VI. PRELIMINARY DESCRIPTIONS OF SOME NEW TITANOTHERES FROM THE UINTA DEPOSITS.

By Earl Douglass.

The writer, with an assistant, Mr. J. F. Goetschius, spent the summer of 1908 collecting fossils in the Uinta Basin in eastern Utah and western Colorado. The principal object of the expedition was the acquisition of Upper Eocene vertebrates and the extension of our knowledge of the geology of the region and the sequence of the extinct mammalian faunæ. About thirteen years had elapsed since the last collecting party had visited the Uinta deposits, and the underlying Tertiary formations had never been carefully explored.

The Director of the Carnegie Museum, Dr. William J. Holland, made it possible to conduct the expedition as the present writer believed it should be conducted, and by dint of thorough and persistent search it was successful in securing a large collection of mammals and reptiles from several different levels of the Uinta deposits through a thickness of 700 feet, or more, of strata. The collections came principally from Horizon "B" of Peterson, and probably, as a rule, from lower levels than those from which previous collections had been made. This undoubtedly accounts for the fact, that, as the fossils are removed from the matrix, a large proportion of them are seen to belong to undescribed species, or exhibit some differences from those which have been previously described.

On account of the large amount of work to be done at the Museum and the condition of the specimens from the Uinta deposits the work of clearing the fossils from the matrix has proceeded slowly, and only a small portion of the material is ready for study. As the absence of the writer during the summer will suspend the work in the laboratory, and as Professor Henry F. Osborn, who is preparing a memoir on the Titanotheres, says that it is especially important that we should know more of the Upper Eocene members of that family, it is thought best to publish a short description of some of those which present new characters.

Had it not been for the kindness of Professor Osborn in allowing

me the free use of his specimens and drawings of the *Titanotheridæ* and for Mr. Wm. K. Gregory's valuable assistance in the comparison and determination of specimens, even this preliminary paper could not have been prepared at this time.

Telmatherium? incisivum sp. nov.

(PLATE XIII, FIG. 1.)

(No. 2398 Carnegie Museum Catalog of Vertebrate Fossils.)

A skull lacking the ends of the nasals. From a thick deposit of sandstone and small gravel evidently of stream origin, near the middle of horizon "B," about three miles northeast of Well 2, Uinta Basin, Utah.

I think that this skull represents a different genus from *Telmatherium*,

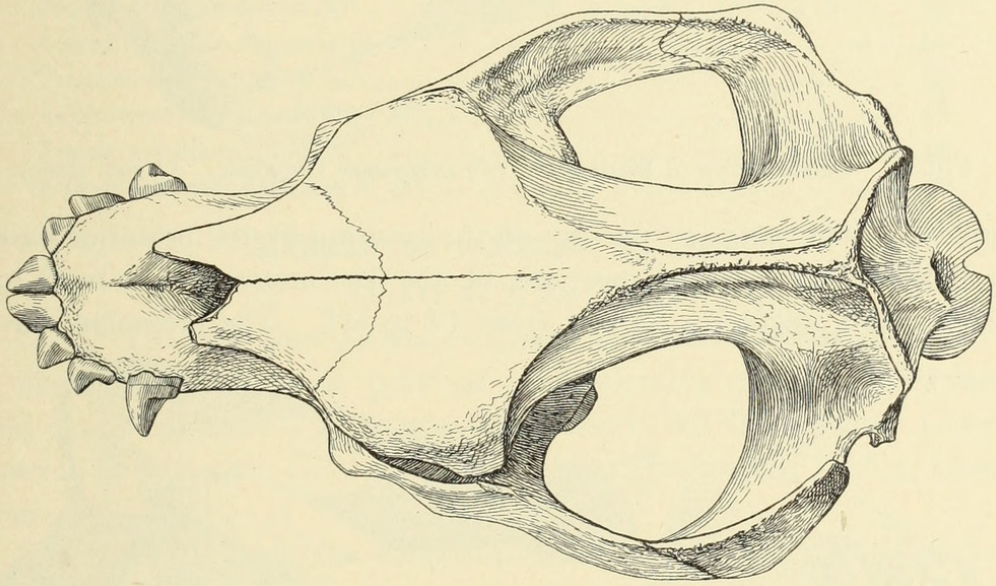


FIG. 1. Superior View of Skull of *T.* (*?*) *incisivum* Douglass. ($\frac{1}{5}$ nat. size.)

but I prefer to place it provisionally here rather than establish another genus. The skull is broad and short, but not high. The forehead is broad and flat. The premaxillaries are oblique, not transverse. The face is short and concave. Apparently there are vacuities anterior to the orbits. Beneath these there is a rounded angle on the malar, but there is no flattened shelf beneath the orbit. The zygomatic arch is spreading and moderately heavy. The sagittal crest is quite high and thin. The superior wings of the occiput are also thin. The brain-case is small; the outward projecting zygomatic processes of the squamosals shelf-like, and broad antero-posteriorly. The paroccipital

processes extend laterally, and are continuous with the paramastoid processes posterior to the external auditory meatus and the postglenoid

