

ANODONTA NAPOENSIS.—Testa laevi, oblongo-elliptica, subcompressa, valde inaequilaterali, antice et postice rotundata; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fusca, encarpiformi, flexuosa, obsolete radiata; margarita pallido-viridi, non iridescente.

Hab.—River Napo, Equador, S. Am., Prof. Orton.

Descriptions of UNIONIDÆ from the Lower Cretaceous Formation of New Jersey.

BY ISAAC LEA.

Prof. Cope very kindly placed in my hands the specimens of *Unionidæ* which he collected in a bed of bluish clay, now first observed to contain them, about six miles north-east of Camden, N. J. This bed is subordinate to the *Green Sand*, so long known to our geologists as belonging to that portion of the Cretaceous group which furnished so many interesting organic remains within the last forty years, particularly the *Hadrosaurus Foulkii*, Leidy, and the *Laelaps aquilunguis*, found by Prof. Cope. The same member of the *Green Sand Formation* has been very productive also of marine *mollusca*, some of which I described in our Proceedings from the beds near Haddonfield, N. J. But, as observed above, no fresh water remains had been found in these cretaceous beds there, and the unexpected development of these *Unionidæ* by Prof. Cope, it is hoped, may lead to other and more extensive results.

These interesting beds in New Jersey have only yet had a very slight development. They will, no doubt, continue to yield their natural treasures to the industrious investigator for many years. The late Prof. Vanuxem, as early as 1818, while examining the Paris basin, was convinced that these New Jersey beds had their equivalent in the *Green Sand* of Europe; and subsequently, in 1828, his notes were published in the Journal of the Academy, where he gave a table of their "relative geological position."

Prof. Cope procured nearly forty specimens of *Unionidæ*, and these are composed of ten species, viz.: eight *Uniones* and two *Anadontæ*. These consist almost altogether of casts, but the forms are well preserved, and in some specimens the inner layers of the nacre are remaining in fragments. These fragments, submitted to the microscope, exhibit the imbricated structure as developed by Prof. Carpenter in the *Unionidæ*, but I could not detect any of that portion of the outer structure of the nacre where the base membrane is deposited in the peculiar cellular structure described and figured in his work. The impress of the muscular cicatrices is visible in many of the specimens. These cicatrices being placed in their usual positions, shewing even the dorsal and pallear scars. While all the massive structure of the cardinal and lateral teeth have been decomposed and carried off, their impress in the clay remains perfect, showing the same forms and striæ which are found in the massive cardinal and lamellar teeth of our western species.

As there are no characters of the shell itself left in any one of the specimens, to designate specific differences, either by form of teeth, color of nacre, or epidermal rays, it remains only to take the outline, transverse diameters, and general curves, to group these specimens. In so doing, I have made these groups conform to the most known species, and named them accordingly. Among these specimens I have noticed none which have nodules or folds, while there is a general resemblance in size and form to those now inhabiting the rivers of the Ohio basin.

As the bed in which these fresh-water shells are found lies below the well-known deposits of "green sand or marl beds," it becomes a very interesting question as to its relations to these superimposed beds. Further investigation can alone give us the data to settle this point. In finding these fresh-water molluscs here, we are naturally brought to consider how far they may have relation to the products of those deposits in Europe, where the same genera of

[June,

fresh-water shells have been found abundant; I of England, in which the distinguished geologist successfully, and in which he found the *Iguanodon* trial reptile, and other animals, together with particularly a large number of *Unionidæ*, analogous happily found by Prof. Cope in this bed below the

I ought to state, in connection with this subject with Mr. Meek, some ten years since, observations in the estuary and fresh-water deposits near the where Dr. Hayden found *Uniones*, *Paludine*, &c. it the lowest, have called this number one. They in our Proceedings May, 1857, that "the estuary the mouth of the Judith River are probably in a of the great Lignite basin, though some portions older."

UNIO NASUTOIDES.—Shell smooth, very wide, co bisangular behind, rounded before; beaks slightly cardinal teeth short and striate; lateral teeth long Length 1.5 inches, breadth 4.6 inches.

