müller, Syst. Nat. Supp. p. 150 (1776.)
    Buff. Pl. Enl. 135, fig. 1. L. enucleator, Linn.

56. Loxia maculata, Müller, Syst. Nat. Supp. p. 150 (1776.)
    Buff. Pl. Enl. 135, fig. 2. L. philippina, Linn.

57. Loxia Moineau, Müller, Syst. Nat. Supp. p. 150 (1776.)
    Buff. Pl. Enl. 134, fig. 1. L. oryx, Linn.

58. Loxia coromandela, Müller, Syst. Nat. Supp. p. 151 (1776.)
    Buff. Pl. Enl. 101, fig. 1. Loxia capensis, Linn.

    Buff. Pl. Enl. 139, fig. 3. Loxia malaca, Linn.

60. Loxia undulata, Müller, Syst. Nat. Supp. p. 151 (1776.)
    Buff. Pl. Enl. 139, fig. 1. L. punctularia, Linn.

61. Loxia lacticauda, Müller, Syst. Nat. Supp. p. 151 (1776.)
    Loxia flabellifera, Gm. Syst. Nat. i. p. 850 (1788.)

    Buff. Pl. Enl. 153, fig. 2. L. ludoviciana, Linn. ?

63. Loxia Nonette, Müller, Syst. Nat. Supp. p. 151 (1776.)
    Loxia cucullata, Bodd. Tab. Pl. Enl. p. 24 (1783.)
    Buff. Pl. Enl. 393, fig. 3. L. collaria, Linn.

64. Loxia aurata, Müller, Syst. Nat. Supp. p. 152 (1776.)
    Loxia Regina, Bodd. Tab. Pl. Enl. p. 24 (1783.)
    Buff. Pl. Enl. 393, fig. 2. L. benghalensis, Linn. ?

    Buff. Pl. Enl. 159, fig. 1, 2. Emberiza ciris, Linn.

    Buff. Pl. Enl. 223, fig. 1. Fringilla senegala, Linn.

    224, fig. 3.

68. Loxia notata, Müller, Syst. Nat. Supp. p. 152 (1776.)
    224, fig. 2.

    224, fig. 1.

70. Loxia melanura, Müller, Syst. Nat. Supp. p. 153 (1776.)
    fig. 1.

    fig. 2.

Buff., Pl. Enl. 341, fig. 1. L. butyracea, Linn.

Loxia dominicensis, Gm., Syst. Nat. i. p. 855, (1788.) Buff., Pl. Enl. 341, fig. 2.

Spermophilus Danbentonii, G. R. Gray?

Buff., Pl. Enl. 204, fig. 2.

Loxia bicolor, Linn., Syst. Nat. i. p. 307, (1766?)
Loxia minuta, Gm., Syst. Nat. i. p. 865, (1788.)

Buff., Pl. Enl. 319, fig. 1. Loxia lineola et Fringilla crispa, Linn.

110. Genus Emberiza.

25. Emberiza passerina, Pall., Trav. i. p. 456, (1771.)

26. Emberiza pithyornis, Pall., Trav. ii. p. 710, (1773.)

27. Emberiza aureola, Pallas, Trav. ii. p. 711, (1773.)


Loxia macroura, Gm., Syst. Nat. i. p. 845, (1788.)
Pentheria Moineau, (Müller)! Buff., Pl. Enl. 183, fig. 1.

111. Genus Tanagra.

Buff., Pl. Enl. 301, fig. 1. T. Sayaca, Linn.

Buff., Pl. Enl. 7. T. tatao, Linn.

Tanagra tricolor, Gm., Syst. Nat. i. p. 891, (1788.) Buff., Pl. Enl. 33, fig. 1.

Tanagra festiva, Shaw, Nat. Misc. xii. pl. 537, (1804?) Buff., Pl. Enl. 33, fig. 2.

Buff., Pl. Enl. 173, fig. 1. Tanagra brasiliensis, Linn.

1864. ]
Tanagra magna, Gm., Syst. Nat. i. p. 890, (178S.)
Saltator maxima (Müller) Buff., Pl. Enl. 205.

Buff., Pl. Enl. 290, fig. 1. T. cayana, Linn.

Buff., Pl. Enl. 128. Tanagra Jacapa, Linn.

Buff., Pl. Enl. 155, fig. 2. T. gularis, Linn.

Buff., Pl. Enl. 114, fig. 1. T. violacea, Linn.

112. Genus FRINGILLA.

42. Fringilla mozambica, Müller, Syst. Nat. Supp. p. 163, (1776.)
Fringilla ictera, Vieill., Nouv. Dict. xii. p. 170, (1817.)

43. Fringilla fusca, Müller, Syst. Nat. Supp. p. 163, (1776.)
Buff., Pl. Enl. 151, fig. 1. Fringilla cannabina, Linn.
Fringilla linota. Gm., Syst. Nat. i. p. 916, (1788.)

44. Fringilla vitis, Müller, Syst. Nat. Supp. p. 163, (1776.)
Buff., Pl. Enl. 151, fig. 2. Fringilla linaria, Linn.

45. Fringilla cardinalis, Müller, Syst. Nat. Supp. p. 163, (1776.)
Buff., Pl. Enl. 6, fig. 2. Loxia oryx, Linn.

46. Fringilla Taria, Müller, Syst. Nat. Supp. p. 163, (1776.)


Buff., Pl. Enl. 157, fig. 1. E. senegala, Linn.


Emberiza borbonica, Gm., Syst. Nat. i. p. 886, (1788.)

A common South American species with abundance of names, of which this is the first, but erroneous geographically. Müller follows Buffon, who gives the locality as Cape of Good Hope. Boddart does the same. (Kortb. p. 397.)

Emberiza mexicana, Gm., Syst. Nat. i. p. 873, (1788.)

[Oct.
    Buff., Pl. Enl. 485, fig. 1. Fringilla cannabinæ, Linn.? 
    Linaria rufescens, Vieill.
    Buff., Pl. Enl. 485, fig. 3. Fringilla spinus, Linn.
    Fringilla larvata, Bodd., Tab. Pl. Enl. p. 4, (1783.) Buff., Pl. Enl. 55, fig. 2. Loxia dominicana, Linn.
    Fringilla cristata, Gm., Syst. Nat. i. p. 926, (1788.)
60. Fringilla rubricollis, Müller, Syst. Nat. Supp. p. 166, (1776.)
    Buff., Pl. Enl. 182, fig. 2. Loxia oyx, Linn.
    Fringilla elegans, Gm., Syst. Nat. i. p. 912, (1788.)
    Tanagra cerulea, Gm., Syst. Nat. i. p. 891, (1788.) Buff., Pl. Enl. 203, fig. 2.

113. Genus MUSCICAPA.
    Muscicapa holosericea, Temm.
    Todius regius, Gm., Syst. Nat. i. p. 445, (1788.)
    Buff., Pl. Enl. 569, fig. 1. M. crinita, Linn.
    Buff., Pl. Enl. 569, fig. 2. M. cayennensis, Linn.
    Muscicapa audax, Gm., Syst. Nat. i. p. 934, (1788.)
    Myiodynastes maculatus, (Müller) ! Buff., Pl. Enl. 453, fig. 2.
    Muscicapa rufiventris, Gm., Syst. Nat. i. p. 941, (1788.) Buff., Pl. Enl. 572, fig. 3.
    Muscicapa Aurora, Bodd., Tab. Pl. Enl. p. 34, (1783.)
    Muscicapa ferox, Gm., Syst. Nat. i. p. 934, (1788.)
    Myiarchus Tyrannulus, (Müller) ! Buff., Pl. Enl. 571, fig. 1.

1864.]
Muscicapa erucha, Bodd., Tab. PI. Enl. p. 23, (1783.)
Muscicapa rubricollis, Gm., Syst. Nat. i. p. 933, (1788.)
Querula purpurata, (Muller)! Buff., Pl. Enl. 381.

Muscicapa fusca, Bodd., Tab. PI. Enl. p. 33, (1783.) Buff., Pl. Enl. 568, fig. 2.
Muscicapa petechia, Gm., Syst. Nat. i. p. 948, (1788.)

Buff., Pl. Enl. 567, fig. 1. Muscicapa senagalis, Linn.

Buff., Pl. Enl. 567, fig. 2. Held to be same as last.

Muscicapa melanoptera, Gm., Syst. Nat. i. p. 939, (1788.) Buff., Pl. Enl. 567, fig. 3.

Prof. Müller uses this name twice. See above, No. 26.

Muscicapa cana, Gm., Syst. Nat. i. p. 940, (1788.)

Muscicapa cristata, Gm., Syst. Nat. i. p. 938, (1788.) Buff., Pl. Enl. 573, fig. 2.


Muscicapa fuliginosa, Gm., Syst. Nat. i. p. 932, (1788.)

Muscicapa nivea, Bodd., Tab. Pl. Enl. p. 34, (1783.) Buff., Pl. Enl. 574 fig. 3.
Muscicapa virgata, Gm., Syst. Nat. i. p. 948, (1788.)

Muscicapa agilis, Gm., Syst. Nat. i. p. 948, (1788.) Buff., Pl. Enl. 574, fig. 2.
Muscicapa oliva, Bodd., Tab. Pl. Enl. p. 34, (1783.)

114. Genus MOTACILLA.

50. Motacilla boarula, Linn., Mant. p. 527, (1771.)
52. Motacilla maura, Pall., Trav. ii. p. 708, (1773.)
53. Motacilla cyanura, Pall., Trav. ii. p. 709, (1773.)
54. Motacilla grisea, Müller, Syst. Nat. Supp. p. 175, (1776.)
Edwards, Birds, pl. 259.
Motacilla sulphurea, Bechst., Naturg. Deuts. iii. p. 459, (1807.)

[Oct.]
55. Motacilla fusca, Müller, Syst. Nat. Supp. p. 175, (1776.)
   Motacilla chrysocephala, Gm., Syst. Nat. i. p. 971, (1788.) Buff., Pl. Enl. 58, fig. 3.
   Motacilla arrantia, Bodd., Tab. Pl. Enl. p. 4, (1783.)

56. Motacilla tricolora, Müller, Syst. Nat. Supp. p. 175, (1776.)
   Motacilla multicolor, Gm., Syst. Nat. i. p. 972, (1788.)

57. Motacilla cristata, Müller, Syst. Nat. Supp. p. 176, (1776.)
   Motacilla cristata, Gm., Syst. Nat. i. p. 972, (1788.)

115. Genus Pipra.

   Buff., Pl. Enl. 34, fig. 3. P. erythrocephala, Linn.

   Manacus gutturosus, Bonap., Conspr. Av. i. p. 171, (1850.) Buff., Pl. Enl. 303, fig. 1.

   Buff. Pl. Enl. 303, fig. 2. Pipra pareola, Linn. (juv.)


   Buff., Pl. Enl. 3, fig. 2. P. caeruleus, Linn.

117. Genus Hirundo.

13. Hirundo daurica, Linn., Mant. p. 528, (1771.)

14. Hirundo alpestris, Pall., Trav. ii. p. 709, (1773.)

In the preceding list, I have not given, as entitled to consideration on account of priority, any names which are to be considered doubtful according to my present knowledge. At this particular time, I may be allowed to say, however, that I have various other authors in view for introduction to ornithological society, without being as yet quite sure what figure they will make, nor what established relations they may disturb.

In the "Delicæ Naturæ Selectæ," Prof. Müller is associated with Georg Wolfgang Knorr, and the work is sometimes quoted as that of the latter named author. It is mainly a series of Illustrations in the various classes of Zoology; and many of them are excellent colored plates, especially those of Crustacea, Insects and Minerals. This work only relates to Ornithology in giving figures of the following species:

Pl. 1. Trochilus moschitus, Linn., Syst. Nat. i. p. 192, (1766.)
   " mellisuga, Linn., Syst. Nat. i. p. 192, (1766.)
   " ruber, Linn., Syst. Nat. i. p. 193, (1766.)
   1, 1. Struthio Camelus, Linn., Syst. Nat. i. p. 215, (1766.)
   1, 2. Diomedia demersa, Linn., Syst. Nat. i. p. 214, (1766.)
   1, 3. Falco Gyrhalco, Linn. ?
   1, 4. Buceros galeatus, Gm., Syst. Nat. i. p. 360, (1788.)
   " ruficollis, Vieill., Nouv. Dict. iv. p. 600, (1816.)
   1, 5. Paradisea regia, Linn., Syst. Nat. i. p. 166, (1766.)
   1, 6. Ardea Grus, Linn., Syst. Nat. i. p. 234, (1766.)

1864.] 17
November 1st.
Mr. Cassin in the Chair.

Fourteen members present.
Mr. Leslie exhibited specimens of limestone rock, containing fossil coral, charged with petroleum, from the base of the Devonian formation, near Lake Erie, western New York. He also exhibited a specimen of petroleum from the first well opened at Erie, Pa., on probably the same horizon as that of the former specimens. The oil was obtained at a depth of 750 feet.

November 8th.
Vice-President Bridges in the Chair.

Nine members present.

November 15th.
Vice President Bridges in the Chair.

Twelve members present.
A paper was presented for publication entitled "On a new Cormorant from the Farralone Islands, California." By J. G. Cooper, M. D.

November 22d.
Vice-President Bridges in the Chair.

Fifteen members present.
A paper was presented for publication entitled "Synopsis of the eastern American Sharks." By Theo. Gill.

November 29th.
Vice-President Bridges in the Chair.

Sixteen members present.
On report of the respective committees the following papers were ordered to be published:

Synopsis of the Eastern American SHARKS.

BY THEODORE GILL.

In the present article, I indicate the imperfection of our knowledge respecting the American Sharks, and have endeavored, as far as possible, with my limited materials, to rectify the synonymy. It will be perceived that I have connected names, proposed by Mitchill and others, with species belonging to different families from those to which they had been previously referred. No specific contradiction in the descriptions existing, and the diagnoses essentially agreeing with the species, it is probable that in such cases the generic relations of the species were assumed without verification of the generic characters. But
when, as in the case of Carechias griseus* of Mr. Ayres, the generic position is not only assumed, but the characters forced to agree with it, tyros might be readily misled, and only knowledge of correlation of essential characters will enable the scientist to arrive at correct conclusions. As I have had the power of examining Odontaspidoids from the same neighborhood which agree, in family characters, with those species described by scientific naturalists, and which essentially agree in other respects with Mr. Ayres' description, I identify them with his species without hesitation, although I cannot adopt the name, since it had received two others previously. I may add that its true relations have been appreciated by both Messrs. Desor and Storer.

As already intimated, this contribution must be considered rather as an exposition of our present ignorance of the species, than the embodiment of the correct nomenclature. It is not too much to say that the titles of half the species to their names require to be confirmed. Although I have seen more or less of most of these species, the want of opportunity to compare them with others, and the critical nature of the characters distinctive of species in this order, forbid the idea of correctness in every instance. As, however, much good may often be done by the mere exposition of our deficiencies, this article is submitted with the hope that it may at least excite investigation.

The synonymy of the American forms is alone introduced.

I. Pectoral fin with the base entire in front. .......... SQUALI.

A. Anal fin present.

a. Caudal lunate; tail keeled on one side. .......... LAMNOIDE.

a. Caudal with the upper lobe much elongated.

b. Branchial apertures entirely in front of pectorals. .......... ODONTASPIDOID.

b. Branchial aperture behind above pectoral.

γ. Caudal exceedingly long. Eyes without nictitant membrane. .......... ALOPECIOIDE.


Head laterally produced. .......... CESTRACIONOID.

Head normally formed. .......... GALEORHINOID.

AA. Anal fin obsolete.

Dorsals each armed in front with spine. .......... SPINACIOIDE.

Dorsals unarmed. .......... SCYMOIDE.

II. Pectoral fin with with the base cleft in front. .......... RHIN.

*RHIN.

LAMNOIDE, Müll. and Henle.

CETORHININAE Gill.

CETORHINUS Blainv.

Tetororaf. Raf., 1810 (desc. and name erroneous.)

Selacher Cuv., 1817.

Selachus Yarrell.

CETORHINUS MAXIMUS Blainv.

Squalus maximus (L.) Fab., F. G. 130. Mit., Tr. N. Y. i. 486.


Squalus rhinoceros Mit., 1828 (fide DeKay.)

Squalus (Selache) maximus Rich., F. B. iii. 291.

Squalus (Selache) aphus Storer, Rep. 407.

* The figure of this species, like the description, is thoroughly unreliable; it is better, however, than that of the Myliobatid bispinosa, in which more attention appears to have been paid to the delineation of mathematical figures and lines than to the representation of nature.

(See Boston Journal N. H., iv., pl. 12.)

1864.]

NATURAL SCIENCES OF PHILADELPHIA.
Selachus maximus **DeKay**, N. Y. F. iv. 357; **St. Syn.** 254.  
**Hab. Am.** Greenland to New Jersey.

If there is any actual difference between the American and European representatives of this genus, they have not yet been pointed out; the example of previous authors in referring both to *C. maximus* is, therefore, still followed. The synonymy of the American fish is alone given.

**ISURINÆ Gill.**

**CARCHARODON** A. Smith.

*Carcharias* obscursus **Storer**. Bu. Journ. ii. 558, (excl. syn.)  

"The first dorsal fin is one foot in length;"  
"The second dorsal is one inch long."  
"The anal fin is one inch long."  
"The upper lobe of the caudal fin measures two feet over its curvature; the lower lobe measures one foot and a half."

These measurements of the fish, called by Dr. **Storer** *C. obscursus*, are incompatible with any form of the family of Galeorhinoidei; the description is only reconcilable with *Carcharodon*. I had, however, at one time supposed that it might be referrible to *Eulamia*, the notice of the dentition, except as to number of teeth (16) in which it agrees with no shark, being vaguely applicable.

The *Carcharias Atwoodi* is also probably the same species, the anal being said to be far behind the second dorsal, and thus distinguished from the "white shark." Dr. Storer doubtless obtained his idea of the latter from Yarrell’s copy of Belon’s figure, which erroneously represents a *Carcharodon* with the anal opposed to that fin.

Having been shown a tooth of a *Galeocerdo*, said to have been taken from *C. Atwoodi*, I have asked whether that species could have belonged to that genus, but the position of the anal and the triangular teeth forbid such identification.

**ISUROPIS Gill.**

**ISUROPIS GLAUCUS**, Gill.

*Lamna punctata** **Storer**, Boston Journ. ii. 534. Rep. 185, pl. 3, fig. 2.

Not *Squalus punctatus* Mitch.†

**Oxyrhina Dекayi** Gill, Cat. 60.  
**Hab.** Mass.; New York.

This species of the eastern coast is probably identical with *Isuropsis glaucus*, said by Müllér and Štěnle to be a native of Java. As it has not, however, been found there by the indefatigable Bleeker, and has been eliminated from the recent enumeration of the species of the Archipelago, it is probable that such habitat is erroneous, and that the specimen described was obtained from Surinam. Prof. Poey has found apparently the same species at Cuba.

**ODONTASPIDOIDEÆ Gill.**

**EUGOMPHODUS Gill.†**

**EUGOMPHODUS LITTORALIS**, Gill.

*Squalus americanus** **Mitch.**, Trans. N. Y. i. 483 (not Shaw.)

---

*The *Carcharias* obscursus* (Storer) must be considered under two heads: 1st. The fish mentioned in the report, which is a species of *Carcharodon*. 2d. Another individual identified by Dr. Storer with *Carcharias* obscursus, and dissected by Dr. Wyman, whose description (Boston Proc. iv. 125, 1851) of its viscera, etc., indicates that it belonged to the *Galeorhini*. The specimen examined by that accomplished anatomist was doubtless the *Eulamia Milberti*, and consequently related to the true *Carcharias obscursus*.†

†"The caudal fin very unequally divided, the upper section being almost twice as large as the lower, and having a process on the lower side." Mitch. Trans. N. Y. i. 485.

† *Eugomphodus* is distinguished from *Carcharias* (Rat.) *Triplochis* or *Odontaspis* by the simple first and fourth teeth of the upper jaw, as well as the first of the lower. The more anterior dorsals also separate it from *O. taurus*.  

[Nov.]
Squalus macrodus Mit., op. cit. ii. 328.
Carcharias littoralis DeKay, iv. 351.
Carcharias griseus Ayres, Boston Journ. iv. 293.
Odontaspis griseus Desor, Bost. Proc. ii. 264.
Eugomphodus griseus Gill, Cat. 60.
Odontaspis americanus Abbots, Proc. Ac. N. S.
Eugomphodus littoralis Gill, op. cit. 1863, 333.

_Hab._ Mass. to New Jersey.

**ALOPECIOIDEÆ.**

**ALOPIAS** Raf.

**ALOPIAS vulpes**, Bon.

Squalus vulpes (L.) _Mitch._
Carcharias vulpes DeK., iv. 348.
Alopias vulpes _Storer, Syn._ 255.

_Hab._ Mass. southwards.

**CESTRACIONTOIDEÆ.**

**CESTRACION** Klein.

_Sphyra_ Raf., 1810.
_Sphyrniæ_ Raf., 1815.
_Cestrorhinus_ Blainv., 1816.
_Zygæna_ Cuv., 1817.
_Platysqualus_ Sw., 1839.
_Sphyra_ Vanderhooven.

_Cestracion zygæna,_ Gill.

Squalus zygæna _L. Mitch., Trans. N. Y. i._ 482.
Zygæna malleus _Cuv._
_Sphyra_ zygæna _M. and II._
_Sphyrniæ_ zygæna _Gray._
_Zygæna_ subarcuatus _Storer._
_Cestracion_ subarcuatus _Gill, Cat._
_Cestracion zygæna Gill, Squali._

_Hab._ Eastern coast generally.