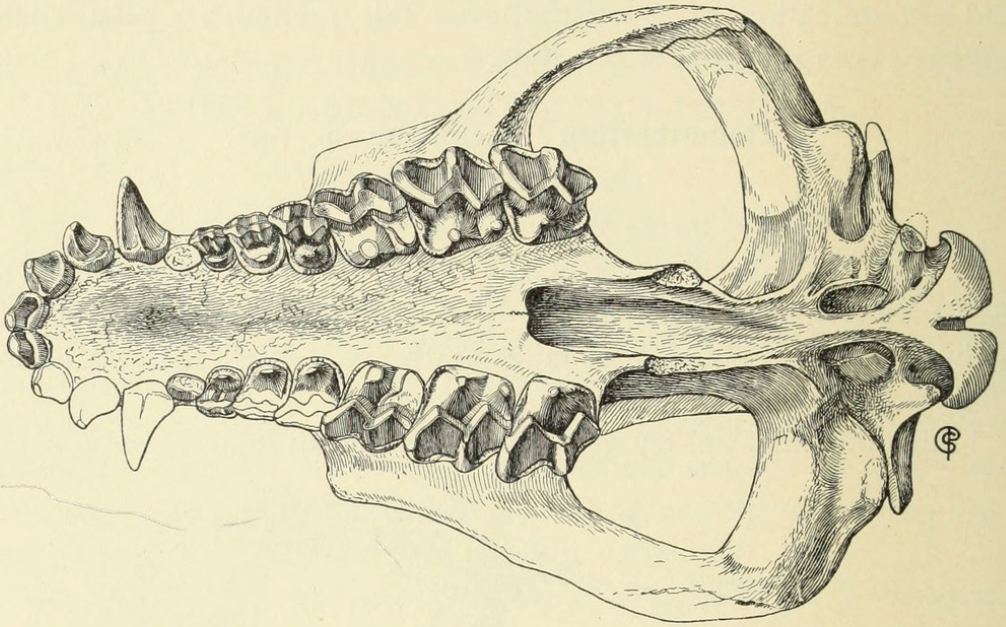


FIG. 2. Palatal View of Skull of *T.* (*?*) *incisivum* Douglass. ($\frac{1}{5}$ nat. size.)

process. The anterior portion of the opening of the posterior nares is between the anterior portions of the last molars. The teeth increase quite regularly in size from $P^{\frac{2}{2}}$ to $M^{\frac{2}{2}}$. The premolars have

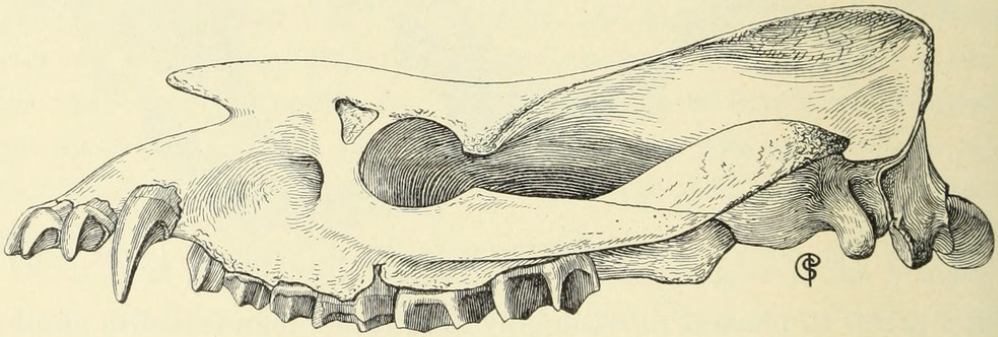


FIG. 3. Lateral View of Skull of *T.* (*?*) *incisivum* Douglass. ($\frac{1}{5}$ nat. size.)

heavy cingula. The deuterocones on $P^{\frac{2}{2}}$ and $P^{\frac{3}{3}}$ are oblong anteroposteriorly while that on $P^{\frac{4}{4}}$ is high and conical.

This skull was discovered by Mr. J. F. Goetschius.

MEASUREMENTS.