Remarks.—This species is very nearly the same known *nasutus*, Say, but it is more acute at the character it is more nearly allied to *Fisherianus* (n

UNIO RADIATOIDES.—Shell smooth, regularly el lateral, subangular behind and rounded before; b dial; cardinal teeth large; lateral teeth large, rath Length 2.4 inches, breadth 4.3 inches.

Remarks.—Some of the large and compressed va nearly of the same outline with this species, and t same position. It is evidently a species of thickne

UNIO SUBROTUNDOIDES.—Shell smooth, subrotu very inequilateral, rounded behind and before; b terminal; cardinal teeth apparently small; later arches.

Length 2.6, breadth 3.4 inches.
Remarks.—Very nearly of the same outline with high in the beaks. The lateral teeth seem to be ut

UNIO CARRIOSOIDES.—Shell smooth, broadly ellip tusely angular behind, rounded before; beaks some medial; cardinal teeth —; lateral teeth long Length 2.5, breadth 4.8 inches.

Remarks.—This is evidently a very regularly for ing gentle and pleasing. It resembles in outline sc large males of *carriosus*, Say.

UNIO HUMEROSOIDES.—Shell smooth, ovately oblc rounded behind and before; beaks slightly raised, dinal teeth large and compressed; lateral teeth rath Length 2.6, breadth 4.2 inches.

* While in London in 1852, my friend Dr. Mantell cons *Unionidæ* from the Wealden, of which he had several hunc tion of publishing them. For this purpose I grouped the and assimilated them to those of our existing western spe from which he never recovered. Dr. Mantell did not publish was dispersed by a public sale. On my return from th months afterward, I found in the cabinet of the late distin portion of them, which he had purchased, and which st written for Dr. Mantell. I am not aware of any of these h

† These descriptions are of course imperfect, being littl mens of all the species are deposited in the cabinet of the 1868.]

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of England, in which the distinguished geologist Dr. Mantell had worked so
successfully, and in which he found the *Iguanodon Mantelli*, a gigantic terres-
trial reptile, and other animals, together with many fresh-water *mollusca*, par-
ticularly a large number of *Unionide*, analogous in form to these now so
happily found by Prof. Cope in this bed below the *Green Sand*.*

I ought to state, in connection with this subject, that Dr. Hayden published
with Mr. Meek, some ten years since, observations made by the former regard-
ing the estuary and fresh-water deposits near the mouth of the Judith River,
where Dr. Hayden found *Uniones*, *Paludine*, &c. These geologists, considering
it the lowest, have called this number one. They say in their paper, published
in our *Proceedings* May, 1857, that "the estuary and fresh-water deposits at
the mouth of the Judith River are probably in a parallel with the lowest bed
of the great Lignite basin, though some portions of them may be somewhat
older."

UNIO NASUTOIDES.†—Shell smooth, very wide, compressed, very inequilateral,
triangular behind, rounded before; beaks slightly raised, nearly terminal;
cardinal teeth short and striate; lateral teeth long, and nearly straight.

Length 1.5 inches, breadth 4.6 inches.

Remarks.—This species is very nearly the same in outline with the well-
known *nasutus*, Say, but it is more acute at the posterior margin, in which
character it is more nearly allied to *Fisherianus* (nobis).

UNIO RADIATOIDES.—Shell smooth, regularly elliptical, compressed, inequi-
lateral, subangular behind and rounded before; beaks slightly raised, subme-
dial; cardinal teeth large; lateral teeth large, rather long and lamellar.

Length 2.4 inches, breadth 4.3 inches.

Remarks.—Some of the large and compressed varieties of *radiatus*, Lam., are
nearly of the same outline with this species, and the beaks are nearly in the
same position. It is evidently a species of thickness and weight.

UNIO SUBROTUNDOIDES.—Shell smooth, subrotund, very much compressed,
very inequilateral, rounded behind and before; beaks slightly raised, nearly
terminal; cardinal teeth apparently small; lateral teeth long, lamellar and
arched.

Length 2.6, breadth 3.4 inches.

Remarks.—Very nearly of the same outline with *subrotundus* nobis, but not so
high in the beaks. The lateral teeth seem to be unusually long and curved.

UNIO CARRIOSOIDES.—Shell smooth, broadly elliptical, somewhat inflated, ob-
tusely angular behind, rounded before; beaks somewhat raised, removed from
medial; cardinal teeth ———; lateral teeth long and slightly curved.