**RENICEPS** Gill.

**RENICEPS TIBURO** Gill.

Squalus tiburo _Linn._
_Cestrorhinus_ tiburo _Blainv._
_Zygæna_ tiburo _Val._
_Sphyra_ tiburo _M. and II._
_Sphyrniæ_ tiburo _Gray._
_Cestracion_ tiburo _Gill, Cat._
_Reniceps_ tiburo _Gill, Squali._

_Hab._ New York southwards.

**GALEORHINOIDEÆ** Gill.

**GALEORHININAÆ** Gill.

**GALEORHINII.**

**EULAMIA** Gill.

_Carcharias_ Cuv., (not Raf.) 1864.]
Squalus carcharias Mit.
Carcharias (Prionodon) Milberti (Val.) M. and H. 38.
Carcharias carchei DeKay, 349, pl. 61, f. 200.
Lamna caudata DeKay, 354, pl. 62, f. 205.
Squalus (Carcharinus) caudata Gray, 44 (excl. syn.)
Squalus (Carcharinus carchei) Gray, 44.
Squalus (Carcharinus) Milberti Gray 45.
Squalus Milberti Gill, Cat. 59.
Squalus carchei Gill, Cat. 59.
Eulamia Milberti Gill, Squali 44.

The specific name here adopted was applied in MSS. by Valenciennes to a specimen sent from New York by Milbert, and was retained for a species to which that specimen, one from Leyden and one in the Museum of Berlin, obtained by Hemprich and Ehrenberg, were referred. The specimen on which the description and measurements were especially based is not specified. The description agrees quite well with the Carcharias carchei of DeKay.

The Carcharias carchei was established on a young female, and the Lamna caudata on the figure of an adult female obtained from Mr. Brevoort, to whom I have been indebted for the information.

That gentleman has shown to me the original drawing of which DeKay's figure was a professed copy. It is drawn with Mr. Brevoort's wanted accuracy, and distinctly represents the last branchial apertures above the pectoral fins; the species is, therefore, a true Eulamia, as its form indicates, and as was suspected by Dr. Gray.

With the European form, Nardo has identified his Squalus plumbeus as well as the S. Cieczchis of Chiereghin.

**PLATYPODON Gill.**

**PLATYPODON OBSCURUS Gill.**

Squalus obscurus Les.
Carcharias obscurus DeKay, (not Storer.)
Carcharias (Prionodon) obscurus M. and H.
Squalus (Carcharinus) obscurus Gray.

Messrs. Putnam and Nason have favored me with notices and partial figures of a shark taken on the coast, and preserved in the Museum of Williamstown College, which appeared to apply to this species. It is scarcely necessary to remark, that the teeth, represented by Lesueur, have been reversed, the wider one belonging to the upper and the narrow to the lower jaw.

**APRONODON Gill.**

**APRONODON PUNCTATUS Gill.**

Squalus punctatus Mitch. Trans. N. Y. i. 484.
Carcharias (Aprion) isodon (Val.) M. and H., 32.
Squalus (Aprion) isodon Gray, 43.
Aprionodon punctatus Gill, Cat.

_Hab._—New York.

"Iris, oblong and vertical.

"Teeth small, triangular and without jagged edges.

"First dorsal situated about the middle of the back. The second dorsal membranous, somewhat adipose, and of a rhomboidal figure. An anal fin corresponding (opposite) to the second dorsal.

"The caudal fin very unequally divided; the upper section being almost three times as large as the lower, and having a process on the lower side." (Mitchill.)

The Squalus punctatus, therefore, cannot be a species of Lamna as long supposed, nor yet a species of Eulamia, Platypodon, or even Scoliodon, with which, among known American species, it can alone have affinities.
The habitat of C. isodon has not been specified; but as the specimen on which it was founded was sent by Mr. Milbert, it was probably obtained at New York.

SCOLIODON M. and H.

SCOLIODON TERRAE-NOVE Gill.

Squalus (Carcharias) terrae-novae Rich.

Hab.—Newfoundland and New York.

As already indicated by Müller and Henle, (p. 189), the S. terrae-novae of Richardson evidently belongs to the genus Scoliodon as now understood, and has no affinity with Lamma to which it has been referred by several authors.*

GALEOCERDO M. and H.

Galeus maculatus Ranz.

To this species I refer two jaws, said to have been obtained on the eastern coast, and others from the West Indies, Lower California and the Western Pacific. The jaws are from adult fishes, and resemble in the form of the teeth the G. arcticus.

Müller and Henle distinguish two species of Galeocerdo.

G. tigrinus, with, 1, a moderate flat snout; 2, teeth \( \frac{23}{25} \), coarsely serrate, and the unpaired one little bent, and with an entire terminal point; 3, elongated caudal; 4, spotted body; 5, last two branchial apertures above the pectorals; 6, anal fin, with the anterior lobe little produced and rounded.

G. arcticus with, 1, a very short snout; 2, teeth \( \frac{23}{25} \), finely crenulated, the unpaired teeth curved and crenulated throughout; 3, caudal moderate; 4, immaculate body; 5, fifth branchial aperture only above the pectorals; 6, anal with its anterior lobe much produced and pointed.

Placing an undue value on these differences, I formerly proposed to generally distinguish G. arcticus.

To Prof. Poey I am indebted for the figure of an adult Galeocerdo, exhibiting the gills and anal fin of G. tigrinus, but the form and teeth of G. arcticus; he believes that his fish is only the adult form of G. tigrinus, and I am obliged to agree with him in this view. The body, and especially the caudal and snout, became abbreviated with age, and the teeth change. The jaws seen by me exhibit variations in number from 21 to 23, but none \( \frac{23}{25} \). Can the latter formula be the result of a typographical error?

MUSTELINÆ Bon.

MUSTELUS Cuv.

MUSTELUS CANIS Dekay.

Squalus canis Mitch. Trans. N. Y. i. 486.

Hab.—Eastern coast.

SPINACOIDÆ Owen.

SQUALUS Art. Raf.

SQUALUS AMERICANUS Gill.

Squalus acanthias Mitch. (vix auct.)

* The S. terrae-novae and Lamma punctata (Aprionodon)—Galeorhinchidae—have been regarded as identical and belonging to the genus Lamma.
Spinax acanthias? Dekay.
Acanthias americanus St. Syn. 254.
Squal is americanus Gill, Proc. Acad. 1862.

Hab.—Eastern coast generally.

CENTROSCYLLIUM M. and H.

CENTROSCYLLIUM Fabricii M. and H.

Squalus acanthias Fab. (not L.)
Spinax Fabricii Reinh.
Centroscyllium Fabricii M. and H. Plag.

Hab.—Greenland.

SCYMNOIDÆ* Owen.

SOMNIOSUS Les.

SOMNIOSUS microcephalus Gill.

Squalus microcephalus Bl. Schu. 135.
Squalus borealis Scoresby, i. 358; xv. 3, 4.
Scymnus borealis Fleming, 166.
Squalus (Scymnus) glacialis Faber, 23.
Scymnus micropterus Val. Nouv. Mem. i. 455, pl. xx.
Squalus norwegianus Blainv, F. Fr. 61.
Scymnus (Læmargus) borealis, M. and H. 93.
Dalatias (Somniosus) borealis Gray, 76.
Somniosus microcephalus Gill, Cat.
Somniosus brevipinna Les.
Scymnus brevipinna Dekay.
Leiodon echnatus Wood.

Hab.—Greenland to Cape Cod.

It is probable, as indicated in my catalogue, that the S. brevipinna is not distinct from S. microcephalus.

RHINOIDÆ Gill.

RHINA Klein.

RHINA Duménil Gill.

Squatia Dumeril Lesueur.
Rhina Dumerilii Gill, Cat.

Hab.—New York?

Genus PLATYPODON Gill.

Synonymy.


Carcharias (Prionodon), sp. Müller and Hentle.
Squalus (Prionodon), sp. Poey.
Isoplaciodon, sp. Gill.

Body slender and fusiform in profile, tapering behind.

Scales tricuspid, surmounted by three keels terminating with the cusps.

* The family Scymnoidæ is represented by five distinct genera.

1. Scymnus.

2. Isistius (Scymnus brasiensis M. and H.) distinguished by its similar and posterior dorsals, &c.

3. Somniosus.

4. Euproctomicrus (Scymnus Labordii M and H.) with teeth like Somniosus, but in moderate number (c. 23) and very small first dorsal.

5. Rhinoscymnus (Scymnus rostratus Risso) distinguished by its dorsals, &c.
Head oblong, with the snout produced, oblong, gradually narrowed, and with its periphery convex. Eyes moderate, with the pupil vertical. Nostrills nearer the front of the mouth than the snout, nearly rectangular to mouth, with the anterior flap small and near the inner angle.

Mouth moderate, but convex in front, and wider than deep. Teeth of upper and lower jaws dissimilar; of each jaw mostly similar, but smaller and more oblique towards the corners of the mouth; two symmetrical front ones in upper, an unpaired one in lower jaw; the two front teeth of the upper jaw inclined towards each other; the rest serrated, oblique, rectilinear or nearly so along the inner edge, and with an obtusely angled emargination at the outer edge, the lower branch of which forms the so-called heel. Lower jaw with a small azygous erect tooth at symphysis; the rest with broad bases and narrow oblique entire or weakly crenulated cusps, inclining more as they recede from the symphysis.

Branchial apertures moderate; the fourth, typically, nearly above the outer base of the pectoral fin.

Dorsal fins dissimilar; the first nearly midway between the pectoral and ventral fins, or little nearer the former, moderate, obtusely produced at the anterior angle, and acutely prolonged at the posterior; the second small, narrow, produced acutely from the posterior angle.

Anal fin nearly opposite the second dorsal, slightly larger than the latter, obtusely enlarged at the anterior angle, acutely produced at the posterior.

Caudal fin above with a pit at base, normally prolonged, and with a moderate lower lobe, narrow towards its rounded apex.

Pectoral fins moderate, but narrowed towards the rounded point, with the inner angle little produced.

Ventral fins moderate, rhomboidal.

Type.—Platypodon menisorrah Gill.

Syn.—Carcharias (Prionodon) menisorrah Müller and Henle.

This genus was first named in the "Analytical Synopsis of the Order of Squali," but no diagnosis was there given. Platypodon differs from Isoplagoiodon in the dissimilarity of the teeth of the two jaws, the two paired teeth of the front jaw, and, perhaps, in the form of the mouth and narrower caudal portion of the tail. Squalus tiburo Poey, S. acronotus P. and S. obscurus Les., belong to it.

Notes of an Examination of the Birds of the Subfamily COEREBINÆ.

BY JOHN CASSIN.


This name is now almost universally applied to the group for which I use it in this paper, and of which the bird described by Linnaeus as Certhia cyanæa may be presumed to be the type. Vieillot, as above cited, evidently adopts it as a name for a group which he regarded as a genus, intending to include that species (C. cyanæa) to which the name Guira-coereba Brasiliensibus had been previously given by Maregrave and Piso in Nat. Hist. Brasil, p. 212. It was not the usage of Vieillot nor of numerous other binominal authors, including Linnaeus, to assume any one species as the type of a proposed or adopted genus, and in my opinion there is a very considerable degree of impropriety, as well as injustice, in ascribing to those authors any other than their real and palpable intentions. For genera, the names of which are adopted from other authors and the same groups intended to be designated, those authors, whether ante-Linnaen or other non-binomial, (or any other,) ought to be considered 1864.]
suited and the types ascertained in that manner, whenever it becomes necessary.

It will be found on reference to Ois. d'Am., Sept., as cited above, that the only species of this genus Coereba given by Vieillot is Coereba flavoeola, supposed to be the same as Certhia flavoeola, Linnaeus. According to the views of some distinguished and judicious authors, that species should be regarded as the type of the genus, and the name Coereba should therefore be applied to a group since designated, and now well known as Certhiola. In such view, I cannot coincide.

Dr. Cabanis, as above, proposes the name Arbelorhina as a substitute for Coereba, apparently objecting to the barbarous origin of the latter. His type is C. cyanea.

1. Coereba cyanea (Linnaeus.)

Certhia cyanea, Linn., Syst. Nat. i. p. 188 (1766).
Certhia flavipes, Gm., Syst. Nat. i. p. 472 (1788).
Certhia cyanogaster, Lath., Ind. Orn. i. p. 295 (1790).
Certhia armillata, Sparrrm., Mus. Carls., No. 36 (1787).
Arbelorhina brevipes et eximia, Cab., Mus. Hein. i. p. 96 (1850). ?


Numerous specimens of this species are in the Museum of the Academy, variously labelled Cayenne, Brazil, Trinidad, Venezuela, and Nicaragua, of which localities I know several to be correct. There is appreciable difference between them in the size and degree of curve in the bills, but all are exceedingly alike in colors. Specimens from Venezuela have the largest bills, and it happens also that one specimen in the Massena collection, marked "Caracciola," in the hand-writing of M. Victor Massena, has the smallest. These large-billed specimens from Venezuela may be entitled to specific distinction, and, in addition to their larger size, seem to have with some uniformity a greater extent of the black of the lores, completely enclosing the eye and extending behind it. A specimen from Panama, belonging to the Smithsonian Institution, has the same character, but is smaller in all its parts. The Mexican and Central American bird may also be distinct, and entitled to the name given by Dr. Selater, as above cited, but probably not on account of having the legs red. I suspect that the adult bird always has the legs of that color, in whatever locality; and, in a very interesting and valuable paper on the birds of the West Indies, Mr. E. Cavendish Taylor says of the bird found in Trinidad: "Its legs and feet are bright red." (Ibis, 1864, p. 81).

There are at present fourteen mounted specimens of this species in the Academy Museum, and numerous others in skins, not exhibited. Notwithstanding the small differences in specimens, as above, I find it impossible to distinguish Dr. Cabanis' species brevipes and eximia in the collection.

2. Coereba cerulea (Linnaeus).


Aud. et Vieilli, Ois. Dor., ii. pl. 44, 45. Edwards' Birds, i. pl. 21, fig. 1. Sparrrm., Mus. Carls., pl. 82. Hahn's Voeg., pt. xii. pl. 4. Reich. Voeg., fig. 3770, 3771.

Six specimens, nearly all of which are labelled "Cayenne." For this species I take specimens with a medium-sized bill, as nearly as possible like the figure in Edwards' Birds, above cited, on which this species is founded.

[Nov.]
3. **Coereba longirostris**, (Cabanis).
   Arbelorhina longirostris, Cab., Mus. Hein., p. 96 (1851).
   Coereba trinitatis, Bonap., Compt. Rend., 1854, p. 258.

Seven specimens, all labelled “Trinidad” and “Caracas,” and strongly characterized by their long and stout bills. The females seem to have the throat more clearly ochre-yellow than in those of other species, and perhaps the longitudinal stripes on the under surface of the body wider and less numerous. The Prince Bonaparte cites “Sparrm., Mus. Carls., pl. 80,” as possibly this species; but evidently erroneously, as that plate (Mus. Carls., pl. 80,) represents the very smallest of Sparrmann’s proposed species.

4. **Coereba brevirostris**, (Cabanis).

   Arbelorhina brevirostris, Cab., Mus. Hein., p. 96.

Four specimens, labelled “Bogota,” “Guayaquil,” and “Cayenne.” That from Guayaquil may be distinct, and seems to have the black gular patch narrower; the black space on the lores seems to be larger, and the light blue of the forehead ends in a sharp angle at the base of the bill.

5. **Coereba nitida**, Hartlaub.

   Coereba nitida, Hartl., Rev. Zool., 1847, p. 84.


   Five specimens, differing in size somewhat, but very similar in plumage. One specimen, which is the original of the figure in Jardine’s Contributions, cited above, is labelled “Upper Amazon;” two others are labelled “Guayaquil,” and two are from Peru, presented by Hon. John Randolph Clay, late U. S. Minister to that Republic.

   One specimen from Guayaquil, and the specimens from Peru, are very considerably the largest,—quite sufficiently so to be regarded as distinct, on the terms which seem to prevail in this genus. The specimen figured as above is the smallest, though apparently quite adult. The figure alluded to is a mere caricature; the wing too long, the tail too short, and the transverse black bars awkwardly attempted to be shown on the abdomen are purely imaginary, there being no such in the specimen.


   Strictly of the same general form as the preceding; but singularly different in color, and in all respects as described by Dr. Sclater, as above cited. Specimens in the Museum of the Smithsonian Institution from Panama.


1. **CHLOROPHANES spiza**, (Linnæus.)

   Motacilla Spiza, Linn. Syst. Nat. i. p. 188, (1758.)
   Coereba atricapilla, Vieill., Nouv. Dict. xiv. p. 50, (1817.)
   Turdus micans, Hahn, Voegel aus Asien, &c., pt. iii. (1819.)
   Nectarinia mitrata, Licht. Verz. p. 15, (1823.)


Eighteen mounted specimens in Acad. Mus. Of this apparently abundant and widely diffused species, there are four varieties in the specimens before me, which, though I cannot at present regard them as species, appear to be well marked, and may be sufficiently constant and perhaps local, to be entitled to specific distinction. On this view of specific identity, the names above are given as synonyms, the first name being that of Linnaeus, in the tenth edition of Systema Nature, in which the species is founded on Edwards' plate 25, fig. 1, and no other authority cited, except fig. 2 of the same plate, which is given as a variety. In the twelfth edition, the name Spiza is continued, and the tenth edition cited, Brisson being cited only as an additional synonyme. This species is in nowise founded on either Brisson's description nor on Seba's figure, and consequently the remarks of several distinguished ornithologists, and the adoption by them of Vieillot's name atricopillus are not correct. I distinguish the following varieties:

a. C. Spiza, (Linnaeus.) Edwards' Birds i, pl. 25. Very nearly of the size given by Edwards in the plate cited, and smaller than C. guatemalensis, Slater. The black of the head extending to the occiput, wings and tail brownish black, the feathers of the latter and quills edged externally with green. All other parts of the plumage fine lustrous yellowish green, occasionally with a bluish gloss in some lights. Total length, about 5½ inches. "Cayenne," "Trinidad."

b. C. guatemalensis, Slater. Larger than the preceding, and with the black of the head extending more fully upon the occiput. The green of the plumage of a lighter shade. Total length, about 5¼ inches. Guatemala, "Nicaragua," Mexico.

c. C. caeruleascens, nobis. Aud. & Vieill. Ois. Dor, pl. 47? Quite as large as C. guatemalensis, and with the black of the head having about the same extent. All the plumage (except the black parts) bluish green, especially to be observed on the under parts of the body. In all other varieties the fine lustrous green of the plumage changes to blue in a limited degree, but in this variety the blue color appears to be constant, and changes to green in some exposures to the light. Total length about 5½ inches. Specimens in the Acad. Mus. are from M. D'Oryhigny's collection, and are labelled, in the handwriting of M. Victor Masseca, "C. Spiza? No. 149, D'Orybigny, Juracares, Bolivia."

d. C. melanops, nobis. Smaller than either of the two varieties immediately preceding, and about the size, or rather smaller than the first variety here given (C. Spiza). Black of the head much restricted, and extending about half way only between the front and occiput, or but little beyond the eyes. Green feathers of the occiput and back of the neck having a strongly defined or scale-like character. Green parts of the plumage much as in the variety C. Spiza, but with the green edges of the quills and tail feathers wider and more clearly defined. Total length about five inches. Two specimens, $\varphi$ and $\varphi\prime$, in Acad. Mus., labelled in Europe, in a handwriting that I do not recognize: "2873, 3045, Certhia Spiza? Rio Negro, Ameriq. Mérid."

3. Genus DACNIS, Cuvier, Reg. An., i. p. 395 (1817). Of this genus I have seen the following species:

A. Cyanodacnis.

Motacilla cyanopephala, Gm., Syst. Nat., i. p. 990 (1788).


Under this name I place numerous specimens of a common Brazilian species, the males of which are clearly the bird figured by Swainson, as above cited. It is not so clear to me, however, that they are precisely that figured and described by either Erisszon or Buffon. The former is the authority for the species Motacilla cayana, Linn. (Briss. Orn., iii. p. 534), and I am not without a suspicion that either a smaller species, next following in this paper, or that D. coerebicolor, Sclater, is entitled to this name. The description by Lesson is short, and applicable to both species, but relying on the locality given by him, "Bresil," it is possible that his name, D. cyanater, is the proper designation for the present bird.

This species is larger than that immediately following, and has the black space on the back larger. It is well represented in Swainson's plate, cited above, and is commonly brought in collections from Bahia and other localities in Southern Brazil.

2. Dacnis nigripes, Pelzeln?

Dacnis nigripes, Pelzeln, Sitzungb. Akad. Vienna, 1856, p. 155?


Pelz. Sitzungb. Akad. Vienna, 1856, pl. 1, fig. 1?

This is, in my opinion, a species distinct from the preceding, though resembling it in colors. It is smaller, and has the black space on the back smaller and more strictly defined. It is figured by Edwards, as above cited, and also seems to be the bird given by Becklemichew, whose name I should be inclined to adopt, were it not anticipated by Vieillot, for the species of this genus usually given as Dacnis plumbea, (Latham). It may also be the species described and figured by that excellent ornithologist, M. Pelzeln, as above cited, but the legs in dried specimens are not black. Ten specimens in the Academy Museum I regard as this species. They are labelled as from Cayenne and Northern Brazil.

3. Dacnis ultramarina, Lawrence.


From the Isthmus of Panama. This is another species of the same group as the two preceding, and resembling them in colors. It is, however, of a different and deeper blue color, and has the black of the throat distinctly tinged with green. It is described, and its peculiar specific characters are stated with his usual precision and judgment by Mr. Lawrence, as cited above.

