

Poster Session IV, (Saturday)

**EXTANT ANIMALS PROVIDE NEW INSIGHTS ON HEAD AND NECK POSTURE  
IN SAUROPODS**

NAISH, Darren, University of Portsmouth, Portsmouth, United Kingdom; TAYLOR, Michael, University of Portsmouth, Portsmouth, United Kingdom; WEDEL, Mathew, Western University of Health Sciences, Pomona, CA, USA

The neck posture of sauropod dinosaurs has long been controversial. At one extreme, some workers have argued for vertical, mast-like necks while, at the other, some have reconstructed these animals with horizontal or even downward-sloping necks that put the head close to the ground. It has recently been argued that neck posture can be reconstructed by positioning the cervical vertebrae and skull in an 'osteological neutral pose' (ONP), the best fit arrived at by articulating the vertebrae while keeping the zygapophyses in maximum contact. When sauropod necks are reconstructed in ONP, their necks are horizontal. It has also been claimed that ONP represents the habitual life posture, and provides an indication of feeding height. Several authors have also reconstructed sauropod heads such that the long axis of the brainstem cavity is parallel with the neural canal of the atlas and axis: or, in other words, that the cranio-cervical junction is fully extended. To date, conclusions on sauropod head and neck posture have taken surprisingly little account of what is known about extant animals. A substantial literature on extant amniotes (mammals, turtles, squamates, crocodylians and birds) shows that living animals do not habitually maintain their necks in ONP. Instead, the neck is maximally extended at the cervico-dorsal junction and maximally flexed at the cranio-cervical junction, so that the mid-cervical region is near vertical. This is true even in apparently short-necked animals. We manipulated the vertebrae of modern mammals and birds and found that the life postures (as determined by X-ray observations) are more extended than ONP, and indeed more elevated than can be achieved when manipulating dry bones alone. The fact that elevated, extended necks are widespread across Amniota means that elevated necks should be assumed for sauropods in the absence of evidence to the contrary. Elevated neck postures for sauropods are indicated by the extant phylogenetic brackets at the levels of Saurischia, Archosauria, Diapsida, Reptilia and Amniota.