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DESCRIPTIONS
OF
SOME REMAINS OF FISHES
FROM
THE CARBONIFEROUS AND DEVONIAN FORMATIONS
OF
THE UNITED STATES.

DESCRIPTIONS
OF
SOME REMAINS OF EXTINCT MAMMALIA.

BY
JOSEPH LEIDY, M. D.

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ART. XIII.—*Descriptions of some remains of fishes from the Carboniferous and Devonian Formations of the United States.*

By JOSEPH LEIDY, M. D.

EDESTUS, Leidy.

Generic Characters.—Maxillary bones segmented; segments beveled anteriorly and excavated posteriorly for coadaption. Teeth in general form resembling those of *Charcharodon*; one coossified with each maxillary segment.

EDESTUS VORAX, Leidy.

Proc. Acad. Nat. Sci., vii, 414. The subject of the present description is a fossil fragment of the jaw of a remarkable and gigantic fish, which was presented to the Academy by William S. Vaux, Esq., who obtained it from an itinerant showman. The latter informed Mr. Vaux, that the specimen was discovered at Frozen Rock, Arkansas river, twenty miles below Fort Gibson, in the Indian Territory.

The specimen is dense, heavy, and jet-black; and when it was first received the crevices about its surfaces were filled with carbonaceous matter. It was probably derived from a coal bed; but the geological features of the locality from which it was obtained I have been unable to learn.

The fragment of jaw is six inches in length; and it measures three inches in depth from the dental border. The sides are symmetrical, and slope divergently from the latter position towards the base, which is convex and moderately keeled in the median line. At the dental border the jaw is about seven eighths of an inch in thickness, and at the thickest part of its base measures one inch and four-fifths. Longitudinally the base of the jaw is slightly concave and furrowed. The surface of the bone is covered with fine vermicular, reticulating, broken ridges, assuming a striking resemblance to arabic writing.

The most remarkable peculiarity of the jaw is its segmented character; and of the segments the fossil retains two very nearly perfect ones with portions of two others. Each segment in outline forms an irregular pentahedron; and each possesses a single coossified tooth, whose broad surfaces abruptly increase the acclivity of the sides of the jaw.

From its general form the fossil might readily be taken for a portion of the lower jaw, but from the fact that no vertebrated animal, neither living nor extinct, has yet been discovered in which the dental branches of the inferior maxilla are segmented, while several genera are known, as the *Lepidosteus* among living fishes, and the

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Dendrodus of the Old Red Sandstone,* in which the superior maxillæ are segmented, therefore it is a fair inference that the fossil in question is a portion of an upper jaw.

The maxillary segments of the fossil are beveled off on each side anteriorly to a nearly acute edge, and are excavated posteriorly, so that the succeeding segments shall fit into those in advance. Each segment contributes to the sides of the jaw a band-like surface curving from the dental border as far back as the position of the second succeeding tooth, and then turning forward at a nearly right angle to the base of the jaw, so that when the segments are conjoined they appear separated on each side by > like grooves.

Near the middle of the anterior margin of the beveled portion of the segments, on both sides there exists an oval foramen, the apparent continuation of a dental canal.

The teeth of the fossil are so closely set upon the jaw that the anterior basal angle of those behind passes the contiguous angle of those in advance. Of the portions of four teeth retained in the fossil, two are sufficiently well preserved to obtain some idea of their form when perfect, as represented in the outlines of figure 1, plate 15. In general form they appear to be like those of *Charcharodon*, but differ in a number of important characters. They are compressed, conical, with coarsely dentated, trenchant edges. Their two broad sides are symmetrical; and they curve forward, so that in the restored condition their anterior margin appears to be convex and the posterior margin concave. Their base presents on each side a lobe-like expansion which extends upon the sides of the jaw, so that they look as if they were excavated and fitted upon the dental border of the maxillary segments.

The width of the teeth at base is one inch and nine tenths, the thickness in the same position four fifths of an inch, and the probable length is about two inches. The denticles are slightly compressed conical, with trenchant edges, and are nearly two lines long and over one line broad. In structure the teeth are solid and consist of hard dentine, which is however of looser texture toward the centre; and they are invested with smooth, shining enamel, about the one sixth of a line in thickness.

The teeth are firmly coossified with the maxillary segments, and indeed their dentinal structure is absolutely continuous with, and undistinguishable by the naked eye from the nearly equally dense ossific structure of the jaw.

A careless inspection of the fossil, at its posterior broken border would mislead one to suppose the teeth were inserted by long fangs into the jaw, an appearance which arises from the narrow portion of one fragment, continuous with its tooth, being received into the excavation of the segment in advance.

Plate 15, figs. 1, 2.—Views of the two broad surfaces of a fragment of the jaw of *Edestus vorax*.

fig. 3.—Outline view of a vertical section of the jaw.

fig. 4.—Outline of transverse section of the teeth, from the same specimen.

* Agassiz, *Pois. Foss. t. ii, pt. 2, p. 13.*

ORACANTHUS, Agassiz.