	Mm.
Length of skull, basal	490
Width of skull	330
Length of dental series	295

	Mm.
Length of molar-premolar series	212
Transverse diameter of I^1	21
Antero-posterior diameter of I^1	22
Transverse diameter of I^2	27
Antero-posterior diameter of I^2	25
Transverse diameter of I^3	22
Antero-posterior diameter of I^3	25
Transverse diameter of canine	24
Antero-posterior diameter of canine	27
Transverse diameter of P^2	22
Antero-posterior diameter of P^2	20
Transverse diameter of P^3	30
Antero-posterior diameter of P^3	24
Transverse diameter of P^4	37
Antero-posterior diameter of P^4	27
Transverse diameter of M^1	48
Antero-posterior diameter of M^1	44
Transverse diameter of M^2	53
Antero-posterior diameter of M^2	46
Transverse diameter of M^3	53
Antero-posterior diameter of M^3	46

Manteoceras uintensis sp. nov.

(PLATE XIII, FIG. 4.)

(No. 2388 Carnegie Museum Catalog of Vertebrate Fossils.)

Skull except posterior portion. Considerably crushed downward and nasals fractured. From gray sandstone in red Uinta beds. Lower portion of horizon "C." About five miles northeast of Well 2, Uinta Basin, Utah.

The skull is high, the forehead broad, and the zygomatic arches spreading. The premaxillary region as seen from the front is broad, though the incisors are only moderately large. The canines are directed outward. The free nasals are short and moderately broad. Apparently the infraorbital foramen is not excessively large. The malar is rounded beneath the orbit and has no protuberance or shelf. The zygomatic arch is not very heavy and is only moderately deep anterior to the glenoid articular surface. It is not nearly so heavy as in *Telmatherium ultimum*. The opening of the posterior nares extends forward to the middle of the second molars. Their border is rounded and thickened.

The incisors are moderately large, but not cupped. They are arranged in an oblique line about half-way between a transverse and

antero-posterior direction. The crowns of $I\frac{1}{1}$ and $I\frac{2}{2}$ are low. The anterior faces are very convex. There are two posterior flattened surfaces separated by a rounded ridge. There are no cups, but the

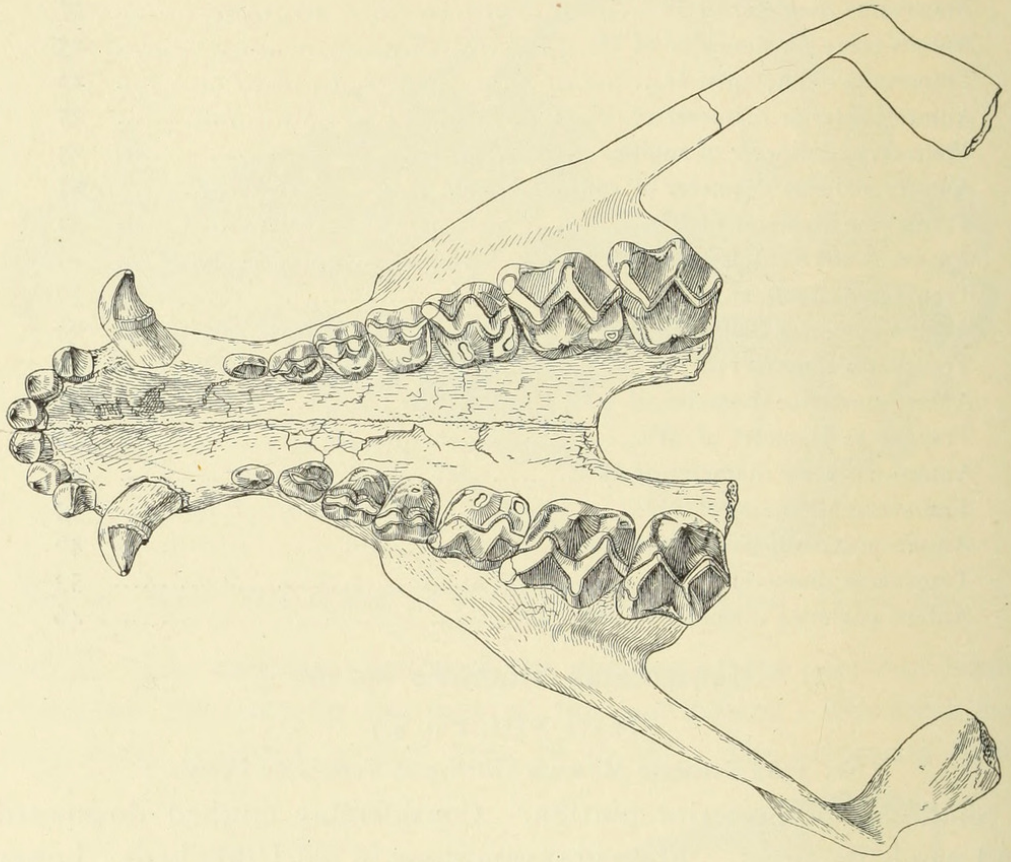


FIG. 4. Palatal View of Skull of *Manteoceras uintensis* Douglass. ($\frac{1}{5}$ nat. size.)