B. Polidacnis.

3. Dacnis melanotis, Strickland.


"Dacnis angelica, De Filippi," Bonap., Comp. Av., i. p. 400? Sclater, Ibis, 1863, p. 315?


Ten specimens, labelled "Cayenne" and "Rio Negro."

5. Dacnis venusta, Lawrence.


Sclater's Ibis, 1863, pl. 7.

A beautiful species, of which the only specimens that I have seen are the types (male and female) in the collection of Mr. Lawrence, kindly lent to me 1864.]
for examination by that gentleman. It is a strongly characterized species, not intimately resembling any other at present known, and easily recognized by its scarlet tibia, which is quite a peculiar and curious character in this group. From Panama, very handsomely figured in the Ibis, as above.

4. _Dacnis egregia_, Sclater.

Sclater, Cat. Am. Birds, pl. 7.
One specimen, labelled "Columbie." A beautiful little species, of which both sexes are very handsomely figured by Dr. Sclater, as above.

5. _Dacnis coerebicolor_, Sclater.

Jard. Contr. Orn., 1852, pl. 93, fig. 2.
Three specimens, labelled "Bogota."

C. _Eudacnis._

6. _Dacnis flaviventre_, D'Orbigny et Lafresnaye.

D'Orb., Voy. Am. Ois., pl. 13, fig. 2. Reich., Voeg., fig. 3749.
Two specimens, one of which is labelled "Peru," and the other "Upper Amazon."

7. _Dacnis pulcherrima_, Sclater.

Sclater, Cat. Am. Birds, pl. 8.
One specimen. This bird is, in my opinion, but doubtfully of this genus, and possibly more nearly allied to _Nemosia._

D. _Ateleodacnis._

8. _Dacnis leucogenys_, Lafresnaye.

One specimen from Venezuela. A curious little species, easily recognized by its white ears and white upper tail coverts, though apparently little known to naturalists.

9. _Dacnis speciosa_, (De Wied).

Four specimens, three of which are labelled as from Brazil. One specimen (Massena Coll., No. 2-776.) may not be this species, though nearly allied. It is darker colored, especially on the head and under parts of the body; the latter character being particularly observable. It is without label stating locality. This specimen is sufficiently dark-colored to resemble the preceding (_D. leucogenys_), but has not the white ears and white upper tail coverts of that species. Under tail coverts dark chestnut.

10. _Dacnis bicolor_, (Vieillot).

_Sylvia bicolor_, Vieill., Ois. d'Am., Sept., ii. p. 32 (1807).
_Sylvia carulescens_, De Wied, Beitr., iii. p. 713 (1831).
_Sylvia plumbea_, Lath., Ind. Orn., ii. p. 553 (1790)?
Vieill., Ois. d'Am., Sept., ii. pl. 90 bis.
Numerous specimens, several of which are labelled "Cayenne." Undoubtedly the species described and figured by Vieillot and the Prince de Wied, but very doubtfully that of Latham. The description by Latham, from a specimen in the Leverian Museum, is short, but he says: "plumage above deep lead color, nearly black," which is difficult to apply to this bird, though his name
is usually given for it, and regarded as synonymous with those above given. Latham says further: "native place uncertain," (Gen. Syn. Supp., p. 188).

This species has the bill and general structure more Sylvia-form than others of this group.

11. Dacnis brevipennis, (Giraud).


Three specimens, one of which is labelled "Cayenne." The smallest species of this group, easily distinguished by the green color of the upper parts of the body, and light blue head. Though well described and figured by my friend Mr. Giraud, of New York, as above cited, this little bird seems to be unknown to naturalists. It belongs strictly to the same group of species as the two species immediately preceding, (D. speciosa and D. bicolor). I regard it as possible that this bird is the female or young of D. speciosa.

E. Hemidacnis.

Genus HEMIDACNIS, Sclater, Cat. Am. Birds, p. 50 (1861).

12. Dacnis albiventris, (Sclater).


Hemidacnis albiventris, Sclat., Cat. Am. Birds, p. 50.

Jard. Contr. Orn., 1852, pl. 100, fig. 2.

Two specimens, adult and young, obtained for the Academy Museum by its excellent members, Messrs. Geo. N. Lawrence and John G. Bell, of New York. Both from Bogota.


1. CERTHIOLA FLAVEOLA, (Linnaeus).


Nectarinia antillensis, Less., Traite d'Orn., i. p. 304 (1831)?

Sloan, Jamaica, pl. 259. Edwards' Birds, pl. 122.

Numerous specimens from Jamaica and St. Thomas, West Indies.

2. CERTHIOLA BAHAMENSIS, (Linnaeus).


Catesby, Carolina, pl. 59.

Quite distinct, and easily recognized by Catesby's figure and the characters pointed out by Prof. Reichenbach in Handb. Speciell. Orn., pt. v. p. 253, who very clearly defines this species.

3. CERTHIOLA LUTIFOLA, Cabanis.

Certhioa luteola, Cab., Mus. Hein., i. p. 96 (1850).


Numerous specimens from the Island of Trinidad, which seem to be this species. Others from Venezuela have the throat slightly darker, but are otherwise very similar.

4. CERTHIOLA MEXICANA, Sclater.


Resembling the preceding (C. luteola), but apparently distinct. Specimens in the Museum of the Smithsonian Institution and in the Academy Museum are from Mexico. One specimen from Ecuador much resembles these Mexican specimens.

5. CERTHIOLA MARTINICANA, Reichenbach.


Specimens from unknown localities, one of which only is labelled "A. An.

1864.

]
illensis, Lesson, Cayenne." One specimen, evidently not in mature plumage, has the superciliary stripes yellow, nearly uniform with the under parts of the body, but is otherwise not different. This species seems to be characterized by its white throat, which color is narrowly enclosed between the dark brown of the cheeks.

6. Certhiola chloropyga, Cabanis.

7. Certhiola guianensis, Cabanis.
   Certhiola guianensis, Cab., Mus. Hein., i. p. 97 (1850), Reich., Voeg., fig. 3825.
   Several specimens, one of which is labelled "Bresil." This species seems to be one of the smallest of the group, the specimens before me being even smaller than the measurements given by Dr. Reichenbach, (Spec. Orn., pt. v. p. 252). Total length 3½ inches.
   The genus Certhiola is the most difficult of this group, and although the species have been indicated with singular ability by Dr. Cabanis, and subsequently more fully described by Dr. Reichenbach, they are not to be distinguished in most cases (as at present described,) without careful scrutiny. In addition to the preceding species, I have seen one other specimen, not in good condition, in the collection of the Smithsonian Institution, from Peru, which is apparently another and probably undescribed species.


1. Conirostrum sitticolor, Lafresnaye.
   Gray's Genera, i. pl. 34. Reich., Voeg., fig. 3751.
   Six specimens, from "Bogota" and "Colombie." One specimen shows a tendency to C. rufum, which I have little doubt is the young of this species.

2. Conirostrum rufum, Lafresnaye.
   Four specimens from Bogota. This bird is very probably the young of the preceding.

3. Conirostrum albifrons, Lafresnaye.
   Ten specimens, four of which are C. albifrons; four are clearly C. caerulei-
   frons, and two are intermediate, showing conclusively that the two are identical, as suggested by Dr. Sclater in Proc. Zool. Soc., London, 1855, p. 138; although in his Catalogue of American Birds (1862,) he continues to give them as distinct species.

   D'Orb., Voy. Am. Mer. Ois., pl. 59, fig. 2.
   Several specimens, one of which, labelled "Taena, Peru," is from Mons.
   D'Orbigny's collection. Two others in a collection from Ecuador, recently [Nov.
presented by Dr. Thomas B. Wilson, seem to be *C. Fraseri*, Sclater, as above, and are only different in having the under parts of the body and the superciliary lines more strongly tinged with rufous, though my impression is that they are specifically identical with D'Orbigny's bird.

One specimen in the Museum of the Smithsonian Institution is the most mature and strongly characterized that I have seen, and is very nearly as represented in D'Orbigny's plate, above cited. It is quite possible that *C. Fraseri* is the young of a species allied to the present, but not identical.


A. *Diglossa*.


*Diglossa baritula*, Wagl., Isis, 1832, p. 281.


Gray's Gen. B., i. pl. 42. Reich., Voeg., fig. 3762, 3763.

Allied to and resembling the next two species, but easily distinguished from either, when in adult plumage, by the darker shade of color of the upper parts, and by the extension of the same color on the sides of the neck and throat, though there is usually a narrow space on the latter communicating with and of the same rufous as the under parts of the body. This species is about the same size as *D. similis*, with which it can readily be confounded. It is smaller than *D. sittoides*. Mr. Gray gives this little species with his usual great care and accuracy in the plate above mentioned.

Specimens are labelled "Mexico."


Reich., Voeg., fig. 3764.

Numerous specimens, generally labelled "Bogota" and "Columbia." This species is about the size of the preceding (*D. baritula*), and much resembles it, but is readily distinguishable by its throat being clear rufous, uniform with the other under parts. It resembles, even in a greater degree, the next species (*D. sittoides*), and in adult plumage is distinguishable only, so far as I can see, by its smaller size. The female of this species seems to present a peculiar character in having the under parts of the body with longitudinal stripes of dull olive, not very distinct, but to be traced in all specimens that have come under my notice. Dr. Reichenbach's figure, cited above, is a good representation of this little bird.


*Uncirostrum Orbignii*, Boiss., Rev. Zool., 1840, p. 5?

D'Orb., Voy. Am. Ois., pl. 58, fig. 3. Reich., Voeg., fig. 3766.

Young birds, labelled "U. Orbignii," are in the Acad. Mus., but the adult is in the Museum of the Smithsonian Institution, and is precisely as given by Mons. D'Orbigny in the plate cited. This species is larger than either of the two preceding species, but is exceedingly similar in other respects to *D. similis*. The specimen now before me has the under parts rather paler rufous, but is, in fact, scarcely distinguishable from that species, (*D. similis*) by any other character than its greater size, though I have no doubt that it is quite distinct, specifically. From Bolivia. I regard it as possible that this bird is the young or female of *D. brunneiventris*, Lafresnaye.

B. *Tephrodiglissa*.


1864.] 18
PROCEEDINGS OF THE ACADEMY OF

D'Orb., Voy. Am. Ois., pl. 58, fig. 1. Reich., Voeg., fig. 3760, 3761.
Specimens labelled "Bolivia," one of which is from M. D'Orbigny's collection. A curious and peculiar species, not intimately allied to, nor resembling any other. It is accurately figured in the plate of M. D'Orbigny, cited.

C. Pyrrhodiglossa.

Diglossa mystacalis, Lafresnaye.

Reich., Voeg., fig. 3756.

From Bolivia. One of the largest species, easily recognized by its black plumage, and rufous stripe from the base of the under mandible, on the side of the neck, and its rufous under tail coverts. Accurately described by the Baron Lafresnaye, and faithfully represented in the plate of Dr. Reichenbach's great work, as cited.


"Diglossa brunneiventris, Des Murs," Lafres., as above.

Des Murs, Icon. Orn., pl. 43.
One specimen from Bolivia, presented by the Smithsonian Institution, in the Museum of which I have seen others. This species is allied to the immediately preceding (D. mystacalis), but is smaller, and has the entire under parts fine rufous-cinnamon, which are black in that species. This bird may be the adult of D. sititoides.

D. Cyanodiglossa.

7. Diglossa personata, (Fraser).


Reich., Voeg., fig. 3752, 3753.

Specimens labelled "Bogota" and "Columbia," generally very similar to each other, but one specimen, perhaps not adult, has little of the black front cheeks and throat which so strongly characterize this species, those parts being blue, nearly uniform with the entire other plumage. In fact, until undoubted specimens of the next immediately succeeding (D. indigotica) were received at the Acad. Mus., I had regarded it, doubtfully, as that species, though much too large. This specimen resembles Reichenbach's fig. 3752, cited above.

8. Diglossa indigotica, Sclater.

"Diglossa indigotica, Verreaux MSS." Sclat., as above.

Sclater, Cat. Am. Birds, pl. 8.
Two specimens in a collection from Ecuador recently presented to the Academy by its generous and steadfast patron, Dr. Thomas B. Wilson. This species somewhat resembles the preceding, but is much smaller, and is otherwise quite distinct. It is very accurately represented in Dr. Sclater's beautiful plate, to which I refer, above.

E. Melanodiglossa.

9. Diglossa Lafresnayeii, (Boissoneau).


Reich., Voeg., fig. 3757.

Specimens labelled "Bogota" and "Pasto." The largest of the species enumerated in this paper, though but little exceeding D. mystacalis. This

[Nov.]
species and the next (*D. humeralis*) are easily recognized by their uniform black plumage, only relieved by the light bluish shoulders.

10. **Diglossa humeralis**, (Fraser).
   Diglossa intermedia, Cab., Mus. Hein., i. p. 97 (1850)?
   Reich., Voeg., fig. 3754.
   Resembling the preceding, and, so far as I can see, only distinguishable by its smaller dimensions, as stated by Mr. Fraser, as above cited. Specimens from Venezuela.

   Reich., Voeg., fig. 3758.
   Specimens from New Grenada. Entirely black and easily recognized, though specimens apparently not mature have the under parts mixed with dull brown, which color prevails on the abdomen and under tail coverts.

12. **Diglossa albilateralis**, Lafresnaye.
   Reich., Voeg., fig. 3758.
   Numerous specimens, labelled "Bogota" and "Columbie." Uniform bluish black, with a tuft of white feathers on each side, under the wing. One plumage, however, which is perhaps not mature, is not black, but always distinguishable by the tuft of white feathers on the side. Upper parts (female or young) yellowish olive green, nearly uniform, under parts reddish ochre yellow, paler on the abdomen, wings and tail dark brown with all the feathers edged with olive nearly uniform with the back.

   Specimens from Costa Rica in the Museum of the Smithsonian Institution. This bird is strictly of the same group as that immediately preceding, and nearly of the same size, but quite a distinct and peculiar species.


1. **Diglossopis caerulescens**, Sclater.
   One specimen from Venezuela.

---

**Dec. 6th.**

Mr. Lea, in the Chair.

Fourteen members present.

The published number of the Proceedings for September and October was laid on the table by the Committee on Proceedings.

The death of Prof. B. Silliman, late a Correspondent of the Academy, on the 24th of November, was announced.

---

**Dec. 13th.**

Vice President Bridges in the Chair.

Eleven members present.

1864.}
Seventeen members present.
The following papers were presented for publication and referred to committees.

"Catalogue of the Cold-blooded Vertebrata of Michigan." By E. D. Cope.

"Descriptions of six new Western Asiatic Unionidae." By Isaac Lea.

"Notes on some species of Birds from South America." By John Cassin.

---

Mr. Jeanes, in the Chair.

Twenty-eight members present.
On report of the respective Committees, the following papers were ordered to be published.

Partial Catalogue of the Cold-blooded VERTEBRATA of Michigan.
Pt. I.

BY PROF. E. D. COPE.

The material whence the present synopsis is derived, is a collection sent to me by Prof. Manly Miles, of Lansing, composed of specimens belonging to the Flint Scientific Institute, to the State Agricultural College, and to the State Collection. As we have but few exact synopses of local collections made at the Northwest, it is hoped the following list may prove of value in indicating the general character of this part of the fauna.

DERMOPTERI.

Ichthyomyzon argenteus Gird. Petromyzon Kirtland.

GANOIDEI.


Amia calva L. Specimens with and without the caudal ocellus.

TELEOSTEI.

NEMATOGNATHI.

Ictalurus gracilis Gill. Pimelodus gracilis Hough.

A specimen with narrower head and larger eye than the caerulescens assigned to the above species with doubt, on account of the very imperfect descriptions given.

Ameiurus currens. Oakland Co.

Although Prof. Gill has assigned not more than nine branchiostegals to this genus, and I find ten in five specimens, and though Prof. Kirtland gives an
anterior position to the adipose fin, which the latter do not exhibit, and though Rafinesque assigns fifteen anal rays and mine have 23 and 24, I prefer doubting the infallibility of these statements to giving another name to the Michigan fish; it is in any case no other described species.

Noturus flavus. No. 204, Swartz Creek, Genesee Co.
Six large specimens, not apparently differing specifically from smaller individuals from the Yonghiogheny and Susquehanna Rivers. Some, however, have but nine branchiostegals instead of ten in the eastern specimens. The orifice of the duct of the poison gland is irregular in position, being sometimes at the base of the posterior pectoral rays, and sometimes even on the side behind the fin, besides in its normal location below the scapular process. From it may frequently be drawn a solid gelatinous style ending in a tripod, each limb of which is dichotomously divided into short branches of regular length.

Telecaphall.

Eventognathi.

Semotilus corporalis, Putnam, not Abbott. Many specimens from near New Hudson, Oakland Co., from Swartz Creek, Genesee Co. and from Grosse Isle.
The Semotilus rhoeheus has been regarded by my friend F. W. Putnam, as identical with this species (vid. Bulletin Mus. Comp. Zool., p. 8,) although I pointed out the differences in my first description (Proc. A. N. S., 1861, p. 564,) when I employed the name cataractus for corporalis. The latter occurs sparingly in the tributaries of the Delaware, but is very common in the affluents of the Susquehanna and Ohio. The former is rare west of the Delaware, where it is abundant, and reaches a large size. S. dissimilis and pallidus are good species from west of the Mississippi.

Ceratichthys cyclotis, sp. nov.

Body much compressed, dorsally flat; the height 4 to 5ths in. total length. Muzzle obtuse, rounded; head entering 4 1/2 times in length (to emargination

† Of an allied genus, Pogonichthys, Dr. Hammond brought from near Bridger's Pass, an undescribed species. It may be called P. (Platygobio) g ulonellus. It may be compared with the P. communis as follows:

Ventrales acuminata, reaching anus.
Anal longer, with eleven rays.
Breath between eyes more than half the top of the cranium, and more than the height of operculum.

Anal shorter, nine rays.
Breath between eyes scarcely half length of cranium above, equal height of operculum.

Head 4 1/2 times in length to caudal emargination; eye 5 to 1/2 times in length of head. Scales 7-18. Fins D. 18; C. 19; V. 19; P. 16. From caudal to front base of anal, 2 in. 10. Total length, 6 in. 3 lines. Above ruddy ash, a faint longitudinal black band on one row of scales above lateral line. Below yellowish white, lips and chin yellow; suboral region ruddy.

Ceratichthys must probably be refered the Ludicurus dissimilis Kirtld., a common fish in the tributaries of the Ohio. The general appearance differs considerably from that of the other species, especially in the more prominent muzzle, and, therefore, inferior mouth; but I find no ordinary characters indicating a different genus.

Ceratichthys micropogon is a species sent me by Jobab Stauffer, Secretary of the Linnean Society, of Lancaster, and was taken in the Conostega by a member of the Society, on one of its excursions. The appearance of the head of this fish is that of a Hypogalepis rather than of a chub, and the difficulty of discerning the minute barbels increases the liability to err in determining its affinities. Mouth slightly oblique, angle opposite anterior border of orbit. Latter enters 2 1/2 times in length of head, which is measured 3 1/2 times in length from muzzle to base of tail. The greatest depth is measured 4 1/2 times in the same distance. Head broad, muzzle obtuse, profile rounded descending. Caudal peduncle long. Scales, as in C. biguttatus, 5-64. Teeth 4-4, without proper masticatory surface, the posterior considerablyhooked. Length, from origin of tail to anterior base of dorsal equal from dorsal to posterior nostril. Rays, D. 18; C. 9; A. 1-7; V. 8; P. 13. Above pale yellowish brown; a broad brown shade from end of muzzle to base of tail; below pale yellowish. Length, 3 in. 6 lin.

1864.]
of caudal.) Anterior base of dorsal measures one-half the distance from end of muzzle to base of tail. Lateral line nearly straight. Operculum rounded posteriorly, scarcely concave above. Eye contained $\frac{1}{3}$ times in length of head. Scales $\frac{3}{4}$; radii fewer and weaker than in biguttatus.

Dermal head tubercles longest on vertex, smallest on muzzle, in four alternating rows, one on each side becoming superncular. Fins. D. 1-9; P. 15; V. 1-8, just reaching vent; A. 1-8; C. 19. The dorsal and anal are much prolonged posteriorly, the greatest horizontal length of the former nearly equaling the length of the upper surface of the head. Six and eight inches are the longest dimensions before us. Color of upper surfaces olive brown; below, from above lateral line, yellowish; preopercular region rosy; pectorals slightly dusky, otherwise no fin markings.

This fish is shorter, stouter and blunter than the biguttatus, and has larger dorsal and anal fins, there being one more ray in the latter. The operculum is not so angulated or concave above.

In some of the specimens of this species, especially among the half-grown, I find a tooth of the second row of pharyngeals, found in Semotilus proper. Nevertheless the barbel is on the end of the maxillary, as in the type of Ceratichthys, and not above it, as in Semotilus. Specimens from Grosse Isle, from Waterford, Oakland Co., from Clinton River and from Bruce, Macomb Co., Michigan.

Ceratichthys stigmaticus, sp. nov.

Dorsal outline rising gradually from end of muzzle to base of dorsal fin. Muzzle projecting a little beyond premaxillary outline. Head (equal greatest depth) 4½ times in total length; eye 3½ times in length of head, its superior rim upon the frontal plane. Scales 840. Radii about 15 exposed, stronger than the concentric lines. Fins short, ventrals a little anterior to dorsal, not reaching the vent. D. 1-8; C. 20; A. 1-7; V. 8. From base of caudal to anterior base of dorsal, equal from latter to posterior nare. General color reddish, operculum and cheeks more silvery. A brown band from muzzle to eye, and a very distinct spot at base of tail. Total length, two and a half inches. Pharyngeal bones stout, the superior limb broad; teeth 1:4—4:1. Barbel on the end of the o. maxillare.

