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Guest editorial

Late Pleistocene and Palaeolithic studies in Northeast Asia

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A B S T R A C T

This volume presents some of the contributions resulting from a conference on recent developments in studies of the NE Asian Palaeolithic and Pleistocene that was held in June, 2013, in Yinchuan, the Ningxia Hui Autonomous Region, in the Peoples' Republic of China, near the famous Palaeolithic site complex of Shuidonggou (SDG). At this conference, over 60 papers were presented on new evidence from China, and others on Mongolia, Korea, Japan, and Siberia, and of these, 22 are published here.

Northeast Asia (North China, Japan, the Korean Peninsula, Mongolia and eastern Siberia) do not figure much in general discussions of the later Palaeolithic, including the emergence in this region of *Homo sapiens*, and the profound environmental and cultural changes that occurred in the later part of the Upper Pleistocene. For most Palaeolithic archaeologists, the chief significance of this region is its early Palaeolithic record, notably the evidence for the earliest hominin occupation in the Nihewan Basin of North China that now extends to 1.66 Ma (Zhu et al., 2004), and the world-famous UNESCO World Heritage site of Locality 1, Zhoukoudian, near Beijing, which is still the site with the largest number of specimens of *Homo erectus*, the earliest of which now date to ca. 600–800 ka (Shen et al., 2009). For Pleistocene specialists, it is usually the superlative record of climate change in the loess-palaeosol sequence of the Loess Plateau that holds their interest, with a record now extending back to the late Oligocene (Guo et al., 2002), and comparable in quality and detail to the marine isotope record, to which it can be correlated (see e.g. Tungsheng Liu et al., 1999).

The later part of the NE Asian Palaeolithic record deserves more international attention than it has hitherto received. First, the emergence of blade industries with Levallois-like features in North China, occurred probably ca. 40 ka. Many researchers believe that this Initial Upper Palaeolithic techno-complex in North China had its roots in Siberia and Central Asia and thus provides important information for the study of migration and interactions among the late Upper Pleistocene human groups in NE Asia and the dispersal of early modern humans in the region. Second, the settlement of Japan was one of the most important colonisation events of the Upper Pleistocene. This probably occurred ca. 40 ka, and thus later than the conjoined landmass of Australia, New Guinea and Tasmania, a.k.a. Sahul. As with Australia, this colonisation would have involved the use of navigable boats as there was no convenient land bridge. A third reason why NE Asia is so interesting lies in the early development of long-distance exchange networks. Obsidian from Japan has been found in northeast China, the Korean Peninsula, and several hundred kilometres inland in Siberia and Kamchatka as early as 30 ka: these networks were far earlier, and functioned over far greater distances than did any network in the European peninsula before the Holocene. Despite the importance of the evidence for the colonisation by sea of Japan by 40 ka, and the subsequent development of long-distance exchange networks in demonstrating that marine navigation was already routine 40 ka in East Asia, from Sahul to the Pacific coast of Siberia, and some 30 ka earlier than in the Mediterranean, NE Asia scarcely figures on the radar of most Palaeolithic archaeologists in Europe, Africa or North America. Forth, the enormous expanse of the North China Plain that extends along the southern margin of Mongolia and the provinces of Liaoning, Jilin and Heilongjiang in NE China is comparable in many respects to the North and East European Plains that extend from northern France to western Russia and the Ukraine. In the Upper Pleistocene, depending up the vicissitudes of MIS 4–2, both plains were steppe grassland in milder periods and cold deserts during climatic downturns, most notably the last glacial maximum ca. 18 ka. Both were inhabited during milder episodes by groups that were highly mobile, skilled hunters of large animals, and adept at utilising plant resources for food and for their material needs of cordage, fibres, and wood. The archaeological and environmental records of the North European Plain are incomparably better known than the Chinese record, but as shown in this volume, new data is now being generated and much more will be in the next few years, so hopefully the North China Plain will soon prove as fascinating and as well-known as its European counterpart. As shown in this volume, new data from the Shuidonggou Valley, Ningxia, and Youfang in the Nihewan Basin, strongly implies that *H. sapiens* or early modern humans probably entered this region ca. 40 ka – roughly the same time as it entered western Europe – and its subsequent history during the later part of the Upper Pleistocene is no less important or interesting than in Europe.

