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Genera of North American REPTILIA, *and a Synopsis of the species. By* RICHARD HARLAN, M. D.

(Continued from page 364 of Vol. V.)

ORDER. SAURIA.*

Characters of the ORDER—Heart composed of two auricles, and, in some instances, of two ventricles: ribs and sternum perfect: lungs vesicular: voice generally restricted to hissing: jaws armed with teeth: tongue, for the most part, slender and extensible: skin covered with scales or plates: generally furnished with four legs, each with five unguiculated toes: male furnished with an exsertile penis, sometimes simple, at others bifurcated; impregnation internal: oviparous; eggs covered with a shell more or less hard: carnivorous.

1st GENUS. AMEIVA. Cuvier.

Lacerta Ameiva, Gmel. Lacépède.
Les Sauvegardes, Cuvier.
Le Tupinambis, Daudin, &c.

Species of this genus exist in Asia, Africa, and America: the Baron Cuvier thus characterises the genus. All the scales small, without carena: an obsolete range of pores beneath each thigh: teeth

* From σαῦρος, (Lizard.) This order includes the genera *Lacerta*, and *Draco*, of Linneus.

notched (dentelées). The same author divides the genus into two sections, viz: *Sauvegardes*, with the tail more or less compressed: scales of the abdomen longer than broad: living on the borders of streams. 2d *Ameiva*, properly so called; which differs from the preceding, in having the tail cylindrical, and furnished like the abdomen, with transverse ranges of square scales, broader than long: all the scales of the throat small: head pyramidal: those included in the last division are inhabitants of America. Whilst South America furnishes us with numerous species, one only has hitherto been discovered as an inhabitant of the United States.

Ameiva *tesselata*.

A. *tesselata*, Say. Long's Exp. to the Rocky Mountains, Vol. II. p. 50.

Char.—*Above* black, marked with nine or ten longitudinal lines, and eighteen or twenty transverse ones, dividing the whole surface in a tesselated manner, the lines being brownish on the back, yellowish on the sides: scales of the back small, convex, and rounded: *beneath* blueish-white, throat and neck yellowish: *head* olivaceous, covered with plates: scales on the throat, somewhat larger than those on the back: anterior feet yellowish within, covered with minute scales; on the exterior and posterior sides, greenish-white, with confluent black spots and minute scales; the anterior side yellowish, with larger

scales: *pores of the thighs* very distinct and prominent: *tail* elongated, brownish above, spotted with black near the base: beneath impure white, immaculate: the scales carinated,* and placed in transverse series.

Length one foot. Tail eight and a half inches. Inhabits the Arkansa territory.

The last family of this order, according to the arrangement of M. Cuvier, is the "*Scincoidiens*," distinguishable by the shortness of their legs, the fixidity of the tongue, and by the regular imbricated scales.

2nd Genus. SCINCUS. Daudin.

Characters of the Genus.—Body more or less cylindrical, covered with uniform, shining scales: imbricated as in the Carp: tongue fleshy, scarcely extensible, and notched: jaws armed with closely approximated teeth, with two small palatine rows: the anus, penis, eye, and ear, resemble those of the Lizards.

There are numerous species of Scinks in the warm climates of both continents. Four species are at present known as inhabitants of the United States.† Not venomous.

* The carinated scales appear to be peculiar to this species of the genus Ameiva.

† The Baron Cuvier remarks with his usual learning: "The Greeks and the Romans gave the name of *Scincus* to

Scincus *quinquelineatus.*

Synonyma. S. *quinquelineatus*, Schneider, Hist. Amphib. fasc. secund. p. 201.

Lacerta quinquelineata, Linn. and Gmel.

Lacerta 5-lineata, var. Green. Jour. A. N. S. Vol. I. p. 348.

Le Scinque a cinque raies, Daudin, Hist. Nat. des Rep. p. 272. pl. LV. fig. 1.

Le lézard strié, Daub. Lacépède.

Lacerta fasciata, Var. Linn. et Gmel.

Lacerta caudâ cæruleâ, Catesby, Nat. Hist. Carol. Vol. II. pl. 67.

Lacerta marianus minor caudâ cæruleâ, Petiver, Mus. Tom. I. pl. I. fig. 1.

Le lézard à queue bleue, Daubenton, Encyc. Method. Idem, Lacépède, Latreille. Vulgo, *The Five-lined lizard.*

Char.—*Above* blackish-brown, marked with five whitish longitudinal lines, the dorsal one bifurcating near the neck: *beneath* of a clear silver-blue: *head* covered with plates, brown, elongated, and flattened, with six longitudinal whitish lines, one above and beneath each eye, with two on the summit, joining before and behind: *tail* similar in colour to the body; the lines gradually effacing, are lost about the middle: all the limbs brown without, marked with a

the *terrestrial crocodile*, consequently to a *sauvegarde*, (Ameiva,) to which they attributed great virtues; but since the middle ages, the species above cited, (S. officinalis,) is generally sold under this name, for similar purposes. The Orientals in particular, regard it as a powerful aphrodisiac. Cur. Regne Anim. V. II. p. 53.

single white line posteriorly, within whitish: posterior extremities with the toes longer than the anterior.

Total length from seven to ten inches; tail nearly the length of the body.

Inhabits South Carolina, beneath the bark of trees. Specimens in the Cab. of the A. N. S. When the tail of the Scink is broken and reproduced, it is of a blue colour.

Scincus *erythrocephalus*.

S. *erythrocephalus*, Gilliams. Journal of the A. N. S. Vol. I. p. 461. pl. XVIII. Vulgo, *Red-headed scorpion.*

Char.—*Above* reddish-brown, tinged with cupreous: *beneath* whitish: *head* red above, whitish beneath, wider posteriorly than at the neck.

Total length eleven inches; tail rather longer than the body, or six and a half inches.

Inhabits southern states. Cab. of the A. N. S.

Scincus *bicolor*.

S. *bicolor*, Harlan. Journal of the A.N.S. Vol. IV. p. 286. pl. XVIII. fig. 1.

Char.—*Above* dusky-brown, darkest on the head: *beneath* silver white: two longitudinal whitish lines on each side of the body: *tail* cylindrical and tapering: two obsolete lines on the posterior part of the thighs.

Total length nine inches four-tenths; tail five inches four-tenths.

Inhabits the southern states. A specimen in the Philadelphia Museum.

Scincus *lateralis*.

Synonyma. S. *lateralis*, Say. Long's Exp. to the Rocky Mountains, Vol. II. p. 324.

Scincus unicolor, Harlan. Journal of the A. N. S. Vol. V. p. 156.

Char.—*Above* light-brown, with a lateral blackish line: *beneath* greenish-white: *head* with the rostrum rather short; a transverse row of scales behind the plates larger than the remaining cervical scales.

Total length four inches; tail two inches two-fifths.

Inhabits the southern states. Cab. of the A. N. S.

3rd Genus. AGAMA. Daudin.

Characters of the Genus.—Body oblong, covered with carinated and reticulated scales: tongue short, thick, and slightly notched at the extremity: head large, callous, and generally spinous on the occiput, covered above with small rhomboidal scales.

Daudin has divided this genus into six sections, three of which will include all the species which inhabit the United States.

AGAMAS properly so called,

Forming the second section of Daudin.

Body oblong, more or less slender, without wharts: tail cylindrical.

AGAMA *undulata*.

SYNONYMA. *Lacerta undulata*, Bosc.

Le stellion ondulé, Daudin, Hist. Nat. des Rept. par Latreille, Tom. II. p. 40.

L'agame ondulé, or *Agama undulata*, Daudin, Hist. Nat. des Rept. suite de Buffon.

Lacerta hyacinthina, Green, Journal of A.N.S. Vol. I. p. 349.

Lacerta fasciata, Idem.

Char.—*Above* cinereous, with irregular, transverse, brownish, bands or undulations: *beneath* bluish, with a large whitish cross: beneath the thighs, with porous grains.

Total length six inches four lines: tail three inches three lines.

Inhabits the middle and southern states. Cab. of the A. N. S.

AGAMA *umbra*.

SYNONYMA. *Iguana umbra*, Linn. Gmel.

Iguana chalcidica, Laurenti.

Iguana tuberculata, Laurenti.

Le lézard umbre, Daud. Lacépède.

Iguane umbre, Latreille.

Agama umbra, Daudin.

Char.—*Above* of a burnt chestnut colour: *beneath* pale cinereous: *throat* yellowish: beneath the neck.

a large spot of deep blackish violet, prolonged upon the occiput: *body* long, cylindrical: occiput callous, spiny: *back* longitudinally striated.

Total length one foot three inches; tail nine inches six lines.

Inhabits Mexico, California, and the south-western territories. Cab. of A. N. S.

Orbicular Lizards,

3rd section of Daudin, or TAPAYIA. (Tapayes.)

Having the skin covered with small scales, and with warty or spiny processes: their form is broad and contracted: body susceptible of inflation.

Agama *cornuta.*

Agama cornuta, Harlan. Journal of the A. N. S. Vol. IV. p. 299. pl. XX. Vulgo, *Horned lizard*, *Horned toad*, &c.

Tapajaxin, B. S. Barton. Med. & Phys. Journal, Vol. III.*

Char.—*Above* variegated-fuscus: *beneath* whitish: *body* depressed oval, scabrous: *head* above quadrangular: *tail* depressed at base, slender and teretile at the extremity, shorter than the body.

Total length four inches; tail one inch five-tenths.

Inhabits the transmississippi territories as far west as the plains of the Columbia river, and as far south as Arkansa. Specimens in the Philadelphia Museum.

* Who confounds it with the animal of that name described by Hernandez and Clavigero.

LACERTINE AGAMAS. (Les Agames Lézardets.)

4th section of Daudin.

These, like the Lizards, have the head covered with plates, and a row of porous grains beneath the thighs; tail cylindrical.

AGAMA *collaris*.

Agama collaris, Say. Long's Expedition to the Rocky Mountains, Vol. II. p. 252.

Char.—*Above* with five or six dusky broad bands, alternating with narrow fulvous bands, which have each a series of yellow or cinereous spots: sides greenish-yellow: sides of the neck fulvous, varied with red, banded with black: *beneath* pale: thighs with a series of pores: *eyes* silvery, pupil black: *tail* long, cylindrical, and tapering: *scales* destitute of carina.

Total length nine inches two-fifths; tail five inches two-fifths.

Inhabits the Arkansa territory. Specimens in the Philadelphia Museum.

4th GENUS. ANOLIS. Daudin.

Characters of the Genus.—Body elongated, covered with very small scales disposed in irregular transverse rows, reticulated on the tail, which is long and cylindrical: tongue short and thick, very slight-

ly notched at the extremity: head elongated, quadrangular, covered with numerous small scales: throat susceptible of inflation during the season of their amours, or when the animal is irritated: four legs, each with five long slender toes, the last phalanx broad, and furnished beneath with imbricated scales, forming transverse striæ, as in the Geckos: hooked nails projecting from the extremity of the last phalanx.

Anolis *bullaris*.

Synonyma. *Anolis bullaris*, Daudin. Hist. Nat. des Rept. suite de Buffon.

Le Roquet, Lacépède, Valmount, Dutertre, Ray.

Lacertus cinereus minor, or the *Least light brown, or gray lizard*, Sloane, Antille, Tom. II. pl. 273, fig. IV.

Lacerta bullaris, Linn. and Gmel. Syst. Nat. p. 1073, No. 32.

Lacerta strumosa, Linn. and Gmel. Syst. Nat. p. 1067, No. 33.

Lacerta viridis jamaicensis, Catesby, Carol. Vol. II. pl. LXVI.

Lacerta viridis Caroliñensis, Idem, pl. LXV.

Le lézard rouge-gorge, Daub. Lacépède.

L'Iguane rouge-gorge, Daud. Hist. Nat. des Rept. par Latreille.

Salamandra strumosa, Seba and Laurenti.

Le goitreux, Daud. Lacépède.

Anolis de St. Domingue, Nicholson, Essai sur l'Hist. Nat. de St. Domin. Vulgo, *Chamelion*, in the southern states.

Char.—*Above* green, changing to brownish, or reddish; a black spot on each temple: *beneath* whi-

tish-gray, spotted with pale fawn: *tail* cylindrical, destitute of carina—the throat becoming red when inflated.

Total length five inches; tail three inches.

Inhabits Carolina, the Antilles, &c.; frequents trees, garden walls, &c. Cabinet of the A. N. S.

5th Genus. LACERTA. Daudin, Cuvier, &c.

Characters of the Genus.—Body elongated, covered above with very small scales, transversely disposed: abdomen covered with six or ten rows of longitudinal, square, smooth plates: a scaly collar beneath the neck, (excepting the *Ameiva* lizards, which form the first section of Daudin.) Tongue long, extensible, and bifurcated: head oblong, quadrangular, sloping before, covered above with plates: tail long, cylindrical, and verticillated: four strong legs, with each five unguiculated toes: a row of porous grains beneath the thighs: jaws armed with teeth:* the cranium advancing over the temple and orbits, in form of a bony shield.

Striped Lizards.

Forming the third section of Daudin.

Having a transverse collar under the neck, formed of several large scales: colour blueish; striped above with longitudinal white lines.

* According to Cuvier, the Lizards are characterised by "two palatine rows of teeth;" we have not been able to detect these teeth in the *Lacerta 6-lineata*.

Lacerta *sexlineata.*

Synonyma. *Lacerta sexlineata*, Linn. and Gmel.

Le lion, Daud. and Lacépède.

Le lézard a six raies, Latreille and Daudin. Figured by Catesby, Nat. Hist. Carol.

Char.—*Above* brown, deeper and nearly black upon the back and sides; slate-blue on the flanks: *beneath* pale yellowish-white: *back* striped with six longitudinal whitish lines, the neck with eight lines.

Total length eight inches two lines; tail five inches six lines.

Inhabits Carolina. Cabinet of the A. N. S.

Dracenoide Lizards,

The sixth section of Daudin.

With two folds under the neck: anterior half of the tail verticillate, posterior half reticulated. The section includes but one species.

Lacerta *quinquelineata.*

Synonyma. *L. 5-lineata*, Daudin.

Lacertus major, cinereus, maculatus ? Sloane, Hist. Jam. p. 333, Pl. CCLXXIII. fig. 3.

Char.—*Above* impure azure-blue, deeper on the body: *beneath* pale: *back* marked with five longitudinal black lines: *flanks* with whitish spots: *tail* verticillated anteriorly, reticulated posteriorly.

Total length six or eight inches; tail about three-fifths.

Inhabits Carolina, and probably the Antilles. Cab. of the A. N. S.

6th Genus. CROCODILUS. Brongniart.

Characters of the Genus.—Of large stature: back and abdomen covered with several rows of large plates, those above with an elevated crest: tongue thick, short, adhering to the lower jaw: skull flat and broad: tail strongly compressed, furnished above with a serrated crest, double anteriorly: legs robust; five toes before, four behind, three internal only furnished with nails, all more or less united by a membrane. Heart with two auricles, and two ventricles; the large arteries uniting and forming a sac immediately before the heart.*

Caimans. (Alligator.) Cuvier.

3d section of Daudin and others.

Having the snout broad and obtuse: teeth unequal: the fourth lower tooth enters a hole, and not a groove, of the upper jaw, when the mouth is closed: feet semi-palmated.

Crocodilus *lucius.*

Synonyma. *Crocodilus lucius*, or *Le Caiman à museau de brochet*, Cuvier. Ann. du Mus. Vol. X. Regne Anim. Tom. II. p. 22. Anim. Foss. Vol. IV.

Crocodilus Mississipiensis, Daudin.

Alligator, or *Crocodile of Florida*, Bartram, Trav. Idem, Catesby, Carol. Pl. LXIII. figure inaccurate.

Idem, Hentz. "Some Observations on the anatomy and phy-

* For some account of the anatomy of the Alligator, vid. Journal of the A. N. S. Phil. Vol. IV. p. 242. "Description of two Sp. of Linnean lacerta, &c. By R. Harlan, M.D." 1824.

siology of the North American ALIGATOR," (*Crocodilus lucius*, Cuv.) Transactions of the Am. Phil. Soc. Philad. Vol. II. New Series, p. 216, Pl. II. 1820.

Char.—*Above* dark cinereous or blackish-brown, tinged with green: *beneath* whitish: *snout* broad and depressed: *neck* above with four carenated plates disposed in a square.

Length from ten to twenty feet; tail nearly the length of the body.

Inhabits the southern states, in fresh water lakes and rivers. Not found north of Carolina on the Atlantic, nor north of Red river on the Mississippi. Cab. of the A. N. S.

ORDER. CHELONEA.

TESTUDO. (Linn.)

CHARACTERS OF THE ORDER.—Heart composed of two auricles, and of a ventricle with two unequal chambers communicating together, wherein the systemic and pulmonic circulations meet, propelling mixed blood through the aorta. Body enclosed in a double shield, a superior, or back-plate, (carapace,) an inferior, or breast-plate, (plastron.) The former composed of eight flattened ribs united to each other, and to the dorsal vertebræ: the latter composed of the sternum, consisting of many pieces united by suture. The cervical and caudal vertebræ are alone moveable. Respiration performed by means of the muscles of the throat, as in the *Batraceans*: jaws destitute of teeth, but furnished with a corneous beak, in some instances serrated: tongue short: œsophagus, in

some instances, beset with fleshy, conical protuberances, having a cardiac direction: stomach simple: bladder large: urine limpid: penis simple, exsertile, grooved the whole length of the inferior surface: eggs covered with a hard shell.

This *Order*, including only the Linnean genus Testudo, is very properly divided into several genera, included under three great families, viz: THE LAND, FRESH-WATER, and SEA, TORTOISES.

1st FAMILY. LAND TORTOISES.

1st *Division*—With the sternum simple, or without a valve.

1st GENUS. TESTUDO. Brongniart.

Characters of the Genus.—Back plate ventricose; legs short and clumsy; toes short and thick, covered with skin which unites them nearly to the last phalanx, armed with strong nails, five behind, four before: sternum simple, generally projecting at the anterior extremity. Exemplified in the *Græca*, the *Indica*, the *Geometrica*, &c., together with the only species observed in the United States,

TESTUDO *polyphemus*.

SYNONYMA. *Testudo polyphemus*, Daudin.
Gopher, Bartram's Trav. Vol. I.
Testudo Carolina ? Linn. and Gmel.
T. polyphemus, Say. Jour. of the A. N. S. Vol. IV. p. 207.

Char.—*Above* depressed: sternum composed of

twelve plates, elongated anteriorly, surpassing the anterior margin of the back-plate in the female only: *tail* short: *nails* depressed, quadrate: *jaws* denticulated.

Length one foot, six inches; breadth twelve inches.

Inhabits Georgia, and the Floridas. Specimens in the Philadelphia Museum.

2nd *Division*—Sternum bi-valvular, giving full protection to the head and members of the animal, when withdrawn into the cavity. Cuvier subdivides the genus into such as have two lids, and such as have but one. We transfer these subdivisions to the family Emydidæ.

2nd Genus. CISTUDA. Fleming.

Synonyma. *Terrapene*, Merrem.

Testudo, Linn. and Gmel.

Les Tortues à boite, Cuvier, Regne Animal.

Cistuda, Fleming. Philosophy of Zoology, Vol. II. p. 270. 1822.—Idem, Say. Journal of the A. N. S. Vol. IV. p. 205. 1824.

Characters of the Genus.—Sternum divided into two lids by a hinge-like articulation, united to the back-plate by a moveable articulation: shell ventricose, and the feet resembling those of the *Testudo*, (Brongn.)

Cistuda *clausa*.

Synonyma. *Testudo clausa*, Gmel. Daudin, and others.

Terrapene clausa, Merrem.

Cistuda clausa, Say, ut supra, who attributes *Testuda Carolina*, Linn., as a synonyme.

La tortue courte-queue, Daud. suite de Buffon, Tom. LXXX. p. 207.

La tortue a goutelettes, or *Testudo virgulata*, Daudin.

Testudo tessellata minor Caroliniana, Edwards, Av. 205. Fig. passim.

Char.—*Shell* convex, oval: *sternum* consisting of twelve anchylosed plates, bivalvular, posterior valve the largest: *superior mandible* hooked, *inferior* elevated at tip and acute: *tail* short: vertebral plates slightly carinated.

Colours and markings varying in different individuals; plates sometimes sculptured, at other times glabrous.

Length of shell five and a half inches, breadth four inches, height two or three inches.

Inhabits the southern and middle states. Cabinet of A. N. S.*

* This species is long-lived; a specimen was lately found on the farm of George Hunter, in Newton, Delaware County, marked J. H. 1761. He lived fifteen years under the protection of the King's subjects, and has survived to witness the jubilee of American Independence.

2nd Family. FRESH WATER TORTOISES.

EMYDIDÆ. Merrem.

Having the toes webbed, and furnished with long, sharp nails, five before, four behind: sternum composed of twelve plates, either continuously solid, or furnished with one or more imperfect hinges: shell generally rather depressed.

1st *Division*—Sternum continuously solid.

3rd Genus. EMYS. Brongn.

Characters of the Genus—Toes longer and more separate, and nails longer than in other tortoises; five before and four behind; the form of their feet, particularly the posterior, being strongly webbed, renders them aquatic, and enables them to swim with velocity: back shell more depressed than in the land tortoises.

Emys *picta*.

Synonyma. *Testudo picta*, Linn. Gmel. Schoepff.
La tortue peinte, Daudin, Latreille.
Testudo cinerea, Shoepff. Vulgo, *The painted or flat backed turtle* of Pennsylvania.

Char.—*Above* dark brown, with the margins of the plates yellow: *head* and *neck* with longitudinal stripes of yellow: *jaws* denticulated.

Length five and a half inches, breadth four inches, height one and a half inches.

Inhabits the middle states; very common in the fresh water brooks of Pennsylvania. There are three or four varieties, including *T. cinerea* of Shoepff, which appears to have been described from a young specimen. Specimen in the Cabinet of A. N. S.

Emys *punctata.*

Synonyma. *Testudo punctata*, Shoepff, Hist. testud. p. 25, pl. V.

La tortue ponctuée, Daud. p. 159. pl. XXII. Idem, Latreille.

Testudo guttata, Shaw, Zool. 3. Pt. I. p. 47. pl. X. Vulgo, *Spotted turtle.*

Char.—Shell blackish, with remote bright, yellow, round spots: *superior jaw* emarginated: *inferior jaw* acute.

Length of the shell four inches, breadth of shell two and a half inches, height one and a half inches.

Inhabits Pennsylvania. Cabinet of the A. N. S.

There is a variety with the shell more depressed, and the spots more numerous; figured in Shoepff's work.

Emys *mulenbergii.*

Synonyma. *Testudo mulenbergii*, Shoepff, Hist. Testud. who figures the back and breast-plates, from a specimen sent by Dr. Mulenberg, from Pennsylvania.

Emys biguttata, Say. Jour. of the A. N. S. Vol. IV. p. 205.

Char.—Shell oblong-oval, slightly contracted la-

terally in the middle: *occiput* with two large fulvous spots: *superior jaw* emarginate: *inferior jaw* acute: *tail* rather long.

Length? rather smaller than E. punctata.

Inhabits Pennsylvania. Cabinet of the A. N. S.

Emys *geographica.*

Synonyma. *Testudo geographica*, Lesueur. Journal of the A. N. S. Vol. I. p. 86, pl. V.

Emys geographica, Say. Journal of the A. N. S. Vol. IV. p. 204.

Char.—*Vertebral plates* sub-carinated, the anterior urceolate; anterior marginal plates slender: *shield* sub-oval, sides compressed: *sternum* nearly the length of the shield: *mandibles* sharp, simple: general colour, dusky, marked with pale sinuous stripes: *tail* banded with yellow.

Length of shell eight inches, width six inches, height three inches.

Inhabits Lake Erie; noticed by Major Long's exploring party on the Ohio and its tributaries.

Emys *scabra.*

Synonyma. *Testudo scabra*, Linn. and Daudin.

La tortue raboteuse, Daud. Lacép. Latreille. Idem, Daud. p. 129.

Emys scabra, Say. Journal of the A. N. S. Vol. IV. p. 210.

Char.—*Colour* dark greenish-brown above, fulvous beneath: *plates* sculptured with concentric and

radiating lines, giving the shell a granulated appearance: *sternum* with a large black spot on each plate: *superior jaw* emarginate at tip; *inferior jaw* acute.

Length from three to nine inches.

Inhabits the northern and middle states. Cabinet of the A. N. S.

Emys *centrata.*

Synonyma. *Testudo centrata*, Latreille. Idem, Daudin.
Testudo concentrica, Shaw, Zool. III. Pt. I. p. 43, Pl. IX.
Vulgo, *Terrapin.*

Char.—*Shell* sub-ovate: *vertebral plates* sub-carenated, excepting the last: *plates* with concentric lines, more or less deeply impressed: *skin* whitish, with numerous blackish spots: *jaws* simple.

Length seven inches, breadth five inches, height three inches.

A smaller variety exists, with the concentric lines nearly obsolete.

Inhabits the southern and middle states, in the vicinity of brackish water. Specimens in the Cab. of the A. N. S.

Emys *reticulata.*

Synonyma: *Testudo reticulata*, Daudin, Bosc.
Testudo reticularia, Latreille.
La tortue reticulaire, Latreille, Daudin.

Char.—*Shell* elongated oval, larger posteriorly, without carinæ: *plates* covered with small parallel

striæ: *sternum* yellowish, rounded at both extremities: colour of the shell deep brown, reticulated with with yellow lines: marginal plates at their sternal junction, with three black spots.

Length seven inches, greatest breadth four and a half inches, height near three inches.

Inhabits the southern states. Cab. of the A. N. S.

Emys *serrata.*

Synonyma. *Testudo serrata*, Daudin, suite de Buffon, Pl. XXI. fig. 1 and 2.

Testudo rugosa, Shaw, Zool. Vol. III. Pt. I. p. 28, Pl. IV.

Vulgo, *Potter*, in New Jersey, or *Red-bellied terrapin.*

Char.—*Shell* sub-orbicular; vertebral plates subcarenated, lateral plates striated or rugous; six posterior marginal plates serrated; all the marginal plates beneath, with a black spot: *jaws* denticulated: *colour* blackish, marked with yellow: *sternum* reddish.

Length from ten to seventeen inches.

Inhabits the southern and middle states. Common in New Jersey, and in the vicinity of the Chesapeake. Cab. of A. N. S.

2nd *Division*—Sternum with two ligamentous hinges, the middle lobe fixed, generally composed of eleven pieces.

Genus. Kinosternon, of Spix.

Emys *pensylvanica.*

Synonyma. *Testudo pensylvanica*, Linn. Gmel. Schoepff. Idem, Shaw, Zool. Vol. III. p. 60, Pl. XIV. Enc. Method. Pl. V. fig. 1. Daudin, suite de Buffon, p. 182, pl. XXIV.

La tortue rougeatre, Daudin, ut supra.

Terrapene pensylvanica, Merrem.

Cistuda pensylvanica, Say. Journal of the A. N. S. Vol. IV. p. 206.

Char.—*Shell* oval, rather convex: *sternum* deeply emarginate, posterior angles rounded: *superior mandible* hooked at tip: *inferior mandible* elevated and acute: *tail* unguiculated.

Length of the shell three or four inches; breadth two or three inches; height one or two inches.

Inhabits the southern and middle states. Cabinet of A. N. S.

A variety with the sternum proportionably broader, and the femoral plates elongated posteriorly; observed by Major Long's exploring party, in the vicinity of the Missouri.

3rd *Division*—Sternum univalve, with a single ligamentous hinge, uniting the anterior lobe to the middle and posterior, which are immoveable.

Genus. Sternothærus. Bell.*

* London Zoological Journal, No. VII, p. 299.

Emys *odorata.*

Synonyma. *Testudo odorata*, Daudin, suite de Buffon, Vol. LXXX. p. 189.

La tortue odorante, Daudin, Latreille, Hist. Nat. des Reptiles, Tom. I. p. 122.

Cistuda odorata, Say. Journal of the A. N. S. Philad. Vol. IV. p. 216.

La tortue à battans soudés, Daudin, or *Testudo glutinata*, Idem. Vulgo, *Stink-pot*, or *Musk-tortoise.*

Char.—*Shell* oval, convex: *sternum* emarginate behind; posterior angles acute, a single plate anteriorly, very small; the whole breast plate narrower than in the *pensylvanica*, with a single valve anteriorly: *head* flattened, pointed, of a brownish colour, with two yellow lines on each side: *chin* with some yellow tubercles in form of processes.

Length four or five inches; breadth two or three inches; rather higher than the preceding.

Inhabits the southern and middle states, giving the preference to muddy ditches. Cab. of the A. N. S.

4th Genus. CHELONURA. Fleming.

Characters of the Genus.—Tail about the length of the shield: back-plate carinated with spinous processes posteriorly: extremities incapable of being withdrawn into the shield.

Chelonura *serpentina.*

Synonyma. *Testudo serpentina*, Linn. Gmel. Schoepff.
La tortue serpentine, Daud. Lacép. Daub.
Testudo serrata, Pennant, Supple. Arct. Zool.
Chelonura serpentina, Say. Journal of the A. N. S. Vol. IV. p. 217. Vulgo, *Snapping turtle*, or *Logger-head*, of the middle states. *Alligator tortoise*, of the southern states. *Coutta*, by the slaves.

Char.—*Shell* sub-ovate, depressed, posterior plates spinous: superior mandible hooked, acute: *tail* very long, compressed and serrated.

Length, sometimes four feet, of the shell about two feet; weighing about twenty pounds.

Inhabits the southern and middle states; preferring ditches and muddy pools. Cab. of the A. N. S.

5th Genus. TRIONYX. Geoffroy.

Characters of the Genus.—Destitute of scales; shield and sternum being covered with a soft skin, or cartilage: an osseous disk in the shield, from which project laterally several ribs, shorter than the cartilaginous border: feet palmated, three inner toes furnished with claws: a corneous beak covered with fleshy lips: nose prolonged into a fleshy trunk: vent situated near the extremity of the tail.

Trionyx *ferox*.

Synonyma. *Testudo ferox*, Pennant, Linn. Gmel. Schoepff.
La tortue molle, Lacépède, Latreille.
La tortue de Pennant, Daudin.
Trionyx ferox, Say. Journal of the A. N. S. Vol. IV. p. 218.
The soft-shell tortoise, Bartram, Trav. Vol. I. p. 11.

Char.—*Sternum* with two callosities; small smooth tubercles on the anterior and posterior part of the covering of the back: *tail* slightly projecting beyond the cartilaginous border, in the female; much longer and thicker in the male: *head* and *neck* very nearly the length of the body.

Length of the body about twenty inches, breadth about fourteen and a half inches; head and neck about thirteen and a half inches in length when protruded; weighing between twenty and thirty pounds.

Inhabits the Mississippi, the Ohio, the northern lakes with their tributary streams; also many of the rivers of the southern states; not observed to exist further south than South Carolina on the sea board.

Specimens, male and female, preserved in spirits in the Cabinet of the A. N. S.

The preceding synopsis includes all the remarks, which our observations enable us to offer, on the two first great families of the *Order* Chelonia. Concerning the third and last family, the Sea Tortoises, (Chelonia, of Brongniart,) we have enjoyed no op-

portunity of investigation, which would enable us to add to the facts already before the public. The ingenious Dr. Fleming, with considerable erudition, and a nomenclature always classical, has recently attempted a revision of this order.* According to this author, the sea tortoises are divided into two groups, consisting of three genera, thus characterized:

First Group.—Breast-plate interrupted by intervening cartilaginous spaces: extremities incapable of being withdrawn into the shield: fore legs remarkably produced, with the toes united, to serve as a fin: living in the sea.

1. Chelonia. Back-plate covered with corneous scales. *Testudo mydas.* L.

2. Coriudo. Back-plate destitute of scales. *Testudo coriacea.* L.

Second Group.—Lips fleshy, with a produced snout: toes webbed.

3. Chelys. (Dumeril.) Back-plate scaly: a protuberance on the hind feet, occupying the place of a

* Vid. "The Philosophy of Zoology; or a general view of the Structure, Functions, and Classification of Animals. By John Fleming, D.D. F.R.S.E. Minister of Flisk, Fifeshire." In two Vols. 8vo. 1824.—Vol. II. p. 268.

web, but destitute of a claw: toes armed with claws: mouth destitute of a corneous beak. *Testudo fimbria*, Gmel.*

We close our observations on this subject, for the present, in offering a *catalogue* or methodical table, of the Reptilia inhabiting the UNITED STATES; together with a few additions and corrections.

* For the species of Sea tortoises which frequent the coasts of the United States, vid. the methodical table at the termination of this essay.

CATALOGUE

OF THE

NORTH AMERICAN REPTILIA.

1st Order. BATRACHIA.

1st Genus.
AMPHIUMA.
means.—1.

2d. Genus.
MENOPOMA.
alleghaniensis.—1.

3d Genus.
SIREN.
lacertina.
striata.
intermedia.*—3.

4th Genus.
MENOBRANCHUS.
lateralis.—1.

5th Genus.
SALAMANDRA.
subviolacea.
Salamandra
tigrina.
cylindracea.
fasciata.
scinciput-albida.
erythronota.
cinerea.
glutinosa.
fusca.
maculata.
subfusca.
longicaudata.
nigra.
bislineata.
rubra.
picta.†
symmetrica.
flavissima.
variolata.‡—19.

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* A description of this species by Captain Leconte, has recently been published, with a plate, in the Ann. of the Lyc. of Nat. Hist. of New York, Vol. II. p. 133, Pl. 1.

* The "Contributions of the Maclurian Lyceum," No. I. A Journal recently commenced in this city, contains a description, by Mr. Green, of five species of Salamanders. The Salamandra *intermixta*, of this author, is identical with the species previously known to naturalists as the *S. picta*. Journal of the Acad. Nat. Sc. Philad. Vol. V. June 1825.—Idem, of this synopsis, p. 333.

‡ Salamandra *Jeffersoniana*, Green, was previously described as a

6th Genus.
RANA.
pipiens.
clamata.
ocellata.
melanota.
halecina.
utricularius.
scapularis.
flaviviridis.
sylvatica.
palustris.
pumila.
gryllus.
dorsalis.
nigrita.—14.

7th Genus.
HYLA.
lateralis.
femoralis.
squirella.
delitescens.
versicolor.—5.

8th Genus.
BUFO.
musicus.
cognatus.
fuscus?—3.*

2nd Order. OPHIDIA.

1st Genus.
OPHISAURUS.
ventralis.—1.

2nd Genus.
COLUBER.
obsoletus.
constrictor.
Coluber
testaceus.
ordinatus.
parietalis.
filiformis.
flagelliformis.
sipedon.
saurita.
sirtalis.
proximus.
flaviventris.
striatulus.
punctatus.
amænus.
rigidus.
septemvittatus.
porcatus.
coccineus.
heterodon.
œstivus.
fasciatus.
getulus.
calligaster.
melanoleucus.
eximius.
floridanus.
vernalis.
atrifuscus.†
erythrogrammus.
doliatus.
maculatus.
guttatus.
molossus.
reticularis.—35.

3rd Genus.
VIPERA.
fulvia.—1.

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variety of *S. variolata*, at page 334, of this synopsis. Mr. Green's paper is accompanied with a very fine engraving of the *S. glutinosa*.

* We have little doubt, but that the *B. fuscus*, will prove a distinct species.

† For *Coluber atrifuscus*, read *C. cauda-schistosus*, the former name having been applied to designate an East Indian serpent; the *Dameen*, of Russel.

4th Genus.
CENCHRIS.
mokeson.—1.

5th Genus.
SCYTALE.
piscivorus.
niger.—2.

6th Genus.
CROTALUS.
durissus.
horidus.
miliarius.
confluentis.
tergeminus.—5.

3rd Order. SAURIA.

1st Genus.
AMEIVA.
tesselata.—1.

2nd Genus.
SCINCUS.
quinquelineatus.
erythrocephalus.
bicolor.
lateralis.—4.

3rd Genus.
AGAMA.
undulata.
umbra.
cornuta.
collaris.—4.

4th Genus.
ANOLIS.
bullaris.—1.

5th Genus.
LACERTA.
sexlineata.
quinquelineata.—2.

6th Genus.
CROCODILUS.
lucius.—1.

4th Order. CHELONIA.

1st Genus.
TESTUDO.
polyphemus.—1.

2nd Genus.
CISTUDA.
clausa.—1.

3rd Genus.
EMYS.
picta.
punctata.
mulenbergii.
geographica.
scabra.
centrata.
reticulata.
serrata.
pensylvanica.
odorata.—10.

4th Genus.
CHELONURA.
serpentina.—1.

5th Genus.
TRIONYX.
ferox.—1.

SEA TORTOISES.

CHELONIA. (Brong.)

6th Genus.
CHELONIA.*
mydas.
caretta.
couana.—3.

7th Genus.
CORIUDO.†
coriacea.‡—1.

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* *Chelonia*, Fleming.

† *Coriudo*, Fleming.

‡ *C. coriacea*, as frequenting the coasts of Carolina, on the authority of Lawson. "Hist. of Carolina."

ERRATA.

Page 320, line 21, for "Vol. IV." read *Vol. V.* p. 417.
Page 320, line 10, for "Latraille," read *Latreille.*
Page 323, line 1, for "Menobrancus," read *Menobranchus.*
Page 324, line 10, for "Axalotl," read *Axolotl.*
Page 360, lines 10 and 11, for "Eximus," read *Eximius.*
Page 370, line 11, for "Carena," read *Carina.*

Remarks on the Osmunda Claytoniana of Linnæus, with a drawing. *By* S. W. Conrad.

Read March 13th, 1827.

The *Osmunda Claytoniana** was introduced into the system of vegetables, as a fern indigenous to Virginia, on the authority of Clayton. It is a rare plant, for it seems to have escaped the attention of most of our botanists. The late Dr. Muhlenberg identified it with the *Osmunda interrupta* of Michaux. In his manuscript Flora Lancastriensis he describes at large that species under the name of *Osmunda Claytoniana,* placing *O. interrupta* as a synonyme; for his description of the fructification, ("*racemis lateralibus, alternis, oppositisque pinnatis,*") can apply only to the *O. interrupta,* which is peculiar in its inflorescence: it is probable, therefore, that he was unacquainted with the real *Osmunda Claytoniana,* which has its fructification always terminal.

Pursh considers this fern a variety of the *O. cinnamomea;* and remarks, that he "recollects very well that the fructiferous stems of that species very frequently grow out into leaves, which may have given rise to the present species." It is certainly more nearly related to that plant than it is to the *O. interrupta;* but its pinnæ are more obtuse, and the segments are closer and not so deep; neither are

* See plate 2, vol. vi.

the specimens which I have seen lanuginous, like the fertile fronds of the *O. cinnamomea*, having only small tufts of a very pale ferruginous tomentum in the axils of the pinnæ. Several years past my friend Charles J. Wister of Germantown found this fern in an exsiccated swamp in the vicinity of that village, and I have since noticed it myself, in a similar situation, near Bristol on the Delaware, and obtained specimens of it; from one of which the accompanying drawing was made by my son, T. A. Conrad.

Specific character.—Frondibus pinnatis; pinnis pinnatifidis, apice coarctato, fructificantibus. L.

Description.—Frond from twelve to eighteen inches high; pinnæ opposite and alternate, rather obtuse, tomentose at the axils; segments ovate, somewhat rounded at the top, entire; fructification terminal, bipinnately panicled, erect; capsules smooth, of a deep ferruginous colour, densely covering the slender pinnulæ.

Analysis of Cyanite and Fibrolite, and their union in one species, under the name of Disthene. By Lardner Vanuxem, *Professor of Chemistry and Mineralogy in Columbia Col. S. C.*

Read April 10th, 1827.

Almost all the confusion existing in Mineralogy arises from inattention to those characters of minerals which are really *specific:* hence innumerable species are created, which involve the science in obscurity, and arrest the progress of the student at almost every step. From my knowledge of mineralogy, I have not been able to find more than four characters that can be relied upon in the designation of species; and if these alone were resorted to, mineralogy would, in a few years, be stripped of many of its false species, or excrescences, and reduced to something like certainty and method. The characters which I consider to be truly specific are, first, Chemical Composition, the basis of mineralogy: second, Crystallization; which includes not only the system of forms and the angles of crystals, but double refraction and polarity: third, Specific Gravity: and, fourth, Hardness.

In most books of mineralogy, mere aggregates of an imperfect crystallization often form the distinctive characteristics of species; as the lamellar, the bladed, the fibrous, and the granular, structure; all which modes of aggregation are to be found in several of

the species, as carbonate of lime, and gypsum; plainly showing that such characters ought not to be relied upon as specific distinctions, or, in other words, should not be used in forming mineral species.

The object of the present memoir is to unite two mineral substances in one species, under HAUY's name of *Disthene;* the substances in question are designated, in Prof. Cleveland's Mineralogy, by the names of Cyanite and Fibrolite, neither of them presenting characters that require them to be separated; on the contrary, their identity is established by their composition, (as will be subsequently shown,) and by their other characters; due regard being made to the difference in the mode of aggregation of their particles.

I was induced to analyze the Cyanite of St. Gothard, in consequence of the difference in the proportions of Silex, as given by *Klaproth* and *Laugier*, amounting to four and five-tenths per cent.

I did not find other appreciable matter in Cyanite and Fibrolite than silex and alumine: I merely obtained traces of manganese and water. The mode of analysis for both substances, was, first, to reduce them to an impalpable powder; secondly, to fuse with two and a-half times their weight of pure caustic potash; thirdly, to dissolve the product in muriatic acid; fourthly, to evaporate to dryness; fifthly, to re-dissolve the alumine in acidulated water; sixthly, to separate the silex from the alumine

by filtering; seventhly, to calcine the silex; eighthly, to precipitate the alumine by ammonia; and, lastly, to filter and expel the water from the alumine by a red heat.

The Cyanite from St. Gothard, gave

silex	42.
alumine	57.50
loss	.50
	100.

A specimen from Chesterfield, Massachusetts, gave

silex	42.56
alumine	57.
loss	.44
	100.

I found the specific gravity of the Cyanite of St. Gothard, to be 3.69; and that of Chesterfield, to be 3.57. Water at 62° of Fahrenheit.

In my collection I have specimens of Fibrolite from three localities in the United States; one from the Schuylkill river back of the Robin Hood tavern, on the Ridge-road: this locality was discovered by Mr. Lea and myself about eleven years ago. It is also found on the road to Cooper's Gap, in Rutherford county, North Carolina: a specimen from this place was presented me by Mr. Leckie. The third

locality is near Wilmington, in the state of Delaware; it was discovered by Mr. Lea. In all these localities the Fibrolite occurs in Gneiss.

These Fibrolites present the same characters as given by Count Bournon, in his description of the specimens from the Carnatic and China.

The Fibrolite of Delaware state is purer and more to be admired than that of any other American locality; some parts of the specimens exhibit an approach to Cyanite, the fibres assuming a partially bladed appearance. It is white, with a lustre of pearl and water blended together; fibres fine, with numerous transverse cracks; specific gravity, 3.21; hardness rather superior to Quartz; infusible.

Its composition I found to be,

silex	42.77
alumine	55.50
loss	1.73
	100.

The essential characters of Cyanite, are its composition, its hardness, its crystallization, and its specific gravity. In *composition* there is an identity in Cyanite and Fibrolite, not only as regards their constituents, but also in their proportions: in *hardness* they likewise accord: in *crystallization* they differ, because one is the result of the undisturbed action, and the other of the disturbed action of this power:

in *specific gravity* there is a discordance; but as yet we have not paid that attention to the *specific gravity of minerals in different states of aggregation*, which is required by the discrepancies which they present to us; it is the least certain of the specific characters of minerals.

NOTE.—It is not improbable that the mineral called *Bucholzite*, (which I have never seen) is a variety of Disthene; for I cannot find any characters in the description given of it, that entitles it to be considered a distinct species. From its black and white colour, it must contain impurities; from its fibrous structure, it may have its fibres broken by Quartz and yet scratch the latter substance. If the Bucholzite of Voightland had been analyzed, we should have sufficient data for determining the question. If the black Cyanite was fibrous, which I found in 1817, on the road from Philadelphia to Chester, it would no doubt be a Bucholzite: as it occurs in Mica schiste, and is mixed with it, the composition of this Cyanite, would exhibit Oxide of Iron, Potash. and more Silex than is contained in pure Cyanite.

Analysis of Tabular Spar from Bucks County, Pennsylvania; with a notice of various minerals found at the same locality. By S. G. Morton, M. D.

Read May 1st, 1827.

In December last I received from Dr. Edward Swift of Bustleton, in this state, a number of minerals found by him on the farm of Mr. Jacob Van Arsdalen, three miles west of Attleboro', and seven north of Bustleton. Among these minerals were several specimens of *Tabular Spar*, so finely characterized that I was induced to visit the locality; an excursion in which I was joined by Dr. Swift and Mr. J. P. Wetherill. All the minerals mentioned in this paper, occur in a small bed of primitive White Limestone, that has been long quarried for burning; it is traversed by one or two narrow veins of Hornblende, and occasionally by others of Quartz, Feldspar, and Sienite; the latter is the predominant rock for several miles round.

We obtained the following minerals:

1. *Tabular Spar.* This mineral, formerly so rare, is here found in masses of several tons weight, in all respects well characterized, and strongly resembling the specimens from lake Champlain: like the latter, it occurs in grouped tabular masses, of a fibrous structure, translucent and possessing a fine pearly lustre: by

exposure to the weather it disintegrates. Its specific gravity is 2.92.

To prevent any deception that might arise from external appearances, I subjected the mineral to analysis, for the success of which I am greatly indebted to the assistance of my friend Mr. J. P. Wetherill. We adopted, with some modification, the process used by Mr. Vanuxem in his examination of the Tabular Spar of lake Champlain.*

One hundred grains of the substance in fine powder, having been calcined in a platina crucible, lost .75 of their weight: the powder was then boiled to a jelly in muriatic acid; water was afterwards added, the solution filtered, and the siliceous residuum calcined.

To the solution thus obtained Oxalate of Ammonia was added, which gave a copious precipitate of Oxalate of Lime; the latter was separated by filtering, and calcined.

The liquor from which the Silex and Lime had been precipitated was evaporated to dryness, and the residuum calcined, by which the Muriate of Ammonia was driven off: the remainder was cautiously examined, and proved to be Oxide of Iron, with a trace of Lime. The Lime obtained by precipitation was also tested for Iron, but gave none.

The substances obtained by the above analysis, afforded the following results:

* *Vide* vol. ii. p. 183, of this Journal.

Silex	51.50
Lime	44.10
Oxide of Iron	1.00
lost by calcination	.75
	97.35

These results prove the mineral in question to be *Tabular Spar*.

2. *Scapolite*, massive and crystallized: the former variety occurs in large masses of a gray colour, and compact texture. The crystals present a quadrangular prism, terminated by a four sided pyramid; most of them, however, are so grouped as to show no determinate form.

3. *Pyroxene*, in hexaedral prisms; more frequently in crystalline masses of various shades of green: also the granular variety, or *Cocolite*, which is abundantly disseminated in the Tabular Spar: other specimens approach near to *Sahlite*.

4. *Zircon*. Of this mineral I observed several traces, and Dr. Swift obtained a large and beautiful crystal, form—*Soustrative* of Hauy.

5. *Mica*, clove-brown and emerald-green, both found in small plates in the massive Scapolite.

6. *Blue Quartz*, in small quantity.

7. *Feldspar*, massive, of a dark blue colour, and brilliant lustre: also in rhombic prisms with the terminal angles truncated, *Unitaire* of Hauy; from half an inch to two inches long, and very perfect.

8. *Garnet*, granular, and in small dodecaedral

crystals, of a pale red colour, disseminated in bluish Quartz, and Carbonate of Lime.

9. *Phosphate of Lime*, massive, and in hexaedral prisms; also in minute bluish grains, *Moroxite?* This mineral is here found in small quantity.

10. *Graphite*, massive, and in delicate hexagonal tables, disseminated in all the other minerals. It may be remarked that *Mansell's Black Lead mine* is only a mile and a half distant, where this mineral is found in great abundance in Sienite.

11. *Sulphate of Iron*, massive, and in octaedral crystals measuring from half an inch to two inches in the diagonal diameter of the base of the pyramid: the proprietor showed us a fragment of one of these crystals of great magnitude.

12. *Oxide of Titanium:* the *silico-calcareous* variety occurs in very oblique four-sided prisms, with bevelled extremities; they measure from half an inch to an inch in length.

This locality is interesting from the variety and abundance of its productions, several of which appear to be inexhaustible; and it will be observed that this circumscribed spot affords most of the minerals of Willsboro' in Vermont, and Rodgers'-rock at lake George.*

I have presented specimens of all the above minerals, excepting the Zircon, to the Museum of the Academy of Natural Sciences.

* A mineral found at Easton, and formerly supposed to be Tabular Spar, is now generally admitted to be *Tremolite;* an opinion which would no doubt be verified by analysis.

