PALEONTOLOGY

Discovery of Triceratops "A Classic of Science"

Its Peculiar Horns, First Thought To Be From a Bison, Proved To Belong To a Strange Armored Dinosaur

NOTICE OF NEW FOSSIL MAMMALS: by O. C. Marsh. In American Journal of Science, Vol. XXXIV, p. 323. *New Haven,* 1887.

AMONG the large number of extinct mammals recently received at the Yale Museum from the West, are several of especial interest, as they serve to mark definite horizons in the Tertiary deposits east of the Rocky Mountains, or show important characters not before observed. A notice of some of these species new to science is given below, and more complete descriptions will appear elsewhere.

Bison alticornis, sp. nov.

This species of Bison is represented by various remains, the most important of which is the portion of a skull, figured below. This specimen, which may be regarded as the type, indicates one of the largest of American bovines, and one differing widely from those already described. The horn-cores, instead of being short and transverse, as in the existing bisons, are long and elevated, with slender, pointed ends. They have large cavities in the base, but in the upper two-thirds are nearly, or quite, solid. Their position is well shown in the cuts. The frontal region between the horn-cores is broad, somewhat convex, and very rugose.

The remains of this species are found in the sandstones of the Denver group, at the eastern base of the Rocky Mountains, where they indicate a well-marked horizon, which may be called the Bison beds, and are probably late Pliocene.

The locality of the type specimen is on the banks of Green Mountain Creek, near Denver, Colorado, where it was found by George L. Cannon, Jr., of Denver. Portions of the same specimen were subsequently secured by Whitman Cross of the U. S. Geological Survey. Other remains were obtained by G. H. Eldridge of the Survey, and all were sent to the writer for examination.

A NEW FAMILY OF HORNED DINOSAURIA, FROM THE CRETACEOUS; by O. C. Marsh. In American Journal of Science, Vol. XXXVI, p. 447. *New Haven,* 1888.

During the past season, a special effort has been made by one field-party of the U. S. Geological Survey, to explore the Laramie formation, more particularly in Dakota and Montana. In this work, important collections of vertebrate fossils have been secured, and among them are remains of some new Dinosaurs of much interest, one of which is briefly described below.

Ceratops montanus, gen. et sp. nov.

The present genus appears to be nearly allied to *Stegosaurus* of the Jurassic, but differs especially in having had a pair of large horns on the upper part of the head. These were supported by massive horn-cores firmly coössified with the occipital crest. The latter are probably attached to the parietal bones, but, as the sutures in this region are obliterated, they may be supported in part by the squamosals.

The horn cores in the type specimen are sub-triangular at base, but nearly round in section in the upper half . . . These horn cores are slightly hollowed at the base, but are otherwise solid. The exterior texture and markings show that they were evidently covered with true horns, and these must have formed large and powerful offensive weapons.

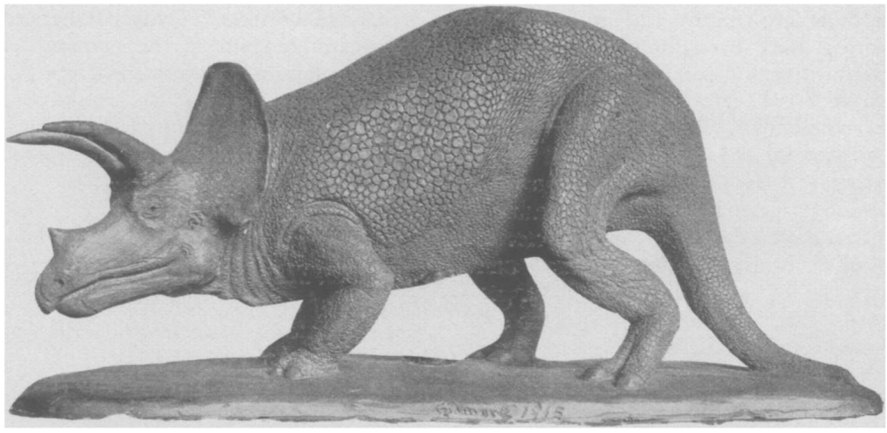
In position and direction, these horn-cores are somewhat similar to the large posterior pair of protuberances in *Meiolania,* one of the extinct *Testudinato*, and to the corresponding ones of the existing *Phrynosoma.* The only known example of similar structure in the *Dinosauria* is the single median horn-core on the nasals of *Ceratosaurus,* from the Jurassic. It is not improbable that there were other horn-cores on the skull in the present genus, but, of this, there is at present no positive evidence. A detached median prominence resembling a horn-core was found with some similar remains, but may pertain to an allied genus.

