

*Three New Ammonites from the Cretaceous of Alberta*

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Genus ACANTHOCERAS Neumayr

*Acanthoceras albertense* sp. nov.

Plate I, Figs. 1, 2

*Description*.—Shell very large, discoidal, of at least five volutions. Whorls quadrangular in section, but tapering toward the venter in the ultimate volution; slightly impressed. Umbilicus wide, being a little over a third of the total width of the shell. Umbilical shoulder declining sharply to the preceding whorl. Ornament consisting of three rows of nodes on each flank on the younger whorls—a row of elongate nodes on either side of the ventral margin and orientated parallel to it, a row of rounded nodes on the ventral shoulder and a row of elongated nodes on the umbilical shoulder at right angles to the whorls. Nodes connected with incipient ribs, but not crossing the venter. On the ultimate whorl ribs become dominant, 18 in number, completely involving the nodes and crossing the venter. Suture line with two saddles on the flank; first lateral saddle twice the width of the second; first lateral lobe as wide as the second lateral saddle and deeper than the ventral lobe; in the younger stages suture more sharply incised and first lateral lobe comparatively narrow. Dimensions of shell: width 35 cm., width of umbilicus 14 cm., height of living chamber 11 cm., width of living chamber 6 cm.

*Remarks*.—There is a certain amount of doubt involved in the generic reference of this species. The genus *Acanthoceras*, as interpreted by most authors, has a median row of nodes on the venter, though these may become obsolete on the ultimate whorl. Our specimen shows no sign of the median nodes back to a whorl diameter of 35 mm. Beyond this diameter, the venter has not been observed. So far as the ventral aspect is concerned, as well as in the development of ribs from the nodes, the species approaches rather closely to Hyatt's genus *Mantelliceras*.<sup>1</sup> A comparison of our species with the type of

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<sup>1</sup>Hyatt, A., *Pseudoceratites of the Cretaceous*, U.S. Geol. Surv., Mon., Vol. 44, p. 113, 1903.

Hyatt's genus, *Ammonites mantelli* Sowerby<sup>2</sup> from the chalk of England fails to show other points of similarity. Sharpe's species has a much rounder, stouter whorl and a distinct alternation in the length of the ribs which our form lacks. It seems preferable, therefore, for the present to ascribe our species to the better known genus *Acanthoceras*. It is quite possible, however, when a more complete study of our species can be undertaken from a larger number of specimens, that it will be found advantageous to erect a new genus to receive it, the genus being intermediate in position between *Acanthoceras* and *Mantelliceras*.

The generic reference of this species involves more than a biologic interpretation, as the genus *Mantelliceras*, so far as the writer can determine, is confined to the Cenomanian in both Europe and North America, whereas the genus *Acanthoceras* enjoys a wider vertical range. The writer cannot, at the present time, subscribe to the view of a Cenomanian age for the beds containing our species.

The type specimen of *Acanthoceras albertense* was collected by Dr. R. L. Rutherford of the University of Alberta, in the basal beds of the Smoky River shales on Pouce Coupe river near the Alberta-British Columbia boundary. Other specimens of the same form were collected by the geological staff of the Hudson's Bay Oil & Gas Co., from the same horizon and from the same general area. It would appear from our present knowledge that *Acanthoceras albertense* occurs at a very definite horizon at the base of the Smoky River shale. The only other specimens in our collections reported from the same horizon is a species of *Prionotropis*, which is described in this paper. Just above this horizon the well-known Turonian pelecypod *Inoceramus labiatus* appears and carries upward several hundred feet through the section. As *Prionotropis* is also a Turonian form, it seems best to consider the basal beds, containing *Acanthoceras albertense*, Turonian in age.

