

Examples of ammonoids (left to right) coiled in a loose spiral (Emperoceras); tight, flat spiral (Placentoceras), and uncoiled (Baculites).

# MONTANA BACULITES

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Baculites is a genus of extinct, Cretaceous cephalopods. Rather than having a coiled shell like many of its close relatives, the mature Baculites shell is straight. In the juvenile stage there is a small spiral at the apex. The maximum length was six feet but usually they ranged in length from three to six inches.

Baculites are often referred to as "petrified fish," however, they are invertebrates (animals without a spinal column, or backbone). Fish are vertebrates; the two should not be confused.

Baculites belong to the Ammonoidea group. Since there are no living representatives of this (Ammonoidea) group, knowledge of the original animal is limited to what can be learned from fossils and the rocks in which they are found.

The typical shell (Fig. 1) is a straight cone divided into numerous compartments (camerae) by traverse partitions (Septa), perforated by a tube (siphuncle). The buoyant chambers (camerae) were located in the rear part of the shell, whereas the weight of the soft parts and the shell surrounding them was concentrated near the front. The Suture marks the line of contrast between the edge of the septum and the outer wall.

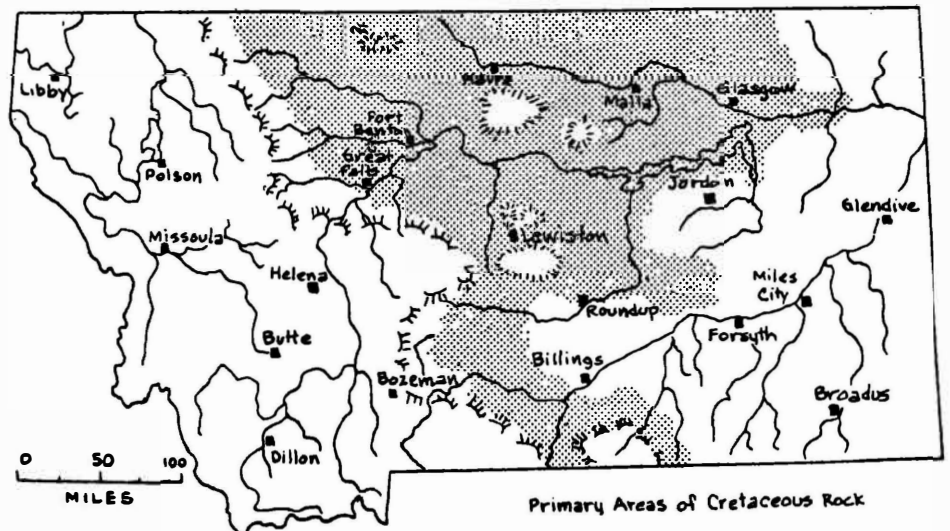
Baculites were able to adjust the pressure within their shells to their surroundings by air passing from the body through the siphuncle to the chambers. This permitted the animal to rise and descend allowing movement in searching for food.

Approximately 125 names for species and varieties have been proposed for Baculites. Of these about 55 have been proposed for specimens from the United States. The oldest species are small and

have simple sutures; the youngest are ordinarily much larger and have more complex sutures. The external part of the suture generally is sufficient for identification (Fig. 2)

The wide geographical distribution of ammonoids accords with a swimming mode of life; but with an external and chambered shell it is not likely that they were capable of a rapid motion through water. Several investigators have suggested that shells of dead ammonoids were distributed widely by currents and may have come to rest where the animal could never have lived. Such a situation accounts for the wide distribution of fossil cephalopods.

Cretaceous rocks of Texas and northeastern Mexico range from soft sandstones to shales and limestones, settled in situations ranging from deltas and tidal flats to reefs, extensive shoals, and waters more than 600 feet deep. These formations also contain enormous numbers of ammonoids, with shells so little broken and worn that they plainly



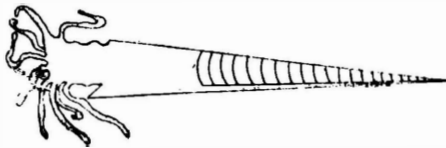


Fig. 1. PHYLUM, Mollusca; CLASS, Cephalopoda; ORDER, Ammonoidea; FAMILY, Baculitidae.