The resemblance in form and position of the posterior horn-cores to those of some of the ungulate mammals is very striking, and, if detached, they would naturally be referred to that group. . . .

The type specimen on which the present genus and species are based was found in place, in the Laramie deposits of the Cretaceous, in Montana, by Mr. J. B. Hatcher, of the U. S. Geological Survey. Other specimens apparently pertaining to the same species were secured in the same horizon of the same region.

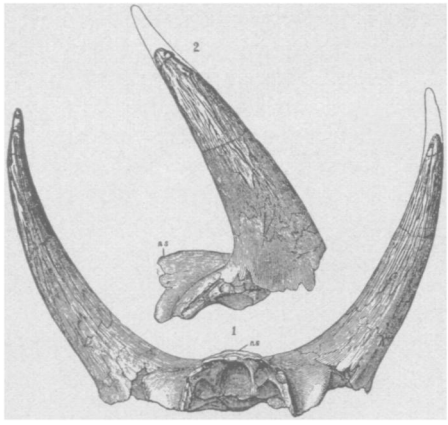
Remains of the same reptile, or one nearly allied, had previously been found in Colorado, in deposits of about the same age, by Mr. G. H. Eldridge, also of the U. S. Geological Survey.

The associated fossils found with the present specimens are remains of other Dinosaurs, crocodiles, turtles, and fishes, mostly of Cretaceous types. The mol-



TRICERATOPS AS HE LOOKED IN LIFE

Restoration by Charles W. Gilmore of the U. S. National Museum, based on a complete skeleton in the Museum collection.



BISON ALTICORNIS

Part of Skull with Horn-cores, of the Dinosaur, which at first were believed to be bones of a fossil "buffalo."

lusks in the same beds indicate fresh-water deposits.

The fossils here described indicate a reptile of large size, twenty-five or thirty feet in length, and of massive proportions. With its horned head and peculiar dermal armor, it must have presented in life a very strange appearance.

The remains at present referred to this genus, while resembling *Stegosaurus* in various important characters, appear to represent a distinct and highly specialized family, that may be called the *Ceratopsidae.*

NOTICE OF NEW AMERICAN DINOSAURIA; by O. C. Marsh. In American Journal of Science, Vol. XXXVII, p. 331. New Haven, 1889.

In the large series of Dinosaurian remains brought together by the writer, in the last few years, and now under investigation, there are a number of new forms, some of which are briefly noticed below. These will all be fully described and figured in the memoirs now in preparation, by the writer, for the United States Geological Survey. . . .

Ceratops horridus, sp. nov.

The strange reptile described by the writer as *Ceratops montanus** proves to have been only a subordinate member of the same family. Other remains received more recently indicate forms much larger, and more grotesque in appearance. They also afford considerable information in regard to the structure of these animals, showing them to be true *Stegosauria,* but with the skull and dermal armor strangely modified and specialized just before the group became extinct.

The vertebrae, and the bones of the limbs and of the feet, are so much like the corresponding parts of the typical *Stegosaurus* from the Jurassic, that it would be difficult to separate the two when in fragmentary condition, as are most of those from the later formation. The latter forms, however, are of larger size, and nearly all the bones have a peculiar rugosity, much less marked in the Jurassic species. In the form here described, this feature is very conspicuous, and marks almost every known part of the skeleton.

In the type specimen of the present species, the posterior horn-cores are much larger than these appendages in any other known animal, living or extinct. One of them measures at the base, no less than twenty-seven inches, and about sixteen inches around, half way to the summit. Its total height was about two feet. In general form, these horn-cores resemble those of *Ceratops montanus,* but the anterior margin is more compressed, showing indications of a ridge.