The species is known outside the Peace River area by one specimen which was collected by Mr. J. B. Webb of the Hudson's Bay Oil & Gas Co., in the basal beds of the Colorado shale near Luscar, Alberta, some 200 miles south of Peace river. These beds are generally considered Turonian in age, though the upper beds of the Blairmore sandstone, which immediately underlies the Colorado shale, is claimed to be Cenomanian in age by Berry.<sup>3</sup> If we can assume that *Acanthoceras albertense* is confined to a definite horizon, it signifies a precise correlation of the lower beds of the Colorado shale as developed in the foot-

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<sup>2</sup>Sharpe, D., Cretaceous Cephalopoda, Palaeontographical Soc., London, 1853.

<sup>3</sup>Berry, E. W., The Upper Blairmore flora, Geol. Surv., Can., Bull. 58, p. 55, 1929.

hills of southern Alberta, with the basal beds of the Smoky River shale of northern Alberta. It also points to a correlation of the upper beds of the Blairmore sandstone with the Dunvegan sandstone which immediately underlies the Smoky River shale.

The holotype of *Acanthoceras albertense* is in the geological museum, University of Alberta, catalogue number Ct. 467.

### Genus ACANTHOSCAPHITES Nowak

*Acanthoscaphites albertensis* sp. nov.

Plate II, figs. 1, 2; Plate IV, fig. 2.

*Description*.—Shell scaphitoid in form, the last whorl being abnormal. Whorls higher than wide, ratio 5:4 at the beginning of the living chamber, compressed, narrowing gently toward the venter, rapidly expanding, deeply impressed, the second outer whorl intruding about one-third the height of the living chamber. Periphery rounded. Umbilicus narrow; umbilical shoulder rather sharply rounded; umbilical wall nearly vertical.

Shell ornamented by primary and secondary ribs. Primary ribs entire, from 16 to 20 in number on the last whorl as preserved on our specimens; quite sharply expressed and slightly arcuate near the umbilicus, becoming less distinct toward the periphery; tending to become nodose at the umbilicus and ventral shoulder on the living chamber; secondary ribs intercalated between the primaries, never reaching the umbilicus, three to four in number between each pair of primaries; all ribs crossing the venter at about equal size.

Suture florescent; ventral lobe deep and wide; first lateral lobe shorter, bifid, developing from a trifid lobe; second lateral lobe short and trifid. First lateral saddle broad and deeply bisected; second lateral saddle narrow. Two auxiliary saddles.

*Locality and Horizon*.—The foregoing description is based on two specimens in the geological museum, University of Alberta: No. Ct. 349, a cotype, presented to the museum by Mr. L. S. Russell and said to be collected from Steeveville, Alberta; the second, No. Ct. 371, a cotype, presented to the museum by Mr. S. Davies and said to be collected from Steeveville, Alberta. The specimens were undoubtedly collected from the Bearpaw shale, the only marine horizon in that vicinity.

*Remarks.*—The genus *Scaphites*, by reason of the great variety exhibited in the species assigned to it, has long been considered a composite group and various attempts have been made by systematists to divide the genus into subgenera. Early attempts proved abortive to a great extent, as divisions were based largely on various external characteristics of small phylogenetic importance. Early studies pertaining to the phylogeny of the group also produced widely separated views, until it was adduced that the group as a whole was derived from several stocks. The basis for our present classification was largely the work of Nowak<sup>4</sup>, and his results have been accepted, with certain modifications and additions, by such present-day authorities as Spath<sup>5</sup> and Reeside<sup>6</sup>.

The genus to which our form is ascribed was proposed by Nowak to include a group of large scaphitoid forms which have been derived from the family Cosmocerotidae through *Acanthoceras*. In their fullest expression they are restricted to the Campanian of European nomenclature and to the Bearpaw shale of North America, including some, though probably not all, of the varieties of Owen's species *Scaphites nodosus*. *Acanthoscaphites albertensis* is also a Bearpaw form, thus supporting the correlation of that formation with the Campanian of Europe.

