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POST-PLEIOCENE FOSSILS

OF

SOUTH-CAROLINA.

BY

FRANCIS S. HOLMES, A.M.,

PROFESSOR OF GEOLOGY AND PALÆONTOLOGY, AND CURATOR OF THE MUSEUM OF NATURAL HISTORY,
COLLEGE OF CHARLESTON, SO. CA.

MEMBER OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE; CORRESPONDENT
OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, AND
LYCEUM OF NATURAL HISTORY, NEW-YORK.

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C. G. PLATEN, DRAUGHTSMAN.

TO
GEORGE A. TRENHOLM, ESQ.,

As an evidence of my friendship and regard,

AND

in grateful acknowledgment under which his kindness has placed me,

THIS VOLUME

descriptive of the fossils of the Post-Pleiocene of our Native State, and belonging to
a period in the geological sequence, connecting the past with
the present History of our Earth,

IS DEDICATED,

by his friend and kinsman,

FRANCIS S. HOLMES.

P R E F A C E .

Extracts from the papers included in this volume were published in pamphlet form, March 1st, 1858; but the edition was soon exhausted. The discovery of fossil bones and teeth which could not be distinguished from similar parts of recent domestic animals, excited general attention, and the subject was freely discussed in the public press both at home and abroad.

In April, 1859, additional evidence of the age of the beds from which these fossils were obtained, was afforded by the discovery of a fragment of Indian pottery associated with the bones and teeth of mastodon, horse, deer, etc., (Plate XIX and XX.) These specimens were taken to Philadelphia, and submitted to the inspection of the members of the Academy of Natural Sciences, at a meeting held July 12th, and published in their proceedings of that evening, page 177. The subject caused considerable speculation, and it was concluded to republish in part what had already appeared in the pamphlet issued in 1858.

A description of the geological formations or beds in which these remains have been obtained, etc., etc., will be found in the introduction to this volume.

A C K N O W L E D G M E N T S .

In acknowledging our obligations to friends who have kindly assisted us whilst engaged in the preparation of this work, the first place is due to Prof. Joseph Leidy, the eminent anatomist of the University of Pennsylvania, for devoting so much of his valuable time and talents to our aid in describing the vertebrata; his kind attention to our interest places us under profound obligations to him.

To Major A. H. Bowman, U. S. A., Chief of the Architectural Bureau at Washington, we are under particular obligations for the use of his valuable and rare collection of fossils from the Ashley beds, and for the deep interest he has always evinced in our work.

Our sincere thanks are also gratefully tendered to the following gentlemen, from whom we have received many kind favors: Dr. Edmund Ravenel, of the Grove, St. Thomas; Henry W. Ravenel, Esq., of Aiken, S. C.; Wm. Simmons, Esq., Yonge's Island, S. C.; Dr. Klipstein, Christ Church; Maj Wm. M. Murray, Edisto Island; Jabez J. R. Wescoat, Esq., Edisto Island; Chas. Boutelle, Esq., U. S. Coast Survey; Prof. Wm. Hume, Citadel Academy; Prof. Saml. H. Dickson, Jefferson College, Philadelphia; Alderman Lucas, Charleston; Dr. R. W. Gibbes, Sen., Columbia, S. C

POST-PLEIOCENE FOSSILS.

INTRODUCTION.

The Post-Pleiocene period is marked in the geological sequence, as that interesting epoch when life upon our globe was manifested in those organic forms, chiefly of the same species that belong to the historical, or present period, and were obviously designed "from the beginning" to be the contemporaries and companions of man, who appeared immediately afterwards; "The crowning point of creation."

It is the last formation of the *Cainozoic or Tertiary*, the epoch just antecedent to the advent of man upon this earth; a period in which, it may be said, the earth had been finally prepared and made ready for him who was to be formed in the likeness of the Creator, and was to have dominion given him over "the fish of the sea, the fowls of the air, the beasts of the earth, the herb and every creeping thing, yea—over all the earth;" a period that will ever be distinguished as the *grand connecting link* between the past and the present.

Sir Chas. Lyell, who is considered the best authority on tertiary geology, placed this connection in a striking point of view, having ascertained that ninety-five per cent of the fossils of the Post-Pleiocene period, are identical with living species.

The crust of the earth, as far as the researches of geologists extend, appears to be separated into strongly marked divisions, that seem to have been formed during four distinct and prolonged periods. These periods, for the sake of convenience, have been named in accordance with the class of animals and vegetables in existence during the formation of each, evidences of which we find preserved in their fossil remains.

The first division has been called *Azoic*; which signifies *without life*; the rocks of this age consist of granite gneiss, etc.; they contain no traces of organic forms, and being the lowest or first formed in the series, and originally in an incandescent state, passed, no doubt, into the condition of rocks, before the creation of animals and plants.

In the second division, the *Palæozoic, or ancient life*, we have indications of the first animals and plants created, not one species of which has outlived the convulsions that

separated this period from its successor; and that served, apparently, in each case to mark the close of one period and the commencement of another.

The next in order and third of the series, is named the *Mesozoic* or *middle life*, and its fossils belong to that middle or intermediate class of animals between the most ancient and recent forms. These also in turn became, like their predecessors extinct, and were succeeded by a later creation.

The next and last age is named the *Cainozoic—recent life*—and by some authors called the TERTIARY, or third grand division, and in which we discover, for the first time, the created forms that are to be the cotemporaries of man.

These divisions, or grand divisions, as they may be called, are again sub-divided into minor periods or formations; the first, consequently the lowest and oldest in the series of the CAINOZOIC or TERTIARY, is called EOCENE, for in it we find representatives of the dawn or commencement of that creation; a few species, two or three per cent, only, having been perpetuated down to the present time.

In the MEIOCENE, the next in age, a larger number of species are found whose existence is thus prolonged.

In the PLEIOCENE, more recent, a majority of the fossils are of recent species; and at last, in the POST-PLEIOCENE—*the most recent*—ninety-five per cent, or nearly all the species, continue to the present time. This last, the Post-Pleiocene, is an extensive formation in the low or flat country of South Carolina and is included in a belt extending from the sea coast about ten miles inland, and occupies depressions in the great marl bed of the Eocene period.

Three distinct formations or beds are here supposed to belong to this age. First the marine beds, composed of a gray sandy clay in which are imbedded innumerable small shells, sometimes very comminuted, but of species now common and living on the coast; many of the large shells are preserved in the position they occupied when living, having both valves entire and perfect, and presenting the appearance of having been destroyed suddenly by an avalanche of sand.

The second, is the blue or pluff-mud bed, composed of a stiff blue clay, containing silicious pebbles, and masses of conglomerates, water-worn and boulder-like, but no angular blocks, and includes remains of marine and terrestrial animals. These pebbles and rolled conglomerates contain casts of the fossils common to the marl of the Eocene bed upon which the blue mud rests, and it has been ascertained that the silicious conglomerates are fragments of the marl, broken off, we infer, by the action of waves, and rolled upon the beach of a Post-Pleiocene sea; they afterwards were imbedded in the blue mud, lost all their lime or calcareous particles, and became silicified.

The third or upper bed includes the peaty deposits, yellow sands and clays, which overlie the pluff-mud.

Sections of the three most important localities may be represented in the following tables:

MARINE BEDS OF THE WADMALAW.

Yellow Sand.....	15 feet.
Ferruginous sand with casts of shells.....	2 feet.
Red Clay.....	2 feet.
Gray sand and mud with comminuted shells, fossils in fine preservation.....	3½ feet.

ASHLEY RIVER BEDS.

Yellow sands with bands of Ferruginous clay.....	4 feet.
Blue mud resting on the white Eocene marl.....	1 foot.

GOOSE CREEK BEDS.

Yellow sand.....	12 feet.
Blue mud.....	2 feet.
Ferruginous sand containing bones, etc.....	3 inches.
Yellow sand.....	3 feet.
Pleiocene marl resting on the Eocene white marl.....	12 feet.

The fossil bones obtained from some of these strata are often in a fine state of preservation, especially those taken from the blue mud, which are generally petrified; those from the sands are likewise well preserved, but in the peaty or upper beds they are not so petrified, retain all their gelatine and appear to decompose rapidly.

Dr. Klipstein, who resides near Charleston, in digging a ditch for the purpose of reclaiming a swamp, discovered and sent me the tooth of a mastodon, with the request that I should go down and visit the place, as there were indications of the bones and teeth of the animal still remaining in the sands which underlie the peat-bed. Accordingly, with a small party of gentlemen, we visited the Doctor, and succeeded not only in obtaining several other teeth and bones of this animal, but nearly one entire tusk, and immediately along side of the tusk discovered a fragment of *pottery* which is similar to that manufactured at the present time by the American Indians. The depth of the excavation was about three feet below the surface; bones of the deer and two teeth of a horse were also found.

This is not a drift-bed, but a deposit of the peat and sand of the Post-Pleiocene formation. The marine beds with their characteristic shells lie immediately beneath, and are exposed on the high land which surrounds the swamp. If we take the one hundred and fifty species of mollusca, whose shells are so beautifully preserved in these beds, and place the entire group along side a similar collection of shells of the recent species living upon the coast, we will observe that they are identically the same in form, character and every other respect. There are among the fossils two shells whose analogues are not now living upon the sea coast of Carolina, but are common in the gulf of Mexico, and West Indian seas. *Strombus pugilis*, abundant on the coast of Florida and Cuba, is a fossil of the Post-Pleiocene; and *Gnathodon cuneatum*, now living in the estuaries near Mobile, and along the

northern coast of the Gulf is found fossil at a depth of eighteen or twenty feet under the city of Charleston, and in such numbers that cart-loads may be obtained from a single locality.

Again, we find two more species that are now extinct, or rather unknown to me in a recent state, one of which I have lately figured and described as *Cavolina Tuomeyi*, after my late friend and colleague Prof. Tuomey; the other is *Telldora lunulata*, Adams, a shell described as recent, from Carolina, but in fact a fossil in the Post-Pleiocene and extinct.

Now let us compare the remains of the vertebrata with a similar group of living animals. Among the former we find teeth of the deer, raccoon, opossum and others well known to be living at the present time in South Carolina; but like the invertebrated we find two or three species which are no longer existing north of Mexico and South America—the *peccary*, the *capybara* and the *tapir*. Again, there are remains of the musk-rat and beaver, but these two animals are extinct in the low country of South Carolina; the beaver has indeed almost been extirpated to the east of the Mississippi river, and the musk-rat is confined to a region above the falls of the rivers of this State.

The mastodon, the megatherium, the mylodon and perhaps one or two others are extinct.

That we may the better appreciate the interesting analogy existing between these two groups as regards the living and extinct species, we will place them in a tabular form, thus:

FOSSIL REMAINS.	MOLLUSCA.	VERTEBRATA.
Species apparently the same as those now living and included } in the fauna of South Carolina,say 140.say 37.
Species not included in the recent fauna of the State, but living } within tropical latitudes.say 2*say 3§
Do. do. in northern latitudes.2†3
Species presumed to be extinct.say 2‡say 5¶

Among the fossils collected in South Carolina from beds of this age—POST-PLEIOCENE—some of which are exposed at Ashley Ferry, Goose Creek, Stono, John's Island, and other localities, a number have been found apparently belonging to animals having specific characters in common with recent or living species not considered indigenous to this country, such as the horse, hog, sheep, ox, etc.

A large collection of fossils from this interesting formation were submitted by me about three years ago, to Professor Leidy, of Philadelphia; the eminent palæontologist, for deter-

* *Strombus pugilis* and *Gnathodon cuneatum*.

† *Mya arenaria*, *Pandora trilineata*.

‡ *Cavolina Tuomeyi* and *Telldora lunulata*.

§ *Tapir*, *Peccary* and *Capybara*.

|| *Elk*, *Beaver*, *Musk-rat*.

¶ *Mastodon*, *Elephant*, *Megatherium*, *Mylodon*, *Castoroides*.

mination; of these a number were returned with the remark, that they appeared to belong to recent species which had become accidental occupants of the same bed with the true fossils. I held the opposite opinion, and believed that these relics were indeed true fossil remains, as they were obtained not only from the banks and deltas of rivers, but a large number from excavations several feet below the surface, and at a distance from any stream, creek, pond, bog or ravine; and in some cases, from excavations below the high sandy land of cotton fields.

In a letter to Dr. Nott and Mr. Gliddon, dated Feb. 10, 1857, Prof. Leidy writes:

“Some time since, Professor F. S. Holmes, of Charleston, submitted for my examination, a collection of fossil bones from a Post-Pleiocene deposit on Ashley River, S. C. Among remains of the extinct horse, the peccary, mylodon, megatherium, mastodon, hipparion, the tapir, the capabara, the beaver, the musk-rat, etc., were some which I considered as belonging to the dog, the domestic ox, the sheep and the hog. Prof. Holmes observes that these remains were taken from an extensive deposit, in which similar ones exist abundantly, and he further adds, that he cannot conceive that the latter should have become mingled with the former, since the introduction of domestic animals into America by Europeans. It is not improbable that the American continent once had, as part of its fauna, representatives of our domestic animals, which subsequently became extinct—though I am inclined to doubt it; but what we have learned of the extinct American horse will lead me carefully to investigate the subject.”

The opportunity for prosecuting this investigation, to some extent, I had the pleasure of affording Professor Leidy, in March last, a month after the date of the above letter. Dr. Hallowell and himself visited me in Charleston, and I accompanied them to Ashley Ferry and Goose Creek.

In a paper written after the Professor's return to Philadelphia he says: “The collections of these gentlemen consist of a most remarkable intermixture of remains of fishes, reptiles and mammals, of the three periods mentioned; and in many cases perhaps we may err in referring a particular species to a certain formation, more especially in the case of the fishes. The remains usually consist of teeth often well preserved, but frequently in small fragments, more or less water-worn, and most of the fossils are stained brown or black.”

The fossils from Ashley Ferry present, as a group, the same appearance as those procured inland at some distance from the river, by digging from three to five feet below the surface. Many specimens from the ferry were considered as recent by Professor Leidy; they appear quite fresh and unchanged in color, and their texture not in the slightest degree altered. To one familiar with the fossils of the South Carolina Post-Pleiocene, this excites no surprise, as it is of common occurrence, more especially among the shells; for example, the olive shell—*Oliva literata*—is found as fresh and highly polished as the recent ones from the sea-beaches along the coast; and *Cardium magnum* retains often, the delicate yellow and brown markings; common to the species.

The color or texture of a fossil, therefore, does not always absolutely determine its relative age; as Professor Leidy has himself remarked in a foot-note to his letter alluded to above, viz;

“Fossilization, petrification, or lapidification, is no positive indication of the relative age of organic remains.

“The Cabinet of the Academy of Natural Sciences, of Philadelphia, contains bones of the megalonyx, and of the extinct peccary, that are entirely unchanged; not a particle of gelatin has been lost, nor a particle of mineral matter added, and, indeed, some of the bones of the former even have portions of articular cartilage and tendinous attachments, well preserved.”

Fig. 8, Plate XXIV, is the tooth of a sperm whale found in the Ashley beds. This specimen, when submitted some years ago to Prof. Leidy, was instantly recognized as a true fossil, similar in color and general character to those of the Ashley beds; specimens from these beds being more fossilized or petrified than those found in the peat-bogs and shell-beds of other localities. Fig. 9, of the same Plate, represents another tooth of the same species, from the Charleston shell-beds, and is as recent and fresh in appearance, as though just taken from the living whale.

From the foregoing it would appear that of the ancient fauna of America, which included representatives of many of our present domestic animals, some species have undoubtedly become extinct; but I confess I am not yet prepared to admit from any evidence yet adduced, or from my own examinations, that all of the living species are distinct from those found fossil in the Post-Pleiocene. The teeth and bones of the rabbit, raccoon, opossum, deer, elk, hog, dog, sheep, ox and horse are often found in these beds, and though associated with those known to be extinct, such as mastodon, megatherium, hipparion, etc., need not necessarily be referred to extinct races also; since their remains cannot be distinguished from the bones and teeth of the living species.

Of the mollusca from the same beds about ninety-five per cent. are to my mind identically the same with species now living on the coast of South-Carolina. Two species of these shells though extinct or not in existence here, are now living in numbers on the coast of Florida and the northern shores of the Gulf of Mexico;* and two have no living representatives that we can discover.†

The question therefore naturally suggests itself—are the living horses, dogs, hogs, raccoons, opossums, deer, elk, tapirs, beavers, etc., and the one hundred and fifty living shells of the coast, the descendants of the animals whose remains we find fossil in the above-named beds?

It has been just remarked that about ninety-five per cent., or nearly all of the one hundred and fifty shells of molluscous animals from these beds, are specifically identical with

* *Strombus pugilis*; *Gnathodon cuneatum*.

† *Cavolina*. *Tellina*.

the recent or living species of the coast,—two are found only at the south of this, and two are extinct. Of the vertebrates, from the same bed, the tapir, peccary, raccoon, opossum, deer, musk-rat, rabbit, beaver, and elk have still their living representatives, generically, if not specifically; and even of the identity of species there seems to be no doubt, as no anatomical differences can be discerned. Two of these species, like the mollusca just alluded to, no longer live in South Carolina; the tapir and peccary are only found in South America and Mexico; the musk-rat, elk and beaver, though extinct on the Atlantic coast, are still living in the interior of the country. And though it has been acknowledged that the mastodon, megatherium, elephant, glyptodon, and two species of Equine genera, etc., are entirely extinct, yet the discoveries made of the remains even of some of these, would indicate that they still existed at a period so recent, that, in the language of Prof. Leidy, “it is probable the red man witnessed their declining existence.”

The peccary, or Mexican hog, an animal common in Mexico, is not indigenous to the Atlantic United States; but his bones have been found associated with human remains in caves used as cemeteries by the Aborigines.* “A tomb in the city of Mexico,” according to Clavigero,† “was found to contain the bones of an entire mammoth, the sepulchre appearing to have been formed expressly for their reception.” And “Latrobe relates that during the prosecution of some excavations, near the city of Tezcuco, one of the ancient roads or causeways was discovered, and on one side, only three feet below the surface, in what may have been the ditch of the road, there lay the entire skeleton of a mastodon. It bore every appearance of having been coeval with the period when the road was used.”

Again I extract from Prof. Leidy’s letter:‡

“The early existence of the genera to which our domestic animals belong, has been adduced as presumptive evidence of the advent of man at a more remote period than is usually assigned. It must be remembered, however, even at the present time, that of some of these genera only a few species are domesticated: thus of the existing six species of *Equus* (Horse) only two have ever been freely brought under the dominion of man.

“The Horse did not exist in America at the time of its discovery by Europeans; but its remains, consisting chiefly of molar teeth, have now been so frequently found in association with those of extinct animals, that it is generally admitted once to have been an aboriginal inhabitant. When I first saw examples of these remains I was not disposed to view them as relics of an extinct species; for although some presented characteristic differences from those of previously known species, others were undistinguishable from the corresponding parts of the domestic horse, and among them were intermediate varieties of form and size. The subsequent discovery of the remains of two species of the closely allied extinct genus *Hipparion*, in addition to the discovery of remains of two extinct equine genera of an earlier

* Bradford’s American Antiquities, p. 31.

† Bradford’s American Antiquities, p. 227.

‡ Nott and Gliddon, Indigenous races of the earth; p. xviii.

geological period, leaves no room to doubt the former existence of the Horse on the American continent, contemporaneously with the Mastodon and Megalonyx: and man probably was his companion."

Lieut. Michler in his report on the Pimos and Maricopas Indians, remarks:* "The former are further advanced in the art of agriculture, and are surrounded with more comforts than any uncivilized Indian tribe I have ever seen. Besides being great warriors, they are good husbandmen and farmers, and work laboriously in the field. They are the owners of fine horses and mules, fat oxen and milch cows, pigs and poultry, and are a wealthy class of Indians. The Pimos consider themselves the regular descendants of the Aztecs, and claim 'Montezuma' to have been of their tribe. One of their legends speaks of his leaving them on horseback on his pilgrimage to found a new country."

"The Indians of North America knew that the Mastodon had a trunk; a fact—though the anatomist infers it from the bones of the skull—it is difficult to imagine them to be acquainted with, except by tradition from those who had seen the living animal.

"No evidence of man's presence has occurred older than the latest Tertiary deposits, which insensibly merge into the alluvial. It seems certain that human remains have been found in chronological association with those of animals long extinct, and there appears no reasons to doubt that some species of animals, as the Irish Deer, the Moa of New Zealand, and the Dodo of the Mauritius, have disappeared from creation within a period of a few centuries."†

EXTRACT FROM THE PROCEEDINGS OF THE IMPERIAL SOCIETY OF EMULATION SÉANCE, OF
JUNE 23, 1859.‡

"For the past twelve years, the world of science has been occupied with the discovery of stones cut by the hand of man, made by our honorable President, M. Boucher de Perthes, in the diluvium, and the deposits of fossil bones, of which an account was given in 1847, in his work, "Antiquités Celtiques et Antédiluviennes."§ The existence of man, contemporaneously with the deluge, so often disputed, despite the proofs given in the work just cited, has just received a signal confirmation.

Mr. Joseph Prestwick, a member of the Royal Society, and of the Geological Society, of London, has visited Abbéville and Amiens.

After having examined the collection of M. Boucher de Perthes, Mr. Prestwick, with the assistance of the Antiquarian Society of Picardy, caused large excavations to be made in the diluvial beds which surround these

* Emory's Report on the U. S. and Mexican Boundary, p. 117.

† Gosse. Omphalos, p. 84.

‡ Translated and published by Mr. Kinsing, Phila., 1859.

§ In 2 vols., large 8vo., with 106 plates, containing 2000 figures, Paris, 1847. Copies can be seen in the Philadelphia Library, and in the Astor Library, New York.

two cities; and, after several days research on the spot, he has acknowledged the correctness of the statements of M. de Perthes, and establishes most fully his great discovery."

"These facts are set forth in a letter, (written in French,) of which the following is a copy:

LONDON, 14th May, 1859.

MONSIEUR BOUCHER DE PERTHES.

President of the Imperial Society of Emulation, Abbéville.

In writing to you a few days ago I omitted speaking in regard to the opinions that I formed concerning the deposits in which the axes of Silex are found.

And first, as to those which you showed me, and those which I obtained at Abbéville and Amiens, I have not the slightest doubt but that they were cut by the hand of man. I speak at present only of those in Silex called axes.

After having attentively examined the beds at Moulin-Quignon, and those of St. Gilles at Abbéville, and St. Acheul at Amiens, I am convinced that the opinion which you advanced in 1847 in your work on the "Antiquités Celtiques et Antédiluviennes," that those axes found in an undisturbed deposit (terrain vierge,) and associated with the bones of the great mammifers, is correct and well founded.

With respect to the beds of Menhecourt, the fact does not appear so certain to me; yet I do not see any error.

Permit me to observe, that up to the time of my visit, I had the strongest doubts in regard to the character of these beds. I thought it possible that there might have been some unperceived geological error. I am very glad to have been enabled to convince myself, through personal research of the truth of so important a fact.

You are at liberty sir, to make what use you may please of this letter. Accept my thanks, and the assurance of my high regard.

JOSEPH PRESTWICK.

Mr. Joseph Prestwick, author of several well known works on Geology, after the verification made at Abbéville and Amiens, wished to assure himself whether the diluvial beds in England were analogous. Accordingly, in the course of May, he opened at Hoxne in Suffolk, a bed of diluvium, and after having established its perfect analogy with those at Abbéville and Amiens, he also found there similar fossil bones and flint axes. Such is the result announced in another letter of this learned Geologist."

"His reports to the Royal Society, and to the Geological Society, excited great interest, and several of their members accompanied Mr. Prestwick in a second visit which he made us. These gentlemen arrived at Amiens on the 28th May, and on the 30th at Abbéville. The examination of the beds, which lasted several days, was conducted on a much more extensive scale, and the same results were obtained, as the following letter shows:

LONDON, 8th June, 1859.

M. BOUCHER DE PERTHES,

President of the Imperial Society of Emulation, Abbeville.

In accordance with your request I send you the account of the discoveries we made during my last visit.

Although I had returned thoroughly satisfied that the flint axes are really found in situ in the gravel beds (diluvium) at St. Acheul, nevertheless I was extremely desirous of discovering one with my own labor, and to have other members of the Geological Society of London, witness the great discovery you have made. Therefore, I set out ten days ago for Amiens, accompanied by my friends Messrs. R. Godwin Austen, J. W. Flower and R. W. Mylne.* We commenced work early next morning, and after several hours spent in research and in the

* Mr. R. Godwin Austen, member of the Royal and Geological Societies of London, is the author of important articles published in the volumes of the Transactions of the Geological Society of London. Mr. J. W. Flower, member of the Society of Antiquarians, is known by his papers on Archaeology, and his fine Geological collection. Mr. R. W. Mylne, member of the Geological and Antiquarian Societies, is known by his great Geological plan of London.

examination of the deposits at the quarry of St. Acheul, Mr. Flower discovered, and took up, with his own hands, at a depth of twenty feet, and at a foot from the surface of the gravel, a very fine axe, well cut, and in length about twenty-five centimetres. It was from a ferruginous bed, above that of the white gravel, that I obtained the other specimen. Above the gravel there was a bed of sand, containing fresh water and fragile land shells, and then of brown clay, of gravel, and of brick clay.

The whole was in good order, and nowise deranged. In fact it was very evident that it was a "terrain vierge."

This discovery removed every doubt of my friends, and I believe that now we are all of the same opinion, in regard to the important truth of which you were the first to make the announcement, and which you have sustained for the past ten years—and of which I am happy to be one of the witnesses.

Accept sir, the assurance of my high regard.

JOSEPH PRESTWICK.

"The conclusions of these eminent gentlemen, members of societies so distinguished, the care that they have taken to establish the character of the deposit and its primitive state, their profound research, their scrupulous exactness which was carried so far as even to photograph the excavations, and the deposits in which the axes were found, and to accept nothing as proof but that which they themselves discovered, and with their own hands drew from the beds and diluvial deposits, should convince the most incredulous.

To M. Boucher de Perthes then, belongs the honor of having first declared that though human bones were not found, yet that the works of man contemporaneous with the deluge, ought to exist in the diluvial beds, and of having, after numerous researches, demonstrated the truth of his theory. A truth which Dr. Rigollot, Corresponding member of the Institute, confirmed in 1854, in his brochure, "*Des Instruments en Silex trouvés a St. Acheul*," and which has just been again confirmed in a still more authentic manner by the learned English Geologists, whose names we have just mentioned; to which we must add that of the celebrated Palæontologist, Falconer, Vice President of the Geological Society of London, who, in 1858, visited Abbéville, and there examined with great care, the rich collection of M. Boucher de Perthes; and also that of Mr. John Evans, member of the Geological and Antiquarian Societies of London, and another of several memoirs on Archæology and Numismatology, in a letter from whom, addressed to our President, we read—"I was present at the sitting of the Royal Society, when Mr. Prestwick read his report on the stone axes found in the diluvium, and I add my testimony to his." After speaking of the axe that his colleague had just discovered in the diluvium, in Suffolk, Mr. Evans, who had accompanied Mr. Prestwick in his first visit to Abbéville, and assisted him in his explorations, says—"I am satisfied these instruments of flint will be found in many other localities if the search for them be properly conducted."

LETTER FROM PROFESSOR AGASSIZ.

KEY WEST, FEB. 25th, 1858.

Prof. F. S. Holmes:

MY DEAR SIR:—I have not forgotten my promise to write you my impressions respecting your important discoveries of fossil mammalia in the Post-Pleiocene beds of South-Carolina. Indeed, I have been thinking of them continually since I saw them, and nothing impressed me so deeply for many years past as the sight of these bones. I consider their careful study in all their relations as of the utmost importance for the progress of our science. It is true there is hardly anything of interest in the animals themselves, since they appear to be all well known types, but their simultaneous occurrence in the same beds showing that they have lived together at a time when the white man had not yet planted himself upon this continent, render their association

as undisputed. How does it happen, that horses, sheep, bulls and hogs, not distinguishable from our domestic species, existed upon this continent, together with the deer, the musk-rat, the beaver, the hare, the opossum, the tapir, which in our days are peculiar to this continent, and not found in the countries where our domesticated animals originated? The whole matter might seem to admit of an easy solution by supposing that the native American horse, sheep, bull, and hog were different species from those of the old world, even though the parts preserved show no specific differences; but this would be a mere theoretical solution of a difficulty which seems to me to have far deeper meaning, and to bear directly upon the question of the first origin of organized beings.

The circumstances under which these remains are found, admit of no doubt but the animals from which they are derived, existed in North America long before this continent was settled by the white race of men together with animals which to this day are common in the same localities, such as the deer, the musk-rat, the opossum, and others only now found in South America, such as the tapir. This shows beyond the possibility of a controversy, that animals which cannot be distinguished from one another, may originate independently in different fauna, and I take it that the facts you have brought together, are a satisfactory proof that horses, sheep, bulls, and hogs, not distinguishable at present from the domesticated species, were called into existence upon the continent of North America prior to the coming of the white race to these parts, and that they had already disappeared here when the new comers set foot upon this continent; but the presence of tapir teeth among the rest show also that a genus peculiar to South America and the Sunda Islands, existed also in North America in those days, and that its representative of that period is not distinguishable from the South American species.

It would be desirable in this stage of the enquiry to compare your tapir teeth with those of the species from Central America, which is considered distinct from the Brazilian species. This circumstance leads naturally to the question of the specific identity of all these animals with those now living in the same locality, and with the domesticated species. And here I confess the difficulty to be almost insuperable, or at least hardly approachable in the present state of our science, when the views of naturalists are so divided as to what are species among the genera *bos*, *ovis*, *capra*. For myself, I entertain doubt respecting the unity of origin of the domesticated horses. But whatever be the final result of this enquiry, this much is already established by the fossils you have collected, that horses, hogs, bulls and sheep were among the native animals of North America, as early as the common American deer, the opossum, the beaver, the musk-rat, etc. What remains to be settled respecting their specific identity, is involved in the controversy now carried on between naturalists, who admit specific distinctions upon a very wide range of differences, and those who limit them within narrow boundaries. But the final solution of this point can in no way lessen the interest of your discoveries.

Should you publish anything upon this subject, let me have your notice, for I am deeply interested in the subject, as I always shall be, in everything you do.

Ever truly your friend,

L. AGASSIZ.

The result of the whole seems to be, that of the animals found fossil in the Post-Pleiocene beds, all the mollusca of the present day are undoubtedly a perpetuation of the same species; that of the higher order of vertebrata, the tapir, peccary, raccoon, opossum, deer, elk, and musk-rat are equally entitled to be considered the descendants of this ancient race. And if the claims of the mollusca to this distinction rests upon a secure basis, because they are peculiar to this country and not obnoxious to suspicion of foreign immigration, it must be recollected that this is equally true of the above named animals.

Those which have hitherto been regarded as of recent and European origin, are the horse, sheep, hog and ox; and it must be reserved perhaps for future consideration to determine how far the negative proof of the non-existence of these animals in the country at the time of its discovery may be regarded in each individual case sufficiently strong to settle the question of his extinction and re-introduction, when so many of his associates and contemporaries have succeeded in maintaining an unbroken line of descent down to the present day.

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ERRATA.

In reference to Plate XVII, second line, instead of *form*, read *four* molar teeth.

In reference to Plate XIX, at fig. 2, for *fifth* molar tooth, read *fourth* molar tooth.

In reference to Plate XX, fig. 9, read Bos TAURUS before the words, last lower.

At page 113, in reference to figures of FIBER ZIBETHECUS, for figs. 1 to 4, read figs. 2 to 4.



POST-PLEIOCENE FOSSILS.

FORAMINIFERA.

Genus, NODOSARIA.—LAMK.

NODOSARIA OBTUSA.—(*New Species.*)

PLATE I. FIG. 1.

DESCRIPTION. Shell elongated, sub-cylindrical, with twenty-two longitudinal, obtuse and flattened ribs; loculi six, convex; aperture round, margin raised and prominent; length, one-fourth of an inch.

This is the only specimen of a NODOSARIA yet discovered in the Post-Pleiocene of South-Carolina. In the Eocene marls of the State, it is common.

PLATE I. FIG. 1, *Magnified.*

LOCALITY. Simmons' Bluff, Young's Island.

Cabinet F. S. H.

POLYPARIA.

Genus, ASTRÆA.—LAM.

ASTRÆA BELLA.

PLATE I. FIG. 2.

Astræa bella, *Conrad*, Jour. Acad. Nat. Sci., Vol. 8, p. 189.

Astræa bella, *Tuomey & Holmes*, Pleiocene Fossils So. Ca., p. 1, pl. 1, fig. 1.

DESCRIPTION. Stars often polygonal, sometimes circular, deep, lamellar; lamellæ numer-

ous, alternately larger and smaller, denticulated and rough on the edges, sides prominently papillated; partitions between the stars thin and plaited by the alternate position of the lamellæ of the adjacent stars.

This coral was first described by Mr. Conrad, from a fossil specimen found near Newbern, North-Carolina. It is common in the recent state on this coast and often incrusting other bodies.

PLATE I. FIG. 2.

Museum, College of Charleston; Cabinet F. S. H.

ASTRÆA CRASSA. — (*New Species.*)

PLATE I. FIGS. 3 AND 3a.

DESCRIPTION. Corallum thick, not incrusting; stars orbicular, sometimes polygonal, irregular, deep; lamellæ about twelve, rough, denticulated.

The cells of this coral resemble *A. MARYLANDICA*, of Conrad; but, unlike that species, it is thick and not incrusting.

PLATE I. FIG. 3, *Coral, natural size.*

“ 3a, *Cell, magnified.*”

LOCALITY. Charleston.

Cabinet F. S. H.

ASTRÆA PETROSA.

PLATE I. FIGS. 4 AND 4a.

Astræa petrosa, *Dana*, *Zoophytes*, U. S. Exploring Expedition, Vol. 8, p. 238.

DESCRIPTION. “Convex; corallum sub-cellular, firm; in a transverse section the stars orbiculate, commonly oblong, one-and-a-half to three lines broad and one-and-a-half to five lines long; many-rayed, rays very thin, with the cellules simple; septa a line thick and quite solid.”—*Dana*.

This fragment, of which we have given an outline in Plate I, Fig. 4a, with a drawing of

four cells, was kindly presented me by Mr. Allen S. Hanckel, who discovered it in St. Andrew's Parish, near Charleston. *A. PETROSA* is a West India coral.

PLATE. I. FIG. 4, *Cells, natural size.*
 " 4a, *Outline of fragment.*

LOCALITY. St. Andrew's.

Cabinet F. S. II.

Class, ECHINODEMATA. Order, ECHINI. Family, ECHINIDÆ.

Genus, MELLITA.—KLEIN.

MELLITA QUINQUEFORA. Variety, AMPLA.

PLATE I. FIGS. 6, 6a AND 6b.

Scutella quinquefora, *Lamk.*, An. sans Vert., Vol. 3, p. 280.

Scutella quinquefora, *Ravenel*, Cat. Recent and Fossil Echinidæ So. Ca., 1848, p. 4, No. 7.

Mellita ampla, *Holmes*, MS.

Mellita ampla, *Ravenel*, Cat. Recent and Fossil Echinidæ So. Ca., 1848, p. 4, No. 8.

Scutella quinquefora, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxiii.

DESCRIPTION. Disk sub-orbicular, truncated posteriorly; margin thin, slightly notched opposite anterior ambulacrum; upper surface moderately convex; lower surface flat, or slightly convex; lunules five, open, long and narrow; posterior lunule wider and about one-fifth longer than the ambulacral petals, sub-ovate, open; posterior pair longer than the anterior or lateral petals; ambulacral furrows on lower surface deep, branched; branches dendritic.

This shell was, ten years ago, referred with some hesitation to a new species, and called *M. AMPLA*, on account of its great size. We now feel quite assured it is only a large variety of *MELLITA QUINQUEFORA*, *Rav.* The conditions for so great development, which existed during the Post-Pleiocene period, have passed away with that age; and were probably owing to the gulf stream washing the shores of South-Carolina before the upheaval of our low country. Individuals of the present period, now living in the waters of the coast, seldom attain one-half the size of their fossil congeners. It is also worthy of remark, that few small specimens, or young shells of this species, are found in a fossil state, though large ones are abundant.

We retain the characteristic specific name *AMPLA* for this variety, which was suggested by our friend, Prof. Agassiz, and give in the plate, fig. 6, a good figure of this magnificent *MELLITA*, surrounding it with an outline (6*a.*) of the largest specimen yet discovered.

PLATE I. FIG. 6, *View from above.*

“ 6*a*, *Outline of largest specimen in the cabinet.*

“ 6*b*, *Profile of same.*

LOCALITY. Simmons' Bluff, St. Paul's.

Museum, College of Charleston; Cabinet F. S. H.

ECHINUS VARIEGATUS.

PLATE II. FIG. 1.

Echinus variegatus, *Lam.*, An. sans Vert., 2d Ed., Vol. 3, p. 365.

Echinus variegatus, *Say*, Jour. Acad. Nat. Sci., Vol. 5, p. 226.

Echinus variegatus, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxiii.

DESCRIPTION. Shell, orbicular, sub-globose, the large tubercles extend in rows from basal to dorsal aperture; lower surface, or base, closely covered with rows of large mammiferous tubercles, varying slightly in size; plates studded with small tubercles, giving the shell a beautiful granulated appearance; the pores in the series of ambulacral bands are placed alternately two and four, and the rows slightly inclined; aperture for the mouth large, circular, with ten fissures or clefts, which are narrow, deep and slightly curved; dorsal aperture irregular; spines short, and numerous, the larger ones subtruncated at their points; a few spatula-like spines surround the mouth.

This species is living in deep soundings off the Carolina coast, and is known as the short-spined sea urchin, or bachelor's button. Like its congener, only one specimen in a perfect state has, as yet, been obtained from the Post-Pleiocene; the fragments and spines are numerous.

PLATE II. FIG. 1, *Shell, natural size, viewed from above.*

“ 1*a*, *Spines.*

LOCALITY. Simmons' Bluff, St. Paul's; Charleston.

Museum, College of Charleston; Cabinet F. S. H.

ANAPESUS CAROLINUS.

PLATE II. FIG. 2.

Anapesus Carolinus, *Troschel*.*Echinus punctulatus*, *Lam.*, *An. sans Vert.*, 2d Ed., Vol. 3, p. 363.*Echinus punctulatus*, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xxiii.*Echinus punctulatus*, *Ravenel*, *Cat. Recent and Fossil Echinidæ So. Ca.*, p. 1.

DESCRIPTION. Disk orbicular; upper surface convex, often sub-conical; ambulacral plates, with two purple bands of pores in pairs, extending from basal to anal aperture, having one row of large tubercles on each side; the interambulacral spaces on the dorsal part of the shell without tubercles, or the fine granules which cover the plates around their base; the sutures of the angular plates distinct; dorsal aperture oval; spines aciculariform, with purple points; those on the base spatulariform.

This fragile shell is seldom obtained in a perfect state from the Post-Pleiocene beds, and never with the spines attached; the specimen from which our figure is taken was procured from excavations made for the tidal drains in the upper part of the city of Charleston, and kindly presented to me by Dr. Wm. T. Wragg, the Alderman under whose superintendance the work was done. Fragments of the shell, and perfect spines, are often found in the sands of the Post-Pleiocene. It is the most common species now living upon the Carolina sea-coast.

PLATE II. FIG. 2, *Shell, natural size, viewed from above.*" 2a, *Spine of the same.*

LOCALITY. Charleston; Simmons' Bluff, St Paul's; Wando.

Museum, College of Charleston; Cabinet F. S. H.

Genus, SCHIZASTER.—AGASSIZ.

SCHIZASTER ATROPOS.

PLATE II. FIG. 3.

Spatangus atropos, *Lam.*, *An. sans Vert.*, 2d Ed., Vol. 3, p. 327.*Spatangus atropos*, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xxiii.*Schizaster atropos*, *Ravenel*, *Cat. Recent and Fossil Echinidæ of So. Ca.*, p. 4, No. 16.

Only a small fragment from the left anterior portion of this shell has been found in the

Post-Pleiocene, but it is sufficiently characteristic to determine the species to which it belongs. *S. ATROPOS* is found along the Carolina coast in a recent state.

PLATE II. FIG. 3, *Fragment, and restored outline of shell, natural size.*

LOCALITY. Abbapoola Creek, John's Island. *Museum, College of Charleston.*

BRYOZOA.

Genus, REPTOCELLEPORARIA.—D'ORB.

REPTOCELLEPORARIA INFORMATA.

PLATE I. FIG. 5.

Cellepora informata, *Lons.*, Quar. Jour. Geol. Soc., London, Vol. 1, p. 505.

Reptocelleporaria informata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 15, pl. 4, figs. 11 and 12.

DESCRIPTION. Incrusting, irregular; surface porous, mammillary; cells unequal; mouth circular, raised, thickened.

This little coral is easily known by its densely porous surface. Our figure represents a fragment of *OSTREA*, incrustated with irregular laminæ of this pretty species; the cells are barely visible without a lens.

PLATE I. FIG. 5, *Fragment of Ostrea, incrustated with this Bryozoa.*

LOCALITY. Charleston.

Cabinet F. S. H.

Genus, LUNULITES.—LAM.

LUNULITES DENTICULATA.

PLATE II. FIGS. 4, 4a AND 4b.

Lunulites denticulata, *Con.*, Am. Jour. Sci., Vol. 41, p. 348.

Lunulites denticulata, *Lons.*, Quar. Jour. Geol. Soc., London, Vol. 1, p. 503.

Lunulites denticulata, *Tuomey & Holmes*, Pleiocene Fossils So. Ca., p. 11, pl. 4, fig. 1.

DESCRIPTION. Shell sub-conical, depressed; interior surface radiate, striated, granulated,

or punctate; cells oblong, denticulate, quincunx; mouths circular, or semi-circular; margin crenulated.

This is a very abundant species in the Post-Pleiocene marls and sands, and is identical with one living on the coast.

PLATE II. FIG. 4, *Shell, magnified.*
 " 4a, *Profile, natural size.*
 " 4b, *Outline of base.*

LOCALITY. Simmons'; Abbapoola; St. Andrew's.
Museum, College of Charleston; Cabinet F. S. II.

ARTICULATA.

Class, CRUSTACEA. Order, CIRRIPIEDIA. Family, BALANOIDEA.

Genus, BALANUS.—BRUG.

BALANUS EBURNEUS.

PLATE II. FIGS. 5 AND 5a.

Balanus eburneus, *Gould*, *Invert. Mass.*, p. 15, fig. 6.

Balanus eburneus, *De Kay*, *New-York Fauna*, part 5, p. 252, pl. 35, fig. 320.

Balanus eburneus, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xviii.

DESCRIPTION. Shell white, smooth, obliquely conical; the raised triangles, with lanceolate points, all inclined backwards; within, regularly grooved.—*Gould*.

A large number of specimens are found in the Post-Pleiocene beds of South-Carolina, and although the above description does not exactly apply to all the varieties, we consider them specifically identical. It is a common species in Charleston harbor.

PLATE II. FIGS. 5, and 5a.

LOCALITY. Simmons'; Wadmalaw Sound; Abbapoola Creek, John's Island.
Museum, College of Charleston; Cabinet F. S. H.

Order, DECOPODA.

See Fauna of South Carolina, appended to Tuomey's Geology of that State, by Prof. L. R. Gibbes, p. xv.

CALAPPA MARMORATA.—FAB.

PLATE II. FIG. 6.

Vulgo, Box or Conch-Crab.

We have only a fragment (the movable finger) of the right claw of this beautiful species of Crab, from the Post-Pleiocene marls, but it is so characteristic as to dissipate all doubt of its existence during that geological period. *Calappa marmorata* is living on the coast of South-Carolina, in deep water, but is rarely captured.

PSEUDOCARCINUS MERCENARIA.—SAY.

PLATE II. FIG. 7.

Vulgo, Stone Crab.

Our figure is taken from a fragment of the lower finger of left claw; the punctured groove along the side is quite characteristic. This also is a common species in the waters of our bays and harbors.

GUIA PUNCTATA.—BROWN.

PLATE II. FIG. 8.

Vulgo, Little-spotted Crab.

The third joint of the right claw is all of this species yet found in the Post-Pleiocene. It is a common crab upon the coast.

LUPA DICANTHA.—LAT.

Vulgo, Sea Crab, [not figured.]

Since our plate was drawn, several fragments of this species have been found. It is the common edible crab, found living along the coast from Florida to Cape Cod.

The five species of above-named decapodous crustaceans were all discovered in the sandy beds of Post-Pleiocene age, at Mr. Simmons', Wadmalaw Sound.

Museum, College of Charleston; Cabinet F. S. H.

Class, ACEPHALA. Order, LAMELLIBRANCHIATA. Family, OSTREIDÆ.

Genus, OSTREA.—LINN.

OSTREA VIRGINIANA.

PLATE II. FIG. 9.