The top of the skull, in the region of the horn-cores, is thick and massive, and strongly rugose.

This skull as a whole must have had at least fifty times the weight of the skull of the largest *Sauropoda* known, and this fact will give some idea of the appearance of this reptile when alive.

As previously stated, the posterior pair of horn-cores of this family are hollow at the base, and in form and surface markings are precisely like those of the *Bovidae.* The resemblance is so close that, when detached from the skull, they cannot be distinguished by any anatomical character. This accurate repetition, in later and still existing forms, of the highly specialized weapons of an extinct group of another class is a fact of much interest.

The present specimen is from the Laramie formation of Wyoming, but fragmentary remains, which may be referred provisionally to the same species, have been found in Colorado.

THE SKULL OF THE GIGANTIC CERATOPSIDAE; by O. C. Marsh. Abstract of a paper read before the National Academy of Sciences, Philadelphia, November 14, 1889. In American Journal of Science, Vol. XXXVIII, p. 501. New Haven, 1889.

The huge horned Dinosaurs, from the Cretaceous, recently described by the writer, have now been investigated with some care, and much additional light has been thrown upon their structure and affinities. A large amount of new material has been secured, including several skulls, nearly complete, as well as various portions of the skeleton. . . .

The unique characters of the skull of the *Ceratopsidae* are especially the following:

1) The presence of a rostral bone, and the modification of the pre-dentary to form a sharp, cutting beak.

(2) The frontal horn-cores, which form the central feature of the armature.

(3) The huge, expanded parietal crest.

(4) The epoccipital bones.

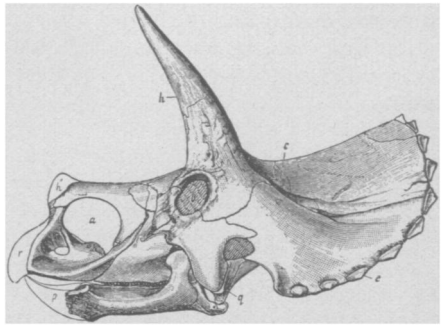
(5) The aborted transverse bone.

These are all features not before seen in the *Dinosauria,* and show that the family is a very distinct one.

The peculiar armature of the skull has a parallel in the genus *Phrynosoma,* among the lizards, and *Meiolania,* among the turtles, and it is of special interest to find it also represented in the Dinosaurs, just before their extinction.

Such a high specialization of the skull, resulting in its enormous development, profoundly affected the rest of the skeleton. Precisely as the heavy armature dominated the skull, so the huge head gradually overbalanced the body, and must have led to its destruction. As the head increased in size to bear its armor, the neck first of all, then the fore limbs, and later the whole skeleton, was specially modified to support it.

These features will be discussed in a later communication, but to the present description of the skull should be added the fact that the anterior cervical vertebrae were firmly coössified with each other, an important character not before observed in Dinosaurs.



TRICERATOPS FLABELLATUS

The skull, seen from the side, of the nearly complete specimen.

*This Journal, vol xxxvi, p. 477, Dec., 1888. . . . The specimen figured in vol. xxxiv, p. 324, may prove to belong to the same genus.

The skull represented on the accompanying plate is the type specimen of *Triceratops flabellatus,* Marsh. It was found in the Ceratops beds of Wyoming by Mr. J. B. Hatcher, who also discovered the type of the genus *Ceratops,* in the same horizon in Montana.

Science News Letter, March 28, 1931

CHEMISTRY

Male Sex Hormone Purified in Vacuum

MALE sex hormone, the glandular secretion responsible for typically masculine appearance and behavior on the part of male animals, is obtainable in a high state of purity by a method of vacuum distillation. The method was described before the Royal Academy of Sciences of Holland by a group of scientists of the pharmacotherapeutic laboratory of the University of Amsterdam. The group consists of Doctors E. Dingmasse, J. Freud, S. Kober, E. Laqueur and A. P. W. Münch.