Another form which should probably be referred to this genus is that described by Meek under the name *Phylloceras? halli*.<sup>7</sup> Meek's species may be compared quite favorably with the present form. A comparison with a plaster cast of Meek's type, kindly provided by Dr. J. B. Reeside, Jr., shows that Meek's form has much finer ornamentation, with nearly twice the number of primary ribs. It also appears to be more compressed, but this feature is difficult to ascertain for certain, as the specimen is deformed to a certain extent by pressure.

Meek's specimen was collected in Montana from the Bearpaw shale, according to Reeside.

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<sup>4</sup>Nowak, Jan, Untersuchungen über die Cephalopoden der oberen Kreide in Polen, pt. 2, Die Scaphiten: Acad. Sci. Gracovie Bull. internat., année 1911, Ser. B, pp. 547-588, 1912.

<sup>5</sup>Spath, L. F., On the Senonian Ammonite fauna of Pondoland: Roy. Soc. South Africa Trans., Vol. 10, pp. 123-136, 1922.

<sup>6</sup>Reeside, J. B., Jr., The Scaphites, an Upper Cretaceous Ammonite group: U.S. Geol. Surv., Prof. Paper 150-B.

<sup>7</sup>Meek, F. B., A report on the invertebrate Cretaceous and Tertiary fossils of the Upper Missouri country: U.S. Geol. Surv. Terr., Vol. 9, p. 458, pl. 24, fig. 3, a, b, c.

## Genus PRIONOTROPIS Meek

*Prionotropis borealis* sp. nov.

Plate III, figs. 1-4; Plate IV, fig. 1.

*Description.*—Shell large, discoidal. Whorls rapidly expanding, slightly involute, stout, flattened on the sides, subquadrate in section. Dimensions of the ultimate whorl at the last septum: height 28 mm., width 21 mm. Umbilicus moderately wide, measuring about one-third the diameter of the shell; umbilical wall abruptly rounded. Ornament consisting of nodose ribs, not always reaching the umbilical margin, occasionally bifurcating, inclined slightly forward, about 17 in number on the ultimate whorl and as high as 24 in number on the inner whorls. Nodes on the inner whorls arranged in several rows, always in alignment with the ribs: a row of elongate nodes on the siphon, the elongation parallel to the whorl; a row of elongate nodes on either side of the siphonal row and similar to it in character; a row of rounded nodes on each ventral shoulder; a row of elongate nodes on the umbilical border at right angles to the whorls. Umbilical nodes occurring on every second, sometimes on every third rib crossing the venter. On the ultimate whorl, nodes on either side of the venter and on the ventral shoulders coalesce, producing a wide, flat flange on the ventral shoulder protruding at right angles to the whorl. Flange, when highly developed, absorbing the umbilical row of nodes. Suture line simple, not strongly incised. First lateral saddle wider than the siphonal lobe and nearly twice the width of the second saddle. First lateral lobe as deep but not so wide as the siphonal lobe. Second lateral lobe inconspicuous.

*Remarks.*—The species is represented in our collections by well-preserved fragments of several specimens. The largest fragments of the ultimate whorl testify to a shell diameter of about 130 mm. The holotype as shown in the plate is considerably below this diameter and as half a revolution of this specimen is occupied by the living chamber, it is believed that it did not attain a much larger size. It follows, therefore, that there is a considerable variation in size of the full-grown specimens.

In its manner of development and in the character of the ornament on the living chamber, the species is reminiscent of *Prionotropis woolgari* Mantell.<sup>8</sup> It differs strongly, however, in the character of the

<sup>8</sup>Sharpe, D., Cretaceous Cephalopoda, Mon. Pal. Soc., London, p. 27, pl. XI, figs. 1 and 2, 1853 et. seq.; also Meek, F. B., Invertebrate Cretaceous and Tertiary fossils of the Upper Missouri country, Rept. U.S. Geol. Surv. Terr., Vol. IX, p. 455, pl. VII, figs. 1 and 3, 1876.

earlier whorls. Mantell's species lacks the alternation in length and strength of the ribs as developed in our species and in the younger whorls has a distinct keel, which our species lacks. In the youngest whorl visible, the shell being at a diameter of 10 mm., the median row of tubercles shows no tendency towards development into a keel. The suture of the two species also differs in a marked degree. The species differs from *P. caurinus* McLearn<sup>9</sup> in much the same particulars; also in the strong row of nodes on the venter, McLearn's species having a slightly developed undulating keel.