Generic Characters. Dorsal rays very large, compressed conical, with a large interior cavity; the external surface furnished with oblique and longitudinal rows of tubercles or tuberculated ridges; without posterior rows of denticles.

ORACANTHUS VETUSTUS, Leidy.

Proc. Acad. Nat. Sci., vii. 414. This species is proposed upon an ichthyodorulite or dorsal ray, from the collection of Mr. Timothy Conrad, now forming part of the cabinet of the Academy. The specimen is from Missouri Territory, but the exact locality from which it was obtained is unknown. It is dense, jet black, and heavy; and it has its apex and base broken away. On one side towards the base it is crushed inwardly, and in this position there is a portion of adherent iron gray limestone, with a partially imbedded segment of a crinoidal stem, which Mr. Conrad views as an evidence that the dorsal ray was derived from the carboniferous limestone. In several places the ray is fissured; but the parts appear to have retained their original relationship, and the form of the ray is nearly perfect.

In its present condition the specimen is five inches long and two and two-thirds of an inch wide at the base; and its thickest portion is about eight lines. Its form is flattened pyramidal and is curved a little backward and slightly also to one side. The broad sides and posterior margin are thickly covered with mammillary tubercles but the anterior margin is smooth. Between the tubercles the surface is slightly striated. On the right side the tubercles are arranged in rows, irregularly longitudinal, and irregularly oblique in the transverse direction. On the left side they are arranged more regularly in longitudinal rows, and they evince a tendency to become confluent in short transverse rows, which pursue an irregular waving course across the ray. On the posterior margin, which is obtuse, there are several longitudinal rows. The anterior margin of the ray is more obtuse than the posterior; and it narrows towards the base. The thickness of the walls of this ichthyodorulite is not easy to ascertain. The apex of the specimen exhibits a solid bony structure, but the base appears to present thin lateral walls and a thick wall to the anterior border.

Plate 16, figs. 1, 2, 3.—Different views of the ichthyodorulite of *Oracanthus vetustus*.

PETALODUS, Owen.

Generic Characters. Teeth with fangs. Crown demi-compressed-pyramidal, broader than long, with trenchant margins, surrounded by a basal cingulum composed of narrow imbricating folds, and descending lower on one side than the other. Fang large, undivided, laminar.

PETALODUS ALLEGHANIENSIS, Leidy.

Sicarius extinctus, Leidy, Proc. Acad. Nat. Sci., vii, 414.

This species of *Petalodus* is established upon the specimen of a tooth, which Mr.

Timothy Conrad borrowed from the cabinet of Charles A. Poulson, Esq., for my inspection. It was presented to the latter gentleman by Townsend Ward, Esq., who, in a note, observes, it was given to him "by the engineer of the stationary engine at the head of inclined plane number 3 of the old portage railroad," which crossed the Alleghany Mountains from Hollidaysburg, in Blair County, Pennsylvania. Mr. Ward further states, "it was obtained from a stratum about one foot thick, black, carboniferous, and calcareous, which was exposed by the excavation for the buildings to accommodate the stationary engine." He then adds, "I obtained quite a number of other fossils there, and from the same stratum near Freeport, above Pittsburg, and I think on the Conemaugh, seventeen miles west of Johnston. I found the stratum distinctly marked at these different localities, and have understood it is also to be seen in Ohio, where it is as distinctly marked by its appearance and fossils. It is in the bituminous coal series, and has a coal seam beneath it."

The tooth is of an iron gray color, hard, well preserved, and perfect, except that the basal angles of the crown and the end of the fang are broken away.

The crown has the form of one half of a broad, compressed cone. Its outer side is smooth, and transversely convex, but slopes in a nearly even plane from the trenchant margins. The inner side is also smooth, and forms a vertical plane from the latter position, and is transversely concave. The trenchant edges, except at the basal angles, are nearly straight, and are minutely serrulated, or rather simply striated.

The basal cingulum surrounding the crown is bow-shaped on each of the broad sides; and it is composed of about nine imbricating, parallel folds. Externally it slopes inwardly beneath the crown; and internally it forms a thick convex ridge descending much below its position externally.

The fang is an osseous plate, thick at the middle and towards the broken end, but thinning towards the lateral borders, which are slightly bent, scroll-like, from within outwardly. The inner surface is transversely concave; the outer one is convex, and presents a wide groove following the course of the basal cingulum.

The measurements of the specimen are as follows: Breadth of the crown (not entire) 14 lines; height, including the basal cingulum, internally $11\frac{1}{2}$ lines, externally 9 lines. Breadth of the fang $10\frac{1}{2}$ lines; length (not entire) internally $4\frac{1}{2}$ lines, externally 7 lines.

Plate 16, figs. 4, 5, 6.—Outer, inner, and lateral views of a tooth of *Petalodus alleghaniensis*.

HOLOPTYCHIUS, Agassiz.

Generic Characters.—Body broad, short, compressed. Tail heterocercal, short. Head flat; the bones rough, or irregularly granulated. A few large conical teeth folded at the base, and numerous small conical, intermediate ones. Scales large, more or less rounded, rhomboidal; the covered portion smooth; the exposed surface

furnished with coarse, longitudinal, flexuose, anastomosing ridges or tuberoles. Ventral fins on each side, posterior to the middle; dorsal fin opposite the anal fin, which is close to the caudal fin; pectorals small.