- Ostrea Virginiana*, *Lister*, *Conch.*, t. 200, f. 34.
Ostrea Virginiana, *Sowerby*, *Genera of Shells*, fig. 2.
Ostrea Virginiana, *Conrad*, *Foss. Shells Tert. Formation*, Vol. 1, p. 28, tab. 14, fig. 2.
Ostrea Virginiana, *Gould*, *Invert. Mass.*, p. 136.
Ostrea Virginiana, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xxii.
Ostrea Virginiana, *Tuomey & Holmes*, *Pleiocene Foss. of So. Ca.*, p. 20, pl. 5, figs. 6 to 9.
Ostrea Virginica, *Gmelin*, *Syst.*, 3336, No. 113.
Ostrea Virginica, *Dillwyn*, *Catal.*, 1, 277.
Ostrea Virginica, *Lam.*, *An. sans Vert.*, VII., 225.
Ostrea Virginica, *Wood*, *Index*, pl. 2, fig. 68.
Ostrea Virginica, *Deshayes*, *Ency. Meth. Vers.* II., pl. 179, figs. 1 and 2.
Ostrea Virginica, *Ravenel*, *Cat. Coll. Shells*, p. 8.
Ostrea Virginica, *DeKay*, *Zoology New-York*, Art. Mollusca, p. 169.

Vulgo, Virginia Rock Oyster.

DESCRIPTION. Shell irregular, ovate-oblong, thick; lower valve radiately plicate,

rugose, or radiately undulating; superior valve smaller, somewhat flat, lamellar or plicate; muscular impression nearly central; hinge with deep channel in lower valve, and corresponding eminence in the upper, extending to apex of shell.

It is exceedingly variable in form and character, both in a fossil and recent state.

Notwithstanding its great abundance in the recent state along our shores, it is by no means a very common shell in the Post-Pleiocene. In the Pleiocene it is a rare fossil.

The long and narrow variety is known on the Carolina and Georgia coasts, as the Raccoon Oyster, and is described in the next article.

PLATE II. FIG. 9, *Interior of lower valve, natural size.*

LOCALITY. Charleston; Simmons', Young's Island; Brown's, St. Andrew's; Ashley Ferry.
Museum, College of Charleston, Cabinet F. S. H.

O S T R E A V I R G I N I A N A . Variety, PROCYON.

PLATE II. FIG. 9a.

Vulgo, Raccoon Oyster.

DESCRIPTION. Shell narrow, greatly elongated, seldom curved, gradually widening from the beak or apex to the other extremity which is rounded; ligamental fossa long and deep; cavity often extending under the hinge in lower valve; its other characteristics are the same as described above in O. VIRGINIANA.

In a recent state, it is a very common shell along the bays and shallow inlets of the coast of South-Carolina; its elongated, narrow form, is due to its position, growing vertically, and in crowded clusters. Individuals are frequently found measuring ten or twelve inches in length, but seldom over one-and-a-half or two inches in breadth. Beds of this species are often exposed at half-tides, at the mouths of rivers and creeks; on the mud-flats they abound. The Raccoon (*Procyon lotor*) resorts to these places upon the first flow of the tide, when the mouths of the Oysters are all opened ready for the refreshing influence of the young flood-tide; quickly and skilfully, by a thrust of his paw, he extracts from the shell his favorite food; hence the name, "Raccoon Oyster."

In the Pleiocene marls of our State, we have found this variety fossil, but it is rare. Only a few specimens have been discovered in the beds of Waccamaw and Goose Creek; and though not abundant in the Post-Pleiocene, it is not uncommon.

"The genus OSTREA had its beginning in the Triassic, was very numerous in the Jurassic, Cretaceous and Tertiary periods, and has its numerical maximum in the present

seas, where it exists at all depths, generally within the limits of tide water, but frequently within deeper soundings."—*T. & H.*

PLATE II. FIG. 9a., *Exterior of lower valve.*

LOCALITY. Charleston; Simmons', Young's Island.

Museum, College of Charleston; Cabinet F. S. H.

ANOMIA EPHIPPIMUM.

PLATE II. FIG. 11.

Anomia Ehippium, *Linn*, Syst. Nat., 1150.

Anomia Ehippium, *Conrad*, Foss. Ter. Form., p. 75, pl. 43, fig. 4.

Anomia Ehippium, *Ravenel*, Cat. Coll. Shells, p. 8.

Anomia Ehippium, *Gould*, Invert. Mass., p. 138.

Anomia Ehippium, *De Kay*, Zool. New-York, Art. Mollusca, p. 168.

Anomia Ehippium, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.

Anomia Ehippium, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 18, pl. 5, fig. 4 and 5.

DESCRIPTION. Shell translucent, orbicular, irregular, undulating, concentrically striated or smooth; lower valve fragile; opening for the bysus, large, oval.

This is an abundant shell of the Pleiocene and Post-Pleiocene periods; the upper, or left valve, is very common upon the sea-beaches of the coast; the lower valve, through which the plug of cartilage passes, is seldom obtained in a fossil state. The recent shell is found attached to drift wood, shells and rocks.

PLATE II. FIG. 11, *Left valve, natural size.*

LOCALITY. Simmons', Wadmalaw Sound; Abbapoola Creek, John's Island.

Museum, College of Charleston; Cabinet F. S. H.

OSTREA FUNDATA.

PLATE II. FIG. 10.

Ostrea fundata, (*Say*), *Ravenel*, Cat. Coll. Shells, p. 8.

Ostrea fundata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.

DESCRIPTION. Shell parasitic, irregular, sub-orbicular, sometimes angular; surface

squamose, spreading laterally; hinge triangular; beaks sub-acute; lateral margins within raised, crenulated; crenulations extending from the apex, a shorter distance on the anterior side than on the posterior; basal margin smooth; muscular impression large.

OSTREA FUNDATA as quoted above, by Dr. Ravenel and Professor Gibbes, is attributed to Say—but I have not been able yet to find, amongst Mr. Say's writings, any description of this species. In courtesy, the specific name is retained. It is a common shell, adhering to drift wood, shells, etc., in the bays of the Southern coast.

PLATE II. FIG. 10, *Interior of valve, natural size. The apex has been broken off, which gives the beak in our figure a truncated appearance.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

PECTEN DISLOCATUS.

PLATE II. FIG. 12.

Pecten dislocatus, Say, Jour. Acad. Nat. Sci., Vol. 2, p. 260.

Pecten dislocatus, Say, Amn. Conch., pl. 56, fig. 2.

Pecten dislocatus, Ency. Meth., pl. 213, fig. 3.

Pecten dislocatus, Conrad, Amn. Mar. Conch., p. 10, pl. 2, fig. 2.

Pecten purpuratus, Lam., An. sans Vert., Vol. 7, p. 134.

Pecten purpuratus, De Kay, Zool. New-York, Art. Mollusca, p. 174.

Pecten purpuratus, Ravenel, Cat. Coll. Shells, p. 8.

Pecten purpuratus, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxii.

DESCRIPTION. Shell sub-orbicular, equilateral; the lower, or left valve, convex; the upper, or right, more compressed, or flat; right auricle of right valve coarsely ribbed; ribs twenty to twenty-two, concentrically and finely wrinkled, and without longitudinal striæ.

The figure in Plate II represents the right valve of this fossil, which differs from the recent species, in being more compressed, and cylindrical; it is undoubtedly identical with the one now in existence upon the coast; the reddish, and almost obsolete spots so characteristic of this shell, is retained in nearly all the fossil specimens, but the color of the shell has been, in every instance, changed to a purpleish lead.

PLATE II. FIG. 12, *Right valve, natural size.*

LOCALITY. Simmons', and sub-marine beds on the Coast.

Museum, College of Charleston; Cabinet F. S. H.

Genus, LIMA.—BRUG.

LIMA GLACIALIS.—(Not figured)

Lima glacialis, Lamark, An. sans Vert., 2d Ed., Vol. 7, p. 116.

Lima glacialis, Ravenel, Cat. Coll. Shells, p. 8.

A fragment supposed to be this species has been found in the Post-Pleiocene, but it is not figured in our plate. It lives in deep soundings off the Coast.

Cabinet F. S. H.

PLICATULA CRISTATA.

PLATE II. FIG. 13.

Plicatula cristata, Lam., An. sans Vert., 2d Ed., Vol. 7, p. 177.

Plicatula cristata, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxii.

Plicatula cristata, Ravenel, Cat. Coll. Shells, p. 8.

Plicatula ramosa, Lam., An. sans Vert., 2d Ed., Vol. 7, p. 176.

Plicatula ramosa, De Kay, Zool. New-York, Art. Mollusca, p. 174.

DESCRIPTION. Shell thick and solid, oblong, wedge-shaped, sometimes triangular or irregular; subcristated; having large folds or ribs, which are somewhat scaly; two large prominent teeth in each valve, sometimes curved; ligamental pit between the teeth, deep color, white, with ferruginous spots.

This fossil presents characteristics common to both species of Lamark, as above named; we hesitated for some time to which it belonged, but upon close examination, I find it is more nearly allied to *P. CRISTATA*; both are found, according to Lamark, in the American seas; *P. RAMOSA* we are inclined to consider a nominal species.

PLATE II. FIG. 13, *Exterior of lower valve, natural size, showing point of attachment.*

Museum, College of Charleston; Cabinet F. S. H.

Genus, AVICULA.—BRUG.

AVICULA ATLANTICA.

PLATE III. FIG. 1.

Avicula atlantica, *Lam.*, An. sans Vert., 2d Ed., Vol. 7, p. 99.

Avicula atlantica, *De Kay*, Zool. New-York, Art. Mollusca, p. 175.

Avicula atlantica, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.

Avicula hirudo, *Say*, Jour. Acad. Nat. Sci., Phil., Vol. 2, p. 262.

Avicula hirudo, *Say*, Conch. United States, (Binney,) p. 90.

DESCRIPTION. Shell inequivalve, inequilateral, pearly; obliquely rounded, and striated; concentric lines of growth wrinkled.

This is a rare fossil in the Post-Pleiocene, though quite common on the sea coast of South-Carolina, and often taken alive; the auricles of the fossil are much shorter than in the recent shell, but the descriptions correspond.

PLATE III. FIG. 1, *Fossil, natural size.*

LOCALITY. Abbapoola, and Doctor's Swamp, John's Island.

Museum, College of Charleston; Cabinet F. S. H.

Genus, PINNA.—LINN.

PINNA SEMINUDA.

PLATE III. FIG. 2.

Pinna seminuda, *Lam.*, An. sans Vert., Vol. 7, p. 61.

Pinna seminuda, *De Kay*, Zool. New-York, Art. Mollusca, p. 187.

Pinna seminuda, *Ravenel*, Cat. Coll. Shells, p. 7.

Pinna seminuda, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.

DESCRIPTION. Shell thin; surface longitudinally furrowed; furrows wide, gradually contracting towards the beaks; ridges between the furrows, six to eight, armed with large erect scales on the buccal side of the valves, and extending obliquely to the middle of the

shell; the rest of the shell is naked, or without spines. It is living on the sea coast of this State.

PLATE III. FIG. 2, *A fragment, with restored outline.*

LOCALITY. Simmons'; Abbapoola.

Museum, College of Charleston; Cabinet F. S. H.

PINNA MURICATA.

PLATE III. FIG. 3.

Pinna muricata, Linn, Syst. Nat., p. 1160.

Pinna muricata, Gmel., p. 3364, No. 4.

Pinna muricata, Lamk., An. sans Vert., Vol. 7, p. 64.

Pinna muricata, De Kay, Zool. New-York, Art. Mollusca, p. 187.

Pinna muricata, Ravenel, Cat. Coll. Shells, p. 7.

Pinna muricata, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxii.

DESCRIPTION. Shell large, fragile, pellucid, sub-truncated; the dorsal half covered with numerous small, erect, sub-acute scales, arranged in longitudinal furrows; those on the inferior half are much smaller; towards the umbones they become obsolete with age.

As this is a delicate shell, we have obtained only fragments, but they are numerous, and very characteristic of the species. Like its congener, *P. SEMINUDA*, it lives upon the sea coast, and was abundant in the Post-Pleiocene period.

PLATE III. FIG. 3, *Fragment, with restored outline.*

LOCALITY. Simmons'; Abbapoola.

Museum, College of Charleston; Cabinet F. S. H.

PECTUNCULUS CAROLINENSIS.—(*New Species.*)

PLATE III. FIG. 4.

DESCRIPTION. Shell sub-orbicular, equilateral, radiately ribbed; ribs twenty-three to twenty-five, striate, depressed, disappearing on the buccal and anal margins; concentric lines few, wide apart; teeth seven to ten, robust; beaks prominent.

This shell is very nearly allied to *P. PASSUS*, *Con.*, of the Pleiocene, but may readily be distinguished by its wider and less numerous ribs, which are obsolete on both buccal and anal margins, and by the beaks, which are much more prominent.

We are not aware of its existence in a recent state.

PLATE III. FIG. 4, *Shell, natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

PECTUNCULUS CHARLESTONENSIS—(*New Species.*)

PLATE III. FIG. 5.

DESCRIPTION. Shell small, somewhat oval, equilateral; buccal and anal sides slightly truncated; ribs numerous, round and elevated; furrows narrow; teeth small, numerous; lips crenate.

This shell has not yet been found living on the Carolina coast, but the small species of the Florida coast seems to be identical with it. It resembles *P. ARATUS*, *Con.*, of the Pleiocene; but the ribs are less numerous, and the furrows between them very narrow.

PLATE III. FIG. 5, *Interior and exterior of shell.*

LOCALITY. Calhoun-street, Charleston.

Museum, College of Charleston; Cabinet F. S. H.

Genus, NUCULA.—LAM.

NUCULA ACUTA.

PLATE III. FIG. 7.

Nucula acuta, *Con.*, *Mar. Conch.*, p. 32, pl. 6, fig. 3.

Nucula acuta, *Con.*, *Foss. Ter. Form.*, p. 57, pl. 30, fig. 2.

Nucula acuta, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xxi.

Nucula acuta, *Tuomey & Holmes*, *Pleiocene Fossils So. Ca.*, p. 53, pl. 17, figs. 10 to 12.

DESCRIPTION. Shell somewhat lanceolate, inequilateral, concentrically striate; buccal

side short, rounded, inflated; anal side produced, beaked, somewhat recurved; lunule lanceolate.

This little species, which is also an inhabitant of our coast, occurs in the Meiocene of Virginia, and in the Pleiocene and Post-Pleiocene of South-Carolina. It is easily distinguished by its rostrated anal side and regularly striated surface.—*T. & H.*

PLATE III. FIG. 7, *Interior of left valve, natural size.*

LOCALITY. Stono; Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

NUCULA PROXIMA.

PLATE III. FIG. 6.

Nucula proxima, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 270.

Nucula proxima, *Con.*, Am. Marine Conch., p. 31, tab. 6, fig. 2.

Nucula proxima, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Nucula proxima, *De Kay*, Zool. New-York, Art. Mollusca, p. 179.

Nucula proxima, *Gould*, Invert. Mass., p. 103, fig. 63.

Nucula proxima, *Tuomey & Holmes*, Pleiocene Fossils of So. Ca., p. 53, pl. 17, figs. 7 to 9.

Nucula proxima, *Say's Conch. United States*, (Binney,) p. 90.

DESCRIPTION. Shell oblique, ovate-triangular, anterior side perpendicular to the base; crossed by minute, concentric, and radiating lines; within pearly; margin crenulated; teeth twelve before and eighteen behind the beaks.—*Gould*.

The very short buccal side, and pearly interior, are quite characteristic of this shell. It belongs to the actual fauna of the coast, and is found fossil in the Meiocene of Virginia, Pleiocene and Post-Pleiocene of South-Carolina.

PLATE III. FIG. 6.

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

Genus, LEDA,—SCHUM.

LEDA LIMATULA:

PLATE III. FIG. 8.

Nucula limatula, *Say*, *Am. Conch.*, pl. 12.

Nucula limatula, *Gould*, *Invert. Mass.*, p. 98, fig. 62.

Nucula limatula, *Con.*, *Foss. Ter. Form.*, p. 57, pl. 30, fig. 4.

Nucula limatula, *Con.*, *Am. Mar. Conch.*, pl. 6, fig. 1.

Nucula limatula, *De Kay*, *Zool. New-York, Art. Mollusca*, p. 180, pl. 13, fig. 218.

Nucula limatula, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 52.

Leda limatula, *Stimpson*, *Shells of New-England*, p. 10.

Leda limatula, *Say's Conch. United States*, (Binney,) p. 164.

DESCRIPTION. Shell elongated, compressed, smooth, polished, inequilateral; buccal side rounded; anal side narrow, somewhat recurved; lunule linear.

Among the fossils of South-Carolina there are no forms of the genus with which this species can be confounded. Its smooth surface, elongated form, and regularly carinated pallial margin, are sufficiently characteristic. Occasionally a few obsolete concentric lines may be seen on the disks, and one or two on the anal margin, towards its extremity.—*T. & H.*

LEDA LIMATULA, according to Stimpson and Gould, is now living on the New-England coast. I have never discovered a single living specimen on the Carolina shores, and it is rare as a Post-Pleiocene fossil. In Tuomey & Holmes' Pleiocene Fossils of South-Carolina, it is said to be abundant on this coast, numerous dead shells having been found upon the beaches, but we fear these were from some sub-marine bed of Post-Pleiocene, and not recent shells. It occurs fossil in the Miocene of Virginia, and also in the Pleiocene of North and South-Carolina.

PLATE III. FIG. 8, *Natural size.*

LOCALITY. Simmons'; Folly Island Beach.

Museum, College of Charleston; Cabinet F. S. H.

Genus, ARCA.—LINN.

ARCA INCONGRUA.

PLATE IV. FIGS. 1 AND 1a.

Arca incongrua, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 268.

Arca incongrua, *De Kay*, Zool. New-York, Art. Mollusca, p. 178.

Arca incongrua, *Ravenel*, Cat. Coll. Shells, p. 5.

Arca incongrua, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Arca incongrua, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 45, pl. 16, figs. 5 and 6.

Arca incongrua, *Say's Conch. U. S.*, (Binney,) p. 93.

DESCRIPTION. Shell squarely orbicular, inequivalve, radiately ribbed; ribs twenty-six to twenty-eight, buccal side shortest; left valve with crenulated ribs on the buccal and anal margins; right valve has all the ribs crenulated; ligament area wide, lanceolate; umbones approximating.

This is the most common shell on our sea coast, and very numerous in the Post-Pleiocene beds. It is rare in the Pleiocene.

PLATE IV. FIG. 1, *Valves, natural size.*

“ 1a, *View of hinge and beaks.*

LOCALITY. Charleston; Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

ARCA AMERICANA.

PLATE IV. FIGS. 2 AND 2a.

Arca americana, *Gray*, Reeve, Conch. Icon., pl. 4, fig. 21.

Arca pexata, *Ravenel*, Cat. Coll. Shells, p. 5.

Arca pexata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

DESCRIPTION. Shell thick, oblong-ovate; buccal margin shortest, and regularly rounded; anal margin obliquely truncated; beaks not ventricose, but prominent, nearly touching, space between them very narrow; ligamental area narrow, and terminating anteriorly at

the beaks; ribs thirty-seven to thirty-nine, radiating, flat, and divided in the middle by a longitudinal line, which becomes obsolete on the umbones; margins strongly impressed within.

This is a common species on the coast of North and South-Carolina, and Georgia; it has been long confounded with *ARCA PEXATA*, (Say,) a shell limited in its Southern range to Cape Hatteras; *A. AMERICANA*, is readily distinguished from it by the truncated anal margin; the greater number of ribs, thirty-seven to thirty-nine, and less prominent umbones; the spaces between the ribs are deeper and narrower.

Like *A. PEXATA*, (Say,) and *A. HOLMESII*, (Stimpson,) it has the hinge-line terminating at the beaks.

Numerous and fine specimens are obtained from all the Post-Pleiocene beds of the State.

PLATE IV. FIG. 2, *Exterior, and hinge.*
 " 2a, *End view.*

LOCALITY. Charleston; Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

A R C A L I E N O S A .

PLATE IV. FIGS. 3 AND 3a.

Arca lienosa, Say, Am. Conch., pl. 36.

Arca lienosa, Tuomey & Holmes, Pleiocene Foss. So. Ca., p. 40, pl. 15, fig. 2.

Arca lienosa, Say's Conch. U. S., (Binney,) p. 192.

DESCRIPTION. Shell equilateral, transversely oblong, inflated, ribbed, rugose; buccal side produced, angular; anal side elongated, obliquely truncated; ribs about thirty-five, unequal, channelled; ligament area, wide, sulcate; sulci slightly diverging, but somewhat parallel to the hinge; umbones distant.

We are not aware of this species now existing, except upon the coast of Florida; it is rare in the Post-Pleiocene, but more abundant in the Pleiocene of South-Carolina.

PLATE IV. FIG. 3, *Shell, natural size.*
 " 3a, *View of hinge.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

ARCA PONDEROSA.

PLATE IV. FIGS. 4 AND 4a.

Arca ponderosa, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 267.

Arca ponderosa, *De Kay*, Zool. New-York, Art. Mollusca, p. 177.

Arca ponderosa, *Ravenel*, Cat. Coll. Shells, p. 5.

Arca ponderosa, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Arca ponderosa, *Say's Conch. U. S.*, (Binney,) p. 92.

DESCRIPTION. Shell thick, ponderous, obliquely-oblong, with thirty to thirty-five ribs; those on the posterior half, impressed with a line or groove; anterior ribs without lines; interstitial spaces equal to width of ribs; buccal margin thick, rounded; anal margin angularly produced, obliquely truncated, thin; pallial margin contracted in the middle; ligamental area wide, crossed with prominent lines or ridges, corresponding to the teeth; umbones prominent, remote.

A. PONDEROSA is a Southern coast shell, and very abundant in the Post-Pleiocene.

PLATE IV. FIG. 4, *Shell, natural size.*

“ 4a, *Hinge view.*

LOCALITY. Charleston; Simmons'.

Museum, College of Charleston; Cabinet F. S. II.

ARCA TRANSVERSA.

PLATE IV. FIGS. 5 AND 5a.

Arca transversa, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 269.

Arca transversa, *Con.*, Foss. Shells Ter. Form., No. 2, p. 15, tab. 1, fig. 2.

Arca transversa, *Gould*, Invert. Mass., p. 96.

Arca transversa, *Ravenel*, Cat. Coll. Shells, p. 5.

Arca transversa, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Arca transversa, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 42, pl. 15, figs 6 and 7.

Arca transversa, *Stimpson*, Shells New-England, p. 8.

Arca transversa, *Say's Conch. U. S.*, (Binney,) p. 93.

DESCRIPTION. Shell transversely oblong, sub-rhomboidal; buccal side shorter, regularly rounded, angular above; anal side elongated, angular; ligamental area narrow, furrowed;

ribs about thirty-five, nodulous in the right valve of young shells; in the left, only those on buccal side are thus ornamented.

A. TRANSVERSA is now living on the coast, and is found fossil in the Miocene of Virginia, Pleiocene and Post-Pleiocene of South-Carolina.

PLATE IV. FIG. 5, *Shell, natural size.*

“ 5a, *hinge view.*

LOCALITY. Simmons'; Doctor's Swamp, John's Island; Hamblin's, Christ Church.

Museum, College of Charleston; Cabinet F. S. H.

A R C A C Æ L A T A .

PLATE IV. FIGS. 6 AND 6a.

Arca cælata, *Con.*, Foss. Ter. Form., p. 61, pl. 32, fig. 2.

Arca cælata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 36, pl. 16, figs. 8 to 10.

DESCRIPTION. Shell trapezoidal; disk widely and not profoundly contracted; ribs numerous, alternated towards the base, tuberculated, aculeated anteriorly and posteriorly; posterior slope depressed; umbo acutely angulated behind; basal margin slightly arched; posterior margin obliquely truncated; beaks approximate.—*Con.*

This species is rare in the recent state on the coast of South-Carolina, but is a common fossil in the Post-Pleiocene beds.

It is a beautiful little shell, much ornamented by its nodulous radiating striæ.

PLATE IV. FIG. 6, *Shell, natural size.*

“ 6a, *Hinge view.*

LOCALITY. Abbapoola Creek, John's Island.

Museum, College of Charleston; Cabinet F. S. H.

Genus, CHAMA.—LINN.

CHAMA ARGINELLA.

PLATE V. FIG. 1.

Chama arginella, *Linn*, *Syst. Nat.*, p. 1139.

Chama arginella, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xxii.

Chama arginella, *Ravenel*, *Cat. Coll. Shells*, p. 7.

Chama arginella, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 22, pl. 7, figs. 4, 5, 6.

DESCRIPTION. Shell orbicular-cordate; ribs radiating, spinous; spines strong, recurved tubular; interstices deep, punctate in young specimens; lunule broadly cordate, buccal side granulated.—*T. & H.*

A few specimens of very young shells, not spinous, but granulated, and with very indistinct characters, have been taken from the Post-Pleiocene sands of South-Carolina. It is rare in the living state upon the coast, but common on the Florida shores. The Pleiocene specimens are very large, with prominent spines.

PLATE V. FIG. 1, *Natural size.*

LOCALITY. Simmons'; Wadmalaw Sound.

Museum, College of Charleston; Cabinet F. S. H.

CARDIADÆ.

Genus, CARDIUM.—LINN.

CARDIUM MAGNUM.

PLATE V. FIGS. 2 AND 2a.

Cardium magnum, *Born.*, *Test. Mus. Cæs. Vind*, pl. 3, fig. 5.

Cardium magnum, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 63, pl. 19, fig. 1.

Cardium maculatum, *Gmelin*, *Conch. Icon.*, pl. 4, fig. 20.

Cardium maculatum, *Ravenel*, *Cat. Coll. Shells*, p. 5.

Cardium ventricosum, *Bruguère*, *Lam.*, *An. sans Vert.*, Vol. 6, p. 400.

Cardium ventricosum, *De Kay*, *Zool. New-York, Art. Mollusca*, p. 207.

Cardium ventricosum, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xxi.

DESCRIPTION. Shell very large, inflated, obliquely cordate; anal side somewhat angularly depressed; radiately ribbed; ribs flattened, buccal ribs crenulated.

This shell presents some variation in form; some individuals are more ventricose, whilst others present a greater disproportion between the length and height. In young specimens, the crenulations on the ribs, on the buccal side, are not always prominent, but after they attain to the height of an inch or two they appear and are very persistent. The buccal ribs are somewhat angular, with the angles turned towards the anal side.—*T. & H.*

CARDIUM MAGNUM is a common recent shell on the coast; is rare as fossil in the Pleiocene, but abundant in the Post-Pleiocene.

PLATE V. FIG. 2, *Exterior and interior of valves, natural size.*
 “ 2a, *Side view of shell.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

CARDIUM MURICATUM.—LINN.

PLATE V. FIG. 3.

- Cardium muricatum, *Linn*, Syst. Nat., p. 1123.
 Cardium muricatum, *Lam.*, Vol. 6, p. 398.
 Cardium muricatum, *Conch. Icon.*, pl. 6, fig. 33.
 Cardium muricatum, *Chemn.*, 6, pl. 17, fig. 177.
 Cardium muricatum, *Ency. Meth.*, pl. 297, fig. 1.
 Cardium muricatum, *Lister*, *Conch.*, pl. 322, fig. 159.
 Cardium muricatum, *Ravenel*, *Cat. Coll. Shells*, p. 5.
 Cardium muricatum, *De Kay*, *Zool. New-York*, Art. Mollusca, p. 207.
 Cardium muricatum, *L. R. Gibbes*, *Tuomey's Geol. of So. Ca.*, appendix, p. xxi.
 Cardium muricatum, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 64.

DESCRIPTION. Shell large, cordately ovate, somewhat oblique, radiately ribbed; ribs convex, muricated with minute, compressed, obliquely arranged tubercles. On the buccal side of the shell, the tubercles are on the anterior side of the ribs; these are followed by a few ribs which are muricated on both sides; and on the anal side the tubercles are turned backwards.—*T. & H.*

Living on the coast of South-Carolina and rarely found fossil in the Pleiocene or Post-Pleiocene formations.

PLATE V. FIG. 3, *Exterior of valve, natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

CARDIUM ISOCARDIA.

PLATE V. FIG. 4.

- Cardium isocardia, *Linn.*, Syst. Nat., p. 1122.
 Cardium isocardia, *Chemn.*, 6, p. 182.
 Cardium isocardia, *Wood*, Conch., p. 217.
 Cardium isocardia, *Lam.*, An. sans Vert., p. 398.
 Cardium isocardia, *Wood*, Index Testaceologicus, pl. 5, fig. 15.
 Cardium isocardia, *Ravenel*, Cat. Coll. Shells, p. 5.
 Cardium isocardia, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.
 Cardium isocardia, *Adams*, Gen. Recent Shells, Vol. 2, p. 455.

DESCRIPTION. Shell obliquely cordate, inequilateral, ventricose, imbricated; anal margin coarsely serrated or notched; ribs thirty to thirty-five, imbricated, sub-fornicated.

Like CARDIUM SERRATUM, this shell, when compared with living specimens, presents characters very much modified by the influences of the conditions of the age in which it lived. I find dead and water-worn shells, on our sea beaches, which to our mind are undoubtedly Post-Pleiocene fossils; the animal does not exist on the Carolina coast, but inhabits the West India seas and Gulf of Mexico. *I have a perfect & beautiful spec. rec'd from*

What is considered a curious incident may be here alluded to; of twenty-six or eight specimens found, there is not a single right-hand valve.

PLATE V. FIG. 5, *Exterior of valve, natural size.*

LOCALITY. Abbapoola; Folly Island; and Simmons'.
Museum, College of Charleston; Cabinet F. S. H.

 Genus, LÆVICARDIUM.—SWAINSON.

LÆVICARDIUM SERRATUM.

PLATE V. FIG. 5.

- Cardium serratum, *Linn.*, Syst. Nat., p. 1123.
 Cardium serratum, *Chemn.*, 6, pl. 18, fig. 189.
 Cardium lævigatum, *Lamk.*, An. sans Vert., Vol. 6, p. 403.
 Lævicardium serratum, *Adams*, Gen. Recent Shells, Vol. 2, p. 457.

DESCRIPTION. Shell thin, smooth, obliquely ovate, inequilateral, ventricose, with

numerous somewhat obsolete radiating lines, which extend to basal margin; the buccal and anal sides are smooth, and without lines; buccal margin round, curve continuous to base of anal margin; anal margin obliquely truncated; interior of the shell profoundly crenulated on the pallial margin only; serratures towards the anterior end large and prominent; the buccal and anal margins are without crenulations, and have thin edges.

This shell resembles *C. SUBLINEATUM*, *Con.*, of the Pleiocene, but is readily distinguished by being more ventricose, having the anal margin truncated, and the crenulations of the pallial margin more profound. It is also a larger and a longer shell. But one valve has yet been found in the Post-Pleiocene. It is not known to be living upon the coast of South-Carolina, but dead shells (Post-Pleiocene fossils?) are sometimes found on the beaches. For a long time we were doubtful about this shell, it being much larger than *C. SERRATUM*, of the Florida coasts; but I am now satisfied the size, and other minor differences, are to be attributed to more favorable conditions for greater development which existed during the Post-Pleiocene age.

PLATE V. FIG. 5, *Exterior, natural size.*

LOCALITY. Abbapoola Creek.

Museum, College of Charleston; Cabinet F. S. H.

CARDIUM MORTONI.

PLATE V. FIG. 6.

Cardium Mortoni, *Con*, Jour. Acad. Nat. Sci., Vol. 6, p. 259, pl. 11, figs. 5, 6, 7.

Cardium Mortoni, *Gould*, Invert. Mass., p. 91.

Cardium Mortoni, *De Kay*, Zool. New-York, Art. Mollusca, p. 207, pl. 23, fig. 251.

Cardium Mortoni, *Stimpson*, Shells New-England, p. 19.

DESCRIPTION. Shell small, thin, sub-ovate, oblique, smooth, without ribs or radiating striæ.

According to Conrad, Gould, and Stimpson, this small shell is common on the Northern Atlantic coast of the United States. I have not yet found it on the Carolina coast, and it is exceedingly rare in the Post-Pleiocene.

PLATE V. FIG. 6, *Shell, natural size. This figure was accidentally blurred in the printing.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

Genus, LUCINA.—BRUG.

LUCINA DIVARICATA.

PLATE VI. FIG. 1.

Tellina divaricata, *Linn.*, Syst. Nat., 1120.

Lucina divaricata, *Lam.*, An. sans Vert., Vol. 4, p. 541.

Lucina divaricata, *Con.*, Foss. Ter. For., p. 39, pl. 20, fig. 3.

Lucina divaricata, *Ravenel*, Cat. Coll. Shells, p. 4.

Lucina divaricata, *Gould*, Invert. Mass., p. 70.

Lucina divaricata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Lucina divaricata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 59, pl. 18, figs. 10 and 12.

Lucina strigilla, *Stimpson*, Shells New-England, p. 17.

Strigilla divaricata, *Turton*, Test. Brit., p. 119.

DESCRIPTION. Shell orbicular, somewhat globose, thin, groove-striated in two directions; striæ divaricate. This pretty species is easily distinguished from its congeners, by the regular outline and sharply cut divaricating striæ.

It is difficult to believe a species to have so wide a distribution, both horizontally and vertically, as this is said to have. It occurs in the Eocene of Europe, in the Miocene of Virginia, in South-Carolina in both Pleiocene and Post-Pleiocene, and belongs to the living fauna of our entire coast.—*T. & H.*

It is very possible that several species are included under this specific name.

PLATE VI. FIG. 1, *Exterior of left valve.*

LOCALITY. Simmons'.

Museum, College of Charleston.

LUCINA COSTATA.

PLATE VI. FIG. 2.

Lucina costata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 60, pl. 18, figs. 12 and 13.

DESCRIPTION. Shell orbicular, thick, compressed, radiately ribbed, concentrically striate, and towards the pallial margin somewhat sulcate.

This fossil is readily distinguished from the small LUCINIDÆ which it resembles, by the prominent rounded ribs.

It occurs in great abundance in the Post-Pleiocene beds near Charleston, although it has not as yet been found amongst the living fauna of the State.—*T. & H.*

PLATE VI. FIG. 2, *Shell, natural size.*

LOCALITY. Abbapoola Creek. *Museum, College of Charleston; Cabinet F. S. H.*

LUCINA RADIANS.

PLATE VI. FIG. 3.

Lucina radians, *Con.*, Am. Jour. Sci. and Arts, Vol. 41, p. 347.

Lucina radians, *Con.*, Foss. Shells Ter. For., p. 70, pl. 40, fig. 3.

Lucina radians, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 57, pl. 18, fig. 4 and 5.

DESCRIPTION. Shell orbicular, concentrically and regularly striate; radiately and obsoletely striate; lunule excavated.

The beaks are prominent and acute, the concentric lines are close and well-defined, the radiating lines somewhat irregular, and on the anal side more distant and prominent. *L. MULTILINEATA* resembles the young of this species, but the radiating lines are more regular and the shell more convex than in the species under consideration.

This pretty species is found on the coast of North and South-Carolina, and in the Post-Pleiocene. It is readily distinguished by its prominent umbones, close and regular concentric striæ and obsolete rather irregular radiating lines.—*T. & H.*

PLATE VI. FIG. 3, *Shell, natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

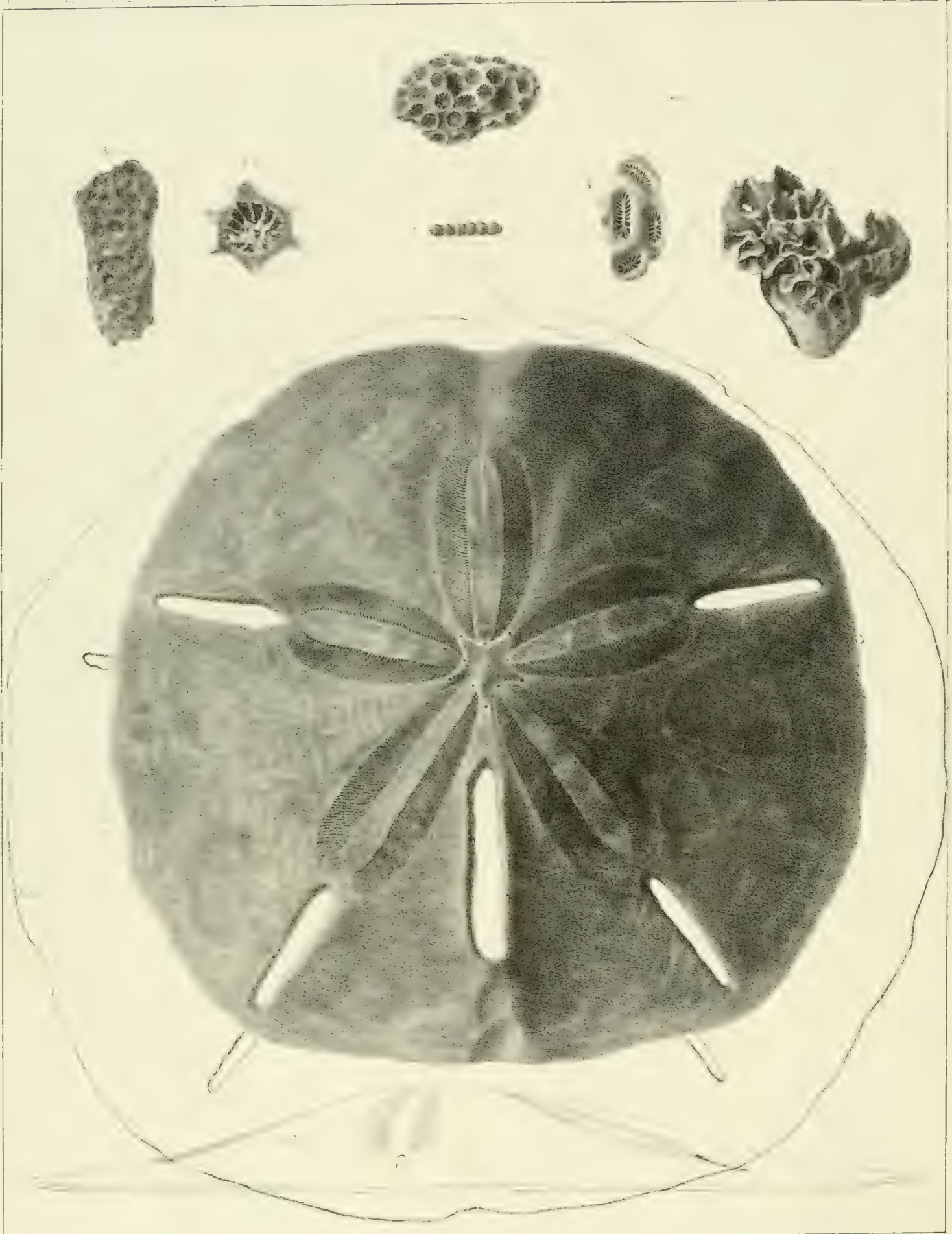
LUCINA TRISULCATA.

PLATE VI. FIG. 4.

Lucina trisulcata, *Con.*, Foss. Ter. For., p. 71, pl. 40, fig. 5.

Lucina trisulcata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., pl. 18, figs. 18 and 19.

DESCRIPTION. Shell ovate, convex, inequilateral; concentrically striate and channelled; lunule cordate, deeply excavated.



POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE I.

FORAMINIFERA.—POLYPARIA.—BRYOZOA.—ECHINIDÆ.

FORAMINIFERA.

FIG. 1. NODOSARIA OBTUSA. Magnified. *Page 1.*

POLYPARIA.

FIG. 2. ASTRÆA BELLA. *Page 1.*

" 3. ASTRÆA CRASSA. *Page 2.*

" 3*a*. Cell magnified.

" 4. ASTRÆA PETROSA. Four cells, natural size. *Page 2.*

" 4*a*. Outline of the fragment.

BRYOZOA.

FIG. 5. REPTOCELLEPORARIA INFORMATA. Incrusting a fragment of oyster shell. *Page 6.*
For other P. P. Bryozoa, see Plate II., fig. 4.

ECHINIDÆ.

FIG. 6. MELLITA QUINQUEFORA. Variety, *Ampla*. View from above. *Page 3.*

" 6*a*. Outline of largest specimen yet discovered.

" 6*b*. Profile of the same.

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE II.

ESCHINIDÆ.—BRYOZOA.—CIRRIPEDA.—CRUSTACEA.—LAMELLIBRANCHIATA.

ESCHINIDÆ.

- FIG. 1. ECHINUS VARIEGATUS. *Page 4.*
" 1a. Spines of the same.
" 2. ANAPESUS CAROLINUS. *Page 5.*
" 2a. Spine of the same.
" 3. SCHIZASTER ATROPOS, with restored outline. *Page 5.*

BRYOZOA.

- FIG. 4. LUNULITES DENTICULATA. Magnified. *Page 6.*
" 4a. Profile, natural size.
" 4b. Outline of base, natural size.
For REPTOCELLEPORARIA INFORMATA, see Plate I., fig. 5.

CIRRIPEDA.

- FIG. 5, BALANUS EBURNEUS. *Page 7.*
" 5a. Aperture, viewed from above.

CRUSTACEA.

- FIG. 6. CALAPPA MARMORATA. *Page 8.*
" 7. PSEUDOCARCINUS MERCENARIA. *Page 8.*
" 8. GUIA PUNCTATA. *Page 8.*
LUPA DICANTHA. Not figured. *Page 9.*

LAMELLIBRANCHIATA.

- FIG. 9. OSTREA VIRGINIANA. *Page 9.*
" 9a. Variety PROCYON. *Page 10.*
" 10. OSTREA FUNDATA. *Page 11.*
" 11. ANOMIA EPHIPIUM. *Page 11.*
" 12. PECTEN DISLOCATUS. *Page 12.*
LIMA GLACIALIS. Not figured.
" 13. PLICATULA CRISTATA. *Page 13.*



POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE III.

AVICULIDÆ. — ARCADÆ.

AVICULIDÆ.

- FIG. 1. AVICULA ATLANTICA. *Page 14.*
" 2. PINNA SEMINUDA. *Page 14.*
" 3. PINNA MURICATA. *Page 15.*

ARCADÆ.

- FIG. 4. PECTUNCULUS CAROLINENSIS. *Page 15.*
" 5. PECTUNCULUS CHARLESTONENSIS. *Page 16.*
" 6. NUCULA PROXIMA. *Page 17.*
" 7. NUCULA ACUTA. *Page 16.*
" 8. LEDA LIMATULA. *Page 18.*

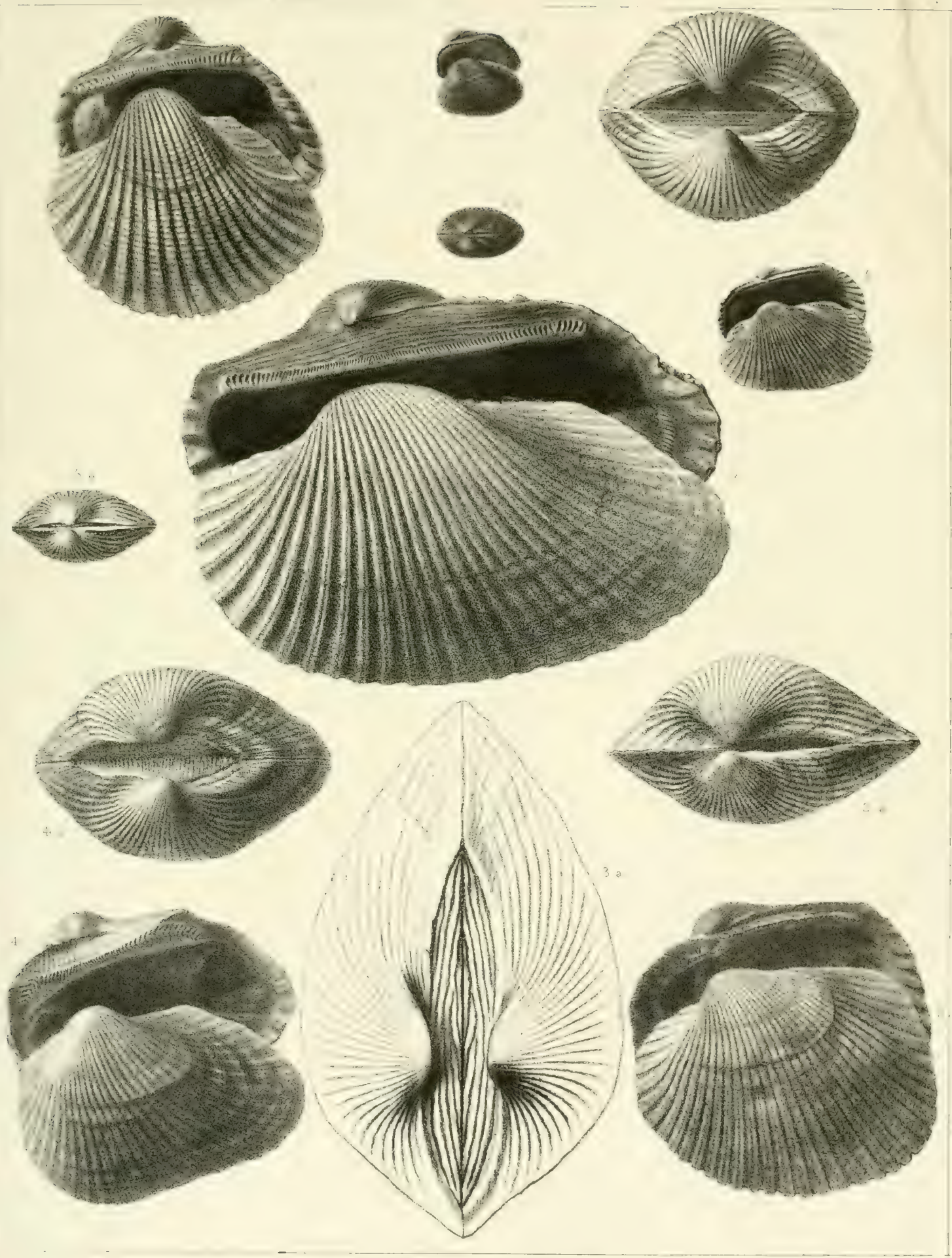
POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE IV.