posterior portion forms a kind of ledge or keel. $I\frac{3}{3}$ is higher and is directed more downward. The posterior portion is flattened and there is a low flat ledge behind the conical cusp. The canine has a moderately high curved crown, on which there are antero-internal and postero-

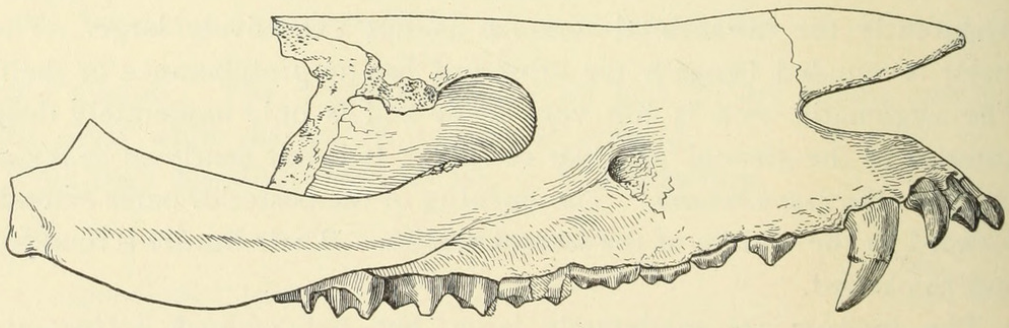


FIG. 5. Lateral View of Skull of *M. uintensis* Douglass. ($\frac{1}{5}$ nat. size.)

external ridges, passing downward from the base to the apex. There is also a narrow postero-internal ledge.

Unless the skull is more crushed laterally than it appears to be, there is a sudden contraction posterior to the canine, so that the first two premolars are much nearer to the median line of the palate than are the canines. The diastema between the canine and $P\frac{1}{1}$ is about 3 cm. in length.

$P\frac{1}{1}$ is a simple oblong conical tooth, which has a small antero-internal depression, and a small ridge passes backward from the apex to the posterior portion of the rudimentary keel. Pms. *2, 3 and 4* have low cusps. The teeth increase nearly uniformly in width and size from $P\frac{2}{2}$ to the last molar. The two outer elements in each are well defined and are sub-equal in size, although the anterior cusp is slightly the larger. The internal cusp on $P\frac{2}{2}$ is small, oblong antero-posteriorly, and is placed far back. The internal cusp on $P\frac{3}{3}$ is much larger, and is crescent-shaped. On $P\frac{4}{4}$ it is more nearly conical. There are rudimentary cingula on the inner faces of the last three premolars. The postero-internal cusp on $M\frac{3}{3}$ is represented by a low crescent-shaped ridge.

MEASUREMENTS.

	Mm.
Length of skull from anterior portion to glenoid articular surface	430
Length of dental series	356
Length of molar premolar series	247
Length of premolar series	106
Length of molar series	141
Transverse diameter of $I\frac{1}{1}$	16
Antero-posterior diameter of $I\frac{1}{1}$	18
Transverse diameter of $I\frac{2}{2}$	16
Antero-posterior diameter of $I\frac{2}{2}$	18
Transverse diameter of $I\frac{3}{3}$	20
Antero-posterior diameter of $I\frac{3}{3}$	22
Transverse diameter of canine	22
Antero-posterior diameter of canine	26
Transverse diameter of $P\frac{1}{1}$	12
Antero-posterior diameter of $P\frac{1}{1}$	22
Transverse diameter of $P\frac{2}{2}$	21
Antero-posterior diameter of $P\frac{2}{2}$	28
Transverse diameter of $P\frac{3}{3}$	28
Antero-posterior diameter of $P\frac{3}{3}$	27
Transverse diameter of $P\frac{4}{4}$	33
Antero-posterior diameter of $P\frac{4}{4}$	30
Transverse diameter of $M\frac{1}{1}$	44
Antero-posterior diameter of $M\frac{1}{1}$	40

	Mm.
Transverse diameter of M^2	53
Antero-posterior diameter of M^2	55
Transverse diameter of M^3	56
Antero-posterior diamerer of M^3	51
Width of palate between canines ?	68
Width of palate between first premolars	54
Width of palate between last molars	83

Dolichorhinus heterodon sp. nov.

(PLATE XIII, FIG. 3.)

(No. 2340 Carnegie Museum Catalog of Vertebrate Fossils.)

From upper part of horizon "B" or lower part of horizon "C," six or seven miles northeast of Well 2, Uinta Basin, Utah.

