ON UINTATHERIUM, BATHMODON AND TRIISODON.

BY E. D. COPE.

Bathmodon pachypus Cope, sp. nov.

The species originally described by me under the name of *Bathmodon radians*, was based on a number of specimens obtained by Dr. Hayden, from the Wasatch formation near Evanston, Wyoming. I subsequently ascertained that this material included two species, a larger and a smaller. The latter I described under the name of *Bathmodon latipes*[1]: for the larger the name of *Bathmodon radians* was retained. Besides various diversities between the skeletons of these species, their astragali exhibit characters which indicate that the genus *Bathmodon* is distinct from *Coryphodon*, although I have admitted their supposed identity in some of my publications.[2] I pointed out the differential characters of the two genera in 1882,[3] but did not then express the most important feature. I then defined *Bathmodon* as follows: "Astragalus subquadrate, without internal hook," and *Coryphodon*, "Astragalus transverse, with internal hook." The absence of the internal prolongation of the astragalus in *Bathmodon*, is due to the presence of a facet for articulation with some bone, which is not found in *Coryphodon*. This may have been a proximal prolongation of the entocuneiform, or perhaps a distinct bone, or even the proximal extremity of the metacarpus of the hallux.

Besides the *B. radians*, I am acquainted with a second species of superior dimensions. The remains consist of a pelvis with femur and several bones of the posterior leg and foot, and the humerus and radius of the foreleg. These bones are as long as those of the largest known *Coryphodon* (*C. anax*), and are more robust. In description of this new species, which I call *Bathmodon pachypus*, I give the following dimensions :—

[1] Annual Report U. S. Geolog. Survey Terrs., 1872, p. 588.

[2] Report U. S. G. Survey W. of the 100th Meridian, iv, 1877, p. 187.

[3] American Naturalist, Jan. 1882, Proceeds. Amer. Philos. Society, 1881, p. 165.

		M.
Length of humerus,		·400
Diameters of proximal extremity	anteroposterior,	·107
	transverse oblique,	·159
Width at epicondyles,		·166
Diameters of condyles	transverse,	·112
	anteroposterior roller,	·058
	anteroposterior flange,	·087
Length of pelvis antero-posteriorly,		·600
Chord of crest of ilium,		·350
Anteroposterior width of peduncle ilium,		·110
Length of ischium from acetabulum,		·150
Length of pubis to symphysis do.,		·160
Length of femur,		·527
Width of femur proximately,		·160
Diameter of head of femur,		·080
Diameter of shaft above third trochanter,		·066
Diameter of shaft at third trochanter,		·106
Width of condyles of femur,		·134
Depth of condyles with rotular crest,		·126
Diameters of astragalus above	anteroposterior,	·0675
	transverse,	·0800
Length of calcaneum,		·100

From the Wasatch of the Big Horn, J. L. Wortman.

Uintatherium robustum Leidy.

I have for some years had in my possession a fragmentary lower jaw from the Bridger beds of Wyoming, which I have been unable to refer to its proper place in the system. It is described in part in the Annual Report of the U. S. Geological Survey of the Territories, 1872, p. 565. The rami support roots and crowns of six molars, and the symphysis has two alveoli on each side. The peculiarity of the animal consists in this latter fact, since the species so far as described, are said to have four teeth on each side of the symphysis, viz., three incisors and one canine. Those present in the present species I suppose to be incisors. The molar teeth are so much like those of *Uintatherium robustum*, that I believe the specimen to belong to that species.