Rhinichthys lunatus, sp. nov.

Stout, the head broad, and contained four times in length to base of tail. Greatest height 4½ times in the same. Dorsal fin a little behind opposite ventrals; latter reaching anal. Caudal lunate, or with a broad shallow emargination. Eye a little less than one-fourth the length of the head. About twenty longitudinal rows between dorsal and ventral fins, and sixty traversed by the lateral line. From end of muzzle to base of first dorsal ray equal from latter point to concavity of caudal. Muzzle projecting just beyond mandible. Rays, D. 1-8; C. 19; A. 1-7; V. 1-8; P. 15. The largest specimens are 2½ inches long.

Above reddish brown, with irregular, rusty spots, which in small specimens trace a lateral shade, and extend on the abdomen; usually the latter is unsullied spotted.

Specimens from Grosse Isle, obtained by Prof. Fox. This fish is stouter than the atronatus, has a smaller eye and a less deeply forked tail, besides the difference in color. Marmoratus has a longer nose, (one more anal ray) and a caudal spot. From obtusus, meleagris and nasutus* it can also be readily distinguished.

*Another species, brought by Dr. Hammond from Kansas, has not been described. Rhinichthys maxillosus is peculiar in its heavy muzzle, and broad mouth, and gular region, and for an elongate form and backward position of fins. Eye with considerable vertical range, entering $\frac{1}{3}$ times into length of head, latter four times to base of tail. Greatest height five and a half times from base of caudal to base of front ray of dorsal equal from latter point to opposite middle of orbit. Fins all small, especially the ventrals, which reach the vent. Dorsal originating a little
Hybopsis *storrianus*. No. 329, Flint River at Flushing, Genesee Co.

Hybopsis *hussonius*, Agass. No. 531. Lake.

*Hypsilepis diplomaria*: Specimens from near Lansing.

*Hypsilepis frontalis*, Agass. Numerous specimens from Grosse Isle, Detroit River, Three Mile Lake and Waterford, Oakland Co.; Swartz Creek, Genesee Co. and Monroe Co.

Specimens from the last locality, seven in number, represent a strongly-marked variety, characterized by the great elevation of the outline in front of the dorsal fin, and other points. From the first dorsal ray, the outline again descends, giving the fin a very oblique position: this extends also, when laid back, as far as above the fifth anal ray, while in *frontalis* it most usually reaches a point opposite the first ray only. The eye is contained-four times in the length of the head—more frequently four and a half times in *frontalis*. The length of the head measures in the depth of the body, from the dorsal outline to the middle of the row below that bearing the lateral line; it extends nearly to the ventral outline in *frontalis*. The pharyngeal bones appear to be relatively rather stouter than in typical *frontalis*, and are not furnished with so prominent an inferior angle to the external ala. This, with the form of the body, would almost indicate a species; but as I find approximations in these and transitions in the other characters, I cannot so consider it. In *H. frontalis* the number of scales traversed by the lateral line varies from 38 to 43.

*Hypsilepis cornutus* Bd.

Specimens from Pine Lake, Emmet County, Bruce, Macomb County, and one from Swartz creek, agree with the many Susquehanna specimens in my possession in a more elongate form of head and body than specimens from tributaries of the Delaware. They often differ from those of the Susquehanna in having a row of scales or two more below the lateral line. In Delaware specimens the head is shorter than in the latter, not more so than in the former, but the depth of the body is greater than in either, entering in length to base of tail 3½ times—in the others 4 and 4½ times. The dorsal fin is a

behind ventrals, like the anal slightly concave on the border. Caudal not deeply forked. *Ray*, D. 1—5; C. 19; A. 1—7; V. 7; P. 15. Twenty-five rows of scales from dorsal to ventral. Largest specimen nearly 6 inches. Silvery. Pale cinnamon above; darker lateral shade; yellowish below. A dark spot at base of caudal.

*Hybopsis phaeona* is a species found in some of the tributaries of the Delaware, which I have received from Trenton, N. J., from my friend Charles A. Abbott. It is more elongate in form than *H. hussonius* and *storrianus*, and has not the round-leaf of the first or the small, compressed head of the last. Eye a little less than one-third length of head; latter 0.5 times to concavity of tail, and more than equal greatest depth of body; in *storrianus* the head does not equal the depth, and the back is more compressed. Angle of mouth not posterior to anterior nostril. Scales 38. Latereal line very distinctly deflected opposite dorsal fin. Base of caudal to posterior edge of dorsal equal from latter to beginning of skin of head. *Ray* D. 13; C. 19; A. 13. Its outer border concave like that of dorsal; V. 19; P. 15. Length 4 inches. Latereal band and below silvery, a dark shade passing through former; no spot at base of tail. Above pale ochre, with a faint median line.

The operculum of this fish is narrower than that of the *hussonius*, rather than broader as in *amarus*, and the head is longer than in the latter. In *storrianus* the mouth is smaller, and the operculum broader, and with a prominent superior angle. The *gracilis* is said to have the pectorals reaching the ventrals, which I have not seen in any of the species at my disposal.

† Cyprinella, distinguished from *Hypsilepis* by its cremate teeth, must receive the Lenticular *kentuckiensis* of Dr. Kirkland. It is abundant in the tributaries of the Ohio, where it represents the nearly allied *C. analostana*, Gir., of the Susquehanna and Delaware. The differences between these species are as follow:

<table>
<thead>
<tr>
<th>analostana</th>
<th>kentuckiensis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head 3½ to 4 times in length to base of tail.</td>
<td>Head 4½ times; muzzle more acute.</td>
</tr>
<tr>
<td><em>Ray</em> 5—6;</td>
<td><em>Ray</em> 6—7;</td>
</tr>
<tr>
<td>2—3.</td>
<td></td>
</tr>
</tbody>
</table>

1864.]
little more anteriorly situated in the Delaware specimens, and there is a row of scales more below the lateral line than in Susquehanna specimens. With typical specimens only, these might be regarded as representing two species, and as such I have already alluded to them; * but in the large number of individuals at my disposal, I find transitions in all the points. The Delaware specimens more nearly resemble the H. cornutus, figured by Dr. Storer.

Squalius proriger.

Until more characteristic points are presented, I provisionally preserve unbroken a series of beardless Chilognath Cyprinoids, with pharyngeal teeth 2 or 1—4 or 5: 5 or 4—1 or 2, of the type uncinato-subconicae raptatorial, and not crenate; the scales, with the usual extent of surface exposed; the isthmus not wide, and the anal fin short. The long anal fin distinguishes Alburnus from it; and the narrow exposed scale surface and masticatory teeth, Hypselepis. Clinostomus Gir., may be said to be distinguishable by the prominent mandible and large gape, but Sp. lepidus (Bleek. Fische Sys. 89) is quite similar in the former point, and the Clin. p. g. has the cleft as short as in most Squalii. Ptychochilus Ag., seems not yet to have been sufficiently distinguished from Clinostomus, and resembles Squalius even more in its terminal mouth. If different genera are here united erroneously, it is because their characters have as yet not been pointed out. They embrace five Pacific slope species, six Eastern American, and many from the old world.

In the species now named the prolongation of the lower jaw is very great; it presents a symphysis knob beyond and above the premaxillary border. End of the maxillary opposite the middle of the pupil. Angle of opercular outline less than 90°. Head narrowed anteriorly; eye four times in its length; latter four times in length to concavity of tail. Greatest height 5 1/2 times in the same. Ventra-l a little in advance of dorsal; from front base of latter to base of tail equal from former point to half way between end of muzzle and nares. Teeth 2.5—4.1 in two specimens. Scales small, with especially strong concentric lines. 1.62. Dorsal high 1.8; Caudal deeply furcate, 19; Anal rather elongate, 1.81. V. 8, not reaching vent; P. 14, elongate. Total length three inches.

Rufus brown above half way to the lateral line; a dark shade from end of muzzle to tail, covered with silver, the latter extending to the belly. Sides punctulate anteriorly.


† Squalius p. g. A species resembling sonic Alburnus in its large caducous scales and attenuated form. Mouth quite oblique; under jaw scarcely projecting; maxillary not reaching line of margin of orbit. Head entering 4 1/2 times into length to fork of caudal; greatest depth seven times. Back broad. Fins D. narrow 8; C. 19. A. 1—10. V. little anterior to dorsal 9. P. narrow furcate 13. Scales 259. Radii stronger than concentric lines. From base of caudal to base of first dorsal ray, equal from latter to anterior border of iris.

Above pale ochre, with a median brown line, and one on each side, from opercular upper angle to tail. Sides and below bright silvery, especially brilliant on the operculum and suborbital region. Lips blackish edged.

Length three inches.

Two specimens from the Youghioheny River, Pa. This may be the species on which Rafinesque established his Lucitus interrumpus, but the discrepancies are so numerous that the identification cannot be made.

Besides the S. (Clin.) funduloides of Girard, another species occurs in the waters flowing into the Susquehanna. This, which may be called S. hyalope, was obtained in the Conestoga by J. Stecker. Its form is that of a true Squalius—as S. e. p. a. s., not having the prominent mandible and compressed body of the species included by Girard in Clinostomus. Mouth little oblique, extending to beyond opposite anterior border of orbit. Muzzle obtuse; head elongate, broad, entering length to base of caudal 24 times. Diameter of eye contained 31 times in length of head, equal lower posterior border of operculum. Base of caudal to front base of dorsal equal from latter point to anterior border of pupil of eye. Teeth 1.4—6.1. Greatest depth 4 1/2 times in length to base of caudal. Scales 745, with ten or eleven strong radii visible. Fins small; radii D. 8. C. 17. A. 18, V. 8. P. 11. Total length about three inches. Color whitish, becoming bluish dorsally; no markings.

[Dec.]
This fish is more compressed posteriorly, has a larger head and eye, and more projecting under jaw than the S. elongatus.

It resembles an Aspius no little, but differs in the shorter anal, and fewer pharyngeal teeth. The Alburnus acutus, badly described by Lapham, is evidently an allied species.

Two specimens; exact locality in Michigan not stated.

Since the above was penned, I have found that Bleeker (in Comptes Rendus xv. 1863,) has united the genera which I have attached to Squalius to Aspius, placing Squalius with Telestes, Scardinius and Cyprinella as synonyms of Leuciscus. That Squalius and Telestes are identical, I fully believe; but if Cyprinella and Scardinius are not different from Leuciscus our ideas of characters must undergo a change.

Plagyrus americanus.

From Saginaw Bay, No. 253, and a variety from Grosse Isle, Detroit River, distinguished by its very elongate form, especially in regard to its caudal peduncle. Scales 246; that is, two rows less above the lateral line than in many high-bodied specimens; there are others quite intermediate.


From New Hudson, Livingston County, from streams flowing into Lake Erie. Larger specimens of this species exhibit a short lateral line, though in many it is wanting. Its points of separation from erythrogaster are as follows:

<table>
<thead>
<tr>
<th>erythrogaster</th>
<th>e o s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head less than one-fourth length to base of caudal. Head narrower; parietal width one-fourth distance from base of first dorsal ray to base of caudal, which is equal from first dorsal ray to nares. Muzzle longer, overhanging, angle of mouth opposite nares.</td>
<td>Head more than one-fourth do. Head broader; parietal width one-third from first dorsal ray to caudal, which equals from dorsal to posterior margin of orbit. Muzzle shorter, mouth more oblique, reaching edge of orbit.</td>
</tr>
<tr>
<td>Scales above lateral line 24 rows.</td>
<td>Scales above lateral line 18 rows.</td>
</tr>
</tbody>
</table>

Alburnops heterodon.

A species having the general structure of Alburnops, and pharyngeal teeth usually, but not always, presenting its characteristic masticatory surface. They have sometimes a trace of the crenulation pertaining to Cyprinella, and are arranged usually in but one row of four on each side, which is sometimes accompanied by a single tooth of the inner row. This species is, therefore, allied to Codoma, Cyprinella and Squalius. Scales 336, with about eleven distant rai in the rather broad exposed surface. Pissure of mouth not reaching line of orbit. Head one-fourth of length to base of tail, a little greater than greatest depth. Diameter of eye one-third of length of head. Operculum higher than long. Outline from end of muzzle to base of dorsal greatly ascending. Greatest breadth of head one-fourth of the distance from end of muzzle to base of dorsal. Dorsal high; the bony ray long; its front ray to the hinder as 2 1 to 1, and contained 2 1 times in the distance from its base to the origin of the caudal fin: like the ventrals, it is nearer the end of the muzzle than the base of the caudal. Ventralis reaching anus; pectorals falling much short of ventrals. Rays, D. 48; A. 8; V. 8.

Length two and a half inches.

Above yellowish-brown; the scales darker bordered; below yellowish-rosy, or sometimes golden. A dark lateral band from end of muzzle to tail, which is covered on the sides by a silver band with blue reflections.

Numerous specimens from Lansing; others from Grosse Isle.

1864.]
Alburnops plumbeolus.

Form compressed; mouth oblique; mandible slightly more prominent than premaxillary border. Eye \(2^{3/4}\) in length of head; operculum higher than long; the superior border very short; the supero-posterior concave; posterior angle more than \(90^{\circ}\). Length to base of tail a little over four times length of head, and \(4^{3/4}\) the greatest depth. Frontal and dorsal outline a gentle arch. Anterior base of dorsal half way between base of caudal and end of muzzle. Height of dorsal less than half length from its anterior base to base of caudal. Fins short; ventrals extending \(3/5\) way to vent. Scales moderate \(6^{3/4}\), with seven or eight rather faint radii, and minute numerous concentric lines. Radial formula D. 1-8. A. 1-9. V. S. P. 13.

Length three inches. Pharyngeal bones with strong ala, especially dilated on the superior angle, terminating in a sharp angle opposite the second tooth from above; lower limb long; teeth 2, 4-4, 2.

Everywhere silvery, with a blueish reflection, except a dusky vertex and brownish dorsal region and basal caudal spot.

From Flint, on a branch of the Saginaw.

I have regarded this species as an Alburnops on account of the distinct masticatory surface of the teeth, although the upper jaw does not overlap the lower as in the types of that genus. The form of the scales distinguishes it readily from Hypsilepis. It is generally similar to Squalius.

Alburnus* rubellus Agass.

The anal fin of this fish is shorter than in true Alburnus: teeth 2, 4-4, 2, without masticatory surface. Scales \(6^{3/4}\). Head \(4^{3/4}\) times in length to base of caudal.

Three specimens from Flint.

Pimephales milesi, sp. nov.

A species differing from the promelas in its larger scales, longer muzzle and other points approximating Hybognathus.

Mouth oblique, outlines of snout forming less than a right angle in profile. Eye entering \(4^{3/4}\) times in length of head, which latter is one-fourth of length to base of tail, and equal to greatest depth of body. Scales \(2^{1/4}\), nearly round, lateral line extending as far as the fourteenth. Dorsal fin with 1, 9 rays; the first and last jointed are equal, the middle the highest. Caudal wide; complete rays 21. Anal small, longer than wide, 1, 7. Ventrals not reaching anal, 1, 8. Pectorals extending three-fifths distance to ventrals. From base of caudal to front base of dorsal equal from latter point to anterior nostril. Frontal breadth double diameter of orbit. Length 2 in. 5 lines.

General color pale reddish-brown, much paler below, and a faint blackish longitudinal line. Top of head blackish; its sides silvery.

From Grosse Isle, Detroit River. Named from Prof. Miles, who, in connection with Prof. Fox, has added much to north-western Zoology.

Pimephales promelas, Raf.

Specimens from near Lansing.

Hyborhynchus† notatus, Agass.

* Alburnus oligaspis.


Brought from Kansas by Dr. W. A. Hammond.

† In this place may be described the Algonsea antica, sp. nov., brought by Dr. Woodhouse from Texas, and presented to the Academy Museum. It is nearest to the formosa of Girard, [Dec.}
One specimen from Grosse Isle, Detroit River.

Though differing in the development of the lateral line, this species stands near Pimelophus in the character of the separation of the bony dorsal ray from the first cartilaginous by a membrane, (erroneously alluded to by some as a peculiar ray,) and in the arrangement of the tuberces on the front. Of the latter, there are two rows crossing the front of the muzzle; the inferior of six, of two on each side on the premaxillary border, and the outer near the eye; the superior of five, one on the middle line. A third row of four is on the border of the superior plane, one behind each pair of nares, and one on each side the middle line of the muzzle.

Hybognathus stramineus.

This genus embraces the described species argyritis, Evansi, nuchalis, nitidus, regius and probably gardoneus (C. V.), to which are added here three others.

In the present species, the dorsal is situated nearer the end of the muzzle than to the base of the caudal, and its height is much less than half the distance from the base of its first ray to the same point; the head enters the length to the caudal a little over four times, being relatively longer than in the species described by Agassiz and Girard, while the eye, entering the length of the head but three times, is relatively larger. The depth enters the length $4\frac{3}{4}$ times. Scales $\frac{3}{36}$; in Evansi $\frac{1}{4}$.40. Ventral fins do not extend to the vent. The dorsal outline rises gently to the base of the dorsal; the profile descends abruptly at the end of the muzzle, which is prolonged in front of the orbit about three-fourths the longest diameter of the latter. Superior border of operculum usually shorter than the posterior. Pharyngeal teeth 4–4.

The general form is stout, and the head broad; caudal not deeply forked. Fin rays —D. 1. 8. C. 19. A. 7. V. 8. P. short, 13. Length about three inches. Color brownish straw color; sides and below silvery, the former most brightly. No dorsal line; a faint line on posterior part of lateral line, and a small spot at base of tail.

Many specimens from Grosse Isle, Detroit River.

Hybognathus volucellus.†

A species distinguished by its depressed elongate head and elongate fins, especially the dorsal. The latter is as far from the end of the muzzle as from

but differs in the much more posterior position of the fins. In this, the anterior base of dorsal is equidistant between end of muzzle and base of tail: in the antica much behind the median point; the ventrals are much nearer the caudal than the chin; in the formosa, the reverse is the case. Scales $\frac{7}{36}$; 50. Head in adults a trifle more than one-fourth total length; eye one-fifth length of head. Maxillary not reaching line of margin of orbit; mouth oblique. Profile long, flat, descending; dorsal outline arched. Body of medium proportions, shortened behind; caudal peduncle short, thick, Fins, D. 1–7 4; C. 19, short, emargination shallow; A. 1–5; V. 9; P. 36.

Sides of head and edges of scales punctulate; general tint above purplish-slate; below, with sub- and inter-operculum, yellow. Largest specimen five inches long. In some small specimens the eye is only one-fourth the length of the head. To the allied genus Lavinia belongs most probably the Leuciscus bosi of Cuv. et Val., from Carolina. The same genus occurs in Lake Ponchartrain.

* Brought by Hammond from the Upper Platte.

† Hybognathus procne has been sent me by my friend, Jacob Stauffer, as an inhabitant of the Conestoga, tributary of the Susquehanna. A small silvery fish, with compressed body and elongate caudal peduncle. Head enters total length $4\frac{1}{2}$ times; diameter of eye into head $\frac{1}{2}$ or three times. Depth into length five or a little more times. From anterior base of dorsal to base of caudal longer than from former to end of muzzle; dorsal high, anterior rays equal $\frac{1}{2}$ from their base to base of caudal. Scales $\frac{3}{31}$. Tail entering total length $6\frac{1}{4}$ times, deeply forked; forks acute. Obliquity of mouth slight. Operculum higher than long; its infero-posterior border very oblique, long. Teeth R. 5–4 L. Length 26 inches.

Top of head, a narrow dorsal band, and the borders of the upper scales blackish; belly and sides of body and head silvery, along the middle line with blue reflections and black punctulations, the latter collected into a streak on the lateral line. Belly yellowish.

1864.]
its anterior ray to the base of the caudal fin. Its anterior rays are three times the length of the posterior, and equal to half the length from their base to the base of the caudal. Muzzle obtuse; vertex plane; dorsal outline arched from nape to fin. Caudal peduncle slender. Head entering length to base of caudal 3½ times, the greatest depth 4 times; diameter of orbit in length of head 3½ times. Operculum as broad as long. Scales 33 34. Radial formula D. 1—5; C. 19, not deeply forked; anal elongate, with short base, 1—7. Ventrals reaching anus, 5. Pectorals just reaching ventrals, falcate. Length 2½ inches.

Above reddish-straw color, without band; sides and below silvery; a dark shade on the lateral line, most distinct on caudal peduncle.

Grosse Isle, Detroit River.

Hybognathus nuchalis, Agassiz.

Numerous specimens from Grosse Isle.

Campostoma callipteryx, sp. nov.

Lips well developed, free round the arched margins of both jaws. Muzzle elongate, steeply descending from front; outline to half way to dorsal strongly but less steeply ascending. Eye superior, small, entering five times into length, and nearly four times into breadth of head; latter four and a half times into length to emargination of caudal, a trifle less than greatest depth. Ventrals under anterior margin of dorsal, not reaching to vent; anal rounded anteriorly. Scales with many weak radii, 5 54, a much narrower area exposed anteriorly than posteriorly. Caudal acute above, rounded below. Radii, D. 1 8. C. 19. A. 1 8. V. 8 one side, 10 the other. P. 16. Pharyngeal teeth uniserial, 4—4. From end of muzzle to anterior base of dorsal in a straight line, equal from base of caudal to middle of base of dorsal. Head above with spinous tubercles.

General color pale, dorsal regions and edge of operculum darker. Median part of all the fins black, terminal membrane opalescent. Total length 5½ inches.

From Flint on the Flint River, which empties into Saginaw Bay.

