Aspects of Middie-Upper Palaeolithic Transition in Northeast ASIA

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1. Introduction

Despite recent advances in the archaeological research of the Upper Pleistocene, the picture of the Upper Pleistocene world is not clear at all for many places. The Upper Pleistocene is of course the period when anatomically modern humans established themselves throughout the Old World - an issue of interest to archaeologists worldwide (Clark 2000). Unfortunately, we know little about the timing and the process of the appearance of modern humans, as well as associated changes in archaeological record in Northeast Asia. With its rather short history of research, our understanding of its Pleistocene prehistory leaves a lot to be desired.

Here, the term Northeast Asia is used as a sort of loose geographical denominator to indicate a vast stretch of landmass, including the area to the west of Europe and Central Asia, and to the north of the Yangzi River in China. In this big place, even completing a basic map of the time-space distribution of evidence

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will require a tremendous amount of work. Furthermore, recent scandal in Japan, first reported at the supposedly early Middle Pleistocene site of Kanutakamori, then spread to include scores of other sites, essentially nullified the validity of all of the so-called Lower and Middle Palaeolithic evidence reported there. We may wait awhile till the dust settles down to see clearly what data actually exist in the Japanese archipelago for the period prior to 30,000 bp. Thus, for now, any discussion about the regional palaeolithic cannot but be made with meager evidence from China, Korea and southern Siberia.

As data are incomplete for so many areas, a serious discussion about the regional Upper Pleistocene archaeology is rather difficult. Nevertheless, it is important and necessary to review available evidence for future research since such an attempt is precisely what is needed for having a better picture of the regional prehistory. The current discussion aims at this purpose. Although data are lacking and unsatisfactory, it may help to define the problems that need to be explained for an improved understanding.

The discussion will begin with a brief assessment of Upper Pleistocene evidence from Korea, from which one may address the issue of conceptualizing the Middle Palaeolithic in the regional prehistory. This is because, with recent progress in research, Korea provides a better Upper Pleistocene archaeological sequence than any other part of the region. The discussion will then proceed to review data briefly from China and Siberia. For conclusion, several salient aspects in the composition of the Upper Pleistocene assemblages of the region will be considered but, again, readers must be reminded that, given the current state of research, much of the discussion
below will be descriptive, rather than explanatory.

2. Korean Evidence

Lying at the eastern end of the Eurasian continent, the Korean Peninsula exhibits a rugged landform. Her geomorphology reflects a long history of severe erosion, and Pleistocene deposits and palaeolithic remains survived only under exceptional conditions. Thus, it is not surprising that progress in research has been extremely slow. Some realistic assessment of the palaeolithic evidence began to appear as late as the 1980s.

For palaeolithic research in Korea, the Imjin Basin probably is the most important area. Here, due to fortuitous geological conditions, deposits have survived better along the Imjin and Hantan Rivers, near the DMZ. The basin became famous originally with "Acheulian-like" handaxes and cleavers (Yi and Clark 1983). Later, both terminal Pleistocene localities (Choi et al. 2001), as well as very early evidence (Yi 1996, 2000, 2002a) were found. It is also believed that "Acheulian-like" pieces had been kept being made into much younger period than believed - that is, middle to late Upper Pleistocene, a finding which demonstrates that the patterning in the regional palaeolithic cannot be easily described by any kind of simplistic notions.

The basic geology and stratigraphy of the Imjin Basin localities were outlined in the 1980s (Yi 1986, 1988), but a more detailed, finer chrono-stratigraphy of artifact-bearing deposits needs to be completed (see Yi 2000 for the details). The most important factor which insured the survival of deposits is the Middle Pleistocene volcanism. The Imjin Basin is a part of a larger structural valley, and intermittent
tectonic and volcanic activities had been recorded since the Cretaceous. Morphology of the basin had been shaped basically by the prolonged episode of erosion throughout the Tertiary and well into the Quaternary. Then, from the early Middle Pleistocene, possibly as early as about 600,000 to 500,000 bp as suggested by several K-Ar and fission-track dates, with renewed volcanism, the narrow river valley began to be filled with lava flows. Subsequent development of basalt plain brought about the formation of a basin of sedimentation. Thick deposits were formed on top of the basalt within which archaeological remains survived extensively. The K-Ar dating puts the age of the final lava flow to ca. 300,000-200,000 bp to the Middle-Upper Pleistocene boundary (Yi 2002a).