Symphysis very much compressed, so that the incisor teeth of opposite sides are close together; its inferior outline curved upwards to the alveolar edge, in an obtuse keel. Base of flange for superior canine distinct, commencing below the posterior edge of the posterior alveolus, and immediately preceded by a mental foramen. Middle line of symphysis rugose. Ramus at last molar robust, owing to the prominence of the inferior part of the anterior masseteric ridge. In connection with the oblique position of the head, the inferior molars are oblique to the long axis of the ramus, sloping upwards and backwards, with exposed anterior roots. The molars increase in size posteriorly, and the last one is abruptly larger than the penultimate. Their structure is as in *U. robustum*, *i. e.*, with an obliquely transverse high crest in front, and a low posterior transverse edge of the heel, and a short oblique crest between the two. The last named is short, and is directed obliquely outwards and forwards towards the external extremity of the anterior crest, but disappears before reaching it. The internal extremity of this and of the low posterior crest, with the external extremity of the anterior crest, rise into cusps. At the middle of the anterior base of the anterior transverse crest there is a tubercle, which represents the anterior limb of the anterior V in *Coryphodon*. The crowns of the premolars are broken away in the specimen.

The alveoli of the incisors are flat, and are directed forwards at an angle of only 20° from the horizontal until near their orifices, where the angle is greater. The roots of the incisors are thus curved upwards and forwards. There is but little space between the anterior alveolus and the anterior angle of the symphysis.

Measurements.		M.
Length from anterior edge of symphysis to anterior base of canine flange,		·074
Width of symphysis below at bases of lateral flanges,		·032
Depth of symphysis between do.,		·040
Width of symphysis above between posterior incisors,		·017
Length of bases of posterior five molars,		·148
Length of bases of true molars,		·110
Diameters crown, m. ii,	anteroposterior,	·031
	transverse in front,	·020
Diameters crown, m. iii,	anteroposterior,	·035
	transverse in front,	·025
Width of ramus at posterior edge of m. iii,		·040

Although the crowns are somewhat worn, the enamel is wrinkled intermediately between coarse and fine.

The specimen described was obtained in the Bridger beds on Henry's Fork of Green River, Wyoming.

Triisodon conidens Cope.

A right maxillary bone and corresponding mandibular ramus represent this species in my collection. The former sustains the last five molars, and the latter the last three, with alveoli of the others and of the canine tooth. The pieces indicate a skull of the size of that of the wolf, and a good deal more robust in its vertical measurements.

The third superior premolar has a base of triangular outline, the external side longer than either of the internal, which are connected by a broadly rounded angle. The external cusp is of lenticular section at the base, and circular section near the apex. An internal cusp is represented by a strong cingulum as in *Periptychus*, which connects with the posterior base of the external cusp. The crown of the fourth superior premolar has a triangular base of which the anterior side is shorter than either of the other two, which are subequal. The external cusp is large, simple, and subconic. The internal is distinct but smaller and is continued posteriorly as a cingulum to the posterior base of the external cusp. No internal cingulum. The crown of the first true molar is worn to the roots. The second true molar is the longest of the series. Its base is a triangle, placed transversely to the axis of the jaw, of which the external side is the shortest, the anterior the next longer, and the posterior the longest. The apex or internal extremity of the crown is obtusely rounded. There are two subequal external cusps, which are injured in the specimen. The internal cusp is the apex of a V whose limbs form the anterior and posterior edges of the grinding face of the crown, extending outwards to near the bases of the external cusps. Posterior to the posterior one is a strong basal cingulum. No internal, and a faint anterior cingulum. There is probably an external cingulum, but it is broken away. The last molar is of an oval outline placed transversely to the cranial axis, both the external and internal extremities contracted, the latter a little the more so. There is a large anterior external conical cusp. The posterior external is small, and is situated at the posterior third of the posterior border of the crown. The internal cusp is well developed, and has a subcircular section. There are strong external and posterior cingula, and a weak anterior one, but no internal cingulum. The posterior extremity of the maxillary bone within the zygoma, is immediately above the posterior border of the last superior molar.