For distinguishing this genus from Chondrostoma I have relied on the less number of teeth in the principal, usually the only, row. The development of the lips diminishes in allied species, so that Girard's Hybognathus placitus cannot well be excluded from this genus.

Campostoma mormyrus, sp. nov.

Muzzle more elongate and much more depressed than in the next species. Head four and one-half times in total length to caudal emargination; eye five times into length of head. Dorsal outline arched. Greatest depth four and one-third times in length,—greater than in gobionium. Scales about equal, 5 49. Fins, D. 1 8. C. 19. A. 1 7. V. 8. P. 15, with the last longer than in gobionium. Length about two and a half inches.

Head and body above reddish; sides and below silvery. Fins unspotted. In these species the outline of the broad mandibular sheath is a flattened arch.

From Bruce, Macomb Co.

Campostoma gobionium.

This and the C. mormyrus and hippops* belong to the type of nasu-

* Campostoma hippops, sp. nov.

Muzzle very long and decurved, with the front convex transversely. Eyes high, small, enter six times into length of head. Back broad, arched in front of dorsal, not so steep as front. From base of caudal to front base of dorsal a little less than from latter to end of muzzle. Head 4½ times in length. Scales 8 57. Fins small; D. 1 8. C. 19. A. 1 7. V. 1 8. two-thirds distance to

[Dec.
tum, Gir., with the muzzle elongated and not elevated as in the callipygous, and the lips little developed. Scales little less exposed anteriorly than posteriorly, 53. Head short, one-fifth of length to notch of tail. Eye four and a half times in length of head. Operculum little higher than long, little concave above. Fins small; D. 1. 8. C. 19. A. narrow, 1. 7. V. 8, reaching three-fifths distance to vent. P. rounded, 16, reaching three-fifths distance to vent. Back arched to dorsal. Tail broad; seven rows of scales on middle of peduncle.

One specimen is three inches long. Color of head and body above dark-brown; below yellowish. Fins without markings.

Locality.—Bruce, Macomb Co., and Grosse Isle.

Hylomyzon nigricans, Agassiz.

Grosse Isle.

Ptychostomus aureolus, Agassiz. No. 231.

Saginaw Bay and Grosse Isle.

Carpiodes thomsoni, Agassiz. Am. Journ. Sci. and Arts, xix. p. 76. and Thoms. Hist. Vermont, p. 133. Nos. 228 and 230. Saginaw Bay, I find one and two more rows of scales than described by Thompson, and the outlines of the latter not quite as regularly continuous as one might infer from Agassiz's remarks. C. damalis, brought by Hammond from the upper Platte, has larger scales and is more elongate, and there are but 25 rays in the dorsal fin.

Description of Six New species of Western Asiatic UNIONIDÆ.

BY ISAAC LEA.

Unio Homensis.—Testa lavi, suboblonga, inaequilaterali, ad latere planulata, postici angulata; valvulis crassis, anticic crassicirribus; natibus prominulis, ad apices plicatis; epidermide tenebroso-fuscâ; dentibus cardinalibus crassis crenulatissque; margaritâ purpureascénti et iridescente.

Hab.—Lake Homs, (ancient Emesa), River Orontes, North Syria. C. M. Wheatley.

Unio Kullethensis.—Testa lavi, oblongâ, inaequilaterali, ad latere planulata, antici subtruncata, postici obtusâ angulata; valvulis crassis, antici crassicirribus; natibus prominulis; epidermide luteola, postici radiata et tenebroso-viridi; dentibus cardinalibus parvis, acuminatis crenulatissque; margaritâ vel alba vel aureâ e valde iridescente.

Hab.—Near Mardin, in a stream from Kulleth falling into the Tigris, Asia. C. M. Wheatley.

Unio Orphaensis.—Testa lavi, oblongâ, inaequilaterali, antici rotundata, postici obtusâ subiugulata; valvulis crassiculatis, antici crassicirribus; natibus subprominentibus, ad apices crurâ et minutâ undulatis; epidermide olivaceâ, virido-radiata; dentibus cardinalibus parvis, compressiss, crenulatis, vent. P. 14, extending half way to ventral. Posterior angle of operculum right; anterior border shorter than posterior-inferior. Length 4 inches.

Body above reddish; head pale; sides and below silvery; a dark spot on base of middle of tail and on middle of dorsal and anal.

Platte River, at Ft. Kearney, Kansas. Dr. W. A. Hammond.

This species resembles the C. mormyrus more than any other. In C. nasutum the head is much longer and the scales larger.

1864.]
in utroque valvulo duplicibus; lateralibus longis subrectisque; margaritā vel alba vel aurea et valde iridescente.

_Hab._—Tigris River, near Mardin Pashalic of Orpha, Asiatic Turkey. C. M. Wheatley.

_**Unio Mardinensis.**—Testā lævi, suboblongā, inæquilaterali, antice rotundatā, posticē obtusē angulatā; valvulis subtenibus, antice crassioribus; natibus prominulis, ad apices crebrē et minutē undulatīs; epidermide luteolā, valde radiatā; dentibus cardinalibus parvis, acuminatis crenulatīsque; lateralibus sublongīs subrectīsque; margaritā aurea et valde iridescente.

_Hab._—Tigris River, near Mardin, Asiatic Turkey. C. M. Wheatley.

_**Unio Emesaensis.**—Testā lævi, subrotundā, inæquilaterali, ad umbones sub-tumidā, antice rotundatā, posticē obtusē subbiangulatā; valvulis crassiusculīs, antice aliquanto crassioribus; natibus prominentibus, ad apices corrugatis; epidermide rufo-fusca et obsolete radiatā; dentibus cardinalibus subcrassīs crenulatīsque; lateralibus brevīs subrectīsque; margaritā aurea et valde iridescente.

_Hab._—Lake Homs, River Orontes, North Syria. C. M. Wheatley.

_**Monocondyla Mardinensis.**—Testā lævi, arcuatā, valdē inæquilaterali, ad latere compressā, antice et posticē rotundatā; valvulis crassiusculīs, antice crassioribus; natibus subprominentibus, recurvis, ad apices minutē undulatīs; epidermide tenebroso-fusca; dentibus cardinalibus parvis, erectīs compressīisque; margaritā cæruleo-albā et iridescente.

_Hab._—Near Mardin, in a stream falling into the Tigris River, Asia. C. M. Wheatley.

---

**Notes on some Species of BIRDS from South America.**

**BY JOHN CASSIN.**

1. **Calliste Lavinie, Cassin,** (Plate 1, fig. 1.)


This bird was described by me as above from a specimen procured in New Grenada, and which is yet the only adult that I have seen. In the museum of the Smithsonian Institution there is another specimen from the mountain region of the Rio Truando, a tributary of the Rio Atrato, New Grenada. The latter specimen is not in mature plumage, but has the outer webs of the quills and the greater coverts of the rufous-orange color, which, on those parts, so strongly characterizes this species, and distinguishes it at once from its allies of the subgroup _Gyrola._ The adult bird is represented of the natural size, in plate 1, fig. 1, of the present volume.

Of this group or subgroup _Gyrola,_ four species are now known, which, though resembling each other in general colors, may be readily distinguished, and inhabit, apparently, distinct regions.

These species are:

1. **Calliste Gyrola,** (Linnaeus.)

_Fringilla Gyrola, Linn., Syst. Nat. i. p. 181 (1758.)

2. **Calliste Gyroloides,** (Lafresnaye.)


3. **Calliste Desmaresti,** G. R. Gray.

_Calliste Desmarestii, G. R. Gray, Gen. ii. p. 366 (1844.)

4. **Calliste Lavinie,** Cassin.


[Dec.]
All of these species are in the Academy Museum, and of the first three numerous specimens. Those three species are accurately and handsomely figured by Dr. Sclater in his Monograph of the genus Callistes.

2. Callistes Hanahalle, nobis, (Plate 1, fig. 2.)

Resembling generally C. cyaneicollis (D'Orbigny,) but is rather larger, has the bill much smaller, and the abdomen always black (not blue as in that species.) The blue of the head above is also different in shade, being paler in the present bird, and this color has much greater depth, each feather being black at base, and with its terminal half pale verditer blue.

Entire head verditer blue, tinged with indigo blue on the throat; back and entire under parts lustrous black; shoulders golden green; greater coverts yellowish green; rump and upper tail coverts lustrous bluish and yellowish green. Quills black, edged externally with bluish green; tail black, all the feathers narrowly edged with green; under tail coverts black, with bluish green edges; under wing coverts black; bill and feet black. A narrow frontal band and stripe in front of the eye black.

Total length about 5 inches; wing 2¾; tail 2 inches.

Hab.—Merida Mountains, Venezuela.

Of this bird, I have now two specimens, one of which was brought from the locality above given, by Mr. George Robbins of this city, and which is undoubtedly correct. At first sight it much resembles C. cyaneicollis, but is not difficult to distinguish by the abdomen being quite black, uniform with the other under parts, and by the different blue color of the head, as above mentioned. The small bill in the present bird is also a strong character.

Numerous specimens of C. cyaneicollis are in the Philadelphia Academy, two of which are types from M. D'Orbigny's collection. All of them, and all others that I have seen, have the blue abdomen well marked as a character, and in one evidently quite mature specimen, marked "Chili," this character is so strongly developed and the blue color extends so far upwards towards the breast, that it seems to have induced some attention, and the specimen has been labelled in Europe "Esp. nouv.?" In this specimen and others, the blue of the head is quite superficial. One other specimen, from M. D'Orbigny's collection, is in young plumage, but has the abdomen blue, though that color is only incipient on the top of the head. All have the bill larger than the present species. Our figure represents this bird of the size of life.

To one possessing attributes amongst the most noble of Christian civilization, an affectionate and most exemplary wife and mother, this bird is dedicated!

3. Orthogonyx olivaceus, Cassin, (Plate 2.)


Of this curious bird no other specimens have come under my notice, than those described as above, which were obtained in the Cordilleras Mountains in New Grenada, by Mr. Charles J. Wood, of this city. It is given in our plate, of the natural size.

4. Pittassoma Michleri, Cassin, (Plate 3.)


Since the publication of my description above cited, fine specimens of this bird have been received from Panama by Mr. George N. Lawrence, of New York, who notices them in his interesting and valuable papers on the birds of that isthmus, in the Annals of the Lyceum of Natural History of that city. The figure in our plate represents the adult male, and is about two-thirds of the size of life.

5. Monasa pallescens, Cassin, (Plate 4.)


No other specimens of this bird have come under my notice since the pub-
lication of the description above cited. The figure in the plate accompanying this paper, is about two-thirds of the size of life, and represents the adult male from the mountain region on the Rio Truando, a tributary of the Rio Atrato, New Grenada.

   I mention this species only for the purpose of again stating, that its name is that of the Baron Lafresnaye as above given. The type specimen, now in the Academy Museum, was described by him while in possession of Messrs. Verreaux, of Paris, and the same specimen was described by Strickland, while afterwards it was in England en route to Philadelphia.

7. Capito versicolor, (Müller.)
   Bucco pictus, Bodd., Tab. Pl. Enl. p. 20 (1783.)
   Bucco elegans, Grm., Syst. Nat. i. p. 406 (1788.)
   Bucco Maynaensis, Briss., Orn. iiv. p. 102.
   Of this species which seems to be little known to naturalists, one specimen, evidently in mature plumage, is in the Academy Museum, and was received some years since from the Hon. John Randolph Clay, in a collection made by him while Minister of the United States to Peru. The skin was one of several which had the appearance of having been made by a non-expert person, and is stated to have come from the mountainous region of the interior of that country. This species is figured by Buffon, as above cited, with sufficient accuracy for recognition.

The Annual Reports of the Recording Secretary, Librarian, and Curators were read, as follows:

REPORT OF THE RECORDING SECRETARY,
For 1864.

During the year ending 30th November, 1864, there have been elected thirteen members and nine correspondents.

The following members have died: Richard Randolph, Wm. D. Parrish, Samuel Ashmead, William J. Taylor, Thomas Dunlap, Wm. Pepper, M. D., John B. Myers.

The death of the following correspondents has been announced: Joseph Henderson, M. D., Francis Boote, Prof. D. J. Eschricht, Jaques A. Gay.

Two members have resigned.

The number of papers contributed and ordered to be published, during the same time, has been fifty-one, as follows:

Theodore Gill, twelve; Isaac Lea, LL.D., eleven; E. D. Cope, four; Elliot Coues, three; H. C. Wood, Jr., three; John Cassin, two; George W. Tryon, two; Jacob Ennis, two; A. Agassiz, F. F. Baird, Wm. M. Canby, T. A. Conrad, J. G. Cooper, M. D., Asa Gray, D. G. Elliott, C. A. Helmuth, Geo. N. Lawrence, Wm. Stimpson, Alex. Winchell, F. W. Lewis, M. D., each one.

All of which is respectfully submitted.

B. HOWARD RAND, M. D.,
Recording Secretary.
[Dec.
REPORT OF THE LIBRARIAN,

For 1864.

The Librarian begs leave, most respectfully, to report that during the past year the following additions have been made to the Library, viz: Journals, 763; works on Anatomy and Physiology, 20; Antiquities, 3; Bibliography, 4; Botany, 39; Chemistry, 1; Conchology, 29; Entomology, 14; Geology, 69; General Natural History, 107; Helminthology, 4; Herpetology, 2; Ichthyology, 4; Languages, 4; Mathematics, 1; Mammalogy, 2; Medicine, 69; Ornithology, 24; Physical Science, 17; Politics, 1; Religion, 4; Useful Arts, 1; Voyages and Travels, 19. Total 1201.

Of these were volumes, 265; tracts and parts of periodicals, 933, divided as follows: Folios, 21; quartos, 256; octavos, 902; duodecimos, 22.

These have been received from the following sources, viz: Societies, 533; Editors, 149; Authors, 82; Smithsonian Institution, 10; University of Toronto, 1; Navy Department, 1; Treasury Department, 1; Library Fund, 137; Maclure Fund, 12; Minister of Public Works in France, 3; Dr. T. B. Wilson, 261; Mrs. Dr. Short, 2; Executors of Dr. Short, 4; J. C. G. Kennedy, 1; Charles H. Hart, 3; Select Council of Philadelphia, 1. Total 1201.

J. D. SERGEANT,

Librarian.

December 27, 1864.

REPORT OF THE CURATORS.

For 1864.

The Curators report the Museum of the Academy to be in its usual good order and state of preservation. Some of the departments are still but partially arranged, and, under existing circumstances, the Curators see no way of completing the arrangement unless they are authorized by the Academy to employ aid for the purpose. Mr. Tryon has undertaken the arrangement of the conchological cabinet, and Mr. Durand has expended much labor in the arrangement of the recent rich additions to the herbarium.

Notwithstanding the extensive additions made in late years to the building of the Academy, the Curators feel the necessity of more space to accommodate the constantly increasing collections. Nearly all the departments are crowded, some of them to such an extent that it has become difficult to introduce a few additional specimens. It is to be hoped that the Academy will direct especial attention to the necessity of making future and ample provision to accommodate, display, and render convenient to access, the incessantly increasing museum and library.

During the year the Academy has been greatly enriched by a donation consisting of the magnificent Herbarium of the late Prof. Charles W. Short, of Louisville, Kentucky, presented by the family on the recommendation of Prof. Asa Gray, of Cambridge. A special notice of this collection will be found in the Report of the Botanical Committee appended to the present one.

Another rich addition, a legacy of our late fellow member, Samuel Ashmead, formerly one of the most efficient Curators of this Institution, consists of a first selection from a large and valuable private collection of about 2000 minerals, together with a beautiful collection of marine algae, made with considerable labor and expense during the later years of Mr. Ashmead's life.

Our stores have further been increased, through the American Philosophical Society, by the deposit of the natural history collection of that time-honored Institution.

By resolution of the Academy, a small collection of ancient works of art have been deposited in the museum of the American Philosophical Society.

1864.]
The following list exhibits the contributions to the museum of the Academy during the year in the various departments of natural history:

**Mammals.**—Of these five species, from Arctic America, were presented by Robert Kennicott, and one species by John Krider.

**Birds.**—Dr. T. B. Wilson and Joseph Jeannes presented 248 specimens, 144 species, from the West African collection of Duchayllu, and from Jalapa, Mexico, of the collection of D'Oca. The Smithsonian Institution presented 31 specimens, 25 species, from the collection of the U. S. Exploring Expedition of the Vincennes and Peacock, 100 specimens from Slam and 9 specimens from other localities. George N. Lawrence presented 51 specimens, 34 species, from Guatemala, New Grenada and Panama. Robert Kennicott presented 22 species from Arctic America. Of others, 36 specimens and 1 nest were presented by T. B. Wilson, J. Krider, C. J. and W. S. Wood, S. Ashmead, R. Frazer, J. Xantus, T. Wyld and D. Gilbert.

**Reptiles and Fishes.**—A small collection of reptiles from Corisco, W. A., was presented by Rev. C. A. Kingsbury and C. L. Pascal.

**Mollusks.**—The Smithsonian Institution presented 71 species of marine mollusca, and 294 species of shells, mostly American, mainly collected and labeled by W. Stimpson. George W. Tryon, Jr., presented 163 species of shells, mostly new to the museum of the Academy. Dr. Gundlach presented 20 species of Cuban shells. Of others, 16 species were presented by A. A. Gould, L. Lea, J. C. Fisher and J. H. Thomson. A small collection from the Florida Reef was presented by George Davidson. The American Philosophical Society deposited a small collection of shells.

**Articulates.**—The Smithsonian Institution presented 62 species of crustaceans, mostly from the collection of Dr. William Stimpson, of the North Pacific Exploring Expedition. Other crustaceans, insects and myriapods were presented by George Davidson, Rev. R. H. Nassau, F. R. Bingham, Dr. J. C. Fisher and H. L. Gaw.

**Echinoderms.**—The Smithsonian Institution presented 16 species of echinoderms from the collection of W. Stimpson, of the North Pacific Exploring Expedition. Small collections of marine animals were presented by Rev. R. H. Nassau, Dr. J. C. Morris, S. Powell and George Merritt. A small collection of echinoderms, corals and sponges were deposited by the American Philosophical Society.

**Fossils.**—E. D. Cope presented 14 specimens of vertebrate liassic fossils from England. Small collections and specimens were presented by Gen. John F. Hartraut, Lieut. A. W. Guernsey, Jacob M. Kunkel, Dr. J. Leidy, F. Peale, Col. W. D. Lewis, Jr., J. F. Frazer, R. E. Knight, J. C. Trautwine, Mr. Painter and Geo. W. Ward. The American Philosophical Society deposited a collection of green-sand fossils from New Jersey and Delaware, a collection of European tertiary fossils, small collections from various formations and localities, and a number of casts in plaster of the vertebrate fossils of the vicinity of Paris.

**Minerals.**—About 500 specimens of minerals were received as a legacy from the late Samuel Ashmead, of which about 400 have been labelled and intercalated with the mineralogical cabinet of the Academy. The mineralogical collection, deposited by the American Philosophical Society, contains many rare and valuable specimens, among which are rich native silvers, sulphures of silver, tin, opal, &c., from Mexico. From this collection upwards of 450 specimens have been labelled and intercalated with the cabinet of the Academy. Altogether there have been added to the latter during the past year, about 1000 labelled specimens. Mr. Lea presented 27 specimens of minerals from Chester and Lancaster Co., Pa., and from New York. The Smithsonian Institution presented 27 specimens of rocks. Joseph Wharton presented 18
minerals from Lancaster Co., and 8 specimens were presented by J. D. Sergeant, W. S. Vaux and J. C. Trautwine. There were also obtained 12 valuable minerals in exchange.

**Botany.**—The magnificent herbarium of the late Professor Short, of Louisville, Ken., presented by his family, consists of almost 300 folio volumes, containing about 6000 species of American plants, and between 3000 and 4000 species of European plants, besides a number of unopened packages of tropical American plants. The collection of marine algae of the late Samuel Ashmead, a legacy to the Academy, is contained in 12 thick quarto volumes. Besides these there are numerous microscopic specimens mounted in the usual manner on glass slides. A collection of marine and fresh water algae, comprising about 700 species, a contribution by Leo Lesquereux to the Central Sanitary Fair, has been purchased by the Curators, according to a resolution of the Academy, of Dec. 6, 1864. Two large fungi were presented by A. Cunningham and Violetta W. Miller.

**Miscellaneous.**—An antique stone hammer from the copper mines of Lake Superior was presented by B. A. Hoopes; an Apache Indian skull from Texas by Dr. E. H. Abadie; 6 worked flints from Abbeville, France, by F. Peale; and a plaster cast of the Neanderthal skull by E. D. Cope.

Respectfully submitted by JOSEPH LEIDY, Chairman of the Curators.

---

**REPORT OF THE BOTANICAL COMMITTEE, For 1864.**

To the Curators of the Academy of Natural Sciences:

**Gentlemen:**—Since my last report, dated December 17th, 1857, our Botanical Department has been considerably enriched.

**First,** by a full set of specimens from the collections made on the Colorado Mountains by Dr. C. C. Parry, Messrs. Elihu Hall, Harbour and Howard.

**Secondly,** by the magnificent herbarium of the late Prof. Charles Wm. Short, of Louisville, presented to our Academy by his family, on the liberal recommendation of Prof. Asa Gray.

**Thirdly,** by the handsome collection of Marine Algae, bequeathed to this institution by our late fellow-member, Mr. Samuel Ashmead.

**Fourthly,** by another most valuable collection of Algae, once the property of Mr. Leo Lesquereux, of Columbus, Ohio, presented by him, as his contribution, to the Philadelphia Sanitary Commission, and just purchased by the Curators.