ARCADÆ.

- FIG. 1. ARCA INCONGRUA. *Page 19.*
" 1a. View of hinge and beaks.
" 2. ARCA AMERICANA. *Page 19.*
" 2a. End view.
" 3. ARCA LIENOSA. *Page 20.*
" 3a. View of hinge.
" 4. ARCA PONDEROSA. *Page 21.*
" 4a. View of hinge.
" 5. ARCA TRANSVERSA. *Page 21.*
" 5a. View of hinge.
" 6. ARCA CÆLATA. *Page 22.*
" 6a. View of hinge.



Brachiopoda

This fossil resembles *L. CRENULATA*; but it is readily distinguished from that species by its less orbicular outline, its prominent and more oblique beaks, and above all, by the short but very deep lunule, which extends under the beaks. The concentric sulci which suggested the specific name to Mr. Conrad, are accidental, quite variable in number and position, and in the larger number of individuals they are absent altogether. The short and deep lunule will serve to characterise all the varieties of the species.—*T. & H.*

PLATE VI. FIG. 4, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

LUCINA KIAWAHENSIS. — (*New Species.*)

PLATE VI. FIG. 5.

DESCRIPTION. Shell sub-orbicular, equilateral, truncately rounded anteriorly and posteriorly, convex, diaphanous, concentrically and finely striated, not punctate; striae numerous, indistinct, irregular; beaks prominent, but not acute; internal margin entire.

This shell very nearly resembles *L. PUNCTULATA*, (*Lea.*) of the Miocene of Virginia, but differs from that species in being not punctulated, but concentrically, numerous and finely striated; it also differs in being of much greater size, often five times as large.

It is very abundant in the Post-Pleiocene, but unknown in a living state.

I have given to this shell the Indian name of Ashley River, which is Kiawah; it was upon its banks we first discovered it.

PLATE VI. FIG. 5, *Natural size.*

Museum, College of Charleston; Cabinet F. S. H.

LUCINA MULTILINEATA.

PLATE VI. FIG. 6.

Lucina multilineata, *Con.*, *Foss. Ter. For.*, p. 71, pl. 40, fig. 6.

Lucina multilineata, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 61, pl. 18, figs. 16 and 17.

DESCRIPTION. Shell orbicular, concentrically and closely ribbed, radiately striate.

This little fossil has the outline and general characters of *L. CRENULATA*, from which

it can only be distinguished by the radiating lines which give the shell a cancellated appearance.

It occurs in the Post-Pleiocene, and is often confounded with *L. CRENULATA*.

PLATE VI. FIG. 6, *Natural size*.

LOCALITY. Simmons', Wadmalaw Sound.

Museum, College of Charleston; Cabinet F. S. H.

LUCINA CRENULATA.—(*Not figured.*)

Lucina crenulata, *Con.*, *Foss. Ter. For.*, p. 39, pl. 20, fig. 2.

Lucina crenulata, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 60, pl. 18, figs. 14 and 15.

DESCRIPTION. Shell orbicular, inflated, concentrically lamellated; lunule slightly excavated.

This little species is readily distinguished by its orbicular outline and the closely arranged concentric lamellæ; the lunule is short and deep. It is distinguished from *L. MULTILINEATA*, which it resembles, by the absence of radiating lines. It is quite common in the Meiocene of Virginia, and is living along the coast from the Chesapeake to Florida.—*T. & H.*

LOCALITY. Abbapoola.

Museum, College of Charleston; Cabinet F. S. H.

Genus, MONTACUTA.—TURR.

MONTACUTA BOWMANI.—(*New Species.*)

PLATE VII. FIG. 2.

DESCRIPTION. Shell small, fragile, ovate-triangular, inequilateral, slightly compressed, concentrically and finely striated in bands of yellow and white; beaks very small, acute; buccal and anal margins regularly rounded; tooth on the buccal side excavated; two teeth in each valve; cavity between them for the ligament.

This little shell corresponds somewhat with Gould's description of *MONTACUTA BIDENTATA*, which is living on the coast of Massachusetts, but differs in size and general outline; and, what is most characteristic, the alternate opaque and translucent concentric bands on the surface. It does not exist on the coast of South-Carolina.

I take pleasure in dedicating this pretty species to a highly valued friend, Major A. H. Bowman, whose scientific attainments command for him the highest estimation of his government, and the admiration of a large circle of friends in South-Carolina.

PLATE VII. FIG. 2, *Natural size, and magnified hinge.*

Museum, College of Charleston; Cabinet F. S. H.

CYRENA CAROLINIENSIS.

PLATE VI. FIG. 7.

Cyclas Caroliniensis, *Bosc.*, Hist. Nat. des Coq. 2, pl. 18, fig. 4.

Cyrena Caroliniensis, *Lamk.*, An. sans Vert., Vol. 6, p. 276.

Cyrena Caroliniensis, *Ravenel*, Cat. Coll. Shells, p. 4.

Cyrena Caroliniensis, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

DESCRIPTION. Shell sub-cordate, thick, sub-inequilateral, tumid; beaks distant, eroded. Only a single valve, much water-worn, and quite small, has been yet found in the Post-Pleiocene; it is abundant in the brackish water of the rush lands of the Carolina sea-coast.

PLATE VI. FIG. 7.

LOCALITY. Simmons'; Doctor's Swamp, John's Island.

Cabinet F. S. H.

Genus, CARDITA.—BRUG.

CARDITA TRIDENTATA.

PLATE VI. FIG. 8.

Venericardia tridentata, *Say*, Jour. Acad. Nat. Sci., Vol. 5, p. 216.

Cardita tridentata, *Con.*, Foss. Ter. For., p. 76, pl. 43, fig. 11.

Cardita tridentata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 67, pl. 19, figs. 8 and 9.

Cardita tridentata, *Say's Conchology U. S.*, (Binney,) p. 194.

DESCRIPTION. Shell round, triangular, thick, radiately ribbed; ribs elevated, strongly crenulated.

This little species is distinguished by its sub-triangular outline, thick, robust and coarsely crenulated ribs. The beaks are slightly turned forward. There are two teeth in the left, and one in the right valve. The species is an inhabitant of the southern coast, and common in the Post-Pleiocene of South-Carolina; we have never found larger specimens.

PLATE VI. FIG. 8, *Natural size.*

LOCALITY. Simmons'; Wadmalaw.

Museum, College of Charleston; Cabinet F. S. H.

CARDITA FLORIDANA.

PLATE VII. FIG. 1.

Cypricardia Floridana, Con., Foss. Ter. Form. U. S., p. 12. Observations on C. ARATA.

DESCRIPTION. Shell ovately oblong; ribs fifteen, transversely radiated, rounded, nodulous; buccal side very short; anal truncated.

This shell is living on the Florida coast, but has not yet been discovered on that of Carolina, and only a single valve found in the Post-Pleiocene.

I give an outline of natural size, and a magnified figure.

PLATE VII. FIG. 1.

LOCALITY. Simmons'.

Cabinet F. S. H.

ASTARTE LUNULATA.

PLATE VI. FIG. 9.

Astarte lunulata, Con., Foss. Ter. Form., p. 44, pl. 21, fig. 8.

Astarte lunulata, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxi.

Astarte lunulata, Tuomey & Holmes, Pleiocene Foss. So. Ca., p. 72, pl. 20, fig. 4.

Astarte mactracea, Stimpson, Shells New-England, p. 18.

DESCRIPTION. Shell small, flat, somewhat angular, concentrically furrowed; buccal margin truncated; anal margin somewhat angular.

This little species is at once known by the regular and angular furrows; straight sides, and prominently arched pallial margin, which is smooth within.

It occurs living on the coast of New-England, South-Carolina, and in the Gulf of Mexico.

PLATE VI. FIG. 9, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. II.

Genus, MERCENARIA.—SCHUMACHER.

MERCENARIA VIOLACEA.

PLATE VI. FIG. 11.

Venus mercenaria, *Linn.*, Syst. Nat., 1131.

Venus mercenaria, *Gmelin*, 3231.

Venus mercenaria, *Lam.*, An. sans Vert., Vol. 6, p. 346.

Venus mercenaria, *Dill*, Cat., Vol. 1, p. 176.

Venus mercenaria, *Wood*, Index, pl. 7, fig. 40.

Venus mercenaria, *Gould*, Invert. Mass., p. 85, fig. 67.

Venus mercenaria, *De Kay*, Zool. New-York, Art. Mollusca, p. 217, pl. 27, fig. 276.

Venus mercenaria, *Ravenel*, Cat. Coll. Shells, p. 4.

Venus mercenaria, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Venus mercenaria, *Stimpson*, Shells New-England, p. 19.

Venus mercenaria, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 81, pl. 21, fig. 6.

Mercenaria violacea, *Adams*, Gen. Recent Shells, Vol. 2, p. 419.

DESCRIPTION. Shell solid, obliquely cordate, concentrically furrowed, radiately striate, anal side somewhat produced, angled; buccal side short, rounded; umbones recurved; lunule heart shaped.—*T. & H.*

The anal slope is comparatively straight, and where it joins the pallial margin, it is slightly produced into a flattened lip.

This species attains considerable size, and then resembles MERCENARIA MORTONI, (*Con.*) It is the common clam of the coast; it existed in South-Carolina during the Pleiocene and Post-Pleiocene periods.

PLATE VI. FIG. 11, *Right valve, natural size.*

“ 11a, *Lunule, natural size.*

MERCENARIA MORTONI.

PLATE VI. FIG. 12.

Venus Mortoni, *Conrad*, Jour. Acad. Nat. Sci., Vol. 7, p. 251.

Venus Mortoni, *Conrad*, Foss. Ter. Form., p. 8, pl. 5, fig. 1.

Venus Mortoni, *De Kay*, Zool. New-York, Art. Mollusca, p. 219.

Mercenaria Mortoni, *Adams*, Gen. Recent Shells, Vol. 2, p. 419.

DESCRIPTION. Shell cordate, inflated, thick and ponderous, with prominent recurved concentric laminae, more elevated on the anterior and posterior margins; ligament margin arctuate; umbones prominent; lunule large, cordate, defined by a deep groove; posterior extremity slightly emarginate; inner margin regularly crenulated.—*Conrad*.

This is the most abundant species of the genus found in the Post-Pleiocene beds, and though not common in the recent state, is still living upon the coast. Mr. Conrad founded the species upon a specimen from Charleston harbor.

PLATE VI. FIG. 12, *Right valve, natural size.*

“ 12a, *Lunule, natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

MERCENARIA NOTATA.

PLATE VI. FIG. 13.

Venus notata, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 271.

Venus notata, *Gould*, Invert. Mass., p. 86, fig. 52.

Venus notata, *De Kay*, Zool. New-York, Art. Mollusca, p. 218, pl. 27, fig. 278.

Venus notata, *Ravenel*, Cat. Coll. Shells, p. 5.

Venus notata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Mercenaria notata, *Adams*, Gen. Recent Shells, Vol. 2, p. 419.

Venus notata, *Say's Conch. U. S.*, (Binney,) p. 49.

DESCRIPTION. Shell sub-cordate, obtusely rounded before, sub-angulated posteriorly; lateral dorsal margin nearly straight, concentric laminae, more elevated on the posterior and anterior margins, and crossed by radiating striae, which give the shell a sub-cancellated character; pallial margin beautifully crenulated; color, whitish, with brown and reddish zig-zig marks; interior margin white, cavity of shell bright purple.

This beautiful little shell was rare in the Post-Pleiocene period, and though living on the coast of South-Carolina, is not abundant.

PLATE VI. FIG. 13, *Right valve, natural size.*

LOCALITY. Simmons'.

Cabinet F. S. H.

Genus, CHIONE.—MEGERLE VON MUHLFELDT.

CHIONE CANCELLATA.

PLATE VI. FIG. 14.

Venus cancellata, Linn., Syst. Nat., 12th Ed., p. 1130.

Venus cancellata, Tuomey & Holmes, Pleiocene Foss. So. Ca., p. 84, pl. 21, fig. 11.

Chione cancellata, Adams, Gen. Recent Shells, Vol. 2, p. 421.

DESCRIPTION. Shell thick, somewhat compressed, decussated, radiately striate, concentrically sulcate; furrows remote, unequal, elevated; anal side lamellar, cardinal teeth thick, lunule cordate, buccal margin regularly rounded, anal margin sub-angulated; pallial margin crenulated.

This shell is easily distinguished by the raised, concentric and remote lines of growth, the radiating striæ are alternately larger and smaller. It is an abundant species in the Post-Pleiocene; and from the number of dead shells found upon our sea-beaches, we infer it is living on the coast.

PLATE VI. FIG. 14, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

CHIONE CRIBRARIA.

PLATE VI. FIG. 15.

Venus cribraria, Con., Pro. Acad. Nat. Sci., Vol. 1, p. 310.

Venus cribraria, Con., Foss. Ter. Form., p. 67, pl. 38, fig. 2.

Venus cribraria, Tuomey & Holmes, Pleiocene Foss. So. Ca., p. 83, pl. 21, fig. 10.

DESCRIPTION. Shell sub-trigonal, slightly ventricose; ribs twenty-five to thirty, con-

centric, lamelliform, elevated, recurved, with elevated transverse striæ on the inferior side of each; lunule cordate, laminated, crenulated on the buccal and pallial margins within, crenulations extending from beak to base of anal margin; teeth divaricate, unequal, triangular.

This shell is sometimes found living on the coast, but very rare in the Post-Pleiocene.

PLATE VI. FIG. 15, *Natural size.*

LOCALITY. Artesian Well, Charleston; Simmons'; Abbapoola.

Museum, College of Charleston; Cabinet F. S. H.

Genus, CALLISTA.—POLI.

C A L L I S T A G I G A N T E A .

PLATE VII. FIG. 3.

Venus gigantea, *Gmel.*, p. 3282.

Venus gigantea, *Chemn.*, 10, p. 254, t. 171, fig. 1661.

Venus gigantea, *Dillwyn*, Cat., Vol. 1, p. 202.

Cytherea gigantea, *Wood*, Index, pl. 8, fig. 100.

Cytherea gigantea, *Lam.*, An. sans Vert., 2d Ed., Vol. 6, p. 302.

Callista gigantea, *Adams*, Gen. Recent Shells, Vol. 2, p. 425.

DESCRIPTION. Shell large, ovate, smooth, polished, very inequilateral; buccal side short, rounded; anal side produced, sub-angulated; lunule ovate, impressed, keeled in the middle. In the recent state, it is prettily coloured with numerous bluish longitudinal rays.

This fine shell is often found in the Post-Pleiocene, and seems to have flourished during that period; it is living on the Carolina coast in deep soundings, but the shells are seldom found on the beaches. It is common on the Florida shores.

PLATE VII. FIG. 3, *Shell, natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

Genus, DOSINIA.—SCOPOLI.

DOSINIA CONCENTRICA.

PLATE VII. FIG. 4.

Venus concentrica, *Gmel.*, p. 3286, No. 82.

Venus concentrica, Dillwyn's Catalogue, Vol. 1, p. 196.

Venus concentrica, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 82, pl. 21, fig. 7.

Artemis concentrica, *Born.*, Sow. Gen., fig. 4.

Artemis concentrica, *Conrad*, Amn. Marine Conch., p. 55.

Artemis concentrica, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Cytherea concentrica, *Lam.*, Vol. 6, p. 316.

Dosinia concentrica, *Adams*, Gen. Recent Shells, Vol. 2, p. 431.

Venus concentrica *Dillwyn*, p. 234. no fig. -

DESCRIPTION. Shell sub-orbicular, depressed, almost equilateral, concentrically striated; striæ equal, closely arranged, distinct; lunule sub-cordate; ligament sunk; margins even; muscular impressions large; pallial sinus angular, ascending; dorsal cleft for hinge lanceolate and gaping.

DOSINIA CONCENTRICA is one of the most common recent shells of the Southern coast, and abundant in the Post-Pleiocene.

PLATE VII. FIG. 4, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

Genus, TAPES.—MÜHLFELDT.

TAPES GRUS.—(*New Species.*)

PLATE VII. FIG. 5.

DESCRIPTION. Shell small, convex, transversely oblong, sub-rhomboidal, inequilateral, with twenty-five or twenty-six ribs; ribs radiating, and interrupted by distinct overlapping zones of increase, which give the shell a laminated, or squamose appearance; umbones, anterior; dorsal margin thick, rectilinear, or very slightly curved, without ribs, squamose; posterior margin sub-truncated, anterior margin shorter, regularly rounded; pallial margin crenated; pallial sinus deep; muscular impressions large.

This shell is now living on the coast of South-Carolina.

PLATE VII. FIG. 5.

LOCALITY. Simmons'.

Cabinet F. S. H.

Genus, PETRICOLA.—LAM.

PETRICOLA PHOLADIFORMIS.

PLATE VII. FIG. 6.

- Petricola pholadiformis*, Lam., An. sans Vert., 3d Ed., Brux, Vol. 2, p. 554.
Petricola pholadiformis, Sowerby's Genera, pl. *Petricola*, figs. 1 and 2.
Petricola pholadiformis, Con., Am. Marine Shells, p. 37, pl. 7.
Petricola pholadiformis, Desh., Ency. Meth., p. 747.
Petricola fornicata, Say, Jour. Acad. Nat. Sci., Vol. 2, p. 319.
Petricola pholadiformis, Say, Amn. Conch., pl. 60, fig. 1.
Petricola pholadiformis, Ravenel, Cat. Coll. Shells, p. 3.
Petricola pholadiformis, Gould, Invert. Mass., p. 63.
Petricola pholadiformis, De Kay, Zool. New-York, Art. Mollusca, p. 228, pl. 33, fig. 228.
Petricola pholadiformis, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxii.
Petricola pholadiformis, Tuomey & Holmes, Pleiocene Foss. So. Ca., p. 87.
Petricola pholadiformis, Adams, Gen. Recent Shells, Vol. 2, p. 441.
Petricola pholadiformis, Say's Conch. U. S., (Binney,) p. 222.

DESCRIPTION. Shell elongated, cylindrical, inequilateral; buccal side very short, rounded radiately, and striate; ribs lamellar; anal side produced; lunule ovate.

Common along the whole Atlantic coast of the United States.

PLATE VII. FIG. 6.

Museum, College of Charleston; Cabinet F. S. H.

PETRICOLA DACTYLUS.

PLATE VII. FIG. 7.

- Petricola dactylus*, *Sow.*, Gen. Shells, pl. 3.
Petricola dactylus, *Say*, Amn. Conch., pl. 60, fig. 2.
Petricola dactylus, *Gould*, Invert. Mass., p. 65, fig. 41.
Petricola dactylus, *De Kay*, Zool. New-York, Art. Mollusca, p. 228, pl. 28, fig. 283, *a*, *b*.
Petricola dactylus, *Ravenel*, Cat. Coll. Shells, p. 3.
Petricola dactylus, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.
Petricola dactylus, *Stimpson*, Shells of New-England, p. 24.
Petricola dactylus, *Adams*, Gen. Recent Shells, Vol. 2, p. 441.
Petricola dactylus, *Say's Conch. U. S.*, (Binney,) p. 222.

DESCRIPTION. Shell elongately-ovate, thick, irregular, inequilateral, covered with radiating lines, and ribs; those on buccal side raised, distinct, without scales; no areola before the beaks.

Common along the whole Atlantic coast of North-America.

PLATE VII. FIG. 7.

Museum, College of Charleston.

Genus, MACTRA.—LINN.

M A C T R A S I M I L I S .

PLATE VII. FIG. 8.

- Mactra similis*, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 309.
Mactra similis, *De Kay*, Zool. New-York, Art. Mollusca, p. 230.
Mactra similis, *Ravenel*, Cat. Coll. Shells, p. 2.
Mactra similis, *Stimpson*, Shells of New-England, p. 20.
Mactra similis, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix. p. xxii.
Mactra similis, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 97, pl. 23, fig. 8.
Mactra similis, *Say's Conch. U. S.*, (Binney,) p. 101.

DESCRIPTION. Shell oblong-oval, equilateral, surface finely marked with concentric lines of growth, which are almost obsolete, and always interrupted irregularly with two or

three raised sub-laminated concentric lines; buccal and anal margins nearly equally rounded, the anal a little more pointed in some specimens; beaks central.

This is a very abundant living species on the Southern coast, and somewhat resembles in outline *M. OBLONGATA*, but is easily distinguished, as the folds on the buccal end are wanting; it is also a thicker shell than *M. OBLONGATA*.—*T. & H.*

PLATE VII. FIG. 8, *Natural size.*

LOCALITY. Simmons'; Abbapoola; St. Andrew's.

Museum, College of Charleston; Cabinet F. S. H.

MACTRA LATERALIS.

PLATE VII. FIG. 9.

Mactra lateralis, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 309.

Mactra lateralis, *Con.*, Amn. Mar. Conch., p. 62, pl. 14, fig. 2.

Mactra lateralis, *Gould*, Invert. Mass., p. 54, figs. 34, 35.

Mactra lateralis, *Ravenel*, Cat. Coll. Shells, p. 2.

Mactra lateralis, *Stimpson*, Shells of New-England, p. 20.

Mactra lateralis, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.

Mactra lateralis, *De Kay*, Zool. New-York, Art. Mollusca, p. 230, pl. 29, fig. 287.

Mactra lateralis, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 97, pl. 23, fig. 9.

Mactra lateralis, *Say's Conch. U. S.*, (Binney,) p. 101.

DESCRIPTION. Shell small, sub-triangular, smooth, or finely marked by the lines of growth, sub-equilateral; buccal margin rounded; anal margin prolonged, pointed; buccal region flat, heart shaped.—*T. & H.*

This is also a common shell on the coast from Massachusetts to Florida.

PLATE VII. FIG. 9, *Natural size.*

Museum, College of Charleston; Cabinet F. S. H.

Genus, GNATHODON.—GRAY.

GNATHODON CUNEATUS.

PLATE VII. FIG. 10.

Gnathodon cuneatus, *Gray*, Sowerby Gen., fig. 83.Rangia cyrenoides, *Desmoulins*.Gnathodon Grayii, *Con.*, Foss. Ter. Form., p. 23, pl. 13, fig. 1.Gnathodon Grayii, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 99.Gnathodon minor, *Con.*, Sill. Am. Jour. Sci., Vol. 42, pl. 2, fig. 14.

DESCRIPTION. Shell ovate, ventricose, inequilateral, thick; buccal margin obtusely rounded, anal margin produced, angular, cuneiform; umbones produced, prominent, eroded; epidermis olive-brown; margin of valves acute, simple; pallial sinus, short, ovate, outline commencing near the middle of the inferior muscular impression; hinge-teeth two in each valve, anterior to the cartilage-pit, which is central, deep, and ovate; excavation extending under dorsal margin nearly to the beaks; the front tooth of the left valve angular, bifurcated, large, beautifully crenulated externally, and at the base within that of the right valve, triangular, massive, and crenulated on the outside only; the hind tooth in both valves small and simple, that of the right is cleft deeply to receive the tooth of left valve; lateral teeth one in each valve, elongated, slightly curved; anterior ends dilated; dorsal sides beautifully crenulated; a narrow elongated ridge resembling a tooth, and crenulated on the inferior side of the anterior end, extends parallel to the lateral tooth on the dorsal side of the right valve.

GNATHODON CUNEATUS, is a variable shell; specimens corresponding to the various descriptions given of the synonyms above named, may be had from the Post-Pleiocene beds of South-Carolina; I therefore do not hesitate to refer them all to one species.

Those from the Pleiocene have their representative in the Post-Pleiocene as well as the recent forms from the Gulf coast; and it would be as easy to make a half dozen species as two or three; for example, that of the Post-Pleiocene, from which the figure in our plate is taken, differs not only in form and size, but the pallial sinus is ovate, short, and transverse, whilst that of the recent is angular or sub-lanceolate, and ascending. Shell beds of the Post-Pleiocene like those found on the surface at Mobile and in Southern Alabama, composed entirely of this species, and referred to the recent period by Professor Tuomey,* underlie the city of Charleston, about sixteen feet below the surface.

It is no longer an inhabitant of the bays of South-Carolina, but common on the Northern marshes of the Gulf of Mexico.

PLATE VII. FIG. 10.

LOCALITY. Charleston.

Museum, College of Charleston; Cabinet F. S. H.

Genus, MULINIA.

MULINIA MILESII.—(*New Species.*)

PLATE VII. FIG. 11.

DESCRIPTION. Shell, oblong-oval, transverse, thin; buccal side produced, sub-angulated, round at point; anal side regularly rounded, somewhat tumid; base emarginated, compressed, compression extending upwards towards umbones; anterior dorsal margin sub-rectilinear; beaks hardly prominent; V tooth strong, recipient cavity for lateral teeth, long, simple; cartilage-pit sub-angular.

This species cannot be confounded with any other shell from the Post-Pleiocene or coast of South-Carolina; its distinct V tooth, elongated anterior side, compressed pallial margin, round and tumid anal side, readily characterise it. The left valve only has yet been discovered. I take pleasure in dedicating it to my friend the adjunct Professor of Anatomy in the Medical College of Charleston, Dr. Francis T. Miles.

PLATE VII. FIG. 11, *Natural size.*

Cabinet F. S. H.

Genus, RAËTA.—GRAY.

RAËTA LINEATA.

PLATE VII. FIG. 12.

Lutraria lineata, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 310.

Lutraria lineata, *Am. Conch.*, pl. 9.

Lutraria lineata, *Con.*, *Am. Marine Conch.*, p. 47.

Lutraria lineata, *Ravenel*, *Cat. Recent Shells*, p. 2.

Lutraria lineata, *De Kay*, *Zool. New-York, Art. Mollusca*, p. 232.

Lutraria lineata, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xxii.

Lutraria papyracea, *Lamk.*, *An. sans Vert.*, Vol. 6, p. 93.

Lutraria papyratia, *Con.*, *Am. Conch.*, pl. 10.

Raëta papyracea, *Con.*, *M.S.S.*

Raëta papyracea, *Adams*, *Gen. Mollusca*, Vol. 2, p. 386.

Lutraria lineata, *Say's Conch. U. S. (Binney)*, p. 158.

DESCRIPTION. Shell transversely sub-oval, thin, whitish, tinged with ferruginous; posterior hiatus patulous; anterior hiatus linear and commencing below the hinge slope;

hinge slope with a rectilinear profile, and flattened oblong subcordate surface; valves unequally wrinkled; posterior margin rounded, shorter than the opposite margin, with a reflected edge, and sub-marginal carinated line; behind the middle of the disk, and some distance before the elevated line, is a broad vitta of hardly perceptible longitudinal lines; within, a little undulated; posterior margin glabrous, with an obtusely indented, sub-marginal line, corresponding with the exterior or carinated one."—*Say*.

RAËTA LINEATA, is not uncommon on the Southern coast, nor in the Post-Pleiocene as a fossil.

PLATE VII. FIG. 12, *Natural size*.

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

RAËTA CANALICULATA.

PLATE VII. FIG. 13.

Lutraria canaliculata, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 311.

Lutraria canaliculata, *Con.*, Am. Marine Conch., p. 46, pl. 10, fig. 1.

Lutraria canaliculata, *De Kay*, Zool. New-York, Art. Mollusca, pl. 31, fig. 298.

Lutraria canaliculata, *Ravenel*, Cat. Recent Shells, p. 2.

Lutraria canaliculata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.

Raëta canaliculata, *Con.*, M.S.S.

Raëta canaliculata, *Adams*, Gen. Moll., Vol. 2, p. 386, pl. 102, figs. 4, 4a.

Lutraria canaliculata, *Say's Conch. U. S.*, (Binney,) p. 102.

DESCRIPTION. Shell transversely-oval, orbicular, very thin and fragile, white, inflated; valves equally, concentrically, and regularly grooved, with very faint parallel lines within the grooves; posterior margin short, sub-cuneiform, compressed; a marginal, longitudinal, irregular, sub-impressed line, between which and the edge, the grooves become mere wrinkles; posterior slope sub-rectilinear, hiatus considerable; anterior margin regularly curved, the slope convex; within grooved as without; anterior angle glabrous.—*Say*.

This is a common shell of the Southern coast; in the Post-Pleiocene beds of Simmons' Bluff, we find numberless specimens in a perfect state, forming little groups of a dozen or more individuals still *in situ*, occupying the vertical position in which they lived.

PLATE VII. FIG. 13.

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

Genus, MESODESMA.—DESH.

MESODESMA CONCENTRICA.—(*New Species.*)

PLATE VI. FIG. 10.

DESCRIPTION. Shell small, trigonal, thick, very inequilateral, concentrically and finely ribbed; ribs regularly rounded; anterior margin rounded regularly, deeper than posterior; anal margin slightly compressed in the middle; posterior extremity of shell prolonged, narrowed, wedge-shaped.

This shell closely resembles MESODESMA ARCTATA, *Gould*; the anterior extremity is not truncated, but regularly rounded; the concentric striæ, or finely rounded ribs, are quite characteristic; I have found a few shells in the sands of our sea-beaches, but none with the animal.

PLATE VI. FIG. 10, *Natural size.*

LOCALITY. Simmons'; St. Paul's.

Cabinet F. S. H.

Genus, TELLINA.—LINN.

TELLINA FLEXUOSA.

PLATE VII. FIG. 14.

Tellina flexuosa, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 303.Tellina flexuosa, *De Kay*, Zool. New-York, Art. Mollusca, p. 210.Tellina flexuosa, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.Tellina flexuosa, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 90, pl. 22, fig. 7.
J. Michauxi Philippi - 1841.

DESCRIPTION. Shell sub-orbicular, surface obliquely sculptured, with very regular parallel lines; longitudinal striæ none; transverse wrinkles minute; buccal margin longer than anal, and less obtusely rounded; beak placed behind the middle, not prominent.—*T. & H.*

This shell is often found in the sands of our sea-coast.

PLATE VII. FIG. 14, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

PERONÆODERMA ALTERNATA.

PLATE VIII. FIG. 1.

- Tellina alternata, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 275.
 Tellina alternata, *Say*, Ann. Conch., pl. 65, fig. 1.
 Tellina alternata, *Ravenel*, Cat. Recent Shells, p. 4.
 Tellina alternata, *De Kay*, Zool. New-York, Art. Mollusca, p. 211.
 Tellina alternata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.
 Tellina alternata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 89, pl. 22.
 Tellina alternata, *Say's Conch. U. S.*, (Binney,) pp. 96, 228.
 Peronæoderma alternata, *Adams*, Gen. Recent Shells, Vol. 2, p. 396.

DESCRIPTION. Shell compressed, oblong, narrowed and angulated before; with numerous parallel, equal, equidistant, impressed, concentric lines, which on the anterior margin are alternately obsolete; interstitial spaces flat.—*T. & H.*

A callous line which is sometimes obsolete, passes from behind the hinge to the inner margin of the posterior cicatrix, and another from before the hinge to the inner margin of the anterior cicatrix. Anterior hinge-slope declining in a somewhat concave line to an obliquely truncated tip.

This is a common species, living on the coast of South-Carolina and Georgia, and not unfrequent on the beach of Florida.

PLATE VIII. FIG. 1, *Natural size.*

LOCALITY. Simmons'; Abbapoola Creek, John's Island.

Museum, College of Charleston; Cabinet F. S. H.

ANGULUS POLITA.

PLATE VIII. FIG. 2.

- Tellina polita, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 276.
 Tellina polita, *Ravenel*, Cat. Coll. Shells, p. 4.
 Tellina polita, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.
 Tellina polita, *De Kay*, Zool. New-York, Art. Mollusca, p. 210.
 Tellina polita, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 91, pl. 22, fig. 6.
 Tellina polita, *Say's Conch. U. S.*, (Binney,) pp. 97, 228.
 Angulus polita, *Adams*, Gen. Recent Shells, Vol. 2, p. 398.

DESCRIPTION. Shell transversely sub-triangular, minutely and concentrically wrinkled;

buccal margin rather shorter than ventral; basal margin nearly rectilinear from behind the middle to the anterior termination.—*T. & H.*

PLATE VIII. FIG. 2, *Exterior of fossil shell, natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

PERONÆA TENTA.

PLATE VIII. FIG. 3.

- Tellina tenta*, *Say*, *Amn. Conch.*, pl. 65, fig. 3.
Tellina tenta, *Adams*, *Boston Jour. Nat. Hist.*, Vol. 3, p. 332.
Tellina tenta, *Gould*, *Invert. Mass.*, p. 68, fig. 43.
Tellina tenta, *De Kay*, *Zool. New-York, Art. Mollusca*, p. 210.
Tellina tenta, *Stimpson*, *Shells New-England*, p. 21.
Tellina tenta, *Ravenel*, *Amn. Conch.*, *Say's observations* on pl. 65.
Tellina tenta, *Say's Conch. U. S.*, (*Binney*,) p. 228.
Peronæa tenta, *Adams*, *Gen. Recent Shells*, Vol. 2, p. 399.

DESCRIPTION. Shell transversely oblong, fragile, smooth externally; polished within and radiately striated; striæ almost obsolete; beaks behind the middle, slightly elevated; buccal side regularly rounded; anal side sub-angular, curved to the right, gaping, tip obviously truncated; hinge delicate, with two cardinal teeth in right valve, and one in the left; lateral teeth, one in right valve, with corresponding depression in the left.

Living on the coast of United States, from Cape Cod to Florida, but rarely found fossil in the Post-Pleiocene.

PLATE VIII. FIG. 3, *Left valve, natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

TELLINA CAYENNENSIS.

PLATE VIII. FIG. 4.

Psammobia cayennensis, *Lam.*, An. sans Vert., Vol. 6, p. 177.

Solen constrictus, *Brug.*, Cat. Mem. de la Soc. d'Hist. Nat., p. 126, No. 3. 1789. to 1792.

Tellina intastriata, *Say*, Jour. Acad. Nat. Sci., Vol. 5, p. 218. 1826.

Tellina intastriata, *De Kay*, Zool. New-York, Art. Mollusca, p. 211.

Tellina cayennensis, *Jay*, Cat. Coll. Shells, 4th Ed., No. 536, p. 25.

Tellina intastriata, *Say's Conch. U. S.*, (Binney,) p. 125.

DESCRIPTION. Shell sub-ovate, ventricose, transversely and distinctly striated; posterior end wrinkled; radiating striæ nearly obsolete externally, within distinct; anterior margin regularly rounded, and continuous with basal margin; posterior end angular, sub-rostrated, tip rounded, curved to the right; within smooth, not striated; posterior dorsal slope oblique, rectilinear, with a fold extending from beak to basal margin.

TELLINA CAYENNENSIS is living on the coast of South-Carolina, but only found near the mouth of the Santee River, where the water is brackish.

PLATE VIII. FIG. 4, *Valves, natural size.*

Museum, College of Charleston; Cabinet F. S. H.

Genus, TELLIDORA. — MÖRCH.

TELLIDORA LUNULATA.

PLATE IX. FIGS. 6 to 7d.

Tellidora lunulata, *Adams*, Gen. Recent Mollusca, Vol. 2, p. 401.

DESCRIPTION. Shell sub-triangular, inequivalve, inequilateral; surface of valves concentrically plicated; beaks prominent, slightly curved laterally; lateral slopes strongly produced, dentated at their edges; two primary teeth in right valve, one in the other; lateral teeth, two in each valve.

TELLIDORA LUNULATA no longer exists on the coast of South-Carolina; *T. BURNETTI*, of Brod. & Sow., now living on the Pacific shores of California, is nearly allied to it. In our fossil shell, the left valve is concave, and the right valve flat; the dorsal anterior slope is almost rectilinear, in some specimens slightly, and convexly curved, and the posterior slope

slightly, and concavely curved; whereas, in the recent species, *T. BURNETTI*, the left valve is flat, the right concave, and the posterior dorsal margin very deeply curved; the dentations are also more profound. We have been careful in giving a number of good figures of these two species, as they have been confounded for a long time.

- PLATE IX. FIG. 6, *T. Burnetti*, left valve.
 " 6a, *T. Burnetti*, interior, right valve.
 " 6b, To show convexity of right valve.
 " 7, *T. lunulata*, right valve.
 " 7a, *T. lunulata*, left valve.
 " 7b, Interior, left valve.
 " 7c, Interior, right valve.
 " 7d, To show convexity of left valve.

LOCALITY. Simmons'; Brown's, St. Andrew's.

Museum, College of Charleston; Cabinet F. S. H.

GENUS, MACOMA.—LEACH.

MACOMA FUSCA.

PLATE VIII. FIG. 5.

- Psammobia fusca*, Say, Jour. Acad. Nat. Sci., Vol. 5, p. 220.
Sanguinolaria fusca, Con., Am. Mar. Conch., p. 34, pl. 7, fig. 1.
Sanguinolaria fusca, Gould, Invert. Mass., p. 66, fig. 42.
Sanguinolaria fusca, De Kay, Zool. New-York, Art. Mollusca, p. 212, pl. 32, fig. 304.
Sanguinolaria fusca, Ravenel, Cat. Coll. Shells, p. 3.
Sanguinolaria fusca, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxi.
Sanguinolaria fusca, Jay, Cat. Coll. Shells, 4th Ed., No. 565.
Tellina fusca, Stimpson, Shells New-England, p. 20.
Macoma fusca, Adams, Gen. Recent Mollusca, Vol. 2, p. 400.
Psammobia fusca, Say's Conch. U. S., (Binney,) p. 126.

DESCRIPTION. Shell thin, compressed, transversely ovate, equilateral, concentrically and distinctly striated; striæ somewhat wrinkled; beaks small, not prominent, central; buccal margin rounded; anal margin narrowed, somewhat pointed; a fold extends from beaks to point of anal margin, which is obtusely rounded; two small unequal teeth in each valve.

This shell is common along the whole Atlantic coast of the United States, but very rare in the Post-Pleiocene beds of South-Carolina.

PLATE VIII. FIG. 5.

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

Genus, SERRULA.—LINN.

SERRULA VARIABILIS.

PLATE VIII. FIG. 6.

Donax variabilis, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 305.

Donax variabilis, *Say*, Am. Conch., pl. 61, fig. 1.

Donax variabilis, *De Kay*, Zool. New-York, Art. Mollusca, p. 212.

Donax variabilis, *Ravenel*, Cat. Coll. Shells, p. 4.

Donax variabilis, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Donax variabilis, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 95, pl. 23, fig. 6.

Serrula variabilis, *Adams*, Gen. of Recent Shells, Vol. 2, p. 406.

Donax variabilis, *Say's Conch. of U. S.*, (Binney,) pp. 99, 226.

DESCRIPTION. Shell triangular; longitudinally striated, with equal, parallel, regular, impressed, but indistinct lines; buccal margin obliquely truncated, cordate, suture sub-convex; anal margin nearly rectilinear, suture indented; pallial margin a little prominent, beyond a regular curve, near the middle; interior edge crenate.—*T. & H.*

This is an abundant recent species upon the sea shores of the South, and is found fossil also in great quantities in the Post-Pleiocene beds.

PLATE VIII. FIG. 6, *Fossil, natural size.*

LOCALITY. Abbapoola; Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

Genus, ABRA.—LEACH.

ABRA ÆQUALIS.

PLATE VIII. FIG. 7.

- Amphidesma æqualis, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 307.
 Amphidesma æqualis, *Con.*, Foss. Ter. Form., p. 76, pl. 43, fig. 9.
 Amphidesma æqualis, *d'Orb.*, Prod. de Paleontologie, Vol. 3, p. 101, No. 1886.
 Amphidesma æquale, *Say*, Am. Conch., pl. 28.
 Amphidesma æquale, *Ravenel*, Cat Coll. Shells, p. 3.
 Amphidesma æqualis, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.
 Amphidesma æqualis, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 93, pl. 23, fig. 3.
 Amphidesma æqualis, *Say's Conch. U. S.*, (Binney,) pp. 100, 182.

DESCRIPTION. Shell obliquely-orbicular, ventricose, smooth; beaks sub-medial, nearest to anal end; umbonial slope sub-marginal, slightly carinated; anal side somewhat warped or bent.

This is a recent species on the shores of South-Carolina, Florida, and Alabama, and fossil in the Post-Pleiocene of this State.—*T. & H.*

PLATE VIII. FIG. 7, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston.

 ABRA ANGULATA.—(*New Species.*)

PLATE VIII. FIG. 8.

DESCRIPTION. Shell sub-orbicular, equivalve, sub-equilateral, convex, anteriorly rounded, posteriorly angulated towards basal margin; anal side with a raised line or warped ridge, extending from beak to angle of margin; surface minutely and concentrically wrinkled; wrinkles distinct towards basal margins, but sometimes obsolete on umbones; beaks distinct, somewhat acute; within radiately striated; striæ often obsolete, or not visible but with the aid of a lens, terminating at basal margin; gives it a finely serrated appearance; pallial impression distinct; lunule deep and broad, distant from margin, projecting up into the middle of the cavity; primary teeth two in each valve, no lateral teeth, but anterior margin of right valve has a projecting rim or elevated edge, which extends from the beak half way down to basal margin; ligamental-cavity sub-

fusiform, parallel with posterior slope. This shell resembles *AMPHIDESMA PUNCTATA*, of Say, but it is readily distinguished by its smooth, not punctured surface, and angular posterior side. It is abundant in the Post-Pleiocene, and though dead shells are often found on our beaches, we have not yet discovered a living specimen on the coast of South-Carolina.

PLATE VIII. FIG. 8, *Valves, natural size.*

LOCALITY. Simmons'; Abbapoola Creek; Artesian Well, Charleston.

Museum, College of Charleston; Cabinet F. S. II.

Genus, *SEMELE*.—SCHUMACKER.

SEMELE ORBICULATA.

PLATE VIII. FIG. 9.

Amphidesma orbiculata, Say, Jour. Acad. Nat. Sci., Vol. 2, p. 307.

Amphidesma orbiculata, Ravenel, Cat. Coll. Shells, p. 3.

Amphidesma orbiculata, De Kay, Zool. New-York, Art. Mollusca, p. 237.

Amphidesma orbiculata, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxii.

Amphidesma orbiculata, Tuomey & Holmes, Pleiocene Foss. So. Ca., p. 94, pl. 23, fig. 4.

Semele orbiculata, Adams, Gen. Recent Shells, Vol. 2, p. 411.

Amphidesma orbiculata, Say's Conch. U. S., (Binney,) p. 100.

DESCRIPTION. Shell orbicular, sub-compressed; surface finely marked with concentric lines of growth, which are interrupted irregularly with raised sub-laminated concentric lines; buccal margin obtusely undulated; interior ligamental-cavity profound, fusiform, parallel with marginal slope, and extending from tip of beak.

In young shells, longitudinal, radiating, and obsolete lines are distinctly seen intersecting the lines of growth, but in older specimens a few lines only are visible upon the buccal folds or undulations.—*T. & H.*

This species is abundantly fossil in the Post-Pleiocene, and is recent on the coast of the State.

PLATE VIII. FIG. 9, *Exterior of shell.*

LOCALITY. Simmons'.

Museum, College of Charleston.

SEMELE TRANSVERSA

PLATE VIII. FIG. 10.

Amphidesma transversa, Say, Am. Conch., pl. 28

Amphidesma transversa, De Kay, Zool. New-York, Art. Mollusca, p. 237.

Amphidesma transversa, Say's Conch. U. S., (Binney,) p. 181.

DESCRIPTION. Shell thin, sub-oval, nearly equilateral, compressed; buccal and anal margins sub-equally rounded; beaks slightly prominent, basal margin regularly rounded.

This shell is now living on the Northern coast of the United States. Mr. Say obtained a specimen from the coast of Georgia, which he says was somewhat worn; was it a Post-Pleiocene fossil?

PLATE VIII. FIG. 10, *Fossil, natural size.*

LOCALITY. Abbapoola Creek. *Museum, College of Charleston; Cabinet F. S. H.*

SEMELE RADIATA.

PLATE VIII. FIG. 11.

Amphidesma radiata, Say, Jour. Acad. Nat. Sci., Vol. 5, p. 220.

Amphidesma radiata, Say, Conch. U. S., (Binney,) p. 127.

DESCRIPTION. Shell transversely oval, orbicular, a little compressed; apex nearly central, a little prominent; posterior slope somewhat concave near the beak; anterior slope rectilinear to the middle; disk somewhat regularly wrinkled transversely, and with minute longitudinal striæ; anterior sub-margin, with a very slight obtuse undulation; cardinal teeth two in each valve, elevated, slender, unequal; lateral teeth very distinct; interior ligamental cavity profound, fusiform.—*Say.*

Our specimen is a single valve only of a young shell. It is not known to be living upon the Carolina coast, but Mr. Say had specimens from the shores of East Florida, and one shell from the coast of Georgia.

PLATE VIII. FIG. 11, *Shell, natural size.*

Cabinet F. S. H.