Measurements of Superior Molars.		M.
Length of bases of posterior five,		·069
Diameters base, Pm. iii,	anteroposterior,	·013
	transverse,	·009
Diameters base, Pm. iv,	anteroposterior,	·0145
	transverse,	·014
Length base of true molars,		·039
Diameters base of m. ii,	anteroposterior,	·0175
	transverse,	·021
Diameters base, m. iii,	anteroposterior,	·010
	transverse,	·0175
Elevation of base of zygoma, above base of m. iii,		·018

The ramus of the lower jaw is, as usually with the Creodonta, deeper and less robust than that of Carnivora of corresponding size. It is also more compressed than that of the *Triïsodon quivirensis.* It retains its depth to below the canine teeth, and does not shallow below the middle of the coronoid process, where also there is no tendency to inflection. The anterior masseteric ridge is not very prominent, and the masseteric fossa is not defined below, nor is the inferior edge of the ramus prominent or ridged at that point.

The premolar teeth are lost, but they occupied but a short space, and were probably only three in number. The first and second true molars are subequal, while the third is a little smaller than either. Each consists of an anterior higher and a posterior lower portion, the lower region being at the junction of the two. The anterior part has a nearly circular section, and contracts towards the apex. The latter is divided into three cusps, a larger external and two lesser internal. The external and posterior internal soon fuse on wearing, and their combined section is a crescent. The anterior inner is small and stands near the inner edge of the crown, and not at the middle as in *T. quivirensis*, and is circular in section. The heel of the tooth rises to its posterior border, which is divided into two cusps. Each of these sends a ridge forwards towards the base of the anterior cone of the tooth. The external is the larger, and reaches that base. The internal is smaller, and falls short of it. The posterior inferior molar differs from the others in form as well as in size. There is no posterior inner anterior cusp, the large external cusp being supplemented by a small anterior internal only, which sends a little ridge downwards and posteriorly. The heel is narrowed, and supports the two cusps on its posterior border in contact, and not separate as on the other teeth. The external is the larger, and extends forwards to the base of the anterior cone near its middle. Some remnants of hard matrix leave it uncertain whether there is a small median posterior marginal tubercle on the first and second molars or not.

The first inferior true molar has a strong external cingulum; the second has none; the third has one, which is most evident between the cusps, is weaker at the base of the posterior lobe, and faint at the anterior lobe. No internal cingula.

Measurements.		M.
Length of true molar series,		·052
Length from m. iii to anterior masseteric ridge,		·013
Diameters of m. i,	anteroposterior,	·017
	transverse,	·0115
Diameters of m. ii,	anteroposterior,	·018
	transverse,	·011
Diameters of m. iii,	anteroposterior,	·016
	transverse,	·0105
Depth of ramus at m. iii,		·047
Width of ramus at m. iii, inferiorly,		·013

The molar teeth of this species are more like those of the *T. heilprinianus* than those of the *T. quivirensis*. This is seen in the more conic character of the anterior lobe of the tooth, and the better development of the anterior inner cusp. The species is a good deal larger than the *T. quivirensis*.

From the Puerco beds of N. W. New Mexico, D. Baldwin.

NOTE.—The superior molar teeth show a resemblance to those of *Mesonyx*, and also to those of *Deltatherium*. Among the *Mesonychidæ*, *Triïsodon* approaches *Sarcothraustes* in the form of the inferior molars, in the expanded heel. On the other hand, the appearance of the anterior cusp of the inferior molars approaches what is seen in *Amblyctonus.* The small transverse posterior superior molar of *Trïisodon* further distinguishes it from *Amblyctonus.* A series of modifications of the dental characters proceeding from the simple to the more complex, may be constructed as follows: 1. *Mesonyx;* 2. *Dissacus;* 3. *Sarcothraustes;* 4. *Trïisodon;* 5. *Amblyctonus;* 6. *Deltatherium.* The first three belong to the *Mesonychidæ*, as distinguished by the form of the tarsal articulations. Whether *Trïisodon* must be arranged with *Amblyctonus* or not, cannot be ascertained until the foot structure is known.