Description of a new species of OSTREA *; with some Remarks on the O. convexa of Say. By* S. G. MORTON, M. D.

Read May 1st, 1827.

OSTREA.

O. falcata, testa falciforme, auriculatâ, tenui; valvula superiore planulatâ, inferiore convexâ; plicis, juxta rostrum nascentibus, ad marginem anteriorem divaricatis; margine posteriori leviter undatâ.

This shell is remarkable for being distinctly auriculated and for its curve, which resembles that of a sickle: its plaits commence in low ridges near the beaks, and gradually become elevated as they diverge towards the anterior margin.

I some months ago found single valves of this fine fossil in the bluish marl, thrown up in excavating the Delaware and Chesapeake canal, near St. George's: more recently my friend Mr. William L. Newbold has presented me with two remarkably perfect specimens, from one of which I took the annexed drawing, showing the lower valve of the natural size: (plate i, fig. 2.)

The same locality affords fine specimens of the Exogyra *costata* of Say, and of the Ostrea *convexa* of the same naturalist; also numerous casts of Pectunculi, Turritellæ, Baculites, Ammonites, &c. The

specimens of Ostrea *convexa* vary so much in form, that some of them might easily be mistaken for distinct species, could we not trace, by the comparison of many shells, the gradual transition of one variety into another until the extremes become identified. In the most striking of these varieties, the inferior valve is *slightly convex, remarkably auriculated or angulated, and has an inconsiderable curvature of the beak;* in which particulars it is the reverse of the shell described by Mr. Say; but in all other respects the analogy between the two is complete. I have presented to the Museum of the Academy of Natural Sciences, five specimens, which amply illustrate the facts above mentioned.

Description of a new species of Grampus, (Delphinus, Cuv.) inhabiting the coast of New England. By Richard Harlan, M. D.

Read March 6th, 1827.

Delphinus *intermedius.* (Nob.)

Char.—Above shining black; side of the abdomen and neck marked with the continuation of the white colour of the abdomen and throat: *beneath* varied with white: *tail* compressed, terminating in a deep constriction just before the caudal fins.

Dimensions.—Length sixteen and a half feet; girth of the largest part ten feet; length of the pectoral fins three feet eleven inches; rictus of the mouth nine inches; pectoral fins one-fourth, dorsal fin one-thirteenth of the total length. Inhabits the coast of New England.

Description.—Colour uniformly black above, with a white patch beneath the throat, becoming a narrow longitudinal strip on the breast between the fins, and a broad longitudinal band on the abdomen; teeth about twenty in each jaw, small, prismatic, slightly reflected, and projecting half an inch above the gums: head blunt, cylindrical, and anteriorly sub-globose: body slightly compressed; tail strongly compressed, almost carinated, and much constricted just before the caudal fins.

This individual, a female, was harpooned in the harbour of Salem, (Massachusetts) in the month of Sept. 1823. The preceding facts, together with a drawing* taken from the recent animal, are due principally to our zealous member, Dr. Charles Pickering, late of Salem, Mass.

Distinctive characters.—The animal at first view, evidently belongs to the sub-genus *Phocæna*, (Cuv.) or such Dolphins as have the snout short and ventricose, without a beak, numerous teeth in both jaws, and a dorsal fin.

Our species bears the closest resemblance, in some

* Vid. pl. i. fig. 3.

respects, to the Delphinus *grampus*,* and Delphinus *globiceps*,† but is distinguished from both by the caudal constriction, as well as in its form, proportions, and markings; the dorsal fin is also proportionably much smaller than in either; the head of the globiceps is more ventricose, and the latter species is chiefly found on the coast of Europe. We have accordingly placed our species in the systems between the two, and named it *Intermedius*.

* *D. grampus*, Hunter, Cuvier, Desm., &c. Figured by Bonnaterre, Cetologie, p. xxii. No. 4. pl. 12. fig. 1., and Duhamel, Peches, pl. ix. fig. 1.—*D. grampus*, Harlan, Fauna Americana, p. 287.

† *D. globiceps*, Cuv. Rapport sur les cétacès échouès a Paimpol, An. du Mus., tom. 19, pl. 1, fig. 2 & 3. Idem, Animaux fossiles, Ed. 2. vol. v. p. 285.—*Delphinus melas*, Traill. Nicholson's Journal, vol. xxii. p. 81.—*Delphinus deductor*, Scoresby.—*Dauphin à tete ronde.* Desm. sp. 777. p. 519.

Additional Observations on the North American Reptilia. *By* R. Harlan, M. D.

Read May 1st, 1827.

1. Description of a variety of the Emys serrata.

Since the publication of the Essay on the North American Reptilia, concluded in the last No. of the Journal, I have received fine living specimens, male and female, of the tortoise, known by the

name of "Potter" in New Jersey, which I have indicated as a variety of the E. serrata, from Carolina.*

Description.—Shell sub-orbicular, lateral plates striated or rugous; the six posterior marginal plates serrated; all the marginal plates beneath, with a black spot or blotch; colour above reddish-brown or blackish; sternum red or reddish; marginal plates over the thighs slightly recurved; neck longitudinally striped: back-plate of the females sub-carinated; of the male, rather flat or slightly concave: colour of the male much lighter and less red than that of the female. Skin greenish-black, especially on the upper portions of the body.

Dimensions.—Length twelve inches, breadth eight inches, height four inches; tail three and a half inches; vent posterior to the middle.

Habits.—Frequenting ditches, small streams, &c.; are more fierce than fresh-water tortoises in general.

2. Note on the CORIUDO CORIACEA.

In addition to the authority already quoted, in favour of the existence of this species on our coasts, we are enabled to add, that there are prepared specimens of the animal in the New York and New England Museums, which were taken on their respective coasts.

3. In the METHODICAL TABLE of the *North American Reptilia*, we have omitted to notice a species

* Vid. p. 28, vol. vi.

of CHIROTES, the existence of which, in this country, is indicated in Major Long's Expedition to the Rocky Mountains, vol. i. p. 484.

4. Reference to plate 1st, fig. 1.

RANA DORSALIS, natural size; described at page 340, of vol. v. Numerous specimens of this species have lately been received from Dr. W. Blanding, of Camden, S. C., where they are known by the familiar name "Savannah cricket."

Notice of certain prepared specimens of Quadrupeds in the possession of a Gentleman lately returned to Philadelphia, from his travels in the United States and Territories. *By* R. HARLAN, M. D.

Read May 1st, 1827.

1. RACCOON, perfectly white, and of the usual dimensions, from the trans-Mississippi country; also one of very large dimensions. Total length three feet six inches, height one foot.

2. Felis *fasciatus ?* perhaps a *variety* of the Striped Lynx, a species hitherto imperfectly described.

Char.—*Above* grayish-brown; *beneath* whitish; *legs* spotted with black, externally of the same colour with the back, internally of the colour of the abdomen; sides of the face and snout fasciated longitudinally: *tail* short, black at the extremity: long retreating hairs on the cheeks: *ears* moderately pencilled with hairs.

Dimensions.—Length of the body seventeen inches; of the head and neck six inches; tail four inches; height at the withers one foot.

3. MINK, from Missouri, a strong marked variety (if not a distinct species) of the MUSTELA LUTREOCEPHALA, (Nob.) vid. Fauna Americana, page 63.

Description.—*Nose* black; *tail* black and exceedingly bushy: *above* blackish-brown; *beneath*, blackish: *legs* entirely black: a transverse black band on the upper and back part of the root of the neck anterior to the scapulæ: *ears* hairy, small and oval, blackish without, whitish within: three small molars above, four below; large molars two in each jaw on either side; incisors six in each jaw; canines large and strong.

Dimensions.—Length of the body ten inches; head and neck six inches; tail fourteen inches; height at withers nine inches.

4. A Fox, from the N. W. Territory, if not a distinct species, at least a strongly marked variety of the Canis *cinereo argenteus.*

Description.—*Above* blackish-gray; *beneath* silvery-white, and blackish along the middle of the abdomen; *legs* entirely black; *ears* blackish without, whitish within, hairy: *cheeks* furnished with long and silvery hairs: *nose* and *whiskers* black; *tail* very bushy and black, except at the root, which is surrounded with gray.

Dimensions.—Length of the body fifteen inches; head and neck eight inches: tail eighteen inches: height thirteen inches.

List of Officers for the Year 1828.

President.

William Maclure.

Vice Presidents.

Zaccheus Collins, George Ord.

Corresponding Secretary.

Reuben Haines.

Recording Secretary.

Samuel G. Morton, M. D.

Librarian.

Solomon W. Conrad.

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George W. Carpenter.

Curators.

J. P. Wetherill, Isaac Hays, M. D., T. R. Peale, Isaiah Lukins.

Auditors.

S. V. Merrick, Judah Dobson, C. W. Pennock.

Geological Observations on the SECONDARY, TERTIARY, *and* ALLUVIAL FORMATIONS *of the Atlantic Coast of the United States of America. Arranged from the Notes of* LARDNER VANUXEM,* *by* S. G. MORTON, M. D.

(Read January 8, 1828.)

The extensive region which is covered by the Secondary, Tertiary, and Alluvial formations of the Atlantic Coast of the United States, would appear to have been hitherto less cautiously examined than the other formations in this country, of which the best proof exists in the fact, that they have, by most writers, been referred to the *Alluvial*† as constituting a single deposit; while by others they have been designated by the general name of *Tertiary*.

One cause which led geologists into the error of considering these depositions as belonging to one age, or class, was the circumstance that by far the greater portion of them consists of unconsolidated materials; a fractional part only existing in the state of rock.—Another cause of confusion, was the difficulty of ob-

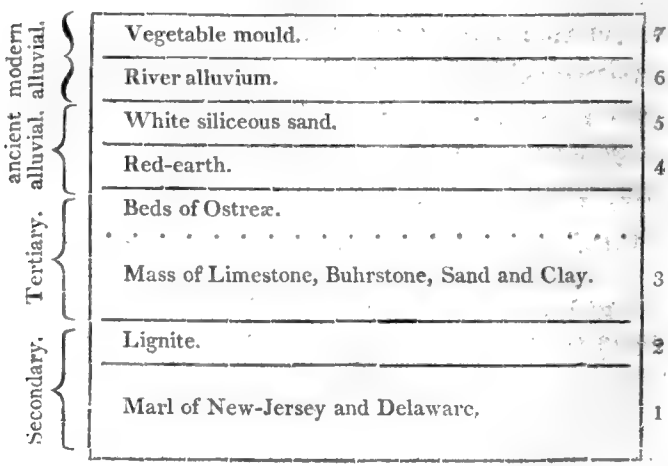
* The friends of Mr. Vanuxem are aware that he lately passed a few days in this city, prior to his embarkation for Mexico: during that period, his time was so engrossed with preparatory arrangements, and with the publication of a chemical essay, that he requested me to arrange the materials of the following paper. After I had finished the manuscript we examined it together, and it is now published as corrected by the author.—S. G. M.

January 5, 1828.

† *Vide* Maclure's Geology of the United States, p. 34, 82, etc

taining the characteristic fossils of the different depositions. Of late, however, the extensive public and other works on the Atlantic frontier of this country, have so exposed the different deposits that they may now be examined, in very many places, in conjunction with their organic products. Still, however, it would be impossible to define precisely the junction of the Secondary with the superimposed Tertiary; this must be left to future investigators; but it may be positively asserted, that the two formations may be at all times unequivocally identified by their fossil remains.

Before proceeding to speak in detail of the three formations, it may be advantageous to give a diagram of them all, arranged according to what I believe to be their *relative geological position*.



The *geographical position* of the three depositions is as follows: they embrace the islands of Nantucket and Martha's Vineyard, on the coast of New-England, and nearly the whole of Long Island; the continental boundary commences in New-Jersey, at Sandy Hook, passes near Amboy and Newark, and strikes the Delaware a little below Trenton; it follows the course of the Delaware river to the vicinity of New-Castle, in the state of Delaware, whence it runs westward towards Baltimore, and passes south by Washington, Fredericksburg, Richmond, and Petersburg, in Virginia; thence a little west of Halifax, Smithfield, Aversboro', and Parkersford on Pedee river, in North Carolina; west of Camden, and Columbia in South Carolina, to Augusta in Georgia; the line now runs in a westerly direction by Rocky Landing on the Oconee river, Fort Hawkins on the Oakmulgee river, Hawkinstown on Flint river, and crossing the Catahouchee, Alabama and Tombigbee rivers, joins the alluvial basin of the Mississippi below Natchez.* The Atlantic ocean forms the eastern, and the Gulf of Mexico the southern boundary of this extensive region.

Secondary Formation. The oldest, or lowest, of the three depositions, (No. 1 of the diagram) is the *Secondary:* this occupies the whole of the northern division indicated in the above geographical sketch, excepting the islands of Nantucket, Martha's

* Vide Maclure's Geology of the United States, p. 33, etc.

Vineyard, and Long Island: that is to say, it includes the Peninsula of New Jersey south of an irregular line running from Sandy Hook to the Delaware river below Trenton; the state of Delaware excepting its northern extremity, also belongs to this formation, together with (in all probability) a small part of the north-east section of Maryland. As a superficial formation, it appears to extend at least from the 38th degree to about 40° 30′ of north latitude, having the ocean on the east, and the Primitive and Tertiary formations for its western and southern boundaries. It embraces upwards of four thousand square miles; and is, for the most part, remarkably level. It is composed of a continuous bed of *Marl*, more uniform in its composition than any of the beds which succeed it; this marl is argillaceous, and contains greenish particles analogous to those which are found in the green sand, or chalk, of Europe.* Its prevalent colour is a dark green, sometimes changed by a higher degree of oxydation of iron; and it is destitute of pebbles and other indications of agitated waters. The *pelagian* fossils by which this formation is characterised, afford ample evidence that it belongs to the Secondary, and not, as commonly supposed, to the Tertiary class. It contains few species of shells, though the individuals are extremely abun-

* Vide Dr. Harlan's Observations on the Geology of West-Jersey, vol. iv. p. 15, of this Journal, which contains Mr. Seybert's Analysis of Marl.

dant; indeed, it may be said to be characterized by *six genera*, viz: *Terebratula, Gryphœa, Exogyra, Ammonites, Baculites* and *Belemnites*:* of these the four last are extinct, and the remaining two are among the rarest of recent genera.

It is only in the states of New-Jersey and Delaware that the Secondary appears as a superficial deposit: in all the more southern states the Tertiary formation is superimposed upon it. The localities south of Delaware in which the Secondary has been hitherto observed, uncovered by the Tertiary, are the following: at Ashwood, near Cape Fear river, North Carolina—near *Mars' Bluff*, on Pedee river—Effingham's Mill, near the Eutaw Springs, on Santee river, on the authority of Dr. Wm. Blanding; and at Cockspur Island, near Savannah river. All these localities, excepting the first, are in South Carolina; Belemnites are found at all of them, and Exogyræ at Effingham's Mill. It is evident from specimens brought from the more southern and western districts, that this formation is uncovered in many other places, though I cannot yet indicate them with precision.

* I have examined the extensive collection of the characteristic fossil shells of New-Jersey and Delaware, in the collection of Dr. Morton, as well as my own collection from the same localities, and consider them as affording unequivocal evidence of the correctness of the geological position which I have assigned to this formation. I refer to Dr. Morton's paper (which follows this) for the specific descriptions of these fossils.—L. Vanuxem.

None of the characteristic fossil shells of this formation have ever been found in the overlying Tertiary deposits of the southern states; nor have they been observed to characterise any disposition in Europe more modern than the chalk; the shells therefore being generically analogous to those of the chalk, the two formations are to be considered as contemporaneous.

In geology, earthy materials are very different in different places of the same age, or deposition, and their characters, even in the primary formations, cannot be wholly relied upon in determining the relative ages of the several deposits. This objection does not obtain with respect to shells, for the more they have been studied, the more constant have they been found, as indices by which to ascertain the relative ages of the formations in which they occur.

The proportion of carbonate of lime in the earth which contains these pelagic shells, increases as we go south; the *marl* of New-Jersey and Delaware yielding but a very inconsiderable proportion of it, sometimes scarcely to be detected. It appears to owe its fertilizing property to a small quantity of iron pyrites, (which passes to sulphate of iron by exposure to the air), and also to animal matter, to its colour, and to its effect, when mixed with sand, of diminishing the calorific conducting power of the latter.

The surface of this deposition appears to form an

inclined plane, gradually rising from, or inclining to the ocean.

In many of the states there is a bed of clay (No. 2 of the diagram) containing *lignite* or *charred wood*, with pyrites, amber, &c., which is no doubt represented, in many places, by beds of sand, containing woody fibre replaced by siliceous matter; for in all cases where wood is enveloped by clay, which admits with difficulty the percolation of water, the mass is found in a black charred state; but, on the contrary, when deposited in a matrix which admits the infiltration of water, such as sand, soil, or loam, the wood appears in the *replaced*, or *petrified* state. The clay bed in question, wherever it has been observed, is super-imposed upon the Secondary: this is particularly obvious near Bordentown, and many other places in New-Jersey, and at the deep cut of the Delaware and Chesapeake canal, in the state of Delaware: it is also seen at Silver Bluff, on Savannah river; at Intermitting Spring, near Edistow, and near Manchester in South Carolina:—also underlying the Tertiary at Longbranch, in New-Jersey.

This mass is by no means well characterized in consequence of the absence of shells, for any bed of clay containing lignite, might be considered as belonging to it. Such a deposit may have occurred at almost any period of modern formations; but this fact does not invalidate the position that a bed, or deposition, of clay and lignite is found resting upon the

mass containing the Pelagian shells, and covered by the more recent, or Tertiary formation.

Tertiary Formation. The *Tertiary* is represented by No. 3 of the annexed diagram, and its geographical distribution is as follows: it embraces, in all probability, the islands of Nantucket, Martha's Vineyard, Long Island,* and Manhattan Island, together with a fractional part of the adjacent coast of New-York and New-England. According to Mr. Peirce, it forms the Neversink Hills in New-Jersey, and it is also observed to a partial extent at Long-Branch, in a bed containing Mytili, which rests on Pyritous Lignite: it also embraces the white clay found below White-Hill, but is nevertheless a rare deposition in either New-Jersey or Delaware, as will be inferred from what has been already said of the marl which constitutes the superficial mass. In the southern part of the peninsula of Maryland it makes its appearance as an extensive deposition, from whence it pursues a southern direction, forming an almost continuous superficial mass, and occupying the limits of the great formation which Mr. Maclure has designated as alluvial.

It is composed of carbonate of lime, with various proportions of clay, or sand, or both; of clay alone; of clay with sand, forming loam; of beds of gravel; or of buhr-stone.

* *Vide* Mitchell in Bruce's Mineralogical Journal, p. 129, and again, p. 261, &c.

This great region is characterized by *littoral* shells, analogous to those of the Tertiary deposits of the Paris and English Basins: unlike the Secondary, this formation contains a vast number of genera, of which few or none are extinct;* indeed, very many of the species differ but little from the littoral shells now existing on various parts of the American coast.

Nearly one hundred and fifty species, and many of them in great abundance, have been found at a single locality in St. Mary's county, Maryland, of which Mr. Say† has already described and figured upwards of forty as new. The genera are proportionably numerous, and among them as most conspicuous, the following may be particularized: Ostrea, Pecten, Arca, Pectunculus, Turritella, Buccinum, Venus, Mactra, Natica, Tellina, Nucula, Venericardia, Chama, Calyptrea, Fusus, Panopœa, Serpula, Dentalium, Cerithium, Cardium, Crassatella, Oliva, Lucina, Corbula, Pyrula, Crepidula, Perna, &c. All these genera, it should be recollected, still exist among recent shells.

These fossils, so totally different from those we have already designated as characteristic of the *Secondary*, have been found abundantly at the very

* The fossil genus which Mr. Say has indicated by the name of *Disjutea*, does not all differ, in the mode of attachment of its appendix, from some species of *Calyptrea* contained in the Cabinet of the A. N. S. Either, therefore, this generic distinction must be abandoned, or some recent shells must be added to it.

† *Vide* Jour. Acad. Nat. Sc. vol. iv. p. 124, &c.

commencement of the Tertiary formation in Maryland, and occur more or less throughout the whole southern range of this great deposition; but in no instance has any one of the six genera which characterize the Secondary, been found in conjunction with the above littoral, Tertiary fossils. It is true, that the Secondary contains a few casts and fragments of some of these genera, such as Arca, Pectunculus, Ostrea, Natica, Turritella, &c., but they are of too rare occurrence to admit of being considered as characteristic shells; they are evidently mere insulated individuals, and as such can have but little geological importance.

In fact, so strikingly different are the fossil reliquiæ of the two formations of which we have spoken, that it is much to be wondered at that they have ever been considered as contemporaneous, especially since the study of Fossil Conchology has afforded so many additional facilities for collecting and comparing geological facts. In truth, the Secondary and Tertiary formations of America appear to have no analogous features: the former is remarkably homogeneous in its earthy mass, and contains very few genera and species of shells, which are all of the *Pelagic* class. Its fossils, wherever observed, whether in New-Jersey or in South Carolina, have hitherto been found not only generically, but even specifically the same, and there can be no doubt, that, wherever it is penetrated, its productions will be found characterized by

the same remarkable simplicity. On the contrary, the shells of the Tertiary, as we have remarked above, are vastly abundant in genera and species, all of which are *littoral*, and disposed in a matrix which presents almost every variety of earthy composition.

That part of the Tertiary which contains shells, is generally found within fifteen or twenty miles of the boundary of the Primitive, the intermediate space being filled with clays of various kinds, of which the *white-clay*, such as is found below White-Hill, in New-Jersey, forms a considerable portion.

The highest point to which this deposition rises is about two hundred and fifty feet, which is near the line of junction with the primitive. The highest known bluff containing shells, is *Shell Bluff*, on Savannah river: it is about seventy feet high, formed of various beds of impure carbonate of lime, of comminuted shells, and having at its upper part, the *ostrea gigantea?* in a bed nearly six feet in thickness (represented in the diagram by the dotted section of No. 3). It has been mentioned by those persons who have written on this subject, that a continuous bed of these ostreæ commences at Eutaw Springs, and passes through Georgia, the Floridas, Alabama, &c. It is well known that these oyster shells are found abundantly in certain places in the states just mentioned; not, however, as a continuous mass, but in beds, or partial depositions, similar to those which

now exist in our bays and estuaries. In all places where met with, these ostreæ occupy the upper part of the Tertiary deposit.

Alluvial Formation. This consists of two depositions, which may be designated as the *Ancient* and the *Modern Alluvial.*

The first of these, or the *Ancient Alluvial,* is chiefly composed of the *Red-earth,* (number 4 of the diagram.) This earth is pretty uniform in its characters, consisting of sand, with a minute portion of clay, coloured by red oxide of iron: its inferior parts often contain pebbles, sometimes coarse nodules or geodes of iron, resting almost invariably on the white or variegated clays, or upon those masses which contain littoral shells. Though not often met with beyond North Carolina, it is extremely abundant in all the states south of it. It appears that much of the *white sand* (no. 5 of the diagram) which covers it more or less thickly, results from the *red-earth* being freed from its colouring and argillaceous matter by the action of rain, and other aqueous agents.

This deposition occupies the highest elevations above the Secondary and Tertiary classes, and consequently could not have been formed by our existing rivers. It is entirely unmixed with the Tertiary, and destitute of the fossils which characterize the latter; it must therefore be considered as distinct from it, at the same time that it is unlike the *modern*

alluvial, whose origin is clearly attributable to the overflow and inundation of our rivers.

The *Alluvial proper*, or *Modern Alluvial*, (no. 6 of the diagram,) is well characterized in the southern states, in consequence of its being thrown up against some one of the masses already spoken of, and there appearing as the *debris* of the rivers which traverse those states; the greater part of which, even at this period, contribute largely to this deposition. The two alluvials of the northern states are not so well defined, in consequence of the similarity of their products; for there is great difficulty in distinguishing even between the Ancient Alluvial and the Tertiary in those states where the *Red-earth* is replaced by other matter, unless shells are present.—Finally, it is certain that all the bones of the mammoth, and other mammiferous terrene quadrupeds found in this region, belong to the two Alluvials.

Description of the Fossil Shells *which characterize the* Atlantic Secondary Formation *of New-Jersey and Delaware; including four new species. By* S. G. Morton, M. D.

(Read December 11, 1827, and January 1, 1828.)

I had originally no other intention in writing this paper, than to describe some new species of Fossil shells from the *Marl* of New-Jersey and Delaware; but, at the instance of my friend Mr. Vanuxem, I have modified my plan, so as to include descriptions of all the species of the *genera* which characterize this interesting formation.

The boundaries of our Atlantic Secondary, so far as they have hitherto been ascertained, are given in the preceding essay, together with the names of the six genera of fossil shells by which this formation is characterized; *viz: Terebratula, Gryphæa, Exogyra, Ammonites, Baculites* and *Belemnites.*

We are indebted solely to Mr. Say, so far as I can discover, for all that has been hitherto written respecting the *species;* but several of these have escaped his observation, and in reference to those which he has described, I hope to give a number of additional facts, and to make some important corrections. I have freely availed myself of the papers of that able naturalist wherever I have found them, of which more specific acknowledgments will be made in the subsequent pages.

My plan necessarily involves some repetition; but as the fossils described by Mr. Say have never been figured, and as it is my intention to give accurate drawings of all the species embraced in this paper, it becomes necessary to accompany them with descriptions; for a figure without a description would be almost as unsatisfactory as the latter without the former. It will be observed that a single species from an English locality is represented in Sowerby's "*Mineral Conchology* of Great Britain:" another, the Belemnite, has been often figured. All the other fossils described in this paper are now figured for the first time.*

Such of the following species as are new have a Latin description appended.

Genus TEREBRATULA.

1. *T. Harlani* (nobis). Pl. 3, Fig. 1 and 2.

Description.† *Shell* large, about twice as long as broad, sides straight and imperfectly parallel;

* Since writing the above paragraph I have read No. 11, vol. ii, of the Annals of the Lyc. of Nat. Hist. of N. Y. in which Dr. Dekay has described and figured the Ammonite of this formation. As I long since figured this fossil, I have had the drawing engraved, but have omitted the description.

† *Descriptio. Testâ* magnâ, oblongâ, lateribus rectis, subparallelis: *valva superiore* plano-convexa, ad marginam biplicatâ: *valva inferiore* maximè convexâ, subsinuata; *nate* incurva; *umbone* elevato.

upper valve plano-convex, obscurely biplicated except near the margin, which has three inconsiderable sinuses: *lower valve* very convex, with a longitudinal ridge and slight lateral depressions; *beak* incurved; *umbo* prominent.

Length two and a half inches: *breadth* an inch and a half.

Variety A. Sides straight, but approximate more or less towards the anterior margin, giving the shell somewhat the shape of a coffin.—Other specimens are more rounded at the sides, and others again straighter, than the one figured. In one or two specimens the upper valve is extremely convex, but the general appearance of the shell nevertheless conforms to the above description.

This fine Terebratula is remarkable for its large size, the straightness of its sides, and the plano-convexity of its upper valve. It is so entirely different from any species with which I am acquainted, that I have no hesitation in considering it new; and I feel peculiar pleasure in dedicating it to my friend Dr. Richard Harlan, whose interesting researches in Fossil Zoology have added greatly to our knowledge of organic remains.

This species is one of the most abundant in New-Jersey, especially at the marl pits near Egypt, respecting which some observations will be made hereafter.—I have also found several very perfect specimens at Ralph's Mill, near Hornerstown, N. J. in a

small branch of Crosswicks creek: the matrix is an indurated arenaceous marl, of a bluish grey colour, from which it is difficult to separate the fossils entire.

My Collection.—Cabinet of the Acad. Nat. Sciences.—Mr. J. P. Wetherill's Collection, &c.

2. *T. fragilis* (nobis). Pl. 3, Fig. 3 and 4.

*Description.** *Shell* very thin, twice as long as broad, sides straight and nearly parallel, concentrically striated; *upper valve* flattened, subconvex, with two very elevated ridges almost the whole length of the shell, and having a deep sinus between them; lateral sinuses less marked: *inferior valve* very convex, with a prominent central ridge and corresponding lateral depressions; *beak* incurved, *foramen* small.

Length an inch and a half; *breadth* three-fourths of an inch.

The general outline of this handsome shell is very similar to that of the T. Harlani, from which, however, it differs by its strongly marked ridges and sinuses, the remarkable flatness of its upper valve, and the extreme delicacy of its shell, which is as thin as paper.

* *Descriptio. Testâ* tenuissima, oblongâ, lateribus subparallelis, striis concentricis: *valvâ superiore* depressâ, sub-convexâ, insigniter biplicatâ: *valvâ inferiore* perconvexâ, rugâ longitudinali elevatâ; *nate* incurva; *foramine* minimo.

Found at Egypt, New-Jersey. I possess but a single specimen, from which the annexed drawing was taken: another in S. W. Conrad's collection has its sides much more rounded, but appears to be specifically the same.

3. *T. Sayi* (nobis). Pl. 3, Fig. 5 and 6.

Syn. T. *plicata*, Say. American Journal of Science and the Arts, vol. ii. page 43.

Description. Shell suborbicular, with ten or twelve profound longitudinal plicæ in each valve, the two middle ones most conspicuous, crossed by three or four transverse striæ: *upper valve* subconvex, straight at the hinge margin: *lower valve* convex; *beak* triangular, not incurved; *foramen* small.

Length half an inch; *breadth* a little more.

The above description differs but little from that of Mr. Say, who adds that this shell bears considerable resemblance to the T. *crumena** of Sowerby, "in the form of its folds, and in their extending to the beak, but the middle of the front is but slightly elevated, with but two folds instead of three as in the *crumena;* the sides also have two or more folds instead of four or more, and the beak is not very prominent."

Variety A. Beak incurved; *lower* valve more convex.

* Min. Conch. pl. 83, fig. 2 and 3.

A single valve in my possession has delicate longitudinal striæ, but I cannot detect them on the shell from which the annexed drawing is made, nor on the other specimens I have examined.

Mr. Say could not have been aware, when he described this fossil, that the name he gave it had already been appropriated. Such, however, is the fact; it will be found in *Lamarck's* system, vol. vi. p. 263, and refers to the *Enc. Methodique*, pl. 243, &c. This volume of Lamarck's work appeared nearly a year and a half before Mr. Say's description was published. As it therefore becomes necessary to change the name of Mr. Say's shell, I have done it in a manner which I am certain will gratify all those interested in Fossil Conchology.

Occurs in the marl of Burlington county, N. J. more particularly at Woodward's Farm, near Walnford, from whence it was first brought by Mr. Samuel R. Wetherill.

My Collection.—Cab. A. N. S. etc.

4. T. *perovalis ?* Pl. 3. Fig. 7 and 8.

T. *perovalis*, Sowerby, Min Conch. Pl. 436, fig. 2 and 3.

Description. Shell ovate, concentrically and longitudinally striated: *upper valve* biplicated, sulcated at the front and sides; *lower valve* thick, *umbo* prominent, *beak* incurved.

Length an inch and three quarters: *breadth* an inch and a half.

Variety A, elongated.

I have not availed myself of Mr. Sowerby's description, nor am I certain that this shell is identical with his: the resemblance, however, is so strong, that I am unwilling to separate them. The American specimen is in all instances more obtusely rounded on the hinge margin of the upper valve, than those figured in the *Mineral Conchology*: it is also longitudinally striated, and for the most part has the upper valve considerably less convex than the lower one: this is particularly the case in the elongated variety. The sinuses are in all instances very superficial.

This shell is common in various parts of New-Jersey: many specimens in the most entire preservation have been obtained at Ralph's Mill, near Hornerstown, with the *T. Harlani*. They are of a bluish grey colour, and imbedded in indurated marl.

It is found with the same appearances near the Poor-House, in Gloucester county; and in considerable numbers and variety near Egypt; at the latter place they are generally friable, disintegrated on the surface, and of a yellowish brown colour from oxide of iron. I am informed this species has also been found very perfect in the lower parts of the state of Delaware.

My Collection.—Cabinet of the Acad. N. S.—Mr. J. P. Wetherill's collection.

Note. Beside the preceding species of *Terebratula,* I possess some casts of a peculiar form from the line of the Delaware and Chesapeake Canal; but as no part of the shell remains, I shall defer the examination of them to a future occasion.

Genus GRYPHÆA.

1. G. *convexa,* (nobis). Pl. 4, Fig. 1 and 2.

Syn. Ostrea *convexa,* Say. "American Journal of Science and the Arts," vol. ii, page 42.

Description. Shell oblong oval, smooth: *upper valve* thin, very concave, concentrically striated, margin reflected abruptly upwards to meet that of its fellow: *lower valve* remarkably convex, smooth, biangulated from the hinge margin, with a longitudinal indented line on one side; a transversely wrinkled groove within on each side of the hinge; *cicatrix* oval; *beak* broad, plane, remarkably incurved; *umbo* not prominent.

Length two and three quarter inches; *breadth* two and a quarter inches; *depth* an inch and a quarter.

Variety A, umbo thick and prominent.

This fossil, together with some others of the same class from the same localities, have been hitherto placed with the genus *Ostrea,* from which I have not hesitated to transfer them to *Gryphæa,* as they undoubtedly belong to the latter.

It will be observed that I also differ from Mr. Say in representing the upper valve as *very concave*; and I am convinced that the slightly convex upper valve of which he speaks, belongs to another species of this genus next to be described: for the annexed drawing (which was taken from a very perfect specimen) shews the concavity of the upper valve to be so great as to form one of the most striking peculiarities of this fossil. Mr. Say remarks, with respect to it, that "it closely approaches to the genus *Gryphæa;* the lower valve is even proportionably more convex than that of *Anomia gryphæa,* and is also furnished with the indented line or lateral lobe as in that shell, *but the umbo is not prominent.*" The latter remark of this accurate naturalist is correct with respect to the shell he described, and the one I have figured; but I have several specimens of *variety A* in which the umbo is remarkably prominent.

This species is not so frequent as those hereafter to be noticed; it has been chiefly found at Woodward's Farm, near Walnford, N. J. and at St. George's in Delaware: a specimen in my collection, from the former locality, is five inches long and four inches and three quarters broad, and very ponderous. The upper valve is so thin and delicate that it is rarely found entire. I have found small specimens in the lower marl beds at Egypt.

My Collection.—Cabinet of the A. N. S.

2. G. *mutabilis* (nobis). Pl. 4, Fig. 3.

*Description.** *Shell* irregularly oval, smooth, broadly expanded each side of the beak, both valves obliquely corrugated each side of the hinge: *upper valve* slightly concave, concentrically striated, outer edge reflected obliquely upwards to the disc of its fellow, with a few lines radiating from the apex to the periphery: *lower valve* convex, transversely undulated, lobed by a longitudinal groove; *cicatrix* subovate; *umbo* prominent; *beak* slightly incurved.

Length four inches; *breadth* four inches and a half.

Variety A. *upper valve* subconvex, *umbo* depressed.

This interesting fossil expands laterally from the hinge on each side, but most on that which is lobed. The radiated lines on the upper valve are few in number and irregular, but in most instances strongly marked. The lower valve has a ridge or line extending from the hinge round the shell, and parallel to the edge; at this point the reflected margin of the upper valve commences, and is continued obliquely upwards to the disc of the corresponding valve. This character, however, is not peculiar to

* *Descriptio.* Testâ subovali, glabrâ, late expansâ ab utroque cardinis latere: *valvâ superiore* subconcavâ, striis concentricis, et lineis paucis ab apice ad marginem divaricatis: *valva inferiore* convexâ, lobatâ, transversim undulata; *cicatrice* subovata; *umbone* elevato; *nate* leviter incurva.

the G. *mutabilis*, but is common to the three species of this genus found in the Atlantic Secondary.

This shell is vastly abundant throughout New-Jersey and Delaware, and presents several varieties of which I have indicated the most striking. It has hitherto been confounded with G. *convexa* (*Ostrea convexa* of Say), and when on a former occasion speaking of the latter fossil, I was also induced to admit their identity.* Since then I have examined upwards of a hundred specimens, and have now no hesitation in considering these fossils to be specifically distinct. There are, it is true, a few intermediate varieties, which no doubt, from accidental causes, present but equivocal characters. In most instances, however, they can be distinguished at a glance; for the great curve of the beak in the G. *convexa*, together with the extraordinary depth of both valves, and the circumstance of its being uniformly longer than broad, are characters which contrast strongly with those of G. *mutabilis*.

Some old specimens of our shell have considerable resemblance to the G. *dilatata*† of Sowerby; the latter, however, is much more convex, its upper valve is flat, and its sides are not similarly produced from the beak. The G. *mutabilis* has also some analogy to the G. *bullata*‡ of the same naturalist;

* *Vide* Jour. Acad. Nat. Sc. vol. vi. p. 51.

† Min. Conch. vol. ii. pl. 149, fig. 1.

‡ Min. Conch. pl. 368, vol. iv.

but the latter is destitute of the projecting wings or angles of the former, nor has it the grooved radiated lines of our shell. It will be well for those who have any doubt of the propriety of placing this series of shells with *Gryphæa*, to compare it with the G. *bullata* and read the corresponding text, together with the remarks on page 21 of vol. 2, of the same work.

I strongly suspect that *variety A* will be yet found to be a distinct species : it has, in fact, fewer characters of the genus Gryphæa than any other shell of this series.

At Woodward's Farm, Mullica Hill, Egypt, and many other places in New Jersey, this fossil exists in great numbers: it is still more abundant at St. George's, in Delaware, where hundreds of specimens were thrown up in excavating the canal. The shell spoken of by Dr. S. L. Mitchell* as a *peculiar oyster* from the foot of the Neversink hills, is no doubt a Gryphæa either of this or the preceding species.

My collection.—Cab. Acad. Nat. Sc.—Mr. J. P. Wetherill's Collection, &c.

3. G. *vomer*, (nobis). Pl. 5, Fig. 1, 2 and 3.

Description.† *Shell* sub-rhomboidal : *upper valve*

* *Vide* his edition of Baron Cuvier's "Essay on the theory of the Earth," p. 384.

† *Descriptio. Testâ* subrhomboidali : *valvâ superiore* parvâ, tenui, subconcava : *valvâ inferiore* convexâ, cum margine lobatâ e cardine obliqué expansâ; *natè* incurva, ad punctum product; umbone elevato.

small, thin, slightly concave; *lower valve* convex, obscurely lobed, the lobed margin obliquely produced from the hinge; a wrinkled groove each side of the latter; *beak* pointed, curved *obliquely* inwards; *umbo* prominent.

Length one inch and three quarters; *breadth* one inch and three quarters.

I was at first disposed to place this shell with G. *vesiculosa* (a green sand fossil) of Sowerby; the latter, however, is differently shaped, deeper, and has not the wrinkled groove each side of the hinge.

Some specimens are deeper than others, and have the beak much more curved; some again have the lobed portion but slightly produced. This shell is so fragile that I have not been able, out of very many specimens, to obtain a perfect one, nor have I yet seen two fitting valves. The upper valve is thin, delicate and more or less disintegrated.

These fossils have a reddish colour from oxide of iron; they are found abundantly in one of the upper marl beds near Egypt, N. J. I have not seen the species from any other locality in this region.

An important fact relating to all the preceding species of *Gryphæa*, is, that in no instance have I been able to detect an attached specimen, although several hundred individuals have passed through my hands. Although these shells do not entirely accord with the peculiarities assigned to this genus by Lamarck, yet it must be borne in mind that the

characters of the Gryphææ have been allowed a much greater latitude by more recent naturalists, and especially by those who have studied *fossils in connexion with Geology*, the only light in which they can be viewed with any degree of advantage.

My Collection, and that of Mr. S. W. Conrad.

Genus EXOGYRA. *Say.*

E. costata. Pl. 6. Fig. 1, 2, 3, and 4.

E. costata. Say. Am. Journal of Science and the Arts, vol. ii. p. 43.

Description. Shell ovate, thick: *lower valve* convex, costated, transversely corrugated, costæ of the disk somewhat dichotomous, sometimes fornicated; apex lateral, with about two volutions; a single profound cicatrix; *hinge* with two nearly parallel, deeply excavated grooves, of which the inner one is shortest and corrugated: *upper valve* flat, with numerous elevated, concentric, squamous plates; outer edge abruptly reflected from the inferior to the superior surface; *hinge* with a single groove on the edge.

Length four inches; *breadth* three and a half inches.

Mr. Say remarks, that this shell is the largest and most perfect which has yet been found in New-Jersey. The specimens vary considerably in the costæ, which are sometimes obscure and even entirely want-

ing. The aged shells become extremely thick and ponderous. It is frequently attached to other shells of the same species, to Belemnites, &c.

The upper valve is often convex in young shells; the latter uniformly possess the squamous plates, which have not been noticed in the original description by Mr. Say; in old specimens, however, they are not unfrequently wanting.

Mr. Say has thought proper to separate this shell from the genus *Chama*, to which, however, it bears a strong analogy. In Mr. J. P. Wetherill's collection (now deposited in the Academy of Natural Sciences) there are several specimens of a fossil from the Green-sand of Wiltshire, England, which appear to be generically the same with the *Exogyra*. The specimens in question seem to answer to the *Chama haliotoidea* of Sowerby, as figured in his 25th plate. If I am correct in the latter supposition, it follows, that Mr. Say's shell is a *Chama* of the English conchologists. Still it is a question whether the peculiarities of both the American and English specimens do not entitle them to generic distinction. The young shells of the *Exogyra* are scarcely to be distinguished from the Wiltshire species, and both have but a single muscular impression in each valve,—a fact at variance with the generic characters of *Chama* as given in the systems.

The annexed accurate drawings, made by my friend Mr. Titian R. Peale, will enable the reader

to judge for himself, even though he may not have seen the fossil.

With regard to this genus, Mr. Say observes, that it seems to differ from *Gryphæa* by having been attached, and by the lateral situation of the spire; the hinge grooves also are parallel to the edge, so as to be transverse with respect to the shell, as in some species of the Chama.*

The *E. costata,* is abundant throughout the Secondary formation of New-Jersey and Delaware, viz: at Mullica Hill, in Gloucester county, New-Jersey, where the shells are charged with ferruginous matter; at Sandy-Hook; at Woodward's Farm, near Walnford in a very perfect state, and associated with *Gryphææ* and innumerable *Belemnites.* In the late excavations at St. George's, in Delaware, the Exogyra has been found in vast numbers, and occasionally of gigantic size. I have seen one specimen which was eight inches in length: others are not an inch long. I am much indebted to my friend, Mr. Wm. L. Newbold, for specimens of this fossil, and others from the same vicinity.

This species has also been found in digging a well near the Eutaw Springs, South Carolina; I have received this interesting fact from Dr. Wm. Blanding, of Camden, South Carolina.

* The generic distinctions of the *Exogyra,* as given by Mr. Say, are particularised in Silliman's Journal, as quoted above.

The fine specimens from which the annexed drawings were made, were obligingly lent to me by my friend Samuel R. Wetherill, of Burlington, who has done much for science by his attention to the fossil productions of New-Jersey.

Cabinet A. N. S.—Peale's Museum.—My collection, &c.

Genus AMMONITES.

A. *hippocripes*, Pl. 5. Fig. 4.

A. *hippocripes*, Dekay. Annals of the N. Y. Lyc. of Nat. Hist. vol. ii. p. 277, and plate 5, fig. 2.

I shall not attempt a description of this fossil, for reasons already mentioned; the recent attention which my friend Dr. Dekay has given to it has decided it as a new species, and his description is too correct, and too recent, to require any additions of mine.

I had long believed this shell to be a *nondescript*, nor had I found in authors any species at all allied to it, excepting, perhaps, the one figured by Faujas in his Natural History of the Mountain of Maestricht;* on comparison, however, it is essentially different from this also. Although I relinquish the description I had intended for this fossil, I have inserted the drawing, as it was made long since, and gives a differ-

* Pl. xxxi.

ent view of the shell from that contained in the Annals of the Lyceum.

This is no doubt the shell mentioned by Mr. Say,* as approaching nearest to A. *elegans* of Sowerby. The resemblance, however, is not striking.

My collection.—Cab. A. N. S.—S. R. Wetherill's collection.

Genus BACULITES.

B. ovata. Pl. 5. Fig. 5 and 6.

B. ovata, Say. "American Journal of Science and the Arts," vol. ii. p. 41.

Description. Ovate, *sides* compressed and semi-elliptically undulated: *septa* six lobed, three on each side with a small one between each, and a small posterior one, dentated at their edges: *first* or *siphuncular lobe* small, not sinuous; *second lobe* with a single projection at each side, and sinus at the tip; *third lobe* dilated with a small sinus each side, and a more obtuse one at the tip; *posterior lobe* very small.

Greater diameter one inch and a fifth; *smaller diameter* seven-tenths of an inch; *length of the segment* half an inch.

The above description is derived from Mr. Say, excepting the semi-elliptical concentric undulations:

* Silliman's "Journal of Science," &c., vol. ii. p. 44.

I found this character to obtain on all the Baculites I had seen from this region, and was therefore induced to examine the identical specimen from which Mr. Say drew his description, which I did by the kindness of my friend Mr. Reuben Haines, in whose collection it is preserved. I at once detected the peculiarity above mentioned, though so much defaced as not likely to be noticed unless suspected to exist; although the specimens of this Baculite vary much in the degree of compression of their sides, they uniformly present the undulatory surface. This circumstance will serve to distinguish it from all previously described species, excepting the B. *cylindrica* of Lamarck, which is cylindrical, and otherwise distinct. Mr. Haines informs me that his specimen was carried for thirty years in the pocket of the finder; which fact sufficiently accounts for the rings having become almost imperceptible. I have figured it on account of its large size: it was found in the marl of Sandy-Hook Bay, New-Jersey, where many other specimens have been obtained. The smaller specimen (pl. 5, fig. 5,) is from Burlington county. They are not unfrequent in other parts of the same state; and have latterly been found in considerable numbers in digging the deep cut of the Delaware and Chesapeake canal.

My collection.—Cab. A. N. S.

Genus BELEMNITES.

B. *subconicus*. Pl. 5. Fig. 7.

B. *subconicus*, Lamarck, Animaux Sans Vert. Tome vii. p. 592.—Enc. Meth. pl. 465, fig. 1.

Description. Shell smooth, inferior part semi-cylindrical; upper half terminating gradually in a pointed cone.

This fossil has been found abundantly in various parts of our Secondary region, from Sandy-Hook, in New-Jersey, to the insulated appearances of this formation in South Carolina. Cockspur Island, in the latter state, derives its name from the vast number of Belemnites which it contains. Other localities in the southern states have been already mentioned:* in New-Jersey they exist in vast numbers at Woodward's Farm, near Walnford, where they are accompanied by Exogyræ and Gryphææ in abundance. At Mullica Hill, they are also common, often so disintegrated as to show their radiated fibrous structure, and in some instances replaced by the crystallised phosphate of iron.

My collection.—Cabinet A. N. S., etc.

* Vide Mr. Vanuxem's paper. Dr. Mitchell, in his Notes to Cuvier's Theory of the Earth, says they are also found on James' river, Virginia; but he does not mention the precise locality.

NOTE. I have considered the preceding *genera* as characteristic of this formation, because they occur in greater or less profusion throughout its whole extent. Several other genera are occasionally met with, but they are few in number, and in most instances so imperfect, as to preclude the possibility of ascertaining their specific characters: where the latter have been recognised they are noticed in the following list, which comprises all the remaining fossil shells *which I have seen* from this region.

Genus OSTREA.

O. *falcata* (nobis), more frequent than any other of the non-characteristic fossils: it mostly occurs in fragments, but many specimens have been found at St. George's, Delaware, in the best preservation.—My collection, Cab. A. N. S.

O. *flabellula*. Two or three valves. Mullica Hill, N. J.—Cab. A. N. S.

O. *cristagalli*. A single specimen. St. George's, Del.—My collection.

Genus ANOMIA.

A. *ephippium ?* I have several specimens in good preservation from St. George's, Del.

Genus ARCA.

Casts of a small species are not unfrequent. I have several from Arneytown, N. J. and from Mr.

Tod's place eight miles from Camden, in the same state. A larger species has been found in digging the Delaware and Chesapeake canal, but no trace of the shell is left.

Casts of the following genera, all more or less mutilated, are contained in my collection and in that of the Acad. N. S.: but they are all of rare occurrence, and none of the shell remains. Of several of them I have seen but a single specimen.

Turritella,
Cucullæa,
Natica,
Pinna,
Cypræa,
Buccinum,
Cardium,
Dentalium.

Miscellaneous Observations.

On some late excursions in New-Jersey, I became for the first time apprised of the extensive distribution of the genus *Terebratula* through this region. I had often seen fragments, but had in no instance met with them in sufficient preservation to determine the species, until a few specimens were received by Mr. Wetherill from the locality at *Ralph's Mills*. This induced me to visit the place, and from some information obtained from the country people respec-

ting the marl-pits near Egypt, I extended my excursion to the latter town. It is intended to confine these observations chiefly to the locality in question, which is one of the most remarkable fossil deposits in this country; nor am I aware that any naturalist has visited it prior to myself.