The skull is long, narrow, and moderately high. The face is short and the brain-case long. The free nasals are long, the posterior opening of the anterior nares extending well backward toward the orbit. The lower border of the nasals approach each other, but this is probably in part due to lateral crushing. The infraorbital foramen is large. The infraorbital shelf is represented by a protuberance, which

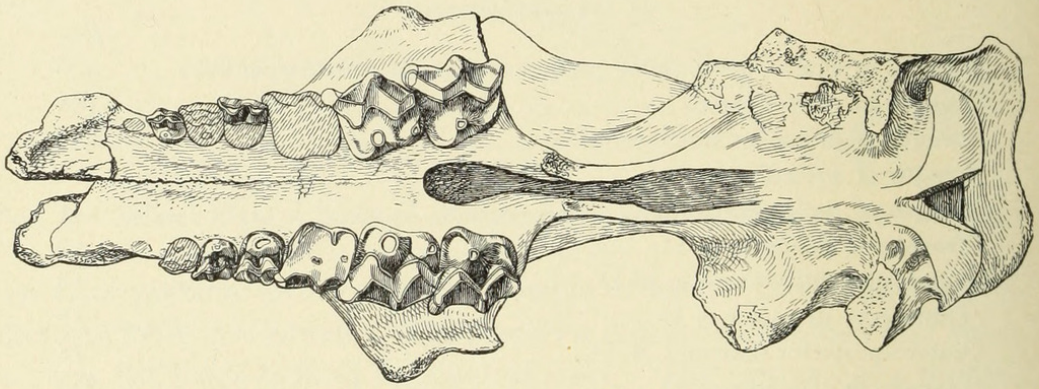


FIG. 6. Palatal View of Skull of *D. heterodon* Douglass. ($\frac{1}{5}$ nat. size.)

is thickened on the free outer surface. If there were horn-cores above the orbit they were very small. The long brain-case was apparently arched from before backward, the posterior descent to the crest of the occiput being very steep, though this may be somewhat exaggerated by crushing. The occipital condyles are very large. The median portion of the occiput above them is convex while above this there is a large concavity. The postglenoid processes are not excessively large.

The premolars are small, the last being very decidedly smaller than the first molar. The first premolar is not preserved, but it was evidently a simple tooth. In the last three premolars there is a lobe o

buttress on the antero-external portion of the tooth, which makes the anterior margin oblique. The inner cusps (deuterocones) are low with rounded summits. They are more nearly opposite the postero-external than the antero-external cusp. There are inner cingula on $P^{\frac{3}{3}}$ and $P^{\frac{4}{4}}$. The antero-internal cusp in M^2 is quite high and $M^{\frac{1}{1}}$ conical.

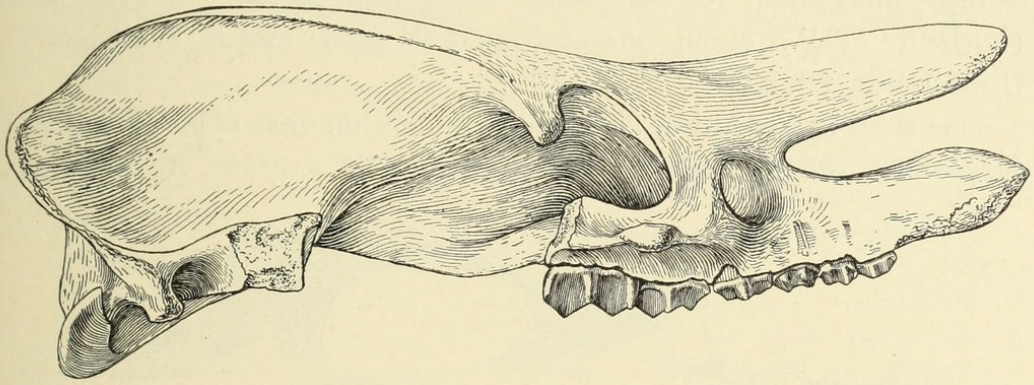


FIG. 7. Lateral View of Skull of *D. heterodon* Douglass. ($\frac{1}{5}$ nat. size.)

The postero-internal cusp is due simply to an increase in height of the cingulum.

This skull was found by Mr. J. F. Goetschius.

MEASUREMENTS.

	Mm.
Total length of top of skull from end of nasals to crest of occiput	500
From anterior of orbit to front of nasals	160
From anterior of orbit to posterior part of narial opening to front of nasals.	55
Width of occiput	128
Height of occiput	140
Length of molar premolar series	190
Length of premolar series	75
Length of molar series	115
Length of P^2	20
Width of P^2	16
Length of P^3	21
Width of P^3	20
Length of P^4	24
Width of P^4	27
Length of M^1	34
Width of M^1	35
Length of M^2	46
Width of M^2	42
Length of M^3	48
Width of M^3	42

Dolichorhinus longiceps sp. nov.