To the above I will add the Texas collections of Dr. Lincecum and Mr. Buckley; the herbarium of Dr. G. Watson, and several hundred plants from Wisconsin and Iowa received from Mr. T. J. Hale, in exchange.

The greatest part of the Colorado specimens were either new to our North American herbarium, or duplicates (handsomer and more complete) of those collected by Mr. Nuttall, in his rapid travels over the Rocky Mountains.

The Short Herbarium is, indeed, the greatest acquisition ever made by our Botanical Department, and will constitute two distinct large herbaria: one of tropical, the other of extra tropical plants. The latter, already arranged by Prof. Short himself, on the same Linnæo-natural plan as our general herbarium, contains, as far as I can judge, about 4000 European and between 6 and 7000 North American species. Among the latter are many new plants to our Botanical Department, derived principally from the last collections of Mr. Charles Wright in New Mexico, Sonora and Cohabuila; from the Texano-Mexican herbarium of Berlandier; from the Collection of Ervendberg in the province of Huasteca, and other Mexican plants from the collection of Drs. Gregg and Coulter, besides a small number from the North American British provinces.

1864.]
This herbarium is, perhaps, not excelled in the scientific world for the magnificence, freshness and completeness of its specimens, and the costly style with which it has been fitted up. It is contained in upwards of three hundred wooden cases, elegantly shaped in the form of folio volumes, each volume averaging from thirty to fifty specimens, enclosed separately in sheets of fine white paper; the large genera or several of the kindred genera under a colored cover, and the American kept apart from the European, each in its portfolio.

The tropical plants are yet in numerous unopened packages, consisting of Holton's Flora Neo-Granadina, 1852-53; Fendler's Plantae Venezuelae, 1854-57; Conthony and Jameson's Plants of the Andes of Quito; R. C. Alexander's Plantae Jamaicenses; Ch. Wright's Plantae Cubenses, &c., &c. When these collections are properly arranged, they will constitute an almost complete equatorial herbarium of about 6000 species.

Besides the above collections, I have to mention a package of East India Ferns, collected by Dr. Griffith; another of Australian Algæ, with other minor packages of Cryptogamous plants, and the two fine volumes of American Musci et Hepaticæ by Mr. Wm. S. Sullivan, all derived from the splendid Short-Herbarium.

Mr. Ashmead's collection of Algæ is, I believe, principally composed of American species. It is neatly set up in twelve elegant cases, in the form of quarto volumes.

The Lesquereux's collection is particularly valuable, containing over 700 species authenticated by the best Algologists of the age, Messrs. Lenormand, Desmazières, Agardh, Mongeot, Meklenbeck, Bonjean and others, among which Mr. Lesquereux's name is not to be passed in silence.

Respectfully,

E. Durand,
Chairman of the Botanical Committee.

The election of officers for the ensuing year was held, in accordance with the By-Laws, with the following result:

President .................. ROBERT BRIDGES, M. D.
Vice-Presidents ............ Wm. S. Vaux.
                          John Cassin.
Corresponding Secretary ... Thomas Stewardson, M. D.
Recording Secretary ....... B. Howard Rand, M. D.
Librarian ................... J. D. Sergeant.
Treasurer ................... Wm. C. Henszey.
Curators .................... Joseph Leidy, M. D.
                          Wm. S. Vaux,
                          John Cassin,
                          J. D. Sergeant.
Auditors .................... Wm. S. Vaux,
                          Joseph Jeanes,
                          Aubrey H. Smith.
Publication Committee .... Wm. S. Vaux,
                          Isaac Lea,
                          Robert Bridges, M. D.
                          Joseph Leidy, M. D.
                          Thomas Stewardson, M. D.

[Dec.]
ELECTIONS FOR 1864.

The following persons were elected Members,—viz:

*Feb.* 23.—Prof. Richard S. Smith.
*March* 29.—John M. Maisch, J. R. Goodman, M. D.
*April* 26.—A. Paul Turner, M. D.
*June* 28.—Horatio C. Wood, Jr., M. D.
*July* 28.—Jos. Wharton.
*Nov.* 29.—Dr. Frederich A. Keffer, U. S. A., Geo. F. Knorr, M. D.
Chas. T. Bonsall.
*Dec.* 27.—J. T. Rothrock, Redwood F. Warner.

The following were elected Correspondents:

*April* 26.—Dr. A. C. Hamlin, U. S. A.
*June* 28.—Prof. Manly Miles, of Lansing, Mich.; Maximilian, Prince of Wied.
*Sept.* 27.—P. J. Van Beneden, Bruxelles.
CORRESPONDENCE.

CORRESPONDENCE OF THE ACADEMY,

For 1864,

Letters were received and read as follows:

January 5th.—Thomas B. Wilson, M. D., Newark, Del., Jan. 1st, 1864, acknowledging his election as President of the Academy.


Chicago Historical Society, 27th Dec., 1863, of the same tenor.

February 9th.—Mr. Aug. Fiot, Bethlehem, Pa., 6th Feb., 1864, acknowledging his election to membership.

March 8th.—Smithsonian Institution, Washington, Jan. 21st and 2d March, 1864, accompanying donations.

March 15th.—The Royal Academy of Sciences, Lisbon, July 11th, 1863; Society of Natural Sciences, Hamburg, Feb. 15th, 1863; Imperial Academy of Sciences, etc., Lyons, 11th April, 1863; Imperial Academy of Sciences, etc., Vienna, Aug. 25th, 1863; severally accompanying donations to the Library.

The Royal Horticultural Society, London, Oct. 17th, 1863; Geological Society, London, Nov. 4, 1863; Natural History Society, Danzig, 8th Aug., 1863; Natural History Society, Nürnberg, Sept. 30th, 1863; Essex Institute, Salem, Mass., March 1st, 1864; New York State Library, Feb. 1st, 1864; Academy of Sciences, St. Louis, Jan. 30, 1864; severally acknowledging the receipt of the publications of the Academy.

Royal Society of Sciences, Leipzig, 22d Aug. and 11th Oct., 1863; Society of Natural Sciences, Luneberg, June 23 and Aug. 24, 1863; Royal Society of Zoology, Amsterdam, Aug. 25, 1863; Society of Friends of Natural History, Mecklenburg, Aug. 29, 1863; Natural History Society, Emden, Oct. 8th, 1863; transmitting their publications and acknowledging the receipt of those of the Academy.

March 22d.—Historical Society, Chicago, March 18, 1864;

The Literary and Historical Society, Quebec, March 17, 1864, each accompanying donations.

M. Mechelin, Paris, Feb. 20th, 1864, proposing the sale of a collection of Zoophytes.

U. S. Sanitary Commission, March 15th and 22d, 1864, accepting the offer of the use of the Hall of the Academy and returning thanks for the same.

The American Philosophical Society, March 19th, 1864, submitting resolutions of the Society in reference to the deposit of specimens.

May 3d.—Imperial Society of Naturalists, Moscou, Sept., 1863; Upper Hessian Society for Natural History, Giessen, Aug. 27th, 1863; Royal Swedish Academy of Sciences, Stockholm, Nov. 18th, 1863; Senckenberg Natural History Society, Frankfurt-am-Main, Nov. 5, 1863; Royal Prussian Academy of Sciences, Berlin, Nov. 30, 1863; Imperial Society of Agriculture, &c., Lyons, April 12, 1863; severally transmitting their publications.
CORRESPONDENCE.

German Geological Society, Berlin, Nov. 5th, 1863; 
Natural History Society, Halle, Oct. 30th, 1863; 
New York State Library, March 17, 1864; 
Smithsonian Institution, Washington, Feb. 26, April 3, June 25, July 13, Oct. 29, Nov. 28, 1863; 
Liverpool Literary and Philosophical Society, Feb. 29, 1863; 
Natural History Society, Bern, (no date); 
Swiss Society of the Collective Natural Sciences, Bern, (no date); 
Batavian Society of Natural Sciences, Rotterdam, Oct. 19, 1863; 
Lyceum of Natural History, New York, 23d Jan., 1864; 
Society "Isis," Dantzig, Nov., 1863; severally acknowledging the receipt of the publications of the Academy.

The Society of Natural Sciences of the Duchy of Luneburg, June 28, 1863; 
Natural History Society, Freiburg, 19th Oct., 1863; 
Zoological Society, Frankfurt-am-Main, Jan., 1864; 
Royal Society of Sciences, Upsal, 15th Oct., 1863; 
Natural History Society, Augsburg, 28th Aug., 1863; 
Natural History Society, Dantzig, Oct. 22d, 1863; transmitting their publications and acknowledging the receipt of those of the Academy. 
Society of Physicians, Steinmark in Graz, Dec. 11th, 1863; 
Imperial Public Library, St. Petersburg, Jan. 10th, 1864; requesting exchanges. 

July 5th.—T. Rupert Jones, Sandhurst, Eng., June 1st, 1863, acknowledging his election as correspondent. 
Alexander Agassiz, Cambridge, 5th May, 1864, of the same tenor. 
The British Museum, April 27th, 1864; 
Geological Society, London, April 27, 1864; 
New York State Library, June 11th, 1864; 
Senckenberg Natural History Society, Jan. 30, 1864; 
Wurtemburg Soc. of Natural History, Oct., 1863; 
Royal Leopoldine-Carolinian Academy, Dresden, Sept. 7th, 1863; 
Lyceum of Natural History, New York, June 15, 1864; 
Imper.al Society of Naturalists, Moscow, 16th and 30th Dec., 1863; 
University Göttingen, June 16, 1864; 
Imperial Geological Institute, Vienna, Aug. 27, 1863; 
W. Haidinger, Vienna, Aug. 27, 1863; 
The Natural History Society, Augsburg, Dec., 1863; severally acknowledging the receipt of the publications of the Academy. 
The Royal Society of Sciences, Göttingen, Feb., 1864; 
Royal Leopoldine-Carolinian Academy, Dresden, Feb. 24, 1864; 
Royal Bavarian Academy of Sciences, April 8th, 1864; 
Smithsonian Institution, Washington, June 16th, 1864; 
Catholic University of Louvain, Dec., 1863; 
Senckenberg Natural History Society, Jan. 30, 1864; 
Royal Society of Sciences, Liege, Jan. 24th, 1864; 
Society of Naturalists, Halle, Feb. 16, 1864; severally transmitting donations. 
The Geological Survey of India, 1st Oct., 1863, transmitting its publications and acknowledging the receipt of those of the Academy. 

August 23d.—The Entomological Society, Philada., July 19th, 1864, transmitting a donation from Prof. Gundlach. 
The Asiatic Society, Calcutta, April 25th, 1864, requesting a supply of deficiencies of the Proceedings. 

October 4th.—C. L. Pascal, Philada., Oct. 4, 1864, accompanying a donation of specimens of Salmo fontinalis, with some remarks thereon. 
Wm. Couper, Quebec, 26th Sept., 1864, offering to exchange Vols. 1.—V.


and part of Vol. VI. of the First Series of the Journal for a copy of Say's Entomology.

November 1st.—Natural History Society of Prussian Rhineland and Westphalia, 11th March, 1864;

Linnæan Society, Emden, Aug. 5th, 1864; acknowledging the receipt of the publications of the Academy.

The Society of Natural Sciences, Zurich, 31st March, 1864, of the same tenor, and desiring missing numbers.

Royal Prussian Academy of Sciences, Feb. 29, 1864;

Royal Academy of Sciences of Madrid, May 3, 1864;

Senckenberg Natural History Soc., June 7, 1864;

Natural History Society, Luneberg, May 2, 1864; severally transmitting their publications.

Royal Academy of Sciences, Vienna, June 23d, 1864;

Society of Physics and Natural History, Geneva, June 21, 1864; transmitting their publications and acknowledging the receipt of those of the Academy.

The Natural History Society of Hanover, April 8, 1864, transmitting its publications and requesting exchange.

December 13th.—C. T. Bonsall, Philada., Dec. 12, 1864, and from Geo. F. Knorr, Philada., Dec. 13, 1864, severally acknowledging their election as members.

The Royal Academy of Sciences of Madrid, April 20, 1864;

Royal Society, London, May 16, 1864;

Historical Society, Chicago, Dec. 9, 1864; severally acknowledging the receipt of the publications of the Academy.

December 27th.—The Batavian Society of Sciences, Rotterdam, Aug. 20, 1864;

Natural History Society, Augsburg, Sept. 6th, 1864;

Imperial Society of Sciences, Moscow, Dec. 27, 1864;

Imperial Academy of Sciences, Vienna, Oct. 8th and 10th, 1863;

Royal Academy of Sciences, Amsterdam, Oct. 28th, 1863;

Lyceum of Natural History, New York, April 18, 1864;

Senckenberg Natural Hist. Society, Frankfurt-am-Main, Oct., 1864;

Society of Natural History, Luneberg, Oct. 16, 1864;

Smithsonian Institution, Washington, Jan. 27, 1864;

Royal Lombardian Institute of Science, &c., Milan, Dec. 2, 1863;

Academy of Sciences of the Institute of Bologna, April 15, 1864;

Natural History Society in Basel, Sept. 27, 1864; severally acknowledging the receipt of the publications of the Academy.

The Royal Danish Academy of Sciences, Copenhagen, June 9, 1864;

Royal Academy of Sciences, Amsterdam, April 4, 1864;

Royal Society of Sciences, Upsal, Sept. 1, 1864;

Society of Friends of Natural History, Mecklenberg, Sept. 18, 1864;

Geological Survey of India, Calcutta, March 22, 1864;

Academy of Sciences of the Institute of Bologna, April 18, 1864;

Royal Meteorological Institute of the Low Countries, Utrecht, July 29, 1864; severally transmitting their publications.

The Royal Danish Academy, Copenhagen, June 9, 1864;

Natural History Society in Halle, Sept. 27 and 28, 1864;

Natural History Society in Emden, Oct. 1, 1864; severally transmitting their publications and acknowledging the receipt of those of the Academy.
DONATIONS TO THE MUSEUM.

1864.

Abadie, Dr. E. H. Nov. 22. Skull of a Mescalero Apache Indian. From the Desert of the Black Hills, Texas.

Algæ. A collection of Marine and Fluviatile Algæ, consisting of about 700 species. Purchased.


Bingham, F. R. Jan. 15th. Three species of Serpents, a Centipede, two insect Larvae and a large Tadpole. From Demarara.

Cope, Edward D. May 17th. Six specimens of a large Ganoid Fish. Two Skulls, two Muzzles, an entire Animal and a sclerotal ring of Ichthyosaurus (two species.) Paddle of Ichthyosaurus, with the impression of the Skin. From the Lisas of Barrow, Leicestershire, England. Cast of Prof. Fuhlrott's Neanderthal Skull.

Cunningham, A. Nov. 22d. Large Fungus, Mt. Ephraim, N. J.

Davidson, George. March 8th. A small collection of Mollusks and Crustaceans, from Florida Reef.


Fisher, Dr. J. C. Nov. 15th. Cray Fish, from the Mississippi at New Orleans. Large Oyster Shell, from Barataria Bay.

Frazer, J. F. Dec. 20th. Two Fossil Whale Vertebrae, from a bluff of York River about five miles above Yorktown.

Frazer, Robert. April 19th. Anas boschas, var., Atlantic City, N. J.

Gilbert, Dr. D. Feb. 2d. Two embryo Turtles and Nest of the Haling Bird.


Guernsey, Lieut. A. W. Sept. 20th. Three Fossil Shells and the caudal vertebra of a Whale, from the miocene formation, near City Point, Va.

Gundlach, Dr. July 19th. Twenty species of Terrestrial Mollusks, from Cuba.


Hoopes, B. A. Nov. 15th. Stone Hammer, from the ancient copper mine pits of Lake Superior.

Jeanes, Joseph. Twenty-seven specimens, of thirteen species of Birds, from Du Chaillú's collections in Western Africa. Forty-seven specimens, 18 species of Birds, from Mr. D'Oca's collections at Jalapa, Mexico.


Knight, R. E. Specimen of Sigillaria, from Carroll Co., Ohio.


Three species of Birds.
DONATIONS TO MUSEUM.

Kunkel, J. M. *June 22d.* A collection of Fossil Plants and Shells, from the triassic rocks, near Frederick, Md.

Lawrence, George N. *March 5th.* Fifty specimens, of forty species of Birds, from Guatemala and New Grenada. *Apr. 19th.* One species of Glosso-

phaga, from Panama.


Leidy, Joseph. *Sept. 20th.* Twenty-two Fossil Echini, from Mecklenberg, Germany.

Lewis, Col. W. D. *Sept. 20th.* A Fossil Fish, from Solenhofen.

Low, H. L. *July 12th.* Corydalis cornutus.

Merritt, George. See Morris.

Miller, Violletta W. *Nov. 22d.* Large Polyopus, Westville, N. J.

Morris, Dr. J. C. *Nov. 15th.* A small collection of Marine Animals, from Newport, R. I. Presented by Dr. J. C. Morris, S. Powel and George Merritt.

Nassau, Rev. R. H. *June 14th.* A collection of Reptiles, Julidae and Marine Animals, from Corisco, West Africa.

Norris, Thad. *Oct. 4th.* Head of a huge Pike, from Connaught Lake, near Meadville, Pa. A four pound Trout, Salmo fontinalis, from near Lake Superior.

Painter, Mr. *Jan. 5th.* A Fossil Coral.

Pascal, C. L. *Oct. 4th.* Three Trout, Salmo fontinalis, one weighing five and three-quarter pounds, from Sault St. Marie.

Peale, F. *Apr. 5th.* Six Fossil Bones and Worked Flints, from Abbeville, France. Received by Mr. Peale from M. De Perthes.

Powel, S. *Sept. 20th.* A Scatella, from Newport, R. I.

Sergeant, J. D. Six specimens Ores of Manganese, Gloucester Co., N. B.

Shepard, C. U. *Apr. 12th.* Eleven fragments of Meteorites and a large Ru-

tile, from Georgia. Received in exchange.

Short, Prof. Charles W. The complete herbarium of the late Prof. Charles W. Short, of Louisville, Ky., consisting of more than 6000 species of North American Plants, and 3000 or 4000 European species, enclosed in 300 quarto volumes, besides numerous packages of Tropical Plants. Pres-

ented by the family of Prof. Short, through the recommendation of Prof. Asa Gray.

Smithsonian Institution. *Jan. 5th.* Seven species of Strepomatidae. *March 5th.* Thirty-one specimens, of twenty-eight species of Birds, from the collection of the United States Exploring Expedition, of the Vincennes and Peacock, and two specimens from Europe. Seventy-one species of Marine Mollusca in alcohol, mostly American. Two hundred and eighty-

seven species of Shells, mostly American. Sixty-two species Crustacea, mostly from the U. S. Exploring Expedition. Sixteen species of Echi-

DONATIONS TO LIBRARY.


Tryon, George W. Jr. Four species of Strepomatidæ. March 15th. Four species of Mollusca. June 22d. Twenty-seven species Helix, twenty-eight Partula, two Succinea, one Vitrina, one Testacella, two Bulimus and six Achatinella. Nov. 15th. Four species of Cyclostoma, six Cylindrella, four Melampus, one Pupina, Sixteen Clausilia, two Truncatella, seven Pupa, two Physa, one Lymnea, five Planorbis, two Lithoglyphus, six Bithinia, three Amnicola, one Spiraxis, four Vivapara, twelve Neritina, six Melanopsis.


Ward, George W. Jan. 19th. Large mass of Teredo, from the Marl of Salem Co., N. J.


Wilson, Dr. Thomas B. March 22d. Sixty-five specimens, of thirty-five species of Birds, from Duchaillu’s collections in West Africa. Apr. 5th. Twenty-three specimens of Birds, from Mr. D’Oca’s collections at Jalapa, Mexico. Apr. 15th. Two species of Birds, from Port Natal. Sixty-two specimens of Birds, from Mr. Duchaillu’s collections in Western Africa. Oct. 18th. Twenty specimens of Birds, from Ecuador; fourteen specimens, of seven species of Birds, from Duchaillu’s collections in West Africa. Tringa himantopus, Long Island, N. Y.


Wood, Wm. S. Apr. 5th. Two species of Birds.


DONATIONS TO THE LIBRARY.

1864.

JOURNALS AND PERIODICALS.

SWEDEN.


DENMARK.

Copenhagen. Oversigt over det K. Danske Videnskabernes Selskabs Forhandlinger og dets Medlemmers Arbeider i Aaret, 1862 and 1863. From the Society.

Videnskabelige Meddelelser fra den Naturhistoriske Forening for Aarets 1849 to 1862. 8 vols., 8vo. 1850—1863. From the Society.


Forhandlingar ved de Skandinaviske Naturforskeres Fjerde und Syvende Mode. 1847—1856. From the Society.

NORWAY.

DONATIONS TO LIBRARY.

RUSSIA.


HOLLAND.


GERMANY.


Berlin. Archiv für Naturgeschichte. Von Dr. F. H. Troschel. 29er Jahrg., 2es Heft to 30er Jahrg., 2es Heft. From the Editor.

Zeitschrift der Deutschen Geologischen Gesellschaft. 15 Band, 2es Heft to 16 Band, 2es Heft. From the Society.


Wochenschrift des Vereins zur Beförderung des Gartenbaues. 6 Jahrg., Nos. 31—51. 7er Jahrg., Nos. 1—30. From the Society.


Monatsberichte der K. P. Akademie der Wissenschaften. 1863. From the Society.


Verhandlungen des Naturforshenden Vereines. 1 Band, 1862. From the Society.


Sitzungs-berichte der Naturwissenschaftliche Gesellschaft Isis, 1863. From the Society.

DONATIONS TO LIBRARY.

301


Halle. Abhandlungen der Naturforschenden Gesellschaft zu Halle. 8en Bandes, 1es und 2es Heftes. 1864. From the Society.