While palaeolithic evidence in the Imjin Basin has been known from within the post-lava flow deposits, at a site named Jangsan-ni, some 10 pieces of shaped tools, including a handaxe-type, were recovered recently from a terrace deposit lying 20+ m above the Middle Pleistocene basalt. As the age of the deposit should predate the beginning of the lava flows in the valley, given the age estimate of the lava flows indicated above, it means that hominid occupied the basin at least by sometime around the Lower-Middle Pleistocene boundary. A testing made in late 2002 produced more evidence. It is expected that localities of similar age will be found in this basin. This discovery, along with reports from China at such sites as Bose and Dingcun localities (Guo, Chen and Huang 1996; Hou Yamei et al 2000; Wang, Tao and Wang 1994; but see Glass 2000 for possible problems with age estimate for Bose samples), strongly suggests that manufacture of "Acheulian-like" pieces had begun probably from the earliest stage of hominid occupation in Northeast Asia.
Yet, in the Imjin Basin, the bulk of archaeological evidence postdate the final lava flow of late Middle Pleistocene age. Rich survival of stone tools on top of the basalt may be explained by taking into consideration the changes made by the formation of lava plain in the narrow valley. With the lava flow, position of the river was elevated to the relatively flat surface of the basalt plain. A lot of change should have followed in the shape and behavior of the river. Details are sketchy, but at least the speed of the flow should have dropped markedly as the river meandered on top of the plain, a condition necessary for increased sedimentation. Excavations revealed occasional cobble-and boulder-size gravels lying on top of the basalt (e.g., National Research Institute of Cultural Properties 1999). They seem to indicate that a substantially strong channel flow was formed later on top of the basalt and stayed there for some time, meaning a chunk of time is missing in the stratigraphic record.

For the age of the post-lava flow deposits, luminescence dating techniques are the only applicable methods so far. A possible Upper Pleistocene age for the deposit was first suggested in the 1980s with three TL dates from widely separated loci (Yi 1986). But among the dates obtained till today, some are stratigraphically reversed and/or appear to be too old, possibly indicating the peculiarities in the depositional environment (Yi 1996, 2002a). In the absence of more reliable chronometric data, age estimate has remained obscure. The problem is exacerbated since the exact stratigraphic provenance of bifaces has not been fully clarified, although they seem to occur frequently in the lower part of the deposit (Yi 2000).

Indeed, age estimation of the deposit has been difficult until grains of late Pleistocene volcanic ash were identified at two Imjin Basin
localities in 1995 (Yi 1996). Known as the Aira-Tanzawa tephra, or "AT" for short, it resulted from a massive eruption of the Aira caldera of Kyushu Island between about 28,000 and 25,000 years ago (Machida and Arai 1992). It has served for many years as the most important marker for Palaeolithic research in Japan, but now provides a reference point for stratigraphic correlation in Korea as well.

Over the past few years, the AT has been identified throughout Korea within a thin layer of yellowish color (Yi, Soda and Arai 1998). No artifacts are directly associated with the ash-bearing layer itself, although they show up in bracketing deposits. Its wide distribution and homogeneity, as well as the inclusion of volcanic ash itself, suggest an aeolian origin, which is supported by SEM and oxygen-isotope analysis of microscopic quartz grains. With AT, the layer should have been formed around the beginning of the Oxygen Isotope Stage (OIS) 2. During its deposition, climatic conditions should have been rather severe (Yi 2000; Yi, Yoo and Seong 2000).

In 2002, identification of another Pleistocene volcanic ash from Kyushu island was reported. At Jeongok-ni (Chongok-ni), grains of Kikai-Tozrahara (K-Tz) tephra, which is datable to ca 95,000 to 75,000 bp (Machida and Arai 1992), were found about 1 m below the AT level. Given the uniform rate of deposition throughout the whole period of sedimentation, the age of the lowermost artifact-bearing horizon was estimated to be of ca 300,000 bp (T. Danhara, personal communication). But, of course, changing composition of the deposit makes it abundantly clear that sedimentation had not occurred at a uniform rate, and the K-Ar dates of the basalt also make such estimate difficult to accept. For a more realistic age estimate of the post-lava flow remains, a comparison between the pedostratigraphy
and the late Pleistocene climatic fluctuation cycles seems to indicate that the lowermost part of the artifact-bearing deposit cannot predate OIS 5 (ca. 130,000 to 75,000 bp) at best, but most probably belong in its last sub-stage, 5a (85,000 to 75,000 bp) or even younger. Such estimate is supported by some luminescence dates obtained from basal silt layer at different places (Yi 1996, 2000).