Genus, CUMINGIA.—Sow.

CUMINGIA TELLINOIDES.

PLATE VIII. FIG. 12.

- Mactra tellinoides*, *Con.*, Jour. Acad. Nat. Sci., Vol. 6, p. 258, pl. 11, figs. 2, 3.
Cumingia tellinoides, *Con.*, Foss. Ter. For., p. 28, pl. 15, fig. 4.
Lavignon tellinoides, *d'Orb.*, Prod. de Paleontologie, Vol. 3, p. 101, No. 1891.
Lavignon tellinoides, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 92, pl. 23, fig. 1.
Cumingia tellinoides, *Adams*, Gen. Recent Shells, Vol. 2, p. 412.

DESCRIPTION. 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.—*T. & H.*

Conrad says this shell inhabits the Northern Atlantic coast of the United States.

PLATE VIII. FIG. 12, *Exterior and interior of shell, natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

Genus, ENSIS.—SCHUM.

ENSIS ENSIS.

PLATE VIII. FIG. 13.

- Solen ensis*, *Linn.*, Syst. Nat., 1114.
Solen ensis, *Lamk.*, An. sans Vert., 2d Ed., Vol. 6, p. 55.
Solen ensis, *Con.*, Marine Conch., pl. 5, fig. 1.
Solen curvus, *Lister*, Conch., t. 411, fol. 257.
Solen ensis, *Gould*, Invert. Mass., p. 28.
Solen ensis, *Ravenel*, Cat. Coll. Shells, p. 2.
Solen ensis, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.
Solen ensis, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 101, pl. 24, fig. 3.
Solen ensis, *Stimpson*, Shells New-England, p. 22.
Ensis ensis, *Adams*, Gen. Recent Shells, Vol. 2, p. 342.

DESCRIPTION. Shell sword-shaped; dorsal and pallial margins parallel; buccal and

anal margins sub-truncate. The genus is distinguished from SOLEN by the number of teeth in the hinge, and by the curved form of the valves.

This is a well-known shell, living all along the coast of the United States.

PLATE VIII. FIG. 13, *Natural size, one valve broken.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

Genus, SILLIQUARIA. — SCHUM.

SILLIQUARIA CARIBÆA.

PLATE VIII. FIG. 14.

Solecortus caribæus, Blain, Dict. des Sci. Naturelle, Vol. 29, p. 240.

Solecortus caribæus, Con., Marine Conch., p. 22, pl. 4, fig. 3.

Solecortus caribæus, Gould, Invert. Mass., p. 30.

Solen caribæus, Ravenel, Cat. Coll. Shells, p. 2.

Solecortus caribæus, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxii.

Solecortus caribæus, Tuomey & Holmes, Pleiocene Foss. So. Ca., p. 99, pl. 23, figs. 12 and 13.

Solecortus gibbus, Stimpson, Shells of New-England, p. 22.

Silliquaria gibba, Adams, Gen. Recent Shells, Vol. 2, p. 347.

DESCRIPTION. Shell oblong-oval, straight, gaping at both ends; buccal and anal margins obtusely rounded; pallial margin straight, slightly compressed near the middle, beaks nearly central, slightly elevated; hinge teeth two, three; sinus of pallial impression very deep, extending beyond the umbo.

SILLIQUARIA CARIBÆA is found in the Pleiocene of South-Carolina; is very abundant in the Post-Pleiocene, and common in the recent state on the coast.

PLATE VIII. FIG. 14, *Valves, natural size.*

LOCALITY. Charleston; Simmons'; Abbapoola.

Museum, College of Charleston; Cabinet F. S. H.

Genus, MYA.—LINN.

MYA ARENARIA.

PLATE VIII. FIG. 15.

Mya arenaria, *Linn.*, *Syst. Nat.*, p. 1112.*Mya arenaria*, *Gould*, *Invert. Mass.*, p. 40.*Mya mercenaria*, *Say*, *Jour. Acad. Nat. Sci.*, Vol. 2, p. 313.*Mya acuta*, *Say*, *Jour. Acad. Nat. Sci.*, Vol. 2, p. 313.*Mya acuta*, *Say's Conch. U. S.*, (Binney,) p. 103.

DESCRIPTION. Shell transversely ovate, equivalve, sub-equilateral, tumid, gaping at both ends, surface wrinkled; anterior margin rounded; posterior margin produced, sub-acute, reflexed, without teeth; process for cartilage-pit in left valve large, of equal length and breadth, and projecting inwards and backwards; cartilage-pit of right valve without a process, but with a tooth-like projection behind it; its anterior margin reflexed; anterior muscular impression narrow, long, club-shaped, extending upwards towards the beaks; pallial impression distinct, irregularly scolloped; pallial sinus deep and broad.

MYA ARENARIA is the long clam of the Boston and New-York markets, and does not exist on the coast of the Southern Atlantic States. The clams of the Charleston market are VENUS MERCENARIA, and VENUS MORTONI. The MYAS found upon our beaches are undoubtedly fossils of the Post-Pleiocene, and this we infer not only from their old and water-worn appearance, but from Mr. Say's description of his species "ACUTA," which he says was from this coast. Like "M. ACUTA," our fossil is more acutely pointed posteriorly than the recent shell.

PLATE VIII. FIG. 15, *Valves, natural size.*

LOCALITY. The beaches of the coast; Simmons'; Abbapoola, &c.

*Museum, College of Charleston; Cabinet F. S. H.*MYA SIMPLEX.—(*New Species.*)

PLATE VIII. FIG. 16.

DESCRIPTION. Shell transversely ovate, convex, not tumid, inequilateral, concentrically striated; anterior and posterior margins obtusely rounded, the former narrowest; pallial margin sub-rectilinear; posterior dorsal margin slightly curved; cartilage-pit excavated,

and having a tooth-like process, distinct and prominent behind; muscular and pallial impressions simple, the latter indistinct.

This small species is readily distinguished by its sub-equal posterior and anterior margins, the anterior being narrowest; beaks not prominent forward of the middle, and by the prominent tooth-like process of the right valve; it differs also from *M. ARENARIA*, in having the anterior muscular impression simple, and not club-shaped.

Not known to exist in the recent state.

PLATE VIII. FIG. 16.

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

Genus, CORBULA.—BRUG.

CORBULA CONTRACTA.

PLATE VIII. FIG. 17.

Corbula contracta, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 312.

Corbula contracta, *Ravenel*, Cat. Coll. Shells, p. 3.

Corbula contracta, *Gould*, Invert. Mass., p. 43.

Corbula contracta, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.

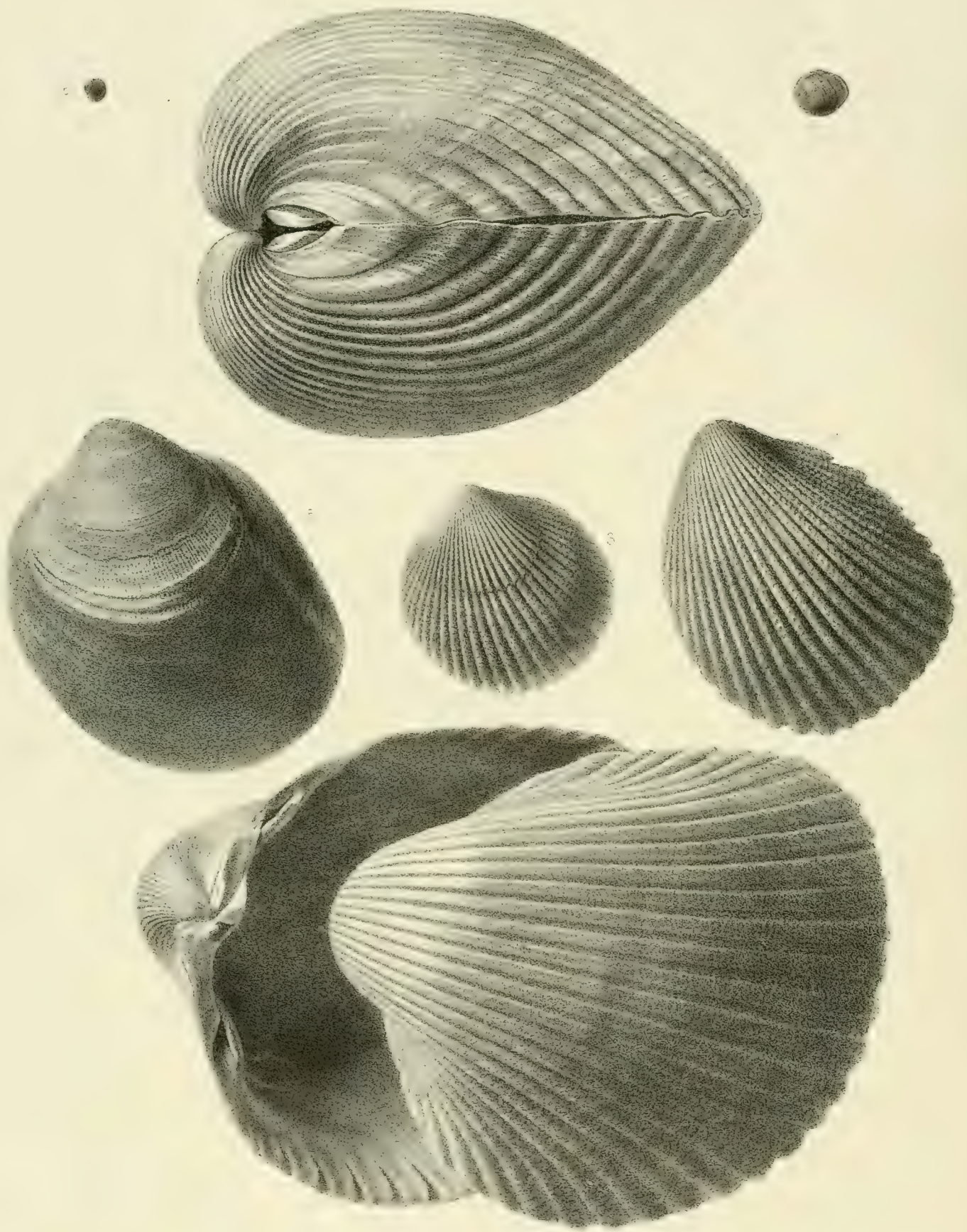
DESCRIPTION. Shell transversely sub-ovate; valves sub-equal, regularly and profoundly striated transversely; beaks not prominent, nearly central, one side rounded and the other sub-acute; basal margin contracted near the middle, one half of the length of one valve concealing one half of the edge of opposite valve.—*Say*.

I have not seen a living specimen, though the shells are common along the beaches of the Southern sea-coast.

PLATE VIII. FIG. 17, *Shell, natural size.*

LOCALITY. Simmons'; Abbapoola; Charleston, Artesian Well.

Museum, College of Charleston; Cabinet F. S. H.



MISSISSIPPIAN FOSSILS
Charleston S. Ca.

POST-PLEIOCENE FOSSILS.
SOUTH-CAROLINA.

PLATE V.

CHAMIDÆ.—CARDIADÆ.

CHAMIDÆ.

FIG. 1. CHAMA ARCINELLA. Natural size. *Page 23.*

CARDIDÆ.

FIG. 2. CARDIUM MAGNUM. Natural size. *Page 23.*

“ 2a. CARDIUM MAGNUM. Side view.

“ 3. CARDIUM MURICATUM. Natural size. *Page 24.*

“ 4. CARDIUM ISOCARDIA. Natural size. *Page 25.*

“ 5. LÆVICARDIUM SERRATUM. *Page 25.*

“ 6. CARDIUM MORTONI. *Page 26.*

This figure was accidentally blurred in the printing.

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE VI.

LUCINIDÆ.—CYCLADIDÆ.—CYPRINIDÆ.—TELLINIDÆ.

LUCINIDÆ.

- FIG. 1. LUCINA DIVARICATA. Exterior, left valve. *Page 27.*
" 2. LUCINA COSTATA. Natural size. *Page 27.*
" 3. LUCINA RADIANS. Natural size. *Page 28.*
" 4. LUCINA TRISULCATA. Natural size. *Page 28.*
" 5. LUCINA KIAWAHENSIS. Natural size. *Page 29.*
" 6. LUCINA MULTILINEATA. Natural size. *Page 29.*
LUCINA CREMULATA. Not figured. *Page 30.*
MONTACUTA BOWMANI. See plate VII., fig. 2. *Page 30.*

CYCLADIDÆ.

- FIG. 7. CYRENA CAROLINIENSIS. Natural size. *Page 31.*

CYPRINIDÆ.

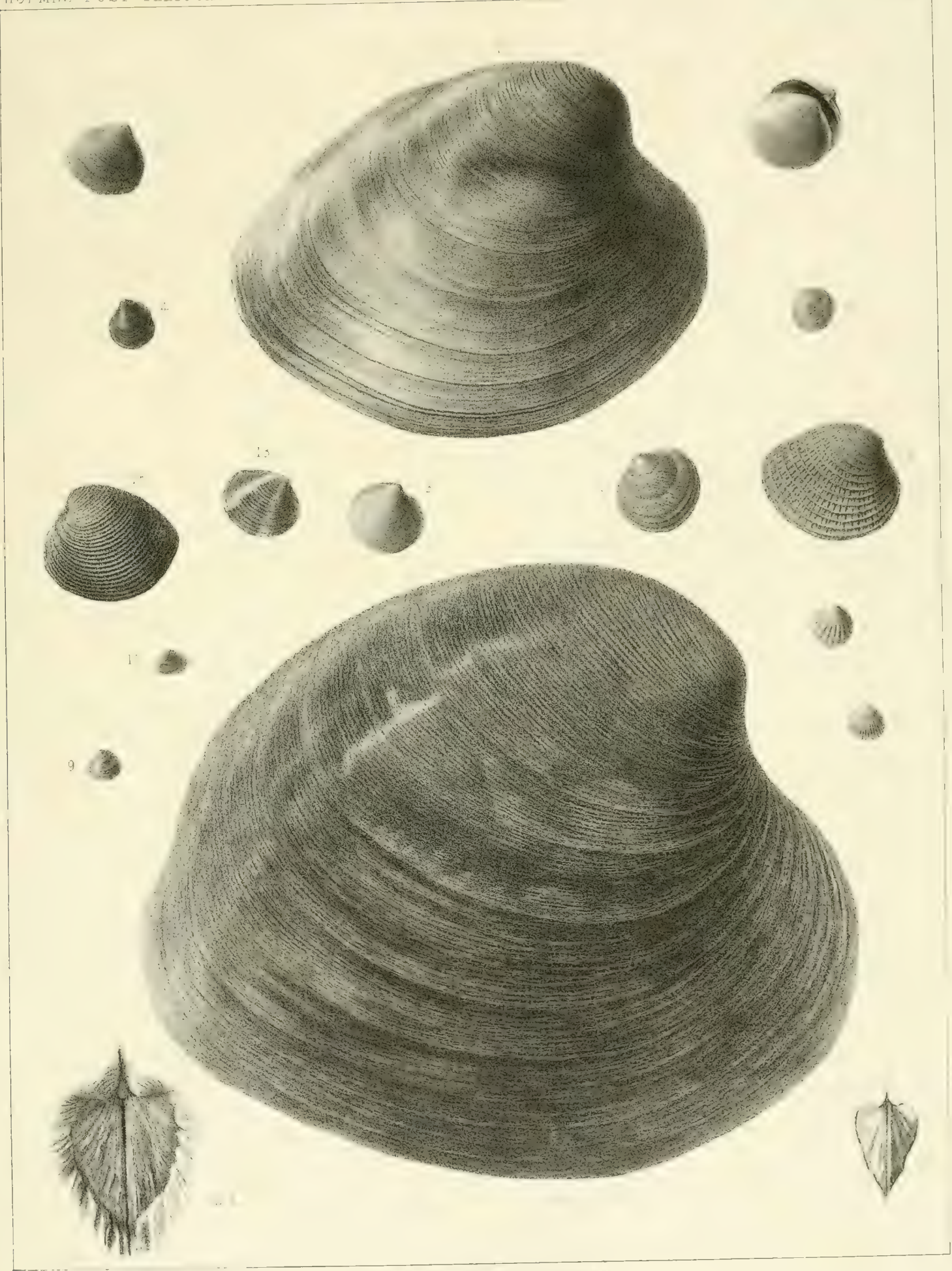
- FIG. 8. CARDITA TRIDENTATA. Natural size. *Page 31.*
CARDITA FLORIDANA. See Plate VII. *Page 32.*
" 9. ASTARTE LUNULATA. Natural size. *Page 32.*

TELLINIDÆ.

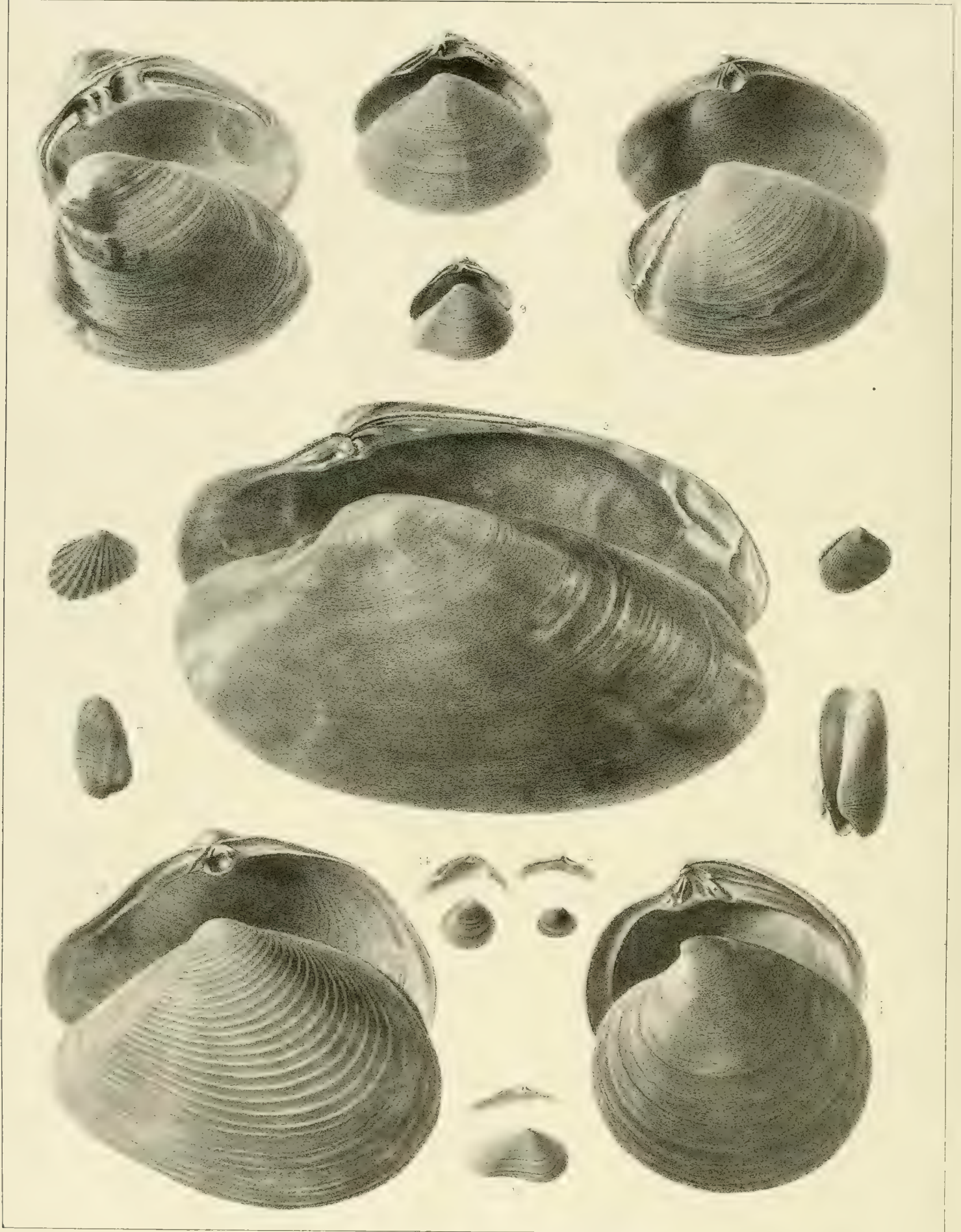
- FIG. 10. MESODESMA CONCENTRICA. Natural size. *Page 44.*
For others of this family, see plates VII. and VIII.

VENERIDÆ.

- FIG. 11. MERCENARIA VIOLACEA. Natural size. *Page 33.*
" 11a. MERCENARIA VIOLACEA. Lunule natural size.
" 12. MERCENARIA MORTONI. Natural size. *Page 34.*
" 12a. MERCENARIA MORTONI. Lunule.
" 13. MERCENARIA NOTATA. Natural size. *Page 34.*
" 14. CHIONE CANCELLATA. *Page 35.*
" 15. CHIONE CIBRARIA. *Page 35.*



Illustrations of the fossils
Charleston, South Carolina



From Plate by J. J. Pilsen
Charleston, So. Ca

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE VII.

CYPRINIDÆ.—LUCINIDÆ.—VENERIDÆ.—TELLINIDÆ.

CYPRINIDÆ.

FIG. 1. *CARDITA FLORIDANA*. Outline of natural size, and magnified figure. *Page 32.*

LUCINIDÆ.

FIG. 2. *MONTACUTA BOWMANI*. *Page 30.*

VENERIDÆ.

FIG. 3. *CALLISTA GIGANTEA*. Natural size. *Page 36.*

" 4. *DOSINIA CONCENTRICA*. Natural size. *Page 37.*

" 5. *TAPES GRUS*. Outline natural size, and magnified figure. *Page 37.*

PETRICOLIDÆ.

FIG. 6. *PETRICOLA PHOLADIFORMIS*. *Page 38.*

" 7. *PETRICOLA DACTYLUS*. *Page 39.*

MACTRIDÆ.

FIG. 8. *MACTRA SIMILIS*. Natural size. *Page 39.*

" 9. *MACTRA LATERALIS*. Natural size. *Page 40.*

" 10. *GNATHODON CUNEATUS*. *Page 41.*

" 11. *MULINIA MILESII*. Natural size. *Page 42.*

" 12. *RAËTA LINEATA*. Natural size. *Page 42.*

" 13. *RAËTA CANALICULATA*. Natural size. *Page 43.*

TELLINIDÆ.

FIG. 14. *TELLINA FLEXUOSA*. Natural size. *Page 44.*

For others of this family, see Plate VI. and VIII.

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE VIII.

TELLINIDÆ.—SOLENIIDÆ.—MYACIDÆ.

TELLINIDÆ.

- FIG. 1. PERONÆODERMA ALTERNATA. Natural size. *Page 45.*
" 2. ANGULUS POLITA. Natural size. *Page 45.*
" 3. PERONÆA TENTA. Natural size. *Page 46.*
" 4. TELLINA CAYENNENSIS. Natural size. *Page 47.*
" 5. MACOMA FUSCA. Natural size. *Page 48.*
" 6. SERRULA VARIABILIS. Natural size. *Page 49.*
" 7. ABRA EQUALIS. Natural size. *Page 50.*
" 8. ABRA ANGULATA. Natural size. *Page 50.*
" 9. SEMELE ORBICULATA. Natural size. *Page 51.*
" 10. SEMELE TRANSVERSA. Natural size. *Page 52.*
" 11. SEMELE RADIATA. Natural size. *Page 52.*
" 12. CURMINGIA TELLINOIDES. Natural size. *Page 53.*

SOLENIIDÆ.

- " 13. ENSIS ENSIS. Natural size, one valve broken. *Page 53.*
" 14. SILIQUARIA CARIBÆUS. Natural size. *Page 54.*
TELLIDORA LUNULATA. See Plate IX, Fig. 7. *Page 47.*

MYACIDÆ.

- FIG. 15. MYA ARENARIA. *Page 54.*
" 16. MYA SIMPLEX. *Page 55.*
" 17. CORBULA CONTRACTA. *Page 56.*
" 18. SAXICAVA FRAGILIS. *Page 57.*

Genus, SAXICAVA.—FLEURIAU DE BELLEVUE.

Genus, BYSSOMYA.—Cuv.

SAXICAVA FRAGILIS.—(*New Species.*)

PLATE VIII. FIG. 18.

DESCRIPTION.—Shell oblong, fragile, concentrically striated, somewhat laminated; anterior and posterior margins obtusely rounded; dorsal margin straight, or slightly curved towards posterior end; pallial margin compressed in the middle; umbones anterior, depressed; pallial impression distinct, simple, at a distance from margins; cardinal tooth in both valves, prominent, nodulous.

We have the right and left valve of this shell from the Post-Pleiocene; it is not known on the coast.

PLATE VIII. FIG. 18, *Right valve, natural size.*

LOCALITY. Simmons'.

Cabinet F. S. H.

Genus, PHOLAS.—LINN.

PHOLAS TRUNCATA.

PLATE IX. FIG. 4.

Pholas truncata, Say, Jour. Acad. Nat. Sci., Vol. 2, p. 223.

Pholas truncata, De Kay, Zool. New-York, Art. Mollusca, p. 248, pl. 34, fig. 223.

Pholas truncata, Ravenel, Cat. Coll. Shells, p. 2.

Pholas truncata, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxii.

Pholas truncata, Say's Conch. U. S., (Binney,) p. 107.

DESCRIPTION. Shell transversely oblong, sub-pentangular; anterior margin rostrated, obtusely cuneiform in the middle; posterior margin broadly truncated at tip; valves transversely wrinkled and longitudinally striated, muricated, particularly on the anterior side, with small erect scales, which are not arched beneath; posterior margin from a line extending from the beak to the inferior angle of the truncature, destitute of the striæ and mutic; hinge callous, formed of the duplicature of the hinge-margin, and destitute of cells; a small tooth upon the inner margin, projecting backwards; dentiform process curved, prominent, slender, flat.—*Say.*

PLATE IX. FIG. 4, *Shell, natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

PHOLAS COSTATA.

PLATE IX. FIGS. 1 AND 1a.

Pholas costata, *Linn.*, Syst. Nat., 1111.Pholas costata, *Lam.*, An. sans Vert., VI., 45.Pholas costata, *Wood*, Gen. Conch., pl. 15, figs. 1 and 2.Pholas costata, *Gould*, Invert. Mass., p. 26.Pholas costata, *Ravenel*, Cat. Coll. Shells, p. 2.Pholas costata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.Pholas costata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 102, pl. 24, fig. 4.

DESCRIPTION. Shell large, thin, oblong-ovate; buccal margin rounded, anal margin more pointed; dorsal margin reflected over the umbones; ribs radiating, with coarse lines of growth, producing tooth-like elevations at regular intervals on each rib.

This is the most common of the three species of PHOLADIDÆ on the Southern coast, and is abundant in the harbors of this State. It often attains the width of six inches.

PLATE IX. FIG. 1, *Fossil, natural size; back view, showing accessory valve.*

“ 1a, *Side view, left valve.*

LOCALITY. Simmons'.

Museum, College of Charleston.

 Genus, DACTYLINA.—GRAY.

DACTYLINA OBLONGATA.

PLATE IX. FIG. 2.

Pholas oblongata, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 320.Pholas oblongata, *Ravenel*, Cat. Coll. Shells, p. 2.Pholas oblongata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. 22.Pholas oblongata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 103, pl. 24, fig. 1.

DESCRIPTION. Shell oblong-ovate, inflated, transversely and longitudinally striated; striæ muricated, and elevated on the buccal side into ribs; buccal margin acutely rounded; anal margin compressed; dorsal margin anteriorly reflexed, forming a cavity; hinge callous, minutely striated transversely and longitudinally, and with about twelve cells.—*T. & H.*

This shell is easily distinguished from *P. COSTATA* by the hinge-plates, which are cellular beneath; the two *dorsal valves* are lanceolate and placed side by side, which is characteristic of the genus. It is living on the coast of South-Carolina, Georgia, and Florida, and is quite common.

PLATE IX. FIG. 2, *Natural size; side view.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

Genus, MARTESIA.—LEACH.

MARTESIA CUNEIFORMIS.

PLATE IX. FIG. 3.

Pholas cuneiformis, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 322.

Pholas cuneiformis, *Ravenel*, Cat. Coll. Shells, p. 2.

Pholas cuneiformis, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.

Pholas cuneiformis, *De Kay*, Zool. New-York, Art. Mollusca, p. 248.

Pholas cuneiformis, *Say's Conch. U. S.*, (Binney,) p. 108.

Martesia cuneiformis, *Adams*, Gen. Recent Mollusca, Vol. 2, p. 331.

DESCRIPTION. Shell sub-cuneiform; anterior margin nearly closed, transversely truncated from the hinge; the surface transversely striated in an undulated manner, with elevated, minutely crenate lines; the interstitial lines smooth; these lines partially interrupt a profoundly impressed longitudinal sulcus which passes from the beak to near the middle of the base; the inferior portion of this margin is destitute of striæ; posterior margin attenuated by nearly rectilinear edges to a rounded tip; surface transversely wrinkled; hinge callous, composed of the reflected margin which forms a cavity before, and is destitute of cells; dentiform process incurved, slender filliform; hinge-plate ovate triangular, with a short projecting angle on the interior middle, and sub-acute behind; within, disk slightly contracted by an elevated line corresponding with the external sulcus.—*Say*.

The *dorsal valve* in this genus is single. Common on the coast of South-Carolina, and fossil in the Post-Pleiocene.

PLATE IX. FIG. 3, *Natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

Genus, TEREDO.—LINN.

Sub. Genus, XYLOTRYA.—LEACH.

XYLOTRYA PALMULATA.

PLATE IX. FIG. 5.

Teredo palmulatus, *Lam.*, An. sans Vert., 2d Ed., Vol. 6, p. 38.Teredo palmulatus, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxii.Xylotrya palmulata, *Adams*, Gen. Recent Mollusca, Vol. 2, p. 333.

This shell, remarkable for perforating the bottom of ships, and known as the ship worm, is common in wood exposed to the waters of the bays and harbors along the coast. We have as yet found in the Post-Pleiocene only portions of the calcareous tubes with which their perforations are lined.

PLATE IX. FIG. 5, *Fragment of tube.*

LOCALITY. Artesian Well, Charleston.

Museum, College of Charleston.

 Class, GASTEROPODA. Order, PTEROPODA. Family, CAVOLINIDÆ.

Genus, CAVOLINA.—GIÖENI.

CAVOLINA TUOMEYI.—(*New Species.*)

PLATE IX. FIGS. 8 TO 8e.

DESCRIPTION. Shell somewhat globular, symmetrical, lateral fissures narrow, slightly curved, extending backwards into the short appendices; mouth large, but not so large as the cavity of shell, arched below, with a reflected lip; margin above irregular, waved; dorsal surface nearly as wide as it is long, radiately ribbed; ribs five, large, the two lateral ones almost obsolete, the three middle ones distinct, margins extending beyond that of the abdomen; apex slightly produced, tumid.

I believe this is the first fossil specimen of CAVOLINA (*Hyalæa*) that has been discovered

in the American Tertiary; as a memento of my late colleague, Professor Tuomey, who was present when I found this beautiful shell, I have given it his name.

PLATE IX. FIG. 8, *Shell, natural size.*

“ 8a, *A view of dorsal surface.*

“ 8b, *View of abdominal surface.*

“ 8c, *Side view, showing lateral fissures.*

“ 8d, *End view, showing mouth.*

“ 8e, *Apex.*

LOCALITY. Simmons'.

Cabinet F. S. H.

Genus, STROMBUS.

STROMBUS PUGILIS.

PLATE X. FIG. 1 AND 1a

Strombus pugilis, *Linn.*, *Syst. Nat.*, Ed. 12, p. 1209.

Strombus pugilis, *Kiener*, pl. 20.

Strombus pugilis, *Lam.*, *An. sans Vert.*, Vol. 9, p. 696.

Strombus pugilis, *Dillwyn's Cat.*, Vol. 2, p. 664.

DESCRIPTION. Shell ponderous, turbinated, ventricose, transversely spinous, base and spire striated, lip rounded at the projecting summit, deeply notched in front.

No longer an inhabitant of the Carolina coast, but common on that of Florida.

PLATE X. FIG. 1, *Shell, natural size.*

“ 1a, *Young shell.*

LOCALITY. Simmons' Bluff; St. Paul's.

Museum, College of Charleston.

Genus, MUREX.—LINN.

MUREX SPINACOSTATUS.—VALENC.

PLATE X. FIG. 2.

Murex spinacostatus, *Valenc.*

Murex asperimus, *Ravenel*, *Cat. Coll. Shells*, p. 15.

Murex —, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xx.

DESCRIPTION. Shell sub-ovate, thick, transversely striated; spire prominent, whorls

convex, with three or four continuous varices; varices spinous; aperture ovate, canal long, narrow, and slightly recurved.

Dead shells of this species often found upon the sea beaches, are supposed to belong to the marine Post-Pleiocene beds, as they are fossil in appearance, and we know of no living specimen having yet been discovered upon our coast.

PLATE X. FIG. 2.

Museum, College of Charleston; Cabinet F. S. H.

Genus, BURSA.

Sub. Genus, EUPLEURA.—H. & A. ADAMS.

E U P L E U R A C A U D A T A .

PLATE X. FIG. 3.

Ranella caudata, *Say*, Amn. Conch., pl. 48.

Ranella caudata, *Gould*, Invert. Mass., p. 297, fig. 204.

Ranella caudata, *De Kay*, Zool. New-York, Art. Mollusca, p. 139.

Ranella caudata, *Ravenel*, Cat. Coll. Shells, p. 15.

Ranella caudata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.

Apollon caudata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 142, pl. 28, fig. 3.

Eupleura Caudata, *Adams*, Gen. Recent Shells, Vol. 1, p. 107.

DESCRIPTION. Shell rhomboidal, thick, checkered with revolving lines and longitudinal ribs; canal long and straight, aperture ovate, outer lip thick, margin with raised granules and lines.—*T. & H.*

This shell is found all along the Atlantic coast from Buzzard's Bay to Florida, but it is more abundant at the South than the North.

PLATE X. FIG. 3, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

Genus, FASCIOLARIA.—LAM.

FASCIOLARIA GIGANTEA.

PLATE X. FIG. 4.

Fasciolaria gigantea, *Keiner*, pl. 10 and 11.Fasciolaria gigantea, *Lam.*, An. sans Vert., Vol. 9, p. 435.Fasciolaria gigantea, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.Fasciolaria gigantea, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 152, pl. 30, fig. 9.Fasciolaria gigantea, *Adams*, Gen. Recent Shells, Vol. 1, p. 150.

DESCRIPTION. Shell fusiform, ventricose, transversely sulcated; spire prominent, acute, coronated, tuberculated; aperture ovate, continuous with canal, which is open and *gracefully*, but *slightly* curved; columella with three plaits.

This shell lives upon the coast of South-Carolina, and attains a great size.

PLATE X. FIG. 4.

LOCALITY. Simmons' Bluff. *Museum, College of Charleston; Cabinet F. S. H.*

FASCIOLARIA DISTANS.

PLATE X. FIG. 5.

Fasciolaria distans, *Lam.*, An. sans Vert., Vol. 9, p. 433.Fasciolaria distans, *Kiener*, pl. 3.Fasciolaria distans, *Ravenel*, Cat. Coll. Shells, p. 14.Fasciolaria distans, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.Fasciolaria distans, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 151, pl. 30, figs. 7 and 8.

DESCRIPTION. Shell fusiform, ventricose, longitudinally and finely striated; whorls marked transversely by dark colored and widely separated bands; sutures simple; spire prominent, acute; pillar with one plait.—*T. & H.*

The dark bands are characteristic of this species; fossil specimens from the Post-Pleiocene retain these markings upon the surface.

It is common in a recent state upon the Southern coast.

PLATE X. FIG. 5.

LOCALITY. Simmon's. *Museum, College of Charleston; Cabinet F. S. H.*

Genus, CANCELLARIA.—LAM.

CANCELLARIA RETICULATA

PLATE X. FIG. 6.

Voluta reticulata, *Linn.*, *Syst. Nat.*, p. 1190.

Cancellaria reticulata, *Lam.*, *An. sans Vert.*, Vol. 9, p. 401.

Cancellaria reticulata, *Ravenel*, *Cat. Coll. Shells*, p. 14.

Cancellaria reticulata, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xx.

Cancellaria reticulata, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 142, pl. 28, fig. 16.

DESCRIPTION. Shell ovate, ventricose, thick; spire short, acute; whorls longitudinally and transversely grooved, obliquely reticulated; aperture sub-ovate, emarginated anteriorly, pointed at posterior extremity; labrum marked within with transverse ridges; columella straight, thick, obtuse, with strong oblique folds; pillar sub-umbilicated, suture distinct but compressed.—*T. & H.*

This species is found recent on the Southern coast.

PLATE X. FIG. 6.

LOCALITY. Simmons'; Wando. *Museum, College of Charleston; Cabinet F. S. H.*

CANCELLARIA VENUSTA.

PLATE X. FIG. 7.

Cancellaria venusta, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 144, pl. 23, fig. 18.

DESCRIPTION. Shell sub-fusiform, turrated, regularly cancellated; whorls with longitudinal, oblique ribs, sulcated transversely; inner lip reflexed on body whorl, smooth and with a distinct raised edge, extending from the base of the pillar and uniting above with the labrum in an arch; columella with two prominent folds slightly oblique; margin of outer lip scalloped, transversely ridged within with ten ridges; ridges equi-distant, straight, long; aperture profoundly ear-shaped, emarginate; suture profound.

This is the most graceful of all its congeners, and cannot be confounded with any other.—*T. & H.*

PLATE X. FIG. 7, *Natural size.*

LOCALITY. Simmons' Bluff. *Museum, College of Charleston; Cabinet F. S. H.*

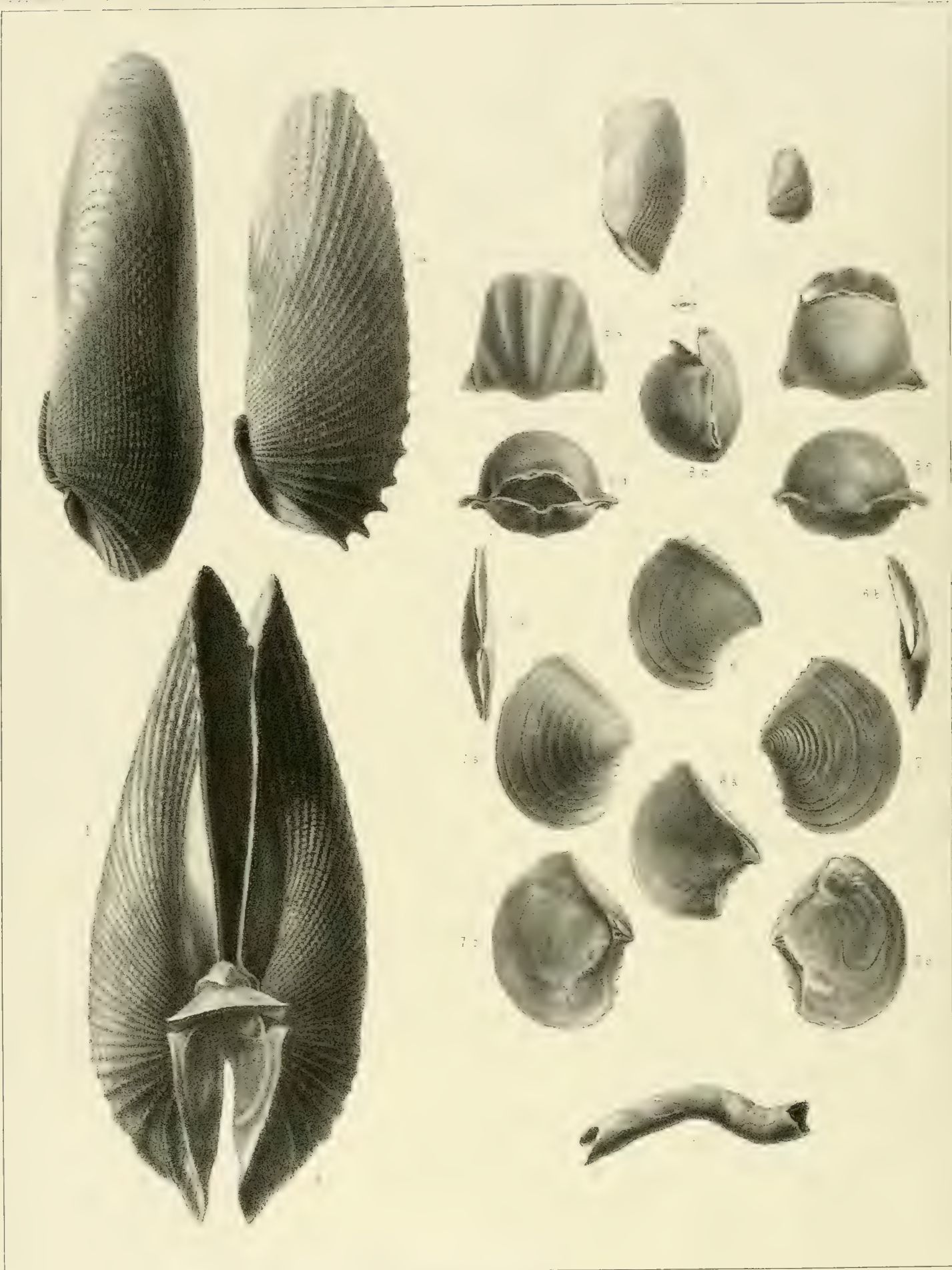


Illustration by J. D. Smith et al.
Proceedings of the U.S. Geol. Surv., vol. 1, p. 10, 1858.

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE IX.

PHOLADIDÆ.—TELLINIDÆ.—CAVOLINIDÆ.

PHOLADIDÆ.

FIG. 1. PHOLAS COSTATA. Side view. *Page 58.*

“ 1a. Back view to show accessory valves.

“ 2. DACTYLINA OBLONGATA. Side view. *Page 58.*

“ 3. MARTESIA CUNEIFORMIS. *Page 59.*

“ 4. PHOLAS TRUNCATA. *Page 57.*

“ 5. XYLOTRYA PALMULATA. Tube. *Page 60.*

TELLINIDÆ.

FIG. 6. TELLIDORA BURNETTII. A recent shell from California. *Page 48.*

“ 6a. Interior of the same.

“ 6b. Side view.

“ 7. TELLIDORA LUNULATA. Fossil. *Page 48.*

“ 7a. Exterior.

“ 7b. Interior.

“ 7c. Interior.

“ 6d. Side view.

CAVOLINIDÆ.

FIG. 8. CAVOLINA TUOMEYI. *Page 60.*

“ 8a. View from above.

“ 8b. View from below.

“ 8c. Side view.

“ 8d. Aperture.

“ 8e. End view.

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE X.

STROMBIDÆ.—MURICIDÆ.—TRITONIDÆ.—CANCELLARIIDÆ.

STROMBIDÆ.

- FIG. 1. STROMBUS PUGILIS. Natural Size. *Page 61.*
" 1a. Young Shell.

MURICIDÆ.

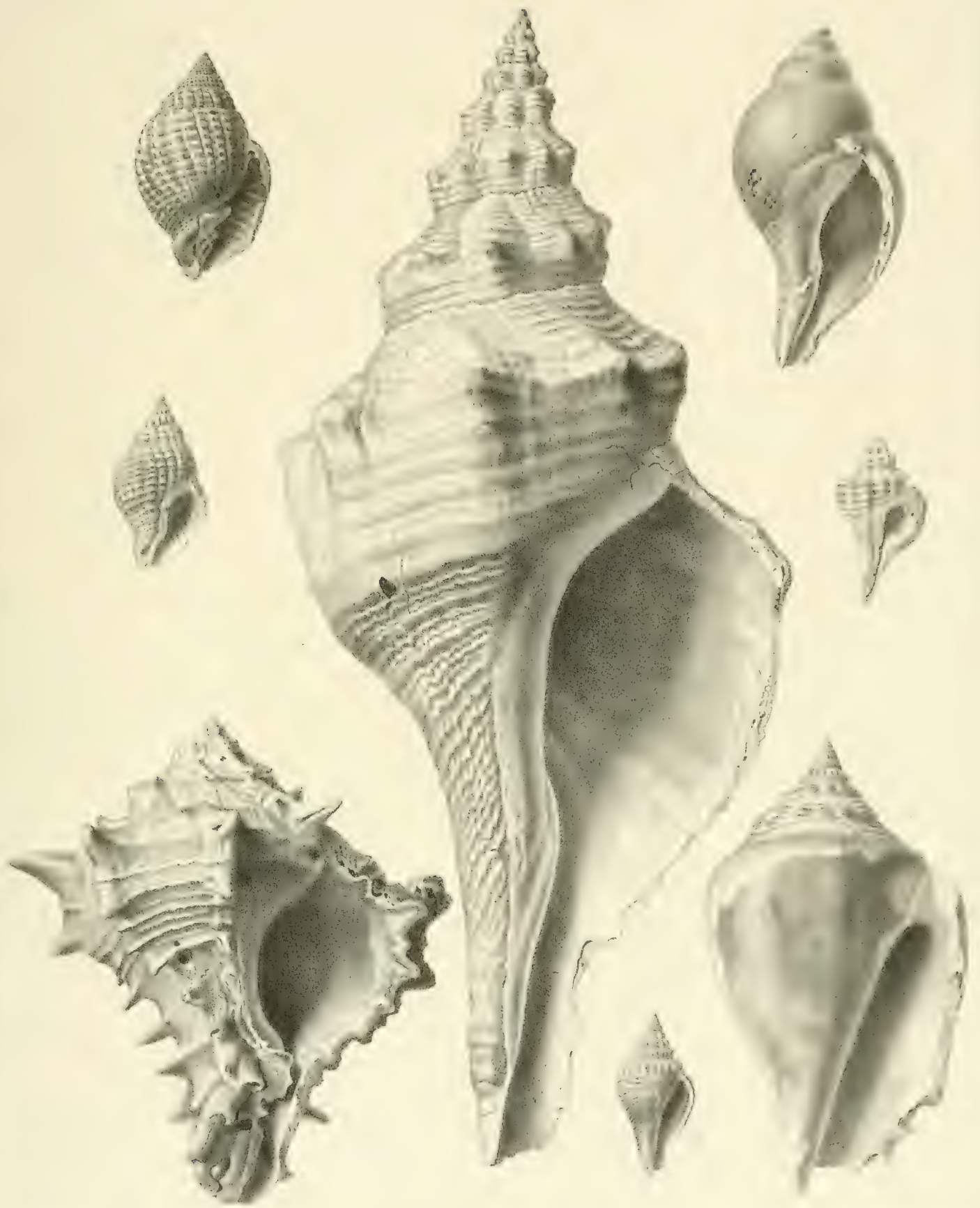
- FIG. 2. MUREX SPINACOSTATUS. *Page 61.*

TRITONIDÆ.

