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XLIV.—Thaumastotherium osborni, a new genus of perissodactyles from the Upper Oligocene deposits of the Bugti hills of Baluchistan.—Preliminary notice

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shorter than next two combined; mesothorax shining, with strong scattered punctures; mesopleura dull, strongly and closely punctured; area of metathorax semilunar, sharply defined behind, with fine weak ridges, the sculpture unusually fine for a *Trachandrena*; tegulæ dark reddish. Wings reddish hyaline; nervures and the large stigma chestnut-red; b. n. meeting t.-m., second s.m. receiving first r. n. beyond middle. Hair of legs pale; scape of hind tibia rather small, white. Abdomen shining, strongly punctured, second segment in middle depressed a little less than half; white hair-bands at sides of second segment, on third except in middle, and right across fourth; hair at apex of abdomen pale fulvous.

Hab. Beulah, New Mexico (Canadian Zone), at flowers of wild plum, May 30 (*Wilmatte Porter*).

On account of the weak sculpture of the metathoracic area this resembles *A. radiatula*, Ckll., but that species has the second abdominal segment depressed more than half, and the hind tibiæ and tarsi are not ferruginous.

Andrena argentinæ, var. *trichomelæna*, v. n.

♂.—Hair of face entirely black; of cheeks, legs, and sides and venter of abdomen mainly black or sooty.

♀.—Hair of face entirely black.

Hab. Florissant, Colorado, 2 ♂ (one of them the type) and 1 ♀ at flowers of *Salix brachycarpa*; 1 ♂ at flowers of *Ribes vallicola*, June 10, 1907. All collected by S. A. Rohwer.

A. argentinæ was described as *A. vicina argentinæ*, Ckll., but it is probably a distinct species.

At Longs Peak Inn, Colorado, alt. 8956 ft., June 25 and 26, 1913, I took *Andrena mariæ*, Rob., *A. tacitula*, Ckll., *A. cyanophila*, Ckll., and *A. medionitens*, Ckll. These records are of interest on account of the altitude.

XLIV.—*Thaumastotherium osborni*, a new Genus of *Perissodactyles* from the Upper Oligocene Deposits of the Bugti Hills of Baluchistan. — Preliminary Notice. By C. FORSTER-COOPER, M.A., University Demonstrator in Comparative Morphology, Cambridge.

DURING an expedition to Baluchistan in 1911 I found, among other fossils, a mammalian atlas and dorsal vertebra remarkable for their unusually large size. These I suggested

might have belonged to an animal whose lower jaws were obtained at the same time, and which were made * the type of a new genus and species, *Paraceratherium bugtiense*.

On a second expedition to the same locality, made the following year, the skull belonging to these same jaws was discovered, which shows clearly enough that the association of jaws and vertebræ was erroneous, the condyles of the skull being far too small for the atlas.

At the same time three other cervical vertebræ of correspondingly large size were brought to light, and with them a femur, tibia, part of an ulna, two humeri, and several foot-bones.

These fragments point to the presence in these deposits of an animal, apparently a Perissodactyle, of such unusual size and shape as to require a new genus for its reception. For the atlas, therefore, and for the bones associated with it, I propose the generic and specific names *Thaumastotherium osborni* †.

The measurements of the various bones are as follows:—

- (1) A left astragalus (fig. 1), Perissodactyle in general form, measuring 18 cm. across the trochlear surface; the edges of this surface are rather rounded as compared with the sharper edges found in the corresponding bone of the Rhinoceros.
- (2) A lateral podial bone (fig. 2) 37.5 cm. in length. A second bone which awaits development from its matrix is somewhat larger and has an apparent length of 44 cm.
- (3) The femur, a strong pillar-like bone, having the head in line with the shaft, is 114 cm. long and 19 cm. across the condyles. There is no trace of a third trochanter.
- (4) The humeri are 85 cm. long, 24 cm. across the lower articular surfaces, 30 cm. across the supra-condylar ridges, the head being 24 cm. from side to side and 19 cm. from front to back.
- (5) The atlas (fig. 3) is 47.5 cm. in extreme width from wing to wing, 24 cm. in depth of wing, and with a condylar surface of 27.4 cm.

* Ann. & Mag. Nat. Hist. ser. 8, vol. viii. p. 711 (1911).

† In naming this animal I take this, my first, opportunity of expressing my gratitude to Professor Henry Fairfield Osborn, President of the American Museum of Natural History of New York, not only for the benefit of a year's training under his guidance, but for his continued interest since that time. I should also like to record at the same time my obligations to his colleagues at the museum for many friendly acts, particularly Mr. Walter Granger and Dr. W. K. Gregory.

- (6) An anterior cervical vertebra (fig. 4, side view) of square shape, measuring 30 cm. in length along the centrum and 33 cm. across the widest part. In shape it corresponds roughly with the anterior vertebræ of the

Fig. 1.