(PLATE XIII, FIG. 2; PLATES XIV AND XV.)

(No. 2347 Carnegie Museum Catalog of Vertebrate Fossils.)

From the lowest level at which fossils were found in horizon "B" of the Uinta, about 700 feet below the bottom of the Uinta red beds (horizon "C"), about one and one-half miles east of Well No. 2, Uinta Basin, Utah.

This skull in general outline is very much like that of *Dolichorhinus hyognathus*, though broader. In describing it I prefer to point out

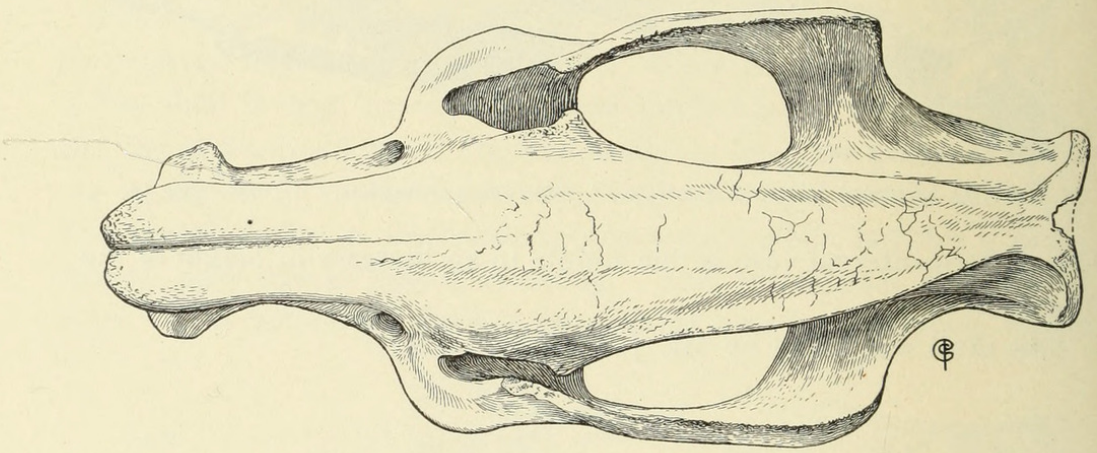


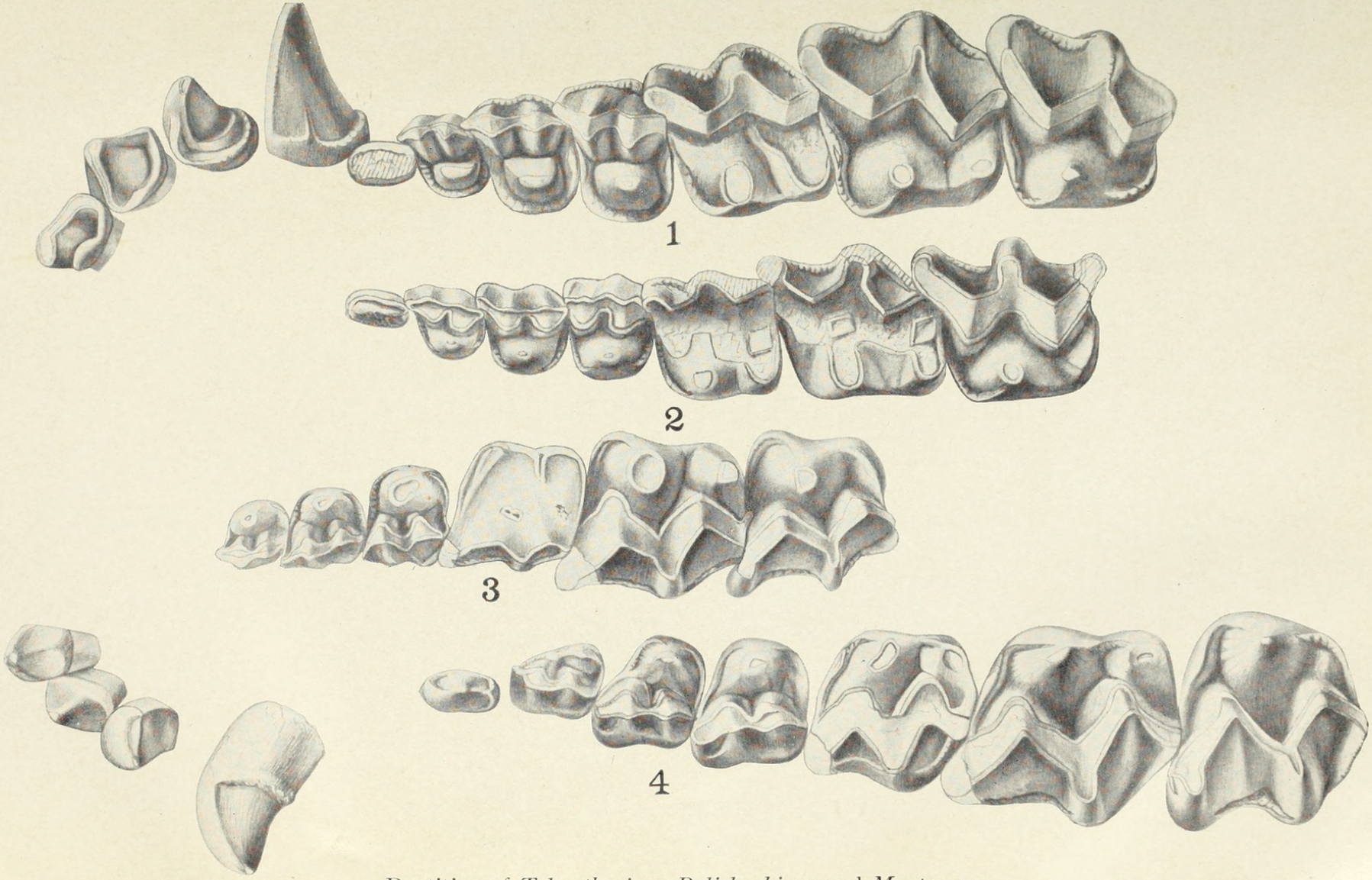
FIG. 8. Superior View of Skull of *D. longiceps* Douglass. ($\frac{1}{5}$ nat. size.)