- FIG. 3. EUPLEURA CAUDATA. Natural size. *Page 62.*
" 4. FASCIOLARIA GIGANTEA. *Page 63.*
" 5. FASCIOLARIA DISTANS. *Page 63.*

CANCELLARIIDÆ.

- FIG. 6. CANCELLARIA RETICULATA. *Page 64.*
" 7. CANCELLARIA VENUSTA. *Page 64.*



BUSYCON.—BOLTON. (1798.)

FULGUR.—MONTF. (1810.)

BUSYCON CARICA.—CON.

PLATE XI. FIG. 1.

- Murex carica, *Gmel.*, Lister's Conch., pl. 880.
 Pyrula carica, *Lam.*, Ency. Méth., pl. 436, fig. 2.
 Pyrula carica, *Lam.*, Woods' Index, pl. 26, fig. 83.
 Pyrula auruana, *Lam.*, An. sans Vert., Vol. 7, p. 138.
 Pyrula carica, *Ravenel*, Cat. Coll. Shells, p. 14.
 Pyrula carica, *Adams*, Boston Jour. Nat. Hist., Vol. 2, p. 269.
 Pyrula carica, *Gould*, Invert. Mass., p. 296.
 Pyrula carica, *De Kay*, Zool. New-York, Art. Mollusca, p. 141, pl. ix, figs. 192, 193.
 Pyrula carica, *Stimpson*, Shells of New-England, p. 47.
 Pyrula carica, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.
 Fulgur carica, *Con.*, Pro. Acad. Nat. Sci., Vol. 7, p. 319.
 Fulgur carica, *Con.*, Cat. Shells Tert. Form., p. 2.
 Busycon carica, *Con.*, Pro. Acad. Nat. Sci., Vol. 8, p. 30.
 Busycon carica, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 145, pl. xxix, fig. 1.

DESCRIPTION. Shell pyriform, ventricose, thick, ponderous, transversely and finely striated; spire not turrated; suture not channeled, but having a series of triangular, compressed, tubercles above; larger ones around the prominent part of body whorl; outer lip simple, sharp; pillar lip flexuous, concave above.—*T. & H.*

This shell is found in the Meiocene of Maryland, and in the Pleiocene of North and South Carolina. Is common in a recent state on this Atlantic coast and often attains a great size.

PLATE XI. FIG. 1, *Natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

BUSYCON PERVERSUM.—CON.

PLATE XI. FIG. 2

- Buccinum ampullaceis ad sinistram convolutis, *Lister*, Conch., t. 907, 908.
 Pyrula perversa, *Lam.*, An. sans Vert., Vol. 9, p. 506.

Pyrula perversa, *Reeve*, *Conch. Icon.*, pl. 3, fig. 13.

Pyrula perversa, *Ravenel*, *Cat. Coll. Shells*, p. 15.

Pyrula perversa, *Wood*, *Index*, pl. 26, fig. 88.

Pyrula perversa, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xx.

Busycon perversum, *Con.*, *Pro. Acad. Nat. Sci.*, Vol. 7, p. 31.

Busycon perversum, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 145, pl. xxix, fig. 3.

Busycon perversum, *H. & A. Adams*, *Gen. Recent Mollusca*, Vol. 1., p. 151, pl. 16, fig. 2.

DESCRIPTION. Shell pear-shaped, sinistral, ventricose; summit of each whorl inclined; prominent part of whorl coronated, tuberculated; suture not canaliculated, but distinct.

B. PEVERSUM is common on the coast of South Carolina. The recent shells often have all the whorls coronated at their summits.

It is found in the Pleiocene of this State, and in the Post-Pleiocene of North-Carolina.

PLATE XI. FIG. 2, *Natural size*.

LOCALITY. Simmons'; Wadmalaw Sound.

Museum, College of Charleston; Cabinet F. S. H.

BUSYCON CANALICULATUM.—CON.

PLATE XI. FIG. 3.

Buccinum ampullaceum, *Lister*, *Conch.*, t. 878, fig. 2.

Murex canaliculatus, *Linn*, *Martini*, Vol. 3, p. 29, t. 67, figs. 742, 743.

Pyrula canaliculata, *Reeve*, *Conch. Icon.*, pl. 8, fig. 26.

Pyrula canaliculata, *Adams*, *Boston Jour. Nat. Hist.*, Vol. 2, p. 269.

Pyrula canaliculata, *Gould*, *Invert. Mass.*, p. 294, fig. 206.

Pyrula canaliculata, *Ravenel*, *Cat. Coll. Shells*, p. 14.

Pyrula canaliculata, *De Kay*, *Zool. New-York*, Art. Mollusca, p. 140, pl. ix, fig. 190.

Pyrula canaliculata, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xx.

Pyrula canaliculata, *Stimpson*, *Shells of New-England*, p. 47.

Fulgur canaliculatum, *Con.*, *Pro. Acad. Nat. Sci.*, Vol. 6, p. 319.

Busycon canaliculatum, *Con.*, *Pro. Acad. Nat. Sci.*, Vol. 7, p. 30.

Busycon canaliculatum, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 146, pl. xxix, fig. 2.

Busycon canaliculatum, *H. & A. Adams*, *Gen. Recent Mollusca*, Vol. 1, p. 151.

DESCRIPTION. Shell pear-shaped; whorls flattened on the summit, covered with revolving lines; body-whorl tumid, terminating in a long canal; angle of each whorl

nodular, suture deeply channeled. The nodular keel which crowns the summit of each whorl, and the deeply channeled suture will distinguish this species readily.—*T. & H.*

Common in a recent state on this coast, from Cape Cod, southward. Fossil in the Miocene of Maryland, and in the Post-Pleiocene of North and South Carolina. Only small specimens have as yet been discovered in the Carolina beds.

PLATE XI. FIG. 3, *Natural size.*

LOCALITY. Simmons'; Wadmalaw Sound.

Museum, College of Charleston; Cabinet F. S. H.

PYRULA. — LAM.

PYRULA PYRUM.—L. R. GIBBES.

PLATE XI. FIG. 4.

Bulla pyrum, *Dill*, *Cat.*, p. 485.

Buccinis ampullaceis tenuibus, *Lister*, *Conch.*, t. 877.

Pyrula spirata, *Lam.*, *An. sans Vert.*, Vol. 9, p. 512.

Fulgur pyruloides, *Say*, *Ann. Conch.*, pl. 19.

Fulgur pyruloides, *Say*, *Conch. United States*, ed. *Binney*, p. 80.

Pyrula pyruloides, *Ravenel*, *Cat. Coll. Shells*, p. 15.

Pyrula spirata, *Reeve*, *Conch. Icon.*, pl. 8, fig. 27.

Pyrula spirata, *De Kay*, *Zool. New-York*, Art. *Mollusca*, p. 142, pl. viii, figs. 180, 181.

Fulgur pyrum, *Con.*, *Pro. Acad. Nat. Sci.*, Vol. 6, p. 319.

Fulgur pyruloides, *Say*, *Jour. Acad. Nat. Sci.*, Vol. 2, p. 237.

Pyrula pyrum, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xx.

Cassidulus pyrum, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 148, pl. xxx, fig. 2.

DESCRIPTION. Shell pear-shaped, thick, spirally striated, flattened above, unarmed; striæ alternately larger; suture canaliculate; spire short, exserted.

Large specimens of this shell common on the southern coast; we have found only one specimen in the Post-Pleiocene of South-Carolina.

PLATE XI. FIG. 4, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

FUSUS.—LAMK.

FUSUS CINEREUS.—SAY.

PLATE XI. FIG. 5.

Fusus cinereus, Say, Jour. Acad. Nat. Sci., Vol. 2, p. 236.

Fusus cinereus, Say, Amn. Conch. iii, pl. 29.

Fusus cinereus, Say, Conch. U. S., ed. Binney, pp. 79, 184.

Fusus cinereus, Conrad, Foss. Shells Tert. Form., p. 19, tab. 4, fig. 3.

Fusus cinereus, Ravenel, Cat. Coll. Shells, p. 14.

Fusus cinereus, De Kay, Zool. New-York, Art. Mollusca, p. 145, pl. viii, figs. 184, A. B.

Fusus cinereus, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xx.

Buccinum plicosum, Gould, Invert. Mass., p. 303, fig. 213.

Buccinum plicosum, Stimp., Shells of New-England, p. 46.

Colus cinereus, Tuomey & Holmes, Pleiocene Foss. So. Ca., p. 150, pl. xxx, fig. 6.

DESCRIPTION. Shell fusiform, cancellate, transversely costate; costæ robust; revolving lines filiform, irregular, alternately smaller; labrum acute, crenated within, and alternating with the raised lines; beak short, obtuse.—*T. & H.*

Common on the shores of the Atlantic States. Fossil in the Pleiocene of South-Carolina, and in the Miocene of Virginia.

PLATE XI. FIG. 5.

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

FUSUS MINOR.—(*New Species.*)

PLATE XI. FIGS. 6, 6a.

DESCRIPTION. Shell minute, fusiform, costate, striate; spire conical, elevated, smooth and polished near the apex; costæ prominent, smooth, round; sutures impressed; striæ distinct between the ribs; base transversely striated, not costated.

PLATE XI. FIG. 6, *Shell, natural size.*

“ 6a, *Magnified view.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

FUSUS CONUS.—(*New Species.*)

PLATE XI. FIGS. 7, 7a, 8, 8a.

DESCRIPTION. Shell conical, costate, striate; costæ, nodulous below the sutures, straight; striæ four on the middle whorls, the upper deeply impressed across the ribs, the intervening are faint; the spire is smooth and polished near the apex; base without ribs, but deeply impressed with transverse, waved, striæ; the whorls are flattened; sutures distinct; aperture semilunar; beaks short, obtuse.

PLATE XI. FIG. 7, *Natural size.*“ 7a, *Magnified view.*“ 8, *Variety of the same.*“ 8a, *Magnified.*

LOCALITY. John's Island.

*Museum, College of Charleston.*FUSUS FILIFORMIS.—(*New Species.*)

PLATE XI. FIG. 9.

DESCRIPTION. Shell fusiform, costate, transversely striate; costæ, smooth, somewhat nodulous at the periphery of the middle whorls; the third whorl cancellate; apex smooth; base without ribs; striæ transverse, numerous, slightly waved, filiform.

In general outline this little shell resembles the young of *F. CINEREOUS*, *Say*, but the smooth ribs, nodulous and angulated periphery of the middle whorls, and beautiful filiform striæ, readily distinguish it from that species.

PLATE XI. FIG. 9, *Shell natural size.*“ 9a, *Magnified view of same.*

LOCALITY. Simmons'.

*Museum, College of Charleston; Cabinet F. S. H.*FUSUS BULLATA.—(*New Species.*)

PLATE XI. FIGS. 10, 10a.

DESCRIPTION. Shell sub-oval, ventricose, costate, spirally grooved, tuberculated; spire short, turreted, smooth at apex; aperture large, terminating in a short recurved canal; outer

lip acute, undulated; the deep spiral grooves across the ribs of the middle-whorls give the shell a tuberculated character; the ribs do not extend below the middle of the body-whorl; aperture semilunar; beak short, slightly recurved; canal wide.

PLATE XI. FIG. 10, *Shell, natural size.*
10a, *Magnified view.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

FUSUS RUDIS.—(*New Species.*)

PLATE XI. FIGS. 11, 11a.

DESCRIPTION. Shell minute, costate; whorls angular, spirally grooved, and with about ten prominent and widely separated longitudinal ribs, which are widest at the periphery of the whorl, and gradually contracting above and below. The spiral grooves, which are interrupted by the ribs, are sufficiently characteristic of this little shell.

PLATE XI. FIG. 11, *Natural size.*
" 11a, *Magnified.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

T E R E B R A . — L A M .

T E R E B R A D I S L O C A T A . — D E K A Y .

PLATE XI. FIG. 12.

Cerithium dislocatum, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 235.

Cerithium dislocatum, *Say*, Conch. United States, ed. *Binney*, p. 79.

Cerithium dislocatum, *Ravenel*, Cat. Coll. Shells, p. 14.

Terebra dislocata, *De Kay*, Zool. New-York, Art. Mollusca, p. 152.

Terebra dislocata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.

Acus dislocatum, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 125, pl. xxvi, fig. 16.

Terebra Carolinensis, *Con.*, Sill. Jour., Vol. 4, p. 345.

DESCRIPTION. Shell subulate, attenuated; whorls with numerous minute revolving impressed lines, and prominent transverse ribs; near the summit of each whorl the

transverse ribs are dislocated by a revolving line deeply impressed, which divides them into two series, the superior being shorter and thicker than the inferior.—*T. & H.*

Recent on this coast, from Maryland to Florida; fossil in the Pleiocene of South-Carolina and Meiocene of Virginia.

PLATE XI. FIG. 12, *Natural size.*

Museum, College of Charleston; Cabinet F. S. H.

BUCCINUM.—LINN.

BUCCINUM OBSOLETUM.—ADAMS.

PLATE XII. FIG. 1.

Nassa obsoleta, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 232.

Nassa obsoleta, *Say*, Conch. U. S., ed. *Binney*, p. 77.

Buccinum Nov.-Eboracensis, *Wood*, Index Suppt., pl. 4, fig. 26.

Buccinum oliviforme, *Kiener*, Inconog., pl. 25, fig. 99.

Nassa obsoletum, *Ravenel*, Cat. Coll. Shells, p. 17.

Buccinum obsoletum, *Adams*, Boston Jour. Nat. Hist., Vol. 2, p. 267.

Buccinum obsoletum, *Gould*, Invert Mass., p. 308, fig. 210.

Buccinum obsoletum, *De Kay*, Zool. New-York, Art. Moll., p. 133, pl. viii, figs. 163, 164.

Nassa obsoleta, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.

Nassa obsoleta, *Stimpson*, Shells of New-England, p. 45.

Tritia obsoleta, *H. & A. Adams*, Gen. Moll., Vol. 1, p. 122.

Buccinum obsoletum, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 135, pl. xviii, fig. 5.

DESCRIPTION. Shell ovate, surface covered with a net-work of lines which gives it a granulated appearance; spire shorter than the body; labrum with a few elevated lines which are interrupted, and do not extend to the margin of the lip; lip simple and sharp; pillar covered with a broad callus.—*T. & H.*

This is a most abundant shell along the whole coast of the Atlantic shore, and is found fossil in the Post-Pleiocene in great numbers. We have obtained it also from the Pleiocene beds of South-Carolina.

PLATE XII. FIG. 1, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

BUCCINUM TRIVITTATUM.—ADAMS.

PLATE XII. FIG. 2.

- Nassa trivittata*, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 231.
Nassa trivittata, *Say*, Conch. U. S., ed. *Binney*, p. 77.
Nassa trivittata, *Ravenel*, Cat. Coll. Shells, p. 17.
Buccinum trivittatum, *Adams*, Boston Jour. Nat. Hist., Vol. 2, p. 265.
Buccinum trivittatum, *Gould*, Invert. of Mass., p. 309.
Buccinum trivittatum, *De Kay*, Zool. New-York, Art. Mollusca, p. 132, pl. viii, fig. 165.
Nassa trivittata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.
Nassa trivittata, *Stimpson*, Shells of New-England, p. 45.
Buccinum trivittata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 135, pl. xxviii, fig. 4.
Tritia trivittata, *H. & A. Adams*, Gen. Mollusca, p. 122.

DESCRIPTION. Shell ovate-conic, cancellate; the surface presenting a net-work of decussating lines; lip with two or three teeth or raised lines within; apex acute.

This species, like *B. VIBEX*, when found on the north-eastern shores of the United States, has usually a chalky aspect, and we have no doubt is from the fossil sub-marine beds of the Post-Pleiocene; in advancing southwards it is more abundant, and living specimens can be had in quantity on the southern coast.—*T. & H.*

It is not uncommon in the Pleiocene beds of South-Carolina, but abundant in the Post-Pleiocene.

PLATE XII. FIG. 2, *Natural size.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

BUCCINUM ACUTUM.—DE KAY.

PLATE XII. FIG. 3.

- Nassa acuta*, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 234.
Nassa acuta, *Say*, Amn. Conch. vi; pl. 5, fig. 3.
Nassæ acute, *Say*, Conch. U. S., ed. *Binney*, pp. 78, 216, pl. 57, fig. 3.
Buccinum acutum, *De Kay*, Zool. New-York, Art. Mollusca, p. 434.

DESCRIPTION. Shell conic-acute, whitish, cancellated so as to appear granulated; granules prominent, somewhat transverse, inequidistant, the transverse grooves being more profound and dilated than the spiral ones, which are six in number; spire longer than body-

whorl, slender towards the tip, acute; suture impressed, but not profoundly; beak distinguished by a depression from the body whorl, and slightly reflected; labrum incrassated, and with elevated lines upon the fauces, which do not attain the edge of the lip.—*Say*.

This species is readily distinguished by the incrassated outer lip.

It is very abundant in the Post-Pleiocene beds, and is recent on the Carolina and Georgia shores.

PLATE XII. FIG. 3.

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

COLUMBELLA.—LAM.

COLUMBELLA AVARA.—SAY.

PLATE XII. FIG. 4.

Columbella avara, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 230.

Columbella avara, *Ravenel*, Cat. Coll. Shells, p. 17.

Columbella avara, *L. R. Gibbes*, 'Tuomey's Geol. So. Ca., appendix, p. xx.

Columbella avara, *Adams*, Boston Jour. Nat. Hist., Vol. 2, p. 363.

Columbella avara, *Gould*, Invert. Mass., p. 313, fig. 197.

Columbella avara, *DeKay*, Zool. New-York, Art. Mollusca, p. 139, pl. viii, fig. 179.

Columbella avara, *Stimpson*, Shells of New-England, p. 48.

Columbella avara, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 139, pl. xxviii, fig. 12.

Astyris avara, *H. & A. Adams*, Gen. Mollusca, p. 187.

DESCRIPTION. Shell small, elongated-ovate; spire pointed, elevated; whorls with spiral impressed lines, and transverse elevated ribs; ribs on body-whorl terminate about the middle; spiral lines on the base distinct; labrum denticulated within; columellar lip with a distinct plate crenated on sub-margin; suture distinct; aperture about one-third the length of the shell.

This is an abundant species in the Post-Pleiocene beds, and common in a recent state on the Atlantic sea-shores, from Massachusetts southward.

PLATE XII. FIG. 4, *Natural size*.

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

COLUMBELLA ORNATA.—RAVENEL.

PLATE XII. FIGS. 6, 6a.

Columbella ornata, *Ravenel*, Proc. Elliott Society, Vol. 1, p. 281.

DESCRIPTION. "Shell small, dirty white, ovate conic; whorls six or seven—in mature species seven can be distinguished—nearly flat, with longitudinal ribs extending almost to the apex; revolving lines interrupted at the ribs, except near the base, where the ribs become obsolete, and the revolving lines are uninterrupted and more decided than elsewhere; suture distinct, with the revolving line next below it more deeply impressed than the others; aperture nearly half the length of the shell, narrow, with a rather deep sinus at its posterior angle, ending in a short canal in front; outer lip thickened and smooth on the outside, being free from the ribs and lines of the whorls, within strongly toothed; pillar covered with smooth callus, the outer edge of which is elevated and sharp; length one-fifth inch."—*E. Ravenel*.

The numerous distinct longitudinal ribs readily distinguish this beautiful little species; it is the most abundant of all the univalves of the Post-Pleiocene beds in South-Carolina.

PLATE XII. FIG. 6, *Natural size.*" 6a, *Magnified.*

LOCALITY. Simmons'; Cainhoy; Waccamaw.

Museum, College of Charleston; Cabinets Dr. Ravenel and F. S. H.

COLUMBELLA LUNATA.—L. R. GIBBES.

PLATE XII. FIGS. 5, 5a.

Nassa lunata, *Say*, Jour. Acad. Nat. Sci., Vol. 5, p. 213.Buccinum lunatum, *Adams*, Boston Jour. Nat. Hist., Vol. 2, p. 266.Buccinum lunatum, *Gould*, Invert. Mass., p. 312, fig 196.Buccinum lunatum, *De Kay*, Zool. New-York, Art. Mollusca, p. 131, pl. vii, fig. 162.Columbella lunata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.Columbella lunata, *Stimpson*, Shells of New-England, p. 48.Nassa lunata, *Say*, Conch. United States, ed. *Binney*, p. 122.Columbella spirantha, *Ravenel*, Proc. Elliott Society, Vol. 1, p. 281.

DESCRIPTION. Shell about six volutions; whorls with two revolving lines of dilated,

sublunate, whitish spots and sometimes a third at the base; suture not deeply impressed; labrum dentate on the inner sub-margin, the superior teeth more prominent; labrum with the plate not thickened.

This is a common but variable shell, from Cape Cod southward. In the Post-Pleiocene it is often found with the spots well preserved.

Professor Adams, in his "*Observations on the Marine Shells of Massachusetts*," remarks: "The coloring in this species varies much in different individuals. Some are of a uniform, very deep brownish-red, and others are of a paler shade of the same color; but the arrangement of colors described in the Journal of the Academy (by Say) is a type of which most of the varieties are modifications. The sub-lunate whitish spots are so much enlarged as to constitute the ground color of the shell, being separated only by narrow, undulate longitudinal lines of brown, while the revolving stripes of brown which usually separate them into two or three series are wanting."

PLATE XII. FIG. 5, *Natural size.*

" 5a, *Magnified.*

LOCALITY. Simmons'; Stono River; Cainhoy.

Museum, College of Charleston; Cabinet F. S. H.

STREPHONA.—BROWNE. (1756.)

OLIVA.—LAM. (1801.)

STREPHONA LITERATA.—TUOMEY & HOLMES

PLATE XII. FIG. 7.

Oliva literata, Lam., Anim. sans Vert., Vol. 10, p. 614.

Oliva literata, Say, Amn. Conch., pl. 3.

Oliva literata, Say, Conch. United States, ed. Binney, p. 152, pl. 3.

Oliva literata, Ravenel, Cat. Coll. Shells, p. 19.

Oliva literata, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxi.

Oliva literata, De Kay, Zool. New-York, Art. Mollusca, p. 152, pl. 7, fig. 157.

Strephona literata, Tuomey & Holmes, Pleiocene Foss. So. Ca., p. 140, pl. xxviii, fig. 13.

Utriculina literata, H. & A. Adams, Gen. Mollusca, Vol. 1, p. 141.

DESCRIPTION. Shell cylindrical, thick, smooth; spire exerted, acute; whorls angular, carinated at the superior margins; suture deeply grooved; labrum acute, simple, smooth; labium sometimes with many oblique folds; aperture linear, incised above, emarginate

below; color yellowish-white ground, with rufous, angulated lines, and zigzag marks upon the surface, and revolving bands of light color.

This is a common shell in the Post-Pleiocene, and many specimens retain their colors and polish. The folds upon the inner lip are of an inconsistent character. We find them more or less developed in different specimens; some are perfectly smooth and simple on the columellar, as on the labrum.

PLATE XII. FIG. 7, *Natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

OLIVA.—LAM.

OLIVA MUTICA.—SAY.

PLATE XII. FIG. 8.

Oliva mutica, Say, Jour. Acad. Nat. Sci., Vol. 2, p. 228.

Oliva mutica, Ravenel, Cat. Coll. Shells, p. 19.

Oliva mutica, De Kay, Zool. New-York, Art. Mollusca, p. 152.

Oliva mutica, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xxi.

Dactylidia mutica, H. & A. Adams, Gen. Mollusca, Vol. 1, p. 146.

Oliva mutica, Say, Conch. U. S., ed. Binney, p. 75.

DESCRIPTION. Shell sub-oval, white or yellowish-white; body-whorl with about three revolving, maculated bands of pale rufous, of which the superior one is continued upon the spire, the intermediate one is dilated, so as to be sometimes confluent with the inferior one, which is narrowest; spire short; suture very narrow; columella destitute of striæ.—Say.

This shell, though abundant in the Post-Pleiocene beds, seldom retains the colored markings upon the surface. It is common in the recent state on the southern coast.

PLATE XII. FIG. 8, *Natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

PLEUROTOMA CERINUM.—KURTZ & STIMPSON.

PLATE XII. FIGS. 9, 9a.

Pleurotoma cerinum, *Kurtz & Stimpson*, Bost. Proc. Nat. Hist., Oct., 1851.Pleurotoma cerinum, *Stimpson*, Shells of New-England, p. 49, pl. ii, fig. 2.

DESCRIPTION. Shell small, fusiform, turreted, with about ten longitudinal folds, and numerous transverse striæ; aperture oblong; labrum simple.

This shell has been found as far north as New-Bedford harbor. It is common on the Carolina coast, and abundant in the Post-Pleiocene beds.

PLATE XII. FIG. 9, *Natural size.*“ 9a, *Magnified.*

LOCALITY. Simmons'; Cainhoy; Waccamaw.

Museum, College of Charleston; Cabinet F. S. H.

VOLUTOMITRA.—GRAY.

VOLUTOMITRA WANDOENSIS.—(*New Species.*)

PLATE XII. FIGS. 10, 10a.

DESCRIPTION. Shell small, sub-fusiform, ventricose; spire much longer than the aperture, papillary; whorls flattened, impressed with numerous transverse dotted grooves which become obsolete below the sutures; sutures distinct; aperture ear-shaped, contracted posteriorly; labrum thin, simple, arcuated; columellar with three oblique plaits.

We are indebted to Dr. Edward Ravenel of St. Thomas, Cooper River, for this specimen, which he discovered in the Post-Pleiocene marl of Wando river. We have named it after this beautiful stream.

Only one specimen yet found.

PLATE XII. FIG. 10, *Natural size.*“ 10a, *Magnified.**Cabinet of Dr. E. Ravenel.*

PORCELLANA.—ADAMS. (1757.)
MARGINELLA.—LAM. (1801.)

PORCELLANA LIMATULA.—CON.

PLATE XII. FIG. 12.

Marginella limatula, *Con.*, Jour. Acad. Nat. Sci., Vol. 7, p. 140.

Marginella limatula, *d'Orbigny*, Prodrome de Paléontologie, Vol. 3, p. 51.

Porcellana limatula, *Con.*, Proc. Acad. Nat. Sci., Vol. 7, p. 31.

Porcellana limatula, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 130, pl. xxvii, figs. 10, 11.

DESCRIPTION. Shell ovate, polished; spire very short; labrum denticulated on the inner margin; margin swelling in the centre; aperture contracted above; columellar with four oblique elevated plaits.—*T. & H.*

This is a common shell in the Post-Pleiocene beds of South-Carolina; it differs from the Pleiocene forms in having a more elevated spire; the columellar has sometimes but three plaits, though four is not uncommon.

PLATE XII. FIG. 12, *Natural size.*

LOCALITY. Simmons'; John's Island.

Museum, College of Charleston; Cabinet F. S. H.

VOLVARIA.—LAM.

VOLVARIA CANALICULATA.—SAY.

PLATE XII. FIGS. 11, 11a.

Volvaria canaliculata, *Say*, Jour. Acad. Nat. Sci., Vol. 5, p. 211.

Volvaria canaliculata, *Say*, Conch. U. S., ed. *Binney*, p. 121.

Bullina canaliculata, *Say*, Amn. Conch., pl. 39.

Bullina canaliculata, *Say*, Conch. U. S., ed. *Binney*, p. 193.

Volvaria canaliculata, *Ravenel*, Cat. Coll. Shells, p. 18.

Bulla canaliculata, *Gould*, Invert. Mass., p. 166, fig. 97.

Bulla obstricta, *Gould*, Invert. Mass., p. 167, fig. 96.

Bulla canaliculata, *De Kay*, Zool. New-York, Art. Mollusca, p. 19, pl. xxv, fig. 328.

Bulla canaliculata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.

Bulla canaliculata, *Stimpson*, Shells of New-England, p. 50.

Tornatina cylindrica, *Emmons*, North-Carolina Geol. Survey, 1858, p. 272.

DESCRIPTION. Shell nearly cylindrical, white, with faint lines of growth, or obsolete wrinkles; spire slightly elevated, mammillated at apex; volution about five, summit of each with a shallow obtuse groove; aperture elongated, narrowed above; labrum thin, arcuated, inner lip with a thin plate of enamel, and an oblique fold near the base; base widely and regularly rounded.

This shell is recent upon the coast from Massachusetts southward, and very abundant in the Post-Pleiocene; from one locality we have collected several thousand specimens. Dr. Gould's *OBSTRACTA* is to our mind only a variety of *CANALICULATA*, the elevated spire is by no means uncommon.

PLATE XII. FIG. 11, *Natural size.*

“ 11a, *Magnified.*

LOCALITY. Simmons'; John's Island.

Museum, College of Charleston; Cabinet F. S. H.

VOLVA.—BOLTON.

VOLVA ACICULARIS.—H. & A. ADAMS.

PLATE XII. FIG. 13.

Ovula acicularis, *Lam.*, Wood's Index, pl. xviii, fig. 7.

Ovula acicularis, *Ravenel*, Cat. Coll. Shells, p. 18.

Ovula acicularis, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xxi.

Volva acicularis, *H. & A. Adams*, Gen. Mollusca, Vol. 1, p. 272.

DESCRIPTION. Shell fusiform, ventricose, smooth, convolute, extremities prolonged into channeled beaks; labrum thickened the entire length; columellar smooth, but with a thickened ridge or longitudinal fold, which is most prominent below the inflated part of the whorl; aperture semi-lunar.

PLATE XII. FIG. 13.

LOCALITY. Simmons'; Charleston.

Museum, College of Charleston; Cabinet F. S. H.

NATICA.—LAM.

NATICA DUPLICATA.—SAY.

PLATE XII. FIG. 14.

- Natica duplicata*, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 247.
Natica duplicata, *Gould*, Invert. Mass., p. 236, fig. 163.
Natica duplicata, *Ravenel*, Cat. Coll. Shells, p. 12.
Natica duplicata, *De Kay*, Zool. New York, Art. Mollusca, p. 121, pl. vii, fig. 147.
Natica duplicata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.
Natica duplicata, *Stimpson*, Shells of New-England, p. 43.
Natica duplicata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 114, pl. xxv, fig. 16.
Natica duplicata, *Say*, Conch. U. S., ed. *Binney*, p. 85.
Lunatia duplicata, *H. & A. Adams*, Gen. Moll., Vol. 1, p. 207.

DESCRIPTION. Shell solid, conical-ovate; umbilicus irregular, deeply grooved, and partially or entirely covered with a callus; aperture ovate, oblique.

This is an abundant species, but variable in shape; in some specimens the spire is more elevated than in others. In a recent state it is common along the Atlantic shores of the United States, south of Nantucket.—*T. & H.*

PLATE XII. FIG. 14, *Natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

NATICA PUSILLA.—SAY.

PLATE XII. FIGS. 15, 15a.

- Natica pusilla*, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 257.
Natica pusilla, *Gould*, Invert. Mass., p. 237, fig. 166.
Natica pusilla, *De Kay*, Zool. New-York, Art. Mollusca, p. 123, pl. vii, fig. 145.
Natica pusilla, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.
Natica pusilla, *Stimpson*, Shells of New-England, p. 43.
Lunatia pusilla, *H. & A. Adams*, Gen. of Mollusca, Vol. 1, p. 207.
Natica pusilla, *Say*, Conch. United States, ed. *Binney*, p. 87.

DESCRIPTION. Shell small, about half inch in length, sub-oval, marked with longitudinal

zigzag lines; sometimes white, without lines; umbilicus nearly closed by lateral pressure of callus, which is white. The fossil specimens are nearly all white, and the shell thick and strong.

It is recent upon the coast from Massachusetts southward.

PLATE XII. FIG. 15, *Natural size.*

“ 15a, *Magnified view.*

LOCALITY. Simmons’.

Museum, College of Charleston; Cabinet F. S. H.

CATINUS.—KLEIN.

CATINUS PERSPECTIVUS.—H. & A. ADAMS.

PLATE XII. FIG. 16.

Sigaretus perspectivus, *Say*, *Amn. Conch.*, pl. 25.

Sigaretus perspectivus, *Say*, *Conch. U. S.*, ed. *Binney*, pp. 175 and 205.

Cryptostoma perspectiva, *Say*, *Amn. Conch.*, iii, pl. 25.

Cryptostoma perspectiva, *Say*, *Conch. U. S.*, ed. *Binney*, pp. 175 and 205.

Calyptostoma perspectiva, *De Kay*, *Zool. New-York, Art. Moll.*, p. 153, pl. vii, fig. 156.

Sigaretus perspectivus, *Ravenel*, *Cat. Coll. Shells*, p. 12.

Sigaretus perspectivus, *L. R. Gibbes*, *Tuomey’s Geol. So. Ca.*, appendix, p. xx.

Catinus perspectivus, *H. & A. Adams*, *Gen. Mollusca*, Vol. 1, p. 212.

DESCRIPTION. Shell oval, very much depressed, but little convex, with numerous transverse, slightly undulated, sub-equidistant, impressed lines and longitudinal wrinkles; transverse lines obsolete beneath; spire not at all prominent, only a little convex; volutions about three; suture a simple, impressed line; within, the slightly elevated line is more or less obvious, not reaching the margin of the labrum; revolution of the whorls visible almost to the summit.

This shell is recent from the coast of New-Jersey southward, and abundant on the coast of South-Carolina.

PLATE XII. FIG. 16, *Natural size.*

LOCALITY. Simmons’.

Museum, College of Charleston; Cabinet F. S. H.

TURBONILLA.—Risso.

This genus comprises a great number of small and extremely beautiful shells which have the whorls longitudinally ribbed or cancellated, and the inner lip simple and toothless.—*H. & A. Adams.*

TURBONILLA SPEIRA

PLATE XIII. FIG. 1, 1a

Chemnitzia speira, *Ravenel*, Proc. Elliott Society Nat. Hist., Vol. 1, p. 280.

DESCRIPTION. "Shell turreted, very slender and pointed, glossy white; whorls ten, nearly flat, reticulated with numerous ribs and interrupted revolving lines; suture well defined, with a distinct, impressed, revolving line a little below it, leaving a raised space like a crimped fillet, wrapped around the shell; aperture about a sixth the length of the shell, ovate, with the posterior angle sharp."—*E. Ravenel.*

Our specimen, from which the figure is drawn, has the apex broken off.

PLATE XIII. FIG. 1, *Natural size.*

" 1a, *Magnified.*

LOCALITY. Cainhoy; Simmons'; Wadmalaw.

Museum, College of Charleston; Cabinets Dr. Ravenel and F. S. H.

TURBONILLA EXARATA.

PLATE XIII. FIGS. 2, 2a, 2b.

Pasithea exarata, *H. C. Lea*, Trans. Phil. So. Phila., Vol. ix, p. 25.

Pasithea exarata, *Lea*, New Foss. Shells, Ter. of Virginia, p. 25, pl. 35, fig. 44.

Chemnitzia exarata, *d'Orb.*, Prod. de Paléontologie, Vol. 3, p. 33.

DESCRIPTION. Shell subulate acuminate, thick, imperforate, shining, costate; spire attenuate, mammillate, smooth at apex; sutures deep, excavated; whorls fifteen, flattened, with numerous flat, obliquely longitudinal ribs; last whorl angulate; base smooth, polished; mouth small, sub-quadrangle, somewhat effuse.—*H. C. Lea.*

The above is Mr. Lea's description, to which we may be permitted to add what to us seems a very important character: *grooves between the ribs smooth and deep, not extending quite to the sutures.*

This is a very abundant shell in the Post-Pleocene of South-Carolina. Mr. Lea's specimen was obtained by Professor Tuomey from the Miocene of Virginia. It is also living on the Southern coast.

PLATE XIII. FIG. 2, *Shell, natural size.*
 " 2a, *Magnified view of same.*
 " 2b, *Magnified ribs and groove.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

TURBONILLA NIVEA.—H. & A. ADAMS.

PLATE XIII. FIGS. 3, 3a, 3b.

Chemnitzia nivea, *Stimpson*, Pro. Boston N. H. Society, Vol. 4, p. 114.
Chemnitzia nivea, *Stimpson*, Shells of New-England, p. 40.
Turbonilla nivea, *H. & A. Adams*, Gen. Mollusca, Vol. 1, p. 231.

DESCRIPTION. This shell differs from *T. EXARATA* in having the grooves and ribs straight and not obliquely longitudinal.

Mr. Stimpson dredged it at the mouth of the Bay of Fundy in fifty fathoms; it is living on the Carolina and Georgia sea shores, and very abundant as a fossil in the Post-Pleocene beds.

PLATE XIII. FIG. 3, *Natural size.*
 " 3a, *Magnified view.*
 " 3b, *Ribs and groove magnified.*

LOCALITY. John's Island; Cainhoy; Simmons'.

Museum, College of Charleston.

TURBONILLA INTERRUPTA.—H. & A. ADAMS.

PLATE XIII. FIGS. 4, 4a, 4b.

Turritella interrupta, *Totten*, Silliman's Jour. Sci., Vol. xxviii, p. 352, fig. 7.
Turritella interrupta, *C. B. Adams*, Boston Jour. Nat. Hist., Vol. ii, p. 275.

Chemnitzia interrupta, *Gould*, *Invert. of Mass.*, p. 268, fig. 173.

Chemnitzia interrupta, *Stimpson*, *Boston So. Nat. Hist., Proceed.*, Vol. 4, p. 16.

Chemnitzia interrupta, *Stimpson*, *Shells of New-England*, p. 41.

Turbonilla interrupta, *H. & A. Adams*, *Gen. Mollusca*, Vol. i, p. 231.

DESCRIPTION. There is only a slight difference in this shell from the two first named species, *T. EXARATA*, and *T. NIVEA*, (page 83.) Like the last named, the ribs are straight, but more numerous, and the grooves are crossed by about fourteen fine revolving lines, which are interrupted by the ribs; in some specimens the lines appear to be in pairs when seen through a lens.

PLATE XIII. FIG. 4, *Natural size.*

“ 4a, *Magnified.*

“ 4b, *Magnified rib and groove.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

TURBONILLA CANCELLATA.—(*New Species.*)

PLATE XIII. FIGS. 6, 6a, 6b.

DESCRIPTION. The whorls of this species are more inflated than any of the foregoing; the sutures are deeper and angular, and the grooves are crossed by four lines, one equidistant from the sutures, and a pair in the middle. To the unassisted eye the shell appears beautifully cancellated.

PLATE XIII. FIG. 6, *Natural size.*

“ 6a, *Magnified.*

“ 6b, *Magnified ribs, grooves, and revolving lines.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

TURBONILLA QUINQUE-STRIATA.—(*New Species.*)

PLATE XIII. FIG. 5, 5a, 5b.

DESCRIPTION. Shell same as *T. NIVEA*; but having only five revolving lines across the grooves, the superior one single and the others in pairs.

PLATE XIII. FIG. 5, *Natural size.*

“ 5a, *Magnified.*

“ 5b, *Ribs and groove with revolving lines.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

TURBONILLA LINEATA.—(*New Species.*)

PLATE XIII. FIGS. 7, 7a, 7b.

DESCRIPTION. In this species there are four revolving lines, in two pairs, across the groove; the inferior line of each pair is wide, nearly twice that of the superior line; the ribs are also wider and more prominent; the lowest whorl profoundly ventricose.

PLATE XIII. FIG. 7, *Natural size.*

“ 7a, *Magnified.*

“ 7b, *Magnified ribs, grooves, and revolving lines.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

TURBONILLA SUBULATA.—(*New Species.*)

PLATE XIII. FIGS. 8, 8a, 8b.

DESCRIPTION. The whorls in this species are not so much inflated as in *T. LINEATA*, (fig. 7,) but the shell more subulate; it has the same number of revolving lines, two pair, but the broad line is the superior.

PLATE XIII. FIG. 8, *Natural size.*

“ 8a, *Magnified.*

“ 8b, *Magnified ribs, grooves, and revolving lines.*

LOCALITY. Cainhoy, Wando River; Toogoodoo.

Museum, College of Charleston; Cabinet F. S. H.

TURBONILLA CAROLINIANA.—(*New Species.*)

PLATE XIII. FIGS. 9, 9a, 9b.

DESCRIPTION. *T. CAROLINIANA* differs from the foregoing in having five pairs of revolving lines.

PLATE XIII. FIG. 9, *Natural size.*

“ 9a, *Magnified.*

“ 9b, *Magnified ribs, grooves, and revolving lines.*

LOCALITY. Cainhoy, Wando River.

Museum, College of Charleston; Cabinet F. S. H.

TURBONILLA ACICULA.—(*New Species.*)

PLATE XIII. FIGS. 10, 10a, 10b.

DESCRIPTION. This species has about eight revolving lines, and more nearly resembles, in general form, *T. INTERRUPTA*, (fig. 4.)

PLATE XIII. FIG. 10, *Natural size.*

“ 10a, *Magnified.*

“ 10b, *Magnified ribs, grooves, and revolving lines.*

LOCALITY. Cainhoy, Wando River.

Museum, College of Charleston; Cabinet F. S. H.

ODOSTOMIA.—FLEMING.

ODOSTOMIA GRANULATUS.

PLATE XIII. FIGS. 11, 11a, 11b.

Acteon granulatus, *H. C. Lea*, *New Ter. Fossils*, p. 29, pl. 36, fig. 54.

DESCRIPTION. “Shell subulate, thick, sub-perforate, nodulously costate; spire elevated, obtuse, mammillate, polished at apex; sutures impressed; whorls six, convex; ribs

transverse, flat, regularly nodulous, a smooth one near the lower suture; last whorl rounded; base costate; perforation very small; mouth ovate, angular above, somewhat effuse; fold on the columellar large, acute. The nodules on the ribs are small, and in regular order, giving the shell a granulate and cancellate appearance. The fold on the columellar is placed about the middle, and is quite large; the mouth is rounded below, and acutely angular above. On the body-whorl the ribs are about eight in number, while there are five on those of the spire. The basal costæ are smooth and smaller.”—*H. C. Lea.*

The fossil, as figured by us, has four of the spire-ribs granulated, and one smooth. The above description of Mr. Lea’s characterizes it as identical with his species from the Miocene of Virginia; but his figure is very unlike that of the Post-Pleiocene shell.

PLATE XIII. FIG. 11, *Natural size.*
 “ 11a, *Magnified.*
 “ 11b, *Magnified costæ.*

LOCALITY. Cainhoy, Wando River.

Museum, College of Charleston; Cabinet F. S. H.

TURBONILLA SUB-CORONATA.—(*New Species.*)

PLATE XIII. FIGS. 12, 12a, 12b.

DESCRIPTION. Shell subulate, acuminate, thick, imperforate, costate; spire attenuate, mammillate, smooth at apex; two first whorls striate; five lower whorls angulate, granulate, transversely grooved, sub-coronated below the sutures; columellar with a small, almost obsolete fold; the spiral ribs of the lower whorls are seven in number, crossed by transverse revolving grooves, which gives the shell a regularly granulate appearance; the granulations of the superior rib, below and next the sutures, are large; the revolving line below the suture is more deeply impressed than the others.

PLATE XIII. FIG. 12, *Natural size.*
 “ 12a, *Magnified.*
 “ 12b, *Granulated whorl.*

LOCALITY. Simmons’.

Museum, College of Charleston; Cabinet F. S. H.

EULIMA.—Risso.

EULIMA EBOREA.—CONRAD.

PLATE XIII. FIG. 13.

Eulima eborea, *Con.*, Pro. Acad. Nat. Sci., Vol. 3, p. 20.*Eulima conoidea*, *Kurtz & Stimpson*, Pro. Bost. So. Nat. Hist., Vol. 4, p. 115.*Eulima oleacea*, *Kurtz & Stimpson*, Pro. Bost. So. Nat. Hist., Vol. 4, p. 115.*Eulima lævigata*, *Emmons*, North-Carolina Geol. Survey, 1858, p. 269.

