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**** *Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

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The Horned Saurians of the Laramie Formation.

IN 1872 Professor Cope made known the remains of a very large dinosaurian reptile from the transition beds of Wyoming, whice he named *Agathaumas sylvestris.* The portion of the skeleton found "rested in the midst of vegetable *débris,* as sticks and stems, and was covered with many beautiful dicotyledonous leaves, which filled the interstices between the bones." The animal was discovered near Black Buttes Station, on the Union Pacific Railroad, fifty-two miles east of Green River, and near the Hallville Coal-Mines. Professor Cope succeeded in recovering sixteen vertebræ, including a perfect sacrum, with dorsals and caudals; both iliac and other pelvic bones, those of one side nearly perfect; some bones of the limbs, ribs, and other parts not determined. Professor Cope's description is thus:—

"The vertebræ are large. The dorsals are short, with vertically oval centra and small neural canal. The diapophyses originate well above the neural canal, diverge upwards, and are triangular in section. The neural spine is very much elevated, and the arch short antero-posteriorly. The zygapophyses are close together in both directions, those of the same aspect being separated by a narrow keel only. They do not project, but consist of articular surfaces cut into the solid spine. The latter is flat, and dilated distally. The articular faces are nearly plane, with a slight median prominence. The ribs have two articular surfaces, but I found no capitular pit on the dorsal centra.

"Elevation of centrum, 7.5 inches; width of the same, 5 inches 7.5 lines; length of same, 3 inches 8.5 lines: total elevation of a dorsal vertebra, 28 inches 3 lines. The sacrum consists of five vertebræ, the anterior centrum not depressed. They give out huge diapophyses, which are united by suture. They are themselves united distally in pairs, each pair supporting a longitudinal convex articular face for the ilium. Each pair encloses a perforation with the centra. The first diapophysis goes off from the point of junction of the first and second vertebræ; the second from the third only, and is more slender. The total length is 25 inches, and the width 30 inches. Its vertebræ are flat below, with latero-inferior angles. The last centrum gives off a simple diapophysis. . . . The iliac bone is extended antero-posteriorly. One extremity is thick and rather obtuse, but of little depth. There is a large protuberance above the acetabular sinus. The other extremity is dilated into a flat, thin plate of rather greater length than the shorter extremity. The total length is about four feet, of which the acetabular sinus measures about 8.10 inches."

Professor Cope continues, "From the above description, it is evident that the animal of Black Buttes is a dinosaurian reptile, the characters of the sacral and iliac bones alone sufficing to demonstrate this point." It is pronounced the largest dinosaur described from North America.

This animal was described again and figured by Professor Cope in the "Vertebrata of the Cretaceous Formations," 1875: "On eight (and perhaps nine) vertebræ, anterior to the sacrum, there is no indication of the capitular articular facet for the rib [on the centrum]. This facet is found, as in *Crocodilia,* at or near the base of the elongate diapophyses. The centra are slightly concave posteriorly, and still less so on the anterior face, with gently convex margins. The neural canal is very small, and the neural arch short and quite distinct from the centrum, having scarcely any suture. The diapophyses are long and directed upwards. They are triangular in section."

The sacrals are then described, and the opinion is expressed that the tail is small: "The reduced and rather elongate form of the last sacral vertebra induces me to believe that this animal did not possess such large and short caudal vertebræ as are found in the genus *Hadrosaurus,* and that the tail was a less massive organ."

There cannot be any doubt that we have in *Agathaumas* a form widely different from any thing described before, clearly characterized by its peculiar sacrum and ilium.

Professor Marsh has created a new name, *Triceratops,* for this genus. That *Triceratops* is the same as *Agathaumas* will be admitted by everybody who will compare the figures published by Professor Cope, of the sacrum, the ilium, and the posterior dorsals, with the corresponding figures given by Professor Marsh. In the *American Journal of Science* (February, 1891) Professor Marsh makes this statement, "The posterior trunk vertebræ have also short, flat centra, but the diapophyses have faces for both the head and tubercle of the ribs, as in crocodiles, a feature not before seen in dinosaurs." Exactly this condition exists in *Agathaumas,* but also, as is well known, in *Iguanodon.* I think any further comment on the identity of *Agathaumas* and *Triceratops* is useless. Everybody can satisfy himself of this fact by comparing the figures of Professors Cope and Marsh.

I shall now show that *Ceratops* Marsh is the same as *Monoclonius* Cope.