the characters which distinguish it from that species. Apparently it is somewhat broader proportionally than that of *D. hyognathus*. The skull is somewhat crushed, but it evidently was not flattened on top. The present specimen had no heavy protuberances or horn-cores, though there may have been the slightest beginning of such. There is a rather narrow shelf, or lateral expansion of the malars, with rounded outer borders, beneath the anterior portion of the orbit, but it is not like the infraorbital process of *D. hyognathus*. The postorbital hook does not appear to have been long or prominent. Evidently the zygomatic arches extend laterally outward more than in the last-named species; the postglenoid processes are not nearly so heavy; the palate is broader; the top of the cranium, though there is no zygomatic arch, becomes narrower anterior to the crest of the occciput.

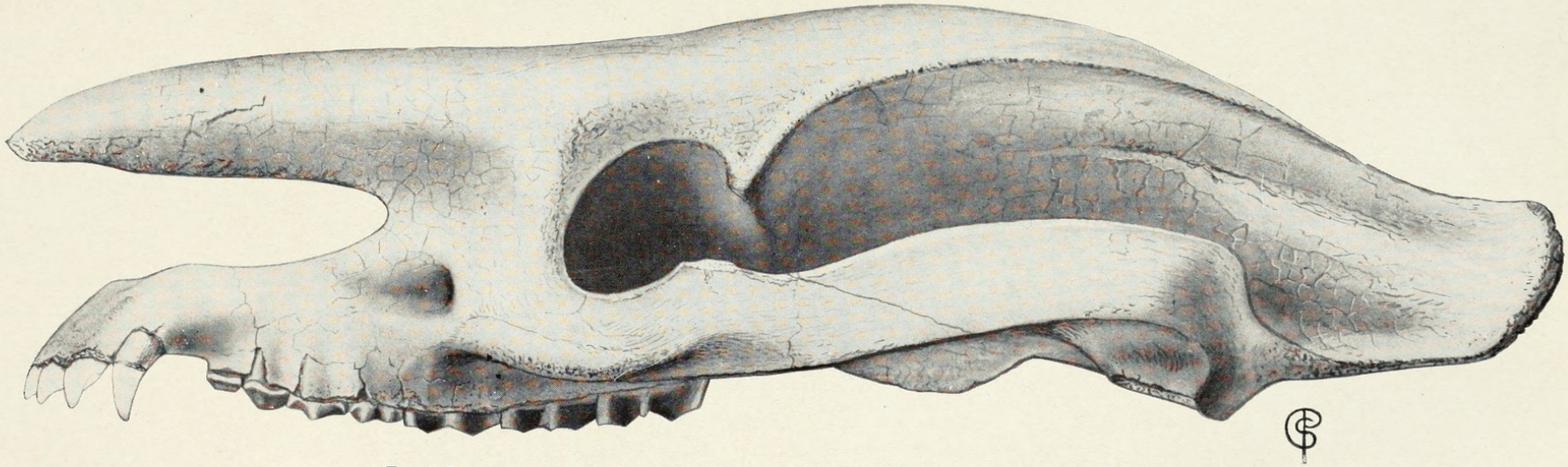
The teeth are very similar to those of *Dolichorhinus heterodon*, so much so, that, if only the teeth were known, they might be referred to that species. They, as well as the skull, are larger.