Since "Acheulian-like" bifaces appear to come from the lower part of the deposit, despite the lack of accurate stratigraphic information, their age could be defined accordingly. In other words, the earliest possible date for these pieces would not be earlier than ca. 130,000 bp, and more likely around 85,000 to 75,000 bp or younger. In other words, the "Acheulian-like" pieces from the Imjin Basin represent a prolonged period of time, but we do not have data for the most part of the Middle Pleistocene - i.e., for the period between the early, pre-lava flow samples and these late, post-lava flow ones.

3. Palaeolithic Stages

Yet, since we do not know their accurate stratigraphic position, it is difficult to delimit the upper temporal boundary for the "Acheulian-like" bifaces. Nevertheless, as microlithic assemblage is known from the uppermost part of the deposit, over the AT-bearing layer, it is reasonable to assume that the transition from the biface to Upper Palaeolithic industry should have occurred some time before the AT fall-out, during the OIS 3 (ca. 60,000 to 28,000 bp).

Indeed, investigations outside of the Imjin Basin seem to indicate that some pieces with "transitional" features appeared during this stage (e.g., Yi, Yoo and Seong 2000; Lee, Choi and Kim 2000). They
are mostly made of same quartz and quartzite, but much smaller in size and not as refined in shape or form as those of bracketing stages. At a glance, it is difficult to recognize any pattern in lithic morphology or technology of manufacture. However, there are a number of generic small tools like scrapers, notches and points made on flakes. Large tools like choppers become smaller over time when compared with the earlier period.

The retouched pieces seem to reflect a high degree of "expediency" in lithic manufacture. But it also seems that in the expediency lies careful and intentional design in tool making. That is, skilled tool-makers appear to have intentionally selected difficult but tough raw materials to exploit durable edges while sacrificing tool form in the process. Similar pieces may be found among some "early", pre-AT fall-out assemblages in Japan, possibly at Hoshino, Mukoyama, Iwazuku 0 level, and Ishinomoto II. For example, one cannot fail to notice the striking similarity between some pieces illustrated in Yi, Yoo and Seong (2000) on the one hand and Archaeological Museum of Iwajuku Culture (1999) and Serizawa (1980) on the other. If this is the case, it may mean that crude pieces were widespread in space and time in the region, possibly recurring over the entire span of the regional palaeolithic. These crude pieces should belong to the earlier part of OIS 3.

Recently, at a site named Yongho-dong in the central part of South Korea, an assemblage of full-blown Upper Palaeolithic nature was reported from below the AT level (C. Han, personal communication). While the report is yet to be published, a significant number of refined small tools appear, along with remarkable differences in the raw materials upon which they are made. Quartz and quartzite now
occur in limited quantities, and are used almost only for heavy-duty tools. Cryptocrystalline rocks replace these coarse-grained materials, and siliceous tuff or mudstone became important and a hint of the introduction of grinding technology is also visible.

Another important Upper Palaeolithic stone tool is a distinctive kind of tanged point, the so-called "Hakuhen Sentoki" in Japanese archaeological jargon, which is usually taken as a marker for "cultural boundary", indicative of an Upper Pleistocene migration and/or diffusion from the Korean Peninsula to Kyūshū Island by some Japanese workers (e.g., Ono, Harunari and Oda 1992, p.23) Its occurrence above the AT has been known for some years, but its existence below the AT suggests that it could have appeared much earlier than previously thought. With such evidence, although the exact timing of the appearance of Upper Palaeolithic is yet to be determined, it may be set around 40,000 bp tentatively.

From these evidence, although premature, we may define three palaeolithic phases during the Upper Pleistocene in Korea around the boundaries of roughly 75,000 and 40,000 years ago. The main components of the earliest phase are large, archaic-looking bifaces and heavy-duty tools. Although some of these might have persisted into OIS 3, a new type of industry occurs during the second phase, which continues into the Upper Palaeolithic, after about 40,000 bp.

If this is the case, how would we conceptualize such patterning in archaeological data? Boundaries suggested above between phases recognized in Korea fit rather too well with the traditional conception in the western Europe. Then, should we better adopt the commonly-held three-stage scheme of palaeolithic to describe these phases? In Korea, the terms Lower, Middle, and Upper Palaeolithic
have been adopted casually. But there is still no consensus definition of these terms (Yi 2002b). After all, what has been just said is the first approximation of the patterning in Korean palaeolithic

However, if the patterning described above has any merit, there is no reason for us not to adopt such a scheme. It may be that it does reflect the real course of changes in the assemblage composition through time. Of course, regardless of the definition of the terms, what is clear is that the Korean Upper Pleistocene assemblages have their own particular characteristics. Whether one adopts three-stage or any other scheme, what is needed is to seek actively patterning in data with an appreciation that any schematic division of the palaeolithic must be based on a sound understanding of the inter- and intra-regional variation in the assemblage composition through time.