HOLOPTYCHIUS AMERICANUS, Leidy.

Holoptychius nobilissimus, Ag., Hall, Geol. of New York, pt. IV, 281, fig. 130.

By this name I propose to distinguish the remains of the genus which have been discovered to the present time in Pennsylvania, although it may possibly include two species. Remains of *Holoptychius* are stated to be quite abundant in certain localities of the Old Red Sandstone Formation of Tioga county; but such as they are, consisting of isolated scales, cranial bones, and teeth, they are so exceedingly friable and the matrix so hard, or so soft and brittle that it is difficult to obtain specimens sufficiently perfect to be characterized. Among numerous specimens, for the most part consisting only of impressions left by the disintegration of the remains, presented to the Academy, by Timothy Conrad, Esq. and Charles E. Smith, Esq., there are a few which I have ventured to describe, and which are represented in figures 9, 10 of plate 16, and figures 1-4 of plate 17.

One of the specimens, represented in figure 9, plate 16, is a portion of a large scale, with an impression of a portion of the remainder. It measures nearly 2½ inches in length, and apparently has been ovably rhomboidal in its perfect condition. The covered portion of the scale constitutes nearly one half, and is smooth. The exposed surface of the scales, as indicated by the impress of the matrix, was furnished with coarse, longitudinal, flexuose, and somewhat ramifying ridges.

A smaller scale, represented in figure 10, plate 16, of which specimens are more frequent than of the preceding, is 14 lines long and 12 lines broad, and is a rounded square. A little more than half its surface has been covered by the scale in advance; and the exposed portion of the surface is covered with coarse longitudinal ridges. This scale resembles an isolated specimen of one from *Holoptychius nobilissimus*, represented in figure 26, plate 31 a, of Agassiz' Poissons Fossiles, but is not at all like those represented in plate 23 of the same work.

The impression of a tooth, left in a portion of matrix by the destruction of the original, from which a clay cast was taken, gives the form characteristic of the large teeth of *Holoptychius*, as represented in figure 1, plate 17. The tooth has been ten lines long and four lines in diameter at the base. It is conical, circular in transverse section, as represented in figure 2, plate 17, and is folded two thirds of its length from the base.

A very imperfect fragment of a maxillary bone, consisting indeed of little more than the thin internal surface adhering to a portion of matrix, represented in figure 3, plate 17, exhibits at the anterior extremity the remains of a large tooth, partially consisting only of its impression; and further back at the margin of the bone it presents two conical denticles about one line long.

A bone, the most perfect specimen preserved of the remains of *Holoptychius americanus*, represented in figure 4, plate 17, appears to be one of the branchiostegal plates. It is trilateral, is sixteen lines wide, and appears to have been about twenty-two lines long. Its surface exhibits numerous short flexuose ridges, and tubercles, characteristic of the cranial bones of the genus.

Plate 16, figs. 9, 10.—Scales of *Holoptychius americanus*.

Plate 17, fig. 1.—Tooth of *H. americanus*.

fig. 2.—Transverse section of the same tooth.

fig. 3.—Fragment of the lower jaw

fig. 4.—A branchiostegal plate.

STENACANTHUS, Leidy.

Generic Characters. Dorsal spine long, narrow, straight, compressed conical, hollow, longitudinally striated, furnished posteriorly with marginal rows of oblique denticles.

STENACANTHUS NITIDUS, Leidy.

Proc. Acad. Nat. Sci., viii, 11. This genus and species are indicated by the specimen of an ichthyodorulite, imbedded in a fragment of rock of the Old Red Sandstone Formation of Tioga County, Pennsylvania, and discovered by Charles E. Smith, Esq., who presented it to the Academy of Natural Sciences. In the same fragment of rock with the spine, there are also small portions of bones, and the impression of a tooth, apparently of *Holoptychius*.

The specimen has its apex broken off, and also a portion of its left wall, exposing a large interior cavity, filled with the sandstone matrix. It appears to have been perfectly straight in its length, and is long, narrow, compressed conical. The anterior border is convex; the sides are longitudinally striated or grooved; and the posterior border is denticulated. There appears to be a pair of close rows of denticles, though the specimen only exhibits one. The denticles are triangular, directed obliquely downward and backward, and seven of them are equal to the space of half an inch.

About half an inch below the broken summit of the specimen, a zigzag fissure or perhaps a suture crosses the spine, as represented in figure 7 of plate 16. From the two lower angles of the fissure, two others proceed longitudinally downward to the broken margin of the specimen. These appear like real sutures, though they are most probably mere cracks, the result of fracture.

The length of the ichthyodorulite in its present condition is two inches and two thirds, and its width at base about half an inch.

Plate 16, figs. 7, 8.—Ichthyodorulite of *Stenacanthus nitidus*; the former figure representing merely the outline.

APEDODUS, Leidy.