The types of this species were obtained in a well dug for water in the town of Grimshaw near Peace river, Alberta. The horizon is undoubtedly the basal beds of the Smoky river shales, which is the underlying rock formation in that area. The specimens were presented to the University of Alberta by Mr. Nick Eilertsen of Grimshaw and are preserved in the geological museum, Cat. Nos. Ct. 468-477.

In conclusion the writer wishes to express his indebtedness to Dr. J. B. Reeside, Jr., of the United States Geological Survey, Washington, for plaster casts of type specimens, preserved in that institution, for study, and also for kindly advice with reference to doubtful specimens. The writer, however, does not wish to hold Dr. Reeside responsible for any conclusions reached in this paper.

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<sup>9</sup>McLearn, F. H., New species from the Coloradoan of Lower Smoky and Lower Peace rivers, Alberta, Geol. Surv., Can., Bull. No. 42, p. 126, pl. 23, figs. 6 and 7.

## EXPLANATION OF PLATES

### PLATE I

(Figures are natural size, except where otherwise stated. Numbers of specimens are according to the catalogue of the geological museum, University of Alberta.)

#### *Acanthoceras albertense* Warren

1. View of holotype, less than one-half natural size. No. Ct. 467.
2. Cross-section of living chamber of holotype, x 1/2.