Length 2.5, breadth 4.8 inches.

Remarks.—This is evidently a very regularly formed species, the curves be-
ing gentle and pleasing. It resembles in outline some of the more transverse
large males of *cariosus*, Say.

UNIO HUMEROSOIDES.—Shell smooth, ovately oblong, very much compressed,
rounded behind and before; beaks slightly raised, removed from medial; car-
dinal teeth large and compressed; lateral teeth rather long and slightly curved.

Length 2.6, breadth 4.2 inches.

* While in London in 1852, my friend Dr. Mantell consulted me in relation to these
Unionide from the *Wealden*, of which he had several hundred specimens, with the in-
tention of publishing them. For this purpose I grouped the whole of this fine collection,
and assimilated them to those of our existing western species. Owing to severe illness,
from which he never recovered, Dr. Mantell did not publish these shells, and his collection
was dispersed by a public sale. On my return from the continent to London, fifteen
months afterward, I found in the cabinet of the late distinguished geologist, Mr. Sharp, a
portion of them which he had purchased, and which still had the labels which I had
written for Dr. Mantell. I am not aware of any of these having been published.

† These descriptions are of course imperfect, being little more than from casts. Specimens
of all the species are deposited in the cabinet of the Academy of Natural Sciences.
1868.]

Remarks.—A rather unusual outline, and more like some South American species than our own, except *humerosus* (nobis), which it is closely allied to. The exterior is very much and coarsely striate.

UNIO ROANOKOIDES.—Shell smooth, very wide and slightly curved at basal margin, compressed towards the beaks, rounded before and behind; beaks slightly raised, well advanced towards the anterior margin; cardinal teeth rather large, very much striate; lateral teeth very long, lamellar, and slightly curved.

Length 2.6, breadth 4.8 inches.

Remarks.—The form of this species is very unusual, and it is nearest in outline to *Roanokensis* and *macer* (nobis). A portion of the nacre remains on the specimen, but there is no appearance of rays on this or any other of these specimens. The anterior portion is remarkably compressed for a *Unio*; this character somewhat applies to others which accompanied it.

UNIO LIGAMENTINOIDES.—Shell smooth, elliptical, very much compressed, very inequilateral, angular behind and rounded before; beaks slightly raised; cardinal teeth compressed; lateral long, lamellar and curved.

Length 2.3, breadth 3.5 inches.

Remarks.—The outline and general appearance of this shell is nearly that of a compressed male *ligamentinus*, Lam., but rather more arched above. The curves are regular, and no doubt that in a perfect state it must have been attractive as its prototype now existing is.

UNIO ALATOIDES.—Shell alate, smooth, subelliptical, very much compressed, inequilateral, rounded before and behind; beaks raised; cardinal teeth oblique and compressed; lateral teeth long, large, lamellar and very slightly curved.

Length 2.9, breadth 4.2 inches.

Remarks.—A single specimen only is before me, and this by no means perfect. It is very closely allied to *alatus*, Say. The anterior dorsal portion of one valve is gone, and that of the other valve is crushed, but the posterior portion is in a very good state, showing a perfect and deep mould of the large, regular, lamellar lateral tooth, over which the posterior dorsal portion of the disk extends into a well-defined wing, which was connate above, but not extending so high as in *alatus*.

ANODONTA GRANDIOIDES.—Shell smooth, elliptical, very much inflated, ventricose, obtusely angular behind, obliquely rounded before; beaks submedial, flattened at the tips, but very much inflated on the umbos.

Length 3.3, breadth 4.9 inches.

Remarks.—This species is more like *grandis*, Say, than any other of our western *Anodonta*. It is about the same size, and of very nearly the same outline. Both the valves are present, and in their natural relevant positions. The umbos are much inflated, but not so much as the other species (*corpulentoides*) herein described.

ANODONTA CORPULENTOIDES.—Shell smooth, rotundo-elliptical, exceedingly inflated, very ventricose, obtusely angular behind, rounded before; beaks submedial, flattened at the tips, but excessively inflated on the umbos.

Length 5.6, breadth 6.5 inches.