Fannas, Zeitschrift für Zoologie, &c. 4 parts, 8vo. 1832. From the Library Fund.


Wurttembergische Naturwissenschaftliche Jahreshefte. 19er Jahrgang, 1es Heft. 1863. From the Society.

Vienna. Wiener Entomologische Monatschrift. 7 Band, Nos. 1—12. 1863. From the Editors.

Die Feierliche Sitzung der K. Akad. der Wissenschaften am 30 Mai, 1862. From the Society.

DONATIONS TO LIBRARY.

Jahrbuch der K. K. Geologischen Reichsanstalt. 1863. 13 Band, Nos. 2 to 14 Band, No. 2. From the Society.
Sixty-nine Medical Theses. From the University of Wurzburg.

SWITZERLAND.
Zurich. Vierteljahreschrift der Naturforschenden Gesellschaft. 6er und 7er Jahrg. 1861—63. From the Society.

BELGIUM.
Louvain. Annuaire de l'Universite Catholique. 27me Annee. 1863. From the University.
Fourteen Theses. From the University.

FRANCE.
Angers. Memoires de la Societe Academique de Maine et Loire. 11me et 12me vols. From the Society.
Memoires de l'Academie Imperiale des Sciences, &c., de Dijon. 2me Serie, Tome 10me. 1862—63. From the Society.
Annales des Sciences Physiques et Naturelles, &c., Publié par la Societe Imperiale d'Agriculture, etc., de Lyon. 3me Serie, Tomes 2—6. 1858—62. From the Society.
Bulletin de la Societe de l'Acclimatation. From tome 10, No. 11, to tome 1, 2me Serie, No. 9. From Dr. Wilson, on the usual conditions.
DONATIONS TO LIBRARY.

Annales des Sciences Naturelles Comprenant la Zoologie la Botanie, &c. From 4me Série 10e Année, t. 19, Bot. No. 5 to Bot. tome 1, 5me Série, No. 5. From the Library Fund.


Annales des Mines. Sixième Série, tome 4, 4e liv. to tome 5me, 2e liv. From the Minister of Public Works, France.


Comptes Rendus de Séances et Mémoires de la Société de Biologie. Tome 4me. 1862. From the Society.

Journal de Conchyliologie. 3e Série, tome 4, Nos. 1 et 2. 1864. From the Editors.

Actes de l’Académie Impériale des Sciences, &c., de Bordeaux. 3me Série, 25e Année, 1er—4e Trimestres. 1863. From the Society.


Annales de la Société Entomologique de France. 3me Série, tome 8, 4me Série, tomes 1me—3me. 1861—64. From the Society.

ITALY.

Bologna. Nouvi Annali delle Scienze Naturali. Tomes 1—10; 21 Série, tomes 1—10; 3d Série, tome 1—10; 30 volumes. 1838. From the Library Fund.


Mémoires of the same. Série 2, tomes 1 et 2. From the Society.


Naples. Societa Reale di Napoli. Rendiconto dell’ Accademia delle Scienze, &c. 1862, Fasc. 1—8; 1863, Fasc. 1—7; 1864, Fasc. 1—2. 1862—63—64. From the Society.

Atti dell’ Accademia. Vol. i. 1863. From the Society.


PORTUGAL.


SPAIN.


GREAT BRITAIN AND IRELAND.


Transactions of the same. Vol. 23, part 2. From the Society.
London. The Athenæum Journal. From parts 430—441. From Dr. Wilson, on the usual conditions.
The Annals and Magazine of Natural History. From No. 72—82. From the Library Fund.
List of Members, &c., of the same. From the Society.
Philosophical Transactions of the same. 1863. Vol. 153, parts 1 and 2. From the Society.
The Reader. Nos. 65—67. From the Editor.
Transactions of the same. Vol. 24, part 2. 1863. From the same.
Two Addresses and List of Members. From the same.

UNITED STATES.

DONATIONS TO LIBRARY.

Proceedings of the American Antiquarian Society. April 7, 1864. From the Society.
Philadelphia. The Dental Cosmos. From vol. 5, No. 6, to vol. 6, No. 5. From the Editors.
Journal of the Franklin Institute. From vol. 76, No. 456, to vol. 78, No. 467. From Dr. Wilson, on the usual conditions.
American Journal of Pharmacy. From vol. 35, No. 1, to vol. 12, 3d Series, No. 6. From the Editor.
The American Journal of the Medical Sciences. 1864. From the Editor.
Mining and Scientific Press. Vol. 8, No. 6. From the Editor.

CANADA.

ASIA.

OTHER SCIENTIFIC WORKS.

Abstracts of Magnetical Observations made at the Magnetical Observatory, Toronto, U. W., during the Years 1856 to 1862, inclusive. 1863. From the University of Toronto.
Allen, Dr. H. Monograph of the Bats of North America. Smithsonian Miscellaneous Collections. Washington, June, 1864. From the Smithsonian Institution.


Description of the Fruit and Seed of Clerodend Thomsopæ. From the Author.

Berg, Dr. O. C. Darstellung und Besprechung sämtlicher in der Pharmacopœ Borussica Aufgeführten Offizinellen Gewächse. Vierter Band. Leipzig, 1863. From Dr. Wilson, on the usual conditions.

Binney, W. G. Synopsis of the Pulmonifera of North America. From the Smithsonian Institution.

Blanchard, E. L‘Organisation du Règne Animal. 37 et 38 Livr. From Dr. Wilson, on the usual conditions.


Bourquinat, M. J. R. Malacologie de l’Algerie. 1me—4me Fasc. Paris, 1863. From Dr. Wilson, on the usual conditions.

Brandt. Recueil de Mémoires Relatifs à l’Ordre des Insectes Myriapods. From the Library Fund.

British Museum. Catalogues of—

Bruce, Jas. Reisen in das Innere von Africa nach Abyssinien. A German edition of Bruce’s Travels, with a Natural History Appendix by Prof. J. F. Gmelin. 2 vols. 12mo. Leipzig, 1791. From the Library Fund.


Cabanis, Dr. J. Museum Heineanum. Theliens 1—4. Halberstadt, 1862—63. From Dr. Wilson, on the usual conditions.


Cluas, Dr. C. Uber die Grenze des Thierischen und Pfanzlichen Lebens. Leipzig, 1863. From Dr. Wilson, on the usual conditions.

Cluaton, Geo. W. Preliminary List of Plants of Buffalo and its vicinity. Buffalo, 1864. From the Author.


Mémoire sur l’Unité de Specialité des especes humaines. 1862. From the Author.


Couch, Jon.  A History of the Fishes of the British Islands.  3 vols., 8vo.  London, 1862.  From Dr. Wilson, on the usual conditions.

Dans, J. D.  I. The classification of Animals based on the principle of Cephalization.

No. III. Classification of Herbivores.  From the Author.
No. II. Note on the position of Amphibians among the classes of Vertebrates.
On the Fossil Insects from the Carboniferous formation in Illinois.  From the Author.


Further observations on the Devonian Plants of Maine, &c.  From the Author.

Davis, Dr. J. B.  Italian Anthropology.  From the Author.
The Neanderthal Skull.  London, 1864.  From the Author.

Dean, Dr. J.  The Gray Substance of the Medulla Oblongata and Trapeziun.  Washington, 1864.  Nine photographs, Author's copy.  From the Author.

De Candolle, A.  Prodromus Systematis Naturalis Regni Vegetabilis.  Pars 15.  Paris, 1864.  From Dr. Wilson, on the usual conditions.

Deshayes, M. G.  Conchylologie de l'Isle de la Réunion (Bourbon.)  Paris, 1863.  From Dr. Wilson, on the usual conditions.

Des Moulins, Ch.  Plants Rares de la Gironde.  Bordeaux, 1863.  From the Author.

Desnoyers, M. J.  Note sur des Indices matériels de la Coexistence de l'Homme avec l'Elephas meridionalis.  From the Author.


Dubois, Ch. F.  Oiseaux de l'Europe.  Livrs. 175 to 188.  Bruxelles, 1863—64.  From Dr. Wilson, on the usual conditions.

Dunker, Dr. W.  Paläontographica.  Beiträge zur Naturgeschichte der Vorwelt.  From Band 9, 5te Lief. to Band 11, 6ste Lief.  From Dr. Wilson, on the usual conditions.

Novitates Conchologicae.  From 1 Lief. to Supplement iii.  1 Lief.  From the same.

Elliott, D. G.  A Monograph of the Tetraonidae.  Parts 1 and 2.  New York, 1864.  From Dr. Wilson, on the usual conditions.

Erichson, Dr. W. F.  Naturgeschichte der Insekten Deutschlands.  Erste Abth. Vierter Band.  Berlin, 1863.  From Dr. Wilson, on the usual conditions.

Fick, Dr. L.  Physiologische Anatomie des Menschen.  8vo.  Leipzig, 1845.  From the Library Fund.

Förg, Dr. A.  Beiträge zur Kenntniss vom innern Baue des Menschlichen Gehirns.  8vo.  Stuttgart, 1844.  From the Library Fund.

Fourth Annual Report of the Board of Agriculture, of the Province of New Brunswick.  Frederick, 1864.  From the Natural History Society of New Brunswick.


Geinitz, Dr. H. B.  Dyas oder die Zeichsteinformation und das Rothliegende.  Heft 1.  Leipzig, 1861.  From Dr. Wilson, on the usual conditions.

Gerhardt, Carl. Der Stand des Diaphragma's. Tubingen, 1860. From the Author.

Goës, A. Crustaceae decapoda podophthalmata marina Sueciae. From the Nor- way University.

Græse, J. G. S. Técor de Livres rares et précieux. Tome 5me. Liv's ii. to v. From Dr. Wilson, on the usual conditions.

Grasberger, L. De Usu Pliniano. Wirceburgi, 1860. From the Author.


Flora of the British West Indian Islands. Parts 1—4. From the Execu- tors of Dr. Short.

Same. Parts 5 and 6. From the Library Fund.

Haeckel, E. Die Radiolarien (Rhizopoda Radiaria.) 2 vols. fol. Berlin, 1862. From Dr. Wilson, on the usual conditions.


Hartig, P. Recherches sur la nature et les causes de la Maladie des Pommes de Terre, en 1843. From the Author.

Hartlaub, Dr. G. Ornithologische Beiträge zur Fanna Madagascar's. Bremen, 1861. From Dr. Wilson, on the usual conditions.


Die Urwelt der Schweiz von O. wald Heer. Erste zu Eilte Lief. Zurich, 1864. From Dr. Wilson, on the usual conditions.

Heller, Dr. C. Die Crustaceen des Südlichen Europa. Wien, 1863. From Dr. Wilson, on the usual conditions.

Henry, L. De Residentia Beneficiatorum Lovanii. 1863. From the Author.

Hewitson, Wm. O. Exotic Butterflies. Parts 49 to 52. London, 1864. From Dr. Wilson, on the usual conditions.

Hoffman, H. Index Fungorum. Lipsie, 1863. From Dr. Wilson, on the usual conditions.

Hoffmeister, Dr. W. Die Botanischen Ergebnisse der Reise seiner K. Hoheit des Prinzen Waldemar von Pfeissen, in den Jahre 1845 und 1846. Berlin, 1862. From Dr. Wilson, on the usual conditions.

Holmber, C. A. Norske Vægtloddler fra Fjortende Aarhundrede. Christiania, 1863. From the Norway University.

Hortus Christianiensis. From the Norway University.

Howse, R. A synopsis of the geology of Durham and part of Northumber- land. By Richard Howse and J. W. Kirkby. From the Authors.

Jager, Dr. G. v. Ueber die Wirkung-n des Arseniks auf Pflanzen. Stuttgart, 1864. From the Author.

Jan, Prof. G. Elenco sistematico degli Osidì, Milano, 1863. From the Au- thor.


Journal of the Select Council of the City of Philadelphia, beginning Jan. 5 and ending July 2, 1863. From the Select Council.

Kálman, G. L. A Lég Urai. Kepek a Madárvilágból. 1 Füzet. Pest, 1864. From the Author.


Kirkby. See Howse.

Klein, J. De Iansenismi origine. Vratislaviae, 1863. From the Author.

Koninck, L. de. Mémoire sur les Fossiles Paléozoiques recueillies dans l'Inde par M. le Dr. Fleming. Liege, 1863. From the Author.

Notice sur une Novelle espèce de Davidsonia. Liege, 1855. From the Author.

Mémoires de Paléontologie. Bruxelles, 1857—58. From the Author.

Nineteen Reports. From the same.

Mémoires sur les genres et les sous-genres des Brachiopodes. Liege, 1859. From the Author.

Recherches sur les Animaux Fossiles. Premiere Partie. Liege, 1847. From the Author.


Descriptions of six new species of Unionidae, from Lake Nyasza, Central Africa. From the Author.


Linden, J. Piscatorem. Iconographie des Orchidées. Premier Volume. Brussel's, 1860. From Dr. Wilson, on the usual conditions.


Lorenzi, See Naleti.

Malaise, C. Mémoire sur les Decouvertes Paléontologiques faites en Belgique, jusqu'à ce jour. Liege, 1860. From the Author.


Marcon, J. Une reconnaissance géologique au Nebraska. From the Author.


Martini and Otto's Buffon's Natural History. Berlin, 1771-1807. 61 vols., 8 vo. From Dr. Wilson, on the usual conditions.

Martius, Dr. C. F. P. V. Glossaria Linguarum Brasiliensium. Einlangen 1863. From the Author.

Die Fieber-Rinde, der China Baum. From the Author.

Medical Theses, sixty-nine. From the University of Wurzburg.


Miquel, F. A. G. Annales Musee Botanici Lugduno-Batavi. Tome 1, Fasc. 1 to 8. From Dr. Wilson, on the usual conditions.

DONATIONS TO LIBRARY.

Molkenbaur. See Dozy.
Morelet, A. Notice sur l'Histoire Naturelles des Acoes suivie d'un description des Mollusques terrestres de cet Archipel. Paris, 1860. From Dr. Wilson, on the usual conditions.
Séries Conchylilogie comprant l'enumeration des Mollusques. 3me Livr. Avr. 1863. Paris. From Dr. Wilson, on the usual conditions.
Oldham, Thomas. Paleontologia Indica. 2 iv. to 3 v. Calcutta, 1863—64. From the Geological Survey of India.
Palæontologiae Society's Publications. Vol. 16, issued for 1862. From Dr. Wilson, on the usual conditions.
Palæontologie Francaise, Terrain Crétacé, Liv. 15 to Terrain Jurassique, Liv. 5 and Crétacé, Liv. 16. From Dr. Wilson, on the usual conditions.
Pallas, P. S. Reise durch verschiedene Provinzen des Russischen Reichs. 5 vols., 4to. St. Petersburgh, 1801. From Dr. Wilson, on the usual conditions.
Tableau Physique et Topographique de la Tauride par P. S. Pallas, 1 vol., 4to. St. Petersburgh, 1795. From the same.
Peter, Dr. H. Untersuchungen über den Bau und die Entwickelungsgeschichte der Bruthknospen. Hameln, 1863. From Dr. Wilson, on the usual conditions.
Pfeiffer, Dr. L. Novitates Conchologicae. 30 Lief. Cassel, 1863. From Dr. Wilson, on the usual conditions.
Pictet, F. J. Materiaux pour la Paleontologie Suisse. 3 vols. Geneva, 1858—63. From Dr. Wilson, on the usual conditions.
Poggendorff, J. C. Biographisch-literarisches Handwörterbuch zur Geschichte der exacten Wissenschaften. Sechste Lief. Leipzig, 1863 From Dr. Wilson, on the usual conditions.
Prestel, Dr. M. A. F. Das geographische System der Winde über dem Atlantischen Ocean. Emden, 1863. From the Author.
Quenstedt, F. A. Geologische Ausflüge in Schwaben. Tubingen, 1864. From Dr. Wilson, on the usual conditions.
Rabenhorst, Dr. L. Beiträge zur Nüheren Kenntniss und Verbreitung der Algen. Heft 1. Leipzig, 1863. From Dr. Wilson, on the usual conditions.
Reakirt, Tryon. Notes on Central American Lepidoptera. No. 2. From the Author.
Reeve, L. Conchologia Iconica. Parts 232 to 237. London, 1863. From Dr. Wilson, on the usual conditions.
Report of the Secretary of the Navy in relation to Armored Vessels. Washington, 1864. From the Navy Department.
Report, Sixteenth Annual, of the Regents of the University of the State of New York. Appendix D. From the Regents.
Report of the Secretary of the Treasury for the year ending June 30th, 1863. Washington, 1863. From the Treasury Department.
Results of the Meteorological Observations made at the Magnetic Observatory, Toronto, C. W., during the years 1854 to 1862, inc. 5 Vols., 4to. Toronto, 1864. From the Observatory.


Roemer, Dr. F. Die Fossile Fauna der Silurischen Diluvial-Geschiese von Sadewitz bei Oels in, Nieder-Schlesien. Breslau, 1861. From Dr. Wilson, on the usual conditions.

Römer, Dr. E. Die Familien, Genera, &c., der zweifuskeligen, kopflosen Mollusken mit inneren Ligament. From Dr. Wilson, on the usual conditions.


Rutimeyer, Dr. L. Die Fauna der Pfahlbauten in der Schweiz. Basel, 1861. From Dr. Wilson, on the usual conditions.

Sandberger, Dr. Fr. Die Flora der Oberen Steinkohlenformation im Badischen-Schwarzwald. From the author.

Sars, M. Oversigt over de i den Norsk-Arctiske Region. From the Norway University.

Schimper, W. Ph. Icones Morphologicae atque Organographicae Introductionem synopsi Muscorum Europarum. Stuttgartiae, 1860. From Dr. Wilson, on the usual conditions.


Schmarda, Ludwig K. Neue Wirbellose Thiere beobachtet und gesammelt auf einer Reise um die Erde, 1853 bis 1857. Band 1. Leipzig, 1859. From Dr. Wilson, on the usual conditions.

Schmidt, Dr. O. Die Spongien des Adriatischen Meeres. Leipzig, 1862, and Supplement, 1864. From Dr. Wilson, on the usual conditions.

Schenck, Dr. L. V. Reizen und Forschungen in Amurlande in den Jahre, 1854—1856. Band 1. 1es und 2es Lief. St. Petersburg, 1859—60. From Dr. Wilson, on the usual conditions.

Setschenow, Dr. J. Physiologische Studien über die Hemmungsmechanismen für die Reflexthätigkeit des Rückenmarks, im Gehirne des Frosches. Berlin, 1863. From Dr. Wilson, on the usual conditions.


Siebold, C. Th. E. v. Die Süßwasserfische von Mittel-Europa. Leipzig, 1863. From Dr. T. B. Wilson, on the usual conditions.

Silva, L. A. R. Corpo Diplomatico Portuguez. Tomes 1 and 2. Lisbon, 1862. From the Academy of Lisbon.

Smithsonian Miscellaneous Collections, Vol. 5. Washington, 1864. From the Smithsonian Institution.


Smithsonian Report for 1862. From the Institution.

Sowerby, G. B. Thesaurus Conchyliorum, Part 22. London, 1863. From Dr. Wilson, on the usual conditions.

Trask, Dr. J. B. A Register of the Earthquakes in California from 1800 to 1863. From the Author.

Troschel, Dr. F. H. Das Gebia der Schnecken. Fünfte Lief. Berlin, 1863. From Dr. Wilson, on the usual conditions.

Trotton's Linne. 7 Vols., 8vo. London, 1802—6. Thos. Say's copy, with MSS. notes and autograph. From Dr. Wilson, on the usual conditions.

Wagner, Dr. R. Handwörterbuch der Physiologie, mit Rücksicht auf Physiologische Pathologie. 4 Vols. in 5. Braunschweig, 1842. From the Library Fund.


Wilcocks, Dr. A. Thoughts on the Influence of Ether in the Solar System. From the Author.

Winchell, Alex. Fossils from the Potsdam of Wisconsin and Lake Superior. From the Author.

Winchell, Alex. On the Prairies of the Mississippi Valley. From the Author.

Wolf, Dr. R. Die Sonne und ihre Flecken. Zurich, 1861. From the Author.


Van der Hoeven, J. Bijdragen tot de Natuurlijke Geschiedenis van der Negertam. Leiden, 1842. From Dr. Wilson, on the usual conditions.

Vanni. See Manetti.

Verdeil, F. See Robin.

Verrill, E. A. Catalogue of the Reptiles and Batrachians found in the vicinity of Norway, Oxford Co., Me. Catalogue of the Birds found at the same place. From the Author.


Zanardini, J. Plantarium in Mari rubro hucusque collectarum enumeratio. Venetiis, 1858. From Dr. Wilson, on the usual conditions.

Zeller, P. C. Chiloniidarum et Crambidarum genera et species. From the Smithsonian Institution.
INDEX OF GENERA.