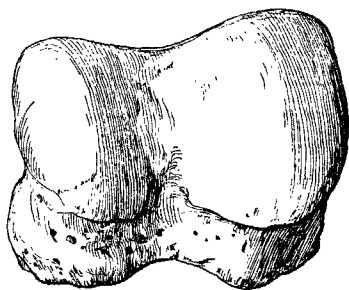
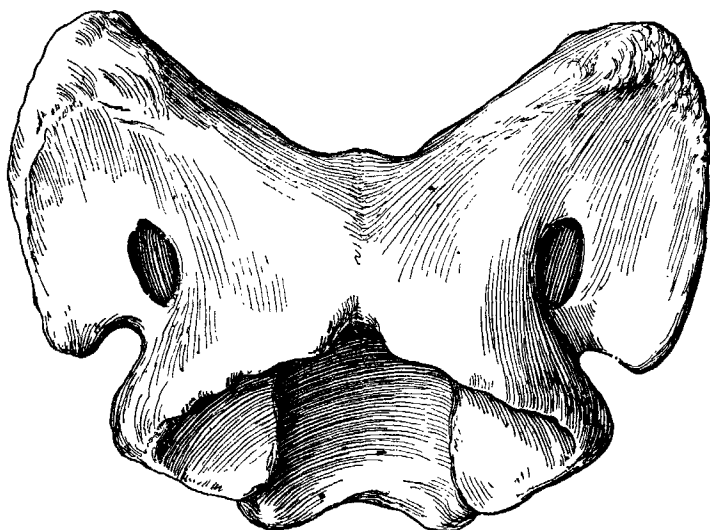


Fig. 2.



Fig. 3.



An anatomical illustration of the human sacrum and coccyx. The sacrum is a large, triangular bone formed by the fusion of five sacral vertebrae. It features a prominent sacral hiatus at the base and a sacral canal. The coccyx, or tailbone, is a small, cartilaginous structure at the very bottom of the vertebral column. The illustration shows the sacrum from a posterior view, with the coccyx attached to its inferior surface.

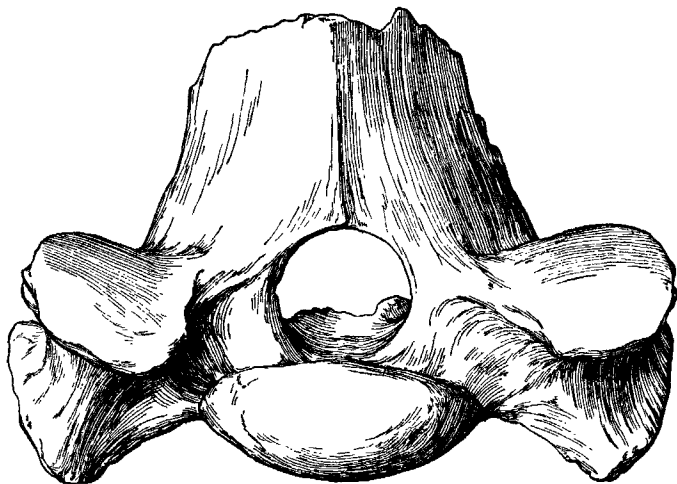
A diagram of a cross-section of a human larynx. The central opening is the glottis, which is flanked by the vocal folds. The surrounding tissue is shaded with diagonal lines, and the central opening is white. Dashed lines indicate the boundaries of the glottis.

horse. The dorsal and ventral ridges are but little marked. The vertebrarterial canal is very large and shows a peculiar feature in the way it excavates the centrum. This modification is also shown by the atlas, and still better in the following vertebra, which is

- (7) A later cervical (fig. 5, front view). This bone differs from that just described in having a less great fore-and-aft depth, the proportions being otherwise much the same. One side being broken away, it has been possible to trace out the course of the vertebrarterial canal, which shows a very curious feature in expanding into a large "cave" in the body of the vertebra to such an extent that the bone between the expansions of each side is reduced to a thin vertical partition running the length of the bone. This structure is shown in the accompanying diagram, which is a plan of a section taken transversely through the vertebra.

Another similar vertebra, which is in process of being prepared, shows the same feature, probably a method of saving weight.

Fig. 7.



- (8) The remaining vertebra (fig. 7) is apparently an anterior thoracic. It measures 42 cm. in width across the posterior zygapophyses. The neural spine is rather peculiar in being very broad and flat, the upper border of the spine is broken away, but it does not seem to have been very much higher.

As some of the bones are not yet fully developed, a further description cannot be attempted here. In fact, there is some difficulty in finding material for the purposes of comparison, owing to the aberrant character of the bones. The astragalus, as may be seen from the figure, is *Perissodactyle* rather than anything else—at all events, it is not *Proboscidian*; moreover, it (as well as the other foot-bones, of which there are a considerable number) is more comparable with those of the *Rhinoceros* than anything else, in spite of great differences in proportion and size. The two podial bones point to an animal exceedingly *dolichopodous*, a remarkable feature when the heavy build of the body is taken into consideration.

The femur and humerus are rather *Proboscidian* at first sight, and are probably thus modified in each case as adaptations to weight-carrying. The absence of a third trochanter does not necessarily imply that the owner is not a *Perissodactyle*, seeing that the *Titanotheres* were without one.

It is the vertebræ, however, which show this animal in the strangest light, for, in addition to the unique structure of the vertebrarterial canal described above, the shape and measurements of the bones themselves point to a very long neck. At the end of this long neck there must have been a very large skull, witness the size of the condylar facets in the atlas. It is very unfortunate that no trace of this skull could be found to give us an idea of its shape; but if we take the length of the skull as about four times the width of the condyles (a proportion found in some of the rhinoceroses), we get a head measuring well over a yard in length. The weight of a mass like this at the end of a four-foot neck (a moderate estimate) would require and account for some strange modifications of the cervical vertebræ.

It is thus impossible at present to give an idea of the position of this animal. I believe all the bones described to belong to one animal both from their close association in the bone-bed and from the universal absence in these deposits of a trace of any other form to which they could belong. The *Elephants* and *Rhinoceroses* living at the same time, of which considerable remains have been found, point to forms of small or not more than medium size (*Paraceratherium bugtiense*, the next largest animal obtained, is about as large as a modern rhinoceros).

It is to be hoped, however, that a stricter examination and comparison of all the available material will throw some more light on the structure and relationships of this interesting form.