In 1876 Professor Cope described a new, very remarkable dinosaur from the Fort Union beds of Montana, under the name of *Monoclonius crassus.*

"*Char. Gen.* — Teeth with obliquely truncate face and distinct root, which is grooved for the successional tooth on the front; no external cementum layer; caudal vertebræ biconcave, and brim narrow; fore-limbs large and massive. The teeth of this genus resemble those of *Hadrosaurus,* and, like them, are replaced from the front, — an arrangement which precludes the possibility of more than one series of teeth being in functional use at one time. The robust fore-limbs and elongate ilium distinguish *Monoclonius* [misprinted *Diclonius*] from *Hadrosaurus.* From *Trachyodon* it differs in the absence of the rough cementum layer on the back of the tooth.

"*Char. Specif.* — The faces of the teeth are acuminate oval in form, and are divided by an elevated keel, which is median above, but turns to one side at the base; margin crenate, the grooves extending more or less on the curves back, which is otherwise smooth; sacrum with ten vertebræ; the last centrum much compressed; the diapophyses extending horizontally from the neural arch above, and connected by a vertical lamina with the iliac supports; length, 27.33 inches. The bones of the limbs are robust, the hinder the longer, but not so much so as in some other genera. Length of femur, 22 inches; width proximally 7.4 inches, distally 6 inches. Length of tibia, 20 inches; greatest diameter proximally 8 inches, distally 7.25 inches. The three anterior dorsal vertebræ are co-ossified, and the first exhibits a deep cup for articulation with the preceding vertebra. The episternum is a T-shaped bone, thin, and keeled on the median line below. Length of transverse portion, 21 inches."

It is evident that the structure of the sacrum at once shows the close affinity of this genus to *Agathaumas*. The description of the sacrum can be applied fully to the sacrum figured by Professor Marsh under the name of *Triceratops*. The description of the fore and hind limbs also agrees very much with that of *Triceratops*, and there is not the slightest doubt that *Monoclonius* belongs to the same family. *Monoclonius* and *Ceratops* are from the same locality, Cow Island, Montana; and the portions of the skull figured by Professor Cope (*American Naturalist*, August, 1889) leave no doubt whatever that *Monoclonius* is identical with *Ceratops*. The elements formerly considered by Professor Cope as episternum represent the parietals. I know and have examined the types of *Monoclonius* and *Ceratops*, and can state that the two forms are not generically distinct. In the April number of the *American Journal of Science* a restoration of *Triceratops* is given by Professor Marsh. I think there is no evidence that the animal had such a long tail as the restoration shows. The post-pubis, the presence of which I had predicted (*American Naturalist*, June, 1890), is not represented. In the February number of the *American Journal of Science* Professor Marsh makes the following remarks about the pubis: "One pubis recently discovered has a short, splint-like process, which may, perhaps, be a remnant of a post-pubic element, although it does not have the position of the post-pubic bone in other dinosaurs." Now, there cannot be the slightest doubt that this process is the same element as in the other *Iguanodontia*, and I do not see that it differs in position. The "splint-like process" is not complete behind, and I predict again that this process extended very much farther behind, just as in the allied *Iguanodontidæ*.

One of the characters now given by Professor Marsh to the horned saurians consists in the presence of a pineal foramen. This is evidently a mistake. The foramen described as a pineal foramen has nothing whatever to do, even if it really exists in all the skulls, with the true pineal foramen. This foramen is absent in all *Iguanodontia*, and it certainly would not make its appearance again in such a highly specialized animal as *Agathaumas*. I have nothing to add in regard to the teeth. I repeat, that they have not two true roots (compare the *American Naturalist*, June, 1890). The lumbars of the *Agathaumidæ* are not absent, as stated by Professor Marsh, but are simply co-ossified with the sacral vertebræ. The statement that the post-frontals meet in the middle line I take the liberty to doubt.

The *Agathaumidæ* (this is the only name which can be given to this group) represents a highly specialized family of the *Iguanodontia* (*Orthopoda*), the nearest allies of which are exhibited by the *Iguanodontidæ*.

The *Agathaumidæ* contain two forms which are well defined (I neglect here the horned saurians *Cratæomus* of the Gosau formation, Austria, of which only fragments are known),— *Agathaumas* Cope, 1872 (*Bison* Marsh, 1887; *Triceratops* Marsh, 1889; *Sterrholophus* Marsh, 1891), and *Monoclonius* Cope, 1876 (*Ceratops* Marsh, 1888). *Polyona* Cope, I think, is also a synonyme of *Agathaumas*.

This result is different from that reached by Professor Marsh, who states in the February number of the *American Journal of Science*, 1891, "The generic names *Agathaumas*, *Cratæomus*, *Monoclonius*, and one or two others, have been given to fragmentary fossils which may belong to this group; but these remains, so far as made known, appear quite distinct from those here described" (*Ceratops*, *Triceratops*). G. BAUR.