DESCRIPTION. Shell sub-conical, smooth, milky-white, sometimes almost transparent; whorls nine to twelve; suture slightly defined; in some specimens a bluish or brown band revolves below the sutures; aperture somewhat oblique, ovate-acute.

This is a variable shell, abundant in the Post-Pleiocene of South-Carolina, and according to Mr. Conrad, found in the Miocene of Suffolk, Virginia. It is recent on the Atlantic coast, from Buzzard's bay southward. *E. CONOIDEA*, *E. LÆVIGATA* and *E. OLEACEA* are to our mind one and the same species.

PLATE XIII. FIG. 13, *Natural size.*LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

OBELISCUS.—HUMPHREY.

OBELISCUS CRENULATUS.—(*New Species.*)

PLATE XIII. FIGS. 14, 14a.

DESCRIPTION. Shell subulate, smooth, angularly channeled at the suture, which is crenulated on the lower whorls only; columellar with three folds, the superior one large and acute, the others small; outer lip with four small teeth internally; whorls fourteen to sixteen; with two indistinct opaque revolving bands, which are sometimes obsolete.

This shell is readily distinguished from its congener, *O. ARENOSA*, of the Pleiocene, by having only the lower edge of the suture crenulated, one more fold and tooth, and opaque revolving bands.

This species, and not *O. ARENOSA*, is now living on the coast of South-Carolina.

PLATE XIII. FIG. 14, *Natural size.*" 14a, *Magnified suture and crenulated whorls.*LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

SCALARIA CLATHRUS.—LINN.

PLATE XIV. FIG. 1.

Scalaria clathrus, var. b., *Say*, *Amn. Conch.*, iii, pl. 27.*Scalaria clathrus*, *Ravenel*, *Cat. Coll. Shells*, p. 13.*Scalaria clathrus*, *De Kay*, *Zool. New York, Art. Mollusca*, p. 127.*Scalaria clathrus*, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xx.*Scalaria clathrus*, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.*, p. 124, pl. xxvi, fig. 15.*Clathrus clathrus*, *H. & A. Adams*, *Gen. Moll.*, Vol. 1, p. 222.*Scalaria clathrus*, *Say*, *Conch. U. S.*, ed. *Binney*, p. 179.

DESCRIPTION. "Shell conic, turreted, imperforate, white, immaculate; whorls from six to eleven, touching each other only by the ribs, but with a narrow interval; ribs nine to each volution; prominent, simple, a little oblique; somewhat recurved, and with a more or less obvious obtuse angle or shoulder above, near the suture; aperture oval-orbicular; base a little angulated; labium distinct."—*Say*.

Common on the Carolina coast, and in the Post-Pleiocene beds.

PLATE XIV. FIG. 1, *Natural size*.

LOCALITY. Simmons'; Cainhoy; Waccamaw.

Museum, College of Charleston; Cabinet F. S. H.

SCALARIA ANGULATA.—SAY.

PLATE XIV. FIG. 2.

Scalaria angulata, *Say*, *Amn. Conch.*, pl. 27.*Scalaria clathrus*, *Say*, *Conch. U. S.*, ed. *Binney*, p. 179.

DESCRIPTION. As regards this species there seems to be some doubt with Mr. Say; he calls it a variety of *S. CLATHRUS*, but to our mind it is a distinct species. The outline of the shell is very unlike that of *S. CLATHRUS*, being more conical and shorter, and the angular, pointed ribs will always distinguish it. We have had several hundred recent specimens from the coast of South-Carolina, and are satisfied they are distinct.

PLATE XIV. FIG. 2, *Natural size*.

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

SCALARIA LINEATA.

PLATE XIV. FIG. 3.

- Scalaria lineata*, Say, Jour. Acad. Nat. Sci., Vol. 2, p. 242.
Scalaria lineata, Say, Amn. Conch., iii, pl. 27.
Scalaria lineata, Ravenel, Cat. Coll. Shells, p. 13.
Scalaria lineata, Gould, Invert. Mass., p. 250.
Scalaria lineata, De Kay, Zool. New-York, Art. Moll., p. 126, pl. vi, fig. 125.
Scalaria lineata, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xx.
Scalaria lineata, Stimpson, Shells of New-England, p. 39.
Scalaria lineata, H. & A. Adams, Gen. Recent Mollusca, Vol. 1, p. 220.
Scalaria lineata, Say, Conch. United States, ed. Binney, pp. 83, 180.

DESCRIPTION. "Shell brownish, elongated, with about seven volutions; costæ robust, obtuse, little elevated, and from seventeen to nineteen on the body-whorl; body-whorl with generally a blackish, more or less, dilated line, which is nearly concealed on the volutions of the spire, by the suture; margin of the mouth robust, white, more dilated at the columellar base; body-whorl with a raised line."—Say.

Recent on the coast from Massachusetts southward.

PLATE XIV. FIG. 3, *Natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

SCALARIA MULTISTRIATA.—SAY.

PLATE XIV. FIG. 4.

- Scalaria multistriata*, Say, Jour. Acad. Nat. Sci., Vol. 5, p. 208.
Scalaria multistriata, Say, Amn. Conch., iii, pl. 27.
Scalaria multistriata, Ravenel, Cat. Coll. Shells, p. 13.
Scalaria multistriata, De Kay, Zool. New-York, Art. Mollusca, p. 126.
Scalaria multistriata, L. R. Gibbes, Tuomey's Geol. So. Ca., appendix, p. xx.
Scalaria multistriata, Gould, Invert. Mass., p. 251.
Scalaria multistriata, Stimpson, Shells of New-England, p. 39.
Scalaria multistriata, H. & A. Adams, Gen. Mollusca, Vol. 1, p. 221.
Scalaria multistriata, Say, Conch. U. S., ed. Binney, pp. 119 and 180.

DESCRIPTION. "Shell conic, turreted, tapering to an acute apex, white, immaculate,

imperforate; whorls about eight, in contact; costæ regular, simple, not reflected, equidistant, moderately elevated; spaces between the costæ, with numerous, approximate, equidistant, impressed lines; suture well impressed; body-whorl with about sixteen costæ."—*Say*.

PLATE XIV. FIG. 4, *Natural size*.

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

LITTORINA.—FERUSSAC.

LITTORINA IRRORATA.—GRAY.

PLATE XIV. FIG. 5.

Littorina irrorata, *Gray*, Zool. Beechey's Voy., pl. 31. fig. 1.

Turbo irroratus, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 239.

Phasianella sulcata, *Ravenel*, Cat. Coll. Shells, p. 14.

Littorina irrorata, *De Kay*, Zool. New-York, Art. Mollusca, p. 106, pl. vi, fig. 112.

Littorina irrorata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.

Littorina irrorata, *Stimpson*, Shells of New-England, p. 33.

Littorina irrorata, *Tuomey & Holmes*, Pleiocene Foss. So. Ca., p. 119, pl. xxvi, fig. 5.

DESCRIPTION. Shell thick, top-shaped; whorls, with numerous revolving, elevated, obtuse, equal lines; body-whorl very large; suture well defined; spire acute; aperture large, entire, rounded-ovate; outer edge of lip thin; labium thick.—*T. & H.*

This shell is rare in the Meiocene, not very common in the Post-Pleiocene, but abundant in a recent state on the salt marshes of southern estuaries, where they are seen in great numbers, clinging to the stems of the marsh reeds—*Spatina glabra*. Mr. Stimpson has found it as far north as Connecticut.

PLATE XIV. FIG. 5, *Natural size*.

LOCALITY. Simmons'; Wadmalaw; Cainhoy.

Museum, College of Charleston; Cabinet F. S. H.

ARCHITECTONICA.—BOLTON.
SOLARIUM.—LAM.

ARCHITECTONICA GEMMA.—(*New Species.*)

PLATE XIV. FIGS. 6, 6a, 6b.

DESCRIPTION. Shell orbicular, sub-trochiform, deeply umbilicated; spire obtuse; whorls about four or five, angulated; a finely serrated carina at the periphery extends from the mouth nearly to the apex, where it becomes obsolete; aperture sub-quadrate; peristome thin, angulated above and below; umbilicus large, spiral, crenulated; base transversely marked with the lines of growth, which extend from the periphery of the body-whorl and form the crenulations on the margin of the umbilicus; suture distinct.

For this beautiful little shell we are indebted to Dr. Edm'd Ravenel, of the Grove plantation, who found it in the marl beds of Cainhoy, Wando river. Only one specimen yet obtained. The serrated carina around the periphery is not visible to the unassisted eye, but requires a lens of moderate power to be distinguished.

PLATE XIV. FIG. 6, *Natural size.*
" 6a, *Magnified view.*
" 6b, *Outline of form magnified.*

LOCALITY. Cainhoy, Wando River.

Cabinet of Dr. Edm'd Ravenel.

ANGARIA.—BOLTON.
DELPHINULA.—ROISSY.

ANGARIA CRASSA.—(*New Species.*)

PLATE XIV. FIGS. 7, 7a, 7b.

DESCRIPTION. Shell solid, smooth, turbate, umbilicate; spire obtuse, discoidal; whorls three to four, ventricose, sub-angulated above; body-whorl larger than the entire spire; suture angulated, deeply impressed; aperture rounded; entire peristome thick, reflected; labrum very thick, greatest on the superior edge; umbilicus wide; spiral-margin round, smooth.

A filliform carina, produced by the flattening of the upper surface of the whorls, extends from the apex to the aperture; in many specimens it becomes obsolete near the apex, and also near the aperture.

Of thirty-four specimens, which we have collected from the marl beds of the Stono, not

one is perfect; the lips of all of them are broken, hence the peristome, though described above as *reflected*, is marked as *doubtful*.

Since the discovery of the specimen of which our figure is a copy, we have obtained many much larger, say three-eighths of an inch in diameter.

PLATE XIV. FIG. 7, *Natural size.*
 " 7a, *Magnified view, from above.*
 " 7b, *Outline, front view.*

LOCALITY. Stono beds, Simmons'; Wadmalaw
Museum, College of Charleston; Cabinet F. S. H.

ADEORBIS.—SEARLES WOOD.

ADEORBIS NAUTILIFORMIS.—(*New Species.*)

PLATE XIV. FIGS. 8, 8a, 8b.

DESCRIPTION. Shell depressly-conical, orbicular, nautiliform, thin, deeply umbilicated; whorls few, say two, angulated at the periphery, smooth, divided externally and regularly into segments by transverse, depressed lines of growth, which are less distinct on the spire, but profound on the base; aperture transversely oval, contracted above; peristome interrupted; umbilicus deep, simple; outer lip arcuate, thin; inner lip sinuated.

We are indebted to Dr. E. Ravenel for this interesting species, which may be readily distinguished from its congeners by the depressed, transverse, arcuated and equidistant lines, which divide the whorls into segments.

PLATE XIV. FIG. 8, *Natural size.*
 " 8a, *Magnified view, from above.*
 " 8b, *Magnified outline.*

LOCALITY. Cainhoy, Wando River.
Museum, College of Charleston; Cabinet Dr. Ravenel.

COCHLIOLEPIS PARASITICUS.—STIMPSON.

PLATE XIV. FIGS. 9, 9a, 9b.

Cochliolepis parasiticus, *Stimpson*, Pro. Bost. So. Nat. Hist., 1857, Vol. 6, p. 307.

DESCRIPTION. "Shell thin, discoidal, convex above, concave and umbilicated below;

the edge thin and sharp; whorls three in number, rapidly enlarging; surface smooth and glossy, indistinctly striated with lines of growth; lip not thickened; diameter an eighth of an inch."—*Stimpson*.

The shell represented in our figure, from the Post-Pleiocene, differs very little from the description of the recent shell, as given above; the fossil is thicker in substance than those which we have obtained from the coast, and those which Messrs. Stimpson and Kurtz found parasitic on *Acoëtes lupina*, a gigantia annelide of the *Aphrodite* family. It is very common in the fossil state.

PLATE XIV. FIG. 9, *Natural size.*

" 9a, *Magnified.*

" 9b, *Magnified outline.*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

FISSURELLA.—BRUG.

FISSURELLA ALTERNATA.—SAY.

PLATE XIV. FIG. 10.

Fissurella alternata, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 224.

Fissurella alternata, *Ravenel*, Cat. Coll. Shells, p. 9.

Fissurella alternata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.

Fissurella alternata, *Say*, Conch. U. S., ed. *Binney*, p. 73.

DESCRIPTION. "Shell oblong-ovate, moderately thick, cinerous or dusky, with equal concentric lines, crossed by alternately larger and smaller radii, all which are equable or not dilated in any part: vertex placed nearer the smaller end; perforation oblique, oblong, and a little contracted in the middle; within white; margin simply crenate; apex with an indented transverse line at the larger end of the perforation."—*Say*.

FISSURELLA ALTERNATA is common on the coast of Carolina and Georgia.

PLATE XIV. FIG. 10, *Natural size.*

LOCALITY. Simmons'; Stono River.

Museum, College of Charleston; Cabinet F. S. H.

CRYPTA.—HUMPH. (1797.)
 CREPIDULA.—LAM. (1801.)

CRYPTA FORNICATA.—H. & A. ADAMS.

PLATE XIV. FIG. 11.

- Patella fornicata*, *Linn.*, *Syst. Nat.*, 1257.
Crepidula fornicata, *Lam.*, *An. sans Vert.*, Vol. 7, p. 641.
Crepidula fornicata, *Martini*, 1, pl. 13, figs. 129 and 130.
Crepidula fornicata, var., *Say*, *Jour. Acad. Nat. Sci.*, Vol. 2, p. 225.
Crepidula fornicata, *Con.*, *Foss. Med. Ter. Form.*, pl. 45, fig. 10.
Crepidula fornicata, *Say*, *Conch U. S.*, ed. *Binney*, p. 73.
Crepidula fornicata, *Ravenel*, *Cat. Coll. Shells*, p. 9.
Crepidula fornicata, *Gould*, *Invert. Mass.*, p. 158, fig. 17.
Crepidula fornicata, *De Kay*, *Zool. New-York*, *Art. Mollusca*, p. 157, pl. vii, figs. 152, 154.
Crepidula fornicata, *L. R. Gibbes*, *Tuomey's Geol. So. Ca.*, appendix, p. xx.
Crepidula fornicata, *Stimpson*, *Shells of New-England*, p. 30.
Crypta fornicata, *H. & A. Adams*, *Gen. Mollusca*, Vol. 1, p. 369.
Crypta fornicata, *Tuomey & Holmes*, *Pleiocene Foss. So. Ca.* p. 110, pl. xxv, fig. 9.

DESCRIPTION. "Shell oblique-oval, convex, smooth, sometimes wrinkled with obsolete undulating longitudinal lines; apex prominent; diaphragm sub-concave, occupying half the interior of shell, the free edge waving. This is a common species in the Pleiocene beds of South-Carolina, and abundant on the sea-shores in a living state. In the marl of Goose Creek a series of united casts occupying their natural position, are common fossils."—*T. & H.*

PLATE XIV. FIG. 11, *Natural size.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

CRYPTA ACULEATA.

PLATE XIV. FIG. 12.

- Crepidula aculeata*, *Lam.*, *Anim. sans Vert.*, Vol. 7, p. 642.
Crepidula aculeata, *Sowerby*, *Gen.*, n. 23.
Crepidula aculeata, *Ravenel*, *Cat. Coll. Shells*, p. 9.

Crepidula aculeata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.
Crepidatella aculeata, *H. & A. Adams*, Gen. Mollusca, Vol. 1, p. 369.

DESCRIPTION. Shell oval, convex, longitudinally ribbed, ribs thick, elevated wrinkled, with a series of erect spines; diaphragm sinuous, with a ridge in the middle extending from the beak to the margin; apex of shell lateral, incurved, sub-terminal.

The lateral, incurved, sub-terminal beaks, are characteristic of this genus.

PLATE XIV. FIG. 12, *Natural size*.

LOCALITY. John's Island, Stono River.

Museum, College of Charleston; Cabinet F. S. H.

CHITON.—LINN.

CHITON APICULATUS.—SAY.

PLATE XIV. FIGS. 13, 13a, 13b, 13c.

Chiton apiculatus, *Say*, Amn. Conch., 8.

Chiton apiculatus, *Say*, Conch. U. S., ed. *Binney*, p. 231.

Chiton apiculatus, *Ravenel*, Cat. Coll. Shells, p. 8.

Chiton apiculatus, *Gould*, Invert. Mass., p. 146, fig. 20.

Chiton apiculatus, *De Kay*, Zool. New York, Art. Mollusca, p. 164, pl. x, figs 201, 202.

Chiton apiculatus, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xx.

Chiton apiculatus, *Stimpson*, Shells of New-England, p. 28.

DESCRIPTION. "Valves eight; dorsal triangles, with series of elevated points; lateral triangles with scattered elevated points. Inhabits the coast of South-Carolina."—*Say*.

Only a single dorsal valve of this shell has as yet been found in the Post-Pleiocene.

PLATE XIV. FIG. 13, *Side view, natural size*.

" 13a, *View from above*.

" 13b, *Magnified view of same*.

" 13c, *Magnified view of one series elevated points*

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.

PLANORBIS.—GUETTARD.

PLANORBIS LENTUS.—SAY.

PLATE XIV. FIG. 14.

- Planorbis lentus, *Say*, Amn. Conch., pl. 4, fig. 1.
 Planorbis lentus, *Ravenel*, Cat. Coll. Shells, p. 11.
 Planorbis lentus, *Gould*, Invert. Mass., p. 202, fig. 132.
 Planorbis lentus, *De Kay*, Zool. New-York, p. 60, pl. 5, fig. 80, a. b.
 Planorbis lentus, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xix.
 Planorbis lentus, *Stimpson*, Shells of New-England, p. 51.
 Helisoma lentus, *H. & A. Adams*, Gen. Mollusca, Vol. 2, p. 262.

DESCRIPTION. "Shell dull brownish or yellowish brown, sub-carinate above, particularly in the young shell; whorls nearly five; striate across, with five raised, sub-equidistant lines, forming grooves between them; spire concave; aperture large, embracing a large portion of the penultimate volution; labrum more acutely, but not very prominently, arquated above, its basal portion horizontally sub-rectilinear in the adult, and not extending below the level of the base."—*Say*

A very imperfect shell was found at Mr. Simmons'.

PLATE XIV. FIG. 14, *Natural size, imperfect specimen.*

LOCALITY. Simmons'. *Museum, College of Charleston; Cabinet F. S. H.*

MELAMPUS.—MONTFORT.

MELAMPUS BIDENTATUS.—SAY.

PLATE XIV. FIGS. 15, 15a.

- Melampus bidentatus, *Say*, Jour. Acad. Nat. Sci., Vol. 2, p. 245.
 Auricula bidentata, *Gould*, Invert. Mass., p. 197, fig. 130.
 Auricula bidentata, *De Kay*, Zool. New-York, Art. Moll., p. 57, pl. v, figs. 92.
 Auricula bidentata, *L. R. Gibbes*, Tuomey's Geol. So. Ca., appendix, p. xix.
 Melampus corneus, *Stimpson*, Shells of New-England, p. 51.

Melampus bidentatus, *H. & A. Adams*, Gen. Mollusca, Vol. 2, p. 243.

Melampus bidentatus, *Say*, Conch. United States, ed. *Binney*, p. 84.

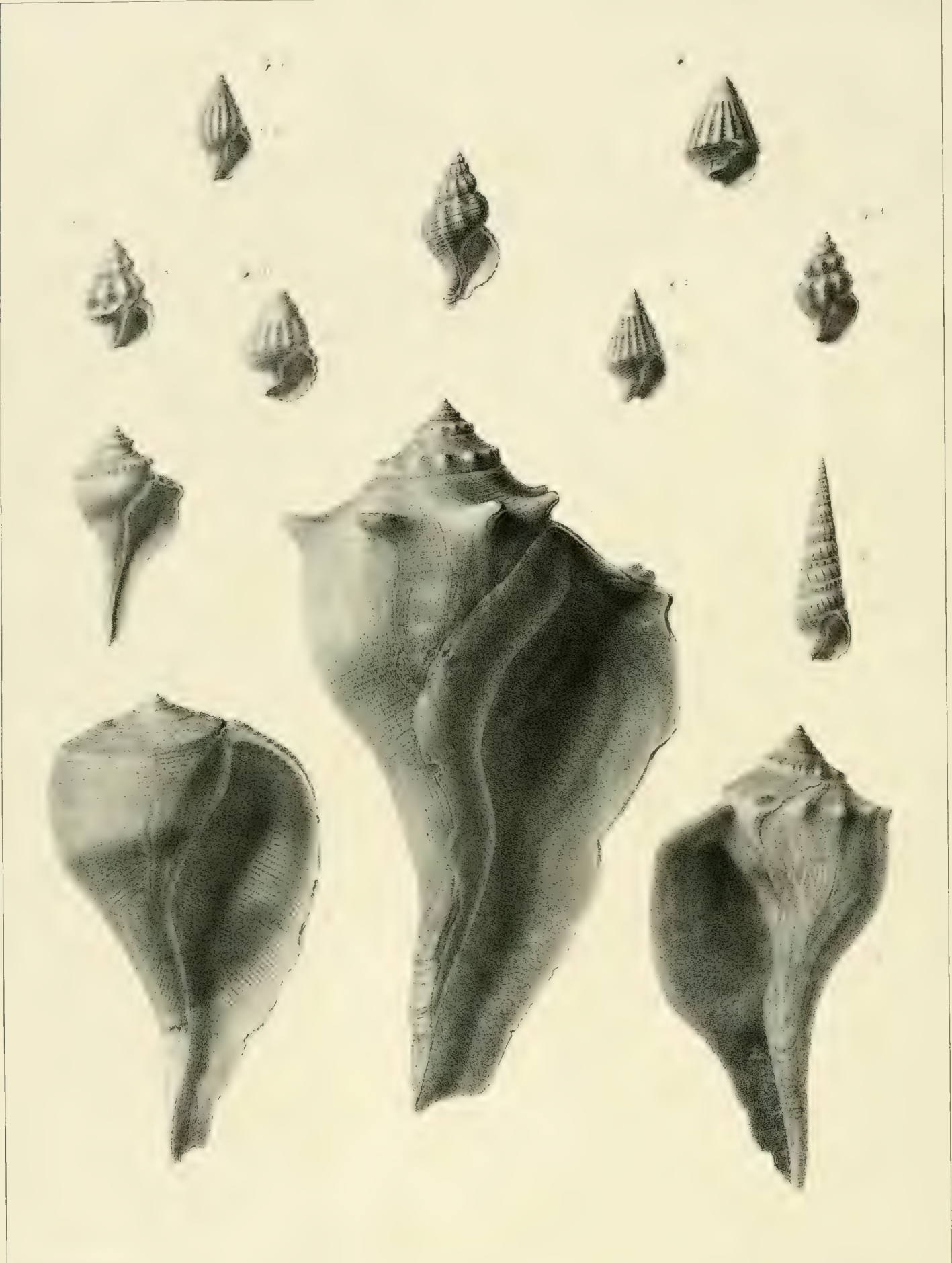
DESCRIPTION. "Shell thin, fragile, dirty-brownish, very little elevated, obtuse; body-whorl with minute transverse wrinkles and revolving impressed striæ; labium bidentate; the superior tooth transverse, prominent, terminating at the exterior edge of the columellar; labrum with four or five elevated striæ, not attaining the edge; base not contracted."—*Say*.

PLATE XIV. FIG. 15, *Natural size*.

" 15a, *Magnified*.

LOCALITY. Simmons'.

Museum, College of Charleston; Cabinet F. S. H.



POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XI.

MURICIDÆ.—BUCCINIDÆ.

MURICIDÆ.

- FIG. 1. BUSYCON CARICA. *Page 65.*
" 2. BUSYCON PERVERSUM. *Page 65.*
" 3. BUSYCON CANALICULATUM. *Page 66.*
" 4. PYRULA PYRUM. *Page 67.*
" 5. FUSUS CINEREUS. *Page 68.*
" 6. FUSUS MINOR. Natural size. *Page 68.*
" 6a. Magnified view.
" 7. FUSUS CONUS. Natural size. *Page 69.*
" 7a. Magnified view.
" 8. FUSUS CONUS. Variety, natural size. *Page 69.*
" 8a. Magnified view.
" 9. FUSUS FILIFORMIS. Natural size. *Page 69.*
" 9a. Magnified view.
" 10. FUSUS BULLATA. Natural size. *Page 69.*
" 10a. Magnified view.
" 11. FUSUS RUDIS. Natural size. *Page 70.*
" 11a. Magnified view.

BUCCINIDÆ.

- FIG. 12. TEREBRA DISLOCATUM. *Page 70.*

NOTE.—For others of this family see Plate XII.

POST-PLIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XII.

BUCCINIDÆ.—CONIDÆ.—VOLUTIDÆ.—NATICIDÆ.

BUCCINIDÆ.

- FIG. 1. BUCCINUM OBSOLETUM. Natural size. *Page 71.*
" 2. BUCCINUM TRIVITTATUM. Natural size. *Page 72.*
" 3. BUCCINUM ACUTUM. Natural size. *Page 72.*
" 4. COLUMBELLA AVARA. Natural size. *Page 73.*
" 5. COLUMBELLA LUNATA. Natural size. *Page 74.*
" 5a. Magnified view.
" 6. COLUMBELLA ORNATA. Natural size. *Page 74.*
" 6a. Magnified view.
" 7. STREPHONA LITERATA. Natural size. *Page 75.*
" 8. OLIVA MUTICA. Natural size. *Page 76.*

CONIDÆ.

- FIG. 9. PLEUROTOMA CERINUM. Natural size. *Page 77.*
" 9a. Magnified view.

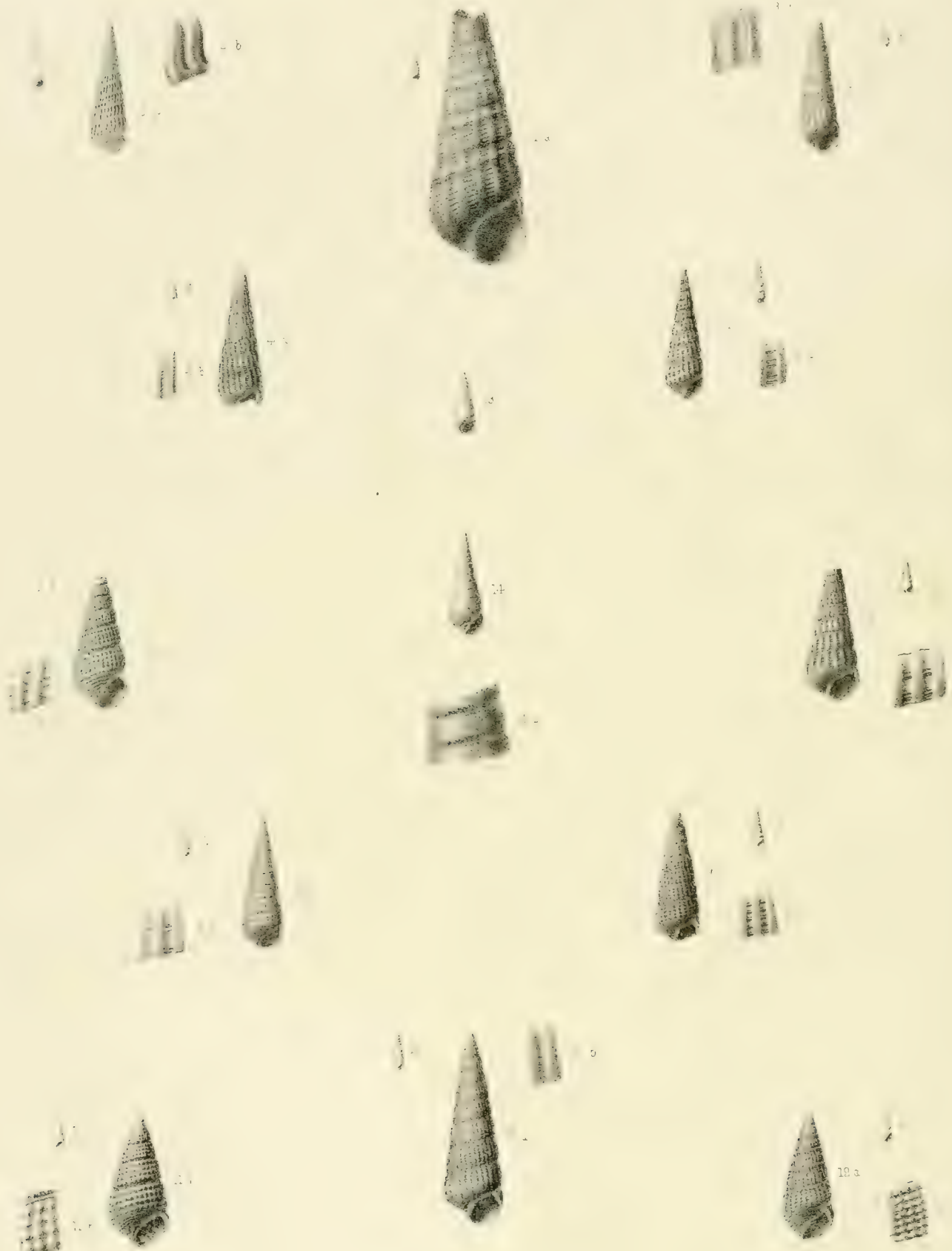
VOLUTIDÆ.

- FIG. 10. VOLUTOMITRA WANDOENSIS. Natural size. *Page 77.*
" 10a. Magnified view.
" 11. VOLVARIA CANALICULATA. Natural size. *Page 78.*
" 11a. Magnified view.
" 12. PORCELLANA LIMATULA. Natural size. *Page 78.*
" 13. VOLVA ACICULARIS. *Page 79.*

NATICIDÆ.

- FIG. 14. NATICA DUPLICATA. Natural size. *Page 80.*
" 15. NATICA PUSILLA. Natural size. *Page 80.*
" 15a. Magnified view.
" 16. CATINUS PERSPECTIVUS. Natural size. *Page 81.*





POST-PLIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XIII.

PYRAMIDELLIDÆ.

- FIG. 1. TURBONILLA SPEIRA. Natural size. *Page 82.*
" 1a. Magnified view.
" 2. TURBONILLA EXARATA. *Page 82.*
" 2a. Magnified view.
" 2b. Magnified ribs and groove.
" 3. TURBONILLA NIVEA. Natural size. *Page 83.*
" 3a. Magnified.
" 3b. Magnified ribs and groove.
" 4. TURBONILLA INTERRUPTA. Natural size. *Page 83.*
" 4a. Magnified view.
" 4b. Magnified ribs and groove.
" 5. TURBONILLA QUINQUE-STRIATA. Natural size. *Page 85.*
" 5a. Magnified view.
" 5b. Groove, ribs and revolving lines.
" 6. TURBONILLA CANCELLATA. Natural size. *Page 84.*
" 6a. Magnified view.
" 6b. Magnified ribs, grooves and revolving lines.
" 7. TURBONILLA LINEATA. Natural size. *Page 85.*
" 7a. Magnified view.
" 7b. Magnified ribs and grooves.
" 8. TURBONILLA SUBULATA. Natural size. *Page 85.*
" 8a. Magnified view.
" 8b. Magnified ribs and grooves.
" 9. TURBONILLA CAROLINIANA. Natural size. *Page 86.*
" 9a. Magnified view.
" 9b. Magnified ribs and grooves.
" 10. TURBONILLA ACICULA. Natural size. *Page 86.*
" 10a. Magnified view.
" 10b. Magnified ribs and grooves.
" 11. ODOSTOMIA GRANULATUS. Natural size. *Page 86.*
" 11a. Magnified view.
" 11b. Magnified ribs.
" 12. TURBONILLA SUB-CORONATA. Natural size. *Page 87.*
" 12a. Magnified view.
" 12b. Magnified whorl, with coronated margin.
" 13. EULIMA EBOREA. Natural size. *Page 88.*
" 14. OBELISCUS CRENULATUS. Natural size. *Page 88.*
" 14a. Crenulated suture magnified.

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XIV.

PYRAMIDELLIDÆ.—LITTORINIDÆ.—TROCHINIDÆ.—CALYPTRÆIDÆ. CHITONIDÆ.—PLANORBIDÆ.—MELAMPIDÆ.

PYRAMIDELLIDÆ.

- FIG. 1. SCALARIA CLATHRUS. Natural size. *Page 89.*
" 2. SCALARIA ANGULATA. Natural size. *Page 89.*
" 3. SCALARIA LINEATA. Natural size. *Page 90.*
" 4. SCALARIA MULTISTRIATA. Natural size. *Page 90.*

LITTORINIDÆ.

- FIG. 5. LITTORINA IRROBATA. Natural size. *Page 91.*
" 6. ARCHITECTONICA GEMMA. Natural size. *Page 92.*
" 6a. Magnified.
" 6b. Magnified outline.

TROCHINIDÆ.

- FIG. 7. ANGARIA CRASSA. Natural size. *Page 92.*
" 7a. Magnified view from above.
" 7b. Outline, front view.
" 8. ADEORBIS NAUTILIFORMIS. Natural size. *Page 93.*
" 8a. Magnified view from above.
" 8b. Magnified outline of shell.
" 9. COCHLIOLEPIS PARASITICUS. Natural size. *Page 93.*
" 9a. Magnified view.
" 9b. Magnified outline of shell.

CALYPTRÆIDÆ.

- FIG. 10. FISSURELLA ALTERNATA. Natural size. *Page 94.*
" 11. CRYPTA FORNICATA. Natural size. *Page 95.*
" 12. CRYPTA ACULEATA. Natural size. *Page 95.*

CHITONIDÆ.

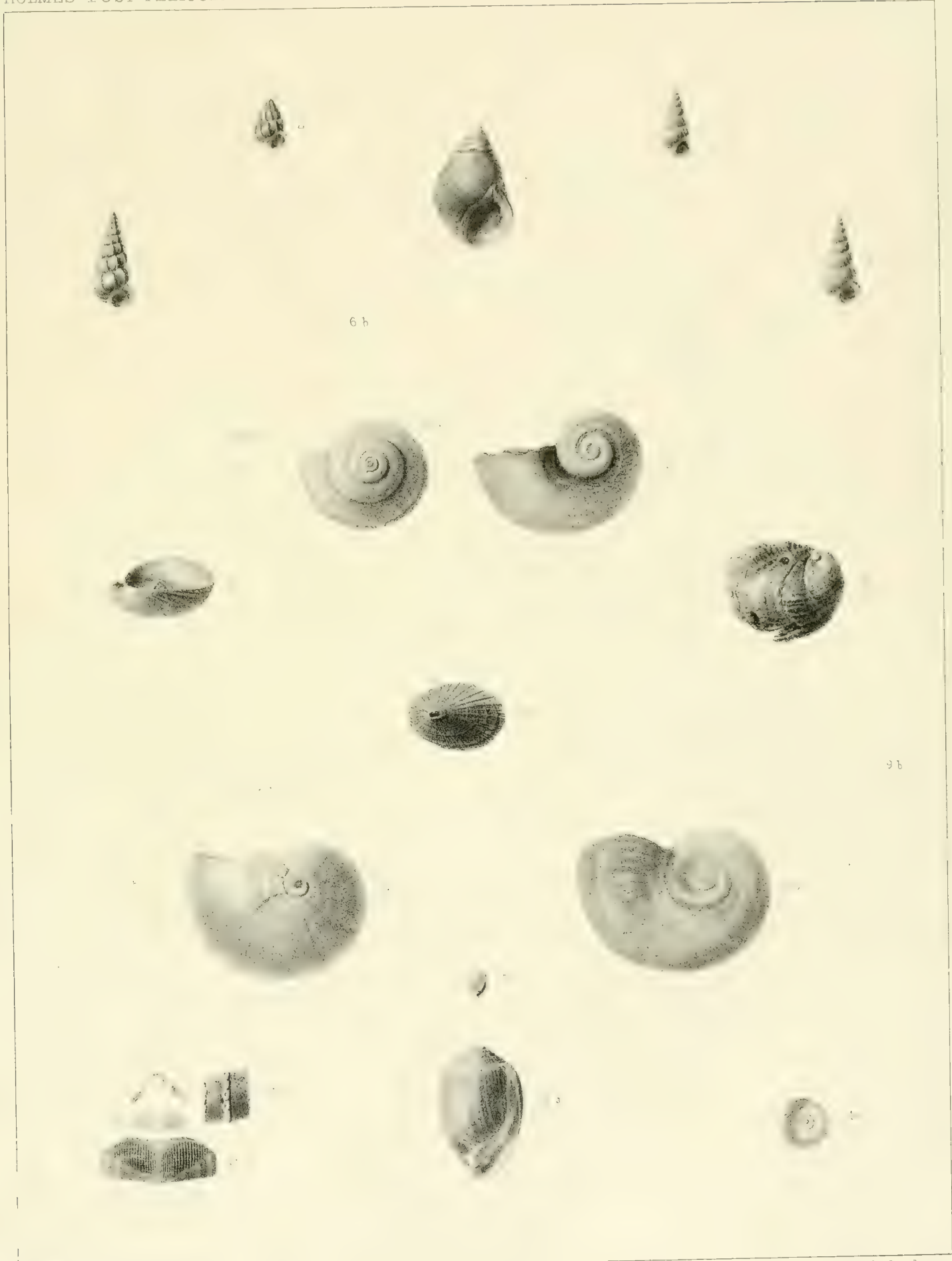
- FIG. 13. CHITON APICULATUS. Natural size, side view. *Page 96.*
" 13a. View from above.
" 13b. Magnified view from above.
" 13c. Magnified view of series of elevated points.

PLANORBIDÆ.

- FIG. 14. PLANORBIS LENTUS. Imperfect shell. *Page 97.*

MELAMPIDÆ.

- FIG. 15. MELAMPUS BIDENTATUS. Natural size. *Page 97.*
" 15a. Magnified.



6 b

9 b

DESCRIPTION OF VERTEBRATE FOSSILS.

BY PROF. JOSEPH LEIDY.

INTRODUCTORY REMARKS.*

THE interesting collection of remains of vertebrated animals, which form the subject of the following pages, with few exceptions, have been submitted to the inspection of the author, by Prof. F. S. Holmes and Capt. A. H. Bowman, U. S. A. The greater part of the fossils were obtained by these gentlemen from the shores of the Ashley river, or its vicinity, about ten miles above Charleston. The country, in the locality indicated, exhibits a base of whitish Eocene marl, containing remains of cetaceans, and of sharks, rays, and other fishes, together with fossil mollusks and zoophytes, which have formed part of the material of the valuable researches of Prof. Holmes.

Above the Eocene formation there is a stratum of Post-Pleiocene marl, about one foot in thickness, overlaid with about three feet of sand and earth mould. The Post-Pleiocene deposit contains quantities of irregular, water-worn fragments of the Eocene marl-rock from beneath, mingled with sand, blackened pebbles, water-rolled fragments of bones, and other more perfect remains of fishes, reptiles, and mammals, which belong to the Post-Pleiocene period, or have been derived from the underlying Eocene formation.

On the Ashley river, where the Post-Pleiocene and Eocene formations are exposed, fossils and pebbles are washed from their bed, and form part of the shingle of the shore, and here become mingled with the remains of recent indigenous and domestic animals, together with objects of human art. From these circumstances, it is sometimes difficult to determine to what particular geological formation or period, whether Eocene, Post-Pleiocene, or Recent, the fossils collected on the Ashley shores, are to be referred. The difficulty is especially great in regard to the remains of fishes, less so with the reptiles and cetaceans, and least so with the other mammalian fossils.

Of those vertebrate remains actually obtained in excavations of the Post-Pleiocene and Eocene formations, more confidence is felt in determining the actual age to which they belong.

* For notes on the geological formations in which the vertebrate fossils described in this paper were discovered, see Appendix to this volume.—(F. S. HOLMES.)

Both the collections submitted to the author by Prof. Holmes and Capt. Bowman, contain remains of the horse, ox, sheep, hog, and dog, which, we feel strongly persuaded, with the exception of many of those of the first mentioned genus, are of recent date, and have become intermingled with the true fossils of the Post-Pleiocene and Eocene periods on the Ashley river and its tributaries. In regard to the remains of the horse, from the facts related in the succeeding pages, we think it must be conceded that several species of this animal inhabited the country of the United States, during the Post-Pleiocene period, contemporaneously with the mastodon, the giant sloth, and the great, broad-fronted bison.

Class, MAMMALIA. Order, SOLIPEDIA.

Genus, EQUUS.—LINN.

EQUUS FRATERNUS. EQUUS COMPLICATUS.

PLATES XV, XVI. FIGS. 2-31.

Equus major, *De Kay*, Zoology of New-York, pt. 1, Mammalia, 108.

Equus Americanus, *Leidy*, Proc. Acad. Nat. Sci., III, 262.

Equus fraternus et *E. complicatus*, *Leidy*, Proc. Acad. Nat. Sci., 1858, 11.

It appears to be quite well authenticated that the Horse, now so extensively distributed, both in a wild and domestic condition, throughout North and South America, did not inhabit these continents at the time of their discovery by Europeans. Coupling this fact with the circumstance, that in many instances fossils may become accidental occupants of earlier geological formations than those to which they actually belong, we should require strong evidence before it is admitted that species of the Horse belonged to the ancient fauna of the western world. At the present time such evidence is not only ample for the purpose, but actually indicates that more equine animals formerly lived in North America than in any other portion of the earth, so far as is known.

Remains of the Horse, discovered in Brazil, Buenos Ayres, and Chili, have been indicated by Dr. Lund,* Prof. Owen,† M. Weddell,‡ and M. Gervais.§ These remains exhibit no well marked characters distinguishing them from corresponding portions of the skeleton of the domestic Horse, and it is uncertain whether they are referable to one or more species.

*Ann. Sc. Nat., 2d s., XII, 319. *Equus neogaeus*; *E. principalis*.

† Voyage Beagle; Fossil Mammalia, 108; Catalogue Foss. Mus. Roy. Col. Surg., 236. *E. curvidens*.

‡ Voyage Bolivie, 204. *E. macrognathus*.

§ Hist. Chili; Zool. I, 146; Rech. Mam. Foss., 33, 35. *E. Americanus*; *E. Devillei*.

Prof. Buckland* and Sir John Richardson† have described remains of the Horse, discovered in association with those of the elephant, moose, rein-deer, and musk-ox, in the ice cliffs of Eschscholtz bay, Arctic America.

In the United States, remains of the Horse, chiefly consisting of teeth, have been noticed by Drs. Mitchell,‡ Harlan,§ and DeKay,|| but these gentlemen have neither given descriptions nor figures by which to identify the specimens. Some of the latter are stated to have been found in the vicinity of Neversink Hills, New Jersey; others in the excavation for the Chesapeake and Ohio Canal, near Georgetown, District of Columbia; and some in the later Tertiary deposit on Neuse river, in the vicinity of Newbern, North Carolina. Dr. DeKay, in speaking of such remains, says: "They resemble those of the common Horse, but from their size, apparently belonged to a larger animal;" and he refers them to a species with the name of *Equus major*.

Dr. R. W. Gibbes** has given information of the discovery of teeth of the Horse in the Pleiocene deposit of Darlington, South-Carolina; in Richland District, of the same State; in Skidaway Island, Georgia; and on the banks of the Potomac river. He further observes that he obtained the tooth of a Horse, from Eocene marl, on the Ashley river, South-Carolina, but the researches of Prof. Holmes†† indubitably indicate the specimen to have been an accidental occupant of that formation.

Specimens of isolated teeth, and a few bones of the Horse, from the Post-Pleiocene and recent deposits of this country, east of the Mississippi river, have frequently been submitted to my inspection. Many of these I have unhesitatingly pronounced to be relics of the domestic horse, though I feel persuaded that many remains of an extinct species are undistinguishable from the recent one.

Whether more than one extinct species is indicated among the numerous specimens of teeth I have had the opportunity of examining, I have been unable positively to determine, but the testimony inclines me to suspect the existence of at least two species. One of these was apparently about the size of the ordinary varieties of the domestic horse, and possessed molar teeth, not more complicated in the arrangement of their enamel than in the latter. The second species was about the size of the English dray horse, and possessed molar teeth, with the enamel much more complexly plicated than in any recent species of *Equus*.

These two species, for which the names heading the present chapter have been proposed, appear to have held the same relation to each other, in size and anatomical constitution, as the *Equus primigenius* and *E. plicidens*, of Europe.

The two species are, however, not always readily separated from each other, for their remains frequently exhibit such an approximation of characters, that it is often difficult to say to which they actually belong.

The specimens of molar teeth of the Horse, which I formerly attributed to the extinct

* Beechey's Voyage to the Pacific, 1831. Appendix, 595. || Zoology New-York, pt. 1, Mammalia, 108.

† Zoology of the Voyage of the Herald, 1854, 17. *Equus fossilis*, Richardson.

‡ Catalogue of Organic Remains, 1826, 7, 8.

** Proc. Amer. Assoc., 1850, 66.

§ Med. and Phys. Researches, 1835, 267.

†† Ibidem, 68.

species of South America, under the name of *Equus curvidens*, Owen,* were obtained from a pond in a marsh of Big-bone-lick, Kentucky, together with some bones of the existing *Bison*, the *Megalonyx*, and the *Mastodon*. From their size, form, and condition of preservation, I am now disposed to believe they are recent remains, which subsequently became mingled with their older associates.