Generic Characters. Opercular bones, thick, covered with hard and finely granulated enamel. Teeth large, compressed conical, with trenchant margins and a grooved base.

APEDODUS PRISCUS, Leidy.

This species is founded upon specimens of a tooth and a fragment of bone, from the Old Red Sandstone Formation of Columbia County, Pennsylvania, which were sent for my inspection by Prof. Baird, from the cabinet of the Smithsonian Institution.

The tooth is seven lines in length, compressed conical, with trenchant edges, and is slightly curved. The two broad sides are very nearly symmetrical; the transverse section being elliptical and rather abruptly narrowed towards the acute poles. The trenchant margins are entire, and the surfaces are smooth, except at their lower half, where the tooth is grooved as in *Lepidosteus* and *Holoptychius*. The base of the tooth is four lines and a quarter in breadth, and two lines and a half in thickness. The tooth appears to be solid, and is invested with thin enamel.

The fragment of bone mentioned, which I have considered as having belonged to the same fish as the tooth, for no other reason than that they were found in association, appears to be a portion of an opercular, or perhaps a sub-opercular bone. It is thick and dense, and on the exposed surface is invested with thin, shining, and minutely granulated enamel. Viewing the specimen as an opercular bone, it has been over two inches in length, and about an inch and a half at its widest part. Its anterior margin is thin, and beveled off for the fourth of an inch for adaptation to the preopercular bone. The posterior margin is convex; the lower extremity is a little prolonged; and the upper broken margin of the specimen reaches one line in thickness.

Plate 17, fig. 5.—Tooth of *Apedodus priscus*.

fig. 6.—Transverse section of the same tooth.

fig. 7.—Portion of an opercular bone.

ART. XIV.—*Description of some remains of extinct Mammalia.*

By JOSEPH LEIDY, M. D.

CAMELOPS KANSANUS, Leidy. Proc. Acad. Nat. Sci., vii, 172.

This genus and species are established upon a fragment of the anterior extremity of an upper jaw of an animal of the camel family, discovered by Mr. Henry Pratten, of New Harmony, Indiana, in the gravel drift of Kansas Territory.

The specimen consists of portions of the left maxillary and intermaxillary bones, the latter of which contains the fang of a transformed incisor or functional canine tooth, as in the lama.

The intermaxillary bone is of very much more robust proportions than in the lama or camel. Its upper part and outer surface form the segment of a slightly flattened cylinder, and from the nasal side to the outer side of the aperture of its alveolus it is an inch in breadth, while in the lama in the same position it measures only the third of an inch, and in the camel about half an inch. The inclination of its nasal border approaches more the horizon than in the lama or camel, apparently indicating the animal to have possessed a lower and perhaps a longer face than in either of the latter genera. The gingival border is rugged as in its congeners, and it presents two irregular pits, apparently the alveoli of incisive germs.

The fang of the functional canine contained in the intermaxillary bone is laterally compressed conical, and is an inch and a half in length. From the orifice of its alveolus it is strongly curved upward and backward, nearly on a line parallel with the curved palatal margin of the bone. The crown of the tooth was directed downward and outward; and at the base it is ovate in section, with the narrow end posteriorly; and it measures six lines and three fourths wide, and three lines and three fourths transversely. A small portion of remaining enamel indicates this to have been thin and smooth.

The small remaining fragment of the maxillary bone attached in the fossil exhibits at its broken margin the portion of an alveolus, situated an inch and three fourths behind the tooth contained in the intermaxillary bone. It has been about four lines in transverse diameter, apparently had a direction curving downward, forward, and outward from its bottom, and probably accommodated a true canine tooth, although the position is unusually far back, a necessary condition however in the *Camelops*, from the distance to which the fang of the functional canine tooth extended backward.

The margin of the hiatus between the alveoli indicated is subacute and concave; and it measures one and three fourths of an inch in length. It is divided about the

middle of its course by the maxillo-intermaxillary suture, which descends at the side of the jaw parallel with the nasal border, and on the palate curves inward and advances as far as the position of the posterior third of the orifice of the intermaxillary alveolus.

Plate 17, fig. 8.—Inferior view of a fragment of the upper jaw of *Camelops Kansanus*.

fig. 9.—Outer view of the same specimen.

fig. 10.—Transverse section of the tooth contained in the same specimen.

CANIS PRIMÆVUS, Leidy. Proc. Acad. Nat. Sci., vii, 200.

This name is proposed for an extinct species of wolf supposed to be indicated by a fragment of a skull, discovered by Mr. Francis A. Lincke, in association with remains of *Megalonyx Jeffersonii*, *Bison americanus*, *Cervus virginianus*, *Equus americanus*, and *Tapirus Haysii*, in the banks of the Ohio River, near the mouth of Pigeon Creek, a short distance below Evansville, Indiana. The specimen, which with others were kindly borrowed for my inspection by Dr. J. G. Norwood, of New Harmony, consists of the left upper maxillary bone containing the back five molar teeth, which are nearly entire except the penultimate tooth.