About half a mile from Egypt, in Burlington county, and on the margin of Crosswicks creek, the marl has been dug from the declivity of a pine-bluff, in such manner as to expose it in a vertical section. The eye at once distinguishes twelve beds or strata, varying more or less in colour and in their contents. The collective height of these beds is about thirty feet, one half of which may be said to be a mass of pelagian fossil shells, consisting of different species of *Gryphæa* and *Terebratula.*

The depth and composition of each bed are nearly as follows; but the extreme inclemency of the weather at the time these observations were made, must be the apology for any inaccuracies they may contain.

	feet	in.
*First bed.** Sandy chocolate coloured marl, without organic remains,	7	
Second bed. Gray indurated marl: no organic remains,	1	
Third bed. Darker coloured, friable marl: no organic remains,	6	

* Counting from the surface of the ground.

	feet	in.
Fourth bed. Friable iron-grey marl with bluish grains: filled with Terebratulæ	1	
Fifth bed. Ferruginous marl with Terebratulæ,	1	
Sixth bed. Bluish grey marl, with Terebratulæ,	0	8
Seventh bed. Same colour as No. 4, filled with Gryphææ, and a few Terebratulæ,	1	3
Eighth bed. Dark marl with Terebratulæ	2	3
Ninth bed. Same with Gryphææ,	4	6
Tenth bed. Dark green, friable marl: without shells,	1	
Eleventh bed. Blackish marl: no shells,	1	
Twelfth bed. Arenaceous green marl, filled with Gryphææ and Terebratulæ—depth unknown:—exposed,	1	
Height of the Bluff,	27	8

These beds are parallel to each other, and exhibit, in all probability, the most regular marl deposit hitherto discovered in this country. The depth and contents of the strata, as given above, were first obtained by myself; subsequently my friend Dr. Edward Swift visited the place at my suggestion, and took the measurements with greater accuracy. The fossils are very much disintegrated by the action of the weather on the surface of the bluff, which is

so charged with oxide of iron as to render it doubly friable. Nevertheless I obtained, in a short time, several very perfect specimens, and Dr. Swift has since procured upwards of a hundred: I have described the several species in the preceding pages, but there can be little doubt that further observation will detect some others.

The lowest bed of green and blackish marl, appears to be more siliceous than those above it, nor can its depth be ascertained; its fossils are so enveloped in the matrix as to be with difficulty separated from it, and the Terebratulæ are uniformly in fragments.

No other genera besides the two above mentioned have yet been found here, excepting only some small fragments of *Fistularia*.

The shells of Egypt, though much disintegrated, have no appearance of having been at any time subjected to the violence of the waves, or of a current; for the Terebratulæ, although extremely thin and delicate, are, in the upper beds especially, seen entire in the marl, but are apt to crumble to pieces in separating them from the mass. There is indeed ample evidence that all these fossils have been deposited in successive long periods in the depths of the ocean, and in a quiescent state of the latter.

It yet remains to be ascertained whether the fossils of each bed are specifically distinct: those in my possession were collected in very unfavorable wea-

ther, and afford no answer to this question. Again it may be suggested that those persons desirous of subjecting the varieties of marl to chemical analysis, will have an opportunity of selecting from this locality a very interesting series of specimens, and affording, in all probability, almost every variety of composition under which this earth presents itself.

It is worthy of remark, that there exists considerable analogy between some of the fossils of this region and those of the mountain of St. Pierre, at Maestricht, as described by Cuvier and St. Fond.* The lower masses of this mountain are chalk, though the upper mass, or chalk of commerce, is wanting. Our Atlantic secondary is most analogous to the former or lowest mass. The Ammonite of N. Jersey and Delaware, as I have mentioned elsewhere, bears more general resemblance to that of Maestricht than to any other I have met with in authors. The Baculites of the two localities, though specifically dissimilar, are much alike in size and in the arrangement of their sutures. The celebrated saurien fossil called the *Maestricht Monitor*,† from its having been first met with at that place, has also been found in two localities in New Jersey.‡ It will be observed

* Vide Hist. Nat. de la Montagne de St. Pierre à Maestricht.

† Cuv. Ossements Foss. tome v. page 310, third edit.

‡ Mitchell, in Am. edit. of Cuv. Theory of the Earth, pl. viii. fig. 4, and Harlan in Jour. Acad. N. S. vol. iv. page 232.

that the Belemnite alone, of our country, is analogous to that of the chalk of commerce.

While the ammonites, the baculites, the monitor, &c. remind us of the mountain of Maestricht, other reliquiæ denote a considerable affinity between this formation and the *Green-sand* of Europe. I have elsewhere noticed the resemblance of a species of *Gryphæa* from New-Jersey to another of the same genus from the green-sand: since that part of my paper has been in press, I have received a shell from the lowest bed at Egypt, which answers, perhaps in every particular, to the G. *vesiculosa* of the Green-sand, and confirms the G. *vomer* as a new species. To this may be added the fact that some specimens of Terebratula, from New Jersey, are very nearly allied to the *T. biplicata* of Sowerby, especially to the variety figured in his 437th plate. My sole design in this paper has been to give a statement of facts; but an ingenious friend has suggested the following query:—might not the preceding facts lead us to infer that the *green-sand* of England belongs rather to the *chalk* than to the green-sand which underlies the chalk? The lower beds of sand in chalk in France consist of the *Craie chlorité;* replace the carbonate of lime with sand and then we have a *green-sand;* which is a reasonable supposition, as sand belongs to no particular period of the modern classes.

EXPLANATION OF THE PLATES.

PLATE III.

Fig. 1. Terebratula Harlani.
2. Side view of the same shell.
3. T. fragilis.
4. Side view of the same shell.
5. T. Sayi.
6. Side view of the same shell.
7. T. perovalis.
8. Side view of the same.

PLATE IV.

Fig. 1. Gryphæa convexa.
2. Side view of the same shell.
3. G. mutabilis.

PLATE V.

Fig. 1. Gryphæa vomer. Lower valve.
Fig. 2. Upper valve of the same shell.

3. Another shell of the same species, with a remarkably curved beak.
4. Ammonites hippocripes.
5. Baculites ovata: small specimen showing the undulated surface.
6. Large specimen of the same fossil.
7. Belemnites subconicus.

PLATE VI.

Fig. 1. Exogyra costata. Both valves.
2. Same fossil, back of the lower valve.
3. Hinge of the upper valve.
4. Hinge of the lower valve.

NOTE.—Plates 1, 2, 3, 4, and 5, of this volume, were presented to the committee of publication by Messrs. John P. Wetherill, C. W. Pennock, and S. G. Morton, M. D. Plate 6 was presented by Mr. Samuel R. Wetherill, of Burlington, New Jersey.

Description of a new Species of SALAMANDRA. *By* RICHARD HARLAN, M. D.

(Read July 3, 1827.)

SALAMANDRA *dorsalis.*

Char.—*Above,* fuscous; *beneath,* yellowish-white; *tail,* longer than the body, strongly compressed, ancipital: a whitish dorsal line extending from the occiput, over the tail; a row of whitish coloured oblong spots on each side of the dorsal line: *tail,* and inferior portions of the body, freckled with black dots, more sparsely on the throat: *vent,* large, protruded, and puckered: *length,* three inches and eight-tenths,—body, one inch and five-tenths,—tail, one inch, eight-tenths.

Inhabits South Carolina. Cabinet of the Academy of Natural Sciences of Philadelphia.—My collection.

Notice of a Mineral, which approaches to the BILDSTEIN *of* WERNER; *with a few remarks on the connexion of Bildstein with Feldspar. By* S. W. CONRAD.

(Read January 15, 1828.)

The Granite of Dixon's Quarry, near Wilmington, Delaware, abounds with several varieties of Feldspar, some of which are very handsome, approaching nearly to Adularia. They are generally white, and readily yield to mechanical division, affording sometimes slender quadrangular prisms, three or four inches in length.

Amongst these varieties, there is one of a remarkable character, the colour of which is dark yellowish gray; it has a shining lustre, and is highly translucent; of this kind specimens occur, which at one end present all the marks of a true feldspar, and at the other gradually pass into a substance entirely different in its aspect and external characters.

This substance, which is found also in detached masses of a bluish-gray, and smoke-gray colour, is soft, readily yielding to the knife, and affording a white powder. It is nearly dull; its fracture is uneven and splintery, with occasional traces of a foliated structure; it is strongly translucent on the edges; and is composed of granular, distinct concretions: fine scales of a silvery white mica, are frequently in-

terspersed through it. When submitted to the action of the blow-pipe, it turns white, and fuses with difficulty on some of the finest edges.

This mineral approaches the nearest in its external characters, to the *Bildstein* of Werner, the geognostic relations of which are unknown. It has not been analyzed; but its close approximation to Bildstein, and the peculiar manner in which it is associated with the Feldspar at Dixon's, has induced me to conjecture that the Bildstein, or Figure-Stone of China, may be derived from Feldspar by a peculiar change in the constitution of that mineral; a circumstance which not unfrequently happens to unorganized bodies; for, besides the total decomposition to which many are subject, there appears to be a change which others undergo, whereby they lose some of their constituent parts, and acquire others, and thus give rise to substances very different in their characters. Steatite, in the opinion of some mineralogists, is supposed to be the product of such a change; and there are many reasons for believing it is not an original mineral.

The same may be said with regard to Nacrite, which appears to be derived chiefly from Mica, from which it differs but little in its principal constituents.

Whether the Bildstein of China be an original or derivative mineral, or its geognostic relations be with Feldspar or otherwise, must be left for future investi-

gation to determine; at the same time it is so intimately related to Feldspar in its chemical constitution, that it should be arranged with that mineral in preference to placing it, as several authors have done, as a variety of steatite, to which it has but little affinity.

The following comparison will show the chemical relationships of Figure-stone and Feldspar, and the great difference between the former and steatite; and it may be remarked, that the several analyses of Feldspar exhibit a difference in composition amongst its varieties, almost as great as that between Chinese Figure-stone and Feldspar from Passau.

	Chinese Figure-Stone.	Feldspar from Passau.	Steatite.	
Silex	55.00	60.25	64.00	
Alumine	29.00	22.00	3.00	
Magnesia			22.00	
Lime	2.00	00.75		
Potash	7.00	14.00		
Iron	1.00	a trace	5.00	and Manganese.
Water	5.00	1.00	5.00	
	99.00	98.00	99.00	
	Vauquelin.	Bucholz.	Vauquelin.	

Description of a New Species of JUNCUS.

By S. W. CONRAD.

(Read January 22, 1828.)

JUNCUS *viviparus.*

Culmo erecto oligophyllo, superne paniculato, foliis teretibus nodoso articulatis, floribus solitariis subsessilibus.

Description.—Stem slender, from eight to twelve inches high, round, paniculately branched above; branchlets, after flowering, generally bulbiferous; sheaths of the branchlets linear, lanceolate, acute, nerved; leaves terete, nodosely articulated, sheathed below; sheaths striated, bifid and membranaceous at the apex, with the segments rounded, entire; flowers small, solitary, axillary and lateral, nearly sessile; leaves of the calix lanceolate acute; anthers oblong included: stigmas filiform exserted; root somewhat creeping with strong fibrous radicles.—Grows in meadows and wet sandy places, flowering late in the summer.

About twelve or thirteen years past, I first detected this plant, on the banks of Crosswicks creek, three miles above Bordentown, New-Jersey; and

have since found it near Burlington. Dr. Charles Pickering has obligingly furnished me with a number of specimens which he collected about two years past in the neighbourhood of Salem, Massachusetts; where, he informs me, it grows abundantly in the meadows. These specimens are more slender than those from New-Jersey, and much more bulbiferous.

Description of two new species of Fossil Shells of the genera SCAPHITES *and* CREPIDULA: *with some observations on the Ferruginous Sand, Plastic Clay, and Upper Marine Formations of the United States.** *By* S. G. MORTON, M. D. *Recording Secretary of the Academy of Natural Sciences: Member of the American Philosophical Society, &c.*

(Read June 17, 1828.)

An extraneous fossil, when viewed simply as such, conveys little interest beyond a passing reflection; but when we are acquainted with its locality and connexions it becomes an important link in that chain of facts, by means of which we ascertain the relative ages and position of the strata of our globe.

* *Corrections of a former paper.* I take an early opportunity to correct two or three errors which crept into the papers published by Mr. Vanuxem and myself in the last numbers of this Journal.

In the first place it is mentioned in Mr. Vanuxem's paper on the Secondary and Tertiary Formations, &c. of the United States (see note at the foot of page 67), that Mr. Say's indicated genus *Dispotea* must be relinquished, or some recent shells must be added to it. Mr. V. and myself were singularly unfortunate in not observing that Mr. Say had already referred at least one recent species to his proposed new genus: Mr. V. had no other object in view than to show that the latter, if acknowledged, was not extinct.

In my paper on the Fossil Shells of New Jersey and Delaware, the concluding query (page 98) should be worded as follows:—"May not the Green Sand of England be considered as belonging rather to the Chalk than as constituting part of a distinct forma-

The value of organic remains in Geological inquiries, though a recent discovery, has been already applied with surprising success in Europe; nor can there be a doubt that equally interesting facts will be elicited whenever the zeal of our naturalists induces them to give patient attention to these fatiguing but important details.

But the geological analogies observable in parts of Europe and Asia very remote from each other, remind us that instead of expecting to find new formations or peculiar phenomena in this country, we should rather expect the corroboration of facts already established by the geologists of Europe. By examining the works of those naturalists in connexion with an extensive series of fossils from both hemispheres, I have endeavoured to identify, in America, those formations which are now universally acknowledged in Europe; and any one who will give a reasonable degree of attention to the subject will admit, that the geological analogies between America and Europe are nearly as obvious in the Secondary and Tertiary

tion?" It may be remarked that this suggestion is by no means new, as will appear in the following essay.

The Terebratula which I supposed might be the *T. perovalis (Sowerby)* will probably prove a variety of *T. Harlani*.

I am also convinced that the Gryphæa from New Jersey which I have mentioned as specifically the same with *G. vesiculosa (Sowerby)* can only be a variety of *G. convexa*.

Effingham's Mills (locality of Exogyra, *vide* p. 63 & 87) is on Lynch's creek, South Carolina.

as in the Primitive formations. These analogies, moreover, are not founded on theory, but on fossil organic remains; conclusions derived from other sources will be more likely to mislead than to instruct.

Genus SCAPHITES. *Parkinson.*

S. Cuvieri (M.) Pl. vii. fig. 1.

S. *anfractu majori* ventricoso, tuberculis octo in utroque latere, cum duobus alteris prope marginem internam; dorso pulchre costato inter tuberculas: *anfractu minori* compresso, costato, semi occultato; septis serratis.

Description. *Larger Whorl* ventricose, with eight prominent lateral tubercles, and two others more elevated at the inner margin on each side; back delicately ribbed between the lateral tubercles; an obscure ridge from each of the latter to the umbilical margin; no visible septa: *smaller whorl* compressed, half concealed, costated all round; septa numerous, serrated like those of an Ammonite.

Diameter of larger whorl, an inch and a half.

Diameter of smaller whorl, an inch and an eighth.

This beautiful specimen is a sub-siliceous cast: it was found about sixty feet below the surface, at the Deep Cut of the Chesapeake and Delaware canal, in an argillo-ferruginous sand, which has the *green grains* and other characters of the *marl* of New Jersey. Two specimens only of the Scaphite were found; the second I have not seen, but am informed that it resembled, in every particular, the one figured in the annexed plate.

This fossil was obligingly lent me by my friend Mr. Wm. L. Newbold, of Delaware city, to whom I am under many similar obligations. The specimen is now deposited in the Museum of the Academy of Natural Sciences. I have named this species in honour of the illustrious Cuvier.

Mr. Sowerby observes* that the genus *Scaphites* (of which he describes but two species) has hitherto been found, in England, only in the Green sand and Chalk marl: M. Brongniart makes a similar observation respecting the occurrence of this fossil in France: facts which corroborate the opinion of Mr. Vanuxem and myself, as expressed in a late number of this Journal, viz: that the marl (so called) of New Jersey and Delaware should be ranked with the Secondary, and not, as hitherto, with the Tertiary class. But whether Mr. Vanuxem's opinion that the American formation is contemporaneous with the *Chalk* of Europe, be correct or not, we may safely infer from the organic remains of the former that it is as much older than the superimposed masses of the Southern states, as the Chalk of Europe is older than the acknowledged Tertiary deposits of that portion of the world.

In a former paper I instituted a brief comparison between the fossils of the Green sand of Europe and those of New Jersey and Delaware: all the observations I have since made have confirmed me in the opinion that these formations are contemporaneous.

* Min. Conch. of Great Britain, vol. i. p. 53, &c.

It will be recollected, however, that in England the Chalk marl, Green sand, Weald clay, and Iron sand are considered as parts of one formation; to this series is applied the name of *Ferruginous sand**,— which will serve better than any other to designate the formation of New Jersey and Delaware. In the latter we find not only the Green sand, mineralogically speaking, but several varieties of argillaceous and calcareous earth, together with those genera of fossil shells and crustacea which characterize the Ferruginous sand of Europe.

Several of the most celebrated French Geologists consider the Ferruginous sand series to belong to the *Chalk formation*, which M. Alex. Brongniart† describes as composed of three sub-formations: 1. White Chalk; 2. Chalk Tuffa or Grey Chalk; and 3. Green Sand, to which he gives the name of *Glauconie*.‡ To this last and lowest division belongs that mass so well known in New Jersey by the name of *Marl;* and the analogy between the two, so strong in a mineralogical point of view, is still more obvious in relation to their organic remains. The great body of facts connected with this subject I intend to give

* Conybeare and Phillips, Geology of England and Wales, vol. i. p. 60, 120, &c. The beds constituting the Ferruginous sand series are interposed between the Chalk and the Oolites.

† Sur les Caractères Zoologiques des Formations, &c. Paris, 1822.

‡ Craie Chloritée of other French writers. Vide Classification des Roches. Par Alex. Brongniart. Paris, 1827.

in detail on a future occasion; and will for the present dismiss this subject with remarking, that while I agree with Mr. Vanuxem in referring the American formation in question to the Secondary class, I am disposed to place it one degree lower in the series than he has done.

The *Ammonites hippocrepis* of Dekay, has lately been found in great numbers in excavating the Deep Cut of the Chesapeake and Delaware canal; a gigantic specimen, nearly fifteen inches in diameter, has been recently deposited in the collections of the Academy of Natural Sciences by Mr. Hugh Lee. This fine fossil, had it been obtained at an earlier period, would have prevented the insertion, in a former number of the Academy's Journal,* of a figure which conveys a very imperfect idea of this Ammonite. Dr. Dekay describes from a fragment, but conjectures the *A. hippocrepis* to be about two inches in diameter. Notwithstanding the different magnitude of the specimens, they appear to be specifically identical.

In the same stratum with the Ammonites is found Lignite perforated by the *Teredo*, or ship worm; also fragments of one or two species of Cancer and Astacus; two species of Linnean Echinus, teeth of the Crocodile, and many fossil shells, which, however, exist almost exclusively in the state of casts. Among these may be enumerated Pecten quinque-

* Vol. vi. pl. 5. fig. 4.

costatus, *Sowerby*,* a species characteristic of both the Chalk and Green sand of England, France, and Switzerland. Also Mya, Trigonia? and a small Ammonite, entirely distinct from the *A. hippocrepis*, and probably a nondescript. With these remains are found many nodules varying from the size of a hazlenut to several inches in diameter, composed of a very compact, greenish substance: some of these, on being broken, present irregular fissures not unlike those of Septaria, and correspond exactly in physical appearances with the nodules described by Messrs. Cuvier and Brongniart† as characteristic of the Green sand in the vicinity of Havre, &c. in Normandy.

This deposit, like the analogous beds in New Jersey, is overlaid by deep strata of sand, gravel, and clay, traversed by iron crusts, and no doubt referrible to the *Plastic Clay* series. Towards the western end of the canal, however, is an extensive bed of Lignite imbedded in a white, siliceous sand. The trunks and branches of trees are here found twenty feet in length, and perforated in every direction by the *Teredo*. This deposit, so far as I have hitherto been able to examine it, appears to be placed below the Secondary marls, or is probably enclosed by them; but as it has not yet been penetrated entirely through, we are ignorant of the subordinate beds. It seems highly probable, therefore, that this bed does not be-

* Min. Conch. tab. 56.

† Descrip. geol. des environs de Paris, p. 13.

long to the Plastic clay, but to the Ferruginous sand. Should this prove to be the fact, it only exhibits another instance of the analogy between the formations in Europe and America; for M. Humboldt* describes a deposit of Lignite in the Green sand near La Rochelle, in France, in which the wood is perforated by the Teredo and contains imperfect amber. Lignite is occasionally found in the lower chalk series of England, especially in the vicinity of Folkstone and Cambridge; at these localities it sometimes even retains the woody fibre.

It must be borne in mind, however, that the American Ferruginous sand formation is subordinate to another perhaps equally extensive, viz: the *Plastic Clay*. The latter, which has hitherto received comparatively little attention in this country,† is superimposed on the Ferruginous sand throughout almost its whole extent. In some places, as at Bordentown, White Hill, the Neversink Hills, &c. it attains a considerable elevation. An irregular line from Sandy Hook to Trenton will answer to the northern boundary of this deposit in New Jersey. From this line it spreads southwardly over a great part of the peninsula, but is more conspicuous and better characterized towards its northern limits, where it presents the various appearances so well described by Messrs.

* Gisement des Roches, p. 294.

† It has been best described by Mr. Finch, in the vii. vol. of the Amer. Jour. of Science.

Cuvier and Brongniart* in their account of this formation in France.

In some parts of New Jersey, especially in the counties of Monmouth, Burlington, and Gloucester, the Plastic clay forms so thin a superstratum that the marl is readily obtained for agricultural purposes; and most of the rivers and smaller streams penetrate, in some part of their course, the Ferruginous sand, exposing the fossils of the latter, and giving unequivocal evidence of the relative positions of the two formations.

The Plastic clay of the United States has hitherto yielded very few organic remains, mostly referrible to the genera Venus, Ostrea, and Pecten. Some persons, however, have confounded the Plastic clay of New Jersey with the Green sand of that district, and quoted the fossils of the latter as belonging to the former. Others, from ignorance of fossil conchology, have imagined the marl of New Jersey to represent the London clay of the English geologists.

Genus CREPIDULA. *Lamarck.*

C. costata (M.) Pl. vii. fig. 2 & 3.

C. testa crassa, ovali, perconvexa; dorso costis numerosis, elevatis, longitudinalibus obtecto; latere sinistro planulato; margine plano.

Shell oval, thick, very convex, with numerous longitudinal elevated costæ; beaked side flattened; margin plain.

* Desc. geolog. des environs de Paris. Ed. 1822. p. 16. etc.

Length $1\frac{7}{8}$ inch. Breadth $1\frac{1}{2}$ inch. Depth 1 inch.

No fossil species of this genus occurs in the works of Lamarck, Sowerby, Parkinson, or the other authors to whom I have had access: there is consequently reason to suppose that the *C. costata* is the only fossil species at present known.

This shell was found by Mr. John Finch in the Tertiary formation of St. Mary's county, Maryland, where it occurs with a great variety of other fossils in a friable matrix of sand and clay.

Specimens are preserved in my collection, and in that of the Academy of Natural Sciences; those in the Academy are marked "Fort Warburton, on the Potomac." They are much disintegrated and the costæ are generally obscure. Mr. Wetherill's collection (now deposited in the Academy) contains some very small fossil Crepidulæ from Maryland, which are probably the young of this species.

Dr. Van Rensellaer* has very properly referred the great deposit of fossil shells in Maryland to the *Upper Marine* formation of the European geologists, an opinion in which I am every day more confirmed. I am also convinced that this formation stretches far to the south, occupying a great proportion of the tract designated as Alluvial in Mr. Maclure's map. It seems more than probable that it even embraces those vast deposits of oyster shells, which, extending through nearly all the more southern States, have at-

* Lectures on Geology, p. 261.

tracted the attention of every class of travellers. I am aware that Mr. Finch considers this formation to have no known prototype in Europe, and designates it by a new name.* In this view I believe him to be in error. With respect to the *London clay* of the English geologists, and the *Calcaire silicieux* of the French, I have not yet seen a series of organic remains which proves the existence of those formations in this country.

Although the contemporaneousness of our Upper Marine formation, with the deposits of that name in Europe, appears to me to be satisfactorily decided, I have heard some doubts expressed, founded on the striking generic and specific differences to be observed between very many of the Maryland fossils and those shells now inhabiting our coast. It is true that several of these genera and a large number of species are no longer inhabitants of our waters, but it will be found that the same fact obtains in reference to the Upper Marine deposits in England. Mr. Sowerby, speaking of the fossils of those beds in Norfolk and Suffolk, says that they "are remarkable for the little change they have undergone, as well as their near resemblance to some of our recent species; and although a few are not easily to be distinguished from them, and others are mutilated, and until seen

* Amer. Jour. Science, vol. vii. p. 39, &c. Mr. F. calls it *Calcaire ostrée*. Would not an English name have been in better taste?

in perfection cannot be distinguished, yet *many* are not at all related to any recent species known, or observed in any other stratum."*

These remarks apply equally well to the Upper Marine beds of Maryland, and the more Southern States; and I have been at some pains to ascertain what number of the fossil species of that formation are still found recent on our coast: they are as follow:

1. Natica duplicata. *Say.*
2. Fusus cinereus. *Say.*
3. Pyrula carica. *Lam.*
4. ——— canaliculata. *Lam.*
5. Ostrea virginica. *Lin.*
6. ——— flabellula. *Lam.*
7. Plicatula ramosa. *Lam.*
8. Arca arata.† *Say.*
9. Lucina divaricata. *Lam.*
10. Venus mercenaria. *Lin.*
11. ——— paphia? *Lam.*
12. Cytherea concentrica. *Lam.*
13. Mactra grandis. *Lin.*
14. Pholas costata. *Lin.*
15. Balanus tintinabulum? *Lam.*
16. Turbo littoreus? *Lin.*
17. Buccinum.

Seven of these species have been already identified

* Min. Conch. of Great Britain, vol. i. p. 185.

† Mr. Say observes that this shell is identical with a recent W. India species, which he thinks had not been described.

by Mr. Say, the remainder were detected by myself: and I have no doubt that many others remain to be added to the list.

Among the Maryland fossils in the Academy is a specimen which answers, perhaps in every particular, to the *Voluta Lamberti*, of Sowerby (tab. 129): and the probable identity of the *Venus rustica* of Sowerby, with the *Isocardia fraterna* of Say, has been suggested by Mr. Say himself.* The *Venus lentiformis* of Sowerby, (tab. 203,) appears to be no other than the recent *Cytherea concentrica*. Hence it would seem that at least three species of shells are common to the Upper Marine formation on both sides of the Atlantic. It is perfectly reasonable to look for similar species in contemporaneous formations, notwithstanding that they may be separated by the Atlantic; the action of the Gulf Stream I conceive to be amply sufficient to account for such a phenomenon, nor can there be a doubt that this cause was as powerful formerly as at present; and to its agency I would attribute the fact, that many recent species of shells are at this time common to the shores of both America and Europe.†

* Jour. Acad. vol. iv. p. 143.

† As this question is intimately connected with geological inquiries, I submit the following imperfect list of those *recent* shells which appear to be common to both the European and American shores of the Atlantic. I have not had opportunity to pursue the subject in detail, but where there is any doubt as to the identity of species I have added a note of interrogation. I am convinced that

NOTE: *Containing a notice of some Fossils recently discovered in New Jersey. By the same.*

(Read June 2, 1829.)

During a late excursion into New Jersey, by Mr. R. Haines, Mr. Joseph P. Smith, Dr. M'Euen, and myself, we visited some *Marl pits* situated on Big Timber creek, in the county and township of Gloucester. The beds in this locality present some appearances so entirely different from any thing hitherto noticed in New Jersey, and at the same time so corroborative of the geological opinions expressed in the preceding paper, that I hasten to give a brief notice of such facts as our hasty examination enabled us to collect.

These beds consist of several varieties of Carbonate of Lime, of which the three following are the most remarkable:

1. An extremely friable earth, which my friend Mr. Paul Beck Goddard kindly analyzed, at my re-

this list may be greatly extended by an expert conchologist. 1. Purpura lapillus. 2. Cyprina islandica. 3. Buccinum undatum. 4. Saxicava rugosa. 5. Turbo neretoides. 6. T. littoreus (T. irroratus, *Say.*) 7. Natica canrena. 8. Lucina divaricata. 9. Pholas crispata. 10. Mactra solida? (M. proxima, *Say.*) 11. Anomica ephippium. 12. Solen ensis. 13. Mya arenaria? (M. acuta, *Say.*) 14. Mytillus edulis. 15. Modiola papuana? 16. Crassina sulcata. To which might be added several species of the Linnean genera *Lepas*, *Teredo*, and other testaceous mollusca, which, by attaching themselves to floating bodies, are conveyed to various parts of the world.

quest, and was found to contain 37 per cent of Carbonate of Lime, with a considerable proportion of Silex, Iron, &c. Some of these masses appear to be in a great measure composed of disintegrated Madrepores.

2. A light coloured, or yellowish limestone, as hard as any of the Secondary limestone of our Western States; contains many organic remains, especially of the Linnean family of Madrepores.

3. A granular variety, intermediate between the former two, and possessing a subcrystalline texture.

All these varieties are occasionally infiltrated by siliceous matter, and considerable masses of a well characterized *Chert* are occasionally found. They also present some appearances of the *green grains* so characteristic of the marls of New Jersey. In these deposits, which do not appear to observe any regular relative position with respect to each other, we found a variety of interesting fossils, of which the following is designed merely as a catalogue.

1. GRYPHÆA CONVEXA. (M) *Ostrea convexa* of Say. This shell, which has hitherto been found in almost every *marl pit* in New Jersey, is also common here, though most of the specimens are much disintegrated by the weather.

2. SPIRORBIS? *Lam.* This shell, which is new to me, I have not yet had time to examine with attention. *Desc.* Volutions four or five in number,

flattened, in contact throughout: aperture quadrangular, which form is preserved in all the whorls: diameter of the largest specimens three-eighths of an inch. Has a strong resemblance to *Planorbis;* and Mr. Sowerby mentions that he found shells in the English Green sand which he referred to that genus, though, he thinks, erroneously. *Min. Conch.* p. 89, 92, and the accompanying plate. I prefer placing the American specimens with the genus Spirorbis until more information can be obtained respecting them.

3. Turbo? *Lin.* This is a beautiful shell, about an inch and a half long, with longitudinal costæ on each whorl: it has much the appearance of the genus *Scalaria, Lam.* but the mouth is too imperfect to enable me to decide. It may possibly prove to be a chambered shell.

4. Trochus. *Lam.* A single cast.

5. Venus. *Lin.* A few imperfect specimens.

6. Spatangus. *Lam.* Closely allied to the well known European Chalk fossil *S. cor marinum,* as figured in Parkinson's Organic Remains, vol. iii. pl. 3, fig. 11. Abundant, from the size of a filbert to an inch and three quarters in diameter.

Another species of *Spantangus* is equally common in this locality; it has but a single sulcus, with four pair of ambulacra: it bears a remarkable resemblance to a species frequent in the English Green sand, and contained in the Academy's collections,

but of which I have not ascertained the specific name. Length same as the preceding.

The American specimens hitherto obtained from the pyritous marl are only in the state of casts; but these are in as good preservation as the European Chalk Echini.

7. CIDARIS? *Lam.* Pentagonal detached plates of some species of Linnean Echinus: oblong, margin granulated, with a central, circular, smooth area, and a tubercle for the attachment of a spine. These remains are well represented by the sections of the mammillated Echinus figured in Mr. Parkinson's great work, vol. iii. pl. 1, fig. 11. A few minute spines were also found.

8. TEREDO. *Lin. T. antenautæ?* Sowerby, tab. 102. *Fistulana,* Lam. It is very difficult to distinguish the species of this genus, especially in the fossil state, and for the present I refer the New Jersey specimens to the above foreign species: like the latter they not unfrequently show the septum figured by Mr. Sowerby, tab. 102, fig. 8. The parietes of our specimens are replaced by Carbonate of Lime, which is generally radiated and very delicately crystallized on the inner surface of the cylinder.

9. ANTHOPHYLLUM. *Schweigg.* This fossil, a Linnean Madrepore, is common in the harder limestone of which I have spoken. Its form is cylindrical, or sub-conical, seldom exceeding three-fourths of an inch in length, and is about one-third less in

breadth. It is essentially composed of longitudinal septa, or plates, which diverge uniformly from a central axis. Each of these fossils is attached by its base and is surrounded on the remaining sides by a large cavity. Faujas, in his Natural History of the Mountain of St. Pierre, plate 37, fig. 3, and pl. 38, figs. 1 & 5, gives drawings of some fossils which appear to be generically the same with those from New Jersey. But I derive the characters of the genus *Anthophyllum* from the splendid work of Dr. Goldfuss,* tab. 13, fig. 11. The specimen delineated by that naturalist is stated to be from the vicinity of the Falls of Niagara.

10. Eschara. *Lam.* Fragments of this genus *(Millepora, Linn.)* are of frequent occurrence. They bear considerable general resemblance to the species in Ellis's Hist. of Corallines, pl. 28, fig. 1.

11. Flustra. *Lam.* Abundant. The species is nearly allied to that given by Ellis, pl. 29, fig. *a*. Flustræ are common associates of the Belemnites, Echini, &c. of the European Chalk beds.

12. Retepora. *Lam.* Of this genus we procured a small but handsome specimen. It is well represented by a fossil species from Maestricht, delineated in Faujas, pl. 39, fig. 3, who calls it a Gorgonia. Dr. Goldfuss figures a specimen of the same fossil, Pl. 9, fig. 12. and also from Maestricht, to which he gives the name of *R. clathrata.*

* Petrefacta Mus. Univ. Regiæ Boruss. Rhen. Bonn.

13. ALCYONIUM? We found some organic remains which bear considerable resemblance to the stems of this singular zoophyte, but nothing of the cup-shaped termination has yet been discovered. Some of these bodies are formed considerably like a Belemnite, but taper much more gradually, and are longitudinally striated their whole length. Their precise nature can only be determined by other and more perfect specimens. It may be remarked, however, that the Alcyonium has been found in Green sand near Annapolis, in Maryland.

14. Another fossil, of which I have not been able to find an analogue, may be described as a very elongated prism, slightly concave on two sides, solid, and radiated from the centre to the circumference like a Belemnite. Length nearly two inches, diameter rather more than an eighth of an inch. We were unable, however, to find the terminal extremity of any of the specimens, nor does the prism, in any instance, appear to taper towards either end: I at first thought they might be the spines of Echini, but the latter circumstance, together with their shape, seemed to discountenance the opinion. They cannot be Encrinal vertebræ as they have no joints.

15. ORTHOCERA? A subconical, chambered cast, which appears to belong to this genus.

16. BONES OF THE CROCODILE. We obtained portions of two jaws of a *Crocodile* which appears to be specifically the same with that described by Dr.

Harlan in a former part of this Journal.* One of these fragments contains three teeth in fine preservation.

The preceding details, however unimportant in an insulated point of view, are extremely interesting to the Geologist, and furnish some entirely new materials for the study of our Secondary formations. I have not leisure at this time to enter into a discussion of the subject, but will mention a few facts connected with it. A part of these fossils such as the Gryphea convexa, Teredo, Remains of the Crocodile, &c. have been found in many parts of New Jersey in the pyritous *Marl:* and although the latter earth is so dissimilar, mineralogically speaking, to the matrix of the fossils described in this note, yet it should be borne in mind that the *Chalk Marl* of Europe (the upper mass of the Ferruginous sand) contains from 20 to 80 per cent of Carbonate of Lime. Hence I would infer that the presence of so large a proportion of lime as Mr. Goddard has obtained from the New Jersey earth, does not exclude the latter from the Ferruginous sand series, inasmuch as in this respect it does not differ from the English Chalk marl. (*Craie tufau* of the French.) Moreover, beds of Chert† are common in both. The genus *Spatangus*, now characteristic of our *Marls*, has not hitherto been found in England in any strata below the Green

* Jour. Acad. vol iv.

† Phillips and Conybeare, Geol. of Eng. and Wales, p. 124.

sand,* nor, so far as I know, in any above the Chalk. The remains of Zoophytes, also, are much more abundant in the Ferruginous sands of England than in any of the superimposed beds, not even excepting the White Chalk. Many of the fossils described in this paper are replaced by *crystalline* Carbonate of Lime, precisely like that composing the Chalk fossils of Europe.

From the facts elicited by these papers I do not hesitate to conclude—

1. That we have in this country an extensive formation contemporaneous with the great Chalk formation of Europe, but more particularly allied to the *Ferruginous sand* of the English geologists, the *Lower Chalk* of the French: that it is the lowest and oldest mass in that tract which Mr. Maclure has called Alluvial: that it occupies a great part of the triangular peninsula of New Jersey formed by the Atlantic, and the Delaware and Raritan rivers, and extends across the State of Delaware from near Delaware city to the Chesapeake; appears again near Annapolis in Maryland; at Lynch's creek in South Carolina; at Cockspur Island, in Georgia; and in several places in Alabama, Florida, &c.

The American Ferruginous sand formation no doubt includes, like its analogue in Europe, several distinct strata or subdivisions, which will probably be found to coincide with the Chalk Marl, Green

* Phillips and Conybeare, Geol. p. 130.

Sand, Iron Sand, &c. The Green sand we undoubtedly possess; but it remains for future enquirers to point out the relative position, extent, and *distinctive* fossils of these substrata in our country.

2. That superimposed on the Ferruginous sand we have the *Plastic Clay and Lignite.* This formation, as already observed, is most conspicuous in New Jersey and Delaware, being thickest near the junction of the Primitive with the modern formations.

3. That superior to both the former we have a vast tract of the *Upper Marine* formation. This has not yet been identified *by fossils* farther north than Maryland, where it is most conspicuous in the southern and middle parts of the peninsula formed by the Chesapeake bay and Potomac river; whence it stretches south and west and crosses the Mississippi.

Above all these is the great diluvial mantle which appears to be common to a great part of the earth's surface, and which has already yielded many remains of several extinct species of quadrupeds.*

* The *Fossil Bones* hitherto discovered in the above formations may be thus briefly enumerated:

Ferruginous Sand. Remains of the *Crocodile* in many places. *Plesiosaurus* at Mullica Hill, New Jersey. *Monitor* (Maestricht animal) at Sandy Hook, Monmouth county, New Jersey, and near Woodbury, in the same State. I believe, however, these remains consist only of teeth. *Shark.* Teeth and vertebræ common.

Explanation of the Plate.

Plate VII. fig. 1. *Scaphites Cuvieri.*

fig. 2. *Crepidula costata.* Back of the shell.

fig. 3. *Crepidula costata.* Interior of the shell.

These fossils are represented exactly of their natural size and proportions; and Mr. Lawson has engraved them with his characteristic accuracy and elegance.

Whale. Near the Raritan river, and at St. George's, in Delaware. *Tortoise.* New Jersey.

Upper Marine. *Walrus*, in Accomac county, Virginia. *Manatus.* Eastern Shore of Maryland. *Whale.* York river, Virg. Teeth and bones of the *Shark* are of frequent occurrence.

Plastic Clay. None.

Diluvium. Remains of the *Mastodon* have been found at Uniontown, Middletown, Longbranch, Deal, and Rancocus in New Jersey, and in several places farther south. The *Elephant* has been found at Middletown, New Jersey, at Beaufort, North Carolina, and on the Eastern Shore of Maryland. *Megatherium.* Teeth and bones on Skiddaway Island, Georgia.

Besides the preceding list, there is in the collections of the Academy a considerable number of bones which have not yet been identified. These, when ascertained, may add several genera and species to the above catalogue.

Remarks on the Pedunculated Cirrhipedes: *with a description of two new species of the Genus* Otion. *By* Reynell Coates, M. D.

(Read February 11, 1829.)

The genus Otion, of Leach, was formed to receive such species of the genus Anatifa, of Brug. as have the rudiments only of the five valves which are proper to most of the pedunculated Cirrhipedes, and which are likewise provided with two auriform appendages on the summit of the tunic, behind the superior valves. In all the species hitherto described, these appendages are, I believe, open at both extremities, permitting the water to enter freely into the cavity of the shell. Lamarck has suggested that these tubes are probably designed to facilitate the supply of fluid to the bronchiæ.

With the exception of the O. Rissoanus, from the Mediterranean, and the O. Dumerilus, from the bottom of a vessel returning to Europe from the Mauritius, all the known species are said to inhabit the North Atlantic Ocean.

The O. Cuvieri, which Lamarck has adopted for the generic type, is regarded by himself and others as Lepas aurita, L. but, as Montagu has justly observed, unless Linneus was deceived with respect to the accessory valves about the mouth which he attributes to this species, it must be widely distinct from any Cirrhipede now known.

Cuvier, in Annales du Museum, and Lamarck, in his Hist. Nat. des Animaux sans Vertebres, both describe the Otions as having but two valves, although the type itself has five. This error is the more surprising, because Blainville, who describes this genus under the name of Aurifera, in the Nouv. Dict. des Sciences Naturelles, and Leach, who instituted it under the received name, both allude to the five valves, and are both referred to by Lamarck.

The specific characters of O. Cuvieri and O. Blainvillii, as given by Lamarck, and drawn from the presence or absence of spots on the body and ears, are of no value whatever, as many species are now known which are possessed of spots, and the two hereinafter described, together with the O. Rissoanus, are deprived of them.

Leach's plates of the Cirrhipedes compylosomata, have never come under my observation; and in his monograph of the genus Otion, in the Zoological Journal, vol. ii. the specific distinctions are drawn from the general colouring of the tunic, and from the characters of the anterior and posterior valves only. They are often expressed in terms too vague to convey any very definite ideas without the aid of plates. Nothing is said of the perforation of the auriform appendages, either as a generic or specific character, but as the species described or figured by other authors have the tubular ears, and as their closure would form a distinction too marked to escape

the notice of a writer who is acknowledged to have carried his nicety of systematic division to a culpable excess, it is reasonable to infer that all the species of Dr. Leach have perforated ears. Such appears to be the conclusion of other conchologists, who describe the auriform appendages as tubes.

These preliminary remarks are made with a twofold intention; firstly, to account for the apparent want of brevity in the specific characters given in this paper; and, secondly, to apologize for the slight changes which I have found it necessary to make in the generic description of the genus Otion, as given by Lamarck, in order to correct the error with regard to the number of valves, and to include a species which appears to form a link in the chain that will probably be found to exist between the genera Otion and Anatifa through the genus Cineras of Leach, and which is yet hardly sufficiently distinct from the first named genus to warrant a separation.

Genus OTION.

Corpus. Processes duo, auriformes, ad tunicæ apicem: apertura lateralis majuscula: brachia plura, articulata, ciliata, per aperturam lateralem exsertitia.

Testa. Valvæ quinque, testaceæ, parvulæ, ut in Anatifis positæ.

**Processus perforati.*

O. depressa. Corpus ad basim depressum, effusum. Processus perforati: valvulæ majores sub-rhomboideæ; apices elevatæ, infra excavatæ; valvulæ superiores lineares; posterior ovalis, minutissima. Habitat. in Oceano Cinensi.

Mus. Acad. Natural Sciences.

The body of this *Otion* is depressed and flattened at its base, which is widened into a circular ring. The primary valves are sub-rhomboidal, somewhat winding, obliquely truncated above and below, and regularly arched internally. Those points which correspond with the apices of bivalve shells, are somewhat elevated, and immediately beneath each of them is a deep notch or fissure. Two prominent divaricate lines, passing from the apex toward the base, enclose a flat triangular space, and from this the shell gradually declines towards the sides. The superior valves are linear, and the posterior valve is very minute and regularly oval. Colour of the body deep purple, peduncle and processes lighter purple. This shell was taken from the side of a vessel in the China seas, but it may have been conveyed there from some distant spot.

The O. depressa will be immediately distinguished from every other species of the same sub-genus, except the O. Rissoanus, by the colour and the absence of spots on the tunic. From this latter it is distinguished by the form of the primary valves, the only ones of which Leach has given the characters. In O. Rissoanus these valves are geniculated, abruptly truncated behind, and gradually acuminated below. In the O. depressa they are obliquely truncated at both extremities, so as to appear pointed at each end.

****Processus imperforati.**

O. Saccutifera—Corpus inflatum. Processus bursiformes, imperforati. Valvulæ majores sub-triangulares, infra acuminatæ, in medio carinatæ; superiores minutæ, sub-triangulares; posterior minutissima.

Habitat. in Oceano Austral Atlantico.

My Collection.

The ears of this *Otion* are completely imperforate. The primary valves are thin, small, angularly bent in the middle, without any elevation of the beak, and acuminated at the lower angle, the base or posterior edge being widely notched. From the apex to the middle of the notch, immediately over the angular bend, is a carina formed by two raised striæ with a slight depression between them. A third stria extends parallel to and very near the anterior margin, or that which is opposed to the other valve, and from this line the margin appears as if rather abruptly inflected. The superior valves are sub-triangular, rather greater in length than in breadth, and exceedingly thin. The posterior valve is very minute, narrow, and somewhat sharpened below. Colour of the base of the peduncle yellowish brown, becoming olivaceous above; body olive, with a purple reflection in oblique lights; appendages purple.

Remark—This shell seems to approach toward the genus Cineras of Leach, in which the inflation behind the superior valves looks like an attempt at the formation of the auriform processes. The specimen from which the description is given was observed ad-

hering to the side of the ship, in company with a group of Cineras vittata near the Cape of Good Hope. It survived until we reached the Isle of France, when I removed it. In consequence of the evaporation of the liquor in which it was placed, nothing now remains but the envelope. The colours which in Otion and Cineras are derived from the mantle, were in this case noted during the life of the animal.

NOTE *on the Geographical distribution of Anatifa vitrea, &c. By the same.*

(Read February 11, 1829.)

This shell is probably identical with *Lepas fasciculata*, Montagu. Lamarck considers the latter as a variety of the former.

It would appear to be a rare shell in the British seas; for, according to Wood, it was but twice observed in forty years.

Montagu states that a great number were once thrown on shore in Devonshire during a few days, after which they disappeared totally. They were attached in groups to floating fuci, one group to a piece of charcoal, and another to the quill of a gull.

Lamarck refers to his own cabinet for the specimens from which he drew the character; they were found on the coast of Spain, and were communicated by Latreille.

In the collection of the Academy there are some specimens presented by Mr. Ord, labelled "Atlantic

Ocean," without any further particulars. They are removed from their support. The same cabinet also contains some examples from Long Branch, New Jersey, presented by Dr. M'Euen; they are attached to the *Fucus vesiculosus*.

From the specific appellation given to this shell by Lamarck it is probable that he never saw the adult, for the glassy appearance is peculiar to the young. The specimens from Long Branch are very small, Mr. Ord's are less than half grown, and the same remark applies to the figure in Wood's Conchology, which was taken from a specimen belonging to Mr. Montagu. I cannot find any notices of the localities of this shell, other than those just quoted.

It is a matter of great importance to ascertain, as far as possible, the native place and the accidental distribution of every animal, in order to pave the way for a more accurate knowledge of the changes produced upon their characters by the operation of physical causes, and also to enable us to determine how far the location of different individuals may aid us in our diagnosis of species.

The pedunculated cirrhipedes may undoubtedly reach all parts of the ocean, by attaching themselves to moving bodies; yet there appear to be certain natural limits beyond which certain species will not flourish; thus, as has been observed, the Otions seem to be chiefly confined to temperate and cold climates, and between the tropics they have only been

met with adhering to vessels which have passed the Cape.

The Cineras vittata was discovered by Montagu in the British seas, and it has been observed elsewhere in the North Atlantic. I met with it at the Cape of Good Hope, but I do not find that it has been noticed in tropical regions. Is it not reasonable to conclude, then, that although these animals may survive the voyage across the Equator, they cannot multiply in hot climates?

With regard to the *Anatifa vitrea*, I wish to lay before the Academy the following reasons for believing that the Southern Ocean is the native place of this species, and that its occurrence elsewhere is accidental.

1. Neither observation nor authority furnish me with any instance of the A. vitrea attaching itself to a fish or to a ship; and it is, therefore, reasonable to conclude that such is not its ordinary habit. If it were a native of the North Atlantic, the nature of the tropical currents would for ever prevent its transportation to the southern temperate zone, by any means other than those just mentioned.

2. The *A. vitrea* multiplies with astonishing rapidity, and occasionally it appears almost to cover the ocean for many square leagues, so that if it were a native of northern seas, it could hardly disappear for such long periods of time, nor would the specimens taken be so uniformly small.