Remarks.—This species is so nearly like *corpulenta*, Cooper, that I have no hesitation to consider it nearest in outline and form to that remarkable species, described by the late Judge William Cooper, and which inhabits the Lake of the Woods, and other north-western waters. There is no mistaking the peculiar great enlargement of the umbos of this species being analogous to *corpulenta*. There are two imperfect specimens before me, but the larger one has the anterior half of the right valve and posterior half of the left valve, which enables me to make a nearly correct description and measurement.

[June,

A sketch of the Natural Order LILIACEÆ, as repr
States of Oregon and California, with special r
lected in an Excursion along our Pacific Coasts, A.

BY ALPHONSO WOOD.

(Commencing at San Diego, Jan. 28, I made wide excursions. Here the hills are covered with four species of the *Cat* journeying north. I visited the splendid plains of San Luis. Arrived at Los Angeles on the 23d. Here flourish almost the temperate fruits, in great abundance. My daily excursions were to the Granite Mountains north and east, to Coconino and to San Pedro west. Next journeyed to San Buenaventura much of it on the beach. Hence diverged to Ojai Ranch Thence to Santa Barbara, known for its grand Mission, on the 28th of March I left for San Luis Obispo, where I spent the 29th and lofty buttes. Next on the Salinas Plains, the vicinity of Monterey four days, and April 4th to 7th in the long Redwood Hills. April 7th to 17th botanized in the region and the following week on the splendid plains and hills south and east of the Bay. April 23d to May 6th, in the Mateo, Oakland, &c.

Our next journey was to the Giant-wood of Calaveras, Yuba, Yamento, Lincoln, Folsom, Murphy's and Vallecito, return were now dressed in their most brilliant robes, in which it shone conspicuously.

A trip to the Geysers commenced June 1st, when the Geysers of Clarkias. In this journey we visited Petaluma, Sebastopol which latter place yields a rich harvest to the botanist, &c.

Next day commenced our long tour northward, again via the Yuba River to near Downieville. Then Red Bluff and Shasta, where I explored the head-waters of the Trinity Mountains, where Brevoortia had long bloomed Mountain, reaching Yreka June 17th. From this place enjoyed volcanic plains, thirty miles, to Mt. Shasta.

June 21st crossed the State line, on the Siskiyou Mountains explored the splendid valley of Rogue River, in the three days were spent in pleasant excursions up and down the bright little town of Willbur. At Eugene, 100 miles to the north of the Wahlamette River. Reached Albany July 1st, and July 4th. Here spent three days in botanic trips, in the Wahlamette University. Hence thirty miles to Oregon power, and one hundred miles from Eugene,—the entire to Portland twenty miles, and to the ocean one hundred miles.

From the city of Portland, June 9th to 17th, my long and excellent company. By the waters of the Great Columbia 18th, laboring diligently one week, with Judge Wilson with one day at the famous Cascades, where the river has torn its bed from the columns of basalt. Next I am permitted to visit the meadows of Forest Grove, twenty-five miles west of Portland and Oregon City, where friends and botanists had already been. August 7th to 11th at Astoria, and Clatsop Plains, &c. Once more reach, and leave Portland, accompanied by friend J. Deerdorf, &c., for the Cascade Range and Mt. Hood. On that awful summit we stood Aug. 20th, and estimated the water boiling at 180° Fahr.

On the 25th, started from Monticello, Washington Territory, on a two days' excursion up the Cowlitz River. Evergreen of the Douglas Fir (*Abies Douglasii*),—would supply the forest for a thousand years. Finally, on the 31st, leave Portland by steamer for San Francisco, 600 miles distant.

Our final excursion was to the Yosemite,—last, not least, around Mt. Diablo (whose flowers had already been gathered once more at Stockton, and across the vast plain to Bear River, and I surveyed along the Giant-wood of Mariposa. In Yosemite, plucking flowers from the bases of clouds, September again in San Francisco, whence, on the 10th, for my trophy, I embarked for home.)

Tribe I.—TULIPEÆ.

ERYTHRONIUM GRANDIFLORUM, Pursh. Scape to perianth segments yellow, acuminate, reflexed from distinct, revolute; leaves spotless.—Woods, from 1868.]