LUCAS, S.G., & ESTEP, J.W., 1998

The late Albian ammonite *Engonoceras* from southwest New Mexico

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Abstract

Specimens of the ammonite *Engonoceras serpentinum* (Cragin) from the upper part of the Mojado Formation in southwest New Mexico indicate a late Albian age (*Drakeoceras drakei* Zone). The top of the Mojado Formation is not as young as the top of the (lowermost Cenomanian) Sarten Formation, nor does the Sarten Formation appear to record a late Albian transgression during *Drakeoceras drakei* time.

Introduction

Age control of the Lower Cretaceous strata of southwest New Mexico is based mainly on limited and incompletely documented biostratigraphic data (e.g., Zeller, 1965; Zeller and Alper, 1965). Here, we document specimens of the late Albian ammonite *Engonoceras serpentinum* (Cragin) from southwest New Mexico (Fig. 1) originally reported by Zeller (1965) and discuss their biostratigraphic significance.

Systematic Paleontology

Order AMMONOIDEA Zittel, 1884
Suborder AMMONITINA Hyatt, 1889
Superfamily HOPLITACEAE Douvillé, 1890
Family ENGONOCERATIDAE Hyatt, 1900
Genus *Engonoceras* Neumayr & Uhlig, 1887
Engonoceras serpentinum (CRAGIN, 1900)

1900 *Sphenodiscus belviderensis* var. *serpentinus* Cragin, p. 31, pl. 2, figs. 4–6.
1903 *Engonoceras serpentinum* (Cragin): Hyatt, p. 61, 162, pl. XIX, figs. 7–14, pl. XX, figs. 1–5.
1910 *Engonoceras serpentinum* (Cragin): Grabau and Shimer, p. 214, figs. 1487a-c.
1920 *Engonoceras serpentinum* (Cragin): Adkins, p. 84, pl. 4, figs. 3, 5, 6, 12.
1982 *Engonoceras serpentinum* (Cragin): Mancini, pp. 251–253, figs. 4i, 5j.
1982 *Engonoceras* cf. *serpentinum* (Cragin): Mancini, p. 251, figs. 4l, 5i.

Referred specimens

Specimens collected by Robert A. Zeller, under field number "493-L5K" now reside in the Los Angeles County Museum (LACM) under catalog numbers LACMIP-7292 thru 7304. Zeller's collection consists of 18 specimens, of which 7 are complete or nearly complete (LACMIP-7292, 7293, 7294, 7295, 7301, 7302, and 7303), 5 preserve between a quarter and a half of a whorl (LACMIP-7296, 7297, 7298, 7299, and 7300), and the remaining 6 are either small fragments or extremely weathered (all assigned to LACMIP-7304).

Locality and horizon

= LACMIP loc. 17201.

Zeller (1965) indicated that all the LACM specimens are from a single bed in the NW¼SE¼ sec. 20 T32S R15W, Hidalgo County, New Mexico (Fig. 1). This bed is stratigraphically high in the section of the Mojado Formation exposed here, which is the formation's type section. Specifically, the *Engonoceras*-bearing horizon is 1,286 m above the base of the Mojado Formation in a Mojado section that is 1,577 m thick (Zeller, 1965, pl. 5).

Description and identification

Damage from differential weathering and breakage obscures some details on most specimens. The unweathered specimens vary from brownish gray (5YR 4/1) to dark yellowish brown (10YR 4/2); the weathered specimens are a moderate yellowish brown (10YR 5/4). The encasing matrix is mostly olive gray (5Y 4/1) when fresh. Although the specimens display some minor individual variation, all of them are sufficiently similar in their suite of characteristics to warrant assignment to the same species, *Engonoceras serpentinum* (Figs. 2–3, Table 1).

All specimens indicate an ammonoid with a compressed, involute to slightly convolute shell of typical oxycone morphology. They have a narrow, slightly concave, sharp-edged, bicarinate venter on the early whorls, becoming more convex and nodose on later whorls as a result of the alternating tubercles and ribbing that develops on the shoulder of the venter. The transition from a bicarinate to a nodose venter occurs over a short distance, commonly within one-eighth of a whorl. Not only does the venter outline zigzag laterally, but the nodes also raise the edge of the venter outwardly. Three sets of tubercles develop on the flanks of the latest whorls: clavate along the shoulder of the venter, clavate about one-third of the way in from the venter, and bullate close to the umbilical shoulder. The umbilical tubercles are the sharpest of the tubercles and the first to express themselves on smaller specimens. These tubercles are connected by faint, broad, distant, slightly sinuous radial ribbing that also develops on the later whorls. The

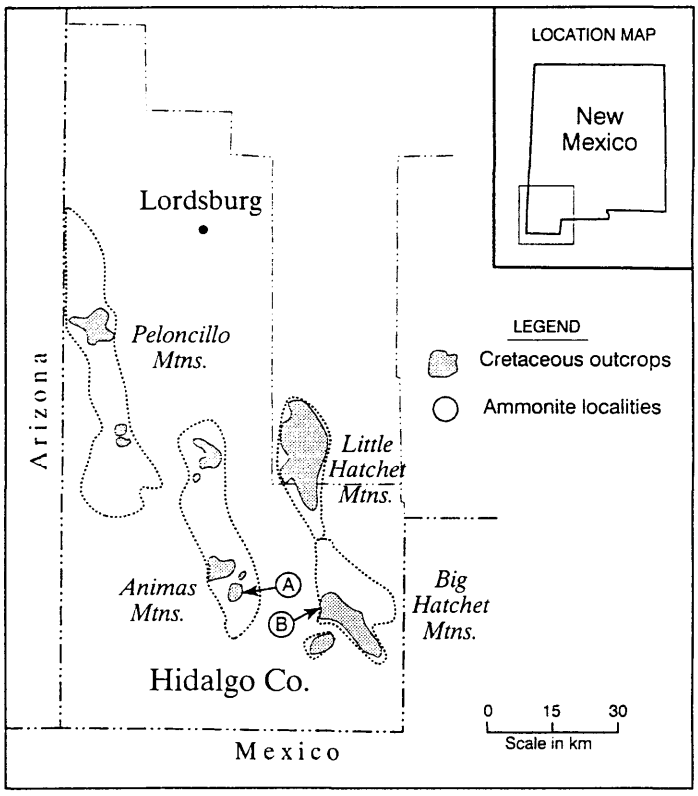

FIGURE 1—Part of southwest New Mexico showing distribution of Lower Cretaceous strata and location of the two *Engonoceras* sites: **A**, Cowboy Spring, Animas Mountains; **B**, Mojado Pass, Big Hatchet Mountains.

FIGURE 2—Selected specimens of *Engonoceras serpentinum* from the Mojado Formation in the Big Hatchet Mountains. Bar scale = 10mm. **A–D**, LACMIP-7294, lateral (A–B) and ventral (C–D) views. **E**, LACMIP-7292, lateral view. **F**, LACMIP-7293, lateral view. **G–I**, LACMIP-7295, lateral (G, I) and ventral (H) views.