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Guest Editorial

Current multi-disciplinary approaches to deciphering the East and Southeast Asian paleoanthropological record

1. Introduction

A number of regional syntheses of the East and Southeast (hereafter, "eastern") Asian paleoanthropological record were published in the 1970s, 1980s, and through the mid-1990s (e.g., Ikawa-Smith, 1978; Whyte, 1984; Wu and Olsen, 1985; Pope, 1988, 1992; Whyte et al., 1988; Schick and Dong, 1993; Pope and Keates, 1994; Schick, 1994; Wu and Poirier, 1995; Etler, 1996). Despite a number of major and important discoveries to the eastern Asian paleoanthropological record over the past two decades or so, the paucity of recent syntheses of the record have hindered its potential contributions to broader paleoanthropological debates (e.g., Out of Africa I, modern human origins). Fortunately, over the past several years a number of reviews and edited volumes that attempt to synthesize, or at least include substantial data regarding, the eastern Asian human evolutionary record have been published (e.g., Dennell, 2009; Norton and Jin, 2009, 2010; Bae, 2010; Fleagle et al., 2010; Norton and Braun, 2010). This special issue of *Quaternary International* ("QI") continues this recent trend by contributing research to various topics relevant to paleoanthropology. Most of the papers included in this volume were part of a session the co-editors organized at the 2011 INQUA Congress that was held in Bern, Switzerland. Although some of the presenters in the INQUA session were unable to contribute their papers to this QI volume, we specifically invited contributions from researchers who had new data to present to the international audience, but not the time or finances to attend the INQUA Congress. The seven papers included in this volume cover a wide diversity of topics. We organized the papers temporally starting with contributions from the Middle Pleistocene (Bae et al., 2012; Huang et al., 2012; Xu et al., 2012) to the Late Pleistocene and Early Holocene (Bae and Bae, 2012; Gladyshev et al., 2012; Jin et al., 2012; Locatelli et al., 2012).

2. Middle Pleistocene

The Middle Pleistocene papers focus on the Movius Line, a topic that has been vigorously debated over the past several years (e.g., Wang, 2005; Norton et al., 2006; Lycett, 2007; Yoo, 2007; Norton and Bae, 2009; Petraglia and Shipton, 2009; Brumm, 2010; Lycett and Bae, 2010; Lycett and Norton, 2010; Wang et al., 2012). Briefly, Movius (1944) observed that there was an apparent absence of bifacially worked implements in China and Southeast Asia, while a plethora of handaxes were present at sites in Europe, Africa, and India. This boundary came to be known as the Movius Line (Schick, 1994; Lycett and Bae, 2010). Because it is generally accepted that handaxes are present in eastern Asia, most of the Movius Line debate focuses on questions related to comparative morphological variation between handaxes east and west of the Line, the age of the eastern Asian bifaces, and the site and artifact density of handaxes found in eastern Asia (Norton and Bae, 2009; Lycett and Bae, 2010).

The Huang et al. (2012) and Xu et al. (2012) papers contribute new paleoanthropological data from the important Bose (Baise) basin from Guangxi, southern China; a basin that is internationally recognized due to the presence of Early Paleolithic handaxes in association with Australasian tektites that were dated to 803 ka (Hou et al., 2000; Wang et al., n.d.). Huang et al. (2012) present the results of recent archaeological field surveys conducted in the Bose basin over the course of two field seasons (2009 and 2010). The primary results of the surveys are the discovery of 56 previously unidentified sites and 65 more handaxes were surface collected. In addition, the Bose bifaces are spatially variable, with more found in the northwest and few discovered in the southeast. Xu et al. (2012), utilizing in part the data from Huang et al. (2012), conducted a Geographical Information Systems analysis of the spatial distribution of the Bose handaxes. The primary result of the Xu et al. (2012) analysis is that the Early Paleolithic sites and handaxes in Bose are spatially variable (higher densities in the northwest, lower densities in the southeast), a point that was also raised by Huang et al. (2012). Both Huang et al. (2012) and Xu et al. (2012) studies emphasize the variability that is present in the Bose basin in terms of the site and artifact densities, a point that was underemphasized in earlier research (e.g., Hou et al., 2000).