A fifth reason why NE Asia deserves more attention is the development of the NE Asian microblade tradition (NEAMT). This tradition was probably either intrusive from eastern Siberia, or

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originated locally, as implied by the new data from Youfang. By the end of the Pleistocene, it had spread into the Korean Peninsula, and Japanese islands. The microblades and microliths of the NEAMT were made from high quality chert or obsidian, and signify intense curation of a scarce resource by people who were highly mobile and consequently needed to conserve the weight of their possessions, and also minimise risk by maintaining the key parts of their technology by having a ready supply of replacement parts. As such, it invites comparisons with the late glacial groups in northern Europe.

These themes are addressed in the contributions in this volume. Appropriately, several papers were about the evidence and its wider significance from the Shuidonggou area. Shuidonggou Locality 1 (SDG1) was discovered and excavated by the French missionary Emile Licent and the Jesuit Teilhard de Chardin in 1923 during their pioneering survey and exploration of North China (Licent and Teilhard de Chardin, 1925). Since then, it has been excavated on numerous occasions, but its dating and cultural affiliations are still unclear. Xiaomei Nian and her colleagues discuss the significance of new OSL dates they have obtained, and show that the flake-blade assemblages from earliest part of this site probably date from ca. 40 ka to ca. 22–25 ka. Nevertheless, further excavation will be needed to date the occupation sequence at SDG 1 more precisely. A technological perspective on the blade technology at SDG is provided by Fei Peng, who concludes by pointing out the similarities of the SDG 1 assemblage with Early (or Initial) Upper Palaeolithic ones from the Altai and Mongolia. Because of the wide chronological range of the upper Palaeolithic layers at SDG 1, further excavations by the Institute of Vertebrate Paleontology and Paleoanthropology under Chinese Academy of Sciences (IVPP) are planned to clarify the sequence of this immensely important site. David Madsen and colleagues discuss the evidence from South Temple Canyon, not far from the Shuidonggou site, from which a lithic assemblage was obtained similar to that from SDG 1. Ingenious and novel dating by ^{14}C of the calcium carbonate adhering to a quartzite flake indicates an age of ca. 41 ka, thus confirming that SDG1 is one of the earliest Upper Palaeolithic sites in NE Asia. Whether this was the result of immigration from Siberia or Mongolia is currently unclear, as is whether it was made by anatomically modern humans, Denisovans, or some other hominin.

Three papers discuss the wider significance and context of the SDG 1 assemblage. In a much-needed review, Steven Kuhn and Nicolas Zwyns critique the definition of the term "Initial Upper Palaeolithic", or "IUP", which began as a specific descriptor of the assemblage from Boker Tachtit level 4 and has since been applied to any early Upper Palaeolithic lithic assemblage with Levallois-like features of blade production. They point out that in Eurasia, the IUP is not a unified phenomenon, and it may reflect numerous local origins and dispersal events: a more precise usage of this term is needed. Evgeny Rybin provides a very welcome (for non-Russian readers) overview of the IUP assemblages from Siberia and Central Asia. This evidence is complex, but appears to indicate the eastward expansion of a blade-based IUP ca. 45 ka from the Russian Altai to central Mongolia and the Transbaikal, where a second centre of a blade-based IUP appeared ca. 40–43 ka as a result, in his view, of human dispersal. The SDG 1 assemblage might therefore be a further consequence of this eastward expansion from the Altai. Mongolia is a vast country with a very poor Palaeolithic record, and thus it is gratifying to include a paper by Nicolas Zwyns and colleagues on new evidence from Tolbor-16 in northern Mongolia. This site has an early Upper Palaeolithic lithic assemblage dated to ca. 37.5–40.5 cal BP that is similar to other IUP assemblages from southern Siberia, and may indicate long-distance contact or movement of populations into this region during MIS3. Given the severity of winter at present times, the populations that inhabited southern Siberia and northern Mongolia must have been highly effective hunters that possessed effective sewn winter clothing and an effective fire technology.