Aega ................................................................. 155  |  Bonasa .......................................................... 23
Aegialites ......................................................... 66  |  Bopyroides ...................................................... 156
Achirus ............................................................. 215  |  Botaurus .......................................................... 65
Acris ................................................................. 182  |  Brachybel ......................................................... 187
Actiturus ......................................................... 67  |  Bucco .............................................................. 243
Actodromas ......................................................... 67  |  Butorides ......................................................... 64
Adamaster ......................................................... 117, 119, 142
Agalychnis ......................................................... 184
Aix ................................................................. 72  |  Calidris ............................................................ 67
Alauda ............................................................... 248  |  Calliste ............................................................ 286
Albomops ............................................................ 281  |  Campeloma ......................................................... 153
Alburmis ............................................................. 282  |  Campestoma ......................................................... 284
Alce ................................................................. 244  |  Canace .............................................................. 23
Alcedo ................................................................. 243  |  Caprella ............................................................ 156
Alopias ............................................................... 148, 261  |  Careharodon ........................................................ 260
Alinus ................................................................. 18  |  Carpiodes .......................................................... 285
Ameurus ............................................................. 276  |  Carphophago ........................................................ 50
Amia ................................................................. 276  |  Cassicus ............................................................. 107
Amnothea ............................................................ 158  |  Cassinia ............................................................. 182
Amphilis ............................................................ 251  |  Caudiosona ........................................................ 166
Amphilasa ........................................................... 158  |  Centroblenius ...................................................... 209
Amphithoe ........................................................... 156  |  Cenocercus ........................................................ 23
Amphithonotus ....................................................... 158  |  Centrosyullum ...................................................... 264
Anas ................................................................. 70, 72, 244  |  Cephaloxys ........................................................ 18
Anclusosa ............................................................ 97  |  Ceratichthys ......................................................... 277
Aneltrrops ........................................................... 230  |  Certhia .............................................................. 244
Aniella ............................................................... 230  |  Certhiola ............................................................ 271
Anisarchus .......................................................... 210  |  Cestration .......................................................... 261
Anolis ................................................................. 169  |  Certhinus ............................................................ 256
Anonyx ............................................................... 167  |  Chaemopsetta ....................................................... 218
Anser ............................................................... 70  |  Chamaeleolis ......................................................... 168
Aprionodon ......................................................... 262  |  Charadrius ......................................................... 66, 248
Arctozonus .......................................................... 188  |  Chaulelasmas ....................................................... 72
Ardea ................................................................. 63, 245  |  Chelysoma .......................................................... 161
Ardetta ............................................................... 64  |  Chlorophanes ......................................................... 277
Artamus .............................................................. 50  |  Chrasmus ............................................................. 281
Aristida .............................................................. 19  |  Citharichthys ....................................................... 220
Atractosteus ......................................................... 153  |  Coereba ............................................................. 265
Aythya ............................................................... 72  |  Columbia .......................................................... 248
INDEX OF GENERA.

Colymbus.......................... 21, 245
Conirostrum....................... 272
Coracias........................... 242
Corvus.............................. 242
Cuculus............................ 243
Cupidonia.......................... 22
 Cyclopterus....................... 189
Cylindrostes...................... 183
Cyphochorea....................... 75, 90
Cynthia............................ 159
 Cyprimeria......................... 212
Cygnathus......................... 182
Cytherea........................... 212

Dacnis............................ 106, 268
Dafta............................... 71
Demiegretta....................... 63
Dendragapus....................... 23
Dendrocygna....................... 70
Desmodium......................... 17
 Didunculus......................... 50
Diglossa............................ 273
Diglossopsis....................... 275
Diploglossus....................... 179, 227
Dosiniopsis......................... 213

Echeneis............................ 69
Ecophora............................ 211
Eleocharis......................... 18
Elephantopus....................... 18
Emberiza............................ 253
Epidalea............................ 181
Kurenates.......................... 68, 107
Erycinella......................... 212
Euchalarodus....................... 216, 221
Kugomphodus....................... 260
Kalamia............................ 281
Kamesogrammus..................... 210
Kumicourtremus..................... 190
Kupagurus......................... 153
Kuprisit.......................... 168

Falco............................... 237
Fasciolaria......................... 211
Florida............................. 62
Fregatta........................... 85, 91
Fringilla.......................... 254
Fulica............................. 69, 246
Fuliclid......................... 71

Galeocerdo......................... 263
Galeorhini......................... 261
Gallinago......................... 67
Gallinula......................... 69
Gambetta........................... 68
Gammarus......................... 157
Garzetta......................... 63
Gerrhonotus......................... 179
Gomphobates......................... 182

Goniobasis......................... 3, 24, 111
Gronias............................ 231
Gynnotus.......................... 151

Halocyptena........................ 78, 90
Heliotropium....................... 18
Hemitacnis......................... 271
Heptancythus....................... 150
Herodias........................... 65
Heteroglossa....................... 182
Hemianatis......................... 182
Himantopus......................... 67
Hippoglossoides................... 217
Hippoglossus....................... 198, 220
Hippolyte......................... 153
Hirundo............................. 257
Hoplobatrachus..................... 182
Hybognathus....................... 283
Hybopsis........................... 279
Hydrocotyle......................... 17
Hyla................................. 182
Hylella............................. 182
Hylanbates......................... 182
Hylomyzon......................... 285
Hyperolius......................... 182
Hypsilepis......................... 279
Hypsopsetta......................... 197

Ibis................................. 65
Ichthomyzon......................... 276
Ichtyolurus......................... 276
Idothea............................ 155
Ignania............................. 227
Isuropsis........................... 260
Iulius.............................. 10

Labrus.............................. 57
Laemancalus......................... 176
Lampropholis....................... 179
Lanites............................. 238
Larus............................... 245
Lepidopsetta......................... 196
Lepidosteus......................... 183, 276
Lepidostuuus......................... 183
Leptecheneides..................... 69
Leptoblenius......................... 209
Leptoclinus......................... 210
Leptoglossa......................... 227
Leptopolis......................... 182
Limanda........................... 217
Limosa............................... 64
Lioplax............................. 152
Liopsetta......................... 217
Liparis............................. 190
Lirosoma........................... 212
Lopbopsetta......................... 220
Lophostoma......................... 251
Locia................................. 216
Lumpenus........................... 113

Lymnaea............................ 113
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymnula</td>
<td>152</td>
</tr>
<tr>
<td>Lyrurus</td>
<td>23</td>
</tr>
<tr>
<td>Majacanas</td>
<td>117, 142</td>
</tr>
<tr>
<td>Malacosteus</td>
<td>188</td>
</tr>
<tr>
<td>Mareca</td>
<td>71</td>
</tr>
<tr>
<td>Melantho</td>
<td>152</td>
</tr>
<tr>
<td>Mentha</td>
<td>18</td>
</tr>
<tr>
<td>Merops</td>
<td>243</td>
</tr>
<tr>
<td>Messeschna</td>
<td>2</td>
</tr>
<tr>
<td>Metoponops</td>
<td>198</td>
</tr>
<tr>
<td>Micropalama</td>
<td>67</td>
</tr>
<tr>
<td>Monasa</td>
<td>288</td>
</tr>
<tr>
<td>Monocondyloea</td>
<td>286</td>
</tr>
<tr>
<td>Morcellistena</td>
<td>105</td>
</tr>
<tr>
<td>Motacilla</td>
<td>256</td>
</tr>
<tr>
<td>Muscicapra</td>
<td>255</td>
</tr>
<tr>
<td>Mustelia</td>
<td>148, 263</td>
</tr>
<tr>
<td>Myosotis</td>
<td>18</td>
</tr>
<tr>
<td>Myxophyes</td>
<td>182</td>
</tr>
<tr>
<td>Myzopsetta</td>
<td>217</td>
</tr>
<tr>
<td>Nectris</td>
<td>117, 123, 143</td>
</tr>
<tr>
<td>Nettion</td>
<td>72</td>
</tr>
<tr>
<td>Noetia</td>
<td>211</td>
</tr>
<tr>
<td>Notorhynchus</td>
<td>148</td>
</tr>
<tr>
<td>Nototrema</td>
<td>182</td>
</tr>
<tr>
<td>Noturus</td>
<td>277</td>
</tr>
<tr>
<td>Numenius</td>
<td>68</td>
</tr>
<tr>
<td>Numida</td>
<td>247</td>
</tr>
<tr>
<td>Nyctherodius</td>
<td>65</td>
</tr>
<tr>
<td>Nyctiarea</td>
<td>65</td>
</tr>
<tr>
<td>Nyroca</td>
<td>72</td>
</tr>
<tr>
<td>Oceanites</td>
<td>82, 90</td>
</tr>
<tr>
<td>Oceanodroma</td>
<td>74, 89</td>
</tr>
<tr>
<td>Octozena</td>
<td>186</td>
</tr>
<tr>
<td>Oideumia</td>
<td>72</td>
</tr>
<tr>
<td>Oligosoma</td>
<td>180</td>
</tr>
<tr>
<td>Ophidium</td>
<td>199</td>
</tr>
<tr>
<td>Oriolus</td>
<td>242</td>
</tr>
<tr>
<td>Orthogony</td>
<td>257</td>
</tr>
<tr>
<td>Orthopsetta</td>
<td>198</td>
</tr>
<tr>
<td>PachyGLOSSA</td>
<td>226</td>
</tr>
<tr>
<td>Paecilocnetta</td>
<td>71</td>
</tr>
<tr>
<td>Paludicola</td>
<td>180</td>
</tr>
<tr>
<td>Paludina</td>
<td>152</td>
</tr>
<tr>
<td>Paralepis</td>
<td>187</td>
</tr>
<tr>
<td>Paralepsis</td>
<td>151</td>
</tr>
<tr>
<td>Paralichthys</td>
<td>197</td>
</tr>
<tr>
<td>Paraphrlys</td>
<td>196</td>
</tr>
<tr>
<td>Parus</td>
<td>257</td>
</tr>
<tr>
<td>Pavo</td>
<td>247</td>
</tr>
<tr>
<td>Pediecetes</td>
<td>23</td>
</tr>
<tr>
<td>Pelagodroma</td>
<td>87, 91</td>
</tr>
<tr>
<td>Pelecanus</td>
<td>245</td>
</tr>
<tr>
<td>Pentacta</td>
<td>161</td>
</tr>
<tr>
<td>Phoenicopleurus</td>
<td>65</td>
</tr>
<tr>
<td>Phascolosomum</td>
<td>159</td>
</tr>
<tr>
<td>Phasianus</td>
<td>247</td>
</tr>
<tr>
<td>Phynosoma</td>
<td>178</td>
</tr>
<tr>
<td>Phylomemusa</td>
<td>181</td>
</tr>
<tr>
<td>Physa</td>
<td>114</td>
</tr>
<tr>
<td>Picus</td>
<td>243</td>
</tr>
<tr>
<td>Pimelometopon</td>
<td>58</td>
</tr>
<tr>
<td>Pimephales</td>
<td>282</td>
</tr>
<tr>
<td>Pipra</td>
<td>257</td>
</tr>
<tr>
<td>Pittasoma</td>
<td>287</td>
</tr>
<tr>
<td>Plagiusia</td>
<td>216</td>
</tr>
<tr>
<td>Planorbi</td>
<td>111</td>
</tr>
<tr>
<td>Plagyrus</td>
<td>281</td>
</tr>
<tr>
<td>Platalea</td>
<td>65</td>
</tr>
<tr>
<td>Platicthys</td>
<td>197</td>
</tr>
<tr>
<td>Platypodon</td>
<td>262</td>
</tr>
<tr>
<td>Pletolax</td>
<td>231</td>
</tr>
<tr>
<td>Pleuronectes</td>
<td>196</td>
</tr>
<tr>
<td>Pleurodera</td>
<td>181</td>
</tr>
<tr>
<td>Pleuronicthys</td>
<td>197</td>
</tr>
<tr>
<td>Pluchea</td>
<td>18</td>
</tr>
<tr>
<td>Podiceps</td>
<td>70</td>
</tr>
<tr>
<td>Podilymbus</td>
<td>70</td>
</tr>
<tr>
<td>Pogonichthys</td>
<td>277</td>
</tr>
<tr>
<td>Polydesmus</td>
<td>6</td>
</tr>
<tr>
<td>Polypedates</td>
<td>182</td>
</tr>
<tr>
<td>Poleprosopus</td>
<td>207</td>
</tr>
<tr>
<td>Ponatopsetta</td>
<td>217</td>
</tr>
<tr>
<td>Porzana</td>
<td>69</td>
</tr>
<tr>
<td>Procellaria</td>
<td>79, 90</td>
</tr>
<tr>
<td>Protocardia</td>
<td>211</td>
</tr>
<tr>
<td>Proteroglossa</td>
<td>183</td>
</tr>
<tr>
<td>Psittacus</td>
<td>239</td>
</tr>
<tr>
<td>Pseudopleuroneutes</td>
<td>216</td>
</tr>
<tr>
<td>Puffinus</td>
<td>117, 127, 143</td>
</tr>
<tr>
<td>Pyxicephalus</td>
<td>182</td>
</tr>
<tr>
<td>Querquedula</td>
<td>71</td>
</tr>
<tr>
<td>Radiolites</td>
<td>214</td>
</tr>
<tr>
<td>Rallus</td>
<td>69, 247</td>
</tr>
<tr>
<td>Rauhastos</td>
<td>241</td>
</tr>
<tr>
<td>Rana</td>
<td>182</td>
</tr>
<tr>
<td>Recurrieostrea</td>
<td>67</td>
</tr>
<tr>
<td>Reinhardtii</td>
<td>218</td>
</tr>
<tr>
<td>Remoreae</td>
<td>60</td>
</tr>
<tr>
<td>Reniceps</td>
<td>261</td>
</tr>
<tr>
<td>Rhina</td>
<td>264</td>
</tr>
<tr>
<td>Rhiinhchthys</td>
<td>278</td>
</tr>
<tr>
<td>Rhyacophilus</td>
<td>67</td>
</tr>
<tr>
<td>Rhytnglossa</td>
<td>226</td>
</tr>
<tr>
<td>Schizostoma</td>
<td>92, 112</td>
</tr>
<tr>
<td>Genus</td>
<td>Page(s)</td>
</tr>
<tr>
<td>---------------</td>
<td>---------</td>
</tr>
<tr>
<td>Scirpus</td>
<td>18</td>
</tr>
<tr>
<td>Scoliodon</td>
<td>263</td>
</tr>
<tr>
<td>Sebastes</td>
<td>59, 146</td>
</tr>
<tr>
<td>Sebastodes</td>
<td>146</td>
</tr>
<tr>
<td>Sebasteomus</td>
<td>147</td>
</tr>
<tr>
<td>Sebastesomus</td>
<td>147</td>
</tr>
<tr>
<td>Semiosisus</td>
<td>57</td>
</tr>
<tr>
<td>Semotilus</td>
<td>277</td>
</tr>
<tr>
<td>Sebastes</td>
<td>231</td>
</tr>
<tr>
<td>Sodis</td>
<td>151</td>
</tr>
<tr>
<td>Somniosus</td>
<td>264</td>
</tr>
<tr>
<td>Spatha</td>
<td>109, 113</td>
</tr>
<tr>
<td>Spathula</td>
<td>71</td>
</tr>
<tr>
<td>Spirobolus</td>
<td>15</td>
</tr>
<tr>
<td>Squallus</td>
<td>280</td>
</tr>
<tr>
<td>Squallus</td>
<td>263</td>
</tr>
<tr>
<td>Squatarola</td>
<td>66</td>
</tr>
<tr>
<td>Semiosisus</td>
<td>159</td>
</tr>
<tr>
<td>Semotilus</td>
<td>210</td>
</tr>
<tr>
<td>Strephobasis</td>
<td>5</td>
</tr>
<tr>
<td>Strepsilas</td>
<td>66</td>
</tr>
<tr>
<td>Strepsipteron</td>
<td>50</td>
</tr>
<tr>
<td>Strix</td>
<td>238</td>
</tr>
<tr>
<td>Sturinus</td>
<td>249</td>
</tr>
<tr>
<td>Succinea</td>
<td>109</td>
</tr>
<tr>
<td>Sudis</td>
<td>187</td>
</tr>
<tr>
<td>Symphemia</td>
<td>67</td>
</tr>
<tr>
<td>Tantalus</td>
<td>246</td>
</tr>
<tr>
<td>Tanagra</td>
<td>253</td>
</tr>
<tr>
<td>Tetrao</td>
<td>23, 247</td>
</tr>
<tr>
<td>Thecaglossa</td>
<td>227</td>
</tr>
<tr>
<td>Thelliuss</td>
<td>117, 122, 142</td>
</tr>
<tr>
<td>Tomodan</td>
<td>166</td>
</tr>
<tr>
<td>Tomopterna</td>
<td>182</td>
</tr>
<tr>
<td>Toluca</td>
<td>166</td>
</tr>
<tr>
<td>Trachycephalus</td>
<td>182</td>
</tr>
<tr>
<td>Trichirus</td>
<td>199, 205</td>
</tr>
<tr>
<td>Tringa</td>
<td>67, 246</td>
</tr>
<tr>
<td>Trichilus</td>
<td>244</td>
</tr>
<tr>
<td>Trochocopus</td>
<td>57</td>
</tr>
<tr>
<td>Trypanostoma</td>
<td>4, 112</td>
</tr>
<tr>
<td>Turdus</td>
<td>249</td>
</tr>
<tr>
<td>Turritella</td>
<td>211</td>
</tr>
<tr>
<td>Typhlophthalmi</td>
<td>228</td>
</tr>
<tr>
<td>Unio</td>
<td>108, 113, 285</td>
</tr>
<tr>
<td>Uropsetta</td>
<td>198</td>
</tr>
<tr>
<td>Uta</td>
<td>176</td>
</tr>
<tr>
<td>Xiphosuru</td>
<td>168</td>
</tr>
</tbody>
</table>
Announcement of the publication of the Proceedings for December, 1864, 21.
Canby, W. M., Notes of Botanical Visits to the lower part of Delaware and the Eastern Shore of Maryland, 2, 16.
Cassin, J., Preamble and resolutions with reference to the late President Isaac Lea, 1; Remarks on rare birds presented to the Academy by the Smithsonian Inst., 50; Notes on an examination of the Birds of the Group Coerebinæ, 92, 263; Notice of the bequest of Mr. Ashmead's collection of Algae to the Academy, 145; First Ornithologæ, Part I, 214, 234; Notes on some species of Birds from South America, 276, 286.
Cooper, J. G., On a new Cormorant from the Farallone Islands, Cal., 258.
Conrad, T. A., Notes on Shells, with Descriptions of new fossil Genera and Species, 186, 211.
Cope, E. D., Contributions to the Herpetology of Tropical America, 165, 166; On the Limits and Relations of the Ictiniformes, 166, 181; On a b ind Silurid from Pennsylvania, 214, 231; On the Characters of the higher groups of Reptilia squamata, and especially of the Diapoglossa, 214, 224; Partial Catalogue of the Cold-blooded Vertebrata of Michigan, 276.

Elections for 1864, 293.
Emsis, J., Additions to the Catalogue of Stars which have changed their colors, 49, 51; On the Influence of the Earth's Atmosphere on the Color of Stars, 152, 161.

Gill, Theo., Note on the Nomenclature of Genera and Species of E-hemioideæ, 49, 59; Description of a new laubrid Genus allied to Trochocopus, 49, 57; Critical Remarks on the Genera Sebastes and Sebasteus, 50, 115; Second Contribution to the Selachology of California, 147; Remarks on several points in Ichthyology and Conchology, 151; Synopsis of the Pleuronectoids of the eastern coast of North America, 186, 214; Synopsis of the Cyclopteroids of eastern North America, 186, 189; Notes on the Paralepidoids and Microstomatoids, and on some peculiarities of Arctic Ichthyology, 186, 187; Synopsis of the Pleuronectoids of California and North-western America, 186, 191; Descriptions of a new Generic type of Pleuronectoids, 186, 193; On the Affinities of several doubtful British Fishes, 186, 199; Notes on the Family Stichæids, 186, 203; Descriptions of new genera and species of Eastern American Pleuronectoids, 186, 220; Synopsis of the Eastern American Sharks, 258.

Helmuth, C. A., New Species of Mor-dellestina collected in Illinois, 49, 16.
Index of Genera, 313.

Lawrence, G. N., Descriptions of New Species of Birds of the Families Caerebidae, Tanagridae, Icteridae and Scolopacidae, 106.

Lea, H., Description of a new Genus of the Family Melanidae, 1, 2; Description of eleven new species of Indigenous Melanidae, 1, 3; Description of Planorbis Newberryi, 1, 5; Descriptions of six new species of Unionidae from Lake Nyassa, Central Africa, 92, 108; Descriptions of six new species of Succinea, 92, 109; Descriptions of thirteen new species of Melanidae, 92, 111; Description of a new species of Planorbis, 92, 111; Descriptions of five new species of Symnaea, 92, 113; Descriptions of two new species of Unionidae from South Africa, 92, 113; Descriptions of twenty-four new species of Physa of the United States and Canada, 92, 114; New Unionidae, Melanidae, &c., chiefly of the United States, 145; Descriptions of six new Western Asiatic Unionidae, 276, 285.

Leconte, Dr. J. L., Remarks on Dr. Gerstaecker's reference to his Classification of the Coleoptera of North America, 49.


Officers for 1865, 292.

Rand, Dr. B. H., Report of the Recording Secretary for 1864, 288.

Resolutions to deposit the specimens of antique art belonging to the Academy in the Museum of the American Philosophical Society, 21.

Sergeant, J. D., Librarian's Report for 1863, 19; Report for 1864, 289.

Standing Committees for 1864, 19.

Stimpson, Dr. Wm., Descriptions of new marine Invertebrata from Puget's Sound, &c., 145, 153.

Tryon, Geo. W., Jr., Synonymy of the Species of Streptomatidae, No. 2, 20, 24; Part 3, 49, 92.

Wilcocks, Dr. A., Thoughts on the influence of Ether in the Solar System, 1, 21, 49, 50.

Wilson, Dr. T. B., Resignation as President, 153.

Winchell, Alex., Description of a Gar Pike, supposed to be new, 165, 183.

Wood, Dr. H. C., Descriptions of new Species of North American Polydesmidae, 1, 6; Descriptions of new species of North America Ilalidae, 1, 10; Description of new Genera and species of North America Myriapoda, 186.
Monasa pallescens.