Among a number of teeth of the Horse in Prof. Holmes' collection, labelled as coming from the Post-Pleiocene deposit of Ashley river, there are several which from their size, construction, and condition of preservation, I feel convinced are of recent date; and these, no doubt, became mingled with the true fossils of that formation, where it is exposed on the Ashley river, in which position I personally found undoubted remains of the recent Horse and other domestic animals, and objects of human art, mingled with remains of fishes, reptiles, and mammals, washed by the river from the banks, composed of Eocene and Post-Pleiocene deposits.

Teeth of an extinct species of Horse, however, undoubtedly belong, as true fossils, to the Post-Pleiocene formations in the vicinity of Charleston. These are usually hard in texture, stained brown or black, from the infiltration of oxide of iron, sometimes well preserved, but more frequently in a fragmentary condition and water-worn. Generally they are not larger than the teeth of the more ordinary varieties of the domestic horse, and sometimes are quite as simple in the plication of their enamel, but usually are more complex, and sometimes exceedingly so.

Figures 19–22, Plate XVI, represent four inferior molar teeth of the extinct Horse, which were obtained by Prof. Holmes from an excavation of the Post-Pleiocene deposit of Ashley river. The pair represented in figures 19, 21, exhibit a greater degree of plication in the enamel than is usual in any of the lower molars of the Horse, whether recent or extinct; but the others present nothing peculiar. They range from two to three inches in length, thirteen to fourteen lines in breadth, and seven to eight lines in width.

Figure 8, Plate XV, represents a first superior molar tooth, neither larger nor more complex in structure than the corresponding tooth of the recent Horse. This specimen, which is dense and jet black in color, was obtained by Prof. Holmes from a stratum of ferruginous sand, two inches thick, exposed on the side of a bluff, on Goose creek, about twelve miles from Charleston.

Having expressed a desire to see the locality from which the tooth just mentioned was obtained, Prof. Holmes afforded me the opportunity of doing so. The bluff is about thirty feet high; its base is formed of a Pleiocene limestone, about fifteen feet thick, and composed of the debris of marine shells; above this is the stratum of ferruginous sand, of Post-Pleiocene age, containing numerous pebbles and rolled fragments of bone, all blackened, like the tooth obtained from the same position. Overlying the latter stratum there is a layer of stiff blue clay, about two feet in thickness, and above this there are about twelve feet of sand and earth mould

* Proc. Acad. Nat. Sci., Phila., III, 1847, 622.

A similar blackened tooth, represented in figure 6, Plate XV, was obtained from the same formation, at Doctor's Swamp, John's Island.

Figures 2–5, represent four superior molars of the extinct Horse, from the Post-Pleiocene bed of the Ashley river, all exhibiting a greater complexity of the enamel folding than is the case in the recent Horse. These specimens are hard, brown in color, and range from two, to about three and a half inches in length, and measure from one inch two lines, to one and a quarter inches in antero-posterior diameter, and from one inch, to one inch and two lines in transverse diameter.

Figure 7, Plate XV, represents a last upper molar of the right side, also from the Post-Pleiocene bed of the Ashley river. The specimen is dense, brown in color, and well preserved, except having lost its exterior cement. Its enamel folding is quite complex; and it measures two and a quarter inches in length, sixteen lines in antero-posterior diameter, and eleven lines transversely.

The Museum of the Academy of Natural Sciences, of Philadelphia, contains a number of teeth of the extinct Horse, of which six upper and seven lower molars were found in association with remains of *Mastodon*, *Elephas*, *Megalonyx*, *Myiodon*, *Ereptodon*, *Bison latifrons*, *Ursus*, *Felis atrox*, etc., in ravines in the vicinity of Natchez, Mississippi; two upper molars, were obtained by Dr. Dickeson from one of the islands of the Mississippi, near Natchez; and an inferior molar was found in association with remains of *Mastodon*, *Elephas*, *Megatherium*, etc., in the excavation of the Brunswick canal, near Darien, Georgia.

The teeth from the vicinity of Natchez are usually well preserved, except that they are generally deprived of their exterior cement, and the dentine is more or less friable. They vary considerably in point of comparative size and degree of complexity.

Figures 24–26, Plate XVI, represent specimens of inferior molars of the extinct Horse, obtained by Dr. Dickeson from the ravines of Natchez. They vary from two and a half, to four and a quarter inches in length, thirteen and a half, to fifteen lines in breadth, and six and a half, to eight lines in width. The tooth represented by figure 25, appears to have belonged to the temporary series, which are larger than their permanent successors.

Figure 27 represents an inferior fourth molar, which, with a portion of the jaw and the impress of the third, fifth, and sixth molars, are preserved in a thick fragment of compact peroxide of iron. The specimen, together with an upper molar of the same animal, and a portion of the lower jaw of *Felis atrox*, similarly preserved, were obtained by W. H. Huntington, Esq., from the vicinity of Natchez, and presented to the American Philosophical Society. The fourth molar, above referred to, is about three and three-quarter inches long, and does not differ from its correspondent in the recent Horse.

Figures 11–15, Plate XV, represent specimens of superior molars, from the Natchez ravines, all with the enamel more complexly folded than in the corresponding teeth of the domestic Horse, as may be seen by comparing them with figure 1, representing the upper molar series of the latter. Figure 13, apparently represents an upper molar of the temporary series. The others measure three and a half, to three and three-quarter inches long; fourteen, to sixteen lines broad; and twelve, to fourteen lines wide.

Figures 17, 18, represent two specimens of upper last molars, above mentioned, from one of the Natchez islands. They are hard, blackened, and water-rolled, and neither differ in size nor complexity from their homologues of the domestic Horse.

Figure 23, Plate XVI, represents a remarkably well preserved specimen of a lower molar, above referred to, from Georgia, where it was discovered by J. H. Couper, in association with equally well preserved remains of other extinct animals. The tooth is brown in color; and it neither differs in size nor form from its homologue in the recent Horse.

In the collection of fossils of Prof. Holmes, there is the specimen of an upper first large molar, labelled from Texas, represented in figure 10, Plate XV. The tooth is of the largest comparative size, and exhibits the highest degree of complexity in the folding of its enamel; in both of which characters it differs in such a remarkable degree from the corresponding tooth, represented in figure 8, from the Post-Pleiocene formation of South-Carolina, that it appears hardly possible that these two teeth should belong to the same species of Horse.

Specimens of upper and lower molars, and incisors, have been submitted to my inspection, by Prof. E. Emmons, who informed me they were obtained from North-Carolina. One of the specimens, a remarkably well preserved superior molar tooth, is represented in figures 16, Plate XV, and 28, of Plate XVI.

Figure 9, Plate XV, also represents a well-preserved superior molar tooth, being the first of the right side. It was sent to me for examination by Dr. B. F. Shumard, who obtained it from the Illinois bluffs, (the quaternary formation, or the bluff formation of Missouri, of the Geological Report,) six miles west of St. Louis.

The Cabinet of the Academy of Natural Sciences, of Philadelphia, also contains the following remains of the extinct Horse:

A tibia, from the ravines of Natchez, Mississippi, obtained by Dr. Dickeson, together with the remains of other extinct animals, previously mentioned. The bone is sixteen inches long, five and a quarter inches broad at the proximal extremity, and three and three-quarter inches broad at the distal extremity.

A metacarpal bone, a calcaneum, a metatarsal bone, two first phalanges and a third phalanx, and an axis, which together with remains of *Elephas* and *Mastodon*, from Big-bone-lick, Kentucky, were presented to the American Philosophical Society, by Thomas Jefferson, President of the United States.

The metacarpal bone is ten inches long, and four and a quarter inches in circumference at the middle of its shaft; the tuberosity of the calcaneum is two and a half inches in depth; the metatarsal bone is one foot long, and about five inches in circumference at its middle; the first phalanx is three and three-quarter inches long, and two and a half inches broad at the proximal extremity; the last phalanx measures two and three-quarter inches on its anterior slope, and four inches broad; and the axis is six and a half inches long.

Lastly, the same collection contains a second phalanx, two inches long and two and a quarter inches broad, from Benton county, Missouri, where it was found in association with large quantities of the remains of *Elephas*, *Mastodon*, and *Bootherium cavifrons*.

Since writing the foregoing chapter, which is, however, partially amended, Dr. F. V. Hayden, the zealous geologist and explorer, attached to Lieut. Warren's Expedition to Nebraska, discovered on the Niobrara river, a formation supposed to be Pleiocene, which contains a most wonderful quantity of equine remains, comingled with the remains of many other extinct animals. In the collection of Dr. Hayden, which I have had the opportunity of inspecting, I have detected the remains of apparently eight species of six genera of equine animals. A particular description of these interesting remains is reserved for publication in Lieut. Warren's Report of his Expedition.

H I P P O T H E R I U M . — K A U P .

H I P P A R I O N . — D E C H R I S T O L .

H I P P O T H E R I U M V E N U S T U M .

PLATE XVI. FIGS. 32, 33.

Hipparion venustum, *Leidy*, Proc. Acad. Nat. Sci., Philadelphia, VI, 241.

Among the most interesting of the fossils discovered, by Prof. Holmes and Capt. Bowman, in the Post-Pleiocene beds of the Ashley river, are two molar teeth of a species of the equine genus *Hippotherium*. These were the first remains of the latter discovered in America, and they indicate the smallest known species.

Both specimens are from the upper jaw; and they are well characterized, not only by the isolation of the internal median enamel column, but also by the complex plication of the interior or central enamel columns.

The larger specimen (Plate XVI, fig. 33,) is firm in texture; has the enamel stained jet black, and the dentine and cement gray. It is broken at the bottom, and has lost its inner median enamel column. In its present condition it is two inches in length; and possesses a moderate degree of internal and posterior curvature. Its antero-posterior diameter is eight and a half lines, and its estimated transverse diameter at the middle is seven lines.

The smaller specimen (Plate XVI, fig. 32,) is firm in texture, and brown in color. It is half worn down; tapers toward the root; and is little less than an inch in length. Its inner median enamel column is antero-posteriorly reniform. The breadth of the tooth is seven and a half lines, and the transverse diameter five and a half lines.

Plate XVI, Fig. 33. The triturating surface of a superior molar tooth of *Hippotherium venustum*, the size of nature. Specimen discovered by Prof. Holmes.

Fig. 32. The triturating surface of a superior molar tooth of *Hippotherium venustum*, magnified two diameters. Specimen discovered by Capt. Bowman.

Order, PACHYDERMATA.

Genus, TAPIRUS.—BRISSON.

TAPIRUS AMERICANUS FOSSILIS. TAPIRUS HAYSII.

PLATE XVII. FIGS. 1-12.

Tapir, *Carpenter*, Am. Jour. Sci., xlii, 390; Ibidem, 2d ser., I, 247.

Tapirus Americanus (?) fossilis, *Leidy*, Proc. Acad. Nat. Sci., Phil., IV, 180.

Tapirus Haysii, *Leidy*, Ibidem, VI, 106; VII, 201.

I have personally had the opportunity of inspecting remains of the Tapir, found in Texas, Louisiana, Kentucky, Mississippi, Indiana, Ohio, and South Carolina, proving an extensive range of this animal at one time over the country of the United States.

The late Dr. Carpenter, of New-Orleans, described several portions of jaws with teeth, (Plate XVII, figures 1-6,) from the banks of the Brasos river, near San Fillipe, Texas, and an isolated molar from near Opelousas, Louisiana. The specimens, which were presented by Dr. Carpenter to the Academy of Natural Sciences of Philadelphia, on close comparison are not found to differ from the corresponding parts of the living *Tapirus Americanus*, of South America, more than do a number of examples from the latter species among themselves.

The collection of the Academy of Natural Sciences, also contains an inferior molar tooth of the Tapir, found near Natchez, Mississippi, in association with the remains of *Mastodon*, *Megalonyx*, etc. The specimen corresponds in form and size with its homologue in the recent Tapir.

The collections of Prof. Holmes and Capt. Bowman, from the Post-Pleiocene deposits of the Ashley river, contain a number of small fragments of molar teeth, and one nearly entire and unworn crown of a second lower molar, (figures 11, 12,) which have the same character of form and size as in the living Tapir. Besides these, the same collections contain fragments of lower molars, and two nearly entire crowns of upper molars, (figures 2, 3,) having the exact form of the corresponding teeth of the *T. Americanus*, but larger in size. The more perfect of these specimens are represented in figures 2, 3, Plate XVII.

Dr. Isaac Hays presented to the Academy of Natural Sciences of Philadelphia, an inferior molar tooth of a Tapir, supposed to have been obtained from Big-bone-lick, Kentucky. The specimen corresponds to the penultimate molar of the *T. Americanus*, but is larger; measuring twelve and a half lines antero-posteriorly, and ten and a quarter transversely. This tooth, which is represented in figures 7, 8, Plate XVII, I have suspected to indicate an extinct species, to which the name of *Tapirus Haysii* was given, though it may be questioned if it had not already been noticed by Dr. Harlan, under the

name of *Tapirus mastodontoides*.* The specimen described by Dr. Harlan, on which the latter was founded, is also stated to have been a lower molar, from Big-bone-lick. Mr. Cooper, however, considered the tooth, described by Dr. Harlan, as the first temporary molar of a *Mastodon*,† and in this view he is sustained by M. De Blainville,‡ and also by Dr. Hays, who informs me he had an opportunity of inspecting the specimen.

Col. B. L. C. Wailes has submitted to my examination a fragment of the left side of the lower jaw, of the larger variety of the Tapir, discovered in Mammoth ravine, Adams Co., Mississippi, in association with remains of the *Mastodon* and *Megalonyx*. The specimen represented in figures 4, 5, contains the posterior two molar teeth, which only differ from those of the recent Tapir in their larger size. Comparative measurements of this fossil with the lower jaw of the *T. Americanus*, are as follows:

	RECENT TAPIR.	FOSSIL TAPIR
Depth of lower jaw below penultimate molar,.....	23 lines	26 lines
Antero-posterior diameter of ...“.....“.....	11½ lines	12 lines
Transverse“.....“.....“.....	8½ lines	10 lines
Antero-posterior diameter of last molar,	12 lines	13½ lines
Transverse“.....“.....	8½ lines	10 lines

A lower back molar, of an old individual of the larger variety of the fossil Tapir has been sent to me for examination by Dr. J. G. Norwood. The specimen was obtained by Mr. Francis A. Lincke, from the banks of the Ohio river, near Evansville, Indiana, where it was found with remains of *Megalonyx*, *Bison Americanus*, *Equus*, *Cervus*, and *Canis primævus*. It is represented in figures 9, 10; and it has the crown worn to a level with the bottom of the transverse valley, and has long divergent fangs. Its diameters antero-posteriorly and transversely are nearly equal, being about ten lines.

A short time since, Prof. J. Brainerd, of Cleveland, Ohio, loaned me for examination an interesting specimen, consisting of a much mutilated fragment of the lower jaw, of the smaller variety of the extinct Tapir, partially imbedded in a block of bluish clay. The fragment contains two broken teeth and part of a third; and belonged to a young individual. The specimen, Prof. Brainerd informs me, was found in the valley of Yellow creek, Columbiana Co., Ohio, in an erosion of the coal series, and was covered with thirty feet of clay, two hundred and sixty-two feet above Lake Erie, and one hundred and eighty-six feet above low water in the Ohio river.

* Med. and Phys. Researches, 264; Fauna Americana, 224. Since writing the above, the specimen, upon which Dr. Harlan characterized this supposed species, has been found in his collection, and is now deposited in the cabinet of the Academy of Natural Sciences, Philadelphia. It is undoubtedly a first temporary molar of the *Mastodon*. See Proc. Acad. Nat. Sci., 1858, p. 12.

† Amer. Month. Jour. Geol., Note, 163.

‡ Osteog. Gen.; Tapir, 34.

Genus, DICOTYLES.—Cuv.

DICOTYLES FOSSILIS.

PLATE XVII. FIGS. 13, 14.

Capt. Bowman's collection of Ashley fossils contains specimens of the crowns of the two back molar teeth of the lower jaw, represented in figures 13, 14, Plate XVII, which have almost the same size and form as the corresponding teeth of the collared Peccary *Dicotyles torquatus*. The collection further contains fragments of two upper molar teeth, which had about the same size as those of the *Dicotyles labiatus*. The specimens apparently indicate a different species from the extinct *Dicotyles compressus* of the Western States, and they perhaps belonged to a species different from the recent ones, but the remains are insufficient to determine this question positively.

Genus, ELEPHAS.—LINN.

ELEPHAS AMERICANUS.

PLATE XVIII.

Elephas primigenius, *Blumenbach*, Remains of an extinct elephant found in North America, and referred to this species by numerous authors.

Elephas Americanus, *Leidy*, Ancient Fauna of Nebraska, p. 9.

Small fragments of teeth and bones, usually much water worn, of the extinct elephant, are not unfrequently found in the Post-Pleiocene deposits in the vicinity of the Ashley river.*

Genus, MASTODON.—Cuv.

MASTODON OHIOTICUS.

PLATE XIX. FIGS. 1, 2, 3.

Mastodon Ohioticum, *Oken*.

Mastodon giganteum, *Cuvier*, Ossem. Fos., and many other authors.

Tetracaulodon, *Godman*.

* Since the above was written a perfect tooth has been discovered and figured in Plate XVIII.—(F. S. H.)

Small fragments of teeth and bones, are found in the Post-Pleiocene deposits of Ashley River, apparently referable to the *Mastodon ohioiticus*.*

Genus, SUS.—LINN.

SUS SCROFA.

PLATE XIX. FIGS. 4, 5.

Remains referable to this species, from the shores of the Ashley River, contained in the collections of Prof. Holmes and Capt. Bowman, are believed, by the writer, to appertain to the recent introduced domestic hog.

RUMINANTIA.

Genus, CERVUS.—LINN.

CERVUS VIRGINIANUS.

PLATE XX. FIGS. 1-4.

Remains of a species of deer about the size of the *Cervus Virginianus*, have been found in association with those of extinct animals near Natchez, Mississippi, in New Jersey, and in other localities.

The collections of Prof. Holmes and Capt. Bowman contain fragments of antlers, portions of jaws, and teeth, from the Post-Pleiocene beds of the Ashley river, not differing from corresponding parts of the skeleton of the recent *Cervus Virginianus*, to which species they probably belonged. See figures 1 to 4a, Plate XX.

Genus, BISON.

BISON LATIFRONS.

PLATE XVII. FIGS. 15, 16.

Bos latifrons, *Harlan*, *Fauna Americana* 273; *Med. and Phys. Researches* 276.

† Several perfect teeth of this species have also been discovered since the above was written. See Plate XIX, figs. 1, 2, 3.—(F. S. H.)

Bison latifrons, *Leidy*, Proc. Acad. Nat. Sci. Phil. vi, 117; Mem. on ext. 8 p. of American ox, 8.

Sus Americanus, *Harlan*, Am. Jour. Sci. xliii, 143.

Harlanus Americanus, *Owen*, Proc. Acad. Nat. Sci., Phil., III, 94; Jour. Acad. Nat. Sci., I, 18.

Harlanius, *Owen*, Bronn. Leth. Geog., 846.

Remains of the extinct broad-fronted bison have been discovered in Kentucky, Mississippi, Texas, and Georgia, in association in these different localities with remains of *Elephas*, *Mastodon*, *Megatherium*, *Megalonyx*, *Myiodon*, *Ereptodon*, *Equus*, *Cervus*, *Canis*, *Ursus*, *Felis*, etc.

In the collection of Capt. Bowman, there is a second premolar tooth of the right side of the upper jaw, from the Post-Pleiocene formation of the Ashley river, which I suspect to belong to the *Bison latifrons*. The specimen presents nothing characteristically different from the corresponding tooth of the recent bison. It is represented in figures 15, 16, Plate XVII, and its crown measures eleven lines in antero-posterior and transverse diameter.

Genus, BOS.—LINN.

BOS TAURUS.

PLATE XX. FIGS. 5-9, 9a.

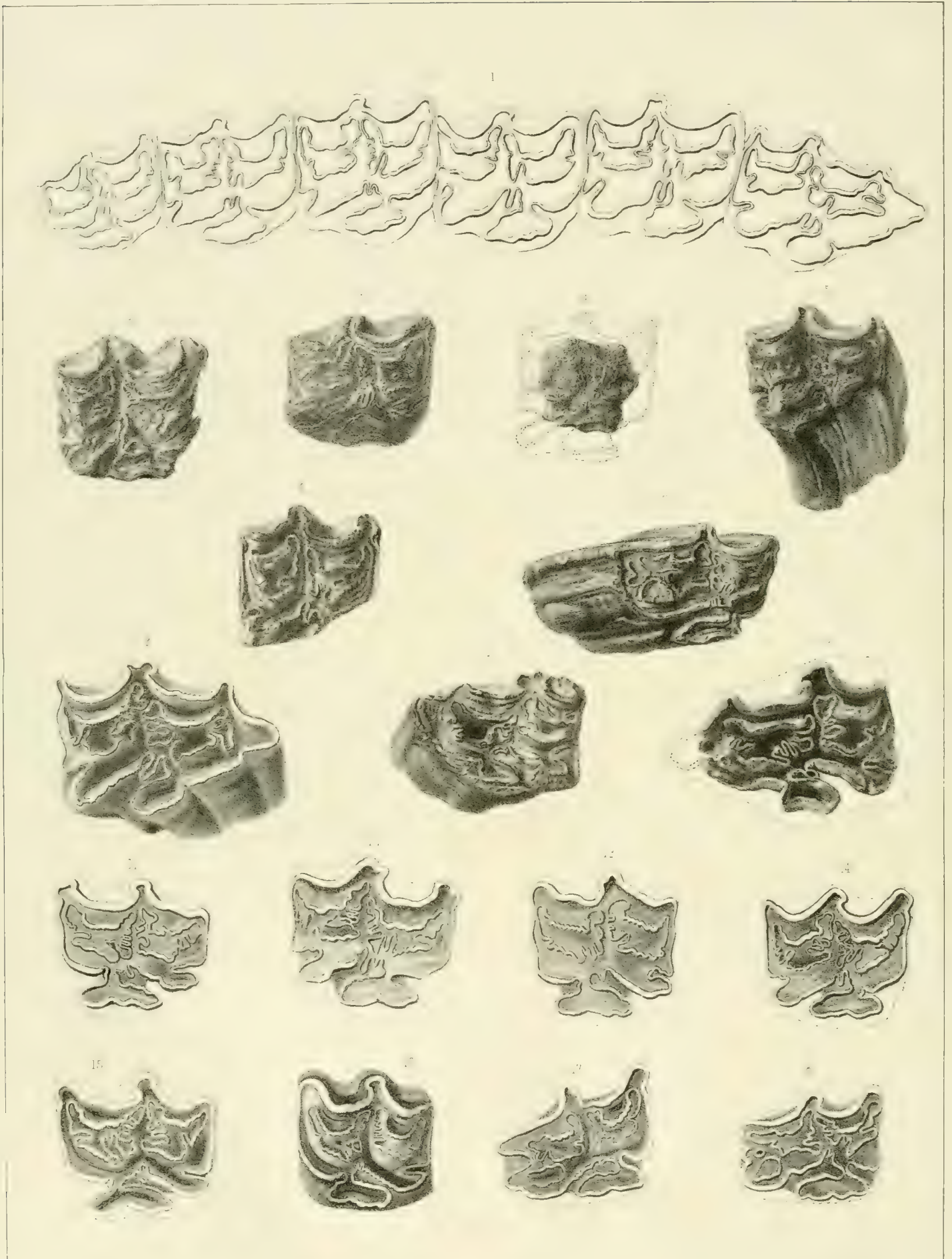
Remains of a species of ox, of the size of the recently introduced domestic animal, found mingled with Post-Pleiocene fossils on the banks of the Ashley river, are considered to belong to the latter.

Genus, OVIS.—LINN.

OVIS AMMON.

PLATE XX. FIGS. 6, 6a.

Remains also of the domestic sheep, are found mingled with the Post-Pleiocene fossils of the Ashley river.



POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XV.

SOLIPEDIA.

- FIG. 1. Series of upper molar teeth, right side, of the domestic Horse. Triturating surfaces, exhibiting the course of the enamel folding. *Page 103.*
- FIGS. 2—5. Upper molar teeth of EQUUS COMPLICATUS, from the Post-Pleiocene deposits of Ashley river, S. C. *Page 103.*
- “ 6. Upper molar of EQUUS FRATERNUS, from Doctor's Swamp, John's Island. *Page 103.*
- “ 7. Last upper molar, EQUUS COMPLICATUS, from Ashley river. *Page 103.*
- “ 8. First upper molar, E. FRATERNUS, from Post-Pleiocene of S. Carolina. *Page 104.*
- “ 9. First upper molar, E. COMPLICATUS, from Illinois Bluffs, Dr. Shumard's collection. *Page 104.*
- FIGS. 11—15. Upper molars, E. COMPLICATUS, from Natchez ravines, Miss. *Page 103.*
- FIG. 16. Upper molar, E. FRATERNUS, from North Carolina. Prof. Emmon's collection. *Page 104.*
- FIGS. 17, 18. Last upper molars, E. FRATERNUS, from Natchez Islands. *Page 104.*

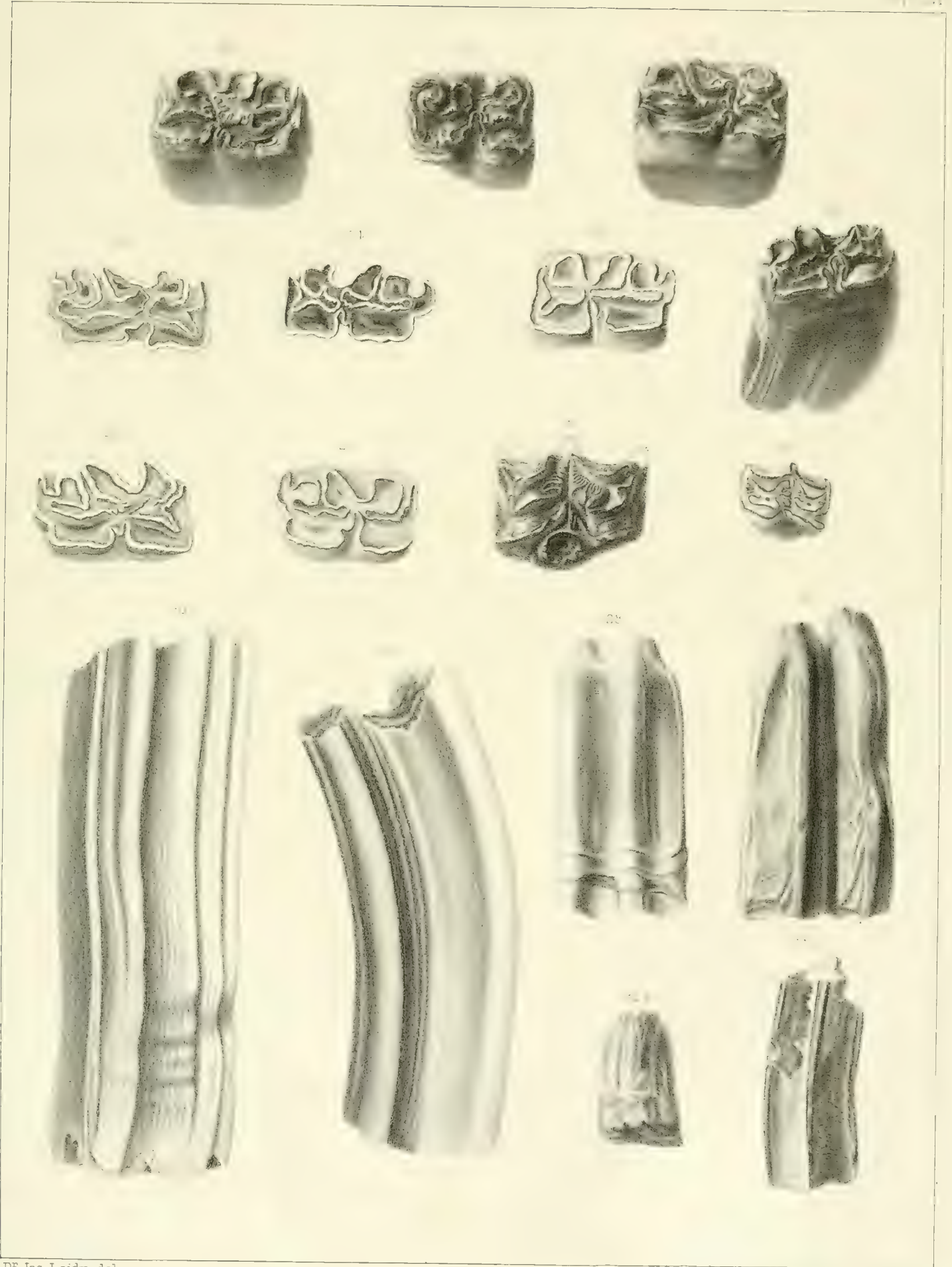
POST-PLEIOCENE FOSSILS.

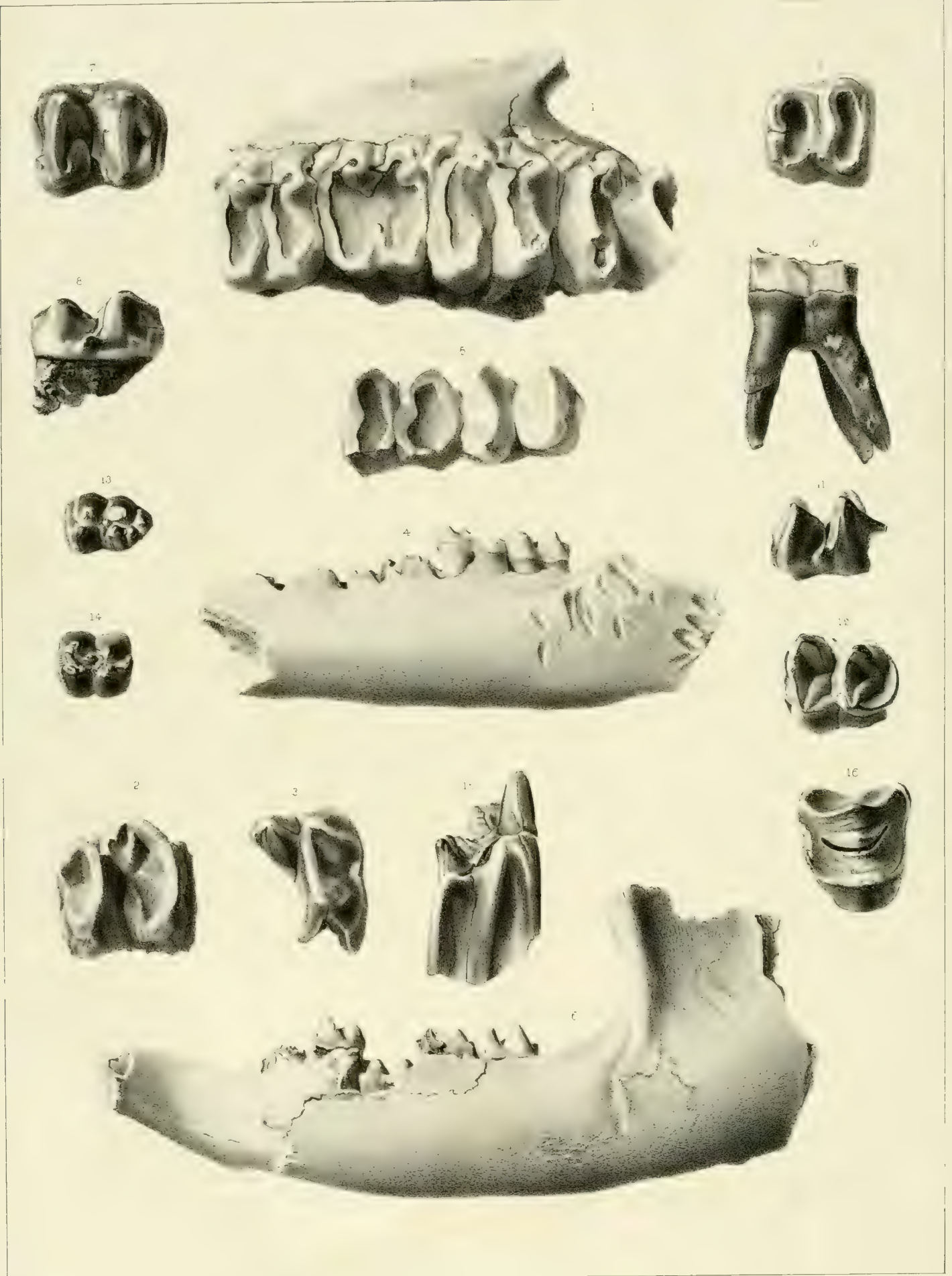
SOUTH-CAROLINA.

PLATE XVI.

SOLIPEDIA.

- FIGS. 19—22. Lower molar teeth of *EQUUS COMPLICATUS* and *E. FRATERNUS*, from the Post-Pleiocene deposits of Ashley river. *Page 112.*
- FIG. 23. Lower molar of *E. FRATERNUS*, from the excavation of the Brunswick Canal, Georgia. J. H. Couper, Esq. *Page 104.*
- FIGS. 24--26. Lower molars, *E. COMPLICATUS*, from the Natchez ravines. *Page 103.*
- FIG. 27. Lower molar, *E. FRATERNUS*, from vicinity of Natchez. *Page 103.*
- “ 28. Outer view of the specimen represented in figure 16, Plate XV. *Page 104.*
- “ 29. Outer view of the specimen represented in figure 3, Plate XV.
- FIGS. 30, 31. Lower and upper molar of *E. COMPLICATUS*, from the Natchez ravines.
- FIG. 32. Upper molar of *HIPPOTHERIUM VENUSTUM*, from the Post-Pleiocene beds of the Ashley river. Magnified two diameters. *Page 105.*
- “ 32a Inner view of the same specimen, of the natural size.
- FIG. 33. Upper molar, *HIPPOTHERIUM VENUSTUM*, from the Ashley river beds. Natural size. *Page 105.*
- FIG. 33a. Outer view of the same specimen.





Otto Koehler del

POST-PLIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XVII.

PACHYDERMATA.—RUMINANTIA.

- FIG. 1. TAPIRUS AMERICANUS FOSSILIS. Fragments of the upper jaw, left side, with the back form molar teeth. From Texas. *Page* 106.
- FIGS. 2, 3. TAPIRUS AMERICANUS FOSSILIS. Portions of the crowns of upper molar teeth from the Ashley river deposits. *Page* 106.
- FIG. 4. TAPIRUS HAYSII. Fragment of the left side of the lower jaw, with the back two molar teeth. One-half the natural size. From Adams Co., Mississippi. *Page* 107.
- “ 5. Triturating surfaces of the teeth of the former specimen. Of the natural size.
- “ 6. TAPIRUS AMERICANUS FOSSILIS. Left side of the lower jaw. Reduced one-half. From Texas.
- FIGS. 7, 8. TAPIRUS HAYSII. Lower molar tooth. From Big-bone-lick, Kentucky. *Page* 106.
- “ 9, 10. TAPIRUS HAYSII. Lower molar tooth. From Indiana. *Page* 108.
- “ 11, 12. TAPIRUS AMERICANUS FOSSILIS. Lower molar tooth, from the Ashley river deposits. *Page* 106.
- “ 13, 14. DICOTYLES FOSSILIS. Two back lower molar teeth, from the Ashley deposits. *Page* 108.
- “ 15, 16. BISON LATIFRONS. Last upper premolar, from the Ashley deposits. *Page* 109.

POST-PLEIOCENE FOSSILS.

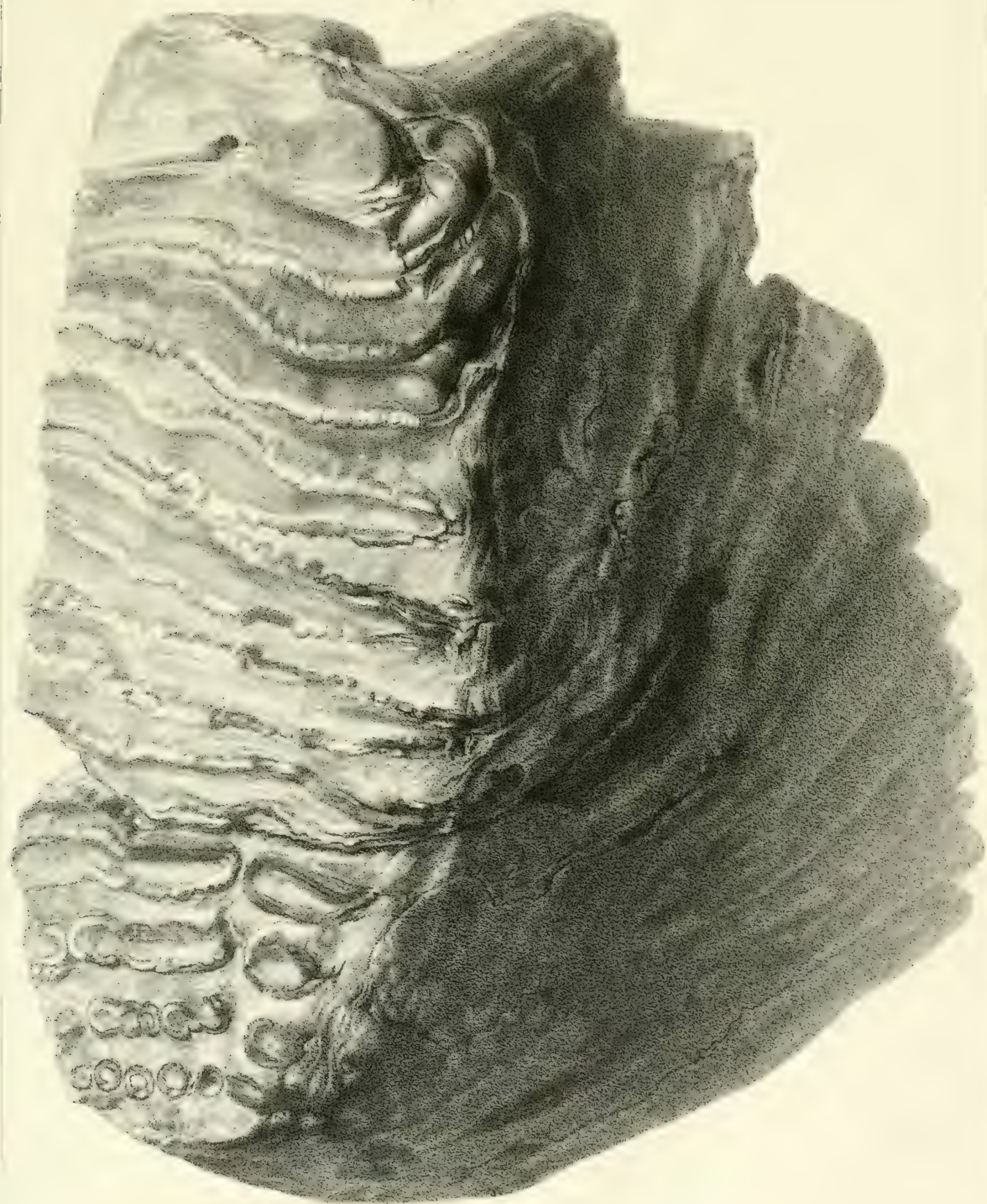
SOUTH-CAROLINA.

PLATE XVIII.

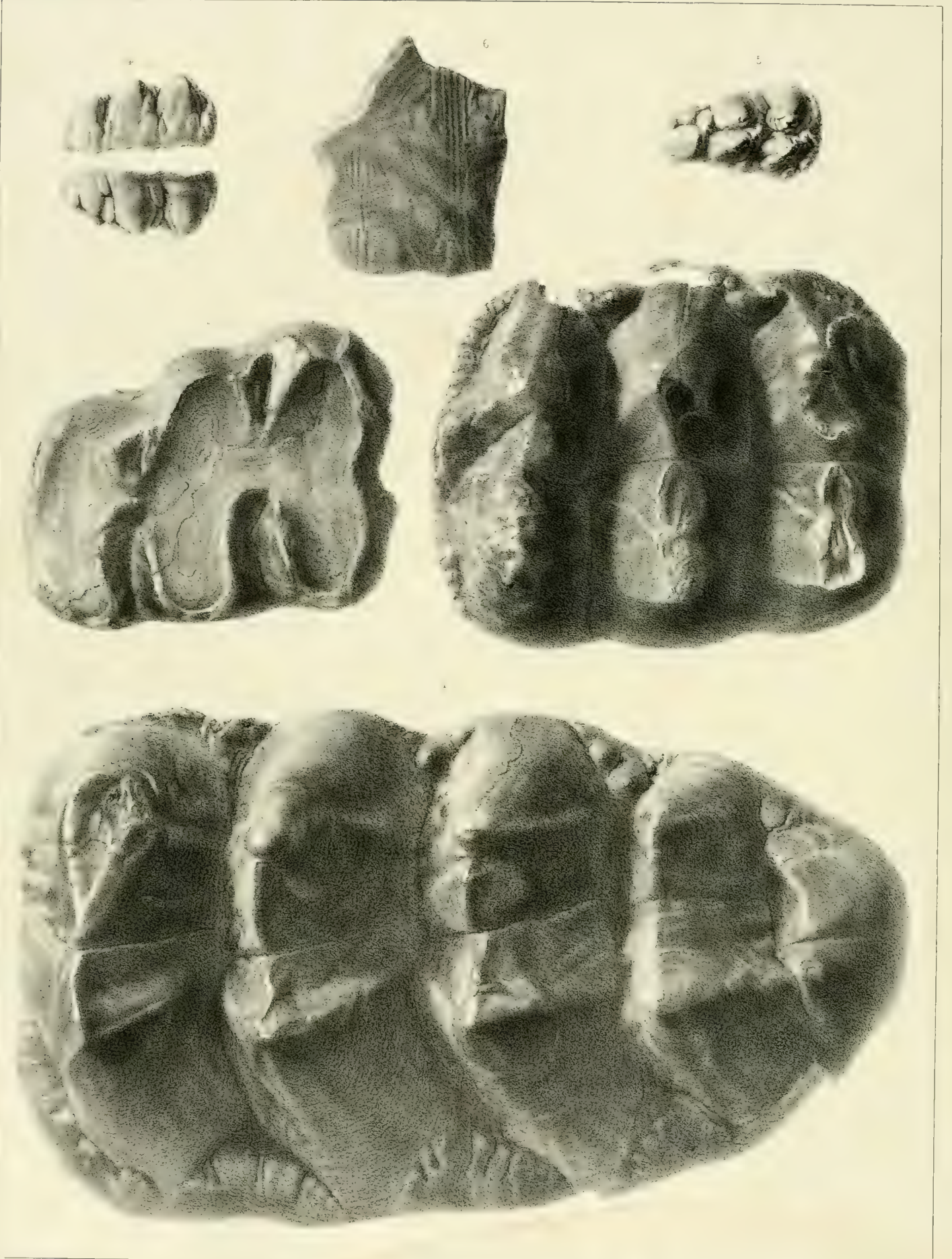
PACHYDERMATA.

FIG. 1. ELEPHAS AMERICANUS. An inferior back molar tooth. From Texas. *Page 108.*

FIG. 1







MAFIPEN. 11. 12. 13.

C G Platen lith

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XIX.

PACHYDERMATA.

FIGS. 1, 2, 3. MASTODON OHIOTICUS. From Dr. L. F. Klipstein, Christ Church. *Page* 108.

FIG. 1. The sixth or last molar tooth. View of the triturating surface. From the same.

" 2. Fifth molar tooth; triturating surface. From the same.

" 3. Fourth molar tooth; triturating surface, much worn. From the same.

" 4. SUS SCROFA. Outer and inner views of the last lower molar tooth. From the Ashley deposits. *Page* 109.

" 5. Triturating surface of the same specimen.

" 6. Fragment of INDIAN POTTERY. From Dr. Klipstein, Christ Church. See appendix to this Volume.