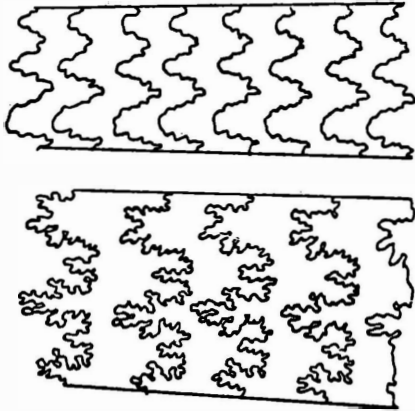


Fig. 2. When the thin outer surface of the shell is removed, suture lines are disclosed. The external part of the suture generally is sufficient for identification. Note the simple suture pattern on the sketched specimen above and the complex on the lower.

were buried close to the places in which they had lived. Fossils and formations give the following record of conditions:

1. Ammonoids did not inhabit the ponds, streams, and brackish bays of deltas.
2. Ammonoids seldom lived in shallow near-shore waters where sand was deposited. Such waters were probably too shallow for these mollusks, became too nearly brackish after hard rains, and grew too warm during the summer.
3. Ammonoids also avoided the extensive shallows in which large dinosaurs waded.
4. Few ammonoids thrived where empty clamshells covered the bottom forming beds of coquina.
5. Ammonoids also avoided reefs built by corals where the water was shallow and rough.
6. Ammonoids reached their greatest abundance and variety in waters 120 to 600 feet deep.

These mollusks were gregarious and except in hostile habitats, they lived and hunted in large schools. If there was an ideal habitat for Cretaceous ammonoids, it was a marly bottom under water more than 120 feet deep, with abundant algae that provided food for varied animals, including those eaten by ammonoids.

The Cretaceous period in which Baculites and all ammonoids reached their

greatest abundance began about 120 million years ago. At the end of the period, a duration of about 50 million years, all ammonoids had become extinct. Also, the incredible world of the dinosaurs came to a climax and then mysteriously they, too, disappeared.

Baculites and many other invertebrates are common in the Cretaceous outcroppings of Montana (see map).

Previously, collecting of both invertebrate and vertebrate fossils was restricted under the Antiquities Act. However, recent changes of federal regulations governing outdoor recreation on public lands administered by the Bureau of Land Management now provide for general collecting of common invertebrate fossils. Under 6010.2 Rules of Conduct, the regulations read:

"(a) Permitted activities — (1) Collecting — hobby specimens. Flowers, berries, nuts, seeds, cones, leaves, and similar renewable resources and non-renewable resources such as rocks, mineral specimens, common invertebrate fossils, and gemstones may be collected in reasonable quantities for personal use, consumption or hobby collecting..."

Recreation Access Maps showing public lands administered by BLM are available from: Bureau of Land Management, Federal Building, 310 N. 26th St., Billings, Montana 59101.

The following is a list of Montana cities located near Cretaceous beds containing common invertebrate fossils and their clubs. These clubs have fossil enthusiasts who will direct you to collecting areas. We only ask that you abide by the rockhounds' code of honor.

Fort Benton — Whoop-Up Trail Rockhounds

Glasgow — Charles M. Russell Gem and Mineral Society

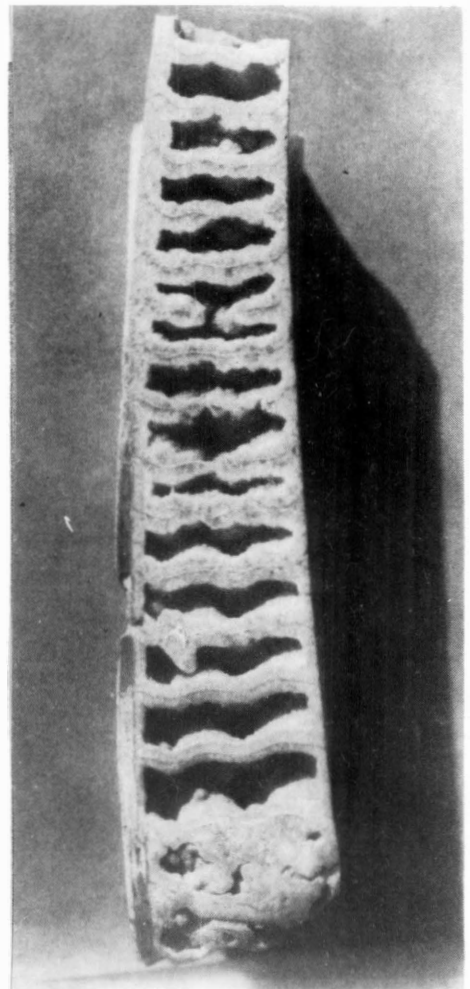
Lewistown — Central Gem and Mineral Society

Malta — Sleeping Buffalo Rock Club

Roundup — Musselshell Mineral and Fossil Society

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Lateral section of a Baculites showing the internal structure. Replacement material inside the chambers is often made up of calcite, barite or quartz crystals

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