3. It usually attaches itself to fuci and other floating plants, and I have never met with any pelagic species of these tribes, in the North Atlantic, which could have supported the weight of a full grown group of these animals.

4. The physiological fact which will be presently mentioned, tends to prove that the natural support of this cirrhipede is a plant peculiar to the Southern ocean.

While we were sailing in the neighbourhood of Tristan d'Acunha, the ship was surrounded for several days by innumerable groups of yellowish bodies, resembling the eggs of a bird floating on bunches of feathers. No one on board could imagine what they might be, and the rapidity of our progress prevented us from obtaining any specimens until the third day, when several were taken in the dip net. They proved to be groups of the Anatifa vitrea, attached to a white spherical fucus which floated like a cork upon the water.

When this fucus was compressed between the fingers all the animals attached to it immediately retracted their arms within the shell, as if by a common impulse. Dissection explained the cause of this singular phenomenon. Immediately beneath the base of each peduncle, there was found a conical cavity in the fucus, reaching nearly to the centre of the ball. This cavity was lined to the apex by the thin membrane which covers the muscular coat of the pe-

duncle internally. The muscular coat terminated at the base of the peduncle, and the tunic was generally somewhat expanded over the external surface of the plant. Other species of Anatifa, which were occasionally found adhering to the same support, exhibited no such arrangement.

The common centre of attachment at the apices of all the cones, was most frequently the scale of a Velella, which had become inveloped by the globe, and it is evident that as the plant grew the animals elongated the lining membrane of the peduncle.

As the shell possesses no power of locomotion independent of the waves and currents, its prey must be allured to it, and the velella, which seems to be its most appropriate food, very readily falls into its trap. The animal probably deposits its eggs upon the scale of its prey, which becomes entangled with the fucus before the shells are sufficiently heavy to sink it.

If asked to explain how this Cirrhipede finds its way to the coasts of Europe and North America, I would answer that the growth of many Anatifæ is exceedingly slow, and it is probable that the currents on the shores of Africa, and in the Southern trades, may have drawn occasional groups into the Gulph of Mexico, whence the gulph stream may have conveyed them to the North.

Finding a congenial climate they would multiply with astonishing rapidity, but owing to the nature of

the northern currents most of them would circulate again and again into the tropical regions, and thus become extinct. Perhaps the want of proper food may be an additional bar to their increase in our seas.

I am well aware that these suggestions are hypothetical, but they are thrown out in order to fix attention upon the important influence, which the singular circulation of winds and waters in the Atlantic ocean must necessarily produce upon the distribution of Marine species.

On the Specific Heat *of the* Atoms of Bodies.

By Alexander Dallas Bache, *Professor of Natural Philosophy and Chemistry, in the University of Pennsylvania.*

(Read February 17, 1829.)

It is announced in most of the later authors upon Chemistry, as a probable fact of the science, that the atoms of all bodies possess the same Specific Caloric. Dr. Ure (Chem. Dict. Art. Caloric) observes that the experiments of Petit and Dulong "have disclosed "a beautiful and unforeseen relation between the "specific heats and primitive combining ratios or "atoms of the metals; namely, *that the atoms of all "simple bodies have exactly the same capacity for "heat.* Hence the specific heat of a simple sub- "stance, multiplied into the weight of its atom or "prime equivalent, ought to give always the same "product."

Turner (Elements of Chemistry, Part 1, Section 1) says: "Petit and Dulong have rendered it probable "that the atoms of all simple substances have the "same Specific Caloric. This opinion is founded "on careful experiments, the results of which are "contained in the following table."

This table, contained in the "Annales de Chimie et de Physique," Vol. 10, 1819, will be given.

On reference to the table of atomic weights con-

tained in Turner's appendix, and on a reduction of the equivalent numbers to the oxygen standard, I met with numbers differing very much from the equivalents given by Petit and Dulong: this table of equivalents being derived from the latest and best authorities, must be assumed as more correct than any preceding one. It occurred to me that an examination of Dr. Ure's less recent table might give numbers not so much at variance with those quoted; but with few differences, fairly attributable to the advance of the science, the equivalent numbers in the body of Dr. Ure's work are the same with those given by Turner.

The table of Petit and Dulong is as follows:

	Specific Caloric.	Relative weights of atoms.	Products of the weight of each atom, by the corresponding capacity.
Bismuth	0.0288	13.30	0.3830
Lead	0.0293	12.95	0.3794
Gold	0.0298	12.43	0.3704
Platinum	0.0314	11.26	0.3740
Tin	0.0514	7.35	0.3779
Silver	0.1557	6.75	0.3759
Zinc	0.0927	4.03	0.3736
Tellurium	0.0912	4.03	0.3675
Copper	0.0949	3.957	0.3755
Nickel	0.1035	3.69	0.3819
Iron	0.1100	3.392	0.3731
Cobalt	0.1498	2.46	0.3685
Sulphur	0.1880	2.011	0.3780

The atomic weights just quoted will now be compared with the equivalents of the same bodies according to Turner, reduction being made from the hydrogen to the oxygen unit.

	Atomic Nos. According to Petit & Dulong.	Atomic Nos. According to Turner.
Bismuth	13.30	9.
Lead	12.95	13.
Gold	12.43	25.
Platinum	11.26	12.
Tin	7.35	7.25
Silver	6.75	13.75
Zinc	4.03	4.25
Tellurium	4.03	4.
Copper	3.957	8.
Nickel	3.69	5.
Iron	3,392	3.5
Cobalt	2.46	3.25
Sulphur	2.011	2.

The effects of this correction of atomic weights upon the specific heat of the different atoms, will be shown by the following table.

Simple Bodies.	Specific Caloric.	Relative weights of atoms, Oxygen unit.	Products of weight of each atom by the correspond. capac: or Spec. Calor. of atoms.
Bismuth	0.0288	9.	.2592
Lead	0.0293	13.	.3809
Gold	0.0298	25.	.7450
Platinum	0.0314	12.	.3768
Tin	0.0514	7.25	.3727
Silver	0.0557	13.75	.7659

Simple Bodies.	Specific Caloric.	Relative weights of atoms, Oxygen unit.	Products of weight of each atom by the correspond. capac: or Spec. Calor. of atoms.
Zinc	0.0927	4.25	.3940
Tellurium	0.0912	4.	.3648
Copper	0.0949	8.	.7592
Nickel	0.1035	5.	.5175
Iron	0.1100	3.5	.3850
Cobalt	0.1498	3.25	.4868
Sulphur	0.1880	2.	.3760

The results of the correction of atomic weights, as exhibited by the fourth column of the above table, would seem to take all plausibility from the hypothesis that the atoms of simple bodies have the same specific heat.

Notice of a new Species of Corallorhiza. *By* Solomon W. Conrad.

(Read June 9, 1829.)

Corallorhiza *Wisteriana.*

Aphylla; floribus pedicellatis, petalis exterioribus linearibus, interioribus lanceolatis, labello subrotundo recurvo maculato, apice emarginato, calcare perspicuo, adnato.

Description.—Scape purplish red, from 7 to 12 inches high, generally flexuose near the top, furnished with from 3 to 4 deeply striated sheaths of a paler colour. Flowers pedicelled, (12 to 16 on a scape) the three exterior petals dark red, linear, and slightly spreading, the two interior ones broader, lanceolate, paler, and spotted; lip white, crystalline, and spotted with red, broad, somewhat rounded, recurved, and notched at the apex. Spur short, conspicuous, adnate to the germen. Root somewhat bulbous, with short branching coralloid radicles. Flowers the beginning of the 5th month.

In the spring of 1828, I received several of these plants from Charles J. Wister, of Germantown, a zealous cultivator of natural history, and particularly of botany, to whom I have dedicated the species. He found them in a wood bordering the eastern side of the Schuylkill, between the Falls and the mouth of the Wissahicon creek. This season many speci-

mens were obtained from the same locality, corresponding in all respects with those first received; but flowering about a week later (5th mo. 12th). The species is characterized by its broad, undivided, spotted lip, conspicuous spur, and slender germen.

Note on the AMPHIUMA MEANS, *described in Vol. III. of this Journal. By* R. HARLAN, M. D.

Since writing a note on this animal, published in the *New York Lyceum of Natural History* subsequently to the account in the Journal of the Academy, some additional information has been obtained.

In a Memoir read before the French Academy of Sciences, November 1826, by Baron Cuvier, another species is described, the A. *tridactylum*, accompanied also with a very detailed account of the anatomy of these reptiles. In addition to the anatomical particulars previously known, Cuvier states that there exist rudiments of false ribs at the extremities of the transverse processes of the few upper vertebræ; and also that vestiges of bones in their rudimental legs were noticed. The author attributes the same habitat. to both species; and thinks it probable that during the earlier periods of existence the Amphiuma is furnished with bronchiæ.

Within a very few days past I have received thirty-four specimens of the A. *means*, through the politeness of Mr. F. Nesbit, of Alabama. They are of various sizes; one two feet ten and a half inches in length, and measuring six inches round the head. Some are very small. The rudimental legs do not increase in size in proportion to the size of the animal, but are proportionably smaller in the largest specimens. On dissection the stomachs of several

were found filled with small fish, beetles, salamandræ, &c.

Mr. Nesbit informs me that the whole number were caught during the present year, in the neighbourhood of Pensacola: all of them being of the same species, would appear to indicate that the habitat of the two species is not the same. Since the appearance of Cuvier's essay I have met with several specimens of his new species, always from the Mississippi and Arkansa rivers, or some of their tributaries.

In several individuals one limb was wanting, without doubt a congenital deformity.

The great number of these reptiles which have passed under my observation, varying in size from 3 inches to nearly 3 feet, induces me to believe that they are never furnished with bronchiæ: the perfectly developed state of the lungs, is another argument in favour of this position.

Descriptions of North American Dipterous Insects. *By* Thomas Say.

Culex. *Linn. Meig.*

C. *musicus.* Tergum purplish, with lateral yellowish spots.

Inhab. Indiana.

Head dull honey-yellow: *vortex* blackish with yellowish hair: *proboscis* and *palpi* black: *thorax* black-purple, with yellowish hair or scales: *wings* dusky: *poisers* white, a little dusky at tip: *tergum* purple, or violaceous, with a band at base, and large lateral spot on each segment of yellowish hair or scales: *feet* black-violaceous: *thighs*, excepting at tip, and *coxæ* whitish, sericeous: *tarsi*, two terminal joints of the posterior pair white.

Length more than one-fifth of an inch.

Chironomus.

C. *tænionotus.* Stethidium green, trilineate; a black line on the middle of the anterior line.

Inhab. Indiana,

Body bright pea-green: *head* yellowish, terminal joint of the antennæ blackish: *thorax* with three dilated, pale honey-yellow vittæ; a black line along the middle of the anterior one: *wings* white: *metathorax* pale honey-yellow, with a blackish spot in the middle, divided by a green line: *tergum* immacu-

late: *pectus* pale honey-yellow: *feet* pale greenish, anterior tibiæ and tarsal incisures dusky.

Length more than one-fifth of an inch. ♀

C. *devinctus*. Tergum black, incisures white; feet with black incisures.

Inhab. Indiana.

Body dusky: *stethidium* dusky livid: *thorax* trilineate with blackish: *scutel* dull honey-yellow: *halteres* and *wings* white: *tergum* brownish-black; incisures, particularly those near the base, white: *thighs* black, anterior pair pale at base; the others with a white annulus near the tip: *tibiæ* and *tarsi* white, with black incisures.

Length nearly one-fifth of an inch.

CERATOPOGON. *Meig.*

C. *scutellatus*. Black; scutel yellow; abdomen whitish.

Inhab. Indiana.

Head blackish: *mouth* yellow: *thorax* pale yellowish, with three black lines, which are widely dilated before, and confluent: *scutel* yellow: *wings* dusky: *poisers* white: *abdomen* whitish: *feet* whitish.

Length nearly one-twentieth of an inch.

Appeared in considerable numbers on the last of August, soon after sunrise.

LIMNOBIA. *Meig.*

L. *livida*. Tergum livid, with a yellowish margin.

Inhab. Mexico.

Head yellowish-brown, with a longitudinal fuscous line: *antennæ* fuscous, paler at base; joints rounded: *thorax* yellowish-brown, trilineate with blackish, exterior lines dilated, middle line capillary: *metathorax* with a grey reflection, yellow each side: *poisers* elongated, reaching the tip of the second abdominal segment, yellow, with a lateral dusky line: *wings* with a slight yellowish-brown tint, cross nervures margined with dusky: *tergum* livid, with a darker dorsal, and submarginal line, and yellowish margin: *pleura* bilineate with fuscous; superior line passing round the pectus before the anterior feet, and the inferior line behind them: *feet* yellowish, with an obsolete dusky band towards the tip of the thighs: *venter* livid, with a yellowish margin and obsolete middle line.

Length more than one-fourth of an inch.

The nervures are arranged nearly as in L. *lutea*, Meig.

TIPULA.

T. *annulicornis*. Pale; antennæ annulate with black.

Inhab. Indiana.

Body very pale honey-yellow: *antennæ* with a black annulus on each joint: *palpi* black at tip: *wings* immaculate: *tergum* with obsolete, dusky, slightly undulated bands.

Length under one-fourth of an inch.

PLATYURA.

P. *subterminalis.* Yellowish; wings with a subterminal band.

Inhab. Indiana.

Body entirely pale honey-yellow: *antennæ,* excepting the two basal joints, fuscous: *ocelli* with a small black areola: *thorax* immaculate: *wings* with a slight yellowish tinge; a blackish, subterminal band, occupying on the costal margin all the space between the small cross nervure and the tip of the next long nervure, and extending to the thinner margin: *tergum* a little more dusky than the thorax: *tibiæ* and *tarsi* dusky.

Length three-twentieths of an inch.

Nervures as in P. *baumhaueri,* Meig. but the small cross nervure on the costal margin is perpendicular to the costal edge.

LEIA. *Meig.*

L. *bivittata.* Honey-yellow; trunk bilineate, and tergum with two series of black punctures.

Inhab. Indiana.

Body rather pale honey-yellow: *antennæ* black at tip: *stemmata* very distinct, in a curved line: *thorax* a little hairy, on each side a dilated black vitta: *wings* fasciate near the tip: *tergum* on each side with a series of oval black spots: *coxæ* white.

Length over three-twentieths of an inch.

Taken on the window in June.

MYCETOPHILA. *Meig.*

M. *discoida.* Thorax pale with a blackish disk; wings with a fuscous spot.

Inhab. Indiana.

Head blackish: *antennæ* whitish, at tip blackish: *thorax* pale honey-yellow; disk blackish owing to three vittæ of that colour being confluent into one: *wings* hyaline, with a fuscous spot on the connecting nervures: *tergum* blackish, somewhat sericeous: *poisers* whitish: *feet* whitish, with blackish tarsi: *abdomen* whitish at base.

Length more than one-tenth of an inch.

Belongs to Meigen's first division of the genus.

M. *nubila.* Dusky; wings immaculate; feet whitish.

Inhab. Indiana.

Body dusky, brownish: *antennæ* first and second joints yellowish: *thorax* on the humerus dull honey-yellow: *scutel* dull yellowish: *wings* hyaline, immaculate: *poisers* whitish, capitulum dusky before the tip: *abdomen* slender, gradually enlarging to the tip: *tergum* with the tips of the segments pale; anal segment pale: *feet* whitish, dusky towards the tips; spines one-third the length of the first tarsal joint.

Length three-twentieths of an inch.

Belongs to Meigen's fifth division.

SCIARA. *Meig.*

S. *unicolor.* Velvet black; wings with a slight violaceous tinge.

Inhab. Mexico.

Body velvet black, with numerous short hairs: *thorax* with a minute humeral, obsolete piceous spot, and another at base of the wings: *scutel* with an obsolete piceous spot on each side: *wings* large, black, with a violaceous tinge; the apicial furcate nervure, as well as all the other nervures, equally definite.

Length nearly three-tenths of an inch.

S. *exilis*. Halteres nearly half the length of the abdomen.

Inhab. Indiana.

Body dusky: *antennæ* as long as the body: *stethidium* yellowish-white: *thorax* blackish: *wings* dusky; apicial forked nervure wide, the inferior portion hardly arquated: *halteres* subclavate, about half as long as the abdomen, a little dusky: *abdomen* a little hairy: *feet* pale.

Length ♂ one-thirtieth of an inch.

PENTHETRIA. *Meig.*

P. *heros*. Black; costal margin of the wings fuscous.

Inhab. Mexico.

Body entirely velvet black: *wings* dusky; costal margin fuscous; costal edge black; nervures of the disk pale.

Length ♀ two-fifths of an inch.

This I believe to be the largest species, yet discovered, of this small genus. The arrangement of

the nervures differ considerably from that of P. *holosericea*, Latr. as represented by Meigen. The male is much smaller and nearly corresponds in the arrangement of its nervures.

DILOPHUS. *Meig.*

D. *stygius*. Velvet black, immaculate.

Inhab. Mexico.

Body velvet black: *thorax* with a transverse series of approximate spines on the collar, interrupted in the middle, and a series of smaller ones before the middle of the thorax: *wings* blackish a little tinged with violaceous: *anterior tibiæ* with a series of acute spines on the anterior middle and tip.

Length one-fourth of an inch.

BERIS.

B. *fuscitarsis*. Nob. When describing this species I observed that "The scutel of my specimen is wanting, I cannot therefore ascertain its number of spines." I have since obtained individuals in Indiana and find that the scutel is altogether destitute of spines or radii. It differs in this respect from all the known species.

XYLOPHAGUS. *Meig.*

X. *fasciatus*. Wings dusky, fasciated; abdomen fasciated.

Inhab. Indiana.

Body dusky: *thorax* —— posterior portion ho-

ney-yellow: *poisers* blackish at tip: *wings* dusky, a more distinct band on the middle and at tip: *feet* honey-yellow; hind tibiæ blackish: *tergum* yellow, basal half of the four basal segments black; remaining segments nearly all black.

Length over two-fifths of an inch.

By an accident the head and anterior part of the thorax of this fine specimen were destroyed, but the above description will sufficiently indicate the species. The wing nervures resemble those of the *maculatus*, Fabr.

THEREVA. *Latr.*

T. *albifrons*. Black, with gray hair: thorax with a blackish vitta.

Inhab. Indiana.

Body black, with numerous gray hairs: *front* silvery: *antennæ* ——: *rostrum* dirty honey-yellow: *thorax* with a broad fuscous vitta: *wings* hyaline: *poisers* black at tip: *tergum* with the segments tipped with a more dense margin of gray hairs, wider and more obvious on the sides: *venter*, the two middle segments with a pale terminal margin: *feet* blackish; *tibiæ* dirty honey-yellow.

Length ♁ three-tenths of an inch.

Resembles *frontalis*, Nob. but is much smaller.

ANTHRAX.

A. *edititia*. Black with fulvous hair: wings fuscous at base.

Inhab.

Body black, covered with dense fulvous hair: *cheeks* naked: *proboscis* rather prominent, black: *antennæ*, two basal joints yellowish: *wings* hyaline, basal half fuscous, including all the costal cellule and the middle transverse nervures which are darker than the other part; two exterior transverse nervures margined with blackish: *halteres* reddish-brown, tip yellow: *tergum* each side and at tip yellowish: *venter*, except on the two or three basal segments, yellowish: *feet* fulvous; *tarsi* blackish.

Length over two-fifths of an inch.

Belongs to Wiedemann's fifth tribe.

A. *limatulus*. Wings fuscous at base and with three fuscous points.

Inhab. Indiana.

Body brownish-black: *occiput* plumbeous, near the neck black, with a black indented line passing up to the vertex: *wings* dusky, fuscous at base, chiefly on the costal portion of it, which extends attenuating beyond the middle; anastomosis, in the hyaline portion, margined with fuscous: *tergum* with four series of silvery points, or rather abbreviated transverse lines.

Length ♂ three-tenths of an inch.

♀ two-fifths of an inch.

Var. a. Posterior cross nervure of the central wing cellule not margined.

Belongs to Wiedemann's second tribe.

Dasypogon. *Meig.*

D. *cepphicus.* Black, with short cinereous hair.

Inhab. Mexico.

Hypostoma, mystax, and *genæ* silvery: *antennæ* black, first joint of the style longer than the second: *vertex* concave, but not very profound: *stemmata* on a common elevation: *thorax* with a slight appearance of lineations before: *poisers* yellow at tip: *nervures* black: *tergum* with the segments having short white hair each side: *metathorax* also somewhat silvery each side: *anterior coxæ* with a slender, arquated, transverse, black common line, and a longitudinal black line of separation: *anterior tibiæ* with silvery hair.

Length one-fourth of an inch.

The nervures of the wings are arranged more like those of an Asilus than of a Dasypogon, but the biarticulate style proves the generic affinity.

Laphria.

L. *saniosa.* Black; abdomen sanguineous.

Inhab. Indiana.

Body blued-black: *head* black; *front* with a silvery reflection: *posterior* and *inferior orbits* reflect-

ing silvery: *wings* black violet: *abdomen* sanguineous, first segment of the tergum blackish.

Length nearly half an inch.

RAMPHOMYIA. *Meig.*

R. *rufirostra.* Black; thorax lineate.

Inhab. Indiana.

Body hairy, black: *proboscis* honey-yellow, black at base: *thorax* blackish-cinereous, opake, with three polished, black, equal lines obsolete behind, and two less obvious ones on each side, connected to the exterior of the dorsal ones in a humeral spot: *wings* with a yellowish tinge towards the base, and a large fuscous carpal spot; middle cellule very short, but little longer than broad: *poisers* honey-yellow, with a fuscous capitulum: *tergum* polished: *feet* very hairy, polished; *anterior tarsi*, first joint as long as the tibia and rather more dilated.

Length ♀ three-twentieths of an inch.

SARGUS.

S. *trivittatus.* Green; thorax dull darker lines; tergum fasciate.

Inhab. Indiana.

Body grass green, not metallic, nor brilliantly polished: *antennæ* terminal joint rounded, yellow; seta black: *stemmata* equidistant, in a fuscous areola: *thorax* trilineate with dull reddish-brown: *poisers* blackish at tip: *tergum*, segments, excepting the

basal one, with a broad dusky band at their bases: *feet* dull yellowish, darker at their tips.

Length from two-fifths to half an inch.

A large species, destitute of the highly polished metallic colour so striking in many species. The thoracic lines are so dilated as to give the thorax the appearance of being entirely dull reddish-brown.

NEMOLETUS. *Meig.*

N. *polyposus.* Black; feet yellowish; thighs black at base.

Inhab. Mexico.

Body black, with a slight tinge of purplish, polished: *wings* white, costal and basal nervures yellowish: *poisers* white: *feet* honey-yellow; *thighs*, except at tip, black; *tarsi*, terminal joint black; *posterior tibiæ* black in the middle: *venter* immaculate.

Length more than three-twentieths of an inch.

This is closely allied to the species which I described under the name of *pallipes*.

STRATIOMYS.

S. *trivittata.* Greenish; thorax with three, tergum with one black vitta.

Inhab. Mexico.

Head yellowish-green; *front* and *vertex* brownish, each with a transverse, somewhat undulated line: *antennæ* reddish-brown, paler at base: *thorax* green, with three broad black vittæ: *scutel* greenish, two-

spined, immaculate: *poisers* pea-green: *tergum* yellowish-green, with a dilated, crenate vitta: *pectus* with a broad black vitta: *proboscis* and point each side on the hypostoma, black.

Length nearly seven-twentieths of an inch.

S. *goniphora.* Black; thorax with minute golden hairs; beneath greenish.

Inhab. Mexico.

Head yellowish-white, two undulated black frontal bands: *vertex* black, yellowish behind: *hypostoma* with a lateral black dot, sometimes obsolete: *proboscis* black: *antennæ* black: *occiput* black: *thorax* with numerous small golden hairs; a yellowish line over the wings: *scutel* black, posterior margin and and spines yellow: *wings* hyaline; costal nervures and cellule yellowish; middle nervures blackish: *tergum* black, with lateral yellow triangles and tip; beneath pale greenish: *pectus* on the disk black: *feet* yellowish, a line beneath the thighs black: *venter* on the posterior disk ferruginous.

Length more than three-tenths of an inch.

Baccha.

B. *costata.* Body black; tergum with white bands.

Inhab. Indiana.

Head silvery; a shining black line from the vertex to the mouth, much constricted on the middle of

the front: *antennæ* obsoletely honey-yellow at base: *occiput* plumbeous with a silvery reflection: *thorax* black: *poisers* white: *wings* hyaline with a somewhat narrow costal margin, not reaching the tip: *scutel* margined with yellow: *tergum* black; first, second, and third segments with an oblique white spot on each side at base, and remaining segments tipped with white; *feet* black; anterior pairs, base of the tibiæ and tip of the thighs honey-yellow; posterior tibiæ honey-yellow at base.

Length half an inch.

XYLOTA. *Meig.*

X. *arquata.* Blackish; tergum fulvous with whitish arcs.

Inhab. Mexico.

Body blackish: *head* above with greenish hair, below the antennæ with whitish hair: *vertex* blackish; tubercle of the antennæ black: *antennæ* black-fuscous: *hypostoma* with a naked black vitta before, and another on each side, from the anterior canthus of the eye to the tip: *thorax* with short hair; with three slender lines on the disk: *scutel* yellowish at tip: *wings* hyaline: *tergum* fulvous; first segment black; remaining segments, excepting the terminal one, with a blackish middle and whitish transverse arquated line each side: *feet,* knees and posterior tibiæ honey-yellow: *venter* yellowish, more dusky at tip.

Length about seven-twentieths of an inch.

Var. a. Tergum black, with transverse arquated lines: posterior margins of the segments yellow.

Milesia. *Fabr. Meig.*

M. *barda.* With yellow hair; tergum black, yellow at base.

Inhab. Indiana.

Body black: *hypostoma* with silvery hair and longitudinal, polished, naked line: *antennæ* piceous: *front* covered by yellow hair: *thorax* densely covered by yellow hair, black in the middle: *scutel* piceous, covered by yellow hair: *wings* with a large fuscous spot on the middle, obsolete in the male: *poisers* piceous: *tergum* black, covered by black hair; basal segment and second segment at base covered by yellow hair: *feet* hairy; *tarsi* piceous: *posterior thighs* of the male much thickened and with their tibiæ arquated.

Length three-fifths of an inch.

This I formerly considered as Eristalis *posticatus,* Fabr. but his attributed characters of "thorax immaculatus" and "femoribus posticis dentatis" seem to prove it distinct.

Syrphus. *Fabr. Meig.*

1. S. *stegnus.* Blackish-blue; tergum fasciate with glaucous.

Inhab. Mexico.

Body black-blue: *hypostoma* with dull cinereous irregular rugosities: *antennæ*, terminal joint beneath dull honey-yellow: *wings* hyaline, between the mediastinal and postcostal nervures yellowish: *poisers* yellow: *tergum* velvet black, opake, with polished glaucous bands, the first one interrupted; second and third occupying the basal half of the segments, the outer margin and the narrow tip, together with a longitudinal line; terminal segment entirely glaucous: *tibiæ* honey-yellow: *venter* cupreous.

Length less than three-tenths of an inch.

2. S. *mutuus*. Tergum yellow, with blackish bands and spots.

Inhab. Mexico.

Head beneath and behind plumbeous: *posterior orbits* dull yellowish: *front* and *vertex* brassy black: *hypostoma* prominent, yellow: *antennæ*, beneath honey-yellow: *thorax* olivaceous, with a blue vitta, and yellow one over the wings: *scutel* dull yellowish, paler at tip: *tergum* with five broad blackish-purple bands, concealing the incisures, and on the middle of the third and fourth segments are two small blackish spots; terminal band somewhat trilobate: *feet* yellow; *posterior tarsi* blackish: *venter* yellow, tinged at tip with ferruginous.

Length one-fourth of an inch.

Closely allied to S. *marginatus*, Nob. but the abdomen is much more elongated.

3. S. *ectypus*. Segments of the tergum edged with yellow and with a lateral oblique line.

Inhab. Mexico.

Head yellow: *proboscis* black: *vertex* blackish: *occiput* black: *posterior* and *inferior* orbits gray: *mouth*, each side and beneath black: *thorax* green-gray, with an obsolete capillary line reflecting yellowish: *scutel* honey-yellow, darker on the middle base: *poisers* yellow: *tergum* black, edged all round with yellow; second segment with two yellow dots; third and fourth segments with their basal edges and dorsal line yellow, and on each side a wider line originating from the base, and curving a little towards the dorsal line, abbreviated, rounded at tip and tinged with rufous; fifth segment rufous with three black spots: *pectus* blued-black: *feet* white; *posterior tarsi* blackish.

Length less than one-fifth of an inch.

Eristalis. *Fabr. Meig.*

E. *trifasciatus*. Thorax grayish, trifasciate; tergum with a band; incisures yellow.

Inhab. Indiana.

Head white, on the vertex a little olivaceous; behind dark olive, with white orbits: *antennæ* with the seta naked, and with a spot above on the front elevation of the hypostoma, and mouth each side honey-yellow: *thorax* gray-olive, with three equidistant blackish bands; middle band as broad as the

other two together; posterior band terminal: *wings* tinged with yellowish, particularly in the middle: *scutel* pale honey-yellow: *tergum* black; second segment with a broad honey-yellow band, interrupted in the middle, and with the third and fourth segments bright-yellow on the posterior margin: *feet* rufous, tibiæ paler at base; posterior thighs blackish at base.

Length over half an inch.

VOLUCELLA. *Geoff. Meig.*

1. V. *violacea.* Dark violaceous; hypostoma whitish.

Inhab. Mexico.

Body blackish-violaceous: *hypostoma* dull honey-yellow, with small hairs reflecting whitish: *thorax*, each side, and *scutel* paler: *wings* blackish at base; this colour is confined to the basal cellules and the costal margin to the middle.

Length $\frac{13}{20}$ thirteen-twentieths of an inch.

The eyes of the specimen are in contact on the vertex.

2. V. *postica.* Obscure violaceous; hypostoma whitish with a lateral black line.

Inhab. Mexico.

Body blackish-violaceous: *head* whitish, tinged with obscure yellowish: *antennæ* fuscous: *hypostoma* with a black line each side: *orbits* behind and above silvery: *thorax* each side and before the scutel, dull honey-yellow: *scutel* honey-yellow: *wings*

hyaline, transverse nervures of the middle margined with blackish: *tergum* yellowish-violaceous, darker on the tips of the segments; third and fourth segments with a small white spot on each side at their bases: *venter* with a yellow disk: *feet* blackish: *tibiæ* dirty honey-yellow.

Length half an inch. ♂

Viewed from before, the posterior segments of the tergum have a hoary appearance, in consequence of having numerous short hairs of that colour. The eyes in the specimen are distant on the vertex.

3. V. *marginata*. Black, head white; tergum with black bands.

Inhab. Mexico.

Head white; *vertex* black; *face* with a black line extending to the tip of the hypostoma: *hypostoma* with a line each side, and all beneath black: *orbits* beneath white, behind glaucous: *antennæ* dark honey-yellow, seta very densely plumose, appearing like a solid mass, black: *thorax* with a vitta on each side over the wings, and two spots at base, yellowish-white: *wings* with the middle cross nervures margined with dusky: *tergum* pale yellow with a black dorsal vitta, and black posterior margins to the segments: *venter* whitish, at tip black: *feet* black; *tibiæ* at base white; *tarsi* at base tinged with rufous.

Length seven-twentieths of an inch, the other sex half an inch.

If it be true that the male, in this genus, is distin-

guished invariably by the contact of the eyes on the vertex, then the male of the present species is nearly double the size of the female, and the former has the more densely plumose antennæ; in this case also the male of the *violacea*, has the loosely plumous antennæ, and the female of the *postica* has the loosely plumous antennæ.

PSILOPUS. *Meig.*

1. P. *femoratus*. Dolichopus femoratus, Nob. Jour. Acad. Nat. Sc. vol. iii. p. 86.

This brilliant species varies in the colour of its thighs, which in my description are stated to be green; a specimen taken in Indiana has whitish thighs.

2. P. *patibulatus*. Nob. Dolichopus patibulatus, Journ. Acad. Nat. Sc. vol. iii. p. 87.

This species also occurs in Mexico.

CHRYSOTUS. *Meig.*

1. C. *nubilus*. Blackish; feet dull honey-yellow.

Inhab. Indiana.

Body blackish: *head* dull plumbeous: *thorax* cinereous, with three brown lines: *wings* immaculate: *poisers* white: *feet* dark honey-yellow; *thighs* black at base and above.

Length rather over one-tenth of an inch.

2. C. *concinnarius*. Green-brassy; tergum blue towards the tip.

Inhab. Mexico.

Head violaceous, with a cinereous reflection: *palpi* with a cinereous reflection: *antennæ* black: *thorax* green with a gray olivaceous reflection: *wings* hyaline, obsoletely tinged with yellowish on the costal margin: *poisers* white: *tergum* with a gray reflection, brassy-green at base, and violaceous towards the tip: *thighs* green: *tibiæ* whitish.

Length one-fourth of an inch.

3. C. *abdominalis*. Green, polished; feet white.

Inhab. Indiana.

Body bright green, brilliant: *hypostoma* purple: *antennæ* yellow: *thorax* immaculate: *poisers* yellow: *tergum*, first segment at base with an obsolete yellowish line: *feet* white: *venter* white, at tip blackish-purple.

Length ♂ one-tenth of an inch.

MEDETERUS. *Fisch.*

1. M. *lateralis*. Tergum pale, with a lateral series of polished spots.

Inhab. Indiana.

Head silvery: *proboscis* and *antennæ* yellowish, seta of the latter with the first joint very short: *eyes* (when recent) green polished, with a cupreous reflection: *thorax* green, somewhat pruinose, with a dorsal rather compound vitta: *wings* hyaline: *poisers* whitish: *tergum* dull yellowish, with a series of

brassy spots on each side, posterior two largest: *feet* and *venter* whitish.

Length nearly three-twentieths of an inch.

The dorsal vitta is impressed behind.

2. M. *punctipennis.* Thorax variegated; wings with brown spots.

Inhab. Mexico.

Thorax olive-brown, trilineate; middle line slender, dull yellowish, obsoletely zigzag; outer lines cinereous with black points: *scutel* brown, cinereous in the middle: *wings* hyaline, with many irregular fuscous spots, hardly to be traced into four bands: *poisers* yellow: *tergum* cupreous, posterior margins of the segments blackish: *feet* white; *tarsi* blackish.

Length nearly one-fifth of an inch.

Dolichopus. *F. Meig.*

D. *abdominalis.* Green; abdomen rufous.

Inhab. Indiana.

Head silvery: *antennæ,* first and second joints black, third ——: *thorax* polished green: *wings* hyaline: *abdomen,* excepting the terminal joint, rufous: *halteres* white: *pleura* and *pectus* blackish, pruinose: *feet* white; *tarsi* dusky.

Length less than three-twentieths of an inch.

Scenopinus. *Latr. Fabr.*

S. *nubilipes.* Black; thorax submetallic; thighs black.

Inhab. Indiana.

Body black: *head* and *thorax* with numerous short hairs, giving it a granulated appearance, the latter with an obsolete rufous lateral tubercle near the humerus, disk slightly metallic: *wings* very slightly dusky: *poisers* blackish: *tergum* transversely grooved: *thighs* black; *tibiæ* dull honey-yellow; *tarsi*, particularly the posterior pair, whitish.

Length less than one-fifth of an inch.

Closely allied to S. *pallipes*, Nob. but may be distinguished by the colour of the feet.

CONOPS. *Fabr.*

C. *tibialis*. Black; two-thirds of the wing fuscous; tibiæ white at base.

Inhab. Indiana.

Body black, with short hairs: *head* yellow: *vertex* black: *front* with a longitudinal black line, bifarious at the base of the antennæ: *hypostoma* with an impressed saggitate spot: *antennæ* black, terminal joint beneath obscurely rufous: *proboscis* black: *mouth*, each side and beneath, black: *occiput* black, with a white reflection: *thorax* black; *humeral tubercle* with a whitish reflection: *scutel* and *metathorax* black, the latter with a whitish reflection: *wings* two-thirds fuscous; central cross nervure very distinct: *poisers* yellow, black at the base of the petiole: *tergum*, segments edged behind with whitish, or yellowish, on the basal suture the white band is com-

mon; near the tip with more or less of a whitish reflection: *feet* black; *tibiæ* white at base, anterior and intermediate pairs near the tip with a silvery reflection.

Length from one half to three-fifths of an inch.

Resembles C. *sagittaria*, Nob. but differs in several characters.

PHASIA. *Latr.*

1. P. *atripennis*. Black; abdomen and base of the thighs ferruginous.

Inhab. Indiana.

Mouth and *hypostoma* pale yellowish: *proboscis* black: *palpi* yellowish: *orbits* yellow, somewhat golden: *antennæ* black, third joint hardly longer than the second, subovate: *front* with a much dilated velvet-black vitta: *thorax* black, with a dilated golden vitta each side before: *wings* black, opake, gradually paler on the thinner margin; apicial cross nervure confluent with the externo-medial nervure before the tip; *poisers* and *scale* yellow: *feet* black; *thighs* at base, *coxæ* and *abdomen* ferruginous.

Length three-tenths of an inch.

The wing nervures are like those of P. *semicinerea*, Meig.

2. P. *jugatoria*. Black, abdomen ferruginous; thorax with golden lines before.

Inhab. Indiana.

Front golden, with a dilated fuscous vitta: *hypostoma* whitish, with two black lines each side descending from the antennæ: *antennæ* fuscous, first joint very short, third ovate, longer than the second: *proboscis* blackish: *palpi* yellow: *thorax* black, a transverse golden line before the middle, from which proceed five golden lines to the anterior margin, the lateral ones more dilated and anterior to the *wings* black, opake; posterior margin abruptly hyaline; apicial cross nervure rectilinear, confluent with the apex of the wing at the tip of the externo-medial nervure: *poisers* and *wing scale* pale ferruginous: *abdomen* pale ferruginous, black at tip: *feet* black; *thighs* at base, and *coxæ* pale ferruginous; *posterior tibiæ* deeply ciliated with dilated scale-like hairs.

Length three-tenths of an inch.

This cannot be the THEREVA *lanipes* of Fabr. of which the thoracic lines are said to be white, and the abdomen black, immaculate; neither can it be the THEREVA *pilipes*, Fabr. which is said by Wiedemann to be a PHANIA, for the antennæ of our species have not the third joint "elongated and linear" as in that genus. It seems also allied to DICTYA *pennipes*, Fabr. which, however, has a large ferruginous spot on the wing.

OCYPTERA. *Fabr.*

O. *arcuata.* Wings blackish on the costal margin; apicial cross-nervure arquated at its origin.

Inhab. Indiana.

Body blackish: *hypostoma* yellowish-white; *orbits*, excepting behind and on the vertex, honey-yellow with a gray reflection: *front* with a dilated blackish vitta: *antennæ* with the base of the third joint obsoletely honey-yellow beneath: *thorax* with yellow hair before the wings: *wings* hyaline; costal margin blackish; terminal cross-nervure not angulated at its origin: *halteres* yellowish: *wing-scales* white: *feet* black; base of the thighs and coxæ yellowish: *tergum* pale yellowish; basal segment with the base and dorsal line black; second segment with a large black triangle; third segment with a gray reflection each side; remaining part black: *venter* pale yellowish, at tip black.

Length three-tenths of an inch.

This may readily be distinguished from other species, by the form of the apicial cross-nervure.

MILTOGRAMMA. *Meig.*

M. *trifasciata.* Tergum black, fasciate with gray.

Inhab. Indiana.

Hypostoma and *posterior* and *inferior orbits* honey-yellow, with a silvery reflection: *antennæ* honey-yellow; *seta* with dense short hairs: *frontal vitta* of equal breadth: *thorax* gray, with many obsolete abbreviated blackish lines: *scutel* gray: *tergum* black; segments, except the basal, silver-gray

on the basal half: *venter* the same: *feet* black; *thighs* on the exterior side with a gray reflection: *wings* tinged with brownish.

Length less than half an inch.

Gonia. *Meig.*

G. *frontosa.* Front very prominent, abdominal segments whitish at base.

Inhab. Upper Missouri.

Body black, with rigid hairs: *head* pale yellowish-white, sericeous: *front* very prominent, gibbous: *eyes* placed very far back, oblong-oval, chestnut-brown: *stemmata* black: *antennæ* blackish-cinereous; *seta* reclivate, robust, terminal joint longest: *proboscis* black: *palpi* pale: *thorax* immaculate: *scutel* pale brownish: *wings* dusky; *nervures* blackish-brown; *costal margin,* towards the base brownish: *feet* black: *tergum* each side near the base with a large, obsolete, reddish-brown spot; segments whitish at base.

Length nine-twentieths of an inch.

Occurred rather common at Engineer cantonment on the Missouri, late in March, on a wounded tree from which much sap had exuded.

Mesembrina. *Meig.*

M. *pallida.* Honey-yellowish; wing nervures margined.

Inhab. Indiana.

Body dull honey-yellowish: *head* pale yellow: *front* with a reddish-brown vitta: *antennæ* very short, hardly half as long as the hypostoma, terminal joint oval: *nervures* margined with brownish: *pectus, pleura* and *feet* paler.

Length two-fifths of an inch.

Cordylura. *Fall.*

C. *qualis.* Dark cinereous, hairy; thorax trilineate; head with a cinereous reflection.

Inhab. Indiana.

Body blackish-cinereous: *head* hemispheric, dark plumbeous, with a silvery reflection: *eyes* approximate above: *antennæ* blackish, rounded at tip; bristle short, two-jointed, thickened at base: *palpi* hairy, black, dilated at tip: *proboscis* rather long, slender, black: *thorax* obscurely trilineate with black, and with two less distinct oblique lines each side: *wings* slightly dusky: *tergum* very hairy, black, when viewed from behind with a gray reflection, except on the dorsal line and sutures: *feet* hairy, black.

Length ♂ one-fifth of an inch.

Dexia. *Meig.*

1. D. *vertebrata.* Abdomen conic, pale yellowish, with a dorsal black line and tip.

Inhab. Indiana.

Orbits, except behind, silvery: *front* fuscous:

hypostoma pale livid, with a dark lateral line bounding the orbits: *antennæ* yellowish, darker at base; *seta* blackish: *thorax* blackish: *tergum* yellowish-white with a black line, which is somewhat dilated at the tip of each segment; tip of each segment and tail black: *feet* black; *coxæ* piceous.

Length half an inch.

Nervures of the wings arranged like those of D. *rustica*, Fabr.

2. D. *analis*. Abdomen yellow, blackish at tip.

Inhab. Indiana.

Head silvery; *front* tinged with dull yellowish: *antennæ* yellowish, tip of the third joint black: *palpi* yellow: *proboscis* black, yellow at tip: *thorax* black, with a somewhat golden reflection; a dull yellow line each side, passing over the origin of the wings: *wings* hyaline, a little dusky, yellowish at base: *scutel* yellow: *pectus* black, with a whitish band before: *feet* yellowish; *tarsi* black: *abdomen* pale yellow, tip fuscous.

Length seven-twentieths of an inch.

The proboscis and palpi are much elongated.

Sapromyza. *Fall.*

1. S. *connexa*. Pale honey-yellow; head whitish.

Inhab. Indiana.

Head whitish: *antennæ* pale honey-yellow, terminal joint rounded: *eyes* greenish, somewhat gild-

ed: *thorax* and *scutel* honey-yellow: *wings* with a slight yellowish tinge: *tergum* paler than the thorax: *feet* white.

Length three-twentieths of an inch.

Closely resembles S. *flava*, Linn. of Europe, but is much larger. The S. *flava* is also an inhabitant of this country.

2. S. *bipunctata*. Yellowish; wing with spots and costal margin fuscous.

Inhab. Mexico.

Body pale honey-yellow: *scutel* with two black points on the posterior edge: *wings* hyaline; costal margin beyond the postcostal nervure, and extending in breadth a little over the subcostal nervure, fuscous; near its tip it extends into the wing so as to form a spot on the externo-medial nervure, this nervure and the interno-medial nervure have each a spot at tip: the two cross-nervures margined: *tergum* more dusky at tip, with an obsolete blackish dorsal line, and posterior margins of the segments.

Length one-fifth of an inch.

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OF

PART 2, VOL. VI.

Notice of the Fall of a Meteoric Stone, *at Deal, in New Jersey. By* Roberts Vaux & Thos. McEuen, M. D.

(Read August 25th, 1829.)

On the 15th August 1829, about 30 minutes after midnight, a meteor was observed at Long Branch, Monmouth county, New Jersey, S. W. of the boarding-houses, at an elevation of from 25 to 30 degrees, from which height it continued to rise "like a rocket," almost to the zenith, curved a little in its path, and exploded with scintillations, and a dark mass fell to the earth.

The light was so brilliant, as to induce several gentlemen, when they first observed it, to suppose the buildings were on fire. The moon had been full within twenty-four hours, yet its light was lost in that of the meteor. A noise followed the illumination, resembling the discharge of small arms in rapid succession.

On the farm of Mr. John West, of Deal, five miles south-west of Long-Branch, several respectable persons informed us, that they were brought from the house by the light, and subsequently alarmed by twelve or fifteen reports louder than muskets, at-

tended by what they supposed to be *"the whistling of bullets"* in the air, and the noise of bodies striking the earth. They recognised the fragment which we have presented to the Academy, as part of the stone they picked up at day-light, about two hundred yards from their dwelling, at a spot to which the sound of the falling body directed their search. They describe the stone as triangular, about three inches in its greatest length, the surface black, with many obtuse indentations; it had sunk about three-fourths of an inch, or half its thickness into the earth, which was sandy loam. A mile distant, in the same direction, other bodies were heard to strike the earth.

One mass only was found, the largest part of which was taken to New York by Mr. West; a very small piece is in the possession of Alexr. M'Gregor, Esq.; and we have the pleasure of handing the remainder to the Academy.

Descriptions of North American Dipterous Insects. *By* Thomas Say.

[Continued from page 178.]

Ortalis. *Fall.*

1. O. *marginata.* Nervures margined with fuscous.

Inhab. Indiana.

Body dull honey-yellow: *front* somewhat fulvous: *hypostoma* with a black line under each antenna: *thorax* yellowish-gray, with two dorsal black lines, exterior to which are three abbreviated lines: *scutel* immaculate: *wings* with the nervures margined with fuscous; *costal margin* fuscous, with a whitish spot near the base, extending into a band, another hyaline spot before the tip: *pleura* honey-yellow: *feet* pale: *tergum* black; first and second segments chiefly honey-yellow; remaining segments gray at base.

Length three-tenths of an inch.

Closely allied to the genus Platysoma, and is a fine species.

2. O. *ligata.* Wings quadrifasciate with fuscous.

Inhab. Mexico.

Body blackish: *head* ferruginous, tinged with glaucous behind and on the vertex: *thorax* blackish-plumbeous: *wings* white, subopake, with four fus-

cous bands; the first a little oblique, across the neck of the wing; second from the tips of the mediastinal and postcostal nervures, and proceeding a little obliquely, so as to be bounded posteriorly by the middle cross nervure; third, perpendicular to the costal margin, and covering the posterior cross nervure; fourth, terminal, slightly connected on the costal edge with the third: *poisers* white: *tergum* coppery-black: *feet* black; *knees* and *tarsi* ferruginous.

Length three-twentieths of an inch.

3. O. *trifasciata.* Wings hyaline, trifasciate with fuscous.

Inhab. United States.

Head blackish-rufous: *thorax* brassy, polished: *scutel* rather darker than the thorax: *wings* with a brown fascia rather before the middle, hardly to be traced to the thinner margin, and not passing over the middle cross nervure; another band passing over the other cross nervure, and nearly parallel to the first; tip brown, as broad as the other bands, and connected to the second band by the costal margin: *feet* honey-yellow; *thighs* dusky at base: *abdomen* greenish, towards the tip tinged with cupreous.

Length one-fifth of an inch.

4. O. *vau.* Blackish; wings with about three bands and tip fuscous.

Inhab. Ohio.

Body dark cinereous, with numerous fuscous points and spots: *antennæ*, terminal joint piceous: superior orbits and band above the antennæ piceous: *vertex* and *front* blackish: *poisers* whitish: *wings* hyaline, near the base a fuscous band much paler in the middle; another somewhat dislocated band passes over the two cross nervures, the inferior or dislocated portion points to a costal spot beyond the middle, and if continued to it would form the letter V, this band is also much paler in the middle; tip fuscous.

Length more than one-fifth of an inch.

The circumstance of the wing bands being paler in the middle, gives the costal margin the appearance of having four equal, equi-distant spots.

The inferior dislocated portion of the second band, is sometimes so extended as almost to join the third costal spot.

When recent, the eyes are sanguineous, with a longitudinal, pale, narrow line.

It occurred in plenty early in August.

Trypeta. *Meig.*

1. T. *electa.* Thorax lineate with bright yellow; wings fasciated.

Inhab. Indiana.