Since the discovery of handaxes at the Chongokni site in Korea (Kim and Bae, 1983), one of the most heavily debated topics is the chronometric age of the bifaces from the Imjin-Hantan River Basins (IHRB) (e.g., Yi and Clark, 1983; Yi, 1986, 2010; Bae, 1988, 1994, 2002; Yi et al., 1998; Norton, 2000; Danhara et al., 2002; Norton et al., 2006; Yoo, 2007; Kim, 2009; Norton and Bae, 2009). Bae et al. (2012) presents a detailed history of the geology of the IHRB and the results of the various attempts at narrowing the age range of the IHRB sites and artifacts. Although several basalt flows were thought to be present in the IHRB, recent geological survey indicates that there are only two primary basalt flows (Chongok and Chatan). The Chongok basalt was fission-track and K/Ar dated to ~0.5 Ma, while the Chatan basalt was dated to ~0.15 Ma (Bae et al., 2012). The debate about the chronology of the IHRB handaxes basically falls into two camps: 1) older

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occupation starting in the middle Middle Pleistocene (e.g., Bae, 1988; Danhara et al., 2002; Norton et al., 2006); and 2) younger occupation starting during the Late Pleistocene and possibly younger than 50 ka (e.g., Yi, 1986, 2010; Yi et al., 1998). Based on multiple forms of evidence (e.g., age of the Chongok and Chatan basalts, presence of AT and KTz tephras in the upper stratigraphic layers, and recent optically stimulated luminescence from the middle strata that roughly corroborate the older occupation age), Bae et al. (2012; see also Bae, 2002; Danhara et al., 2002; Norton et al., 2006) suggest that a conservative estimate of any cultural deposits overlying the Chongok basalt should date from 350 to 300 ka, and possibly slightly older than that, with the upper stratigraphic layers dating to the Late Pleistocene. Any archaeological deposits overlying the Chatan basalt should date to the Late Pleistocene to the Holocene. Cultural deposits found sandwiched between the Chongok and Chatan basalts should date to between 0.5 and 0.15 Ma (Bae et al., 2012).

3. Late Pleistocene/Early Holocene

The papers that focus on the Late Pleistocene/Early Holocene cover a wide diversity of topics. The first two papers in this section review questions about the Korean (Bae and Bae, 2012) and Mongolian (Gladyshev et al., 2012) Paleolithic archaeological records. The final two papers in the volume are vertebrate paleontological studies that focus on Late Pleistocene and Early Holocene micromammals from island Southeast Asia (Locatelli et al., 2012) and southern China (Jin et al., 2012).

Bae and Bae (2012) review the question of the Early to Late Paleolithic transition in Korea in its broader geographical context. There have been two primary hypotheses proposed to explain this transition: 1) an *in situ* evolutionary development model (Seong, 2006); and 2) a north–south migration model (KD Bae, 2010). Although there is variable support for both of these models, Bae and Bae (2012) note that when looking at the record in its broader spatial-temporal context both models have problems. For instance, there is little evidence for an *in situ* evolutionary development in Korea from the Early Paleolithic core and flake tools to the Late Paleolithic blade and microblades. Indeed, recent reviews (e.g., Lycett and Bae, 2010; Lycett and Norton, 2010) note that the only region where such a development currently appears is Africa, which is at least indirectly suggestive of higher population densities in that continent vis-à-vis eastern Asia during much of the Pleistocene. Bae and Bae (2012) propose a new model ("migration/trade interaction model") that is a variation on the earlier proposed north–south migration model (KD Bae, 2010). The primary difference is that because there is no clear consensus from genetics regarding hominin migration routes in eastern Asia during the Pleistocene, that there is currently little support for hominins from southern China migrating to the Korean peninsula during glacial periods [when sea levels would have been lower in the Yellow Sea/West Sea region (see Norton, 2007)]. Alternatively, migrations northward during interglacial periods would have been hindered because of the high water levels present during those environmental stages (in other words, hunter-gatherers moving from southern China to the Korean peninsula would have likely had to skirt the Yellow Sea/West Sea. Thus, in the migration/trade interaction model migrations from Siberia likely took place, possible trade interactions between Korean and Siberian Late Paleolithic hunter-gatherers may have occurred, and it is possible there may have been some migrations from places like southern China by hunter-gatherers who were still using Early Paleolithic stone toolkits (Bae and Bae, 2012).

