

*MEETING OF JULY 1st, 1887.*

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PALAEONTOLOGICAL NOTES.

BY T. W. STANTON.

About five miles north of the town of Boulder there is an exposure of the dark shales of the Fort Pierre division of the Cretaceous. Here, as in the similar beds of the Black Hills of Dakota and in the strata of Fossil Ridge, near Ft. Collins, Colo., there is a mingling of Fort Pierre species of fossils with those of the Fox Hills group. Owing to this close palaeontological connection between these two groups Dr. C. A. White has united them under the name of the Fox Hills group, instead of following King's classification in which the Ft. Pierre is joined to the underlying Niobrara and Ft. Benton on account of lithological resemblance and the three are called the Colorado group. The exposed beds are about 100 feet thick. There are several thin beds of limestone at intervals through the shale, and about half way up the hillside there is a bed a foot or more thick, made up almost entirely of the remains of *Inoceramus Vanuxemi*. Near the top of the exposure there are two thin layers of concretionary limestone that contain a large number of fossils, among them several forms of cephalopods which are partially described and commented on in these notes. There are also a few others from a lower horizon—perhaps 200 feet lower—in the same neighborhood. The concretions do not form continuous beds, but vary in size, from two or three inches in diameter to masses three or four feet across and a foot thick. A few of them are barren, but in most cases the nucleus is one or more fossils.

The following is a partial list of the fossils from this locality that have been identified :

1. *Inoceramus Vanuxemi*, M. & H. ?
2. *Anisomyon borealis*, Morton.
3. *Baculites ovatus*, Say.
4. *Placenticerus placenta*, DeKay (sp.).
5. *Scaphites nodosus*, Owen.
6. *Ancyloceras jenneyi*, Whitfield ?
7. *Ptychoceras crassum*, Whitfield ?
8. *Ptychoceras Mortoni*, M. & H.
9. *Heteroceras nebrascense*, M. & H.
10. *Heteroceras tortum*, M. & H.
11. *Heteroceras cochleatum*, M. & H.
12. *Helicoceras stevensoni*, Whitfield.
13. *Helicoceras Mortoni*, M.

Of this list Nos. 4, 6 and 8 are from the lower horizon, all the others from the beds first mentioned.

1. *Inoceramus Vanuxemi*, M. & H. ?

The shells mentioned above as occurring in great numbers in one stratum agree with the description of *I. Vanuxemi* given by Whitfield in the "Geology of the Black Hills of Dakota." He extends the species so as to include the forms referred by Meek to *I. proximus* and variety.

2, 3, 4 and 5. These present no unusual features worthy of note.

6. *Ancyloceras jenneyi*, Whitfield ?

The single specimen referred to this species is imperfect at both extremities, but one entire volution is preserved. It agrees with the published description in surface ornamentation and in the details of the suture. The general form, however, is more like that of *Hamites*, the two limbs being almost straight and parallel. The volution measures three inches in its longer diameter and two inches in the shorter.

7. *Ptychoceras crassum*, Whitfield.

Several individuals that seem to belong to this species have been collected. The unusual thickening of the shell described by Whitfield is not noticeable in any of them.

One specimen that is considerably flattened laterally may possibly belong to another species.

8. *Ptychoceras Mortoni*, M. & H.

This differs from Meek's type specimen in being slightly larger and having a rather more complex suture.

9. *Heteroceras nebrascense*, M. & H.

This species was first described by Meek and Hayden from a small fragment. Whitfield gives a more extended description from a larger specimen but in both cases the fossil was doubtfully referred to the genus *Heteroceras* owing to the fact that there was no evidence of deflection of the body volution. The several specimens here assigned to this species differ slightly from each other in the size of the annular costæ and the distance between them, but they doubtless belong to the same species. The best example is now in the cabinet of the State University, at Boulder. It consists of almost two volutions of the spire and enough of the body or deflected volution to show its entire form, although the aperture is broken. Above the deflected portion the shell is closely coiled and agrees with the published descriptions. The deflected part bends downward very rapidly until it has taken a direction almost at right angles to the last coil of the spire; then curving upward it terminates within an inch of the preceding volution. The space enclosed by this short hook has about the same diameter as the body whorl. The sudden change of direction just below the spire gives the shell at that point a peculiar twisted appearance similar to that which Meek described as a characteristic of *H. tortum*, but it is probably common to all the western species of *Heteroceras*. These forms would seem to be related to one from South America described by Karsten under the name *Lindigia*.

10. *Heteroceras tortum*, M. & H.?

A fragment, consisting of almost the entire deflected or body volution and just enough of the lower part of the spire to show where it belongs, is referred to this species. It is a large, sinistral, spiral shell the surface of which is

ornamented by strong subangular costæ and two rows of very prominent nodes. The body volution has the same form as that described under *H. nebrascense*. The larger extremity of the specimen measures 1.6 inches in diameter. The diameter of the umbilicus in the deflected volution is 1.2 inches.

Another specimen consisting of one whorl of the spire of a closely coiled sinistral shell possibly belongs to the same species. The surface ornamentation is similar to that last described. The diameter of the umbilical cavity is not more than half that of the enclosing whorl.

11, 12, 13. These are doubtfully identified from fragments that show no points of special interest.

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#### INFORMAL NOTES.

Mr. F. F. Chisolm gave the results of a recent examination of the coal-field in the Elk Head Mts., Colorado, of which a preliminary notice\* was presented at the December meeting. The exploration of the three veins showed them to be too impure, in most places, to be of any economic value.

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\* Proc. Colo. Sci. Soc., Vol. II, p. 147.