Head pale yellowish: *thorax* honey-yellow; a line before the wings bright yellow, another over the

wings confluent behind with the bright yellow scutel, and another on the middle abbreviated before: *wings* hyaline; a brown V on the middle, the posterior limb extending along the costal margin, to the tip or a little below; a brown point on the costal margin within the V; near the base a brown band parallel to the basal limb of the V: *poisers* pale yellow: *abdomen* pale yellow, *ultimate* segment with a black dot each side: *pleura* with a yellow line each side.

Length three-tenths of an inch.

2. T. *obliqua.* Yellowish; wings with oblique bands; tergum with two series of black dots.

Inhab. Indiana.

Body pale brownish-yellow: *wings* with a definite yellowish costal margin, and three very oblique bands proceeding from the costal margin; basal band terminating on the thin margin midway between the anal and axillary nervures; middle band terminating at the tip of the anal nervure; outer band terminating at tip of the interno-medial nervure; costal margin ending a little beyond the externo-medial nervure; the bands are edged exteriorly with a black line, which is dilated into a spot at tip: *thorax* with two black dots behind: *scutel* yellow, pale: *tergum* with a series of black dots each side.

Length one-tenth of an inch.

The wing bands are parallel and equi-distant, the intervals are as broad as the bands.

3. T. *caliptera*. Wings black, with hyaline points, apicial edge white.

Inhab. Indiana.

Body dull brownish, or dirty honey-yellow: *hypostoma* with two deep black dots: *wings* rounded, black, with very numerous, sub-equal, hyaline points, those of the thinner margin rather larger; apicial margin white: *poisers* yellow at tip: *tarsi* paler than the leg.

Length more than one-fifth of an inch.

Chlorops. *Meig.*

C. *proximus*. Yellow; thorax trilineate with black.

Inhab. Indiana.

Body yellow: *antennæ* black: *vertex* with a black triangle, elongated before almost to the base of the antennæ: *occiput* with a large black spot, like a dilated continuation of the triangle of the vertex: *thorax* with three black vittæ: *scutel* immaculate: *wings* hyaline: beneath the scutel a large black spot: *tergum* dull yellowish; segments dusky at tips; second segment with a black spot each side at base: *venter* tinged with green: *feet* tinged with honey-yellow.

Length less than three-twentieths of an inch.

Closely allied to C. *lineatus* of Europe, but differs in the colour of the tergum.

Ephydra. *Meig.*

E. *hians.* Cinereous; front dark bluish.

Inhab. Mexico.

Body dark cinereous: *front* and *vertex* dark bluish: *antennæ* black-brown; second joint as long as the third; seta thick at base, slender at tip: *hypostoma* hairy: *thorax* with a slight green reflection: *scutel* also with a slight green reflection: *tergum* the same.

Length nearly one-fifth of an inch.

Lonchœa. *Fall.*

L. *polita.* Black; tarsi white.

Inhab. Indiana.

Body shining black, with a very slight tint of blue hardly perceptible: *antennæ* as long as the hypostoma; terminal joint more than three times as long as the two others together, at its base under the seta obscure honey-yellow: *hypostoma* with a slight gray reflection: *wings* hyaline; *nervures* pale brownish: *tarsi* yellowish-white, last joint dusky.

Length more than three-twentieths of an inch.

Additional Observations on the Geology *and* Organic Remains *of New Jersey and Delaware.* *By* S. G. Morton, M. D.

(Read January 19, and July 6, 1830.)

Most of the following fossils have been already generically noticed in the former pages of this volume; but as I have recently had access to better specimens, I propose to give their characters more in detail.

Not long since, my friend Professor Silliman expressed a wish to have a communication on this subject for the "American Journal of Science," edited by him; in consequence of which, I wrote a paper entitled "Synopsis of the Organic Remains of the Ferruginous Sand Formation of the United States; with Geological remarks." This Synopsis has been published in the xvii. and xviii. volumes of the above work, and is there illustrated by accurate figures of most of the species hitherto discovered.

The following paper is designed to embrace such species as are figured in the synopsis, but have not been specifically described; and I am able, through the kindness of Professor Silliman, to illustrate some of these species by copies of one of the plates contained in the Journal of Science. To the latter work, and to my former papers in this volume, the reader is referred for the geological details connected

with this subject. On the present occasion I shall merely observe, that the Calcareous deposits of New Jersey appear to extend, with some intermissions, from Salem, in Gloucester county, to Vincentown, in Burlington county, parallel to the river Delaware, and about eight or ten miles to the east of it. These beds appear to rest upon the Ferruginous sand, or marl; thus having the same relative position as the Chalk and Green sand of Europe.

BELEMNITES.

1. *B. Americanus* (M.) Plate viii. fig. 1, 2, 3.

Amer. Jour. of Science, pl. 1, fig. 1, 2, 3.
Jour. Acad. Nat. Sc., vol. vi. pl. 5, fig. 7.
Mitchill, Amer. ed. of Cuvier's Theory of the Earth, pl. fig.

Description. Sub-cylindrical, with a slight contraction towards the base, which gently expands: base marked by numerous deep, ramose furrows, at first directed obliquely upwards, but becoming longitudinal as they approach the apex, giving the surface a coarsely granulated appearance. In the base is a fissure extending about one-third of the length of the shell, and communicating with a conical chamber; this chamber is sub-central, and marked with concentric circles. On the back is a plane surface, narrow towards the base, and expanding gradually towards the apex, where it becomes indistinct. Colour, clove brown: translucent.

Var. B. Surface finely granulated.

Var. C. Sub-fusiform. Pl. 1, fig. 3.

All the specimens I have seen, consist either of radiated carbonate of lime; of a similar structure replaced by phosphate of iron; or, of the phosphate regularly and beautifully crystallized.

This species is vastly abundant in the marls of New Jersey, and in many places where this formation has been exposed in the more southern states. The specimen from which the present description is drawn is five inches and a half in length, and is the largest and most perfect I have seen. It was obtained by Mr. T. A. Conrad near Arneytown, in New Jersey; at which place they also occur not more than one inch in length.

This species has an analogue in the *B. mucronatus* of Schlottheim, which is characteristic of the Chalk throughout Europe. It seems also to resemble the belemnite of Maestricht, as figured by Faujas; this, however, is considered by Sowerby as a variety of B. mucronatus. On a former occasion, I referred the American species to B. subconicus of Lamarck. (Vide vol. vi. page 91.) The figure there given is imperfect in detail, though the general outline is correct, it being that of an unusually cylindrical specimen. It is possible, that the finely granulated surface of some of these Belemnites (var. B) may be owing to mechanical or chemical agents.

Cabinet of the Acad. Nat. Sc.

2. *B. ambiguus* (M.) Plate viii. fig. 4 and 5.
Amer. Jour. of Science, vol. xviii. pl. 1, fig. 4 and 5.

Description. Strait, elongated, quadrangular, minutely striated longitudinally; front convex; back flat; sides slightly depressed by a longitudinal groove; apex obtuse, obscurely stellated; colour yellowish white, opaque; substance radiated carbonate of lime.

Length two inches; breadth one-sixth of an inch.

The specimens present some variety in the proportions of their sides, but the preceding characters will apply to most of them.

I always suspected this singular fossil for a Belemnite, but was undecided until I met with the "Memoire sur les Belemnites" of M. de Blainville. The *B. cylindricus* of that author is the analogue of the American species; the latter appearing to differ chiefly in the distinctness of its lateral grooves. It is observed of the B. cylindricus, that it has rarely been observed with any trace of either a chamber or terminal extramity. My specimen shows the latter, but not the former; and the numerous individuals in the collections of the Academy are destitute of both.

This fossil was first noticed by me at page 125 of the present volume, as occurring in the Calcareous deposits of Gloucester county, New Jersey. More

recently, it has been found in similar strata near Vincentown, in the same state.

Cabinet of the Academy of Natural Sciences.

I take this opportunity to add a few remarks of M. de Blainville on the geological position of Belemnites, inasmuch as they corroborate the opinion I have heretofore expressed in reference to the relative age of the marls of New Jersey, &c.

"Jusqu 'ici," says he, "leur presence est presque characteristique des terrains secondaires, ou des formations qui se trouvent entre les terrains intermediaires, et les terrains tertiaires superieurs à la Craie. Je ne connais, en effet, presque aucun auteur qui indique les Belemnites veritables dans les differens strates du terrain de transition, non plus que dans les terrains de sediment superieurs à la craie."*

The author then states on the authority of Mr. Underwood, that Belemnites have never been found in the London clay, as some have asserted. Conybeare and Phillips make a similar observation.

The celebrated *plateau* of Maestricht, abounds in Belemnites; and, although Professor Buckland refers it to the *Calcaire grossier*, he stands almost alone in this opinion; and M. Blainville adds, "if such were the fact, we must consider the Belemnites as adventitious; which would be difficult."

That the Belemnites of New Jersey are *in situ*, no one can doubt; and their immense numbers give

* Mem. sur les Belemnites, p. 48.

them a geological importance which should not be overlooked.

AMMONITES.

1. *A. Delawarensis* (M.) Amer. Jour. of Science, vol. xviii. pl. 2, fig. 4.

Description. Volutions uncertain; each volution furnished with elevated, transverse ridges, which bifurcate about half way across, and terminate in prominent tubercles on the margin: ridges, previous to bifurcation, marked by three or four conspicuous nodes; back between the tubercles, slightly convex.

Probable diameter from eight to twelve inches.

Of the preceding species some fragments only have been found, of which I have described and figured the most perfect. The striking differences between this ammonite and any others I have met with, have induced me to give it a specific designation, though so small a part of the cast has been preserved. The figures in the Journal of Science, represent the natural size and proportions.

Found at the Deep Cut of the Chesapeake and Delaware canal, by Mr. A. A. Dexter.

Cabinet of the Amer. Philos. Society.

2. *A. Vanuxemi* (M.) Amer. Jour. of Science, vol. xviii. pl. 3, fig. 3 and 4.

Description. Whorls, depressed, sub-convex, with numerous slightly curved tuberculated ribs;

back marked with a single, prominent, central ridge, on each side of which the terminations of the costa form distinct, angular prominences.

Supposed diameter, three inches; thickness, five-eighths of an inch.

Found at the Chesapeake and Delaware canal. Hitherto fragments only have been obtained, the most perfect of which is figured in the Journal of Science. Larger specimens have been found.

I have much pleasure in dedicating this species to my friend Mr. Lardner Vanuxem.

Cabinet of Acad. of Nat. Sciences.

Cabinet of Amer. Phil. Society.

3. I possess fragments of a third species, but they are too imperfect for description.

Note on the A. placenta (Dekay.) Amer. Jour. of Science, vol. xviii. pl. 2, fig. 1, 2 and 3.
Jour. Acad., vol. vi. pl. 5, fig. 4.
Annals of N. York Lyc., vol. ii. pl. 5, fig. 2.

At page 88 of the present volume, I have referred to *A. placenta* under the name of *A. hippocripes;* an error into which I was led by a mistake of the gentleman who described this fossil. The latter was first noticed by Dr. Dekay, in the second volume of the Annals of the New York Lyceum of Natural History; but, by some unaccountable mistake, the description there given, refers to the wrong figure in the accompanying plate; thus

fig. 2, of pl. 5, is the A. placenta; whereas the text refers to fig. 5, which is in reality the *A. hippocripus*. My drawing and notices, therefore, at pages 88 and 113 of this volume, refer to the *A. placenta*, which I have since had accurately figured in the Journal of Science, as above mentioned.

BACULITES.

Note on the Baculites ovatus (Say). Pl. 5, fig. 5, 6, and pl. 8, fig. 6, 7, 8.

The figures of this fossil, given in a former part of this Journal, being less correct than I designed, I have since had it drawn with great accuracy, as will be seen by reference to the annexed plate.

This species is also found in the Missouri territory, in the valley intervening between the Rocky mountains and the Mississippi river. I am, moreover, convinced that the *B. compressa* of Say, from the same locality, is a distorted individual of the B. ovatus. All the specimens alluded to, are contained in the collections of the Academy.

SCALARIA.

S. annulata (M.) Amer. Jour. of Science, vol. xviii. pl. 3, fig. 6.

Description. Volutions, four or five, convex and prominent; each volution delicately striated laterally; striæ decussated by from twenty to thirty oblique, longitudinal elevated ribs.

Length one inch and a quarter.

This beautiful shell is probably a Linnean *Turbo*, and answers so well to the genus *Scalaria* of Lamarck, that I have ventured to associate them, although I have not in any instance seen the mouth entire.

Not unfrequent in the Calcareous strata of Gloucester county, New Jersey, where it is associated with Echini, Belemnites, &c. &c.

Cabinet Acad. Nat. Sciences.

VERMETUS. *Sowerby.*

V. rotula (M.) Vol. vi. pages 121, 122.
Amer. Jour. of Science, vol. xviii. pl. 3, fig. 18.

This fossil is described in the present volume at the place above quoted: I there referred it, with a question, to *Spirorbis*. Since that time I have read Mr. Sowerby's* revised exposition of the genus *Vermetus*, and do not hesitate to refer the American specimens to it. The latter indeed bear a striking resemblance to those figured by Mr. Sowerby, pl. 596, fig. 4 and 5.

Frequent in the Calcareous beds of New Jersey.

GRYPHÆA.

Note on the Gryphæa vomer (M.) Pl. 8, fig. 11, 12.
Amer. Jour. of Science, vol. xviii. pl. 3, fig. 1, 2.

* Min. Conch., vol. vi. p. 193, &c.

I first described the *Gryphæa vomer* at page 83 of the present volume; but the figures there referred to (pl. 5, fig. 1, 2, 3,) are varieties of *G. convexa*, which were inserted inadvertently. I take this occasion to correct the error, by re-writing the description, and giving an accurate figure of the shell.

Description. *Shell* irregularly oblong; *upper valve* thin, fragile, slightly concave, with from seven to ten distinct squamous plates: *lower valve* convex, indistinctly lobed, lobed margin obliquely produced: *beak* prominent, pointed, crossing the hinge margin transversely, and re-curved at the side.

It is but very recently that I have obtained entire specimens of this fossil: the Marl pits of New Egypt now afford them in considerable numbers.

The *G. vomer* varies in size from an inch to an inch and a half in length; the larger specimens are much elongated, but the species may be readily detected by the squamæ of the upper valve. The beak is often as much curved as that of the *Exogyra*, and its general outline is very similar to *Exogyra undata* of Sowerby (tab. 605, fig. 7), but the American shell has the simple hinge of *gryphæa* and *ostrea*.

Some specimens are very long, in proportion to their width, and present a great convexity of the back, and consequent depression of the upper valve, rendering them longitudinally curvate. Almost every individual I have seen, has been attached by its beak; from which cause they are generally imperfect in this part.

CUCULLÆA.

C. vulgaris (M.) Amer. Jour. of Science, vol. xviii. pl. 3, fig. 21.

Description. Ventricose, triangular, flattened before; *beak* prominent and incurved; *shell* thick, with numerous delicate, longitudinal striæ.

Length an inch and a quarter: breadth an inch and three-fourths.

Cordiform casts of this shell, have been long familiar to those who collect marl fossils: it is mentioned, under the genus *Arca*, at pages 92 and 93 of this volume. Recently, Mr. William Riley has obtained a number of valves more or less perfect, some of which show the auricular appendage characteristic of *Cucullæa.*

Cabinet Acad. Nat. Sciences.

SPATANGUS. *Lam.*

1. *S. cor marinum?* (Parkinson). Jour. Acad., vol. vi. p. 122.
   Parkinson, Organic Remains, vol. iii. pl. 3, fig. 11.
   Amer. Jour. of Science, vol. xviiii. pl. 3, fig. 10.

This characteristic fossil of the White Chalk of Europe, is familiar to geologists. If the American species is not identical with it, it is at least a striking analogue.

From the Calcareous beds of Gloucester county, New Jersey.

2. *S. stella* (M.) Amer. Jour. of Science, vol. xviii. pl. 3, fig. 11.

Description. Globose, with five short sulci; diameter half an inch.

Found with the preceding species, from which it differs in size, and in not having the posterior sulcus continued to the base.

ANACHYTES. *Lam.*

1. *A. cinctus* (M.) Amer. Jour. of Science, vol. xviii. pl. 3, fig. 7.

Description. Heart shaped, with five pairs of dotted ambulacra; the posterior pair being in a deep sulcus extending to the base.

Length about one inch.

Found with the preceding species.

At page 122 of this volume, I have alluded to this fossil by the name of *Spatangus*, to which it does not strictly belong.

2. *A. fimbricatus* (M.) Amer. Jour. of Science, vol. xviii. pl. 3, fig. 9.

Description. Heart shaped, with five pair of dotted ambulacra; one pair being in a posterior sulcus extending from the vertex to the mouth; passing between the two latter points, are also eight or ten double lines on each side; the lines of each pair approximate, and are nearly parallel.

The double lines on this fossil appear single, unless closely examined, and divide the dorsum into about twenty triangular sections.

Length an inch and a half: breadth an inch and a quarter.

Found with the preceding species, by Mr. Titian R. Peale.

3. *A. cruciferus* (M.) Amer. Jour. of Science, vol. xviii. pl. 3, fig. 8.

Description. Oval, with five pair of ambulacra, running from the apex to the mouth; each ambulacrum formed by two double lines, an eighth of an inch apart, parallel, and connected by delicate transverse striæ: apex sub-central.

Length three-fourths of an inch.

Found with the preceding species, by Mr. T. R. Peale.

ANTHOPHYLLUM.

A. atlanticum (M.) Plate 8, fig. 9, 10.
Amer. Jour. of Science, vol. xviii. pl. 1, fig. 9, 10.

At pages 123 and 124 of the present volume, I gave a description of this interesting fossil, and have nothing now to add but the specific name, and an accurate figure.

Corrected catalogue of the Fossil Shells, Echinodermata and Zoophytes, hitherto found in the Marls of New Jersey and Delaware:—

Ammonites placenta. *Dekay.*
Ammonites hippocrepis. *Dekay.*
Ammonites delawarensis. *M.*
Ammonites Vanuxemi. *M.*
Ammonites. (*Indeterminate.*)
Anthophyllum atlanticum. *M.*
Anomia epphippium? *Lam.*
Ananchytes cinctus. *M.*
Ananchytes fimbricatus. *M.*
Ananchytes cruciferus. *M.*
Avicula. (*Casts.*)
Alcyonium.
Alveolites glomeratus? *Say.*
Belemnites americanus. *M.*
Belemnites ambiguus. *M.*
Baculites ovatus. *Say.*
Bulla? (*Casts.*)
Cyprea. *Lin.* (*Casts.*)
Cucullæa vulgaris. *M.*
Clypeaster. *Lam.*
Cardium. (*Casts of two species.*)
Caryophyllia. *Lam.*
Dentalium. (*Casts.*)
Exogyra costata. *Say.*
Eschara. *Lam.*

Echinus. *Lam.*
Flustra. *Lam.*
Gryphæa convexa. *M.*
Gryphæa mutabilis. *M.*
Gryphæa vomer. *M.*
Mya. (*Casts.*)
Natica. (*Casts.*)
Ostrea falcata. *M.*
Ostrea cristagalli? *Lam.*
Ostrea. (*Two or three indeterminate species.*)
Pectunculus. (*Casts.*)
Pecten quinquecostatus. *Sowerby.*
Pecten. (*Two or three indeterminate species.*)
Plagiostoma. (*Indeterminate.*)
Pinna. (*Casts.*)
Retepora.
Rostellaria. (*Casts.*)
Serpula.
Scaphites Cuvieri. *M.*
Scalaria annulata. *M.*
Spatangus cor marinum? *Parkinson.*
Spatangus stella. *M.*
Terebratula Harlani. *M.*
Terebratula fragilis. *M.*
Terebratula Sayi. *M.*
Turritella. (*Casts.*)
Tellina?
Trochus. (*Casts.*)
Trigonia?

Teredo.

Vermetus rotula. *M.*

Besides the preceding genera, fragments of many others have been observed, but too imperfect to decide upon.

EXPLANATION OF PLATE VIII.

Fig. 1, Belemnites Americanus, natural size.

2. Transverse section of same fossil.

3. Same species, subfusiform.

4. Belemnites ambiguus, one-third larger than natural.

5. Transverse section of same species, natural size.

6, 7, 8. Baculites ovatus.

9, 10. Anthophyllum atlanticum.

11, 12. Gryphæa vomer.

On the Geology *and* Organic Remains *of a part of the Peninsula of Maryland. By* Timothy A. Conrad.

[Read May 20, and June 15, 1830.]

At the request of several members of the Academy, I lately visited the peninsula of Maryland, for the purpose of collecting organic remains, and observing the geological characters of that district. The beauty and variety of fossil shells which abound there, as well as their importance in geology, would long since, it might be supposed, have enlisted many active inquirers; but such has not been the fact. Mr. Maclure included it, with a vast tract which has also no claim to the title, under the term Alluvial; and but little notice appears to have been taken of the peninsula of Maryland, until Mr. Say described about forty species of fossil shells, brought from thence by Mr. Finch. Neither of these gentlemen, however, drew any geological inferences from the organic remains they examined: but Dr. Van Rensellaer has since referred the deposits in question to the Upper Marine formation, as described by Conybeare and Phillips. Dr. S. G. Morton, in a former number of this Journal, supports the same opinion; and indicates several species of fossil shells which are common to both sides of the Atlantic: a list of these species will be given, including a few others which have since been ascertained.

The Tertiary deposits of Maryland occupy all the tract south of an irregular line running from the vicinity of Baltimore to the city of Washington; the Potomac river forms the western, and the Chesapeake bay the eastern boundary of this triangular peninsula. Its greatest length from the northern boundary of the Tertiary, is about ninety miles; the whole is covered by a diluvial deposit of sand and gravel, which generally conceals the strata of organic remains, except in the beds of streams, or the sides of ravines, which are often very deep; in some few places, the fossils appear near the surface, as at Fort Washington, in the vicinity of which perhaps the oldest of the beds to be noticed in this paper occur.

About three miles north of the low sandy point which forms the southern extremity of the peninsula, the bank of the Potomac rises to an elevation of about fifteen feet at its highest point: the fossils are visible in this bank to the extent of a quarter of a mile. The inferior stratum is a lead coloured clay, containing vast numbers of the *Mactra lateralis* of Say; which, in many instances, appear in nearly vertical veins, as though they had fallen into fissures. The *Pholas costata* is also numerous, and each individual remains in the position in which the living shell is usually buried in the sand or mud; that is, vertical, with the posterior or short side pointing downwards; they are so fragile, that they can rarely be taken entire from the matrix. Upon this stratum of clay, in a matrix of sand, lies a bed of the *Ostrea Vir-*

ginica, in some places a foot in thickness. It is nearly horizontal; in some places at least eight or ten, and in others not more than four feet above high water mark. The diluvial above exhibits a vein of small pebbles, traversing it horizontally, and at a distance resembles a stratum of shells. Not only are the fossils of this locality the same as existing species, but in some instances they retain their colour; a circumstance common to the later deposits of Europe. The distance to the nearest point on the Atlantic ocean is about forty-five miles, but it is at least one hundred by the course of the bay. The following list includes all the fossils of this locality.

N. B. Those species which are found recent on our coast are printed in *italics*, and those to which a C. is appended, I have described as new.

UNIVALVES.

Acteon melanoides. C.
Crepidula convexa. Say.
——— *glauca.* Say.
Fusus cinereus. Say.
Nassa obsoleta. Say.
——— *trivittata.* Say.
Natica duplicata. Say.
——— interna. Say.
Ranella caudata. Say.
Scalaria.

BIVALVES.

Arca transversa. Say.
——— *ponderosa.* Say.
Corbula contracta. Say.

*Clathrodon cuneata.** Gray.
Cytherea convexa. Say.
Mactra lateralis. Say.
Mya mercenaria. Say.
Mytilus hamatus. Say.
Nucula lævis. Say.
——— concentrica. Say.
Pandora trilineata. Say.
Petricola pholadiformis.† Lam.
Pholas costata. Lam.
Psammobia fusca. Say.
——— *lusoria.* Say.
Solen carribeus. Lin.
——— *ensis.* Lin.
Venus mercenaria. Lam.
Venus.

It will be observed, that nearly all the above shells are known to inhabit the shores of the United States at the present time; the few of them which are now only known in the fossil state are extremely rare, or of minute dimensions, and have, probably, from these causes, escaped the scrutiny of those of our conchologists who have given their attention exclusively to recent species.

Some of the above existing species, however, are at present inhabitants of much more southern latitudes than their fossil locality. Thus the *Mytilus hamatus, Clathrodon cuneata, Arca ponderosa,* &c., are rarely found beyond Florida and the Gulf of

* I believe this shell to be the Cyrena truncata of Lam.
† P. fornicata, Say.

Mexico. The recent *Mya mercenaria* abounds in the Potomac river, and in the Chesapeake bay and its inlets; but its usual associate, the *Venus mercenaria*, does not exist in the Potomac or its tributaries.

It is obvious that this deposit of marine organic remains, is the most recent hitherto discovered in this country. To what class of formations it strictly belongs, is a question I leave for others to answer; inasmuch as its characters are perhaps too recent even for the *Upper Marine* deposits of the European geologists. Its relics are sub-fossilized, and in this respect resemble some of the most recent formations of the West India islands.

At the distance of fifteen miles north of the above mentioned locality, and in the precipitous banks of St. Mary's river, organic remains of a very different character abound: they occur on both sides of the river (which is one mile broad), but they are most numerous on the western shore, extending with some interruption nearly a mile. Like the Upper Marine in England, this locality contains many extinct species; it also furnishes a large number of genera, with few species of each, while the individuals are in great abundance; indeed they are scattered along the shore in such profusion, and at the same time are so perfect, that they might easily be mistaken by an unpractised observer for recent shells; especially where the waves cast them up on a low sandy point, at a distance from the bluffs where the deposits occur *in situ*. But, although the water of St. Mary's river

is brackish, the existing species are few, and, except the *Ostrea virginica*, probably none of them found here in a fossil state. The bank is precipitous in many places, and is elevated perhaps thirty feet at the highest point above tide water; a stratum of shells is here observed fifteen feet above the river, and the vein of pebbles traverses the overlying diluvial, as at the first mentioned locality. Silicious masses, with imbedded shells, are numerous, and are used for the foundations of buildings. The inferior stratum of these banks is clay, which appears to contain the same species of shells with the sand above it.

The *Voluta Lamberti* of Sowerby, is not a rare species at this locality, which, in its geological features, much resembles that part of Suffolk where the same shell occurs, described in Sowerby's Mineral Conchology, vol. ii. p.67. The Crag is there described as resting upon blue clay, and the organic remains of the former mix with those of latter. The same fact is also observed in most of the tertiary deposits of Maryland; the matrix of the shells in Suffolk is in some places very loose, and in others so indurated as to be used in building, and answers in every particular to the beds at St. Mary's river.

I obtained at this place the following organic remains:—

UNIVALVES.

Actèon ovoides. C.
Bulla acuminata. Sow.
Calyptræa grandis. Say.

Calyptræa costata. Say.
Cassis cœlata. C.
Cancellaria lunata. C.
Conus diluvianus. Green.
Dentalium attenuatum. Say.
Fasciolaria Lamberti.*
Fusus cinereus. Say.
Fusus quadricostatus. Say.
——— errans. C.
Murex acuticosta. C.
Nassa trivittata. Say.
——— *obsoleta.* Say.
——— *lunata.* Say.
——— quadrata. C.
Natica duplicata. Say.
——— *heros.* Say.
Pleurotoma catenata. C.
——————— limatula. C.
——————— communis. C.
——————— parva. C.
——————— rotifera. C.
——————— gracilis. C.
——————— dissimilis. C.
Pyrula carica. Lam.
——— *canaliculata.* Lam.
Scalaria clathrus.
Terebra simplex. C.
Trochus humilis. C.
——————— reclusus. C.
Turritella plebeia. Say.
——————— variabilis. C.

* Voluta Lamberti, Sowerby.

Turritella laqueata. C.
Voluta solitaria. C.

BIVALVES.

Amphidesma carinata. C.
Astarte undulata. Say.
Arca arata. Say.
Cardium.
Corbula inequale. Say.
——— cuneata. Say.
Cytherea concentrica. Lam.
——— convexa.
Isocardia rustica.*
Lucina cribraria. Say.
Mactra ponderosa. C.
Mactra.
Ostrea virginica. Lam.
Pecten Madisonius. Say.
Pholas costata. Lam.
Saxicava distorta. Say.
Solen ensis. Lin.
Venericardia granulata. Say.
Venus mercenaria. Lam.
——— *paphia?*

Near Charlotte Hall, about thirty miles north of St. Mary's river, a vast deposit of the *Perna maxilla*, of Lam., lies at the base of a ravine, at least thirty feet below the surface of the diluvial; the matrix is sand. In the bed of a rivulet, I found many specimens of the *Pecten Madisonius;* and I was informed that a large bed of oyster shells (probably

* Venus rustica, Sowerby; Isocardia fraterna, Say.

the *O. compressirostra* of Say) also occurred in this vicinity, but I did not see it. Charlotte Hall is in the north of St. Mary's county, at about an equal distance between the Potomac and Patuxent rivers. I found at this place the following shells:

Patella.
Isocardia rustica.
Venus mercenaria. Lam.
Pecten Madisonius. Say.
Perna maxilla. Lam. (P. torta, Say.)

Owing to the rains which fell during my stay at Charlotte Hall, I was unable to make the necessary researches and observations; otherwise, no doubt, the list of fossils would have been greatly extended.

Twenty miles north of Charlotte Hall, at the village of Piscataway, the organic remains appear as a superficial deposit. This village is situated in Prince George's county, five miles east of Fort Washington on the Potomac. In the side of a ravine, traversed by a small stream, a bed of the *Turritella Mortoni* (nobis) occurs, accompanied by the *Venericardia planicosta** of Lamarck; both are quite numerous; the matrix is a mixture of sand and clay, but the latter predominates.

Shells are also imbedded in a silicious vein, which traverses the bank of Piscataway creek, about six feet above the level of the water; indurated masses, containing casts of shells with merely a trace of the

* Lamarck, Ann. du Mus. Sowerby, Min. Conch., vol. i. pl. 50.

shell remaining, are very commonly met with in the neighbourhood.

The shells I obtained here, are comprised in the following list:

Monodonta glandula. C.
Natica.
Turritella Mortoni. C.
Nucula.
Venus mercenaria.
Venericardia planicosta. Lam.
Crassatella alæformis. C.

The indurated matrix of various indeterminate shells may be observed here, and on the road leading from the above mentioned village to Fort Washington. The fort is situated immediately on the Potomac, at an elevation, perhaps, of one hundred feet above tide water: nearly on the summit of this bank, abundant fragments of the *Ostrea compressirostra* (Say), a species here very numerous, indicate perhaps the greatest elevation at which the fossils of this formation are found. West of the fort is a deep valley, through which runs a small brook, nearly parallel with the course of the Potomac; in the bed of which, some distance north of the fort, numerous casts of a species of Turritella are imbedded in a very hard silicious matrix. Indurated casts of the *Cucullæa gigantea* (nobis), upon which the shell remains, are observed in the side of a ravine running nearly at right angles with the brook, and terminating on the summit of the hill near the fort; these casts are

associated with very entire and numerous individuals of the *Ostrea compressirostra*, and are imbedded in loose sand. I could find no trace of fossil shells in the precipitous bank of the river, and I was unable to ascertain the depth of the deposit; this bank exhibits a thick bed of clay, containing abundance of selenite, and, on the authority of Dr. Jackson of Fort Washington, is sometimes coated by an efflorescence of alum. I also found in it a fragment of a bone of some marine animal. Below the clay is a friable ferruginous sandstone, appearing in loose blocks, but very limited in extent; the clay, south of this sandstone deposit, extends at least to the level of the river.

It seems to me probable, that a formation contemporaneous with the *London clay* also exists in Maryland, and I would suggest that the deposit (in the vicinity of Fort Washington) just mentioned, is an indication of it. It has been observed that the organic remains of this locality are considerably different from those of other parts of the peninsula. I met with the *Turritella Mortoni* and *Cucullæa gigantea* in no other place. The *Venericardia planicosta* is abundant, though generally friable and difficult to preserve entire; I however obtained a pair of fitting valves, in a perfect state, about four and a half inches in diameter, and answering, I conceive, in every particular to the descriptions and figures of this fossil as given by Lamarck, in the "Annales du Museum," and by Sowerby, in his "Mineral Conchology."

This large and beautiful species is characteristic of the equivalents of the London Clay, in its various deposits from England to Piedmont. Its discovery in our own country is, therefore, an interesting occurrence in geology.

For the present we may safely note the following species as common to the United States and Europe:

1. Pectunculus subovatus. Say.
   Syn. P. variabilis. Sowerby.
2. *Lucina divaricata.** Lam.
3. Isocardia rustica.
   Syn. I. fraterna. Say.
   Venus rustica. Sowerby.
4. *Cytherea concentrica.* Lam.
   Syn. Venus lentiformis. Sowerby.
5. *Solen ensis.* Lin.
6. Venericardia planicosta. Lam.
7. *Ostrea virginica.*† Lin.
8. Bulla acuminata. Sowerby.
9. *Fissurella græca.* Lam.
10. Fasciolaria Lamberti. Voluta Lamberti. Sowerby.

* This interesting shell is at present found recent in the West Indies, in the United States, and on the coast of Europe: it is found fossil in England, France, and Maryland. These facts show how extensive may be the distribution, and how long the duration, of a single species.

† Brongniart observes, that this oyster is found at Nissan, between Narbonne and Beziers, in France.

Whoever will compare the Maryland fossil shells with those from New Jersey and Delaware, will be struck with the fact, that not a solitary species is common to both formations; that not one of the Maryland genera is extinct; and that many of the species are still inhabitants of our coast. These facts, so at variance with those which characterize the Marl district, thoroughly corroborate the opinion of Dr. Morton that the latter is of Secondary origin.

Geological researches into the fossil deposits of Maryland have but recently commenced; they already present us with about one hundred species of shells; a number which will no doubt be greatly augmented by future inquirers. It is my intention to furnish a few supplementary observations on a future occasion, and I will then give a complete catalogue of the fossils of Maryland.

APPENDIX:

Containing descriptions of twenty-nine new species of FOSSIL SHELLS, *noticed in the preceding paper. By the same.*

[Read June 22, 1830.]

GENUS MUREX. *Lin. Lam.*

Murex acuticosta. Plate ix. fig. 1.

Shell with four or five acute foliated varices ending above in a pointed, compressed spire, alternating

with four shorter rounded varices ending above in a tube; aperture oval and entire; margin reflected; beak closed, and slightly recurved.

This shell is allied to the *M. tubifer* of Lam., but it has no tubes, nor spires, except those which crown the summit of the whorls. I found but one perfect specimen of this species.

Cabinet of the Academy.

Genus VOLUTA. *Lin. Lam.*

Voluta solitaria. Plate ix. fig. 7.

Shell ovate oblong, smooth; spire with the whorls concave above, and straight at the sides, having the angles tuberculated; aperture dilated at the base; columella four plaited.

The large whorl is obsoletely striated at the base, and the plaits on the columella are oblique and subequal. I obtained but a single specimen.

Cabinet of the Academy.

Genus CASSIS. *Lam.*

Cassis cælata. Plate ix. fig. 14.

Shell with transverse tuberculated ribs, and intervening striæ; whorls of the spire longitudinally ribbed; right lip toothed within; columella granulated and wrinkled.

The transverse striæ of the grooves between the ribs are very distinct, and between each of the tubercles

a longitudinal raised line crosses the grooves, giving the shell somewhat of a cancellated appearance.

Cabinet of the Academy.

Genus TROCHUS. *Lin. Lam.*

1. *Trochus humilis.* Plate ix. fig. 5.

Shell depressed, with very fine transverse striæ; sides straight: whorls with a very slight obtuse elevation revolving immediately above the suture; apex acute; aperture rhomboidal; umbilicated.

The specimen from which the above description was taken, exhibits part of its original markings; a band of light coloured minute spots revolves near the suture on the large whorl; and another band of similar, but larger spots revolves near the middle of the same volution; the striæ are very strong on the base, particularly near the umbilical margin. It is a very rare species.

Cabinet of the Academy.

2. *Trochus reclusus.* Plate ix. fig. 6.

Shell much depressed; transversely striated; whorls flattened on the summit, with straight sides; aperture transversely ovate; umbilicus profound, carinated and slightly funnel-shaped.

The carina within the umbilicus is visible on the two last whorls: both species have lost part of their outer coating, and are pearly and irridescent. But a single individual was found with the preceding species.

Cabinet of the Academy.

Genus MONODONTA. *Lam.*

Monodonta glandula. Plate ix. fig. 15.

Shell conical, with about four convex volutions; revolving striæ fine, crowded and wrinkled; suture deeply impressed; right lip toothed within at the base; margin entire.

The teeth or tubercles extend to the base of the columella of this shell. I obtained but one specimen.

Cabinet of the Academy.

Genus PYRULA. *Lam.*

Pyrula sulcosa. Plate ix. fig. 8.

Shell pyriform; ventricose; transversely ribbed, and longitudinally sulcated; summit of the whorls flattened, and subcanaliculate; right lip striated within; channel much contracted; beak straight or slightly recurved at the base.

This is a remarkable and beautiful species, for which I am indebted to Dr. Morton.

Pyrula canaliculata. Lam. A variety of this shell is found at St. Mary's river, which is coronated with elevated tubercles; it has also very fine transverse striæ, elegantly decussated by the lines of growth. It is accompanied by numbers of the variety of *P. carica* indicated by Say, in a former number of this Journal.

Cabinet of the Academy.

Genus TURRITELLA. *Lam.*

1. *Turritella Mortoni.* Plate x. fig. 2.

Shell turreted, conical, thick, with revolving distant, and finer intervening striæ; whorls with an elevated acute carina near the base of each; volutions about eleven; the striæ are largest on the elevations of the whorls, which are slightly concave above, and abruptly terminate at the sutures; the lines of growth on the last whorl are strong and much undulated.

I dedicate this species to my friend Dr. S. G. Morton, who has so ably illustrated the geology of this country connected with its organic remains.

Cabinet of the Academy.

2. *Turritella variabilis.* Plate x. fig. 3.

Shell subulate, turreted, tapering to an acute apex; whorls flattened in the middle, with from two to five smooth ribs on each, and transversely striated; suture impressed.

The ribs are generally three in number, but a variety occurs with two only, or the intermediate one becomes obsolete. The largest specimens, which much exceed the figure in size, sometimes have five ribs on each whorl.

Cabinet of the Academy.

3. *Turritella laqueata.* Plate ix. fig. 17.

Shell turreted, smooth, polished, longitudinally ribbed; whorls slightly convex; suture impres-

sed; aperture ovate. One-fifth of an inch in length.

It has some resemblance to the *Turbo similimus* of Montagu, but the ribs are more numerous, and it is also a larger species.

Cabinet of the Academy.

Genus CANCELLARIA. *Lam.*

Cancellaria lunata. Plate ix. fig. 4.

Shell turreted, with longitudinal oblique ribs; transversely sulcated; whorls of the spire narrowed at the base and flattened on the summit; apex acute; right lip regularly toothed within; columella with three plaits, the upper one large and distant, and the last plait uniting with the base of the columella; aperture lunate.

I found but a single individual of this species at St. Mary's river.

Cabinet of the Academy, and Dr. Morton's collection.

Genus NATICA. *Lam.*

Natica fragilis. Plate ix. fig. 3.

Shell ovate, thin, fragile, smooth, with fine revolving impressed striæ; spire very small; apex acute; aperture extending about four-fifths of the length of the shell; columella much narrowed and arcuated, exhibiting the internal volutions.

Dr. Morton's collection.

Genus FUSUS. *Lam.*

Fusus errans. Plate ix. fig. 2.

Shell subfusiform, transversely striated, with short longitudinal ribs or undulations on the large whorl; spire conical, costated; upper part of the whorls concave and plain; right lip toothed within, and plicated on the margin; beak recurved.

The striæ in general are alternately larger and smaller. This is a numerous species, and has a general resemblance to some varieties of the *F. cinereus* of Say, but it is very distinct.

Cabinet of the Academy.

Fusus cinereus. Say. The variety of this shell mentioned by Say, in a former number of the Journal, is found at St. Mary's river four and a half inches in length. I have no doubt that it is identical with the *F. cinereus,* notwithstanding its size and the produced beak.

Genus PLEUROTOMA. *Lam.*

1. *Pleurotoma catenata.* Plate ix. fig. 13.

Shell subfusiform; with two approximate chain-like or nodose carinæ on each whorl; the large whorl with strong revolving and intervening finer striæ; spire elevated, conical; whorls concave on the upper part; beak slightly recurved.

The carinæ upon the whorls of the spire are placed nearest the base: the old shells of this species become quite thick, and have the right lip much

arcuated; the spire occupies about half the length of the shell.

Cabinet of the Academy.

2. *Pleurotoma limatula.* Plate ix. fig. 12.

Shell subfusiform, glabrous, with short oblique longitudinal ribs; whorls concave above and plain; left lip reflected over the columella with a callus at its superior termination.

Cabinet of the Academy.

3. *Pleurotoma communis.* Plate ix. fig. 23.

Shell subfusiform, smooth, with one obtuse carina revolving in the middle of each whorl, except the last, which has three; the lowest one obsolete; beak attenuated and slightly recurved.

This is a numerous species of the locality at St. Mary's river.

Cabinet of the Academy.

4. *Pleurotoma rotifera.* Plate ix. fig. 9.

Shell subfusiform; spire with an elevated crenulated carina on each whorl; two approximate carinæ near the middle of the large volution; sinus profound.

I obtained but one specimen, which was at the same locality as the preceding.

Cabinet of the Academy.

5. *Pleurotoma dissimilis.* Plate ix. fig. 11.

Shell conical, smooth; spire with obsolete oblique

nodules joining the suture at the base of each volution; suture impressed; left lip with a callus at its superior termination; columella truncated; a slight sinus at the base of the right lip.

Cabinet of the Academy.

6. *Pleurotoma gracilis.* Plate ix. fig. 10.

Shell subfusiform; spire and beak attenuated; whorls with two revolving rows of tubercles on each, divided by a striated sulcus; whorls strongly striated at the base; suture undulated; large whorl with strong distant revolving and intervening finer striæ.

A variety occurs with only one row of tubercles on each whorl, and an impressed line beneath.

Dr. Morton's collection.

7. *Pleurotoma parva.* Plate ix. fig. 18.

Shell subfusiform, transversely striated, with oblique longitudinal ribs; upper part of the whorls concave and plain.

This small but elegant species is quite numerous at St. Mary's river.

Cabinet of the Academy.

Genus MARGINELLA. *Lam.*

Marginella denticulata. Plate ix. fig. 21.

Shell smooth, polished, spire conical; columella four plaited, the three lower plaits oblique; right lip

denticulate within; aperture rather more than half the length of the shell.

Cabinet of the Academy.

Genus NASSA. *Lam.*

Nassa quadrata. Plate ix. fig. 16.

Shell turreted; spire with the whorls rather square, and slightly projecting at the angles; left lip reflected over the columella, and thickened above.

This appears to be a distinct species, but all the specimens I have seen are imperfect: in some, there are traces of tubercles on the angles of the whorls, and the young shells have the whorls less angular.

Cabinet of the Academy, and Dr. Morton's collection.

Genus TEREBRA. *Lam.*

Terebra simplex. Plate ix. fig. 22.

Shell elongate conical, smooth, with plain undivided whorls; sides straight; the lines of growth are very distinct, and the large whorl slopes abruptly towards the base; the aperture is rather large.

This species is quite numerous.

Cabinet of the Academy.

Genus ACTEON. *Mont.*

1. *Acteon melanoides.* Plate ix. fig. 19.

Shell conical, with about six volutions, strongly striated transversely; the striæ are three or four in

number on the upper whorls, and the last has about eight; the aperture is ovate, with the fold in the centre.

Cabinet of the Academy.

2. *Acteon ovoides.* Plate ix. fig. 24.

Shell ovate, smooth, polished, transversely striated; spire short and conical; aperture more than half the length of the shell; suture deeply impressed. The striæ are about twenty in number on the large whorl, and are impressed; the aperture is long and moderately wide, and the fold large.

Cabinet of the Academy.

Genus CUCULÆA. *Lam.*

Cuculæa gigantea. Plate x. fig. 4.

Shell subtriangular, obliquely cordate; very ventricose, with numerous longitudinal sulci; anterior side flattened, produced and subcuneiform; posterior side very short; umbones gibbous; beaks distant, and much incurved.

Three and three quarter inches in length; and five and a quarter inches in breadth.

This large Cuculæa is very abundant in the neighbourhood of Fort Washington, where it may be observed nearly entire; but as the cast is extremely hard, and the shell chalky, it is seldom extracted from the matrix with even a small portion of the shell attached.

Cabinet of the Academy.

Genus MACTRA. *Lin. Lam.*

Mactra ponderosa. Plate x. fig. 5.

Shell subtriangular, convex, thick, concentrically undulated; anterior margin depressed, with an obtuse plication at the angle; beaks nearest the posterior margin.

Three and a quarter inches in length, and four and a quarter inches in breadth. The cardinal pit is large, thick, and subcordate, and the lateral teeth are short and very robust; when the valves are closed, the depression on the anterior slope forms a slightly concave area.

This shell never equals in size the *M. solidissima* of Dillwyn, but it is generally thicker and heavier: it is numerous at St. Mary's river; and imperfect specimens were long since obtained by Mr. Finch. This is the same fossil which Dr. Morton supposed to be the *M. grandis* (*M. solidissima*) of our coast. *Vide* p. 118.

Genus CRASSATELLA. *Lam.*

Crassatella alæformis. Plate x. fig. 1.

Shell transversely ovate oblong; anterior side rostrated; posterior side short and rounded; umbones transversely sulcated; margin slightly crenulated within.

I found but a single valve of this species, which is very distinct from Say's *C. undulata.*

Cabinet of the Academy.

Genus VENERICARDIA. *Lam.*

Venericardia Blandingi. Plate ix. fig. 20.

Shell suborbicular; ribs about twenty, rather square, with a rough tuberculated carina on the back of each; anterior margin slightly truncated.

This shell is very like Sowerby's V. carinata, but it is smaller, and the carinæ are not smooth: it has been imbedded in a hard silicious matrix, and the carinæ are worn, except near the margin, where they are very distinct.

I am indebted to Dr. Morton for this fossil; it was sent to him by Dr. Blanding, of Camden, S. C., who found it at Vance's Ferry in that state, where other shells occur characteristic of the Maryland Upper Marine formation.

Cabinet of the Academy.

Genus AMPHIDESMA. *Lam.*

Amphidesma carinata. Plate ix. fig. 23.

Shell transversely ovate, with concentric, rather distant, elevated, acute striæ; intervals transversely striated; anterior side with a slight fold; beaks rather prominent, with the apex acute; lateral teeth none.

Cabinet of the Academy.

EXPLANATION OF THE PLATES.

PLATE IX. Fig. 1. Murex acuticosta.
2. Fusus rusticus.*
3. Natica fragilis.
4. Cancellaria lunata.
5. Trochus humilis.
6. ——— reclusus.
7. Voluta solitaria.
8. Pyrula sulcosa.
9. Pleurotoma rotifera.
10. ——— gracilis.
11. ——— dissimilis.
12. ——— limatula.
13. ——— catenata.
14. Cassis cælata.
15. Monodonta glandula.
16. Nassa quadrata.
17. Turritella laqueata.
18. Pleurotoma parva.
19. Acteon melanoides.
20. Venericardia Blandingi.
21. Marginella denticulata.
22. Terebra simplex.
23. Pleurotoma communis.
24. Acteon ovoides.
25. Amphidesma carinata.

PLATE X. Fig. 1. Crassatella alæformis.
2. Turritella Mortoni.
3. ——— variabilis.
4. Cuculæa gigantea.
5. Mactra ponderosa.

* The specific name *errans* being preoccupied, I have adopted that of *rusticus*.

Note.—I regret to be obliged to state, that fig. 3, on plate x., is not a correct copy of my drawing; there should be no such irregularity in the ribs, nor distortion of the whorls, as in the figure. Figures 17, 18, and 19, are perhaps too small for the crayon; they can only serve to show the natural sizes and outlines of the shells. In fig. 24, the fold on the columella is far too indistinct.

Description of two new Species of the Linnæan Genus Lacerta. *By* T. R. Peale, and J. Green, M. D.

Agama torquata.—Cauda longiuscula: corpore supra cinereo fusco: Collo pene torquato: Cauda et membris fasciatis: squamis dorsalibus quadratis; carinatis et spinosis: abdominalibus lævibus: femoribus tuberculosum serie; subtus pallescente: palmis et plantis pentedactylis.

