

## UNIQUE PADDLE MORPHOLOGY OF THE PLIOSAUR (PLESIOSAURIA) *BRACHAUCHENIUS LUCASI*

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An articulated group of exceptionally large plesiosaur paddle elements (FHSM 13997) from the basal Lincoln Limestone Member, Greenhorn Limestone (Middle Cenomanian) of central Kansas displays unusual morphology and represents only the second record of paddle material for *Brachauchenius lucasi*. The elements include sixteen articulated epipodial, mesopodial, metapodial, and phalangeal elements, measuring 60 cm in proximo-distal dimension and 35 cm in antero-posterior dimension. Fused distal mesopodial 2-3 is a massive element that is markedly wider than long and is larger in overall size than the overlying mesopodial. Fused distal mesopodial 2-3 is generally equi-dimensional in other plesiosaurs, and is not nearly as large relative to other podials.

More striking is the configuration of the fourth metapodial. Sir Richard Owen was the first to note that the fifth metapodial is shifted proximally into the distal mesopodial row in plesiosaurs, a character that unites all members of the order. FHSM 13997 reveals that the fourth metapodial is also shifted proximally into the mesopodial row. This results in the contact of fused distal mesopodial 2-3 with seven other podials, including the fourth metapodial, a unique configuration among plesiosaurs. Williston's referred specimen of *B. lucasi* (USNM 2361) includes articulated paddle material that also clearly exhibits proximal shift of the fourth and fifth metapodials, and contact of fused distal mesopodial 2-3 with the fourth metapodial. Based upon this, FHSM 13997 is referred to *B. lucasi*, and this taxon's peculiar paddle morphology is noted here for the first time.

A scaled restoration of the complete FHSM 13997 paddle was prepared, based upon comparison with many other plesiosaur taxa, to arrive at an estimate of the overall size of the paddle and the skeleton as a whole. Were it complete and including the propodial, the paddle of FHSM 13997 would measure some 2 meters in length, and by comparison with pliosaur body plans this equates to an animal roughly nine meters in total length.