The fragment on comparison with the corresponding portion of the skull of the common wolf of Europe, and its american congeners, differs only in being larger and in presenting slight variations in the teeth, not however greater than those found among different varieties, or perhaps even individuals of recent wolves.

Certain naturalists may regard the fossil as indicative of a variety only of the *Canis lupus*, and of the correctness of such a view, an attempt will not be made here to decide. Naturalists have not yet systematized that knowledge through which they practically estimate the value of characters determining a species. What may be viewed as distinct subgenera by one will be considered as only distinct species by another, and a third may view both as varieties or races. In the use of these words, or rather in the attempt to define them, we go too far when we associate them with the nature of the origin of the beings in question. We know nothing whatever in relation to the origin of living beings, and even we cannot positively deny that life connected with some form was not co-eternal with time, space, and matter, and that all living beings have not successively and divergently ascended from the lowest types.

To return to a consideration of the fossil: the maxilla has the same form as the corresponding bone of recent wolves with which I have had the opportunity of comparing it. The infra orbital foramen, is vertically oval, directed forward, and is on a line vertical to the interval of the third and fourth molar teeth.

The crown of the penultimate molar tooth is rather less concave posteriorly than in any recent specimens under inspection; and its antero-posterior diameter internally is greater in relation with the same diameter externally; or in other words the tooth

internally is less narrowed than in recent wolves. It is also broader in the antero-posterior diameter when compared with its transverse diameter; and its basal ridge externally is a little more abrupt and is slightly crenated at the border.

The second and third molar teeth have their basal ridge internally a little better developed, which is also the case with the internal oblique ridge, descending towards the cusp anteriorly.

The principal measurements of the fossil, in comparison with those of the corresponding part in recent wolves, are given in the following table.

| MEASUREMENTS. | | St. Bernard Dog, of Europe. | Canis lupus, of Europe. | Canis occidentalis, of Ohio. | White Wolf, from Nebraska. | Canis citius, Townsend, from Oregon. | Canis primævus, (fossil.) |
|--|--------------------------------------|--------------------------------|----------------------------|---------------------------------|-------------------------------|---|------------------------------|
| | | <i>lines.</i> | | | | | |
| From base of crown of third molar to upper margin of maxilla, | | 25 | 24 | 21½ | 24 | 26 | 31 |
| From base of crown of fourth molar to upper margin of maxilla, | | 34 | 36 | 30 | 34 | 36 | 41 |
| From back of last molar to canine alveolus, | | 38 | 43 | 41½ | 42½ | 46 | 53 |
| Antero-posterior diameter of first molar alveolus, | | 3 | 3½ | 3½ | 4 | 4 | 4½ |
| Do. | do. of second molar tooth, | 5 | 6½ | 7 | 6¾ | 7 | 7 |
| Do. | do. of third molar, | 6 | 8 | 7¾ | 8 | 8 | 8½ |
| Do. | do. of fourth molar, | 9¾ | 13 | 12½ | 12½ | 13 | 16 |
| Do. | do. of fifth molar, | 7 | 8 | 8½ | 8 | 8 | 9 |
| Transverse | do. do. | 8 | 10¾ | 11 | 10½ | 10¾ | 11½ |
| Antero-posterior diameter of last molar, | | 4 | 4 | 4¾ | 4 | 4¾ | 4¾ |
| Transverse | do. do. | 5¼ | 7 | 7½ | 6½ | 7 | 7 |

Plate 17, fig. 11.—Outer view of the fragment of the upper jaw of *Canis primævus*.

fig. 12.—Lower view of the same specimen.

URSUS AMPLIDENS, Leidy. Proc. Acad. Nat. Sci., vi, 303.

This species is founded upon a fragment of lower jaw and an upper molar tooth, which were discovered in association with remains of *Megalonyx*, *Myiodon*, *Ereptodon*, *Equus americanus*, *Cervus virginianus fossilis*, and *Mastodon*, in a ravine in the neighborhood of Natchez, Mississippi.

The fragment of the jaw is of the left side; and it contains the last molar tooth, It has about the same size as the corresponding portion of the jaw of the common black bear (*Ursus americanus*), or of that of the grizzly bear (*Ursus ferox*) at an age when the permanent teeth have all protruded but are not yet worn by attrition. Its form also does not vary from what it is in the latter animals, except that it is more convex externally.

The last molar tooth is intermediate in size to that of the black and the grizzly bear, but the form of the crown is more like that of the former than that of the latter.

The specimen of an upper molar is the penultimate one of the left side. It has very nearly the same form as in the grizzly bear, except that the small cone in front of the outer pair of principal cones is almost as well developed as that behind them.

The slight variations indicated in the fossils might be considered as insufficient to characterise them as having belonged to a distinct species from the grizzly bear, but when we reflect upon the equally slight variations which exist in the homologous parts to the fossils in certain recent species of the genus, and recollect that the fossils in question were found in association with remains of the *Megalonyx*, &c., in a country never known to have been inhabited by the grizzly bear, we cannot help inclining to the belief that they belonged to a species distinct from the recent ones.

