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A new specimen of *Chasmosaurus belli* (Ornithischia: Ceratopsidae), a revision of the genus, and the utility of postcrania in the taxonomy and systematics of ceratopsid dinosaurs

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Abstract

A previously undescribed chasmosaurine specimen excavated in 1919–1920 by William Cutler from the Dinosaur Park Formation of Alberta, Canada is referable to *Chasmosaurus belli*. The specimen comprises an almost complete skull in which, uniquely among *Chasmosaurus*, the cranial elements are disarticulated, allowing detailed examination of their morphology for the first time. The complete braincase is present and allows comparison with the braincase of other ceratopsians. The specimen also preserves an uncrushed and undistorted postcranium, including cervical, dorsal and sacral vertebrae and limb elements. The vertebral column of *Chasmosaurus* has never previously been described in detail, and NHMUK R4948 affords the opportunity to examine it because of the unparalleled state of vertebral preservation. A proliferation of new chasmosaurine genera has recently been described; many of them differ from each other only in details of frill and epiparietal morphology. Several of these are based on specimens previously referred to *Chasmosaurus*. As a result, the characters that distinguish *Chasmosaurus* from other Campanian chasmosaurines are unclear. However, the genus *Chasmosaurus* and species within the genus are diagnosable and valid based on unique combinations of characters and frill morphology. Detailed examination of the postcranial morphology of a variety of centrosaurines and chasmosaurines has highlighted previously undescribed synapomorphies for the two major ceratopsid clades, concentrated in the pectoral girdle and forelimb. Inconsistencies in the vertebral formula of specimens referred to *Chasmosaurus belli* suggests that the postcrania of ceratopsids may vary between species and genera far more than previously thought, and that postcranial characters should be incorporated into phylogenetic and taxonomic studies.

Key words: Chasmosaurinae, Dinosaur Park Formation, Upper Campanian

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