They placed their glandular material, already partly purified by chemical processes, in a distilling apparatus which was exhausted to a nearly complete vacuum by means of an airpump. When heat was applied, it was found that the hormone came over in a very nearly pure state at temperatures between 80 and 90 degrees Centigrade, somewhat below the boiling point of water. Above 90 degrees other products also were distilled over, reducing the concentration of the hormone in the end-product.

The material obtained is probably not completely pure hormone. It does not wholly crystallize, but forms crystals that lie in an oily-appearing bath.

Thus far only very small quantities have been worked with, and experiments have yet to be made to learn whether the method can be used successfully for the purification of the hormone in pharmaceutical quantities.

Science News Letter, March 28, 1931

Life in

The Bronze Age

investigated by

Montellius

is the subject of the next

CLASSIC OF SCIENCE

ARCHAEOLOGY

Britons of the Stone Age Had Breakfast in Bed

Excavation of Ancient Village Reveals Stone Beds Holding Remains of Meals and Also Hidden Treasures

EVIDENCE that our ancestors of the Stone Age really slept in stone beds has been obtained by Prof. V. Gordon Childe, of the University of Edinburgh in his excavations at Skara Brae, a ruined village in the Orkney Islands off Scotland.

In a report to the British journal, *Antiquity,* Prof. Childe describes the furniture of a bed-sitting room, marvelously preserved, in one of the stone huts at Skara Brae.

The beds, which stand against the wall of the stone hut, are oblong box-like enclosures with stone slabs for sides, held in place by stone wedges driven into the floor. The slabs at the head and foot are taller, like bedposts, and perhaps designed to support a canopy of skins, Prof. Childe suggests. For a mattress, the sleeper probably had ferns or heather.

Eating in bed seems to have been an old custom, judging by the gnawed bones found in the floors of the beds. Beads and other valuables were also found in them, showing that the mattress of a bed was a hiding place for treasures then, as today.

"Members of the family used to sit by day on the edge of the bed's front partition-slab, which is often noticeably worn save at the ends where the 'bedposts' protected it," Prof. Childe stated. "Articles they were making or using are frequently to be met on the floor between this improvised seat and the fire."

Above each bed were recesses in the stone walls in the form of cupboard shelves. In these were kept personal belongings. The room also contained a stone cupboard with two tiers of shelves, a hearth in the center of the room, and several tanks sunk in the floor, apparently for keeping limpets fresh until they should be eaten.

Nine huts were excavated. Furniture in all was similar, it was found.

The village was abandoned precipitately, as a variety of valuable objects left in the huts testifies. Passageways in the houses were tiny, and speedy flight was attended with difficulties. Prof. Childe found hundreds of beads and fine amulets dropped and scattered at the narrowest point in one doorway and along the passage.

No one ransacked the huts for valuables or removed the stone furniture. The village was buried in sand. Prof. Childe suggests that a storm of great severity was the enemy that routed the villagers.

The age of Skara Brae is not yet determined, but Prof. Childe considers that it was a belated Stone Age settlement, which existed in the British Bronze Age and which has been remarkably preserved through very unusual circumstances.

Science News Letter, March 28, 1931

PSYCHOLOGY-ETHNOLOGY

Goes to Mexico to Study Differences in Races

TO STUDY the effects of race crossing and to find out what differences, if any, exist between the minds of men of different races, is the purpose of an expedition which has departed for Yucatan, Mexico, under the direction of Dr. Morris Steggerda of the Carnegie Institution of Washington.

The expedition will be a follow-up of a study recently conducted by Dr. C. B. Davenport, director of the department of eugenics, of the Carnegie Institution of Washington, and Dr. Steggerda at Jamaica, British West Indies. In Jamaica, a number of psychological tests were given to three different color groups—Blacks, Browns, and Whites—all living under similar environmental conditions. It was found that the Whites received superior scores on 9 of the 12 tests given; in one test, that of form discrimination, there were no certain differences between the three groups; in one, the repetition of seven numbers, the Browns were superior; and in one, the Seashore test of musical ability, the Blacks came out ahead.

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