Length about six inches: tail rather longer than the body, tapering and rounded: *back* light purple inclining to dusky, darker on the upper part of the *head*, legs, and tail: *legs* and *tail* obscurely banded with white: *throat* light purple speckled with white, a narrow line of crowded white spots along the inferior edge of the lower jaw; *beneath* a broad whitish band from the throat to the vent, contracted in the middle: *tail beneath*, and *under* side of the legs whitish: on the neck there is a black collar distinctly margined with white, passing obliquely from the anterior portion of the shoulder to the spine: *thighs* furnished with a series of pores: scales of the back rhomboidal, carinate, and terminating in a point; scales beneath, quadrangular, minute, and smooth; scales on the tail arranged in rings, and the striæ produced by their acute carinæ give it a hexagonal appearance: *toes* long, slender, banded, and furnished with curved claws.

This fine Agama was brought from Mexico by Pro-

fessor W. H. Keating. It resembles in many particulars the *A. undulata*, so common in all our Southern and Middle States. The beautiful collar on the back of the neck sufficiently distinguishes it. The animal is also proportionably shorter, and the spines of the scales more acute, especially those on the tail. In the angulated appearance of the tail, occasioned by the longitudinal carinæ, it approaches the *A. angulata* of Gwinn, which also resembles our *A. undulata*. These three species, together with *A. umbra*, all perhaps natives of North America, form an exceedingly natural group.*

The *A. torquata* is exceedingly abundant at Temascaltepec, about eighty miles S. W. of the city of Mexico. Professor Keating informs us that they infest the houses, and are quite troublesome on account of their numbers and their docility, crawling along the walls and secreting themselves behind the furniture in almost every apartment. Great numbers may be seen on old logs, and on the roofs of the houses, basking in the rays of the sun. They are considered perfectly harmless by the inhabitants, who are only annoyed with them on account of their numbers and familiarity.

* In the edition of the Règne Animal, for 1829, Cuvier notices a reptile, described by Spix under the name of *Agama nigri-collaris*. We have not seen any description of the animal, but judging merely from its name, it must approach very near the *A. torquata*. The native place of the *A. nigri-collaris* is Brazil, it is therefore no doubt distinct from the *A. torquata*.

Scincus ventralis.—Cauda longa: corpore supra olivacea, cum maculis nigris, subtus albeo: squamis dorsalibus carinatis et imbricatis: plica maculata in utroque latere corporis: palmis et plantes pentadactylis.

Body, above, olive green, with small irregular black spots; beneath, whitish: head cordate, acute, larger than the neck, and covered above with large irregular convex scales; tongue short, fleshy, and bifid: teeth minute: angles of the mouth reaching to the ear: scales of the back quadrangular and sub-carinate, forming eight elevated ridges; scales beneath rhomboidal: the sutures between the scales, both above and below, form longitudinal and transverse lines or ranges of scales, which gives the whole a tessellated appearance: back separated from the abdomen on each side by a longitudinal fold of the skin from below upwards, forming a kind of groove, which commences at the angles of the mouth and terminates at the vent, including the fore and hind legs; the skin within this fold is granulated, of a whitish colour, and semetrically marked with twelve square black spots; the distance between the fore and hind legs is proportionably greater than in most of the scinks: legs rather short, with short toes furnished with small curved nails: tail long, cylindrical, and tapering, covered with regular quadrilateral imbricate scales, in transverse and longitudinal rows.

Dimensions of a middle sized specimen 15 inches.

Length of the body, $5\frac{1}{2}$ inches.

Length of the tail, $9\frac{1}{2}$ inches.

Three individuals of this species of scink were brought from the mining districts of Mexico, by Professor W. H. Keating, and are now in the cabinet of the Acad. Nat. Sciences. The most characteristic peculiarity of this animal is the granular lateral fold of the skin, which divides the body nearly into two equal portions, much in the same manner as the hollow furrow in the *Ophesaurus ventralis*. The resemblance of the head of that animal to that of the scink, has been noticed by all herpytologists; and those who are fond of tracing the analogies which subsist between different species and genera of animals, will find in the lateral fold of the *Scincus ventralis* another link in the chain of connection which unites the Ophidious and Saurian races. We have preferred to consider this animal for the present as a scink, but we are aware, that with a less violation of the arrangements of nature, than that which often occurs on this subject, that we might constitute with it a new genus, under the name of *Ptero-gastenes*, in allusion to the attachment of the ventral scales to the upper part of the body, by the lateral folds.

The *Scincus ventralis* is not unfrequently met with in Mexico. It is called *E'scorpion* by the natives, who consider it exceedingly poisonous. When a stick is presented to the mouth it thrusts out its tongue, somewhat in the manner of a Coluber.

Descriptions of new North American HEMIPTEROUS INSECTS, *belonging to the first family of the section* HOMOPTERA *of Latreille. By* THOMAS SAY.

CICADA. *Oliv. Latr. Germ.*

1. C. *hieroglyphica.* Greenish; head and thorax litterate with black.

Inhab. Pennsylvania and New Jersey.

Body greenish: *head* rounded before; bifasciate with black before the eyes; from the superior band proceed four black lines upon the vertex, the exterior ones abbreviated, the others double and including the superior stemmata, whence they proceed single to the occiput: *thorax* with several black lines, the middle one double and angulated on the exterior side: *scutel* with eight or ten black lines and curves: *hemelytra* hyaline, with three or four brown anastomoses, and near the tip of each nervure a brown dot; costal nervure and nervures towards the base green, edged with a very slender black line: *posterior tibiæ* with the four spines in pairs, perfectly opposite; the fifth spine very near the terminal spines: *beneath* immaculate.

Length to tip of hemelytra one inch and one fourth.

This species is rather rare.

2. C. *rimosa.* Black; posterior edge of the thorax rufous.

Inhab. Missouri and Arkansaw.

Body black above: *head* a little angulated before: *hypostoma* with the double middle line or lateral margin rufous; a rufous spot over the antennæ: *thorax* obsoletely varied each side with piceous; posterior and lateral edges rufous: *scutel* with the elevated cruciform line, two spots before it, and two or three on each side rufous: *hemelytra* without any margined anastomosis; the cellules much undulated: *tergum*, posterior edges of the segments rufous: *beneath* rufous, varied with black: *posterior tibiæ* with four equidistant spines in one longitudinal series, and two remote ones in another.

Length to the tip of the hemelytra one inch and one fourth.

Mr. Nuttall presented me two specimens, which he obtained on the Missouri, and I found one on the Arkansaw.

On the prominent middle of the hypostoma is a very obvious impressed line.

This species is nearly as large as the *C. septendecim*, Linn. from which however the above description will distinguish it.

3. C. *vitripennis*. Hemelytra vitreous immaculate; anterior thighs, posterior spine hardly oblique.

Inhab. Arkansaw.

Body blackish above: *head* with a rufous anterior line between the eyes and posterior margin: *hypos-*

toma convex, no longitudinal impressed line; greenish with a blackish disk: *thorax* with a large lateral rufous confluent spot, central line and posterior margin: *scutel* with four rufous lines, the two inner ones connected anteriorly by a rufous W: *hemelytra* very transparent, immaculate: *tergum*, posterior edges of the segments rufous: *beneath* greenish: *venter*, segments at base and each side black: *anterior thighs* with the posterior spine not larger than the anterior one, and but little oblique: *posterior tibiæ* with four equidistant spines in one series, and two remote ones in another series.

Length to the tip of the hemelytra one inch and one fourth.

Presented by Mr. Nuttall, from the Arkansaw.

FLATA. *Fabr.*

1. F. *pruinosa.* Plumbeous; hemelytra vertical, with a blackish spot or two before the middle.

Inhab. United States.

Body above plumbeous or with a hoary pubescence: *head* not prominent before: *hypostoma* greenish-yellow, the lateral edges prominent and extending a little further down than the antennæ, an abbreviated, elevated line above: *hemelytra* vertical, with from one to four spots before the middle; inner margin towards the base with elevated points: *beneath* yellowish-green.

Length to tip of hemelytra less than one third of an inch.

A common species. Beneath the pruinose covering the hemelytra are fuscous.

2. F. *conica.* Greenish; hemelytra, nervures not radiating on the margin.

Inhab. Indiana.

Body greenish-yellow: *head* a little prominent, angulated before: *vertex* flat, horizontal: *hypostoma* simple: *thorax* and *scutel* simple: *hemelytra* vertical; *nervures* prominent, obvious; no radiating nervures on the margin; colour green; edge at tip alternating with brown.

Length to tip of hemelytra less than half an inch.

In the vertical position of the hemelytra, the *pruinosa* and *conica,* together with the *bivittata,* Nob. resemble the *relicta,* Fabr.

3. F. *nava.* Cinereous varied with fuscous; nervures spotted; hypostoma with a black band.

Inhab. Indiana.

Head small; front with three elevated lines, lateral line spotted, middle of the hypostoma white with a broad black band: *thorax* very short, almost lineolar, angulated: *scutel* large, tricarinate, with a large blackish spot occupying the greater portion: *hemelytra* grayish; nervures spotted with black, particularly the costal, on which is a larger one near the tip; *intermediate tibiæ* biannulate with blackish.

Length to the tip of hemelytra nearly one fourth of an inch.

Var. a. Spots of the hemelytra obsolete: body yellowish: hypostoma bifasciate with black.

Var. b. Hemelytra immaculate.

In this species the tip of the hemelytra is a little dilated inwards so as to lap over when at rest, and the scutel is not longer than the thorax.

4. F. *opaca.* Blackish; beneath with a white vitta; head a little advanced.

Inhab. near Lake Erie and Indiana.

Body, above, brown-black: *head,* before the eyes, equal in length to the diameter of the eye; *hypostoma* with the central line and lateral edge elevated; on the middle a whitish band: *vertex* with an impressed longitudinal line; tip rounded: *thorax* with an elevated line: *scutel* with three elevated lines, the lateral ones a little arquated: *hemelytra* opake, irrorate with minute white points; dilated towards the inner tip so as to lap over the opposite one; a quadrate whitish spot beyond the costal middle, and one or two smaller ones nearer the tip: *pleura* with a lateral whitish vitta: *feet* black: *venter* blackish.

Length to tip of hemelytra over two fifths of an inch.

This is a fine species, and was obtained by Mr. Isaiah Lukens. The hemelytra are dilated inwards near the tip, as in *nava,* but the scutel is more than as long again as the thorax, and the head is differently formed before. I have recently found a specimen in Indiana.

5. F. *pallida.* Pale brownish; beneath yellow; head a little advanced.

Inhab. Pennsylvania and Florida.

Body, above, pale brownish-yellow: *head,* before the eye, rather longer than the longitudinal diameter of the eye: *eye* oval: *hypostoma,* elevated line obsolete, excepting near the superior tip; superior half yellow, inferior half dusky; each side before the eye dusky, the bounding line passing under the eye: *vertex* with an impressed line: *scutel* as long again as the thorax, three lined, the lateral ones a little arquated: *hemelytra* with about eight or ten remote brown points: *pectus* on the superior half blackish.

Length to the tip of the hemelytra less than two-fifths of an inch.

Resembles *opaca*; the hemelytra being dilated and the head prominent as in that species.

6. F. *bullata.* Hypostoma with an oval elevated line on the disk.

Inhab. United States.

Hypostoma with an elevated line longitudinally in the middle, each side of which is another elevated, much arquated line, forming an oval, and all confluent above, with a transverse line at tip of the head: *vertex* with a line behind: *thorax* with two impressed punctures: *scutel* not longer than the thorax: *hemelytra* brown-cinereous, sub-bifasciate with black and bullate near the costal margin before the middle.

Length to tip of hemelytra over one fourth of an inch.

In form it resembles the *cynosbatis*, Fabr. and the two following species.

7. F. *quinquelineata*. Scutel five-lined: nervures punctured with black.

Inhab. New Jersey.

Body yellowish: *hypostoma* with the longitudinal line and lateral edges elevated, the former somewhat bifid above: *scutel* with five, distinct, elevated lines: *hemelytra* with the nervures minutely punctured with blackish; hyaline slightly clouded with ferruginous towards the tip, and with an obsolete band before the middle; a more obvious fuscous dot towards the tip of the costal.

Length to tip of hemelytra three tenths of an inch.

Occurred on Pinus rigida early in August.

8. F. *humilis*. Blackish; scutel five-lined.

Inhab. Pennsylvania.

Body brownish-black: *hypostoma* with a central elevated line and lateral edges: *vertex* with a whitish spot each side: *thorax* narrow: *scutel* with five elevated lines: *hemelytra* with brown nervures, those near the tip fuscous: *feet* and *tip of the venter* yellowish.

Length to tip of hemelytra over three-twentieths of an inch.

Resembles *quinquelineata*, but is much smaller and differently coloured and marked.

MEMBRACIS. *Fabr. Germ.*

1. M. *tartarea.* Black; hemelytra hyaline at tip.

Inhab. Pennsylvania.

Head and *thorax* black, polished, immaculate; the latter simple, slightly elevated; tip acute, rather slender and greenish: *hemelytra* with the four apical cellules hyaline, excepting that the including nervures are margined with fuscous: *feet* greenish: *thighs* tinged with rufous: *abdomen* green: *venter*, segments at their bases dusky.

Length to tip of hemelytra less than one-fifth of an inch.

2. M. *semicrema.* Green; head and anterior thoracic disk black.

Inhab. Florida.

Head black, a green band between the anterior angles of the eyes: *thorax* little elevated, simple, green, with a large black anterior disk; tip rather slender, acute: *hemelytra* hyaline; *nervures* mostly blackish; three terminal cellules subequal, rather broader than long: *beneath* yellowish-green.

Length to tip of hemelytra less than one-fifth of an inch.

Somewhat resembles *tartarea.*

3. M. *calva.* Thorax simple, black; head greenish.

Inhab. Pennsylvania.

Head greenish, more or less black at base: *thorax* simple, hardly elevated, black, polished, generally greenish at tip, which is not slender: *hemelytra* hyaline: *nervures* pale greenish: *pectus* black: *feet* greenish: *thighs* more or less black.

Length to tip of hemelytra less than three-twentieths of an inch.

A smaller species than the *tartarea* and *semicrema*, and the thorax is not so slender at tip. I obtained many specimens on Eupatorium maculatum, in the axillæ of the leaves, early in July.

4. M. *goniphora*. Thorax flattened before, subulate behind.

Inhab. Missouri.

Above greenish, minutely reticulate with yellowish-rufous: *thorax* greatly elevated, flattened before so as to form an acute line each side, which meet at the greatest elevation, rather before the middle, from whence the curvature descends by an acute carina to the tip, which is subulate and arquated: *hemelytra*, three terminal cellules unequal.

Length to tip of hemelytra three-tenths of an inch.

Several specimens were presented to me by Mr. Nuttall, who obtained them during his voyage up the Missouri river.

5. M. *festina*. Thorax with a subacute line each side before, meeting behind the middle.

Inhab. Florida.

Body yellowish-green: *thorax* unarmed, carinate behind; at tip attenuated, subulate and complying with the general curvature; each side before a carinate line, meeting together at the carina behind the middle, and with the carina tinged with rufous; front of the thorax not altogether flat, but a little convex: *hemelytra*, three terminal cellules unequal; the two costal ones equal, as broad as long; the inner one not obviously larger than the others together, somewhat longer than broad.

Length to tip of hemelytra one-fifth of an inch.

The lateral prominent lines of the unarmed thorax, separate this species from all those which I have described, excepting *goniphora*, which, however, is larger, the thorax more elevated, and the lateral lines meet before the middle of the length of the back.

NOTE: *by S. G. Morton, M. D.*

In Mr. Vanuxem's paper on the Secondary, Tertiary and Alluvial formations of the United States, (published in this volume,) Cockspur island, on the coast of Georgia, is mentioned as a locality of *Belemnites*. I have twice since quoted the statement on Mr. Vanuxem's authority; but there appears to be some mistake in relation to it; for Captain Le Conte, U. S. A., authorises me to say, that he has personally examined every part of Cockspur island, that it is strictly *Alluvial*, and presents no traces whatever of organic remains.

August 16, 1830.

Observations on the Electrical Characters of CAOUTCHOUC, *or* GUM ELASTIC; *with some applications of which they are susceptible. By* WALTER R. JOHNSON, M. A. N. S. P. *Professor of Mechanics and Natural Philosophy in the Franklin Institute.*

[Read April 20, 1830.]

Most treatises on electricity, contain an enumeration of the substances, which, under ordinary circumstances, retain the electric fluid when developed, and which are called non-conductors. Among materials of this class, those possessing *vitreous* and *resinous* properties occupy a conspicuous place, and their well known opposite peculiarities, have given rise to the opinions maintained and to the terms employed by those who adhere to the Dufayan theory of two electric fluids.

The list of non-conductors enumerated by Singer, embraces the following substances:

"Shell lac, amber, resins.
Sulphur, wax, jet.
Glass, and all vitrifications, talc.
The diamond and all transparent gems.
Raw silk, bleached silk, dyed silk.
Wool, hair, feathers.
Dry paper, parchment, and leather.
Air, and all dry gases.

Baked wood, dry vegetable substances.
Porcelain; dry marble.
Some silicious and argillaceous stones.
Camphor, *elastic gum*, lycopodium.
Native carbonate of Barytes.
Dry chalk, lime, and phosphorus.
Ice at —13° Fahrenheit.
Many transparent crystals when perfectly dry.
The ashes of animal and vegetable substances.
Oils, of which the heaviest appear the best.
Dry metallic oxides."

Though *elastic gum* is by this author, placed among the non-conductors of electricity, and has of late been observed by Dr. J. K. Mitchell, to possess this property in an eminent degree, even when reduced to extreme thinness, yet I am not aware that the inference has heretofore been drawn, that this substance must, according to a general principle, be found an active and powerful electric. Such, however, appears to be the fact, and as it may possibly lead to some useful and commodious applications of a botanical production, I have deemed it appropriate to offer to the Academy, a few remarks respecting its peculiarities.

When we rub with caoutchouc the surface of a piece of paper, with a view to remove pencil lines or spots of any kind, we find that by rubbing lightly, scarcely any effect is produced in the first moments of the operation, or at least that the rubber clings

with much less force to the paper, than after some time has elapsed.

Most persons probably imagine that this difference arises from the cohesive character of the gum, some portions of which they suppose may be left on the paper. I apprehend that the effect, in the first instance, may be attributed to electricity; the cohesive qualities of the caoutchouc, after the contact has been made very intimate, keeping the irregularities of surface so knit together, that one or the other, or both must be removed, in order to allow the rubber to move parallel to the surface of the paper. Under ordinary states of moisture and temperature, paper is a conductor. It therefore allows the electricity which it would accumulate and receive, if insulated, to escape immediately, while that of the non-conducting rubber is retained, and acts upon the particles of paper and other materials, causing them to adhere to its surface. When the hand is passed over the rubber so as to deprive it of its electricity, these portions of paper mixed with parts of the rubber itself, easily drop off, and lie scattered on the paper. It is sometimes regarded as matter of surprise that so light a rubbing with the hand will displace these detached masses of rubber and paper from the surface of the caoutchouc, while they adhered firmly, a moment before, under the most active rubbing and intense pressure. The removal of the electric excite-

ment is probably sufficient to account for the fact in question.

When we rub a piece of warm dry paper, the latter as well as the rubber, evinces the development of electricity, which may be seen in its pertinacious adhesion to a table, wall, piece of cold paper, or any other unelectrified substance with which it may come in contact. The rubber and the paper now take opposite states, since the former can no longer part, by conduction, with the portion of electricity which it receives from the rubbing.

If we press a piece of Indian rubber closely upon the brass cap of Bennet's gold leaf electroscope, and then withdraw it suddenly, the leaves will diverge and strike the sides of the glass.

If the rubber be simply stretched and then brought to the cap of the electroscope, the same indication of electrical excitement is given, but in a more feeble and imperfect manner. In both these experiments the mode of separating the rubber from the cap appears to influence essentially the result, since a gradual withdrawing of it leaves scarcely any signs of action, while a smart separation causes the leaves to diverge at once to their greatest extent.

The development of electricity by every change, and especially by every sudden change, of density, is a fact generally known to chemists, and is certainly very remarkable in the substance under consideration.

The change of temperature may likewise be made perceptible, even to the senses, by bringing the piece of caoutchouc, when recently stretched, in contact with some part of the body: a moderate sensation of warmth is perceived, and a corresponding coolness, when after a few moments it is again allowed to contract.

The electric properties of gum elastic apparently confirm the law enunciated by Coulomb, in respect to the electrical state of bodies electrified by rubbing.

According to that law, when the surfaces of two bodies are rubbed together, that body, the integrant particles of which are least removed from each other, and which vibrate least about their natural centres of equilibrium, seems by this very circumstance to be the more disposed to receive the *vitreous* electricity.

The particles of gum elastic may be considered as presenting an extreme case of vibration, and accordingly the resinous state is induced by rubbing with almost every other substance.

Since the method of expanding gum elastic bags, by treating them with ether, was first practised by Dr. Mitchell, that gentleman has informed me that he has made some experiments which tend to show that even when reduced to extreme thinness this substance would resist the passage of a spark from the prime conductor of an electrical machine, and his inference is, that its non-conducting power is perfect. To bring this matter to the test, it would

be desirable to repeat the experiments with strongly charged batteries. The gum would, in all probability, be found, like glass, to yield under charges of sufficient intensity.

The fact, however, that it has a power of resisting to a considerable extent, points it out as a good medium to be interposed between the two surfaces of the condenser, or substituted in some form for the Leyden phial.

For this purpose, a piece of gum, reduced to a very thin sheet, may be interposed between two sheets of tin foil and laid upon a table; a thicker sheet of gum may then be laid upon the upper sheet of foil, so that the edge of the latter should be at some distance from that of the former. The whole may then be rolled up into a coil, allowing a small part of the included tin-foil to project out at one end of the roll. A charge may now be given to this apparatus, and a shock obtained by connecting the outer sheet of tin with the part of the inner, projecting at the end.

A disk of metal may be covered with a thin sheet of caoutchouc and another disk furnished with an insulating handle placed above it; this apparatus will serve all the purpose of the ordinary condenser.

I have stretched a piece of gum upon a circular piece of board, six inches in diameter, with a coat of tin-foil underneath; on rubbing this with flannel, it becomes highly electrified, and if a plate, like the

upper or receiver plate of the electrophorous, be placed upon it and touched, it will evince a very vigorous action on the electroscope.

This effect may be increased by the use of the condenser, and even a common Leyden jar may be charged in favourable weather to a considerable degree of intensity.

By a single contact of the plate of this electrophorous so much electricity is sometimes developed, that it will communicate to a pin's head, electricity enough to turn the small needle of the silk thread torsion-balance through two or three revolutions.

The non-conducting property of caoutchouc may be profitably employed in the construction of torsion balances for measuring the intensity of electrical action. For this purpose a string of the gum, of any convenient thickness, may be cut from a sheet or bag, making it as nearly as practicable of *uniform* thickness. This may afterwards be reduced to the required size by treating it with ether, stretching it and allowing it to remain distended until the ether is fully evaporated. A small longitudinal hole may then be made at one end, through which a needle of gum shellack, carrying a disk of metal, or what is better, a very thin spherical bag of caoutchouc at one extremity, may be accurately adjusted on its centre of gravity. *Insulators* of this substance may be formed either in plates, strings, or conical portions of bags to support any required apparatus.

Hence it appears that nearly a complete set of electrical apparatus may be formed of this substance, capable of being transported with perfect ease and safety under circumstances in which the common apparatus would be inevitably demolished. In a large bag, or extended sheet, it may be used for the *cylinder* or *plate* of the common machine. A portion of the same may be substituted for the *rubber*. The electrophorous, the condenser, and the Leyden jar may be formed of it. The torsion balance constructed with balls of this substance instead of pith balls, is an instrument far preferable to that of Coulomb. The jar may receive either the coiled form already described, or it may have the usual form by making the inner coating of tinned iron, covering it with a thin sheet of gum, and then adding an exterior coating of metal.

Description of two New Species of SALAMANDER. *By* JACOB GREEN, M. D., *Professor of Chemistry in Jefferson Medical College.*

[Read August 17, 1830.]

SALAMANDRA.

1. S. *cirrigera.*—Cauda longiuscula corpore supra fusco, nigroque variato, lineis duabus distinctis; sincipite cirrigera; subtus albida.

Stewart's S. *Length* three inches—*tail* rather longer than the body—slender and rounded—*snout* obtuse, with two short thick fleshy *cirri* projecting between the nostrils and the upper lip—*eyes* large and very prominent, nostrils very minute—*back* yellowish, speckled with black points, with a black line on each side edged with white. These lines commence behind the eyes—pass a little distance above the legs, and unite at the tip of the tail—a row of minute white dots may be traced along the inferior edge of these lines. *Sides* speckled in obscure lines—beneath whitish—fore feet four toed—hind feet five toed—Female more robust, without the cirri—and the markings not so distinct.

For this remarkable salamander, I am indebted to the kindness and the minute researches of my friend William Stewart, Esquire. He discovered two pair of them near New Orleans, under some large chips of wood. They have some resemblance both to the

S. erythronota and the S. bislineata. When these animals were alive, the cirri or nasal appendages were about one-fourth of an inch long. From the situation where they were found, and from their general appearance, they must be placed among what are called Land Salamanders; but their fleshy cirri seem conclusively to prove that their principal resort must be in the water. Cirri we believe, have never before been noticed on any animals, except among fishes. We are aware that at certain periods, some species of the Salamander show peculiar developments which afterwards disappear. The membrane on the toes of the S. palmipes and a portion of the beautiful crest in the S. cristata, (both natives of France,) are examples of the fact to which we allude. The cirri however, of the reptiles before us, we think will be found a permanent character—at all events they are sufficiently so, to entitle them to their specified name.

2. S. *ingens*—Cauda longiuscula—corpore supra ferrugineo, fusco, cœruleoque maculato—subtus luteolo nigroque variato.

Great S. *Length* nearly eleven inches—*tail* three-fifths of the whole length of the animal, much compressed along its upper edge, and gradually tapering to a slightly obtuse tip—*head* rather long—*snout* oval —*lower jaw* less prominent than the upper—*eyes*

slightly protuberant and approximate—*colour* throughout dusky ferruginous or dirty red, with dark bluish blotches which are most distinct on the tail—*skin* very porous. On the sides of the tail these pores assume a granular appearance—*legs* thick and strong—*toes* stout and rather long—the outer edge of the outer toes of the hind feet fimbriated as in the Protonopsis horrida of Barton or S. alleghaniensis of Daudin—which animal it resembles so much, that at first sight I had no doubt of their identity—*fore feet* four toed—*hind feet* five toed.

This animal is by far the largest and most robust of the salamander kind, that I have seen or read of. It was taken in a fresh water stream near New Orleans, and brought to this city in a bottle of alcohol; it is therefore impossible to say what the precise colour of the skin was at the time of its capture, but from the short time it has been in the alcohol, there can be little doubt that its present obscure colour and markings, are nearly the same as when the animal was alive.

I am indebted to the kindness of my friend Dr. Samuel M'Clellan for this interesting animal. Dr. M'Clellan's late excursion to Mexico, has enriched other departments of Natural History, with some new species.

Description of Fifteen New Species of RECENT, *and three of* FOSSIL SHELLS, *chiefly from the coast of the United States.* By TIMOTHY A. CONRAD, *Member of the Academy of Natural Sciences of Philadelphia.*

Read October 5th, 1830.

Having obtained permission to describe such shells belonging to the collection of the Academy of Natural Sciences, as I believe to be new, I avail myself of the privilege so liberally granted, to publish a few species which inhabit the coast of the United States; I have elsewhere met with some other marine shells which do not appear to be noticed in the systems, and these will be included in the present paper.

I embrace this opportunity, also, to make a few remarks on the *Mactra solidissima* of Chemnitz, which has been confounded both with the *M. solida* and *grandis*, neither of which inhabits our coast. During a recent visit to the sea shore, I examined great numbers of the *M. solidissima*, from half an inch to five inches in length, and the varieties in form are so numerous that I am not surprised to find a few of them elevated to the rank of species. The very young shells generally have an obtuse elevation extending from the apex to the base, and causing the basal margin to project in the centre; as the shell increases in size this character is lost, but the beaks

are, in general, much nearer central in young and half grown, than in old individuals, and in this state it closely resembles the *M. solida* of Great Britain; to this variety Mr. Say has given the name of *M. similis*.

The following synonyma I believe, will prove to be correct.

MACTRA.

M. solidissima. *Chem. Dill. Wood. Index Test. pl.* 6. *f.* 22.
M. solida, var. β. *Gmel.*
M. procera. *Solander.*
M. grandis. *Solander. Wood. Index Test. pl.* 6. *f.* 19.
M. stultorum. *Solander.*
M. gigantea. *Lamarck.*
M. similis. *Say.*

1. *M. arctata.* Plate XI, fig. 1. Shell subovate, solid, compressed, anterior side short, truncated and somewhat angular; posterior side produced, with the end margin rounded; cartilage pit triangular and profound; posterior lateral tooth elongated, and crossed by regular elevated striæ.

Inhabits Massachusetts.

Cab. Academy, No. 840. I. Lea, D. B. Smith.

This shell somewhat resembles in shape the *M. donacia*, Lam. The specimens in the Academy's collection were obtained on the coast of Massachusetts, by Dr. C. Pickering.

2. *M. tellinoides*, Plate XI, fig. 2 and 3. Shell ovate, thin, fragile, with numerous raised, concentric striæ, one end regularly rounded, the other slightly compressed and somewhat pointed at the extremity; lateral teeth distinct in one valve, in the other obsolete.

Inhabits the northern coast.

Cab. Academy, No. 1510. W. Hyde, I. Lea, D. B. Smith.

For this species I am indebted to Mr. William Hyde, who politely lent me the only specimen in his cabinet; he informed me that it came from Holmes' Hole on the coast of Massachusetts.* It has generally a slight fold on the smaller side which gives it the aspect of a Tellina.

3. *M. nucleus*, Plate XI, fig. 4. Shell small, triangular, thick, with an obsolete concentric ridge; umbones flattened and rectilinear; apices nearly central and very acute; posterior slope depressed; lateral teeth strong; colour within pale brown.

Inhabits New Jersey.

Cab. Academy, No. 852.

CARDIUM.

1. *C. laqueatum.*—Shell cordate, ventricose, thin, with about 33 subtriangular, transversely

* Since writing the above I have seen many specimens received by Mr. Smith from Rhode Island, and one in Mr. Lea's cabinet, which he informs me is from Florida.

wrinkled ribs; umbones prominent; lunule not profoundly impressed and somewhat lanceolate; cardinal tooth subulate.

Cab. Academy.

Inhabits———Fossil from Maryland.

Length 1½ inches; length and height nearly equal. The only determinate fossil species of its genus yet discovered in this country; I found it only in the clay beds at St. Mary's river, and always in a state of decomposition, that rendered it impossible to obtain any but mutilated specimens.

2. *C. Mortoni*, Plate XI, fig. 5, 6, 7.—Shell subovate, oblique, slightly ventricose, thin, destitute of ribs or radiating striæ; white, covered with a pale brown epidermis darker towards the base and wrinkled at the ends; within striated, and of a yellow colour; margin entire or obsoletely serrated, whitish, with generally an oblong black or dark purple spot on the posterior side.

Inhabits the northern coast.

Cab. Academy, No. 1064. Dr. Morton, I. Lea.

This shell has not the polish nor distinctly serated margin of *C. serratum* to which it is nearly allied; the striæ are occasionally obsolete or only slightly serrate; the margin towards the anterior end, and the young shells are marked with angular fulvous spots, similar to the young of *C. lævigatum* and several other shells. Dr. S. G. Morton first received specimens of this species which he believed to be undescribed,

and it is to him that I am indebted for the use of many individuals, from which the description has been drawn; and it is therefore with pleasure that I introduce the shell with his name. Numbers were taken alive in Long Island Sound by Mr. William R. Clapp; and Professor A. D. Bache lately presented specimens to the Academy which he procured on the coast of Rhode Island. This species has not been observed south of Long Island.

3. *C. pinnulatum*, Plate XI, fig. 8.—Shell suborbicular, small, thin, and fragile; ribs about 26, flattened but becoming convex towards the base, where they are generally muricated with a single row of minute, equidistant points; colour whitish or pale brown.

Inhabits Massachusetts.

Cab. Academy, No. 1087.

This small species of Cardium was lately presented to the Academy by William Oakes, Esq. of Ipswich, Massachusetts.

PECTEN.

P. Pealeii.—Shell ovate, dull red, varied with cinereus, with about 26 flattened, transversely rugose ribs, each divided at its base by a longitudinal sulcus; interstices with each a scaly elevated longitudinal stria; inferior valve slightly convex, reddish; ribs flattened, with a profound sulcus at the base of each, and very few interstitial striæ; ears ribbed and unequal.

Inhabits Maine, where it was found by Mr. T. R. Peale, at the mouth of a river, having probably been brought there by an otter.

It has the shape of *P. varius* of Europe.

Cabinet Acad. Nat. Sc. No. 1400.

MYA.

M. hyalina, Plate XI, fig. 12.—Shell ovate, oblong, extremely thin, fragile, pellucid, anterior side short and rounded; posterior side produced, slightly reflected and truncated at the extremity; epidermis pale with radiating rugose striæ, obsolete or wanting upon the umbones, but distinct towards the base and posterior end, where the epidermis is wrinkled; beaks prominent, within polished, tooth broad, erect, little elevated, with its posterior edge fitting into the slight groove of a projecting plate, in the opposite valve.

Inhabits the northern coast of the U. S.

Cab. Academy, No. 1207. T. Rogers, I. Lea, D. B. Smith.

CYTHEREA.

C. convexa, Say.—This shell was described as a fossil and believed to be exclusively such; but I have found it recent on the sea beach of New Jersey; and Mr. D. B. Smith lately received two very perfect specimens from Rhode Island, the valves of which are attached by the ligament, and appear to have been taken with the living animal. They were

collected by Lieutenant Brown, of Newport, Rhode Island.

Cab. Academy, No. 1241.

NUCULA.

N. recurva, Plate XI, fig. 21.—Shell oblong, concentrically striated above, and obliquely towards the base; anterior side rostrated and recurved; posterior end rounded; beaks nearly central.

Inhabits the West Indies.

Cabinet of the Academy, No. 1452.

LUCINA.

L. sphæroides, Plate XI, fig. 9, 10.—Shell globose, white; ribs divaricating, triangular and acute; interstices concave and transversely wrinkled; anterior end depressed; margin entire, lunule minute.

Syn. Tellina divaricata. *Chemnitz,* vol. 6, t. 13, f. 130.

Inhabits Africa.

Cab. T. Rogers, I. Lea.

This shell is well figured by Chemnitz, who confounds it with *Tellina divaricata,* Lin. I do not find this figure referred to by later authors, nor any description of this remarkable and beautiful species, except in the observations of Chemnitz: he says it is rare, that it came from the West Indies, and that few collections could shew a pair of valves; this shell he observes is bluish white, or ash colour; but the specimens I have seen are pure white; one valve which Mr. Lea kindly lent me to figure, is

tuberculated towards the base, caused by concentric furrows dislocating the ribs. Mr. Lea informed me that it was found near Liberia, on the African coast. It appears to belong to the genus *Ungulina*, Kam.

ANATINA.

A. Leana, Plate XI, fig. 11.—Shell inequivalve, elliptical, sub-compressed, very thin and fragile, white with a yellowish slightly polished epidermis; anterior side rather shorter and slightly more obtuse than the posterior, with a linear gape; margin waved; beaks very small.

Inhabits the northern coast of the U. S.

Cab. D. B. Smith, I. Lea.

This is a remarkable species, and readily recognised; when dry the epidermis cracks, is very brittle, and coloured with reddish brown at the ends. I first observed this shell in the cabinet of my friend Mr. I. Lea, who liberally lent it to me for the purpose of description: but Mr. D. B. Smith having received a very perfect specimen from Rhode Island, I have to offer him my acknowledgments for the use of it. This was sent to him by Lieut. Brown of Newport, R. I. I have given Mr. Lea's name to this shell, as a small tribute of respect for his talents and industry in illustrating American conchology.

MYTILUS.

M. leucophæatus, Plate XI, fig. 13.—Shell incurved, white, with a very rugose epidermis; anteri-

or side much depressed; hinge margin excavated, with the teeth obsolete; on the posterior side, under the beaks, is a pointed laminar tooth directed inwards.

Cab. Academy, No. 1453.

Inhabits the southern coast of the U. S.

Found attached by its byssus, to the *Ostrea virginica*. Mr. William Riley presented me with several specimens, and informs me that he observed great numbers of them between the shells of two attached oysters.

ARCA.

A. maxillata.—Shell subrhomboidal, compressed, elevated; umbones rostrated and nearly rectilinear;

Fossil from Maryland. Philadelphia Museum.

I have never seen the shell of this species, the description being drawn from a cast.

VENUS.

V. alveata, Plate XI, fig. 14, 15.—Shell subtriangular, thick, with about six, much elevated, very thick and profoundly reflected concentric ribs, remote, and becoming smaller towards the posterior end; margin crenulated.

Syn. V. paphia, Lam.

Inhabits ————. Fossil from Maryland.

Cab. Academy.

This shell is related to *V. paphia,* with which species it appears to be confounded by Lamarck, as

his description of *V. paphia* was drawn from a fossil from Wilmington, N. Carolina. My shell is a fossil from St. Mary's river, Maryland, where it is by no means rare; it may be distinguished from *V. paphia* by its shape, which is shorter in proportion to its height; and by the remote and recurved ribs, which do not abruptly, and in a regular line, become much smaller towards the posterior end.

BALANUS.

B. geniculatus, Plate XI, fig. 16.—Shell subconical, white, with prominent, flexuous, longitudinal ribs, with two angular elevations on each, between which the valves are crossed by a carinated line; valves coarsely striate, and the interstices delicately striated transversely; aperture large and ovate.

Inhabits Maine.

Found adhering to *Pecten magellanicus,** which inhabits deep water on the coast of Maine; and it is by no means rare, although it appears to be found only in company with the Pecten alluded to. The

* This is probably a misnomer, as it is doubtful whether this species ever came from the Straights of Magellan; but however that may be, Mr. Peale informs me that it is abundant on the coast of Maine, where it lives in deep water, and is dredged up by the fishermen as an article of commerce; the animal being esteemed a luxury in some parts of the New England States. The fossil *P. Clintonius* described by Say has been thought to be the same species, and certainly very much resembles it, but I have no doubt that it is distinct

figure represents an attached specimen in my collection, for which I am indebted to Mr. Peale.

Cab. Academy, No. 1511.

VELUTINA. *Blainville.*

V. rupicola, Plate XI, fig. 17, 18.—Shell obliquely subovate, very thin, fragile, pellucid whitish, covered with a rough brown epidermis with spiral raised striæ; first two whorls minute, body whorl ventricose; aperture suboval and nearly as long as the shell; inner lip not thickened and but slightly reflected.

Inhabits Massachusetts.

Cab. Academy, No. 508. I. Lea.

A very perfect shell of this species was presented to the Academy by Dr. C. Pickering, who informed me that it adheres to rocks on the sea coast, and has the habits of the Patellæ; in this particular it resembles *V. Otis;* but it certainly approaches very near to *V. lævigata,* from which however it is sufficiently distinct, as the foregoing description and the figures will render evident. I am indebted to Mr. I. Lea for a specimen, and this, (like all which I observed in that gentleman's cabinet) has a very light coloured epidermis; whilst that in the Academy's collection is deep brown, probably from age.

LACUNA. *Turton.*

L. pertusa, Plate XI, fig. 19.—Shell conical, rather elongated, thin, semitransparent, with an

olivaceous epidermis, very minutely striated spirally and wrinkled transversely; whorls five, rounded, suture deeply impressed; apex rather obtuse; body whorls slightly ventricose; generally with four darker bands, one band in each of the other volutions; columella with a wide and deep groove, ending in a profound umbilicus; aperture subovate.

Inhabits Massachusetts.

Cab. Academy, No. 1306. D. B. Smith.

This shell resembles *L. quadrifasciata*, but differs in the large size of its groove and umbilicus. The markings are variable, and the bands are sometimes dilated, forming two only on the body whorl; other specimens are a nearly uniform dark horn colour; there is no subcarination on the large volution, as in *L. quadrifasciata*. Mr. Smith received his specimens from Lieutenant Brown.

PATELLA.

P. alveus, Plate XI, fig. 20.—Shell oblong, elevated, thin, pellucid, with fine radiating striæ, rounded at each end; sides nearly straight; apex not central, and pointing towards the short end; colour whiteish with reddish brown irregular spots and lines, which are distinctly visible within.

Inhabits Massachusetts.

Cab. Academy, No. 506. I. Lea.

The Academy is indebted for this, and several other highly interesting shells, to the researches of

Dr. Pickering on the coast of Massachusetts. Mr. I. Lea also found it on the coast of Nantucket.

EXPLANATION OF PLATE XI.

☞ All the figures are of the natural size.

Fig.

1. Mactra arctata.
2. 3. Mactra tillinoides.
4. Mactra nucleus.
5. 6. 7. Cardium Mortoni.
8. Cardium pinnulatum.
9. 10. Lucina sphæroides.
11. Anatina Leana.

Fig.

12. Mya hyalina.
13. Mytillus leucophæatus.
14. 15. Venus alveata.
16. Balanus geniculatus.
17. 18. Velutina rupicola.
19. Lacuna pertusa.
20. Patella alveus.
21. Nucula recurva.

Description of the Fossil Bones *of the Megalonyx, discovered in* "White Cave," *Kentucky.* By R. Harlan, M. D.

[Read March 8th, 1831.]

Megalonyx *laqueatus.*

For many years it was ascertained that the collection of fossils in the cabinet of the late Mr. Clifford of Kentucky, contained some of the remains of a Megalonyx. On the death of this gentleman, his whole collection passed into the hands of Mr. Dorfeuille, proprietor of the Cincinnati Museum,—who added a very extensive collection of fossils of almost every variety, principally from the Basin of the Mississippi. During the summer of 1829, this collection was offered for sale; when my estimable friend *John Price Wetherill,* Esq. with that distinguished liberality which he has so repeatedly displayed towards the sciences and those who cultivate them, authorized me when on a visit to Cincinnati in the autumn of the same year, to purchase these invaluable reliques, which, together with other admirable contributions in this department, he has caused to be arranged in the cabinet of the Academy of Natural Sciences of Philadelphia.

The fossil bones which form the immediate subject of the present dissertation were labelled "White Cave," Kentucky; being one of those saltpetre caves

so numerous in the limestone formation, in the states of Kentucky, Tennessee, and Virginia. One of them named the "Mammoth Cave," Kentucky, is said to extend thirteen miles, and runs under Green River. During the late war the United States government was supplied with nitre from these caves, which salt, it is said, is not regenerated so soon as usual in other countries; the atmosphere within them is exceedingly dry and antiseptic; Indian Mummies, which consist of human bodies simply desiccated, together with their ornaments, have been frequently discovered in a state of high preservation; and bones of the existing species of animals have occasionally been observed.*

* From a communication received from my intelligent friend Dr. Black, late of Kentucky, we copy the following extract relative to the *White Cave*.

"The Cave is located in Edmondson County, Kentucky, on the Southern bank of *Green River*—130 miles distant, following the course of the stream, and 50 miles, in a direct northern line, from the Ohio river—120 miles S. W. of Lexington. It penetrates the second or upper bank of the river nearly at its summit, about half a mile from the mouth of Mammoth cave. The entrance dips a little below the horizon, and is 8 or 10 feet deep, and is only sufficiently large to admit of the simultaneous ingress of one person feet foremost. The first chamber is of an irregular elongated oval shape, with a low, flat, uneven roof, seldom allowing a grown person to stand erect. Water continually dropping from the ceiling keeps the floor very wet, this is irregular, and covered with a thin layer of alluvial soil—mud or clay and gravel. The second chamber differs from the first in having the ceiling covered with quill-like stalactites, and its floor more level, is intersected with small channels of running water, so transparent, as to be scarcely perceptible.

Along with the remains of the Megalonyx, we have received portions of skeletons of the Bos, the Cervus, the Ursus, and a metacarpal bone of the human species. The remains of the Bear alone appear to be nearly as ancient as those of the Megalonyx. Strictly speaking, these bones are not fossilized; they retain a very considerable quantity of animal matter, but are much more brittle and lighter than recent bones; most of the articulating surfaces are still more or less covered with cartilage: they are mostly of a yellow ochreous colour: it is stated that they were found on the surface of the floor of the cave; whilst those of the Megalonyx Jeffersonii were buried two or three feet beneath the surface, and are completely fossilized; they are still in very good preservation in the cabinet of the American Philosophical Society.

The remains of the new Megalonyx, consist of two claws of the fore feet; a radius, humerus, scapula, one rib, and several remnants; os calcis, tibia, a portion of the femur; four dorsal, and one lumbar vertebræ; a portion of a molar tooth; together with several epiphyses: the bones being portions of the skeleton of a young animal, are occasionally imperfect at their extremities.

The third chamber is more regular than either of the others, and is chiefly distinguished by an irregular pile of limestone, which has evidently fallen from above, and very probably closes the passage to other chambers. Saltpetre, so common in other caves, has not been detected in this."

In the same collection there are a humerus nearly perfect, and a metacarpal bone of an adult animal of the same species, disinterred subsequently at that almost universal cemetry of fossil quadrupeds, "Big-bone lick."

The bones of the fore arm and fore foot, together with a single tooth of the "*Megalonyx Jeffersonii*" discovered in 1796 in a cavern in Green Briar county, Virginia, (vid. Cuvier Anim. foss. vol. v. part 1. ed. 3. p. 160.) are the only portions of the skeleton of this genus hitherto obtained. On comparison of the similar parts of the skeleton of the new animal, they will be found to display strong characters of specific distinctions.

In addition to the Megatherium and Megalonyx, so elaborately described by Baron Cuvier in his "Ossemens fossiles," this author has furnished us with indications of the existence of two other fossil quadrupeds of the order Edentata; one of these he refers to the genus "Manis," but of immense magnitude, when compared to the largest of that genus now existing, if we may judge from the size of an ungueal phalanx, which was disinterred in the vicinity of Eppelsheim, canton of Alzey, on the Rhine. This fossil quadruped may have been twenty four feet long.

The other fossil to which the Baron alludes, is an armadillo, (Dasypus) more than ten feet in length, lately discovered in the alluvium of the "Rio del

Sauce" in the vicinity of Montevideo; this animal was evidently covered with scales, and its femur, which weighed seven pounds, is said to resemble in every respect that of the armadillo.

With these preliminary remarks, we proceed to the description of the bones in question, commencing with those which we are enabled to compare with similar bones of its kindred species: these latter being already minutely and accurately described in the Anim. foss., it is only necessary to note the points of dis-similitude.

1. The largest claw or ungueal phalanx, which appears to belong to the medius, in general contour resembles that of the M. Jeffersonii; but is much thicker and stronger, being one half as high as it is long, measured posteriorly; and is more curved at the point, and more abruptly arched above;—the inferior osseous plate or tubercle, is globular, and protuberant, and in place of two foramina as in M. J., the vessels entered a notch, at the posterior base of the tubercle, and run in a direction parallel to the axis of the bone, but the artery soon divides, one branch penetrating the substance of the bone, within the osseous sheath, another running upwards between the bone and nail; as is demonstrated by a groove and foramen. The osseous sheath, which rises upward and appears to have spread from the tubercle, is broken off from both sides. The articulating surface, and the whole

aspect of the bone, denotes a much more powerful instrument than the same bone of the adult species to which it is allied. Vid. table of dimensions at the end of this paper, and pl. 12. fig. 1 and 2.

2. The second claw or that of the annular finger, is smaller, and proportionably more slender, and bears the same comparison as the first to the annular claw of the M. Jeffersonii, but is a much more interesting specimen on account of the *preservation of the nail itself,* which is of a compact lamellated corneous structure, of a reddish ferruginous tint, and adheres closely to the bone beneath, and to the osseous sheath above, which is fractured and removed on the exterior side, and shows the nail passing upwards and backwards as far as the articulating epiphysis, pl. 12. fig. 3. The inferior or cutting edge of the claw or nail is canaliculate, as in the *Bradypus tridactylus.*—At the inferior portion of the claw, the corneous substance is three tenths of an inch in thickness.

On the interior surface the osseous sheath is perfect, and extends above the dorsum of the bone, vid. pl. 12. f. 4. This phalanx is much more curved than that of the M. Jeff. and differs also in its relative proportions; its height is about one third its length. Vid. table of dimensions.

All the claws in this species, as well as in those of the M. Jeffersonii, were evidently furnished with osseous sheaths, but are broken in the specimens of the last named species; a fact which could not be so

readily ascertained by examining the plaster casts of the bones alone; in which respect again the Megalonyx is more closely allied to the sloth.

3. The contour of the superior head of the *radius* is circular, as in the Megalonyx Jeffersonii;—and in its general aspect this bone resembles that of the last named species, but is proportionably thinner, narrower, and longer;—cartilaginous matter remains adhering to the articulating surfaces. The epiphysis from the radio-carpal extremity is lost. Vid. pl. 12. fig. 5. anterior, and fig 6. posterior view.