The Shuidonggou valley contains over 12 localities, of which several have recently been excavated by IVPP. SDG 2 lies near 100 m from SDG 1, and has an Upper Palaeolithic sequence from ca. 40 ka (Gao et al. 2013). Feng Li and colleagues analyze archaeological materials from SDG 2 with respect to ecology, technology, economy and social organization, and symbolic behaviors. This locality shows a range of cultural innovations in different archaeological layers. They argue that the continuous evolution of flake technology in North China from 40 ka to 20 ka supports the hypothesis "*Continuity with Hybridization*" of local populations, and suggest that seeking cultural innovations of ancient populations should focus on evolutionary processes leading to individual behaviors rather than identifying "modern behaviors" using a list summarized from materials derived from findings in Europe and Africa. Ying Guan and colleagues discuss the evidence for plant use at this site by analysis of starch grains, phytoliths and plant tissue on stone artefacts. They show that edible plants were probably an important part of the diet of the inhabitants, and this helps offset the common perception that they were overwhelmingly reliant on meat. This type of analysis is comparatively recent in China, and a nice illustration of how younger Chinese researchers are developing new lines of enquiry in Palaeolithic investigations in China. This is also shown by the study by Zhenyu Zhou and colleagues of the heat-treated rocks from SDG 2 and 12, which dates from the late glacial, ca. 11 ka. They show through XRD analysis and compression tests that the inhabitants at both sites clearly understood by at least 32 ka how heating rock improved its flaking characteristics. This is the first study of its kind in China, and doubtless further examples will be found. A different role of fire is explored in the paper by Xing Gao and colleagues on fire-cracked rocks from SDG 12. They show through simulation experiments that these rocks had shattered after being heated at high temperatures and then immersed in water. This strongly suggests their use as boiling stones for cooking liquid foods and boiling water. They also point out that this would also have been an effective way of killing bacteria such as *Escherichia coli* and thus making water safe to drink. As with the previous paper, this evidence is the first of its kind in China, and is another example of the impact that young Chinese Palaeolithic researchers are beginning to make on their discipline. The paper by Mingjie Yi presents an overview of SDG12, which was recently and extensively excavated by IVPP. SDG 12 has a microblade technology, indicating the intensive use of high-quality chert to produce microblades and microliths for composite tools. She argues that this technology was critically important to a population that inhabited a harsh environment that necessitated high residential mobility, sophisticated cold weather clothing, stone boiling to maximise nutrient returns, and probably the use of nets and cordage. Faunal data indicates a shift from large game to a more diverse diet that included plant foods and small game. In the wider context of the Eurasian landmass, SDG 12 is one of the clearest examples of how humans adapted to the rigours of late glacial environments. Her paper is followed by Shinji Kato's on the microblade industries of Northeast Asia, and attributes its presence in China to immigration from the north, and in Japan to dissemination via existing exchange networks. An alternative perspective is provided in a second paper by Xiaomei Nian and colleagues on the dating of Youfang in the Nihewan Basin. This site contains a microblade technology, and they show through OSL dating that its human occupation lasts from c. 26–29 ka. Youfang is thus the earliest site with a microblade technology, and this raises the probability that it was an indigenous development in North China.

Three papers on Ningxia and Inner Mongolia show how new approaches are benefiting Palaeolithic research in China. Shuwen Pei and colleagues presents a taphonomic analysis of SDG 7, which dates to ca. 22–30 ka. They show through a thorough examination of the site formation processes that the archaeological material was preserved in a primary context, and not re-deposited as previously suggested. Although this type of study has long been routine in studies of fluvial and lakeshore sites in Africa and the Levant, this study is among the first of its kind in China. The same is true of the paper by Hong Chen and colleagues on the use-wear analysis of artefacts from locality 1 at Wulanmulun, dating to ca. 50–65 ka. They show that use wear was observable on ca. 40% of the artefacts they examined, and resulted from defleshing and slicing of animal products. It is to be hoped that further studies of this kind will increase understanding of the informal lithic assemblages that comprise so much of the Chinese Palaeolithic record and defy easy classification. Wei and colleagues take an ecological approach to study the background of human adaptation at the Wulanmulan site. Based on faunal analyses, they believe that paleoenvironment in the area might be a mixture or mosaic of grassland and forest with some small streams and swamps and the region at the time is suitable for human habitation. They also point out that mammals present at the site were mostly hunting preys of humans living in the area.

