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PALEONTOLOGICAL NOTES

A "SEGMENTED" EPIDERMAL TAIL FRILL IN A SPECIES OF HADROSAURIAN DINOSAUR

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Hadrosaur integument has been described by several authors (i.e., Osborn, 1912; Brown, 1916; Versluys, 1923; and Lull and Wright, 1942), and as stated by Lull and Wright, most if not all hadrosaurs probably had "an integumentary fold or frill down the center of the back above the neural spines." Brown (1916) stated that *Corythosaurus casuarius* (AMNH 5240) had a "median fold of skin . . . along the back in the dorsal, sacral and caudal regions . . ." As seen on the specimen and in Brown's figures, the fold's dorsal edge was

continuous and only slightly interrupted by rises over the neural spines.

Along the dorsal border of a tail section (Museum of the Rockies, Bozeman, Montana, MOR V 007) of what is presumably either *Edmontosaurus* or "*Anatosaurus*" *copei*, from the Hell Creek Beds of Montana, a frill with distinct "segments" is present. The specimen (Figure 1) consists of 18 articulated posterior caudal vertebrae encased in a fine grained, dense, siltstone nodal. Skin impressions are preserved on much of the



FIGURE 1—Photograph of MOR V 007 showing surface with caudal vertebrae and impressions of "segmented" frill. Block is 1,016 cm long.

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rock background. The specimen, donated to the Museum of the Rockies by Mr. Will DeGeraty of Bozeman, was part of a whole skeleton that has since been collected by another party and transported to Switzerland.

As seen in Figures 1 and 2, the "segments" of the frill are directly above the dorsal tips of each neural spine. The dorsal edges of the "segments" are flat and on the average about 80 mm above the corresponding spines. Each "segment" is approximately 50 mm wide and 45 mm deep (dorso-ventrally). Spaces between the "segments" average about 10 mm wide. Surfaces of the "segments" have vertically oriented striations rather than tubercles as seen on the sides of the tail. The "segments" also appear to have been relatively thin in cross-section and to have bent, conforming with the sediment surface topography. Between the "segmented" portion of the frill and the dorsal tips of the spines, the skin appears to have been thickened, for a groove with a tubercled surface extends nearly the entire length of the specimen. The tubercles in this region are very small and appear similar to the background tubercles illustrated by Osborn (1912, Plate VII). On lateral surfaces of the tail, tubercles range between 1 and 6 mm in diameter. The ventral border of the tail, although incomplete, appears to have

been smooth (non-segmented), with only faint tubercles.

Although only a portion of the tail is present, it is likely that the "segmented" frill extended from near the base of the tail, up over the sacral region and possibly to the cervical region. The thickened part of the frill evidently supported the individual "segments," which were probably for visual display.

I thank Steve Jackson for the photography and the Museum of the Rockies for support.

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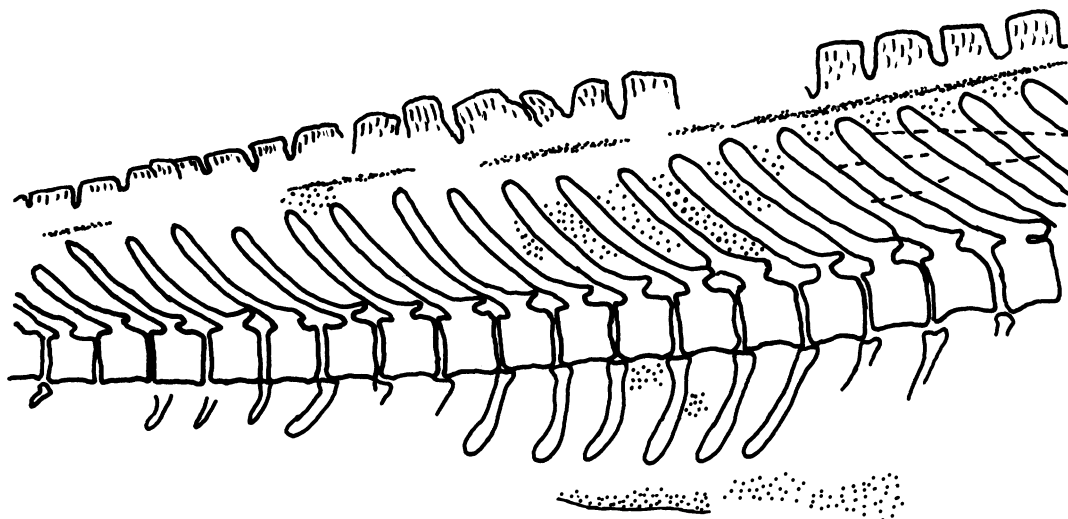


FIGURE 2—Drawing of MOR V 007 showing surface structure. Dots are locations of tubercles, concentrated dots above neural spines are locations where assumed thickened skin fold exists. Dashed lines are positions of ossified tendons. Size of tubercles and striations on "segments" are exaggerated.