4. The fractured *molar tooth*, appears to have belonged to the inferior maxilla on the right side; the crown is destroyed; a part of the cavity of the root remains. The body is compressed transversely, and presents a double curvature, which renders its anterior and exterior aspects slightly convex; the posterior and interior gently concave; these surfaces are all uniform with the exception of the interior or mesial aspect, which presents a longitudinal rib or ridge one half the thickness of the long diameter of the tooth; with a broad, not profound, longitudinal groove or channel along each of its borders. It is from this resemblance to a portion of a fluted column, that the animal takes its specific appellation.

The crown would resemble an irregular ellipsis widest at the anterior portion.—The tooth consists of a central pillar of bone surrounded with enamel, the former of a dead white, the latter of a ferrugin-

ous brown colour: the transverse diameter is more than two thirds less than its length, whilst that of M. Jeffersonii is only one third less—the antero-posterior diameter is one half its length in the former, and two thirds less in the latter. The proportions of this tooth are consequently totally at variance with that of its kindred species. (Vid. pl. 12. fig. 7. 8. 9. *a.* exterior,—*b.* interior,—*c.* crown.)

5. *Os humeri.*—The portions of the skeletons of this genus, which remain to be described, being heretofore unknown, our means of comparative observation as regards its kindred species are at an end; among its congeners however, there exists ample means of comparison. In the *form* of the humerus of the *Orycteropus*, for example, we find the almost exact counterpart of that now under notice. (Vid. Anim. foss. vol. 5. part 1. pl. 12. fig. 2. Ed. 3.)

It has already been remarked that the individual whose bones are above described, was at death a young animal, perhaps one third less than the adult size; consequently the epiphyses are generally separated, and in some instances lost: this is the case with the arm bone. Being in possession of a larger and much more perfect specimen of a fossil humerus of the same species from Big-bone-lick, we shall draw our descriptions from this;—merely remarking of the former, that it bears the same relative proportions to the radius, as is observed in the same

parts in the *Orycteropus*. Myrmecophaga Capensis.—Pall. (Vid. Table of dimensions.)

The humerus from Big-bone-lick, is nineteen inches long, and is of the colour and consistence of the bones of the Mastodon from the same locality. Like the same bone in the Myrmecophaga and Orycteropus, it is distinguished by the extreme length of the internal condyle, in order to afford origin to the large muscles which move their enormous claws. This internal condyle is also distinguished by a large foramen, for the transmission of nerves and blood vessels, and to relieve them from the pressure to which they would be subjected by the action of the large muscles in their vicinity. This foramen is characteristic of all the species included in the order Edentata, with the exception of the *Sloth* and *Megatherium*. The shaft is strongly marked with longitudinal ridges and depressions; its superior head by a large external and internal protuberance; its lower head, together with the radio-humeral articulating surface, is broad and flat, with a depression or cavity on the posterior part, for the coronoid process of the ulna. The external condyle is partially fractured, but judging from the apparent curvature at its superior border, its outline is precisely the same as that of this condyle in the Orycteropus. (Vid. pl. 13. fig. 10. from Big-bone-lick. Fig. 11. White Cave, Kentucky.)

6. *Scapula.*—As a counterpart for this bone we might refer to its almost miniature likeness, the scapula of the *Myrmecophaga jubata*, to which it bears a closer resemblance than to that of any other animal. In both, the bone is nearly as high as broad; and both are perforated by a distinct foramen, in place of a notch, near the anterior and inferior angle; but they differ in the relative position of the superior and posterior angle, in the relative lengths of the different borders, and in the relative length of the acromion process. The posterior border is nearly rectilinear in the present instance, and curved in the Ant-eater. The acromion process is nearly on a line with the anterior border of the glenoid cavity, in the former; whereas this process projects below, and before this border in the latter. In both, the acromion projects a considerable distance from the coracoid process, with which it has no connection. The anterior border of the megalonyx scapula being broken, we have by dotted lines, attempted its restoration in the figure. The glenoid cavity is an ellipsis, nearly twice as long as it is broad. It is most probable that the new animal, like the Orycteropus, was destitute of clavicle, in which respect they differ from the Megatherium, the little Ant-eater, and the Sloth. (Vid. Tab. of dimens. and pl. 13. fig. 12. which may be compared with the humerus of the Orycteropus, pl. 9. fig. 6. vol. 5. pl. 1. ed. 3. Anim. foss.)

7. A metacarpal bone, which probably belonged to the same animal from which we have derived the humerus, was lately obtained by Mr. Cooper from Big-bone-lick, for a cast of which we are indebted to Dr. Dekay;—it is proportionably shorter and thicker than the metacarpal bone of the index finger of the M. Jeffersonii, to which it bears a general resemblance; it differs also in the diagonal or oblique position of the articulating surface of its inferior head, and in the greater size of its tuberosities; from the marks on its superior or carpal head, it must have belonged to the right fore-foot, and is part of a skeleton of an animal much larger and more powerful than the M. Jeffersonii. (pl. 13. fig. 13. back view, fig. 14. anterior articulating surface.)

8. *Ribs.*—The first rib of the left side has its inferior extremity broken off;—it is characterized by the extreme width of its superior head; the largeness and proximity of the two articulating surfaces; and the deep furrows for the lodgement of muscles. —pl. 13. fig. 15. The remaining rib is in a state of perfect preservation; it is much thicker in proportion to its length than that of the Rhinoceros; the superior extremity is marked, for a small distance, with a furrow for the intercostal arteries, on both the anterior and posterior borders:—the distal extremity is narrow; it appears to be one of the anterior false ribs, left side. (Tab. dimens.—and pl. 14. fig. 16.)

9. *Vertebræ.*—These consist of four dorsal and one lumbar; pl. 13. fig. 17. appears to be one of the posterior dorsal. The general resemblance is to that of the Megatherium; but the spinous process is not so long; all the processes have lost their epiphyses. The lumbar vertebra is larger and heavier, as usual. The bodies of all are perforated by one or two large foramina, running from the base to the spinal canal. (Vid. Tab. of Dimens. pl. 13. fig. 18.)

10. *Femur.*—An epiphysis, comprising the inferior head, is the only portion of this bone preserved; this however is very important, as it enables us to construct the knee joint, which in this animal presents remarkable characters. When it is recollected that the whole order of the Edentata, like that of the Monotremata, are characterized by their abnormal physical developments, the peculiar structure observed in the new fossil animal will appear less surprising.

The internal condyle is very considerably larger and projects further downwards than usual; where it is received into a rather deep concavity of the tibia. The external condyle is smaller and represents a segment of a flattened sphere, the longest diameter of which is in the antero-posterior direction; the depressed surface looking obliquely inwards, toward the internal condyle, from which it is separate nearly two inches. The pulley-like surface for the ac-

commodation of the rotula, is large, and strongly marked, though not deep. This portion belonged to the femur of the right side. Vid. Tab. Dimens. and pl. 14. fig. 19.

11. *Tibia.*—This bone is in a good state of preservation with the exception of the inferior head, which is deprived of its epiphysis. The depression on the superior head for the reception of the internal condyle, is nowise remarkable, except for its unusual depth; it would admit of extensive motion without liability to luxation. The central ridge which divides the head does not extend across the surface: the articulating surface is convex; and on its outer border, in place of the usual depression for the reception of the external condyle there exists a segment of a *flattened sphere*, projecting upwards nearly on a level with the central ridge, and in a manner isolated from the other portions of the articulating surface, leaving a considerable portion of the anterior and exterior part of this surface, irregularly raised, not covered with cartilage, and bearing marks of tendinous insertions. This sphere is rather more depressed than the external condyle, on which it moves; and projects posteriorly, much beyond the border of the interior articulating cavity. On the exterior and rather posterior lateral portion of this sphere, there is a rough and honey-comb appearance, evidently intended for the attachment, by anchylosis, of the superior head of the fibula,

which must have occupied a position nearly posterior as well as exterior to the tibia. The body of the tibia is uniform anteriorly and depressed; gradually narrowing and compressed towards the middle, and again enlarging at the inferior portion: posteriorly the body of the bone presents a broad ridge, causing a considerable projection at the upper part, and descending in a straight line from the sphere in the centre of the bone, and disappears before it reaches the middle of the tibia. By referring to the tab. of dimensions, and pl. 14. fig. 20 and 21. being an interior and posterior view—and to fig. 22. being a view of the articulating surface, a more correct idea of this anomalous structure will be obtained, than can be given in a description. The tibia is of the left leg.

12. There is an articulating epiphysis, which appears to have been attached to the inferior head of a tibia; but is unlike any portion of bone of that kind that has come under my observation. It presents a large articulating surface, still covered with dark coloured cartilage; there is a short internal maleolus, separated from the articulating surface anteriorly by a deep groove for the passage of a strong tendon, and two other grooves, situated laterally and rather posteriorly; there is also a small articulating surface projecting obliquely upward and outward from the exterior border; the bone is convex anteriorly, and concave posteriorly. It appears too large to have formed a part of the tibia just described, pl. 14. fig. 23.

13. The Os calcis presents some analogy in general contour to that of the Badypus tridactylus, but is proportionably much shorter, as will be seen by referring to the table of dimensions; it presents three articulating surfaces for attachment to the astragalus; superior, inferior, and exterior. Vid. pl. 14. fig. 24. The inferior border is concave; the superior, probably, an oblique plain; (this portion being fractured.) The posterior and inferior extremity is inclined inwards. Vid. pl. 14. fig. 25.

14. The inferior maxilla of a Bear, found in "White Cave," is introduced here, as it displays appearances of an antiquity nearly equal to that of the bones of the Megalonyx. It appears to have belonged to the common black Bear, (Ursus Americanus,) pl. 14. fig. 26.

Our animal with the teeth constructed after the manner of the Sloth, presents in the remaining portions of the skeleton, a singular admixture of characters peculiar to the Ant-eater, the Armadillo, and the Orycteropus.

In size, the adult of the present species surpasses the Megalonyx of Jefferson, being about one third less than the Megatherium. It possesses peculiarities of organic structure, which certainly entitle it to rank as a distinct species; indeed a minute examination of the tooth and knee joint, render it not improbable, supposing the last named character to be peculiar to it, that if the whole frame should

hereafter be discovered, it may even claim a generic distinction; in which case, either Aulaxodon, or PLEURODON, would not be an inappropriate name; referring to the ribbed or fluted form of the mesial aspect of the tooth, M. Desmarest's most prominent character of this genus, viz. "Molars cylindrical," will not apply to this animal. In every instance, when it could be accomplished with any degree of certainty, an attempt has been made to restore the fractured portions of bone, by introducing dotted lines.

The fossil humerus disinterred at Big-bone-lick, and which appears to have belonged to an adult individual of the present species, is nineteen inches in length; the same bone of the Megatherium is twenty-six inches and four tenths; the height of the whole skeleton of the latter, according to CUVIER, being seven feet four inches and five tenths; which would give to the new animal, a height of about five feet, supposing the existence of similar proportions. The radius of the new animal, (being part of the young skeleton found in "White Cave") is about one sixth less than that of the M. Jeffersonii; and the individual to which it belonged, may have been about the size of the common ox, although it was not more than three fourths grown, if we are permitted to judge from comparisons made on the size of the os humeri, and metacarpal bone of the fossil animal found at Big-bone-lick, with those from White Cave.

The laws of co-existence, when applied to estimate the relative proportions of animals, must of course be admitted with some limitation, these proportions being known to vary according to age, and other circumstances. Thus the legs of the colt are proportionably much longer than those of the horse; and were we to conclude from the extreme size of the internal condyle of the os humeri of the *Orycteropus*, that the claws of this animal are equally developed with some others of the same order, the conclusion would be erroneous. Further, the bones of the fore arm of the new Megalonyx, (young specimen) are actually smaller than those of the M. Jeffersonii, yet the claws of the former are absolutely larger and stronger. Indeed, as Cuvier has already remarked, there exists exceptions to all those general laws of co-existence, so admirably established by his boundless penetration. Thus, to the general law, "Ruminant animals furnished with sharp canines are destitute of horns," are opposed the examples found in the Cervus *moschatus*, and in the subgenus, Rusa. Again, "Ruminants alone are characterized by cloven hoofs"—the genus *Sus* furnishes an example directly at variance with this rule. Such exceptions however stand in relation to the whole system, as "spots in the sun;" the only surprise is, that they do not more frequently occur. In fine, the deeper we enter into the study of this

most important and deeply interesting department of knowledge, based as it is, on the unerring principles of geometrical and mathematical science, the more cause we find to look up with admiration to that "Master Spirit," which diffusing itself through every department of animated nature, has conferred upon this, a dignity, order, and utility, equalled only by the science of astronomy; and which certainly cannot be surpassed by any pursuit that may occupy the mind of man.

TABLE OF DIMENSIONS.

LARGE CLAW.

	Inches.
Length of the largest Claw	6. 8
Height	3. 4
Length of articulating surface along the cord of the arch	1. 6
Breadth of the same	1. 6

SMALL CLAW.

Length	6. 0
Height	2. 0
Length of articulating surface along the cord of the arch	1. 1
Breadth	1. 1

RADIUS.

Length without inferior head	12. 6
Greatest width	3. 1
Thickness	1. 0

MOLAR TOOTH.

Length of the fragment	2. 3
Antero-posterior diameter	1. 4
Transverse	0. 8

HUMERUS

From Big-bone-lick.

Length	19. 0
Greatest diameter of its shaft	3. 0
——— of superior head	5. 5
Breadth of inferior head, about	9. 0
Long diameter of the foramen in the internal condyle	2. 0
Short or transverse diameter	1. 0
Diameter of superior articulating surface	4. 0
Length of articulating surface of inferior head	6. 0
Distance of the extremity of the internal condyle from the centre of the shaft	6. 0

HUMERUS

from White Cave, without epiphyses.

Length	12. 8
Diameter of the shaft	2. 0

METACARPAL BONE

from Big-bone-lick.

Length	5. 0
Long diameter of anterior head	2. 5
Short diameter	1. 5

SCAPULA.

Length of the spinal border not following its curvature, about	13. 0
Posterior border	9. 0
Anterior border	9. 0
Height of scapula from the centre of the spinal border, to glenoid cavity, about	11. 0
Length of glenoid cavity	3. 5
Transverse diameter	2. 0
Height of the spinous process	3. 0
Length of the acromion process	3. 0
Breadth	1. 5

RIB.

Breadth of the head of the first rib	3. 8
——— of articulating surface	2. 3
Length of the false rib following its curvature	29. 0
Breadth	1. 5

VERTEBRÆ.

Height of a dorsal vertebra

from the base of the body to the apex of the spinous process	7. 0
Diameter of the body	2. 5
——— of the spinal canal	2. 0

FEMUR.

Greatest breadth of the inferior head	8. 6
Diameter of the internal condyle	3. 0
——— external	2. 0
Breadth of the rotuline surface	3. 3

TIBIA.

Length, about	10. 0
Transverse diameter of the superior head	6. 4
Antero-posterior diameter across the external condyle	5. 0
Transverse diameter of the middle of the bone	2 7
Antero-posterior diameter	1. 7

TIBIAL EPIPHYSIS.

Transverse diameter	5. 3
Antero-posterior diameter	2. 7

OS CALCIS.

Length	5. 5
Height of articulating surfaces	4. 0
Breadth of the same	3. 3
Height of the body of the bone	3. 0

EXPLANATION OF THE PLATES.

PLATE XII. Fig .1. Ungueal phalanx of the medius finger.
2. View of the inferior surface of the same.
3. and 4. Lateral views of the annular phalanx.
5. Radius, anterior view.
6. Radius, posterior view.
7. Molar tooth, external lateral view.
8. ———, interial lateral view.
9. Crown of the tooth.

PLATE XIII. 10. Humerus from Big-bone-lick.
11. Humerus from White Cave.
12. Scapula.
13. Metacarpal bone of the index finger, back view.
14. ——— anterior articulating surface.
15. First rib.

PLATE XIV. 16. False rib.
17. Posterior dorsal vertebra.
18. Lumbar vertebra.
19. Condyles of the Femur.
20. Tibia, posterior view.
21. ——, interior view.
22. ——, articulating surface.
23. Epiphysis from the inferior head of a Tibia.
24. Os calcis, articulating surface.
25. ——— lateral view.
26. Inferior maxilla of a Bear.

Description of an extinct Species of Fossil Vegetable, *of the family Fucoides. By* R. Harlan, *M. D. &c.*

[Read March 8th, 1831.]

Ord. Nat. ALGÆ. Cryptogamæ aquaticæ, plerumque marinæ; fronde inarticulata et carnosa; familias *Ulvacea* et *Fucacea* formant.

Fam. *Fucoides*,[1] Sternb. *Algacites*, Schloth. "Frons continua, nunquam articulata, plerumque difformis, nec symmetrica; aut subcylindrica, simplex vel sæpius ramosa, nuda vel rarius folia sustinens; aut membranacea, integra seu magis minusve lobata, nervis nullis vel imperfecte notatis, vage ramosis nec unquam anastomosantibus percursa. Fructificatio, dum exstat, punctiformis vel vesiculas sessiles aut pedicillatus efformans."—(*Brongn.*)

Sect. *Cladorytes.** Stipes ramosus; ramis subcylindraceis, transverse rugatis.

Fucoides *Alleghaniensis.** Fronde compressa, rugata; apice recurva, obtusa; ramis inequalibus, digitatis et fastigiatis, enervibus, nudatis.

Place in the Series.—Compact sandstone, subjacent to the coal formations.

Locality.—One of the eastern ridges of the Alleghany mountains, about 40° north latitude, and about 77° west longitude, from Greenwich; one

[1] Including a general group of Fossil Algæ.

hundred and fifty miles from Philadelphia; ten miles east of Lewistown, north side of the Juniata river, Mifflin county, state of Pennsylvania.

This fossil Fucus presents one of the richest specimens of vegetable organic remains, that has hitherto come under my notice; not only is there a fragment of stone two and a half feet long by one and a half feet wide, with the surface completely crowded with the forms of this plant, but they lie upon each other three or four layers deep, as is demonstrated by a horizontal fracture. (Vid. Pl. XV. Fig. 1.) They project in bold relief from the surface, with their distal extremities disposed in every direction; they appear to have been of different ages, and vary in size accordingly from two to five inches in length, the largest being eight tenths of an inch in thickness. In breadth they vary from one to five tenths of an inch: they are generally gently arched from the base towards the apex, and more or less recurved at top; in every instance the apex is curved downwards and sinks into the stone. The superior surface of both the stalk and branches is cylindrical, transversely wrinkled by irregular channels, and marked by a longitudinal depressed line.

The most perfect and distinct specimen has been selected and figured, of the natural size, in order to display the digitations of the stalk, and fasciculation of the branches; (Vid. Pl. XV. fig. 2.) They have

grown in such profusion and are so crowded together that the commencements or bases of the stalks are for the most part concealed; so that in this specimen which is five inches long, the stalk of the plant, previous to the first digitation or branch, is only seven tenths of an inch in length; the largest stalk exposed to view being one inch and eight tenths.

The branches are all compressed laterally as well as the stalk, (Pl. XV. fig. 3.) and are fasciculated or closely applied side by side at the commencement, and gradually diverge more or less towards their distal extremities, and in the present instance are given off in the following order commencing from the right,—one—two—three, gradually increasing in size; descending again to the stalk, there is a much larger branch, which soon subdivides into four irregular branches of various sizes: but in this respect there exists no uniformity: in every case, however, the stalks very soon divide into two or more branches; the latter are more or less wrinkled apparently according to age, the rugæ being more or less obsolete in the largest,—profoundly developed in the smaller or younger specimens.

The plants are fractured in many places, and in various directions, but the fractured portions do not display any evidence of organization; nor is there any appearance of leaves, nervures, or fructification. The mass of the fragment of rock in which these fossils occur, is about half a foot in thickness,

and weighs something less than two hundred pounds; it is of a very compact texture, and readily strikes fire under the hammer. When I first observed this geological specimen, on my return from an excursion to the Alleghany Mountains in the month of August of the past year, it constituted part of a pavement before the door of a tavern: the landlord informed me, that the stone came rolling down the mountain, (which is here very precipitous) within a few yards of the house, and that viewing it as a very ornamental specimen, he had placed it in the earth before his door to attract public notice; and I confess that at the short distance in which I first viewed the specimen, it appeared to represent a beautiful piece of artificial sculpture. There exists a vertical fracture on one portion of the stone, which has evidently occurred subsequently to the petrifaction of the plants, and is filled at present with quartz, forming an irregular vein.

Brongniart, has already determined with sufficient accuracy, the existence of thirty-six species of fossil Fuci. (Vid. Histoire des végétaux fossiles, ou Recherches Botaniques et Geologiques sur les végétaux renfermés dans les diverses couches du globe. Par M. Adolphe Brongniart.)

To this author, together with the work of Baron Sternberg, I have been indebted for details of great interest concerning these extinct vegetable species. M. B. confesses his inability to divide this family

into distinct genera, inasmuch as the characters proper to define them accurately, occur too rarely to admit of a precise classification; but he has divided the general group of fossil Algæ, to which has been given the name "*Fucoides*," into sections, founded on the form of the branches; which sections are found to correspond with sufficient accuracy to one or more genera of living ALGÆ.

Only two species of fossil Fuci, have been hitherto observed in North America, viz: F. *dentatus*, and F. *Serra*. M. B. describes these as occurring in the "Transition limestone of Canada," and as being very different from any of the existing species. Both in the north of America and of Europe these fossils have been discovered in some of the most ancient strata of the globe. In Europe, among the lower secondary formations (terrains de sediment inférieur), the bituminous Schists of Mansfield, and the anthracite coal mines of Scania, are the only strata which contain impressions of Fuci. They become more common in the strata which separate the Jura limestone from the chalk, where some remarkable species have been discovered. According to M. Keferstein, the "Grauwake" of the Apennines, which often contains Fuci, belongs to the transition formations, which, judging from its relations to the carboniferous limestone enclosing belemnites, probably corresponds to the Lais formations.

At Bignor, in England, these fossils are found in the *Ferruginous sand*, according to M. Greenough;

and at Voisons, Switzerland, according to M. M. Dufresnoy and Elie de Beaumont, they are found in the green sand formation, which separates the Jura limestone from the chalk.

M. Brongniart remarks, that if we admit these fossil Fuci to belong to an epoch nearly contemporaneous with the marine lignites underlying the chalk of the isle of Aix, the submarine flora which characterizes this period indicates a vegetation very different from that of the existing species on those coasts, and which approaches rather to those of the equatorial regions, than to those of the frigid zone.

In the chalk itself only a single vestige of a plant of this family, the "F. *lyngbyanus*," has been discovered; this appears allied to a genus peculiar to the equatorial regions. In examining the fossil Algæ of the superior secondary regions, M. Brongniart arrives at a very different result: most of these species are from Monte-Bolca, and display great analogy to those genera at present existing on the Mediterranean coasts. Thus "marine vegetation, like the terrestrial, displays stronger affinity to that of our climate in proportion as the formations in which they occur are more recent. They present, on the contrary, characters more analogous to those of the vegetation of equatorial climates, in proportion as they belong to an epoch of more ancient formation."

In the course of the present investigation I have been led further to admire the great harmony that

is found to preside over all the laws which regulate organic life. It may be readily anticipated to what immense extent the study of fossil botany, added to that of fossil zoology is calculated not only to enlighten us as regards the antediluvian climates, but to direct us finally to a certain knowledge of the comparative ages of the various strata which constitute the crust of the globe we inhabit.

EXPLANATION OF PLATE XV.

Fig. 1st. A general view of the surface of the stone containing the fossil plants.

2nd. A single plant of the natural size; anterior view.

3d. A lateral view of one of the branches.

Notice of some Parasitic Worms. By Samuel George Morton, M. D. *Lecturer on Anatomy, &c.*

[Read March 15, 1831.]

Much attention has been given of late years to those parasitic worms which infest the various classes of animals; and it is now well established that besides the species which are strictly intestinal, there are many more, entirely distinct in structure, inhabiting the other cavities of the body. There appears at first sight to be much confusion and irregularity in these animals; if carefully examined, however, they present a surprising constancy of organization. Thus, the worms of the alimentary canal are limited to a few species, each preserving its appropriate characters without being modified by constitution or by climate. Other species are peculiar to other parts of the body, and here again we find the same definite organic characters.

My friend Mr. John Townsend, lately presented me with a Mink (*Mustela vison*) which had been killed a few hours previous on the bank of the Schuylkill river. On dissecting this animal, I observed a considerable disproportion in the size of the kidneys, and accordingly took them from the body with the ureters and bladder attached. The smaller kidney was about an inch and three quar-

ters in length, and perfectly healthy; the other was about one third larger. On opening the latter, I found that it consisted of a sac containing parasitic worms.

This sac was no doubt the proper capsule of the kidney, but so much thickened as to resemble the dura mater: not the smallest trace of glandular structure remained, and the sac was completely filled by two worms, which were coiled with each other like a skein of thread. The largest of them is upwards of fifteen inches in length; the smaller about eight inches; the diameter of the former is a line and a half; of the latter, three fourths of a line, and it is really surprising how these animals could have existed in the small space they occupied.

Mr. Rudolphi in his *Traité sur les Entozoaires*, as quoted by Dr. Bremser,* has been at much pains to classify the Parasitic worms; and I find a specific identity between his *Strongylus gigas* and the animals obtained in my dissection.

To the dimensions of the latter just given, I may add, that they have a cylindrical body, terminating abruptly at each extremity, and delicately annulated from the mouth to the anus. Eight longitudinal striæ run the whole length of the animal, which, previously to immersion in spirits, was of a translucent yellowish brown colour. The smaller of the two has

* Traité Zoologique et Physiologique sur les Vers Intestinaux, &c. Paris, 1824. Lamarck, An. sans Vertebres, T. 3. p. 202.

the male organs so clearly described and figured by Bremser, (loco citato, Pl. 3, fig. 3 and 36) while the larger one is obviously a female. It is worthy of remark, that there were attached to the internal surface of the capsule three spiculæ of bone, one of which is flattened, measures an inch in length, and has lateral projections. These have doubtless been secreted by the arteries of the kidney.

This *Strongylus* is found only in the kidneys of the mammalia, and has been noticed in Man, the Dog, Otter, Seal, Horse, Ox, the different species of the genus *Mustela*, &c.

M. de Blainville, in his notes to Dr. Bremser's work, details the characters of one of these worms which he took from the kidney of a Marten (Mustela martes) which correspond in almost every particular with those I have described; a singular proof of the constancy of the specific characters of animals so obscure as these, and so far geographically removed from each other.

Some men, and even some physicians, insist on the utility of intestinal worms, and consider them to be a kind of scavengers in the bowels they inhabit. It may be inquired, however, whether the analogy will hold good with respect to all parasitic worms, those of the lungs, kidneys, bladder, &c. &c.

Do not reason and analogy go to show us, that where there are worms there is disease, and that in our efforts to cure the latter we should eradicate the former?

Descriptions of new NORTH AMERICAN HEMIPTEROUS INSECTS *belonging to the first family of the section Homoptera of Latreille.* By THOMAS SAY. [Continued from page 244.]

MEMBRACIS.

6. *M. vau.* Thorax with an oblique band before the middle, and transverse one near the tip.

Inhab. Pennsylvania.

Thorax not greatly elevated, rounded and unarmed before, carinate acutely, from before the middle to the posterior tip; tip hardly reaching the end of the nervures of the hemelytra; a whitish, very oblique band, edged with fuscous, crosses the back before the middle, and reaches the lateral edge behind the middle; near the tip a transverse band, and between the two bands a whitish spot; *hemelytra,* a little fuliginous at base and tip; three terminal cellules unequal, the inner one being as large as the two others together.

Length to tip of hemelytra one fourth of an inch.

7. *M. inornata.* Immaculate; thorax carinate; wings white.

Inhab. Pennsylvania.

Body greenish or yellowish green: *thorax* acutely carinate, from near the anterior margin to the tip; not greatly elevated, rounded before, unarmed; tip not attaining the tip of the cellules of the hemelytra: *hemelytra* whitish; three terminal cellules

unequal, inner one larger than the two others together, terminal one almost oval transverse: *oviduct* dusky.

Length to tip of hemelytra one fourth of an inch.

In form resembles *M. vau.*

8. *M. subulata.* Thorax subulate behind, carinate, with two obsolete whitish vittæ each side.

Inhab. Maryland.

Body yellowish, (green when recent); *head* a little inequal: *eyes* green undulate with black: *thorax* rounded before; acutely carinate; towards the tip slender, acute; on each side two obsolete, whitish, impunctured lines; tip not reaching the three terminal cellules of the hemelytra: *hemelytra*, three terminal cellules rather broader than long, subequal.

Length to tip of hemelytra more than one fifth of an inch.

The tip of the thorax is still more attenuated than that of the *bubalus*, Fabr.

9. *M. quadrivittata.* Thorax quadrilineate with sanguineous.

Inhab. Maryland.

Body pale yellowish green: *head* trifasciate with black: *thorax* gibbous, with a rounded tubercle over the origin of the hemelytra; four sanguineous vittæ extending near to the middle, the lateral ones oblique; four transverse black spots before, and a dorsal impunctured line; tip acute: *hemelytra*

hyaline; nervures fuscous, greenish towards the base and basal costal margin: *tergum*, segments black at base: *venter* black at base: *pectus* sanguineous each side, disk with large black spots.

Length to tip of hemelytra two fifths of an inch.

Several specimens occurred, on the eastern shore of Maryland, cast up by the waves.

10. *M. mera.* Unarmed; thorax fasciate with fuscous beyond the middle; tip dull sanguineous.

Inhab. Pennsylvania.

Body greenish: *head* immaculate: *thorax* almost regularly arquated above, with a fuscous band, rather behind the middle; tip dull sanguineous: *hemelytra* fuscous at tip; nervures with narrow fuscous edges: *feet* tinged with rufous.

Length to the tip of the hemelytra less than two fifths of an inch.

The thorax has no angulated appearance before, but is obtusely rounded before, and behind the middle, and more obtusely so above. In the 4-*vittata* the thorax declines rectilinearly from near its greatest elevation to the tip without the slightest concavity, whereas in the present species the thorax, beyond the band, declines somewhat abruptly, beyond which it still declines, but rectilinearly to the tip. The tip of the thorax extends as far as the nervures of the hemelytra.

11. *M. marmorata.* Above marbled with rufous and yellow.

Inhab. Pennsylvania.

Head rufous with yellow spots: *thorax* regularly arquated above, behind the middle the line of curvature is a little concave; tip nearly as long as the nervures of the hemelytra: *hemelytra* tinged with rufous at base and fuliginous at tip: *feet* rufous.

Length to the tip of the hemelytra three tenths of an inch.

In general form it resembles *M. mera*, but it is shorter, and the tip of the thorax is considerably shorter in proportion.

12. *M. arquata.* Thorax simple, quadrilineate with fuscous.

Inhab. Pennsylvania.

Thorax cinereous, tinged with rufous on the back, each side of which is a fuscous somewhat undulated line, confluent with the margin behind the middle; exterior to the fuscous line is a cinereous arquated line within which is an abbreviated marginal fuscous line; back not much elevated, simple; tip terminating more obtusely than usual and with a cinereous spot above: *hemelytra* hyaline, with a dusky base, and fuliginous spot in the middle and at tip; nervures margined with brown; terminal cellule smaller than either of the two adjoining ones and transverse: *thighs* blackish.

Length to tip of hemelytra over one fifth of an inch.

Resembles the *picta* as represented by Coquebert.

13. *M. belligera.* Thorax with a projecting horn; tip slender, acute.

Inhab. Pennsylvania and Florida.

Thorax green, with small, fulvous spots; a compressed horn before, which is not in the slightest degree arquated, at its extremity rounded; back not carinated, but with an impunctured line; tip slender, and equally slender when viewed laterally as from above, acute: *hemelytra* hyaline, at base varied with green and yellow; terminal nervure about three times longer than wide.

Length to tip of hemelytra and tip of the horn half an inch.

Resembles *bimaculata*, Fabr. but the tip of the thorax is much more attenuated and acute and the terminal cellule of the hemelytra is elongated.

In addition to the *bimaculata*, F. *sinuata*, F. *emarginata*, F., we must place in this genus, his CENTROTUS *bubalis*. The CENTROTUS *acuminatus* of that author, is only the female of his MEMBRACIS *bimaculata*. His *sinuata* does not appear to me to differ specifically from the *emarginata*.

CERCOPIS, *Fabr. Germ.*

C. bicincta. Sanguineous; wings fuscous, bifasciate.

Inhab. Indiana.

Body sanguineous: *rostrum* blackish at tip: *antennæ* blackish: *vertex* with an obsolete dusky band: *thorax* blackish, edged with sanguineous, except on the posterior part; a rufous band on the middle: *scutel* blackish, sanguineous each side: *hemelytra*

blackish, with two yellow or rufous, narrow bands: *humerus* sanguineous: *pleura* with one or two large black spots: *abdomen* disks of the segments blackish: *thighs* beneath, and *tarsi* blackish.

Length to the tip of the hemelytra two fifths of an inch.

Resembles the *rubra*, Linn. and *sororia*, Germ. but is sufficiently distinct. It frequently occurs in this state, sometimes in Pennsylvania, and Mr. Nuttall gave me a specimen which he obtained in Arkansaw.

APHROPHORA, *Germ.*

1. *A. bilineata.* Grayish; hemelytra with a black abbreviated line from the humerus.

Inhab. Missouri.

Body above gray: *head* with an obsolete, double, brownish line: *ocelli* not very distinct: *eyes* trilineate with dusky: *antennæ* with a fuscous spot at tip: *thorax* with a hardly perceptible, double, brownish line, and another behind the eye: *hemelytra* with a longitudinal blackish line from the humerus, parallel with the costal margin, abbreviated at the middle; *costal margin* whitish: *tergum* black; lateral edge and tip yellowish: *beneath* yellowish.

Length to tip of hemelytra less than one fourth of an inch.

2. *A. quadrinotata.* Pale; hemelytra dusky, with two large hyaline costal spots.

Inhab. U. S.

Body pale yellowish: *head*, on the anterior margin beneath, with black spots: *rostrum* black at tip: *stemmata* sanguineous: *vertex* with a longitudinal, slightly elevated line: *thorax* rather darker behind, and with a slightly elevated longitudinal line: *hemelytra* pale brownish, with two large white or hyaline costal spots, which are somewhat margined with fuscous.

Length to the tip of the hemelytra nearly three tenths of an inch.

To this genus, as formed by Germar, belong the following species which I formerly published, viz.

Cercopis parallela.
Cercopis quadrangularis.
Cercopis obtusa.

Jassus, *Fabr. Germ.*

J. inimicus. Head with two dots, thorax with a transverse series of dots.

Inhab. Virginia.

Body pale, with a yellowish or greenish tinge: *head* with a black dot each side at tip; *hypostoma* with transverse fuscous interrupted lines: *thorax* with a transverse, arquated series of about four fuscous points on the anterior margin; posterior disk a little dusky: *scutel* with a black abbreviated line each side at base, and an obsolete, double, diverging line in the middle: *hemelytra* hyaline, with brown nervures: *tergum* blackish, margin yellow.

Length to tip of hemelytra over three twentieths of an inch.

Var. a. Hemelytra with the cellules edged with fuscous; nervures whitish.

When in the larva state this species is said to depredate on the roots of wheat. Several specimens were sent me by Professor Green, in the year 1822, who received them from a farmer of Virginia.

2. *J. acutus.* Head elongated, acute; thorax five lined.

Inhab. Indiana.

Body above with minute, brownish reticulations: *head* much elongated, as long as the thorax and half the *scutel*; with about three gray lines consisting of the absence of reticulations: *thorax* about five-lined: *hemelytra* with larger reticulations, enclosing whitish spots which are somewhat larger on the costal margin: *beneath* blue-black; disk of the head yellow: *feet* yellowish spotted with black.

Length to tip of hemelytra nearly one fifth of an inch.

3. *J. immistus.* Head yellow, with green bands before and a cupreous one above; wings reticulated.

Inhab. Indiana and Missouri.

Head pale yellow; a brown subcupreous band between the anterior angles of the eyes, a slender green one near the anterior edge complying with its curvature, and at least two green slender bands beneath the anterior edge: *antennæ* with a somewhat elongated

seta: *thorax* bifasciate with subcupreous, first band partly concealed by the head, the other interrupted in its middle; *scutel* subcupreous on its basal half: *hemelytra* bluish-white, fuscous at base and tip, and reticulate with fuscous in the middle; the fuscous portions have a subcupreous, brilliant reflection: *wings* whitish, with brown nervures: *pectus* immaculate: *feet* pale yellowish; *posterior thighs* greenish, their tibiæ with a series of green points and tip, their tarsi green in the middle.

Length to tip of hemelytra more than one fifth of an inch.

4. *J. seminudus.* Hemelytra white with a large brown band.

Inhab. Indiana.

Body yellowish-white: *head* before rounded, obtuse, nearly parallel to the posterior edge: *thorax* and *scutel* obsoletely spotted with greenish: *hemelytra* whitish, somewhat opalescent; a broad common brown band on the middle, partially edged with fuscous and a brownish spot near the costal tip: *tergum* blackish each side on the middle: *beneath* immaculate.

Length to tip of hemelytra over one fifth of an inch.

5. *J. sanctus.* Hemelytra white, with a common brown cruciate mark.

Inhab. Indiana.

Body yellowish-white: *head* subacute, with two

minute fuscous points near the tip and an undulated line on the anterior edge: *thorax* dusky across the middle: *hemelytra* white, somewhat opalescent, with a common large cruciform mark on the middle, composed of brownish spots with blackish edges and including a whitish common spot; tip with large spots: *venter* with a dusky band and small lateral spots: *feet* immaculate.

Length to tip of hemelytra nearly one fifth of an inch.

6. *J. verticis.* Vertex hardly as long as half the greatest diameter of the eye.

Inhab. Missouri.

Body beneath yellow, immaculate: *vertex* remarkably short, wide, irrorate with fuscous, not so long as half the greatest diameter of the eye: *eyes* small, remote: *thorax* yellowish, irrorate with fuscous; *scutel* yellowish, irrorate; two obsolete darker spots at base: *hemelytra* fuscous; a hyaline spot on the middle of the inner margin, and a hyaline band, sometimes interrupted, near the tip; costal margin whitish: *tergum* blackish with a yellow margin: *feet* white.

Length to tip of hemelytra nearly one fifth of an inch.

7. *J. irroratus.* Varied with whitish and brown; hemelytra reticulate.

Inhab. U. S.

Body whitish-gray, irrorate with small, irregular

numerous, fuscous spots: *head* with the anterior and posterior edges parallel: *scutel* more dusky on the lateral margin: *hemelytra* subopalescent, reticulate with fuscous, with four or five darker spots on the costal margin towards the tip; *pectus* and *pleura* not irrorate, but with a few blackish spots: *thighs* fasciate and *tibiæ* spotted with fuscous or blued-black: *tergum* blackish; margin yellow with an abbreviated fuscous line on each segment.

Length to tip of hemelytra three tenths of an inch.

A common species; I have obtained it in Pennsylvania, Indiana, Florida, and Missouri.

8. *J. clitellaria.* Hemelytra blackish, with a common yellow spot, and costal margin.

Inhab. Indiana.

Body pale yellow: *head* with two black dots before, and a broad black band at base, occupying half the clypeus: *thorax*, posterior half black: *scutel* black: *hemelytra* black, with a very large subovate, common yellow spot; a broad vitta on the costal margin, gradually attenuated to the humerus and truncate at the opposite extremity; tip and terminal third of the inner margin brown: *beneath* pale yellow.

Length to the tip of the hemelytra one fifth of an inch.

8. *J. novellus.* Vertex with a series of five black dots.

Inhab. Indiana.

Body blue-black: *head* yellowish: *hypostoma* varied with fuscous lines: *vertex* with five black dots in an arquated series: *thorax* with a yellowish disk, in which are a longitudinal line and two dots: *scutel* edged with yellow: *hemelytra* dusky with pale nervures; an opalescent spot on the costal middle: *feet* yellowish.

Length to tip of hemelytra less than three twentieths of an inch.

10. *J. olitorius.* Head yellow; hypostoma bilineate with red.

Inhab. Pennsylvania.

Head yellow; a longitudinal red vitta each side on the hypostoma; *thorax* and *scutel* black-blue, edged with dull rufous; *hemelytra* brownish bronze; nervures fuscous: *pectus* and *venter* black; sutures dull yellowish: *anterior* and *intermediate feet* pale yellow: *posterior thighs* blued-black with yellowish tip, their tibiæ blued-black with yellow spines, their tarsi dull yellowish.

Length more than one fourth of an inch.

J. subbifasciatus. Brown; hemelytra bifasciate with whitish.

Inhab. Pennsylvania.

Body clear light brown: *head* yellow, with a capillary black line on the vertex, and two rufous, subarquated, lines on the hypostoma: *scutel* with about four obsolete, dusky, small spots: *hemelytra* with a whitish band almost interrupted, behind the middle, and an abbreviated band before the middle,

on the second short nervure of the thinner margin and extending to the third nervure; *nervures* fuscous: *pectus* with large black spots.

Length ♀ to the tip of the hemelytra three tenths of an inch.

TETTIGONIA, *Latr. Germ.*

1. *T. occatoria.* Yellowish green, lineate with fuscous.

Inhab. Indiana.

Body above yellowish-green: *head* with a black point at tip; above five-lined; exterior lines submarginal, passing over the stemmata, second pair of lines confluent before and not reaching the tip; central line very small, abbreviated, basal: *thorax* also five-lined, corresponding with the lines of the head, and the three inner ones passing upon the scutel: *hemelytra* lineated with yellowish-green and fuscous, the two inner fuscous lines corresponding with the two exterior lines of the thorax; tip blackish with a yellowish band: *wings* blackish.

Length to tip of hemelytra one fourth of an inch.

2. *T. versuta.* Yellow; head, scutel and hemelytra lineate with dark green.

Inhab. U. S.

Body yellow: *head* with a blackish-green anterior edge; above tinged with fulvous on the disk, with a submarginal, dark green line each side, which is interrupted and diffracted behind the middle, and does not reach the tip of the head, near which it joins a double, obsolete line, which passes over the

middle of the head: *thorax* with a large green spot: *scutel* with several dark green lines: *hemelytra* with three oblique, green vittæ and blackish dots on the apicial margin: *tergum* dusky, or blackish with lateral yellow triangles.

Length to the tip of the hemelytra less than one fourth of an inch.

3. *T. quadrivittata.* Hemelytra sanguineous with oblique green vittæ and margin.

Inhab. U. S.

Body yellow: *head* with a blackish anterior and lateral edge, passing through the eyes: *thorax* rufous, anterior and posterior margins green, the latter connected with a yellowish lateral spot, and a dorsal green vitta which is abbreviated before: *scutel* rufous: *hemelytra* sanguineous, with a green margin and two oblique green vittæ, of which the inner one proceeds from the humerus to the inner margin, and the other is abbreviated and partially twice interrupted: *tergum* sanguineous.

Length to the tip of the hemelytra more than three tenths of an inch.

Very closely allied to *A. bifasciata,* Linn. of Europe, but that species is much more hairy; in the 4-notata all the nervures of the hemelytra are distinctly visible.

4. *T. mollipes.* Yellow; hemelytra green with a pale margin.

Inhab. U. S.

Body yellow: *head* elongated, acute before; beneath the eyes, a brown line which is continued on

the pectus: *thorax* green, a broad anterior and lateral yellow margin: *scutel* greenish-yellow: *hemelytra* green; nervures paler; exterior and apicial margins pale yellow or whitish; a pale yellowish, capillary, oblique line from the humerus to the inner margin: *tergum* black-purple, lateral edge and tip yellow.

Length to the tip of the hemelytra over three tenths of an inch.

A common species.

5. *T. bifida.* Green, head and thorax banded, and hemelytra lineated with blackish.

Inhab. Indiana.

Vertex white with a central, transverse, dark green, abbreviated line; prominent tip of the head with a dark green spot; labrum yellowish, at tip dusky: *thorax*, anterior margin and posterior submargin, with a transverse dark green transverse line, anterior submargin and posterior margin with a white transverse line: *scutel* on the edge and a central, transverse, abbreviated line dark green: *hemelytra* with six rather oblique dark green lines, the exterior one bifid at tip: *beneath* blackish: *feet* pale.

Length to the tip of the hemelytra about one fifth of an inch.

6. *T. hieroglyphica.* Dull rufous; head and scutel lineated; hemelytra spotted.

Inhab. Arkansaw.

Body obscurely dull rufous: *head* with a black dot at tip, above literate with black: *thorax* with a

dusky posterior disk: *scutel* with black more or less curved lines: *hemelytra* obsoletely spotted, nervures being pale: *beneath* pale yellowish: *pectus* with large black spots: *feet* immaculate: *tergum* blue-black, edge yellow.

Length to tip of hemelytra one fifth of an inch.

Agreeably to the arrangement of Germar, the following of my published species, may be placed in this genus, viz.

CERCOPIS *obliqua*,—*C. basilaris*, and *C. comes*; as well as the following species of Fabricius, viz. CICADA *undata*, *C. irrorata*, and CERCOPIS *costalis*.

The species which I published under the name of CICADA *mixta*, has the same relation to this genus as the *C. costalis* of Panzer.

List of Donations to the Museum of the Academy of Natural Sciences, during the years 1827–28–29–30.

1827.

January. 500 N. Amer. Plants. *Dr. B. H. Coates.*

February. Sandstone with Dendrites. *Mr. S. W. Conrad.*

Testudo elephantopus. *Dr. Harlan.*

March. Thirteen specimens of vegetable impressions in slate, from Mauch Chunk and Pottsville. *Dr. R. E. Griffith.*

6 specimens of minerals from Peru. *Capt. Brants.*

Topaz, from Connect. *Mr. Carpenter.*

Nacrite. *Mr. Conrad.*

Anatifa aurita? &c. &c. China sea. *Dr. Harlan.*

Arctomys tridecem-lineata. *Dr. Pickering.*

Beryl, Haddington, Pa. *Mr. Conrad.*

Collection of N. A. Fungi. Rev. *L. De Scheweinitz.*

April. Disthéne. *Mr. Lea.*

Pearl, from Venus mercenaria. *Mr. Leaming.*

Selenite, &c. *Mr. W. R. Johnson.*

Dried Ferns, from China. *Mr. W. W. Wood.*

May. 17 specimens of Tabular Spar, Scapolite, Tetanium, &c. &c. from Bucks Co. Penns. *Dr. S. G. Morton.*

Fossil Bones of the Crocodile, N. Jersey. *Mr. S. R. Wetherill.*

Coluber getulus, &c. S. Carolina. *Dr. Blanding.*

Three species of Coluber, S. Carolina. *Dr. Blanding thro' Dr. Harlan.*

Venus Dione. *Mr. Ord.*

June. Fourteen specimens minerals, from vicinity of Boston. *Dr. Pickering.*

5 specimens Ostrea convexa. (fossil) *Dr. S. G. Morton.*

July. Emys serrata. *Mr. Collins.*

Salamandra erythronota. *Dr. Pickering.*

——— dorsalis. *Dr. Blanding thro' Dr. Harlan.*

Living specimens of Hirundo swampena. *Dr. Harlan.*
Lava, W. Indies. *Mr. Dietz.*
Ostrea falcata, Delaware. *Dr. S. G. Morton.*
Ophisaurus ventralis. *Dr. Harlan.*
August. Coluber amœnus. *Dr. Harlan.*
Jasper. *Mr. Conrad.*
Fossil Charcoal, &c. *Mr. Merrick.*
Amber and organic remains, Ches. & Del. Canal. *Mr. Sloan.*
October. Chromate of Iron, Penns. *Mr. Townsend.*
Lophius, Key West. *Dr. Dubarry.*
23 species marine shells, from Peru, &c. *Capt. A. Davis.*
8 specimens minerals from Peru. *Capt. A. Davis.*
Scarabeus titius. *Mr. Collins.*
November. Two specimens Carb. of Copper; Chessy, Fr. *Mr. Jos. P. Smith.*
Iguana, Gallipagos Ids. *Capt. Davis.*
Collection of minerals. *Mr. Etting.*
Raja, Rhode Island. *Mr. Collins.*
December. Chetodon, Zeus, and Hippocampus; Del. Bay. *Dr. Harlan.*
Box of European Insects. *Mr. Lukins.*

1828.

