

Reply to Stojanowski *et al.*

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In the accompanying Comment¹, Stojanowski *et al.* challenge the evidence for inter-group conflict at Nataruk². They make two arguments—first, that the lesions in three crania are due to soil compression; second, that there is a correlation between body position and age, reflecting different burial traditions. We believe that their interpretation is incorrect in both counts.

Stojanowski *et al.* argue that the fractures in three Nataruk skulls do not meet forensic criteria, the criteria are unreliable, and the location of lesions is linked to skull/face orientation. We focus on cranium 71264, argued by Stojanowski *et al.* as an example of soil compression effects. This skull has two primary lesions (challenging any site-wide association between skull trauma location and face orientation), one on the left temporoparietal area, another on the frontal bone; these show clear in-bending of bone at impact-point and out-bending of affected regions, radiating fractures, directional change,

depressed adhering bone fragments, lesions across sinuses, evulsion of molars, and differential lateral displacement of maxilla and mandible. We know of no selectively targeted, multi-directional soil compression agent that could account for the observed pattern in this, or other Nataruk crania. The criteria used for identification of perimortem trauma are not only consistent with the literature^{3,4}, but clearly identify multiple traumatic lesions at Nataruk².

Stojanowski *et al.* also argue that prone individuals at Nataruk are older than the rest, and that the site must be a cemetery, with sequential burial traditions, to have preserved the remains. To support this, they (1) claim that there are four prone individuals at Nataruk, not two, by redefining the word ‘prone’ thus including two skeletons found flexed on their side²; (2) dismiss the absence of burial pits or the shells/fish adhering onto the bones as irrelevant; (3) do not account for the fact that bodies and body parts were strewn over 20,000 m²; (4) incorrectly state that the majority of human remains at Nataruk were articulated and uncommingled; (5) argue for ‘limited variation in body positioning’ (figure 1 from ref. 2 shows clearly the diversity of position/direction of bodies, limbs, heads and faces at Nataruk); and (6) draw parallels with cemeteries in Sudan⁵. These are rich multi-stratified, younger sites (~8000–2000 years BP), in one of which earlier burials (with residual burial pits) were prone, later Neolithic ones, flexed³. However, prone skeletons in Sudan, although rare, are found across time—from 30,000–20,000 years ago at Wadi Kubbania⁶ to as recent as 1st millennium BC at Jebel Moya^{7,8}, and preserved unburied bodies found before in East Africa⁹. In fact, there are no chronological, stratigraphic or internment parallels between the Omdurman sites and Nataruk, as there are no universal East African pre-Neolithic burial traditions.

Nataruk is not a cemetery, the majority of remains were disarticulated and dispersed; the human remains’ multiple cranial and post-cranial traumas are more consistent with perimortem traumatic lesions than soil compression, and critically include embedded projectiles. There is no association between body position and age, or face orientation and location of fractures. A case of inter-group conflict remains the best explanation of what happened at Nataruk.

References

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