The comparative dimensions of the fossils are as follows :

| | U. americanus. | U. ferox. | U. amplidens. |
|---|----------------|-----------------|---------------|
| Depth of lower jaw below the last molar, | 5 to 18 lines. | 18 to 20 lines. | 17 lines. |
| Antero-posterior diameter of the last lower molar, | 8 " " | 11 " " | 9½ " " |
| Transverse do. do. do. | 5½ " " | 7½ " " | 7 " " |
| Antero-posterior diameter of the upper penultimate molar, | 8½ " " | 11 " " | 10 " " |
| Transverse do. do. do. do. | 6½ " " | 8 " " | 7½ " " |

Plate 17, fig. 13.—Outer view of the fragment of the lower jaw of *Ursus amplidens*.

fig. 14.—Triturating surface of the last molar contained in the same specimen.

fig. 15.—Outer view of a left upper penultimate molar.

fig. 16.—Triturating surface of the same specimen.

URSUS AMERICANUS FOSSILIS.

Remains of the common black bear (*Ursus americanus*) have on several occasions been discovered in association with those of extinct animals. Dr. Harlan* mentions an inferior maxilla, which was found in Big-bone Cave, Tennessee, in association with remains of the *Megalonyx*. The specimen, which is preserved in the collection of the Academy, contains none of the teeth, and it is unchanged from the original texture, except that it has lost a small portion of its gelatin. It is not improbable that the specimen may be of much later date than the *Megalonyx* remains with which it was found.

Another specimen preserved in the cabinet of the Academy, consists of the left half of the lower jaw containing the canine and anterior two molar teeth of a species of bear, discovered in a ravine in the vicinity of Natchez, Mississippi, in association with remains of *Megalonyx*, *Myiodon*, *Ursus amplidens*, *Equus americanus*, *Bison latifrons*, *Cervus*, &c. The specimen corresponds closely in its anatomical characters with its homologue of the common black bear. The bone is exceedingly friable, and is enveloped in a thick layer of compact peroxide of iron, in the same manner as the specimen upon which was established the *Felis atrox*,† and which was found in the same locality.

PROCYON PRISCUS, Le Conte. Amer. Jour. Sci. and Arts, 2d s. v, 106.

This species of extinct raccoon was first indicated by Dr. John L. Le Conte, from some specimens which were found in association with remains of several animals of

* Journ. Acad. Nat. Sc., vi, 269. Med. and Phys. Res., 329, pl. xiv, fig. 26.

† Trans. Am. Phil. Soc., 2d ser. x, pl. 34.

the peccary tribe, *Platygonus compressus*, *Protochœrus prismaticus*, &c., in the lead region of the vicinity of Galena, Illinois.

Besides several phalanges, the fossil specimens alluded to consist of several fragments of jaws and teeth.

A small fragment of the upper jaw (figure 17, plate 17) of the left side contains the fourth and fifth molars, which have the same form as the corresponding teeth of *Procyon lotor*, but are about one sixth larger.

A specimen of a right upper canine tooth has the same size as in the recent raccoon, but is rather less compressed towards the subacute borders of the crown. (Figure 24, plate 17.)

A small fragment of the right side of a lower jaw, (fig. 19,) rather larger than the corresponding portion of the same bone in the recent raccoon, contains the canine and the fourth molar tooth. The former has the same form, as in the recent raccoon, and is only a little larger. The latter tooth is not only larger than its representative in the recent raccoon; but it has the inner posterior ridge of the crown continuous with the principal cusp and not terminating in a small cusp, and the tubercle at the outer posterior part of the base of the principal cusp is hardly developed in comparison with its condition in the recent raccoon. (Figs. 19, 20, 21.)

An apparent, isolated, inferior, third molar tooth (figs. 22, 23) of the left side has more nearly the form of the fourth one than of its homologue in the recent raccoon, and it is also relatively larger in comparison with its associated succeeding tooth than in the latter species. The principal cusp and that developed from its base postero-externally are more distinctly separated than in the corresponding points of the fourth molar of the recent raccoon. The anterior heel also is less developed and that posteriorly is less excavated than in the succeeding tooth of the recent raccoon, with which it is compared in preference to the corresponding one of the latter species. The size and form of the two fangs of the fossil tooth correspond with the same characters of the two alveoli for the third molar in the fragment of a lower jaw above indicated. In conclusion it must be admitted that had this last described tooth been found alone it would without hesitation have been viewed as a third inferior molar of *Procyon lotor*. (Figure 22, plate 17.)

Plate 17, fig. 17.—Outer view of the superior fourth and fifth molars of the right side of *Procyon priscus*.

fig. 18.—View of the triturating surfaces of the same teeth.

fig. 19.—Fragment of the lower jaw of the right side containing the canine and the fourth molar.

fig. 20.—View of the triturating surface of the latter tooth.

fig. 21.—Inner view of the same tooth.

fig. 22.—Outer view of the left inferior third molar.

fig. 23.—View of the triturating surface of the latter tooth.

fig. 24.—Outer view of the right superior canine.

ANOMODON SNYDERI, Le Conte. Am. Journ. of Science and Arts, 2d ser. v, 106.