February. Gryphæa mutabilis, 3 specimens; Delaware. *Dr. S. G. Morton.*
———— vomer. Pr. by same.
Terebratula Harlani. Pr. by same.
Garnet in Blue Quartz. Pa. *Dr. S. G. Morton.*
May. Andalusite. S. Car. *Dr. W. Blanding thro' Dr. Morton.*
Chrysoprase, Blue Spar, &c. *Dr. S. G. Morton.*
June. Three species marine shells. India. *Capt. Brants.*
Radiated Talc. S. Car. *Dr. Blanding.*
Female Condor (vultur gryphus), S. Amer. Mess. *Pennock, Wetherill,* and *Harlan.*

38 species marine shells. *M. Joshua Haven.*
Box of Seeds and Roots. *Dr. Wallich of Calcutta.*
July. Sphærulite. Hungary. *Dr. Harlan.*
Tooth of Asiatic elephant; Horn of the Rhinoceros, &c. *Mr. G. Blakie.*
2 specimens Anodonta. Union Canal. *Mr. Ord.*
Ten specimens Fossil Shells. Italy. *Dr. M'Euen.*
August. Rock Crystals. Lake George. *Dr. Hadley.*
One hundred specimens of Fossil Shells from New Jersey and Delaware. Dep. by *Dr. S. G. Morton.*
September. Diodon, &c. St. Thomas, W. I. *Smith and Stewardson.*
Sienite. Quincy, Mass. *Dr. Hays.*
Fish and Reptiles from W. Ind. *Smith and Stewardson.*
Six specimens marble. Spain. *Mr. G. Patrullo.*
Geological specimens. Silver Lake, Pa. *Mr. W. R. Johnson.*
October. Plants from Mts. of Quito. *Mr. J. Wright.*
Loligo brevipinna. *Dr. Harlan.*
Pecten maximus. *Mr. Conrad.*
Three species of Astacus. *Dr. Harlan.*
Zircon. N. Carolina. *Dr. S. G. Morton.*
November. Twenty species Exotic, and 23 of American Shells. *Dr. Pickering.*
11 species marine Shells. *Col. Abert.*
Unio lanceolatus. *Mr. Lea.*
Siliceous sinter. Iceland. *Mr. Lea.*
Agate pebbles. *Mr. A. Lawson.*
Lepidolite, &c. &c. Sweden. *Mr. Maclure.*
3 species Unio. *Mr. Conrad.*
6 species exotic shells. *Dr. Pickering.*
Insects. Porto Rico. *Mr. Lea.*
December. Ammonite? Lake Erie. *Dr. M'Euen.*
Fossil Tubipore. *Dr. S. G. Morton.*
Native Gold, in Quartz Rock. N. Carolina. *Dr. W. Blanding.*
2 species Cyprea. *Mr. Conrad.*

Minerals. *Mr. Conrad.*
Polished Agates. Scotland. *Mr. Jno. Ronaldson.*
Mosses and Ferns, from Savoy. *Mr. Jos. P. Smith.*
Lithomarge. Del. Co. Pa. *Mr. Jno. Ronaldson.*
Orthocera. Lake Ontario. *Mr. Conrad.*
Fossil Shells and Bones. Del. and Ches. Canal. *Mr. Hugh Lee thro' Dr. Morton.*

1829.

January. Cubic Pyrites. South Carolina. *Dr. Blanding.*
Achatina. Oahu. *Mr. J. Green.*
Willow Grouse. Green Bay. *Dr Pitcher thro' Dr. Harlan.*

February. Fourteen specimens of shells and Zoophytes. *Dr. R. Griffith.*
12 species shells. *Mr. Peale.*
4 species shells. *Dr. S. G. Morton.*
Larvæ of Phryganidæ. England. *Mr. J. J. Smith, Jr.*
Ophiura, &c. Florida. *Mr. T. R. Peale.*
Cyprea argus. *Dr. S. G. Morton.*
Collection of Plants from Tropical America, &c. *Mr. Peale.*
5 specimens minerals. *C. C. Baldwin, Esq. thro' Dr. Pickering.*
Swimming Bladder of Accipeter huso. *Mr. M. L. Dawson.*

March. Collection of minerals from Milo, in Mediterranean. *Prof. A. D. Bache.*
Hydrophane. *Mr. T. F. Betton.*
Russian Insects. *Baron de Struve.*
200 fossil shells, &c. of the Chalk Basin of Paris. *Dr. M'Euen.*
20 species Exotic Shells. *Mr. T. F. Betton.*
Crocodilus lucius, and 3 species shells. *Mr. Goddard.*
8 species marine shells. *Dr. S. G. Morton.*
55 specimens British minerals. *Mr. Jos. P. Smith.*
30 American Geological specimens. *Dr. S. G. Morton.*

Clay and Lignite, near Baltimore. *Col. Abert.*
Geological series from Canada. *Dr. M'Euen.*
April. 41 species marine shells. *Mr. Jos. P. Smith.*
Coluber. Java. *Dr. Harlan.*
Amphitrite. *Prof. A. D. Bache.*
Meleagrina and a Madrepore. *Mr. Goddard.*
Moroxite. Bucks Co. Pa. *Dr. Morton.*
10 specimens Clay and Lignite; near Baltimore. *Dr. C. T. Jackson.*
Specimens illustrating the geology of the Ches. & Del. Canal. *Mr. Lee thro' Dr. Morton.*
Series of the Marls of New Jersey and Delaware. *Dr. S. G. Morton.*
Stalactite. *Prof. Bache.*
15 species shells. India. *Mr. J. P. Smith and Dr. Morton.*
3 specimens of the German Leach. *Dr. Harlan.*
May. Two species Coral. *Mr. Goddard.*
14 species shells. Ceylon. *Mr. W. Hembel.*
12 specimens Brazilian Amethyst; 2 of agatized wood, &c. *Mr. Goddard.*
5 species American marine shells. *Dr. S. G. Morton.*
24 species of Fossil Shells, Crustacea, &c. from New Jersey. *Mess. Haines, J. P. Smith, M'Euen and Morton.*
June. Boa, from S. Amer. *Mr. Jno. Peirce.*
Amphitrite. *Dr. R. E. Griffith.*
Echinus lucuntur. *T. R. Peale.*
Varieties of Iron ore. *Prof. A. D. Bache.*
Shells from Long Branch. *Mr. W. Warder.*
Organic Remains. Virginia. *Mr. Jno. Livzey.*
3 specimens minerals. *Mr. I. Lea.*
4 Do. Graphite. *Mr. T. Fisher.*
10 species marine shells. *Lt. Nicholson thro' Dr. Harlan.*
About 200 specimens of European minerals. *Mr. H. Seybert.*
Amphiuma means. Florida. *Dr. Harlan.*

July. Fifty species Plants. Pocono Mt. Penns. *Dr. Darlington.*
Plants of Pennsylvania. *Dr. R. E. Griffith.*
80 species Plants of New Jersey. *Mr. Conrad.*
Plants from the White Mts. N. Hamp. *H. Little, M. D.*
200 species Amer. Plants. *Dr. C. Pickering.*
40 species of Plants from White Mts. N. Hamp. *W. Oakes, Esq. thro' Dr. Pickering.*
200 species of Plants of New Jersey, Maryland, &c. *Dr. C. Pickering.*
Asterias. *Mr. Conrad.*
4 species shells. *Dr. Pickering.*
5 species Amer. marine shells. *Dr. S. G. Morton.*
August. Quartz crystals and Trilobites. Trenton Falls, N. Y. *Mr. Hedelius.*
Fossils from Long Branch. *Dr. M'Euen.*
Quartz Crystal. *Dr. Dewees thro' Dr. Hays.*
Sulphate of Strontian. Sicily. *Dr. S. G. Morton.*
Antimony. Spain. *Mr. Maclure.*
Crustacea. *Dr. M'Euen.*
6 species fresh water shells. Tennessee. *Mr. Conrad.*
5 species marine shells. *Dr. S. G. Morton.*
Jasper. W. Ind. *Mr. Hedelius.*
Vegetable remains, in slate. *Mr. R. Haines.*
September. Organic remains. Tennessee. *Mr. Conrad.*
Meteoric stone. Fell Aug. 15, 1829, at Long Branch. *Mr. Vaux and Dr. M'Euen.*
Meteoric stone. Fell at Monro, Georgia, 8th May 1829. *Dr. Boykin, thro' Mr. Lea.*
Ampullaria. S. Amer. *Mr. Allison.*
Achatina perdix. Liberia. *Mr. Lea.*
Madrepores, &c. *Dr. M'Euen.*
Sulphate of Lead. Spain. *Mr. J. P. Wetherill.*
Macle. Massachusetts. *Mr. W. R. Johnson.*
3 specimens minerals. *Mr. J. J. Allison.*
Dr. Harlan deposited the following articles:
Trilobite, Black river, N. Y.—Fossil Tooth of a

Tapir.—Jaw of a Bos, Big bone lick.—Caudal vertebra of Mosasaurus: N. Jersey. Ribs and vertebra of Plesiosaurus, N. Jersey. Also a Red Fox, male and female Humming-birds, male Condor, Peacock, Amer. Wild Turkey, male and female South sea domestic fowls, &c. &c. and the skeletons of a man and horse.

November. Collection of American marine shells. *Prof. A. D. Bache.*

Exogyra costata. *Mr. T. A. Conrad.*

Analcime. Ireland. *Dr. M'Euen.*

December. Crustacea: near Albany, N. Y. *Dr. Eights.*

Gryphæa convexa. (fossil) *Mr. T. A. Conrad.*

Series of Fresh water and Land shells. *Mr. I. Lea.*

Gorgonia. *Mr. Collins.*

Terebratulæ in Blue Marl. N. J. *Mr. I. Peirce.*

Wavellite. Cork, Ireland. *Dr. S. G. Morton.*

Several fresh water shells. *Dr. Blanding.*

Secondary Limestone, with organic remains. N. York. *Mr. Thomas Collins.*

Collection of Plants from Missouri. *Dr. C. Pickering.*

Zinc Blende. Mexico. *Mr. Goddard.*

1830.

January. Anthracite. Pottsville, Pa. *Dr. R. E. Griffith.*

Crotalus durissus. *Mr. Ellmaker.*

6 species marine shells. W. Ind. *Mr. Goddard.*

Topaz, Chlorophane, Bismuth, &c. from Connecticut. *Mr. W. R. Clapp thro' Dr. Morton.*

Cytherea Dione. *Mr. Lukins.*

5 species fresh water shells of U. S. *Dr. S. G. Morton.*

3 agate pebbles. *Same.*

3 species shells. *Mr. Poulson.*

Fossil fish in Slate. (Esox eislebensis) *Mr. Feuchtwanger.*

16 species marine shells. Pacific Ocean. *Dr. Ruschenberger, U. S. N.*

16 species Insects. *Mr. G. Ralston.*

Crystallized Fieldspar. Buenos Ayres. *Mr. Wagner.*

16 specimens minerals. *Dr. R. E. Griffith.*

2 segments of Basaltic columns from Giant's Causeway, Ireland. *Prof. A. D. Bache.*

February. 3 species marine shells, and several minerals. *Mr. Jacob Peirce.*

5 specimens of Agatized Wood, &c. from Antigua. *Dr. E. Swift, thro' Dr. Morton.*

8 species marine shells. *Mr. A. R. Dietz, Jr.*

3 specimens vegetable impressions in slate. Rhode Island. *Prof. A. D. Bache.*

March. Scalaria pretiosa, and other shells. *Mr. Poulson.*

Topaz; Connect. *Dr. S. G. Morton.*

April. Large mass of scapolite, with sphène, &c. Bucks Co. Pa. *Dr. E. Swift, thro' Dr. Morton.*

Geological specimens, from the Broad Mountain, Penns. *Mr. L. Ellmaker.*

Sulphate of Magnesia. Virga. *Mr. B. Tappan.*

Melania, and other shells. N. Carolina. *Dr. Blanding.*

May. Extensive series of Fossil Shells from the Tertiary Formation of Maryland. *Mr. T. A. Conrad.*

Two teeth of the Mastodon. N. Jersey. *Mr. G. C. Forsyth.*

Horns of the Chamois goat. *Mr. Barry of Boston.*

Fossils from N. Jersey. *Mr. T. A. Conrad.*

Large specimen of Graphic granite. Delaware. *Mess. Peirce & T. Fisher.*

June. Twelve species marine shells. *Capt. Hayes.*

3 specimens minerals. Norway. *Mr. Feuchtwanger.*

Pecten magellanicus. Maine. *Mr. Peale.*

Several species marine shells. Florida. *Dr. Jas. Cox.*

Chelonura serpentina, &c. *Col. Abert, thro' Dr. Harlan.*

Series of Geological specimens from the north shore of Lake Superior. *Dr. Pitcher thro' Dr. Pickering.*

16 species marine shells. Ireland. *Dr. S. G. Morton.*

Lucanus elaphus. Cape May. *Mr. Leamy.*

15 species Fossil shells. Maryland. *Mr. T. A. Conrad.*

July. Nine species of Reptilia: Para, S. Amer. *Col. Abert, thro' Dr. Harlan.*

Geological specimens. Schuylkill Co. Pa. *Mr. S. Kneass.*

Pearl, from the common oyster. *Mr. Furst.*

3 species shells. India. *Dr. Huffnagle, thro' Dr. Harlan.*

9 species European Reptilia. *Dr. Harlan.*

293 Skins of Birds of Surinam, S. Amer. *Dr. Hering, thro' Mr. L. De Schweinitz.*

Albatross. *Mr. Blakie.*

Ten specimens fossil Producti, &c. Ireland. *Dr. S. G. Morton.*

August. 20 specimens of Fossil organic remains, from the Sandstone of the Juniata, Pa. *Mr. Thos. Fisher.*

Patella. Maine. *Mr. T. R. Peale.*

Four species Unio. *Mr. Lea.*

Symphynota compressa. *Dr. Pickering.*

Selenite. Nova Scotia. *Mr. Ronaldson.*

September. Symphynota Bi-alata. China. *Mr. Wood.*

3 species shells. India. *Mr. Wood.*

Favosite. Ohio. *Mr. T. Fisher.*

Organic remains from Bedford Springs, Pa. *Mr. Hayden.*

Moschus pygmæus and Sciurus bicolor. Java *Mr. Wood.*

Avicularia. Arkansaw. *Col. Abert.*

Mountain trout. Juniata. *Dr. Harlan.*

Emys odorata. Mass. *Mr. Haines.*

Organic remains. N. Jersey. *Mr. Hedelius.*

Tooth of Mosasaurus. N. Jersey. *Mr. T. A. Conrad.*

Perdix rufa. Majorca. *Mr. T. Morgan.*

Icterus agripennis. *Dr. Harlan.*

Male and young of same bird. *Dr. M'Euen.*

Unio circulus. Ohio. *Mr. Lea.*

Fusus cinereus, &c. *Dr. S. G. Morton.*
Larva of Bombyx. *Same.*
October. Picus auratus, male and female. *Mr. I. Parrish.*
Podiceps Carolinensis: young. *Dr. Harlan.*
Skin of Black eared Barbet. S. Amer. *Mr. Goddard.*
Baltimore and orchard Oriole. *Dr. S. G. Morton.*
Rallus, 3 species. U. S. *Dr. M'Euen.*
Vespertilio Auduboni. *Dr. Harlan.*
Plants from Virginia. *Mr. W. S. Warder.*
20 specimens of Fossils. Ohio. *Mr. T. Fisher.*
6 specimens from Coal formation of Wilkesbarre, Pa. *Dr. P. Price.*
Exogyra costata, Gryphœa mutabilis, and other fossils. Cahaba, Alabama. *Mr. T. Nuttall.*
Skin of Boa Constrictor. Trinidad. *Mr. C. S. Smith.*
Land Shells, from Alabama. *Mr. T. Nuttall.*
Cyclas dubia, &c. *Mr. T. A. Conrad.*
Several marine shells from Massachusetts. *Mr. W. Oakes thro' Dr. Pickering.*
Alcedo ispida, and A. alcyon. *Dr. Harlan.*
Sternus predatorius. *Mr. Goddard.*
Phoca vitulina; skin presented by *Dr. Harlan*, and mounted at the expense of a club of members.
7 species marine shells. Rhode Island. *Prof. A. D. Bache.*
Turbinella scolimus, and 7 other species of shells. *Dr. Morton.*
Spondylus. *Mr. James Griffith.*
3 species fossil shells. England. *Mr. R. C. Taylor.*
3 specimens minerals. Arkansas. *Dr. Harlan.*
4 specimens Porphyry. Boston. *Dr. Pickering.*
Fossil wood. Wyoming, Pa. *Mr. D. Cunningham.*
November. Scolopax fedoa. *Dr. Harlan.*
109 skins of Birds of India. *Dr. M. Burrough.*
Skeleton of Am. humming-bird. *Mr. Remington.*
2 specimens of Salamander. *Mr. J. Green.*
3 species Amer. marine shells. Rhode Id. *Prof. Bache.*
Shells from W. Indies. *Mr. T. F. Betton.*
Phalaropus pilearius. *Dep. by Dr. Harlan*; also

23 fresh water Fishes, and 30 Reptiles from Europe.

November. Phaæton ethereus. *Dr. Mervin, thro' Dr. Harlan.*

Bituminous coal. *Mr Tappan.*

Anthracite. *Mr. Thomas Fisher.*

Salamandra fasciata. *Dr. McMurtrie.*

Rocks of which the Delaware Breakwater is built. *Mr. Simmons.*

Plotus melanogaster. *Dep. by Dr. Burrough.*

Felis rufa. *Dr. Mease.*

Picus varius, *Mr. Hedelius.*

2 species marine shells. Rhode Id. *Prof. A. D. Bache.*

3 do N. Jersey. *Mr. T. A. Conrad.*

Diodon, Ostracean and young Alligator. Mississippi. *Mr. J. H. Markland.*

Diodon. India. *Dr. Shackman.*

Spawn of Pyrula. *Mr. Jas. Griffith.*

Cyprea and Tornitella. W. Indies. *Mr. Goddard.*

Strix otus. *Dr. M'Euen.*

500 species of Plants, from Guiana. *Dr. Hering of Surinam, thro' Mr. De Schweinitz.*

500 species of Quadrupeds, Reptiles, Fishes, &c. &c. from Surinam. *Dr. Hering, thro' Mr. De Schweinitz.*

December. Bos grunniens, *Lin.* and Cashmire goat. *Dep. by Dr. Burrough.*

Talc. Cumberland, R. I. *Mr. Allison.*

Fringilla carnaria. *Mr. F. Bacon.*

American Grebe. *Mr. Goddard.*

Stuffed skin and mounted skeleton of a Rhinoceros. *Dep. by Dr. Burrough.*

To the preceding List the following Deposits and Donations remain to be added:

One thousand specimens of Minerals, embracing the entire collection of *Thomas M'Euen, M. D.*—deposited by that gentleman.

Nearly one thousand specimens of Fossils, from the valley of the Mississippi; consisting of Bones of the Mastodon, Elephant, Megalonyx, &c. together with numerous Shells, Zoophytes, &c. Deposited by *John Price Wetherill, Esq.*

In the summer of 1829, a private subscription was entered into by a number of members, for the purpose of erecting a series of horizontal, glass covered cases, against the gallery railing of the Academy's Museum, &c. The object was effected by the following subscriptions:

Thomas M'Euen, M. D.	$70
C. W. Pennock, M. D.	10
R. Haines	20
J. P. Wetherill	25
Z. Collins	25
W. Hembel	10
Jas. Read	10
S. V. Merrick	5
Henry Seybert	40
T. F. Betton	10
S. G. Morton, M. D.	29
Charles Hedelius	10
W. S. Warder	5
Jos. P. Smith	25
	$304

In June 1829, an Herbarium case (cost $53 50) was presented to the Academy at the joint expense of the following members: Mess. Vaux, Harlan, J. P. Wetherill, Dr. Wetherill, Doornik, Carpenter, Hembel, Haines, Morton, and Pickering.

The number of books presented to the Academy during the period embraced by the present volumes of the Journal, is so great, that the Committee of Publication have deferred a printed notice of them in this place, in the expectation that the Society will soon publish a systematic catalogue of their Library, which now embraces between two and three thousand volumes.

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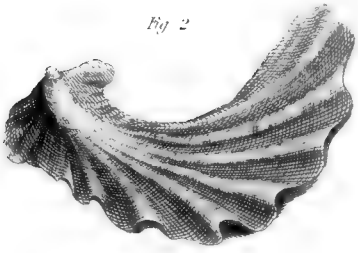
Fig. 2

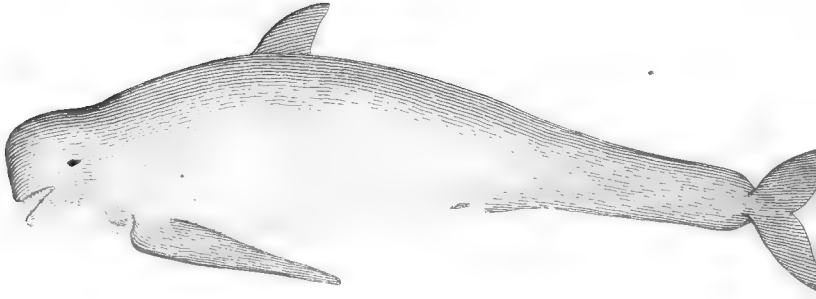


Ostrea falcata

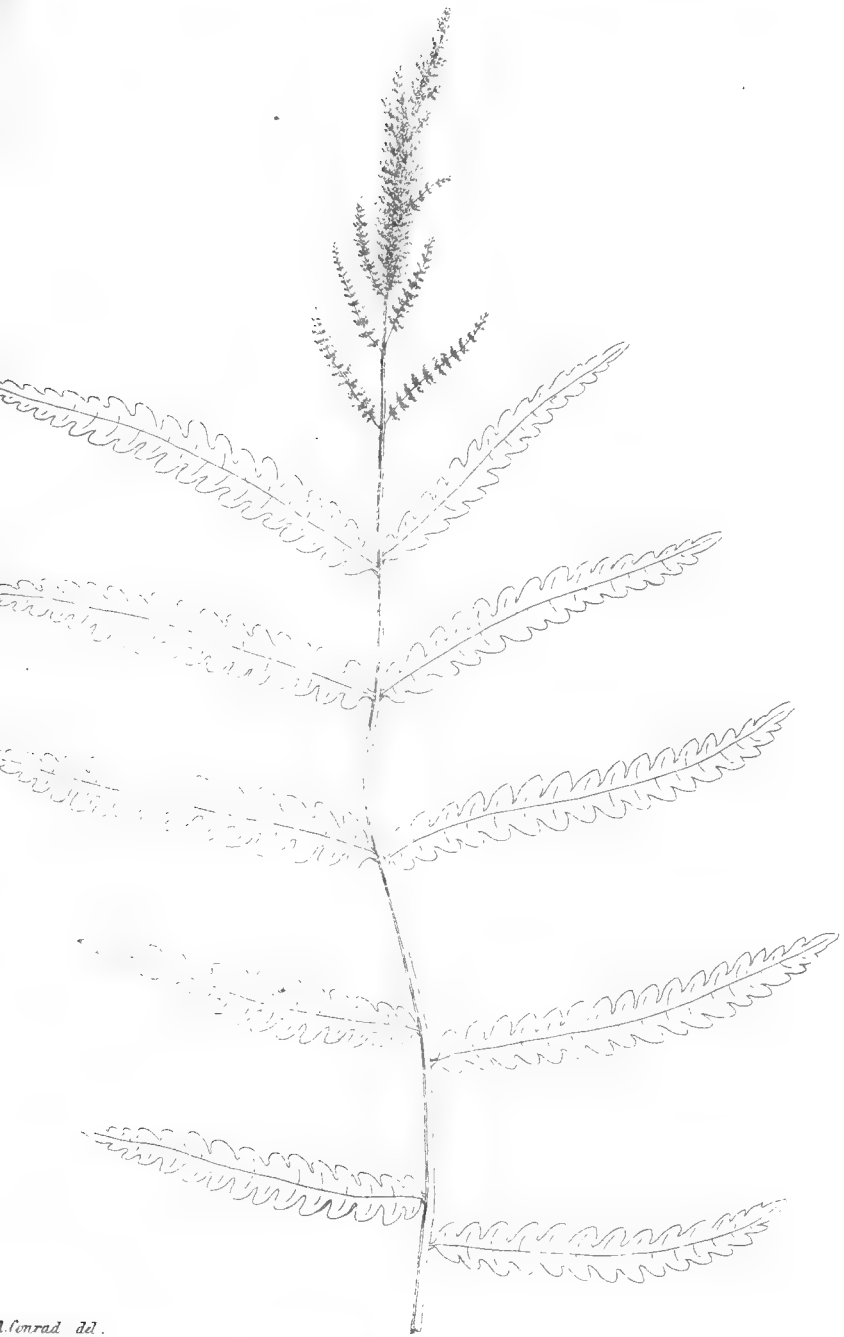
Fig. 1

Rana dorsalis.

Fig. 3.



Delphinus Intermedius



T. Conrad del.

Osmunda dayteniana

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 6

Fig. 5.

Fig. 4

Fig. 7.

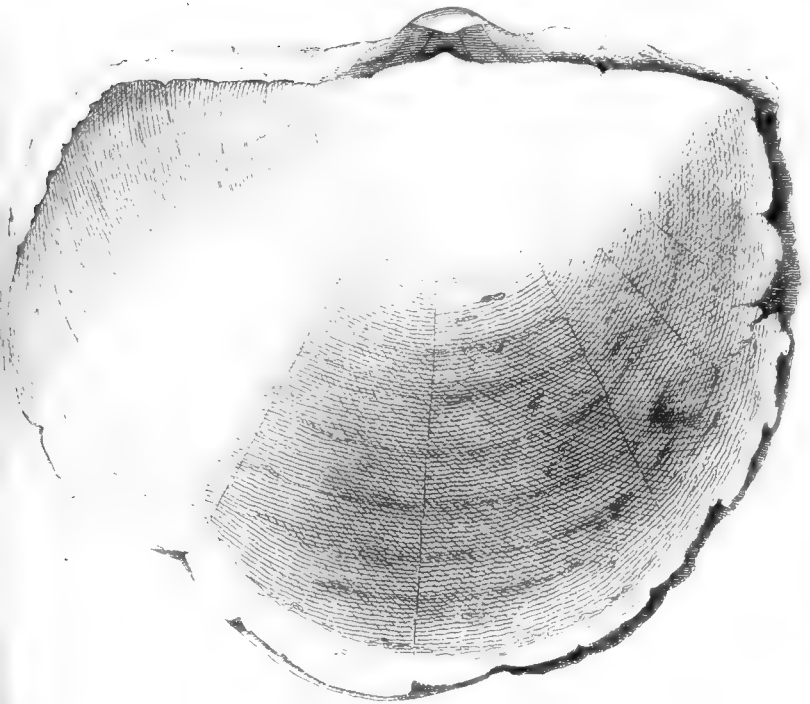
Fig. 8.

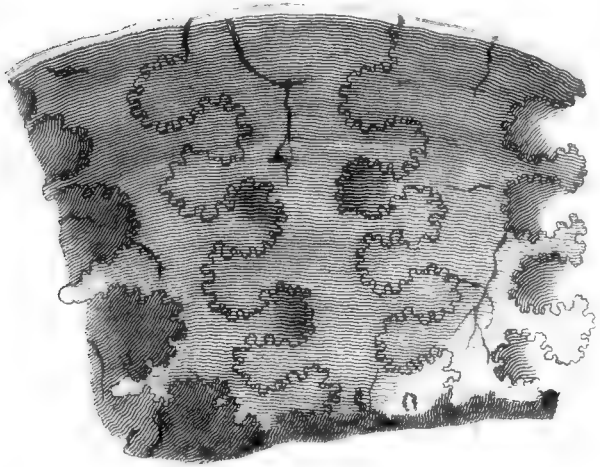
S. G. Morton M.D. del.

Fig. 1

Fig. 2

Fig.





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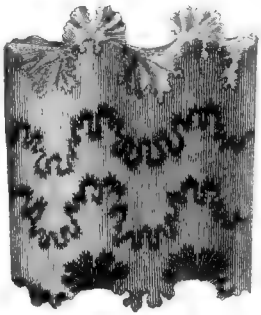
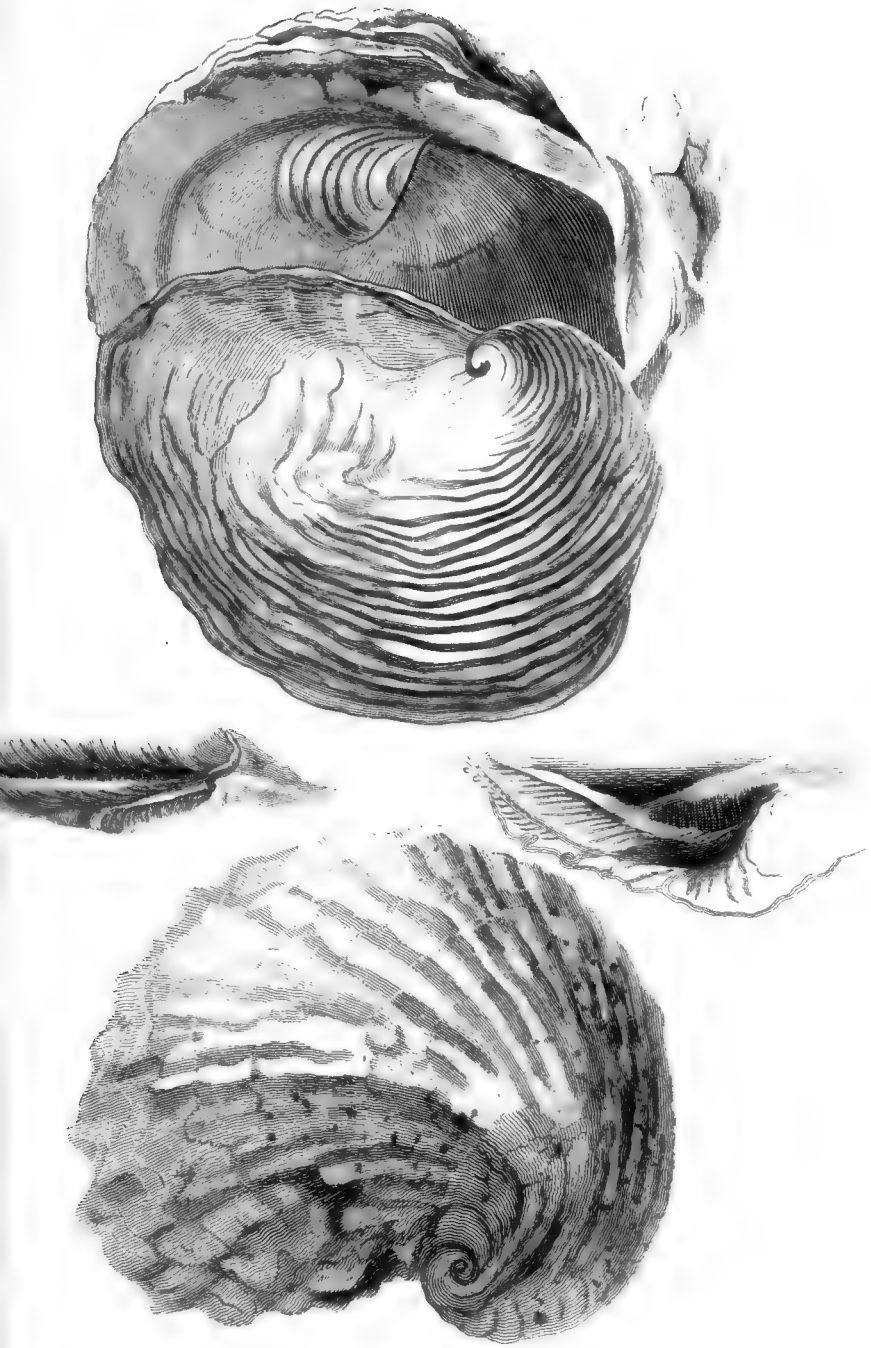
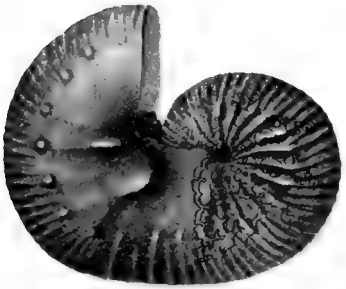




Scaphites Conradi

Fig 1



Crepidula costata

Fig 2

Fig 3.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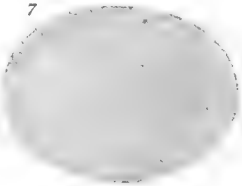
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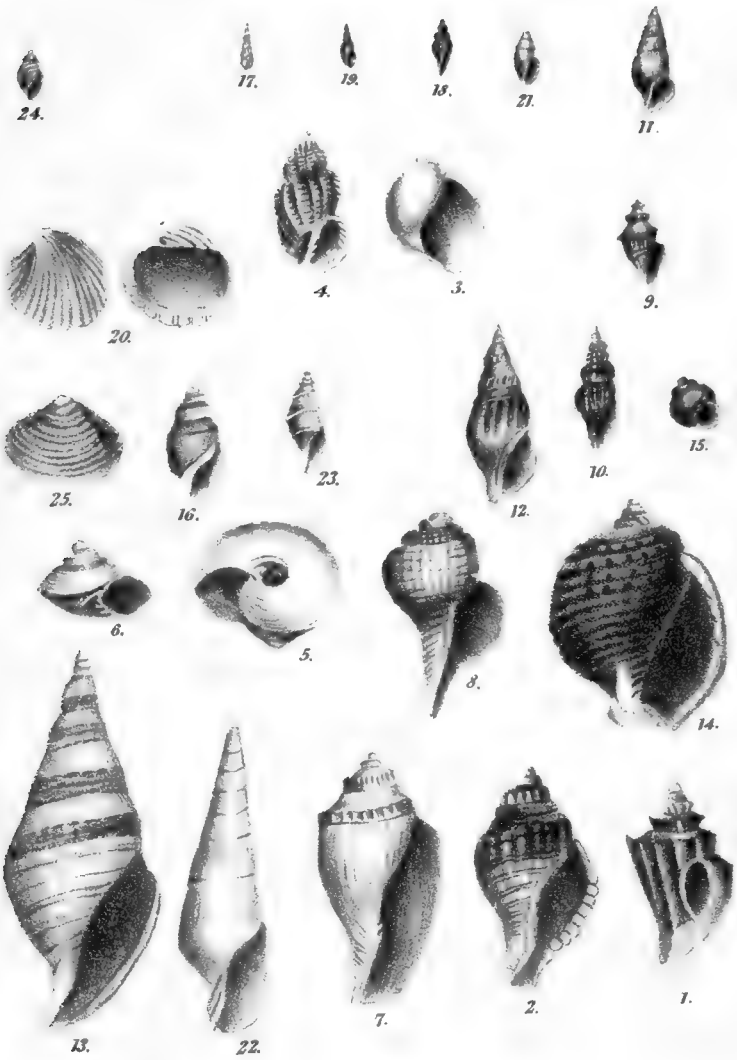

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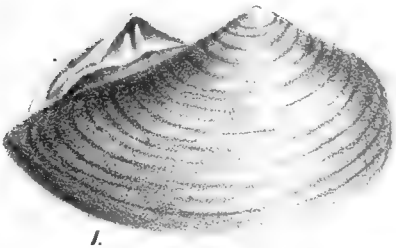

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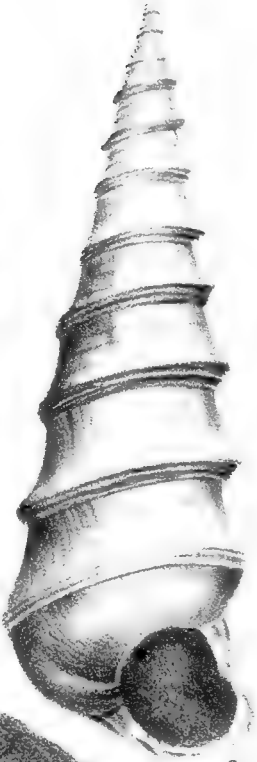

2.

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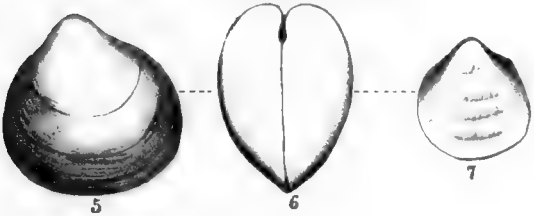
5.

T. A. Conrad del.


Mactra arctata.
1


Mactra tellinoides.
2
3


Mactra nucleus
4


Cardium Mortoni.
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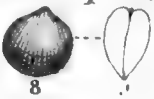
Cardium pinnulatum.
8


Anatina Leana.
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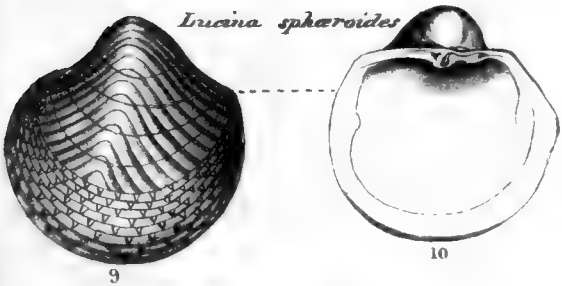
Lucina sphæroides
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Mya hyalina.
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Balanus geniculatus
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Mytilus leucophæatus.
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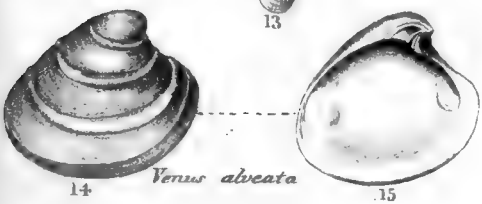
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Venus alveata
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Nucula recurva.
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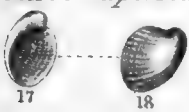
Velutina rupicola
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Lacuna pertusa.
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Patella alveus.
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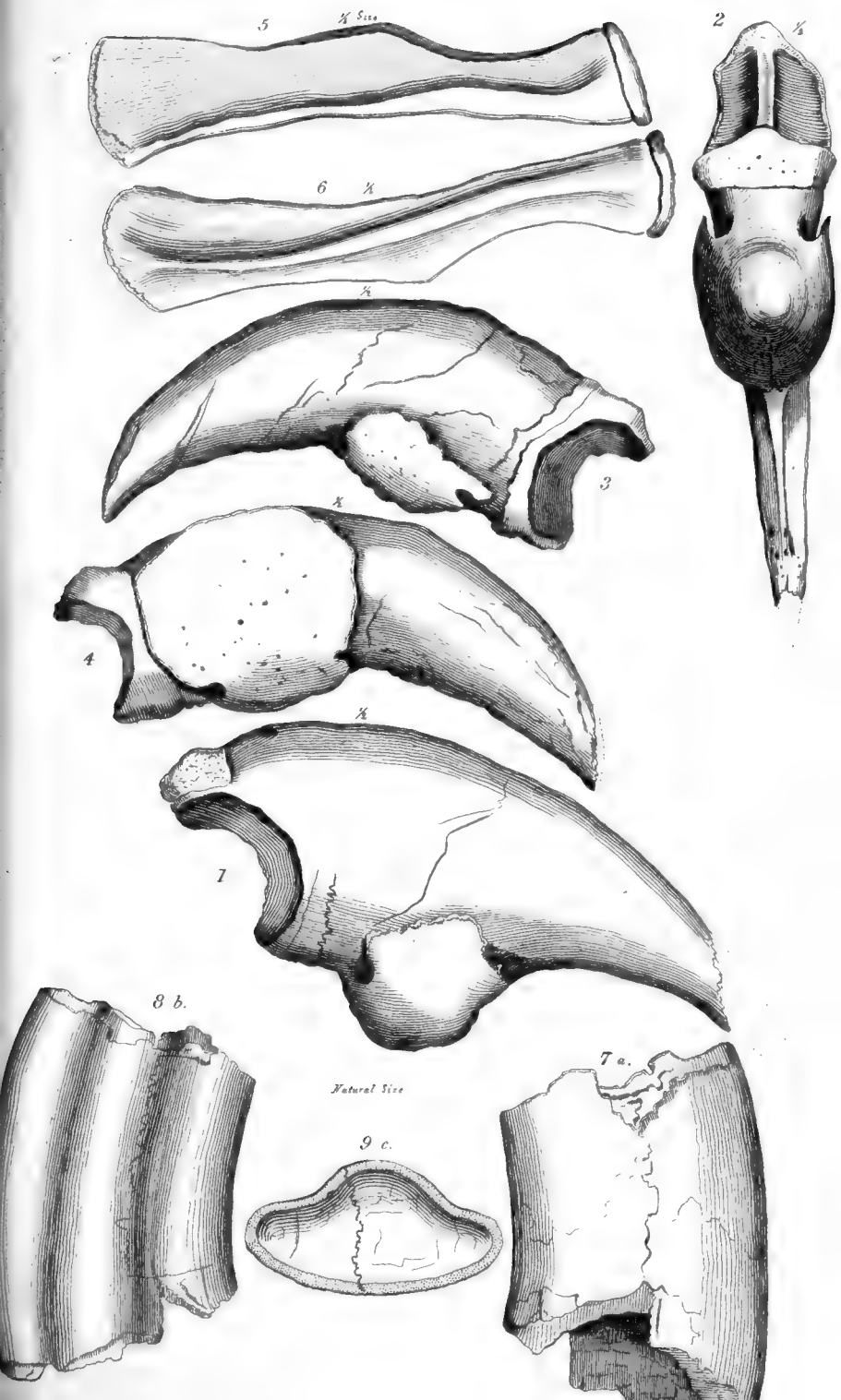
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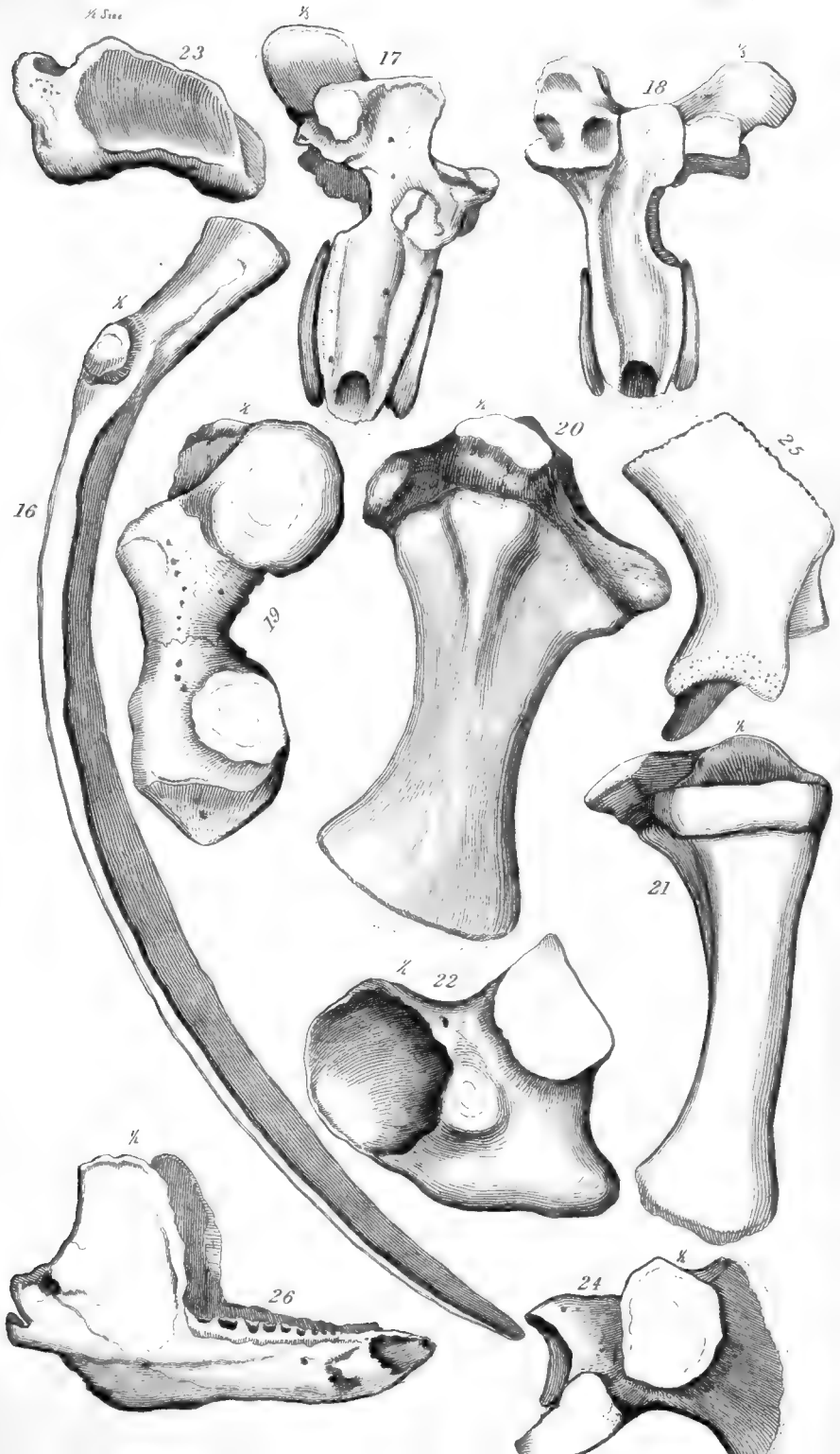
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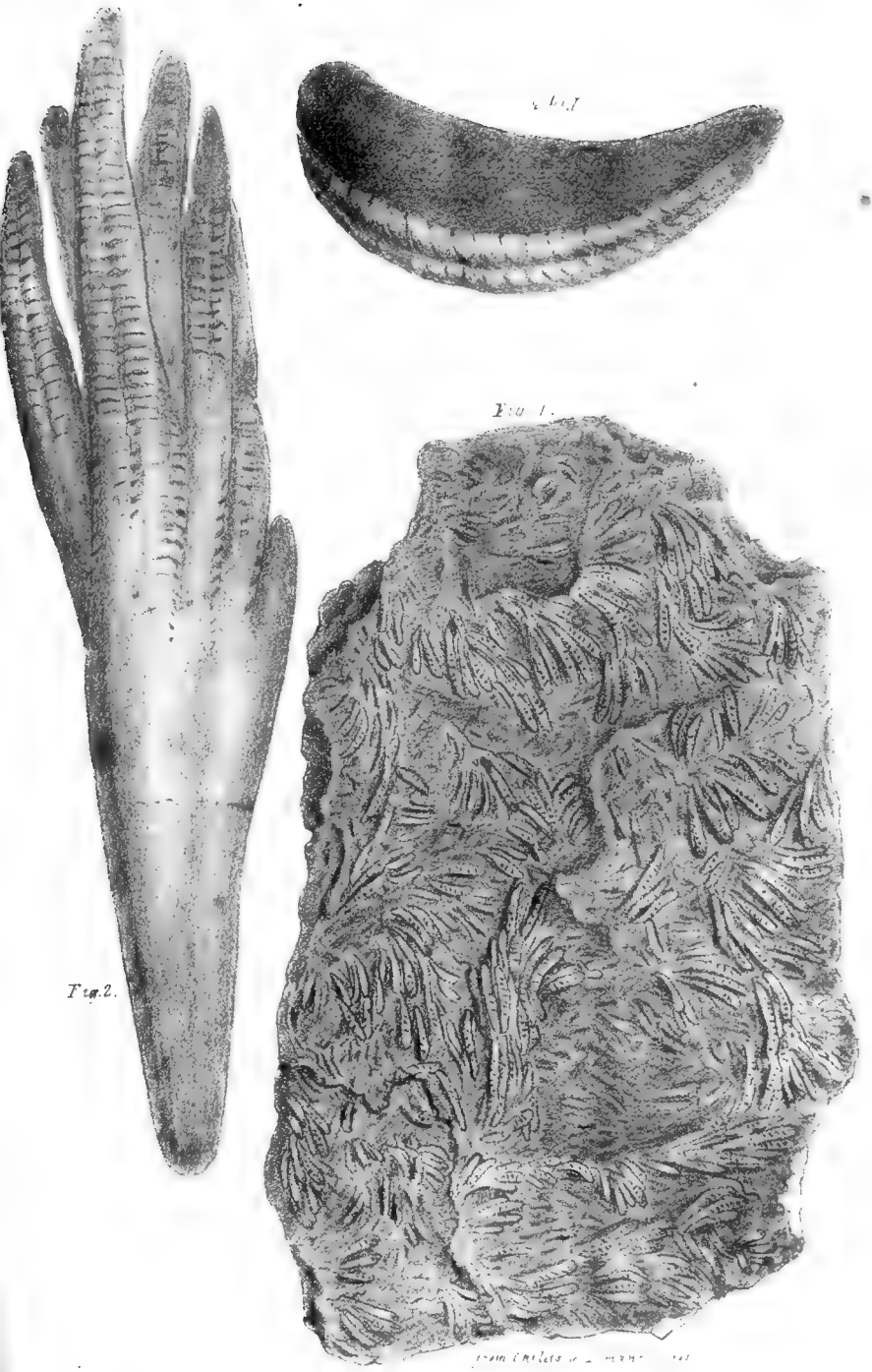

Fig. 2.

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