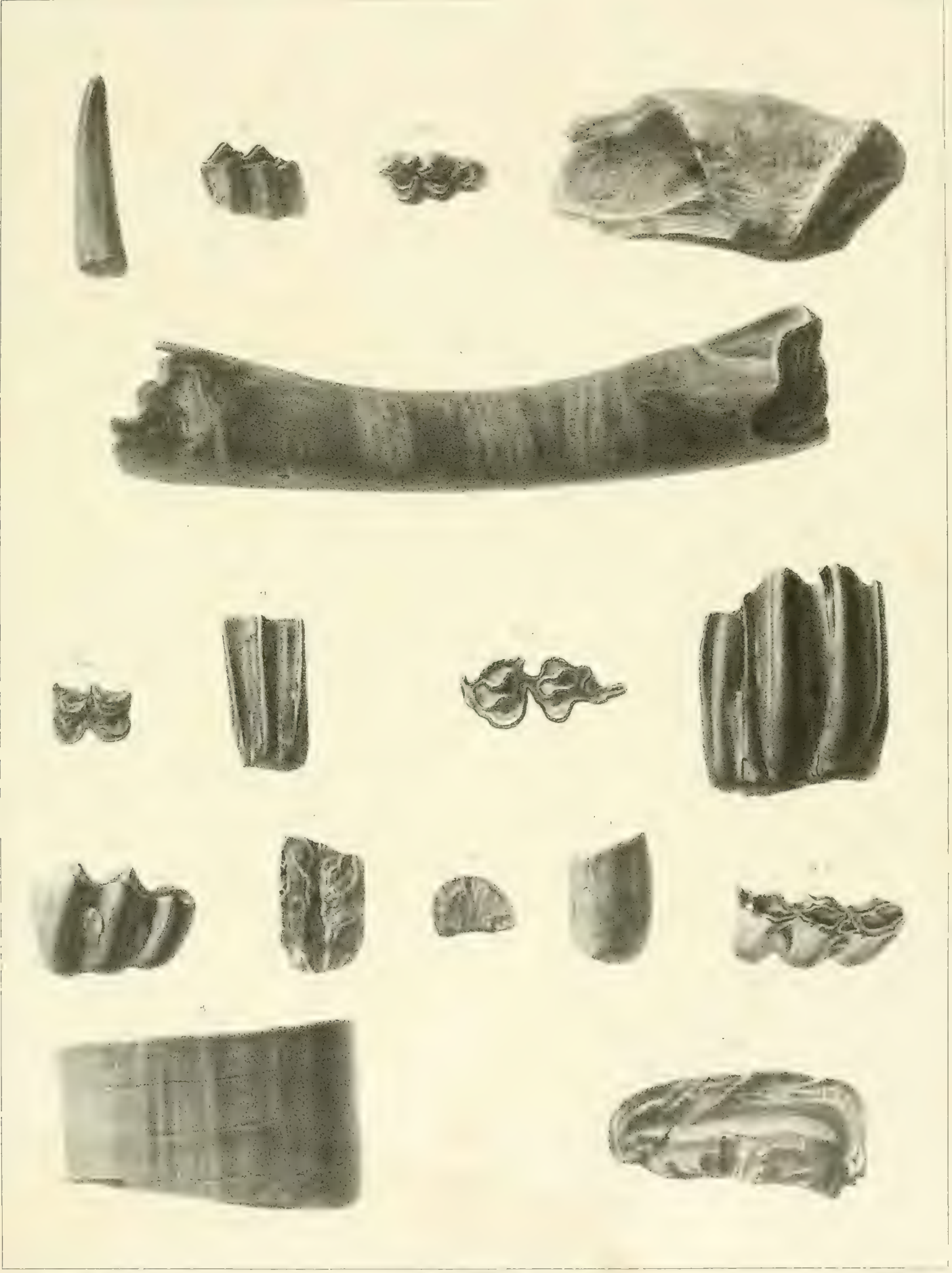
POST-PLIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XX.

RUMINANTIA.—EDENTATA.

- FIGS. 1, 2, 3. *CERVUS VIRGINIANUS*. Fragments of antlers from the Ashley deposits. *Page 109.*
- FIG. 4. Last molar tooth, outer view.
- “ 4a. Triturating surface of the same.
- “ 5. *BOS TAURUS*. Last lower molar tooth, inner view. From the Ashley deposits. *Page 110.*
- “ 5a. Triturating surface of the same.
- “ 6. *OVIS AMMON*. Lower molar tooth, inner view. From the Ashley deposits. *Page 110.*
- “ 6a. Triturating surface of the same.
- “ 9. Last lower temporary molar, outer view.
- “ 9a. Triturating surface of the same.
- FIGS. 7, 7a 7b. *MYLODON HARLANI*. Three views of a fragment of a lower molar tooth. *Page 111.*
- “ 8, 8a. *MEGATHERIUM MIRABILE*. Two views of a fragment of a lower molar tooth.
Page 111.



EDENTATA.

Genus, MEGATHERIUM.—CUVIER.

MEGATHERIUM MIRABILE.

PLATE XX. FIGS. 8, 8a.

Megatherium mirabile, *Leidy*, Mem. Ext. Sloth Tribe, 49, 59.

Several small fragments of teeth of the *Megatherium*, in Prof. Holmes' collection were obtained from the Post-Pleiocene bed of the Ashley river. Previously to the discovery of these specimens, remains of the *Megatherium* had been found in no other locality of North-America, than in the State of Georgia.

Genus, MYLODON.—OWEN.

MYLODON HARLANI.

PLATE XX. FIGS. 7, 7a, 7b.

Eubradys antiquus, *Leidy*, Proc. Acad. Nat. Sci., Phil., VI, 241; Anc. Fauna Nebr., 10; Mem. Ext. Sloth Tribe, 58.

Two small fragments of lower molar teeth of *Mylodon Harlani*, were obtained from the Ashley Post-Pleiocene beds. One of the fragments is represented in figures 21, plate 16, of "a memoir on the extinct Sloth Tribe of North-America," by the author.

RODENTIA.

Genus, CASTOR.—LINN.

CASTOR CANADENSIS.

PLATE XXI. FIGS. 1, 2.

Castor Canadensis, *Kuhl*, Beit. z. Zoologie.Castor Americanus, *F. Cuv.*, Hist. d. Mammif.

Castor fiber, *Say, Harlan, etc.*

Castor fiber, *Wyman, Am. Jour. Sci., 2d ser. X, 61.*

Remains of the Beaver are not unfrequently found throughout the United States, in recent deposits, in localities in which the animal is not now existing. Prof. Wyman has further described remains of the Beaver, found in association with those of *Mastodon*, *Megalonyx*, and *Castoroides*, in the vicinity of Memphis, Tennessee. The cabinet of the Academy of Natural Sciences, of Philadelphia, also contains portions of skulls and jaws with teeth, found together with remains of the Mastodon, in marshes in New-Jersey. Teeth of the Beaver, jet black in color, have likewise been obtained by Prof. Holmes and Capt. Bowman, from the Post-Pleiocene deposit of Ashley river.

Genus, HYDROCHOERUS.—BRISSON.

HYDROCHOERUS AESOPI.

PLATE XXI. FIGS. 3-6.

Oromys Eesopi, *Leidy, Proc. Acad. Nat. Sci., Phila., VI, 241.*

Hydrochoerus Aesopi, *Leidy, Proc. Acad. Nat. Sci., Phila., VIII, 165.*

In 1853 I received from Prof. Holmes a small fragment of an incisor tooth, obtained from the Post-Pleiocene deposit of the Ashley river. The specimen I suspected to indicate a large rodent animal, allied to the South-American *Hydrochoerus capybara*, and characterized it under the name of *Oromys Aesopi*. Capt. Bowman's collection of fossils, from the Ashley river beds, subsequently received, was found to contain portions of two molar teeth, which prove the former specimen really to have belonged to a species of *Hydrochoerus*. More recently Prof. Holmes obtained an additional fragment of a molar tooth, from the Ashley Post-Pleiocene deposit.

The fragment of an incisor referred to, belonging to the lower jaw, is a little more than an inch in length, and measures five lines in breadth, but does not differ from the corresponding portion of the same tooth in the recent *Capybara*, except that the enamel is more strongly ridged, longitudinally, than in any of the specimens with which it was compared.

Of the two portions of molar teeth, of Capt. Bowman's collection, both belong to the left side of the lower jaw. One of them consists of the posterior three enamel folds or columns of the second tooth in the series, and the other consists of the anterior two columns of the last tooth. The former specimen measures four-and-a-half lines transversely and antero-

posteriorly; and the latter measures six-and-a-half lines transversely, two-and-a-half lines antero-posteriorly. Neither differ, in any important character, from the corresponding portions of their homologues in the recent *Capybara*.

The portion of a molar, of Prof. Holmes' collection, consists of the anterior pair of columns of the third tooth of the left series of the lower jaw.

Genus, LEPUS.—LINN.

LEPUS SYLVATICUS.

PLATE XXII. FIG. 1.

Lepus sylvaticus, *Bachman, Leidy*, Trans. Amer. Phil. Soc.

Remains, apparently, of the common Gray Rabbit have been found in association with those of other rodents, and of the extinct Peccary, near Galena, Illinois.

A few specimens of molar teeth, black in color, apparently belonging to this species, were obtained by Prof. Holmes and Capt. Bowman, from the Post-Pleiocene beds of the Ashley river.

Genus, FIBER.—CUV.

FIBER ZIBETHICUS.

PLATE XXII. FIGS. 1-4.

Fiber zibethicus, *Cuvier, Harlan, etc.*

The collections of Prof. Holmes and Capt. Bowman contain numerous specimens of blackened molar teeth, together with a few incisors and fragments of jaws, from the Ashley Post-Pleiocene deposit, which neither differ in form nor size from the corresponding parts of the recent Musk-rat.

Genus, *CASTOROIDES*.—FOSTER.*CASTOROIDES OHIOENSIS*.

PLATE XXII. FIGS. 5-8.

Animal of the order Rodentia, Amer. Jour. Sci., XXI, 80.

Castoroides Ohioensis, Foster, Second Rep. Geol. Surv. Ohio, 81; Hall and Wyman, Brit. Jour. Nat. Hist., V, 385; Wyman, Am. Jour. Sci., 2d s. X, 62.

Remains of this most huge of all rodent animals, according to Prof. Wyman, have been discovered in New-York, Ohio, Tennessee, and Louisiana.* The cabinet of the Academy of Natural Sciences, of Philadelphia, contains the greater portion of an upper incisor, two upper molars, and two petrous bones of this animal, which were obtained in digging a well, forty feet below the surface, near Shawneetown, Illinois. In Plate XXII, figure 5, is represented the upper incisor above referred to.

Prof. Holmes' collection contains a small fragment of an incisor and of an upper molar tooth, from the Post-Pleiocene deposit of Ashley river.

Though the skull of *Castoroides* resembles that of the Beaver, the teeth differ totally in their form and constitution. The molar teeth of the former are constructed upon the same plan as those of the Capybara, consisting of a series of flat columns of dentine invested with enamel and held together by cement.

The upper incisors in section form a half ellipse with the plane inward. The antero-external convex surface is invested with thick and strongly fluted enamel, and the posterior surface is smooth and concave. The cutting extremity of these teeth is worn away as in the Musk-rat, that is to say into a deep depression on the inner side of the beveled surface. The lower incisors are trilateral in section, the inner and posterior sides smooth and slightly depressed, and the antero-external surface convex and invested with enamel as in the corresponding upper teeth.

The fluting of the enamel surfaces of the incisors extends in a well-marked manner into the dentine.

* Amer. Jour. Sci., 2d s. X, 64.

CARNIVORA.

Genus, PROCYON.—STORR.

PROCYON LOTOR.

PLATE XXIII. FIG. 1.

Procyon lotor, Storr, Prod. Meth. Anim., 1780.

Procyon lotor, Desmarest, Audubon, Bachman, etc.

The collections, of Prof. Holmes and Capt. Bowman, from the Ashley Post-Pleiocene deposit, contain molar teeth, black in color, not differing in form and size from those of the recent Raccoon.

PLATE XXIII. FIG. 1, *Right side lower maxillary bone of the Raccoon, shaded tooth, a fossil, from the Ashley beds.*

LOCALITY. Ashley Ferry.

Museum, College of Charleston.

Genus, ARCTODUS.—LEIDY.

ARCTODUS PRISTINUS.

PLATE XXIII. FIGS. 3, 4.

Arctodus pristinus, Leidy, Proc. Acad. Nat. Sci. Phila., VII, 90.

The collection of Capt. Bowman contains the crown of a molar tooth from the Post-Pleiocene deposit of the Ashley river, which I suspect to indicate an extinct animal allied to the Bear. The specimen most resembles the corresponding portion of the lower left penultimate molar of the latter. It is oblong-oval in outline and is broader anteriorly than posteriorly, being the reverse condition to that in the Bear. On the inner side it is straight and nearly vertical, and on the outer side is convex and more deeply and equally bilobed than what appears to be its homologue in the latter animal. The triturating surface (Plate XXIII, figure 3), as in the Bear, is an oblong, superficial depression surrounded by a chain of hill-like tubercles, of which the largest pair extend across the anterior part of

the crown. The enamel is strongly corrugated; and the specimen measures eleven-and-a-half lines antero-posteriorly and eight lines at its widest part transversely.

PLATE XXIII. FIG. 3, *Penultimate lower molar; view of the triturating surface.*

“ 4, *Lateral view of same specimen, with restored fangs in outline.*

LOCALITY. Ashley Ferry.

Museum, College of Charleston.

Genus, CANIS. — LINN.

CANIS FAMILIARIS.

PLATE XXIV. FIG. 1.

Teeth and bones of the domestic Dog are found mingled with the Post-Pleiocene fossils on the shores of the Ashley river.

PLATE XXIV. FIG. 1, *Anterior portion of the skull of the dog. The shaded teeth indicate the fossils from the Ashley beds.*

Museum, College of Charleston.

MARSUPIALIA.

Genus, DIDELPHYS. — LINN.

DIDELPHYS VIRGINIANA.

PLATE XXIII. FIG. 2.

Didelphys Virginiana, Shaw, Gen. Zool. I, 1800.

Didelphys Virginiana, Desmarest, Harlan, Audubon, and Bachman, etc.

The fragment of a lower jaw, containing the last molar tooth, of an opossum, was obtained from the Post-Pleiocene formation of Doctor's Swamp, John's Island, ten miles south-west of Charleston.

PLATE XXIII. FIG. 2, *Left lower maxillary of Opossum; the shaded portion indicates the fossil fragment from John's Island.*

Museum, College of Charleston.

SIRENA.

Genus, MANATUS.—RONDELET.

MANATUS ANTIQUUS.

PLATE XXIV. FIG. 5—7.

Manatus antiquus, *Leidy*, Proc. Acad. Nat. Sci., Phil., VIII, 165.

Remains of the *Manatus* have been noticed in the later Tertiary deposits of New Jersey, Maryland, Virginia, and North-Carolina.

The cabinet of the Academy of Natural Sciences, of Philadelphia, contains the rib of a species of *Manatus* from the Miocene marl of New-Jersey. The collection of fossils, from the Ashley river Post-Pleiocene beds, contains a small fragment of a large rib of the *Manatus*, and among the fossils, of Capt. Bowman, from the same locality, there is a molar tooth perhaps of the same species. The tooth (Plate XXIV, figure 5,) most nearly resembles the sixth or seventh molar of the right side of the upper jaw of *Manatus latirostris*, Harlan, than which it is considerably larger. It has no anterior basal ridge as in the latter species, but from both of the inner lobes the summits are prolonged in a curvilinear manner to the middle of the outer lobes. The antero-posterior and transverse diameters of the specimen are about nine-and-a-half lines.

PLATE XXIV. FIG. 5, *Inner view of upper molar.*

“ 6, *View of the triturating surface of the same.*

“ 7, *Outer view of the same.*

LOCALITY Ashley beds.

Museum, College of Charleston.

Genus, PHYSETER.

PHYSETER ANTIQUUS.

PLATE XXIV. FIGS. 8, 9.

Physeter antiquus, *Leidy*, Proc. Acad. Nat. Sciences, Phila., VI, 378.

Remains of Spermaceti Whales, apparently of the same species, have been discovered in the Post-Pleiocene deposits of South Carolina and in the Miocene formations of Virginia.

The remains, consisting of teeth and vertebræ, though presenting no character of importance by which to distinguish them from the recent Spermaceti Whale, nevertheless, are supposed to indicate a different species on account of their great age. A tooth of the *Physeter antiquus*, being the best of several specimens found in the Ashley Post-Pleiocene beds, is represented in figure 8 of Plate XXIV. It is of small size compared with the large ones frequently seen from the recent species, and although it is as large as any of the fossils we have had the opportunity of inspecting, the difference in size may depend on the difference of age of the individuals. Fig. 9, of the same plate, represents a tooth of quite perfect and recent appearance, discovered in an excavation in the vicinity of Charleston, which Prof. Holmes supposes to belong to the same species as the fossils of the Ashley beds.

PLATE XXIV. FIG. 8, *Lower tooth of Physeter antiquus, Leidy, from Ashley beds.*
 " 9, *Another tooth of more recent appearance, from Charleston beds.*

Museum, College of Charleston.

LEPIDOSTEIDÆ.

Genus, LEPIDOSTEUS.—LACEPÈDE.

LEPIDOSTEUS BISON?

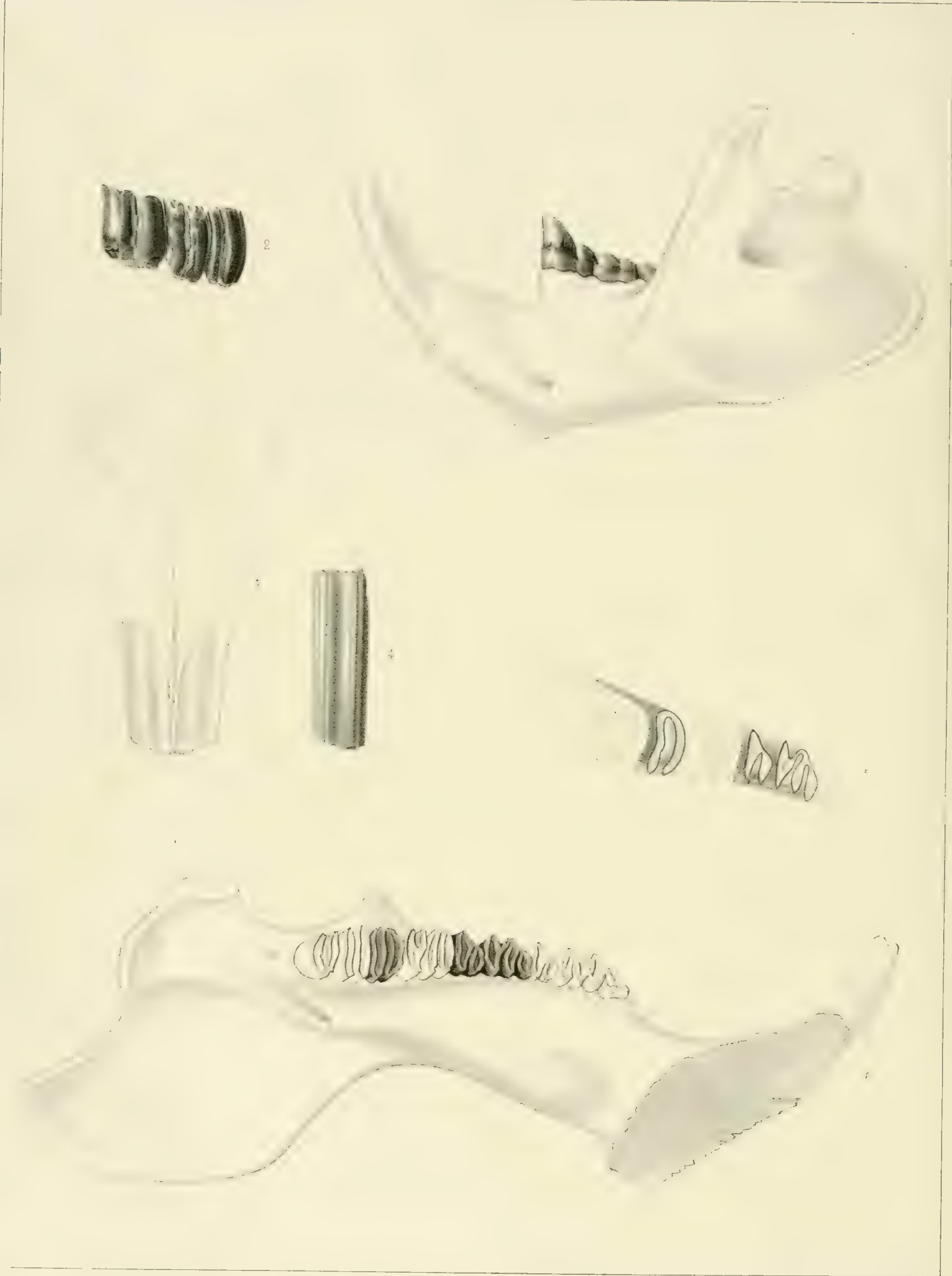
PLATE XXV. FIG. 1.

Some small fragments of jaws, with teeth, of a species of *Lepidosteus*, have been found among the Ashley river fossils. One of these specimens is represented, at *a*, figure 1, Plate XXV, in position in its relation with the skull of the existing *Lepidosteus bison*.

PLATE XXV. FIG. 1, *Skull of recent Lepidosteus; shaded portion indicates the fossil fragment.*

LOCALITY. Simmons'.

Museum, College of Charleston.



POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XXI.

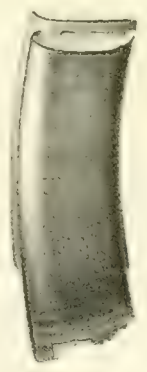
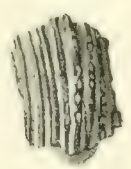
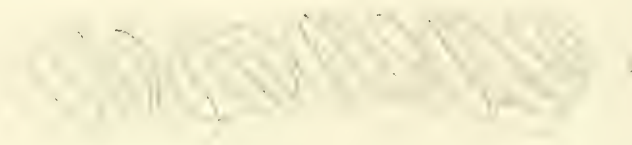
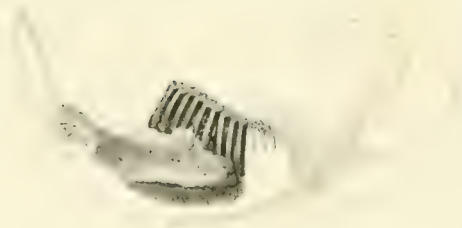
- FIG. 1. CASTOR CANADENSIS. Left lower maxillary bone. From a recent specimen.
- " 2. CASTOR CANADENSIS. Lower molar teeth. Fossils from the Ashley beds. *Page 111.*
- " 3. HYDROCHÆRUS CAPYBARA. Front view of upper jaw and incisors. From a recent skull.
- " 4. HYDROCHÆRUS ÆSOPI, Leidy. Fragment of an upper incisor. Fossil from Ashley river. *Page 112.*
- " 5. HYDROCHÆRUS ÆSOPI, Leidy. A series of lower molars; the shaded parts indicating the fossil specimens from the Ashley beds.
- " 6. HYDROCHÆRUS, recent. Left lower maxillary bone. The shaded teeth indicating the position of fig. 5.

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XXII.

- FIG. 1. *LEPUS SYLVATICUS*, or common Gray Rabbit. Left lower maxillary bone. The shaded teeth indicate the fossils found in the Ashley beds. *Page 113.*
- “ 2. *FIBER ZIBETHICUS*, or Musk-Rat. Fragment of right lower maxillary bone, with teeth. From the Ashley beds. The restored outline of the jaw from a recent specimen. *Page 113.*
- FIGS. 3, 4. Incisors of the same, from the Ashley.
- FIG. 5. *CASTOROIDES OHIOENSIS*, from Shawnetown, Illinois. Side view of an upper incisor. Specimen in the collection of the Academy of Natural Sciences, Philadelphia. *Page 114.*
- “ 6. Small fragment of an incisor of the same animal from the Ashley beds.
- FIGS. 7, 8. Fragments of molar teeth from the same locality.
- FIG. 9. Series of lower molars, in outline, from a specimen, found near Memphis, Tennessee, and now in the Cabinet of the Academy.





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POST-PLEIOCENE FOSSILS.
SOUTH-CAROLINA.

PLATE XXIII.

- FIG. 1. PROCYON LOTOR, the Raccoon. Right lower maxillary bone. The shaded penultimate molar indicates a fossil from the Ashley beds. *Page* 115.
- " 2. DIDELPHYS VIRGINIANA, the Opossum. Left lower maxillary bone. The shaded portion indicates a fossil fragment from John's Island. *Page* 116.
- " 3. ARCTODUS PRISTINUS, Leidy. Penultimate lower molar. View of the triturating surface.
- " 4. Lateral view of the same specimen, with the fangs restored in outline. *Page* 115.

POST-PLIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XXIV.

- FIG. 1. *CANIS FAMILIARIS*, the Dog. Anterior portion of the skull. The two shaded molar teeth indicate fossils from the Ashley deposit. *Page 116.*
- " 2. Astragalus of the Deer, from the Ashley beds.
- " 3. Phalanx undetermined, from the Ashley beds.
- " 4. Phalanx undetermined; from the Ashley beds.
- " 5. *MANATUS ANTIQUUS*, Leidy. Inner view of an upper molar. From the Ashley beds
- " 6. View of the triturating surface of the same specimen. *Page 116.*
- " 7. Outer view of the same.
- " 8. *PHYSETER ANTIQUUS*, Leidy, ancient sperm whale. Lower tooth. Fossil from the Ashley beds. *Page 117.*
- " 9. Tooth similar to the above, but of more recent appearance; found in the Charleston beds.



Genus, XIPHIAS.—LINN.

XIPHIAS ROBUSTUS.

PLATE XXVII. FIGS. 3-5.

Remains of an extinct species of Sword-fish, are frequent in the Eocene formations of South Carolina, to which the above name has been given. The anterior extremity of the mouth of this species is represented in figure 5, Plate XXVII. Small fragments of jaws, apparently of the same species, as represented in figures 3 and 4 of the above plate, have likewise occasionally been found in the Post-Pleiocene beds of the Ashley river.

PLATE XXVII. FIGS. 3 and 4, *Fragments of Xiphias robustus, Leidy.*

“ 5, *Extremity of the upper jaw from the Eocene.*

LOCALITY. Ashley beds.

Museum, College of Charleston.

Genus, PASTINACA.—CUV.

PASTINACA HASTATA?

PLATE XXVII. FIGS. 1, 2.

Remains of a Sting-ray, consisting of the fragment of a spine, and a pair of co-ossified vertebræ were found in the Post-Pleiocene deposit of Simmon's Yorges Island.

Family, SQUALIDÆ.

The sharks are represented in the collection of Pleiocene and Post-pleiocene fossils, by a dozen specimens of teeth, apparently belonging to five different species, but they are suspected by the writer to appertain to the Eocene period.

Two of the teeth, the largest specimen of the collection, of which one is represented in figures 1, 2, of Plate XXVI, have the form of the anterior-superior teeth of certain existing species of *Carcharias*, but appear to be solid as in the genus *Carcharodon*. The crown is moderately thick and straight, with the lateral borders equally curved and coarsely denticulate. The enamel is smooth, and there are no lateral cusps. The inner surface of the root slopes outwardly, and presents at its middle a vascular foramen. The points of the roots are bent outwardly; and the intervening surface externally is concave.

Two small teeth of the collection, represented in figures 3, 4, of Plate XXVI, resemble inferior teeth of the existing *Carcharias Milberti?* of our coast. The crown of the smaller specimen has its lateral borders obscurely denticulate. The larger specimen has the base of its crown widely expanded, and the lateral borders distinctly denticulate. The root in both specimens, internally at the middle, is divided by a vertical sulcus.

A single tooth, represented in figures 5 and 6 of Plate XXVI, belongs to the genus *Lamna*. The crown is smooth externally, and slightly corrugated towards the base internally. On each side it is provided with a small uncinatè denticle. The root is thick, prominent, and divided by a sulcus at the middle internally; and has its extremities prolonged downward.

Another tooth, represented in figure 7 of Plate XXVI, belongs to the genus *Galeocerdo*. The anterior border of the crown is distinctly denticulated; the upper portion of the posterior is feebly so, and the lower expanding portion coarsely.

A minute tooth, represented in figure 8 of Plate XXVI, has a trilobate crown, with a thick, quadrate root.

The remaining specimens, of which several are represented in figures 9–14, of Plate XXVI, appear to be symphysial and extreme lateral teeth. They have a conical, uncinatè crown, with an expanded base, and a wide, thick, trilobed root. We are unable to refer them to any genus; perhaps they belong to *Carcharodon*.

ISCHYRHIZA.—LEIDY.

ISCHYRHIZA MIRA.—LEIDY.

PLATE XXV. FIGS. 3–9.

Ischyrhiza mira, *Leidy*, Proc. Acad. Nat. Sci.

Ischyrhiza antiqua, *Leidy*, Proc. Acad. Nat. Sci.

Ischyrhiza antiqua, *Leidy*, Emmons' Rep., N. C., Geol. Surv., p. 225.

Teeth of a large sphyrenoid fish have been discovered in the green sand formation of New Jersey and Mississippi, and upon the Neuse river, North Carolina, which have been referred to an extinct genus under the name of *Ischyrhiza*. Figures 3–8 of plate XXV, represent the teeth of the same genus discovered in South Carolina.

All the specimens which have come under the inspection of the author are imperfect, except the one represented in plate XXV; nor have we been able to arrive at a positive conclusion whether they indicate more than a single species. If they belonged to one

species, the localities in which its remains have been found, would prove it to have extended from the green sand period, through the tertiary period, and to have become extinct just prior to the present period.

The teeth correspond with the largest anterior teeth of both upper and lower jaws of the *Barricuda* (*Sphyræna barricuda*), but indicate a much more powerful and equally voracious fish.

The specimen represented in figures 3 and 4 exhibits well the form of these remarkable teeth. Its crown inverted, with smooth shining enamel, is laterally compressed conical, with an antero-posterior sigmoid flexure in the length. Two-thirds of the posterior border from the point, and the whole of the anterior border are trenchant. The apex is rather abruptly pointed, and appears to be inserted with thicker enamel than the other portion of the crown.

The root or fang of the tooth presents a remarkable anatomical character in its gradual expansion to the base of attachment to the jaw. It is nearly as long as the crown is quadrilateral, and slightly unsymmetrical. Its base is divided antero-posteriorly by a broad cleft, deepening in front and behind, and on the outer sides is vertically grooved.

The teeth of the *Ischyrrhiza* have a cavity in the interior, extending from the fang into the crown, but presenting no communication with the exterior.

PLATE XXV. FIG. 3, *Lateral view of a tooth of Ischyrrhiza mira, Leidy.*

“ 4, *Anterior view of the same specimen.*

“ 5, *Lateral view of another specimen.*

“ 6, *Anterior view of the same.*

“ 7, *Base view of the same.*

“ 8, *Base view of figs. 3 and 4.*

LOCALITY No. 3. Ashley beds.

No. 5. Darlington, (Miocene?)

Museum, College of Charleston.

TRICHIURUS.

TRICHIURUS LEPTURUS FOSSILIS.

PLATE XXV. FIG. 2.

Teeth of a ribbon fish, not differing in form nor size from the large anterior teeth of the upper jaws of the existing *Trichiurus lepturus*, have been discovered by Prof. Holmes in the Post-Pleiocene formation at Simmons'.

Two of the specimens represented in figure 2 of plate XXV, exhibit the remarkable

characters of these teeth. In form they are elongated conical, compressed laterally and curved backward; with the anterior border trenchant, and with the apex barbed posteriorly.

PLATE XXV. FIG. 2, *Skull of recent Ribbon fish; the two large barbed teeth shaded, indicate the fossils from Simmons'.*

Museum, College of Charleston.

Genus, ALLIGATOR. — CUV.

ALLIGATOR MISSISSIPIENSIS.

PLATE XXVII. FIGS. 6, 7.

Remains, consisting usually of much mutilated teeth or fragments, referable to the Alligator, are frequently found among the Post-Pleiocene fossils of the Ashley river. Fig. 7, Plate XXVII represents two specimens of teeth from this locality.

PLATE XXVII. FIG. 6, *Right side lower jaw of the Alligator, reduced to one-fifth natural size.*

“ 7, *Two teeth fossil from Ashley beds.*

Museum, College of Charleston.

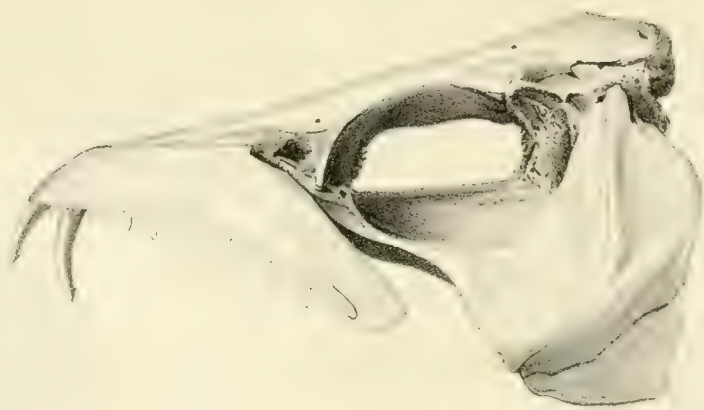
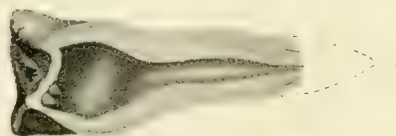
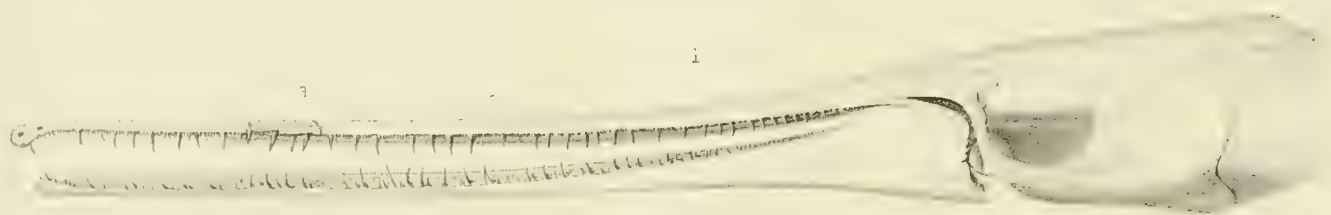
CHELONIA.

Genus, TESTUDO. — BRONGNIART.

PLATE XXVIII. FIGS. 1-4.

Remains of several species of Turtles are found in the Post-Pleiocene deposit of the Ashley river. In Plate XXVIII, figure 1, the vertebral extremity of a costal plate of a huge species is represented. The specimen measures at its widest part six inches, from which position it narrows outwardly. In thickness the specimen measures an inch and a quarter.

The remaining figures of the same plate exhibit the fragment of a costal plate and two marginal plates of a smaller, and perhaps a different species of Turtle from the former.



Charleston, So Ca

POST-PLIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XXV.

- FIG. 1. Skull of LEPIDOSTEUS, or the recent Gar fish. The small shaded portion of the jaw, marked (2) indicates a fossil fragment, apparently of the same species from the Ashley beds. *Page 118.*
- " 2. Skull of recent TRICHIURUS, or the Ribbon fish. The two anterior, large, barbed teeth, indicating fossil specimens from Simmons'. *Page 121.*
- " 3. Lateral view of a tooth of ISCHYRHIZA MIRA, Leidy. *Page 120.*
- " 4. Anterior view of the same specimen.
- " 5. Lateral view of another specimen.
- " 6. Anterior view of the same.
- " 7. Bare view of the same.
- " 8. Bare view of Figs. 3, 4.
- " 9. Interior view of a specimen from the Green Sand of New Jersey, exhibiting the central cavity.

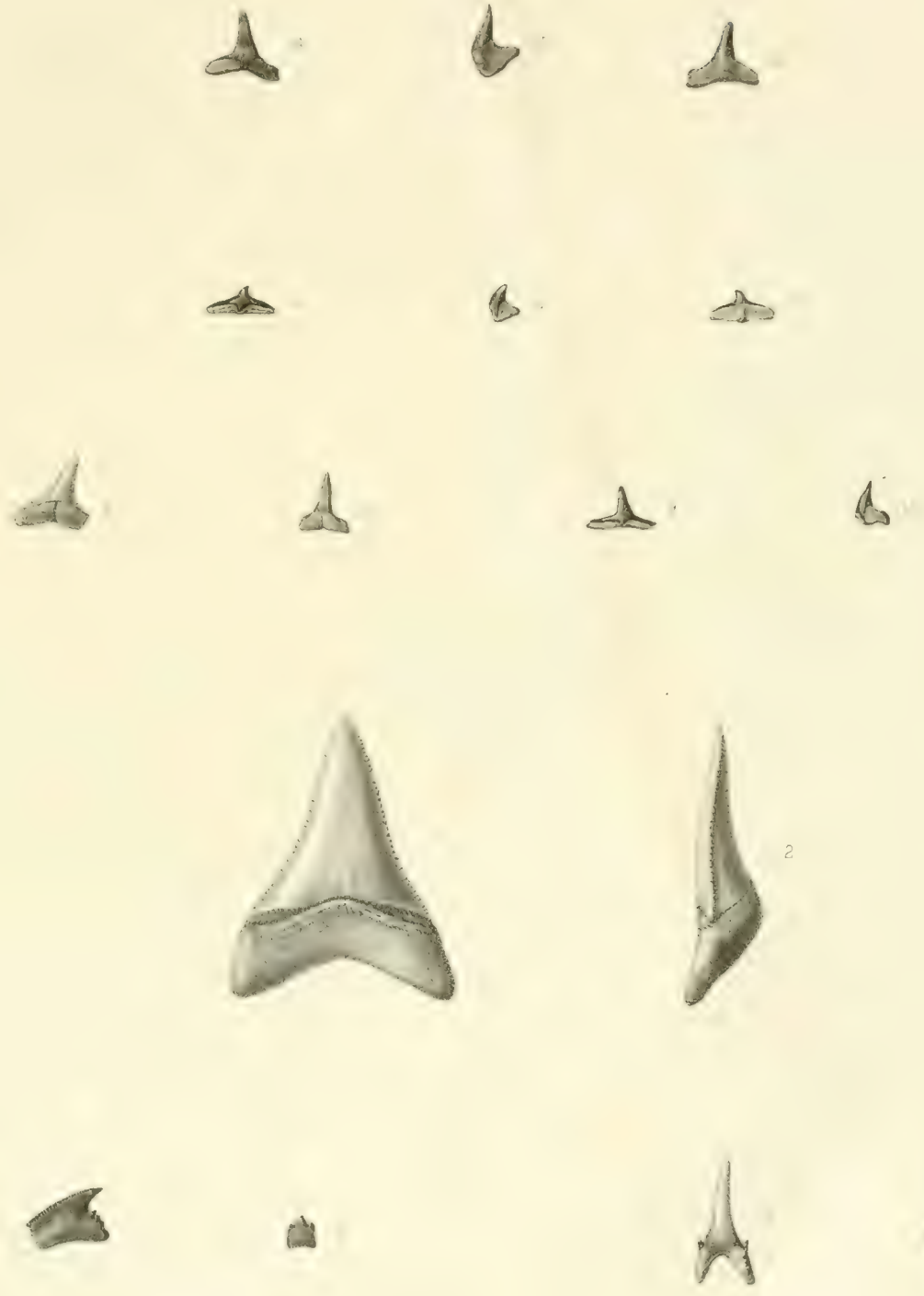
POST-PLEIOCENE FOSSILS.

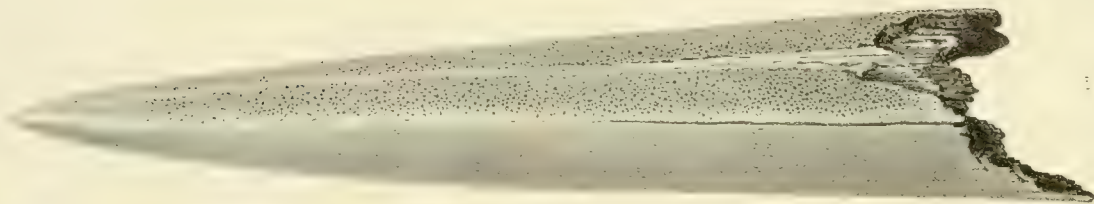
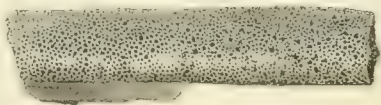
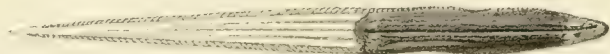
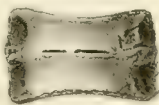
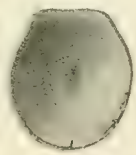
SOUTH-CAROLINA.

PLATE XXVI.

- FIG. 1. Front view of a tooth of *CARCHARODON*.* *Page* 119.
" 2. Lateral view of the same specimen.
FIGS. 3, 4. Two small teeth resembling those of the existing *CARCHARIAS MILBERTI*.
" 5, 6. Front and lateral views of a tooth of *LAMNA*. *Page* 119.
FIG. 7. Tooth of *GALEOCERDO*. *Page* 119.
" 8. Sixteen various small teeth of sharks, undetermined.

* A monograph on the fossil shark teeth of South Carolina will be published in the volume, on the Eocene Fossils of this work.





POST-PLEIOCENE FOSSILS:

SOUTH-CAROLINA

PLATE XXVIII.

FIG. 1. Fragment of a costal plate of a large extinct Turtle, TESTUDO. One half the diameter of nature.

" 2. Fragment of a costal plate of a smaller species.

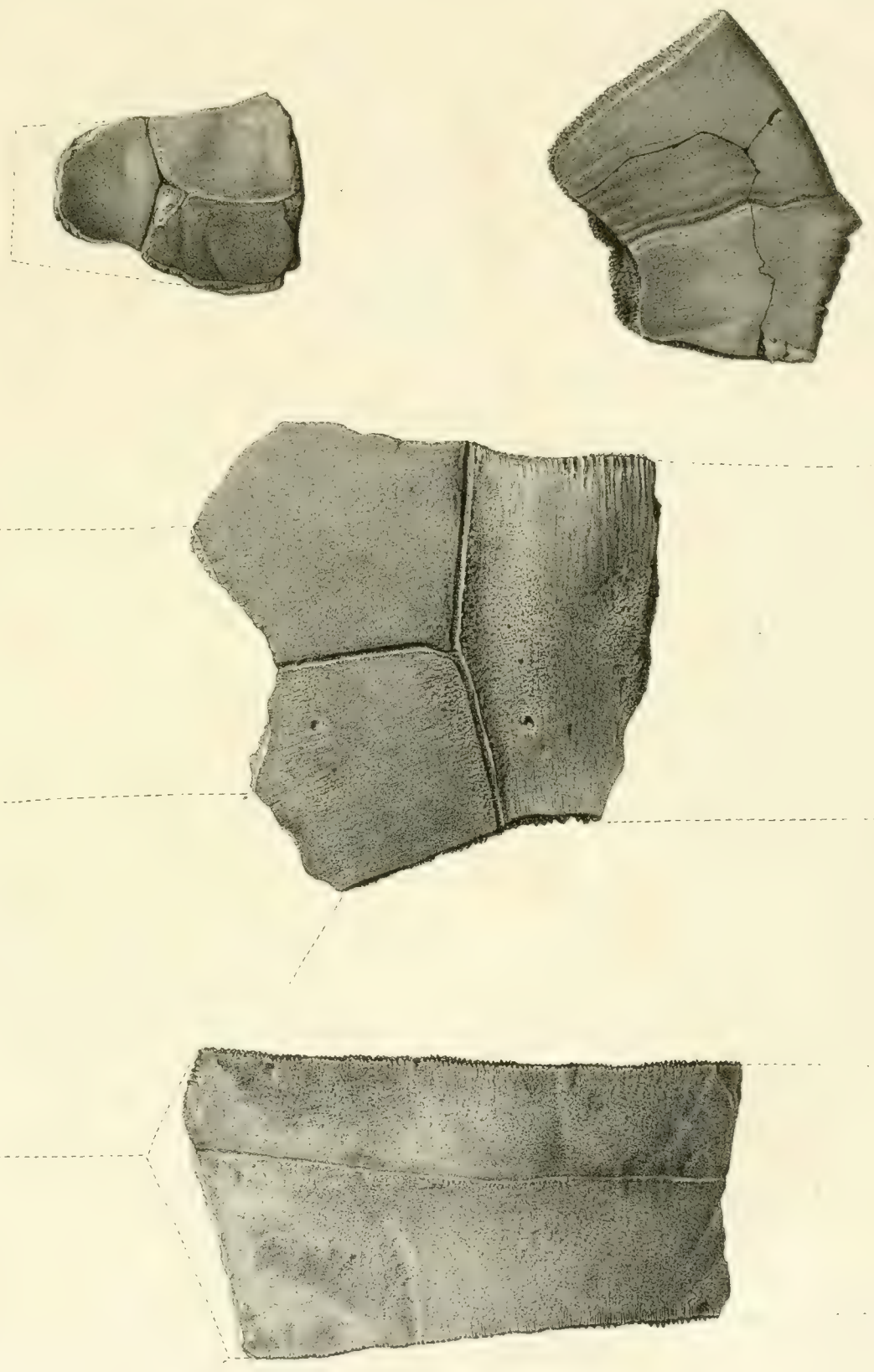
FIGS. 3, 4. Marginal plates, perhaps of the same species. *Page 122.*

POST-PLEIOCENE FOSSILS.

SOUTH-CAROLINA.

PLATE XXVII.

- FIG. 1. Fragment of a spine of a Sting-ray, *PASTINACA*, restored from a recent specimen. The fossil from Simmons', Yorges Island. *Page 119.*
- " 2. Vertebrae of the same.
- FIGS. 3, 4. Fragments of the upper jaw of a Sword fish, *XIPHIAS ROBUSTUS*. *Page 119.*
- FIG. 5. Extremity of the upper jaw of the same species, from a specimen obtained in the Eocene formation, intended to indicate the position of Figs. 3, 4.
- " 6. Right side of the lower jaw of the Alligator, from a recent specimen, reduced to one-fifth the diameter of nature.
- " 7. Two teeth of the Alligator, from the Ashley beds. *Page 122.*





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