Gladyshev et al. (2012) present preliminary results of excavations at the Tolbor-15 site in Mongolia. The importance of this paper is that the authors place Tolbor-15 in its broader spatial-temporal context and discuss these findings along with similar research results derived from their multi-disciplinary multi-national research conducted in Mongolia over the past two decades. One of the key points raised by Gladyshev et al. (2012) is that the Early Upper Paleolithic (EUP) in the region dates to between 40 and 26 ka and this cultural period can be divided into an early stage (40–35 ka) and a late stage (33–26 ka), with the division primarily based on variation in lithic technologies. The early stage of the EUP is represented by blade technologies, while the late stage of the EUP is represented by more flake technologies with a parallel development of microblade technologies (Gladyshev et al., 2012). Tolbor-15, the focus of this particular paper, dates to the latter stage both chronologically [29–26.7 ka (uncalibrated radiocarbon dates)] and culturally (microcores and microblades). Another point Gladyshev et al. (2012) make is that their research seems to support the proposed cultural connection between Kara Bom (Siberia) and Shuidonggou (Ningxia, Northern China), as suggested by earlier researchers (e.g., Brantingham et al., 2001). Hopefully, future regional comparative research can draw more connections between the important sites from Mongolia and Siberia and eastern Asia (Brantingham et al., 2001; Norton and Jin, 2009). The important discussion points raised in the Gladyshev et al. (2012) paper are certainly a good start in this direction.

The findings from Liang Bua (Flores, Indonesia) over the course of the past decade have potentially revolutionized paleoanthropology for many years to come (Brown et al., 2004; Morwood et al., 2004; Morwood and Jungers, 2009; Aiello, 2010). Locatelli et al. (2012) contribute an analysis of the lesser known associated giant rats from Liang Bua, one still extant on Flores (*Papagomys armandvillei*), and two now extinct (*Papagomys theodorverhoeveni*, *Spelaeomys florensis*). Following the island rule (Foster, 1964; Case, 1978; Lomolino, 2005), Locatelli et al. (2012) find that these rats are clear-cut cases of island gigantism. The authors also suggest that because no other large mammals were present on the island when Holocene humans first arrived on Flores that these giant rats probably served as a food source for the hunter-gatherers. It is interesting to note that most of their discussion focuses on samples that appear to postdate the occupation by *Homo floresiensis* despite being from the same site. Furthermore, placing the findings in the broader context, it might be interesting as well to see if the rats from Middle Pleistocene deposits in Flores were also being utilized by hominins, particularly given the archaeological findings from Mata Menge (Morwood et al., 1998). The Locatelli et al. (2012) analysis and other regional studies (e.g., Zijlstra et al., 2008) are good starts in this direction.

Jin et al. (2012) conduct an analysis of the micromammal assemblage from the Early Holocene site of Tangzigou in Yunnan Province, southern China. This study is a follow up to an analysis of the macromammal faunas from the same deposits (e.g., Jin, 2010). Jin et al. (2012) note that contrary to what might be expected of a natural micromammal accumulation where the majority of the skeletal elements should be derived from very small micromammals (<100 g), Tangzigou is dominated by large micromammals (>100 g), particularly Rodentia. Partially based on this evidence and also based on the fact that many of the micromammal dentaries appear to have been calcined, Jin et al. (2012) interpret this pattern as the Tangzigou Early Holocene hunter-gatherers actively hunted, cooked, and consumed these micromammals. Because taphonomic research is still a relatively young field in China and most studies focus on macromammals (e.g., Norton et al., 2007; Norton and Gao, 2008a, 2008b; Jin, 2010), the Jin et al. (2012) analysis that focuses specifically on the micromammals from one site is an important start to widening the scope of vertebrate taphonomic research in China.

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