### PLATE II

#### *Acanthoscaphites albertensis* Warren

1. Lateral view of cotype. No. Ct. 371.
2. Lateral view of cotype. No. Ct. 349.

### PLATE III

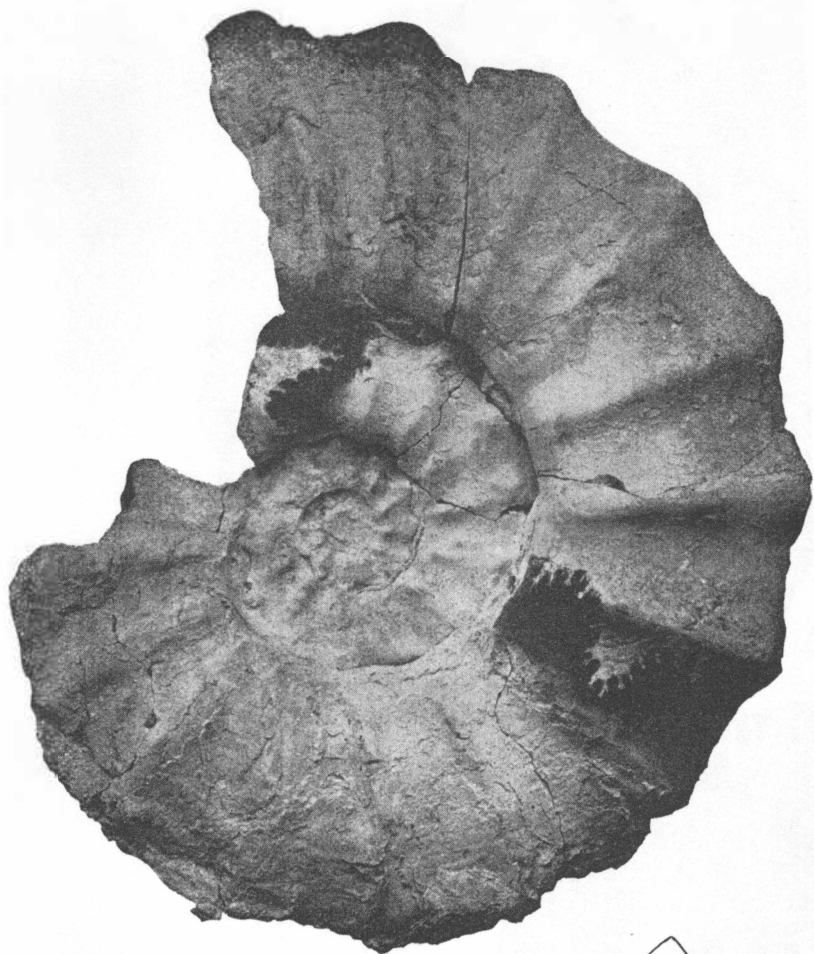
#### *Prionotropis borealis* Warren

1. Lateral view of holotype. No. Ct. 468.
- 2, 3. Lateral and ventral views of fragments of other specimens. Nos. Ct. 476 and 469. Paratypes.
4. Lateral view of a specimen showing the younger whorls. No. Ct. 471. Paratype.

### PLATE IV

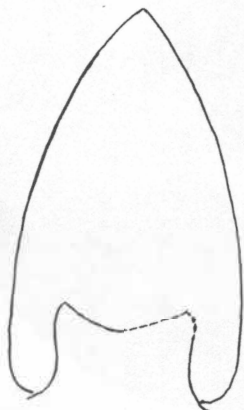
1. *Prionotropis borealis* Warren. Lateral view of part of a living chamber of a large specimen. Paratype. No. Ct. 473.
2. *Acanthoscaphites albertensis* Warren. Ventral view showing cross-section of the living chamber. Cotype. No. Ct. 349.

PLATE I



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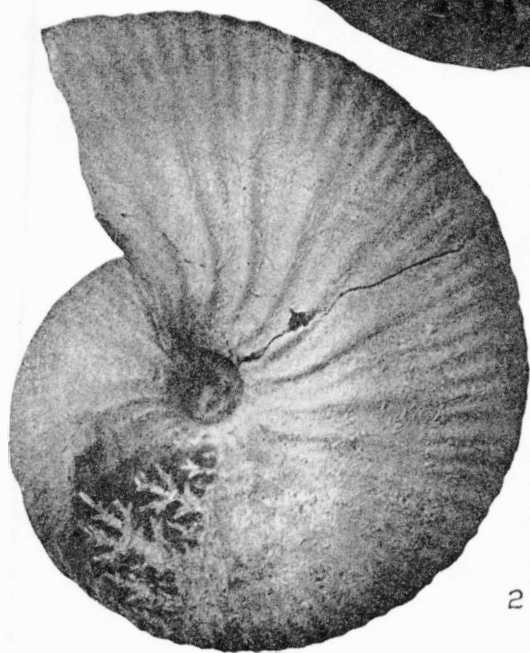
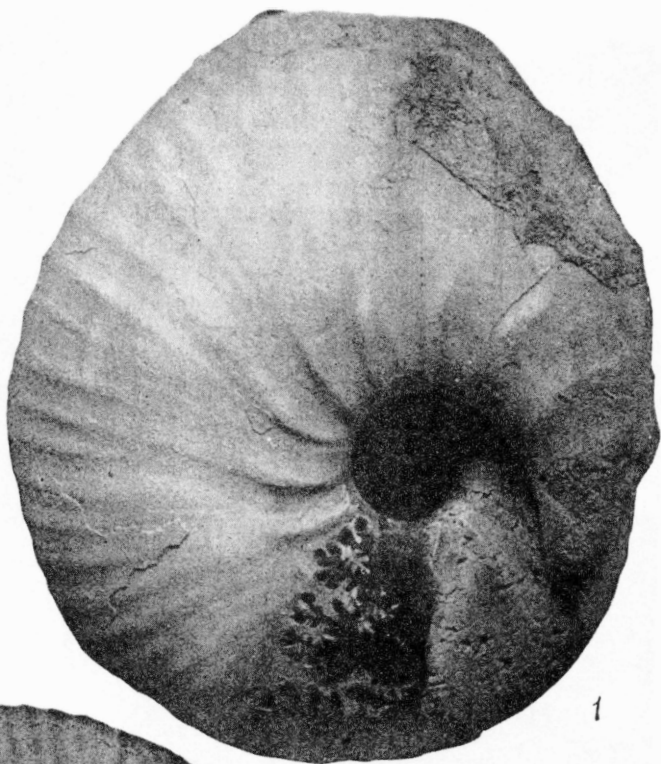
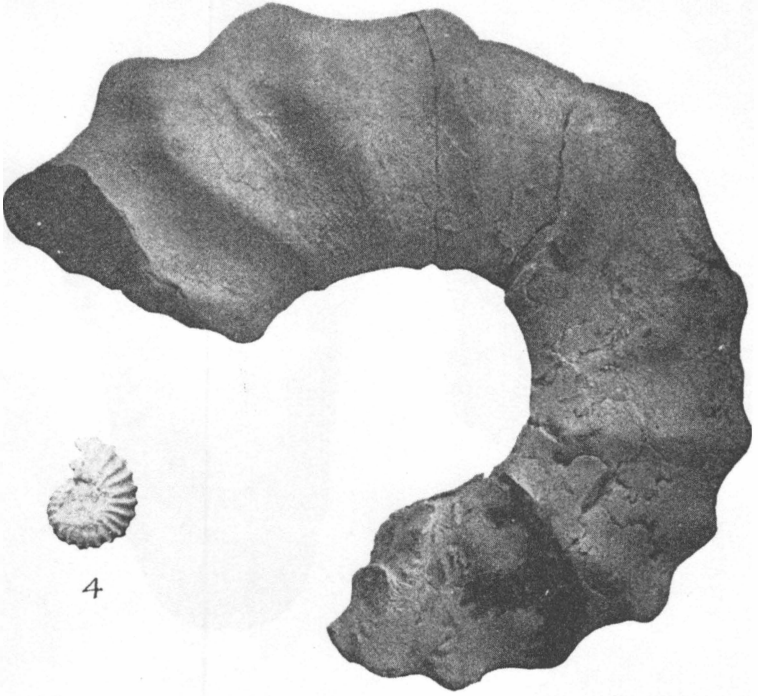


