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From Eric Delson

Morphometric analysis and geochronology of Hominin fossils from Maba (Guangdong, China).

CHRISTOPHER J. BAE[1], DONGFANG XIAO[2], LICHENG QIU[3], GUANJUN SHEN[4], ERIC DELSON[5], NOREEN VON CRAMON-TAUBADEL[6], STEPHEN J. LYCETT[6], JENNIE JH JIN[7], and HUA TU[4]. [1]University of Hawaii, [2]Maba Museum, [3]Guangdong Institute of Archaeology, [4]Nanjing Normal University, [5]Lehman College/CUNY & NYCEP, [6]University of Kent, [7]Joint POW/MIA Accounting Command.

The question of "replacement events" versus "transitional stages" has long been a strongly debated topic in paleoanthropology. A good example of this is the question of the nature of hominin evolution in eastern Asia during the Middle to Late Pleistocene. Two major questions relevant to the eastern Asian record are: "Did *Homo erectus* evolve into modern *H. sapiens* with archaic *H. sapiens* as the transitional group?"; or "Was *Homo erectus* replaced by dispersing *H. heidelbergensis*, a so-called "early" replacement event, only later to be replaced by modern humans from the western Old World?" In this paper, we analyze hominin fossils from the late Middle Pleistocene Maba Cave (Guangdong, China) to test these hypotheses. Maba is best known for the presence of a partial hominin cranium that has traditionally been allocated to archaic *H. sapiens*. We present a morphometric analysis of a hominin partial mandible and five teeth (four upper M1s and M2s and a lower M3) that were excavated from Maba in 1960 and 1984 but previously unreported in the Western scientific literature. The Maba partial mandible is compared to better known mandibles from the Middle Pleistocene Old World (e.g., Mauer, Arago, and Tighenif). The Maba teeth are compared to data collected from selected hominin fossils and Holocene Chinese and Korean dental collections. A recent dating analysis of the Maba deposits suggest the age of the capping flowstone may be as old as 237 ka. We discuss the meaning of these new dates in this paper.

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Organizing, administering, and sustaining an open-access database, examples learned from PRIMO.

ERIC DELSON[1,2,3,4,5], ERIC FORD[6], MARTIN FRIESS[5,7], STEPHEN R. FROST[5,8] and WILLIAM HARCOURT-SMITH[1,2,3,4,5]. [1]Department of Anthropology, Lehman College/CUNY, [2]Anthropology Ph.D. Program, CUNY Graduate School, [3]Department of Vertebrate Paleontology, American Museum of Natural History, [4]NYCEP (New York Consortium in Evolutionary Primatology), [5]NYCEP Morphometrics Group, [6]Computer Science Ph.D. Program, CUNY Graduate School, [7]Département Hommes, Nature, Sociétes, & CNRS UMR 7206, Muséum national d'Histoire naturelle, Paris, [8]Department of Anthropology, University of Oregon.

Data in paleoanthropology are of many types: linear dimensions, landmark coordinates, images, surface and CT scans, stratigraphic and geographic locality information, taphonomic observations, specimen collection and life history information, bibliographic ciations, and artifact dimensions, scar counts or mineralogy, among others. Beginning in 2000, Delson and NYCEP Morphometrics Group (NMG) colleagues have built PRIMO, the PRImate Morphometrics Online database, as an open source for metrical data supported by collection, specimen and related metadata (a term whose definition is controversial). Caliper data collected by Delson and others, mainly on extant and fossil cercopithecids, were posted first, with landmark data collected by Microscribe added more recently. PRIMO is thus rare among databases in our field in providing original metrical data, mainly unpublished, for other scholars to employ in their own research. About 8000 individual specimens and over 600 linear measurements and landmarks are included. Most data are open access (following an emailed request for a login password), but some may be restricted by the collector to a subset of individuals granted access while primary research is ongoing; non-NMG researchers may deposit data. Geographic and stratigraphic data are being prepared for inclusion, as are scan data (which may require host institution permission). We are working with such hosts to reduce their restrictions on access and also with the coordinators of other databases to facilitate searches via an integrating "portal". Funding for PRIMO has come through NSF grants supporting 3D research, which is aided by the ability for collaborators to access and exchange data online.

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Impact of global climatic change on the evolution of *Theropithecus oswaldi*.

STEPHEN R. FROST[1], EMILY H. GUTHRIE[1] and ERIC DELSON[2,3,4]. [1]Department of Anthropology, University of Oregon, [2]Department of Anthropology, Lehman College, [3]Department of Vertebrate Paleontology, American Museum of Natural History, CUNY, [4]NYCEP (New York Consortium in Evolutionary Primatology).

We examined the impact of global climatic change on the morphological evolution of *Theropithecus oswaldi*, which has an extensive fossil record spanning the time period from prior to 3.5 until approximately 0.25 Ma when significant changes occurred in global climate and regional African habitats. Thus *T. oswaldi* is an ideal primate for studying the relationship between climate and evolution.

Theropithecus oswaldi is recognized as a terrestrial grazer based on its limb skeleton, carbon isotopic ratios from enamel, and dental microwear. Several morphological trends are clear over its chronological range and appear to occur throughout Africa, although data are sparser for North and South compared to East Africa. These trends include an increase in body size, molar size and enamel complexity, enlargement of cranial superstructures, reduction of anterior dentition, shortening of the rostrum, and some evidence for increasing terrestrial adaptations in the postcranium. Evolution of these morphological trends is the basis for recognizing the chrono-subspecies of *T. oswaldi*: *T. o. darti*, *T. o. oswaldi*, and *T. o. leakeyi*.

While changes in *T. oswaldi*'s morphology through time generally tracked the overall increase in aridity that occurred throughout the Pliocene and Pleistocene, they did not coincide with specific major shifts in global climate, such as the global cooling event associated with the onset of major continental glaciation in the Northern Hemisphere at approximately 2.8 Ma, nor the shifts in predominant orbital cycle at approximately 1.7 and 1.0 Ma. Instead, their evolution seems to track a steady increase in adaptation to terrestrial grazing.

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