In association with the remains of *Procyon priscus*, just described, there was found a curious tooth, which Dr. Le Conte has supposed to be the left superior canine of a large insectivorous animal. It is quite peculiar in form; and its affinities I am at present unable to determine.

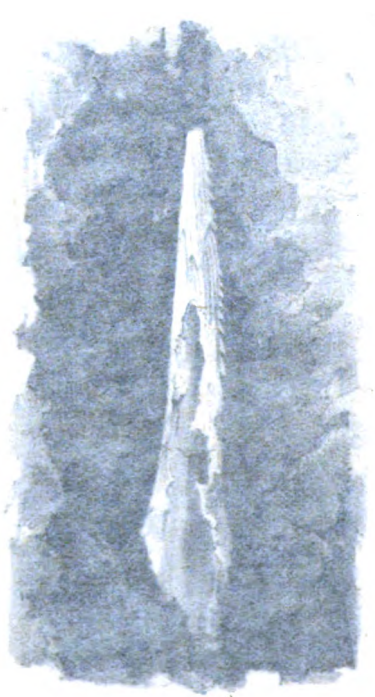
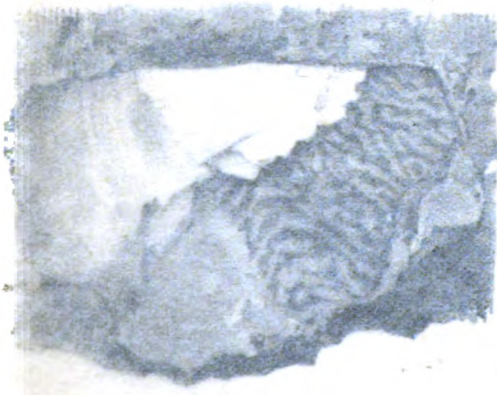
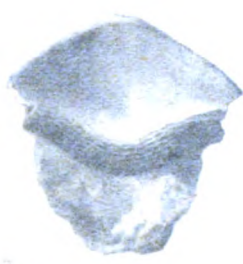
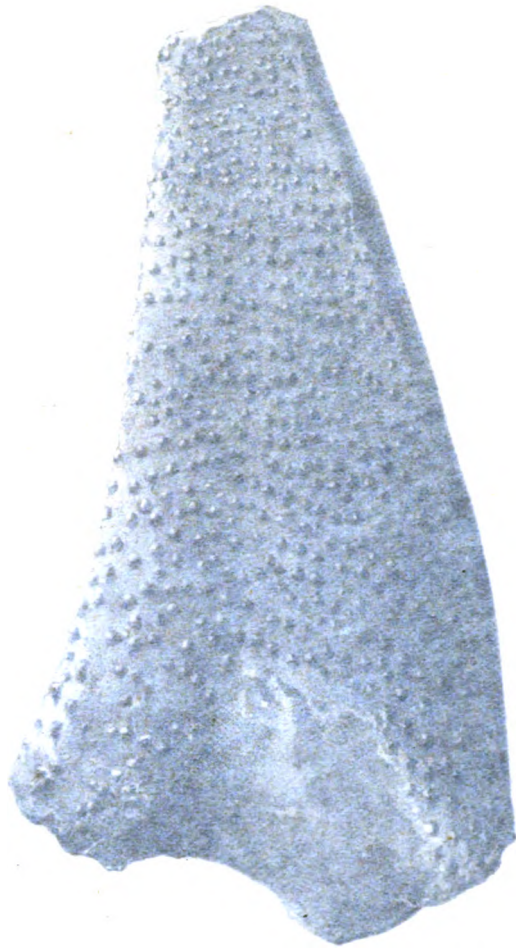
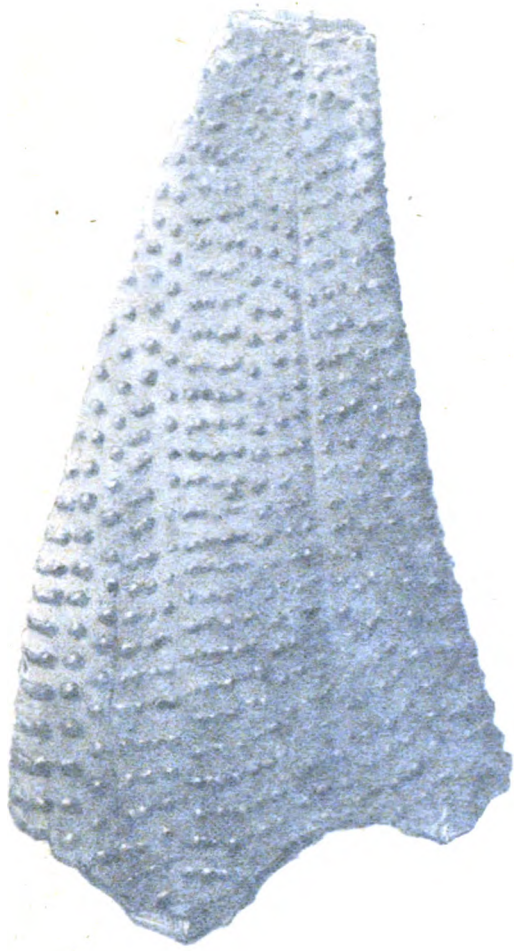
The tooth is compressed to a remarkable degree, and on the inner side for the greater part of its length is depressed, so that a transverse section except near the apex of the crown would be reniform. The crown is curved conical, and is most convex externally. Posteriorly its outer and inner surfaces are separated by a feeble ridge; and internally about half way towards the base it is furnished with an anterior and a posterior tubercle, of which the former is lower than the other.

