

investigate modularity in an ontogenetic sample of *Papio hamadryas ursinus* crania without their *a priori* designation. Forty-three 3D landmarks were obtained from each specimen. After superimposing the landmark configurations using a generalized partial procrustes analysis, orthogonally projected to the tangent plane, the effects of allometry and sexual dimorphism on craniofacial variation were removed by multivariate regression. As modules are internally integrated regions that are relatively independent from each other, covariation between cranial modules should be significantly weaker than other random partitions of the cranium. The 2-block partial least squares RV coefficients for all possible pairs of spatially-contiguous landmark subsets were then calculated and significance determined using permutation tests.

The nasal-premaxillary-maxillary region and posterior cranial vault were found to be modular in nature and, with the exception of areas of contact, statistically independent from one another. The same can be said of the cranial vault and anterior occiput. The maxillary portion of the face and anterior occiput, on the other hand, displayed a strong degree of integration likely reflecting the involvement of the latter in lower facial development and positioning.

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To the West! A dental morphology investigation of gene flow between populations of the Iranian Plateau and the macro-Mesopotamian interaction sphere during the last three millennia B.C.

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Despite archaeological evidence at the Bronze Age site of Tepe Hissar in north-eastern Iran of contact with populations of south Central Asia and the Indus Valley, biological evidence of gene flow between populations of these regions was found to be starkly absent (Hemphill 2010). Such results suggest either inter-regional gene flow was absent, or that the Tepe Hissar population experienced gene flow with commercial partners of other regions. Hasanlu, located in northwestern Iran astride a crossroads leading to Mesopotamia, contains archaeological evidence of extensive contact with Mesopotamian populations. This research tests whether the inhabitants of Tepe Hissar experienced gene flow with populations involved in the macro-Mesopotamian interaction sphere found in northwestern Iran. This investigation is based on assessment of 17 tooth-trait variations scored in accordance with the Arizona State University Dental Morphology System in a sample of 136

individuals recovered from Tepe Hissar, 70 individuals recovered from Hasanlu, and 2,241 individuals of 22 samples of prehistoric and living Central Asians, Pakistanis, and peninsular Indians. Intersample differences were examined with hierarchical cluster analysis, neighbor-joining cluster analysis, multidimensional scaling and principal coordinates analysis.

Results consistently identify Tepe Hissar individuals as possessing closest affinities to inhabitants of Hasanlu. By contrast, Tepe Hissar individuals exhibit little to no affinities to prehistoric Central Asians or to prehistoric or living individuals from the Indus Valley and peninsular India. Hence, it appears commercial contacts between Tepe Hissar and populations to the west *did* result in significant gene flow, while trade contacts across the Iranian Plateau did not.

Dental evidence bearing on morphological dating of the LB1 specimen.

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The dating of the skeleton LB1 from Flores, Indonesia, is less certain than suggested in the literature. Dates from the surrounding deposits are contradictory. Direct dating of the bones has not been performed. Thus, the age of LB1 should be considered by other dating techniques. Morphological dating has been applied in palaeoanthropology and is commonly used in archaeology.

The aim of the present study was to test whether the condition of the LB1 dentition compels the view that the individual represents a member of a new species, or is more consistent with membership in a regional population of extant *Homo sapiens*. The new evidence provided here comprises observations on the original specimens and photographs of the dentition.

Tooth dimensions are consistent with modern humans. Tooth morphology exhibits numerous concordances with the extant Rampasasa. The presence of dental caries in LB1 (lower premolars and a canine) indicates a low probability of belonging to a hunter-gatherer society. Dental attrition of LB1 is of a type more common in agricultural societies than among hunter-gatherers, the differences in attrition between molars are small. The *ante mortem* loss of lower right P4 without alterations of the adjacent structures suggests a surgical extraction. Evi-

dence of a Class II restoration with radiolucent material in the lower left M1 has been disputed, but not refuted by an independent examination that until now has been precluded by selectively restricted access to the specimen. Dental modifications would strongly favor an affiliation to a modern society with dental surgery techniques.

The relation between standard error of the estimate and sample size of histomorphometric ageing methods.

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Histomorphometric ageing methods report varying degrees of precision (measured through standard error of the estimate or SEE). These techniques have often been developed on variable samples sizes (n) and the impact of this parameter on SEE is poorly understood. This paper explores the relationship between n and reported SEE through a review of the literature (abstracts, articles, book chapters, theses, and dissertations) and a mathematical simulation. Thirty-eight studies reporting n and SEE in years were included in the current study. Reported SEE values were highly variable ranging from 2.58 to 16.00 years (Mean: 8.51; Stdev: 3.56). To examine the probabilistic relationship between n and SEE we generated a simulated population of 50,000 individuals where histomorphometric 'ages' were assumed to reflect normally distributed random error about chronological age. SEE values were calculated for randomly selected subsamples of varying size. This simulation revealed that in large samples (>100) SEE converges on the level of variation present in the population; however, in smaller samples SEE becomes increasingly variable. In general, this pattern matched the observed pattern of published SEE values. While numerous sources of variation exist between different methods, the impact of insufficient sample size should not be overlooked. Notably, while SEE values as low as 2.58 years have been reported, studies which exceed 150 individuals report a mean SEE value of 11.05 years (Stdev: 1.91). Meaningful comparison of the precision of different approaches requires larger samples than are frequently used and would ideally be based upon standardized samples.

Plant foods and the dietary ecology of Neanderthals.

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Previous research has suggested that Neanderthals had a narrower diet than