Clark University, Worcester, Mass., April 2.

The Shrike.

A PLEASANT article, chiefly concerning the shrike, or butcher-bird,— one of John Burroughs's bright articles,— calls to my mind some questions concerning the food of the shrike. Burroughs says that the shrike kills lizards, toads, birds, etc., by striking them on the head, then eats the brains only, and hangs up the carcass. What for?

Professor A. Newton, in "Encyclopædia Britannica," says the shrike hangs up its prey, or impales it, for greater convenience in tearing the carcass to pieces in order to devour it. I have seen a shrike's nest *in situ*. Around it hung a beetle, a mouse, a small bird, and a big bumble-bee. All were within reach of the bird as she sat on her eggs. A dart forward of her head brought her beak upon any one of these victims. For what were they hung up? For traps, I venture to suggest.

The shrike, no doubt, strikes its prey on the thin skull-bone. Let us say that instinct teaches that here is the spot most vulnerable for a beak no larger than that of the shrike. The exposed brain presents a soft eatable morsel, and the shrike eats it *en passant*. Then it hangs up its booty, and straightway the decaying carcass attracts insects, blue-flies notably, and thereon the shrike feasts. I believe that the shrike is chiefly insectivorous; and its habit of hanging up plunder, making a kind of larder all about its nest, is to call there plenty of large flies, which can be safely picked off as the bird sits on her eggs. True, the shrike hangs up carcasses far from its nest; but to these carcasses it can return frequently for the flies they have attracted. No doubt the instinct which suggests converting the vicinage of the nest to a shamble will prompt the bird to hang up whatever is killed by it, in the place nearest at hand. JULIA MCNAIR WRIGHT.

Fulton, Mo., April 7.

Iroquoian Etymologies.

IN an article in *The American Anthropologist* (vol i. No. 2) suggesting an Algonquian origin for the word "Iroquois," the writer had occasion to criticise a derivation given to this word by Mr. Horatio Hale, in his "Iroquois Book of Rites." This criticism is as follows: —

"Mr. Hale finds what he believes to be at least a possible origin in the indeterminate form of the Iroquois word *garokwa* ('pipe,' or 'string [error for "portion"] of tobacco'), *ierokwa* ('they who smoke,' briefly 'tobacco people'), the Iroquois being well known to have cultivated tobacco. With reference to this derivation, I am not aware that *garokwa* is used as a verb in any of the Iroquoian tongues. If not so used, it cannot, of course, have an indeterminate form, *ierokwa*; if this form existed, it would mean, not 'they who smoke,' but 'one smokes by which.'"

In the next issue of the quarterly named above, Mr. Hale tried, in "Indian Etymologies," to defend his erroneous derivation which had been called in question by the writer. Among other things equally remarkable, he says, "I have no desire to criticise it, but may be allowed to vindicate my own suggestion from the imputations of ignorance or carelessness, which his objections seem to imply. For this object it is not necessary to claim a profound knowledge of the Iroquois tongue, which is one of the most difficult of languages; but Mr. Hewitt, who has read my volume on the 'Iroquois Book of Rites,' might, perhaps, have reasonably given the author credit for a more careful study of the first principles of the language than he seems willing to suppose. With reference to my suggested derivation of the word from the verbal form *ierokwa* ('they who smoke,' reminding one of 'The Tobacco People,' which was a well-known designation of a Huron tribe), Mr. Hewitt remarks, 'I am not aware that *garokwa* is used as a verb in any of the Iroquoian tongues.' If he will refer to the volume just mentioned, he will find, on p. 116 (paragraph 2), the word in question used as a verb in this native composition. The form here employed is *denighroghkwaien*."

If *denighroghkwaien* were an instance of the stem of *garokwa* used as a verb, it would prove Mr. Hale's position and the justness of his remarks; but, unfortunately for Mr. Hale, it is not such an instance. This will be shown in the sequel.

Moreover, Mr. Hale's contention that a mere superficial knowledge of the tongue is sufficient preparation to enable one to analyze accurately its terms and sentences is inconsistent and self-contradictory: since, if it be true that the Iroquoian tongue is "one of the most difficult of languages," then, before putting forth any etymologic analysis of its vocables and sentences, it is not only necessary, but imperative, to have a knowledge of its grammatic and morphologic processes sufficiently "profound" to enable the student attempting an etymology to ascertain the several parts of speech, their flexions, and their positions in sentence-words, because such a knowledge will prevent him from mistaking the