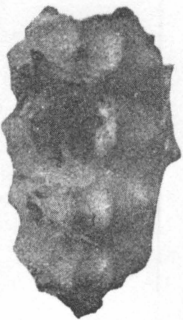
PLATE III



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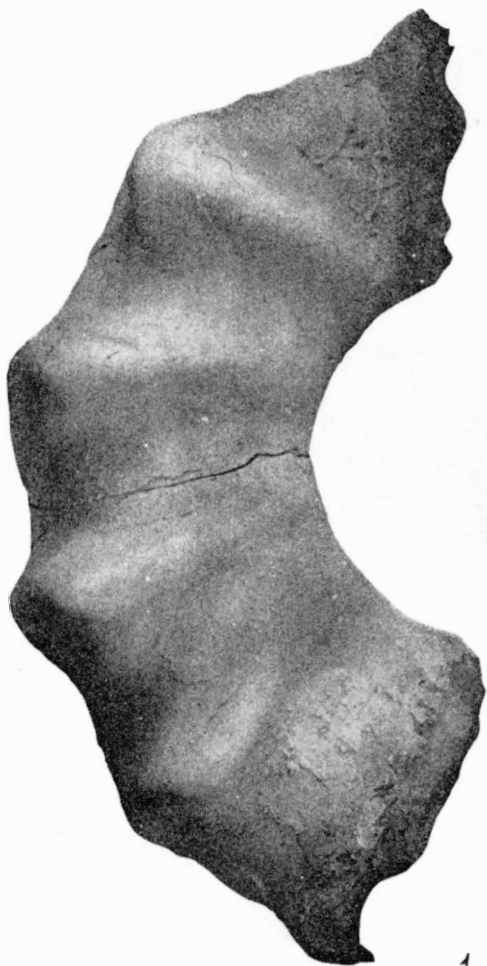


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PLATE IV



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