MEASUREMENTS.

	Mm.
Length of top of skull	590
Length of free nasals	150
Length of skull posterior to anterior portion of orbit	393
Width of skull at glenoid articular surface	267
Width at infraorbital shelves	247
Length of molar premolar series	192
Length of premolar series	88
Length of molar series	112
Length of P^1	15
Width of P^1	11
Length of P^2	20
Width of P^2	20
Length of P^3	24
Width of P^3	25
Length of P^4	27
Width of P^4	31
Length of M^1	30
Width of M^1 about	37
Length of M^2	37
Width of M^2	44
Length of M^3 about	41
Width of M^3 "	43

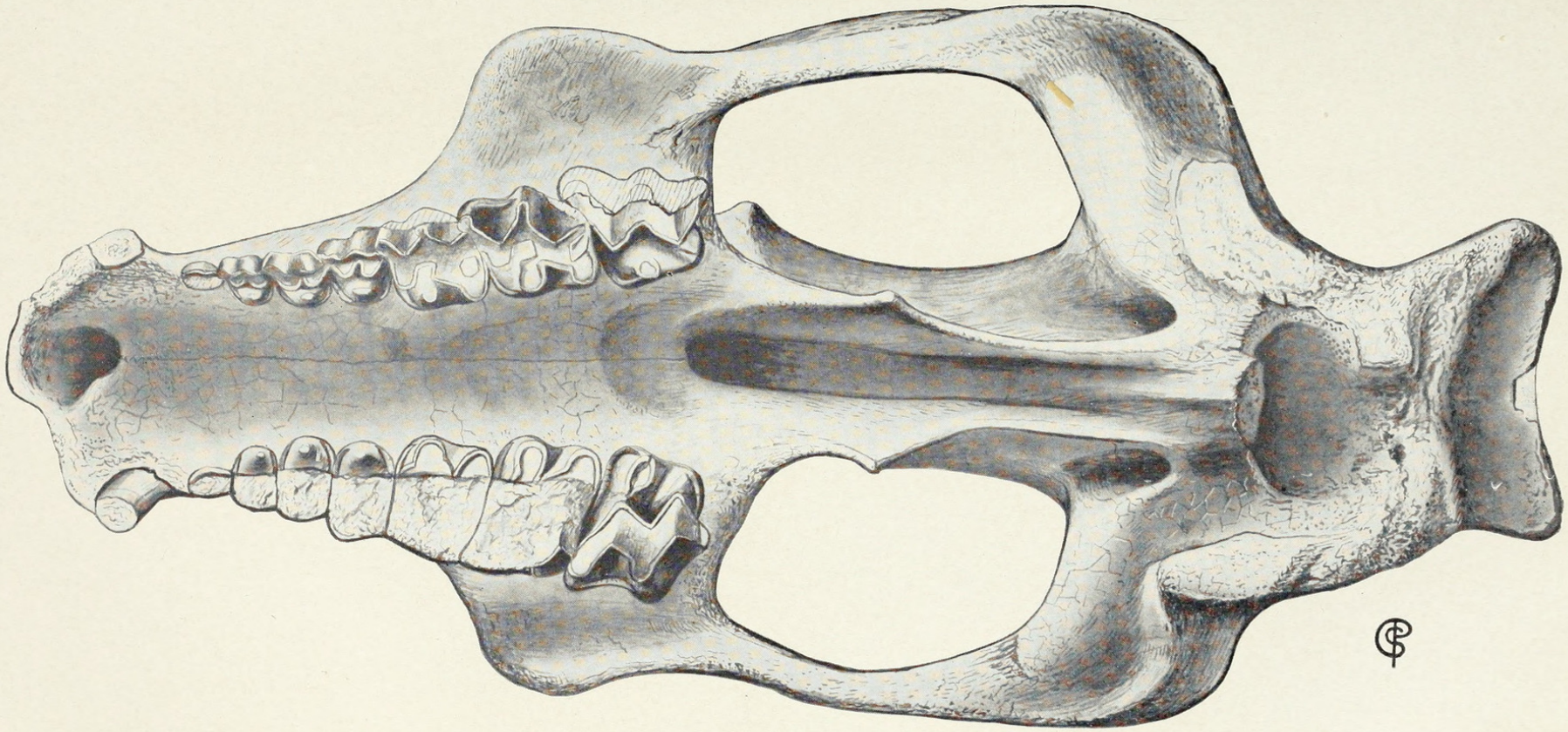


Dentition of *Telmatherium*, *Dolichorhinus*, and *Manteoceras*.



Dolichorhinus longiceps Douglass. C. M. Cat. Vert. Foss. No. 2347.

(Somewhat less than one-third natural size.)



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