The fang at the broken border of the specimen is nearly half an inch broad and is less than two lines thick. In consequence of the depression of its inner wall, the pulp cavity has a curved linear form, thus (

In its perfect condition the tooth has apparently been in the neighborhood of an inch and a half long, and the base of the crown measures five lines broad and one and three quarter lines thick.

Plate 17, fig. 25.—Outer view of tooth of *Anomodon Snyderi*.

fig. 26.—Inner view of the same tooth.



BRACHIOPOD VALVES
FROM THE

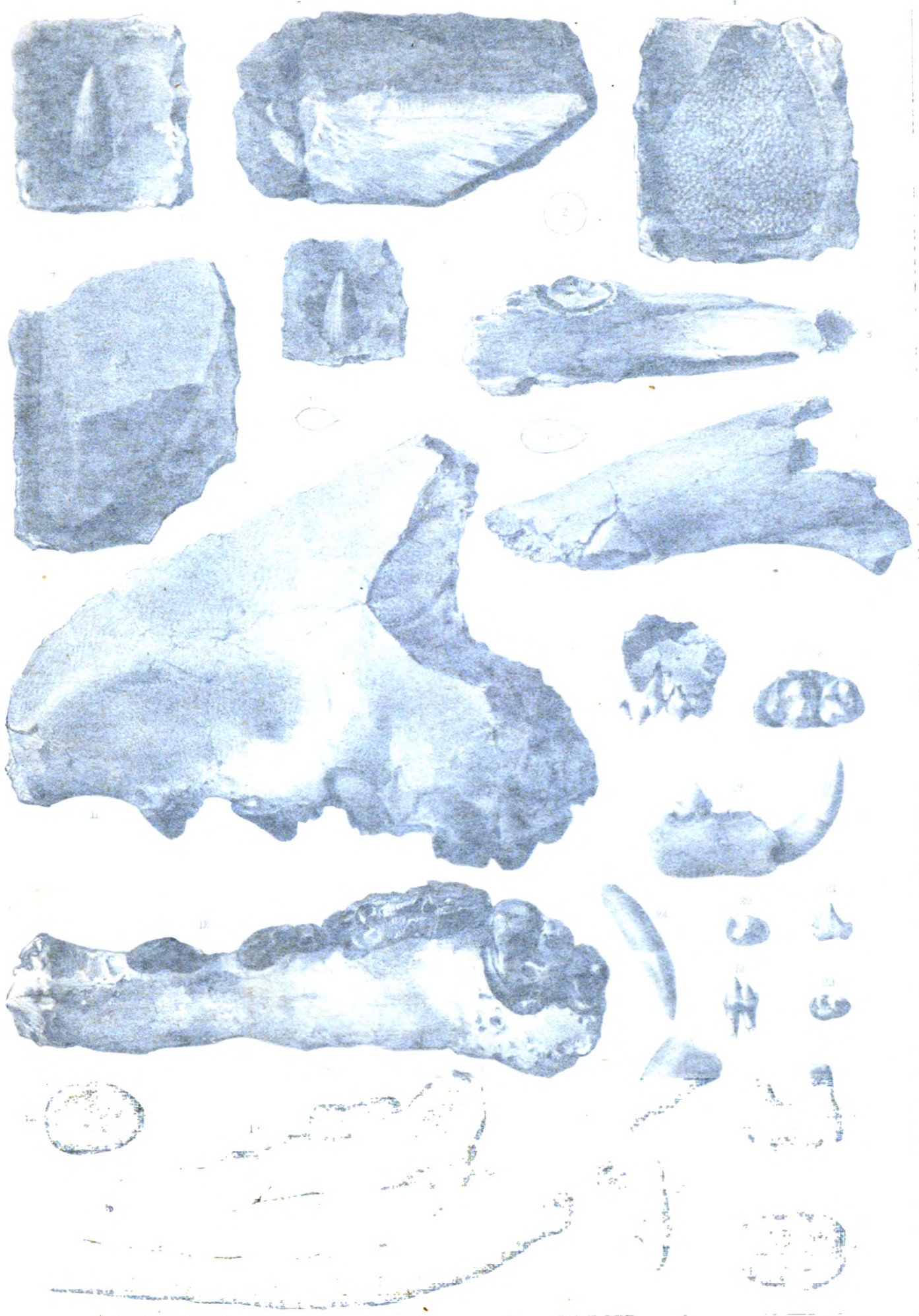


Fig. 10. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.