Comments

MARK COLLARD AND STEPHEN J. LYCETT
Department of Anthropology and Sociology, University of British Columbia, Vancouver, Canada, and AHRB Centre for the Evolutionary Analysis of Cultural Behaviour, University College London, London, U.K. (mark.collard@ubc.ca)/Leverhulme Centre for Human Evolutionary Studies, Department of Biological Anthropology, University of Cambridge, Cambridge, U.K. (s.lycett@human_evol.cam.ac.uk). 27 IV 05

Reno et al. challenge recent claims that the evolution of hominid limb proportions has involved reversals and/or other forms of homoplasy. They focus on the precision and accuracy of limb length estimates that have been published for OH 62 and BOU-VP-12/1. They target these fragmentary specimens because their limb proportions have been suggested to be more primitive than those of the *Australopithecus afarensis* specimen A.L. 288-1 even though they are younger and, in the case of OH 62, more craniodentally derived and therefore potentially support the hypothesis that hominid limb proportion evolution has involved homoplasy. Having concluded that the humerofemoral index of OH 62 is "ultimately unknowable," they turn to BOU-VP-12/1 and find its humerofemoral index to be more like that of *Homo sapiens*, A.L. 288-1, and the *H. erectus* specimen KNM-WT 15000 than those of the extant apes. They point out that, while BOU-VP-12/1 may have a *Pongo*-like brachial index on the basis of point estimates for the lengths of its humerus and radius derived from regression analyses, when the 95% prediction limits are taken into account its brachial index is potentially compatible with all living hominoid species. Finally, they report the results of an analysis in which BOU-VP-12/1's limb lengths were informally estimated. This procedure returned a narrower range of possible brachial indices for BOU-VP-12/1 than the regression-based analysis and suggested that the brachial index of BOU-VP-12/1 was higher than that of *H. sapiens*. They therefore argue that the most parsimonious interpretation of the available evidence is that the brachial index of BOU-VP-12/1 is similar to that of "other ancestral hominids typified by A.L. 288-1."

Their critique of attempts to reconstruct the humerofemoral index of OH 62 is reasonably persuasive. We are not entirely convinced that the humerofemoral index of OH 62 is "ultimately unknowable," but the lack of association between proximal and maximum femur length in their sample of humans and apes certainly suggests that little confidence can be invested in current estimates of the length of OH 62's femur or of its humerofemoral index. Their treatment of BOU-VP-12/1, in

contrast, is unconvincing. It is not at all clear that the most parsimonious interpretation of the available evidence is that BOU-VP-12/1's brachial index is similar to that of A.L. 288-1. One issue is the use of informal estimates of limb bone length. They contend that their "anatomical estimates" are likely to be more accurate than estimates derived from regression analysis because of the "general familiarity of observers in the field with the details of the skeletal anatomy (e.g., muscle insertion and origin sites) of the five related genera at issue in this problem (*Homo, Pan, Gorilla, Pongo,* and *Hylobates*)." This is problematic. While individuals can undoubtedly become reasonably proficient at estimating unknown quantities, reliance on expert intuition rather than formal quantitative procedures does not provide a sound foundation for any science, since it goes against the principle of interobserver repeatability. Moreover, in contrast to the regression-based method, there is no satisfactory means of calculating the confidence interval associated with an expert's estimate of the length of a given bone. Accordingly, Reno et al.'s "anatomical estimates" of BOU-VP-12/1's limb lengths are valueless. A further problem with the suggestion that BOU-VP-12/1 should be assumed to have a brachial index comparable to that of A.L. 288-1 is that, even if Reno et al.'s "anatomical estimates" were valid, they would not exclude the possibility that BOU-VP-12/1's brachial index was in the range of the brachial indices recorded for *Pongo*. The two "anatomical estimates" for BOU-VP-12/1 reported by Reno et al. return brachial indices of 96 and 98. According to their figure 4 and table 1, the 95% prediction limits for the brachial indices of *Pongo* range between 93 and 109. Thus, the anatomical-estimate-based brachial indices for BOU-VP-12/1 fall comfortably within the *Pongo* range. This is consistent with the regression-based estimates of BOU-VP-12/1, which Reno et al. discount. Given this, we suggest, the appropriate conclusion to draw is that the brachial index of BOU-VP-12/1 is indeterminate at this time.