Several papers presented new evidence from Central China. Two were on material collected from the Hanshui Valley in Central China that provide conflicting perspectives on the Early Palaeolithic of China. The first by Yinghua Li and colleagues examines the chaîne opératoire involved in flaking stone tools. In their view, there is no clear evidence of what could be regarded as Acheulean. In contrast, Hao Li and colleagues examine the Large Cutting Tools (LCT's) collected in the Danjiangkou Reservoir Region, and argue that there is in fact a true Acheulean component in China, providing that the Acheulean is recognised as technologically variable and complex.

Youping Wang and Tongli Qu present new evidence from the Central Plain in Henan Province on its record of occupation during and after MIS 3. They show that in the early part of MIS3 there was a major change indicated by long-distance procurement of stone and a more diverse tool-kit; the lithic technology was based on a simple flake and core technology throughout MIS 3 which was replaced by a blade and microblade technology near the end of the Pleistocene. One interesting recent discovery is an elephant skull at Zhaozhuang that was found in a layer dated to ca. 35 ka and rested on top of a pile of rocks; this is interpreted as evidence of ritual behaviour on the grounds that other agencies (e.g. fluvial transport) can be excluded.

Two papers presented new evidence on artefacts found in loess deposits in Central China. The first by Shejiang Wang and colleagues reviews earlier discoveries and presents new materials in the southern part of the Chinese Loess Plateau. This area has a long record of hominin occupation, as evidenced by the Gongwangling *H. erectus* cranium that has been dated to 1.15 Ma (An and Ho, 1989; Zhu et al., in press) but has recently been shown to be considerably older (Zhu et al., in press), and also the Chenjiawo *H. erectus* mandible, dated to ca. 650 ka. Its artefactual record is poor, however, partly because loess-palaeosol sections can be over 100 m thick. Nevertheless, this disadvantage is offset by the point that when artefacts are found in sections, they can often be precisely dated with reference to the detailed loess-stratigraphy developed by Tungsheng Liu and many others over the last 30 years. Shejiang Wang reviews earlier work and provides new evidence of artefacts in the Upper Pleistocene L (loess)1, S (soil)1, and L2 from the late Middle Pleistocene. Earlier material dating to the tripartite S5 (568–575 ka and 581–625 ka) from three localities at Liuwan in the Luonan Valley is presented in a paper by Xuefeng Sun and his colleagues. This type of stratigraphic work will prove invaluable in precisely dating the Chinese Early Palaeolithic and determining its climatic context depending on whether artefacts are found in interglacial palaeosols or glacial loess units.

The final paper by Kazuki Morisato and Hiroyuki Sato examines the late glacial record of northern Kyushu, Japan. They show that as a result of regional differences, populations in northern Kyushu were highly mobile, with high degree of artefact curation but a low degree of artefact diversity. In contrast, those in southern Kyushu maintained smaller territories, were less mobile, a lower degree of curation and a more diverse material culture (including pit traps and pit dwellings). One statistic that might encourage European colleagues to pay more attention to Japan is that it contains over 16,000 Palaeolithic and early Jomon sites (40,000–11,500 bp.): despite its neglect by western scholars, it can hardly be dismissed as a blank part of the Palaeolithic map.

Hallam Movius (1948) cast a very long shadow over the Palaeolithic of East Asia by dismissing its inhabitants as backward, primitive and conservative because they rarely made handaxes or prepared cores. Today, few would see these as reliable indicators of human “progress”. Palaeolithic research in China in particular has developed at a rapid pace in the last few years with increasing numbers of staff and students benefitting from study outside China, and then importing and developing new lines of enquiry. Greater interest is also being expressed in the Palaeolithic record of NE Asia by American and European researchers, and there is now emerging greater transnational interest among the countries of NE Asia, as shown by the range of nationalities represented at the Yinchuan conference in June 2013. It is to be hoped that these trends will continue, and that a steady output of high quality research will flow from all those interested in the Palaeolithic and Pleistocene of this large, complex and fascinating part of the world.

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Xing Gao*
The Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences, 142 Xiwaidajie, Beijing, 100044, China

Robin Dennell
Department of Archaeology, University of Sheffield, Northgate House, West Street, Sheffield, S1 4ET, UK

* Corresponding author.
E-mail address: gaoxing@ivpp.ac.cn (X. Gao).

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