4. Boundary Definition and Chinese Data

To define palaeolithic stages may be a tricky business not only for Korea but for Northeast Asia in general. In this vast territory, the Middle Palaeolithic is a rather loose term, with a kind of fuzzy centrality to it, but with rather sharp intra-regional differences as well. In general, the Lower-Middle Palaeolithic boundary is not defined by consensus. This is partly because of differences in the sub-regional research traditions, but mostly because of big spatial gaps for the early periods in many areas.

Defining the Middle-Upper Palaeolithic boundary may be somewhat easier, since the definition of the Upper Palaeolithic corresponds to that used in the West. While there are variations across the region in
the content of assemblages and in the age of the earliest sites, the Upper Palaeolithic usually is equated with blade technologies. So far, there is no compelling evidence that the Upper Palaeolithic appeared in Asia prior to 40,000 years ago. By 30,000 bp, it was well established in many parts of the region. So, even without Korean data, at least in Japan and Siberia, it is usually thought that the Middle-Upper Palaeolithic transition took place sometime between 40 and 30,000 years ago (e.g., Ono, Harunari and Oda 1992; Kimura 1997).

Difficulty in defining the Middle Palaeolithic in Northeast Asia may well be seen in the case of China. An argument was made recently that the concept of "Middle Palaeolithic" is inappropriate in Asia, and that we should use instead a 2-stage scheme of "Early" and "Late" Palaeolithic. To the author, there is little basis for a distinct "Middle Palaeolithic", since he believes that the archaeology changed little up till the end of the early Upper Pleistocene, presumably 80,000 to 70,000 years ago (Gao 1999, Gao and Olsen 1997).

Although one may certainly understand the author's frustration, his argument reminds one of the notion popular in Japan years ago (Ikawa-Smith 1973). To the current author, it seems that the regional palaeolithic did, in fact, change through time, but in different ways from the West. It is also worth remarking that the Chinese Middle Palaeolithic was originally conceptualized as a sort of loose chronological marker designed to indicate archaeological sites found in early Upper Pleistocene litho-stratigraphic units. Later, it came to refer to any assemblage of presumed Upper Pleistocene age which looked old enough to pre-date the Upper Palaeolithic (Yi 1986).

So, as a broad generalization, the Middle Palaeolithic usually
indicates assemblages from early Upper Pleistocene deposits predating the Upper Palaeolithic. The problem with that, however, is that the Upper Pleistocene deposits themselves are not well dated. For example, while the famous Middle Palaeolithic sites at Dingcun and Xujiaoyao are known to be late Middle to early Upper Pleistocene in age (Gao 1999), in fact, they are much more complex (e.g., Wang, Tao and Wang 1994). On the other hand, some Upper Palaeolithic assemblages could be older than 40,000 bp.

Whatever their age, a typical Middle Palaeolithic assemblage in China would include large and small pointed tools and bifaces, disc-like cores and scrapers. Usually,debitage is ignored, or not reported. The Chinese Middle Palaeolithic database has not improved much in the past 15 years. In addition to those sites mentioned above, Zhoukoudian Locality 15, Loufangzi and Liujiaxie may be included in the inventory of Middle Palaeolithic Other sites such as Tashuihe and Shiyu may represent the Middle-Upper Palaeolithic transition. They have disc-like cores, some blades, and radiocarbon dates ranging from 35,000 to 30,000 years ago (Sagawa 1998).

5. Middle Palaeolithic and Mousterian in Siberia

To turn to Siberia, the situation is more influenced by historical factors, especially contact with the West, than it is in the more southerly parts of East Asia. Unlike Japan, the 3-part palaeolithic periodization scheme has been in place for a long time Researchers from St Petersburg in the 1920s noticed the existence of levallois technology among many late palaeolithic assemblages in western Siberia. Thus, terms like "Mousterian" or "Mousteroid" are, and have
been, used interchangeably with "Middle Palaeolithic" from the start (Okladnikov and Kirilov 1980). However, for a long time, no concrete new information was derived from excavations and surveys for the Siberian Middle Palaeolithic Beginning in the 1960s, this began to change (Kimura 1997; Yi 1993).

From the 1960s, Mousterian assemblages have been recorded at many open-air localities in southern Siberia, from the Angara basin (e.g., Monastyrskaya Gora, Gora Gluyanaya, Gora Takarskaya and Gora Balushkina; Medvedev 1975, Volokitin 1988, 1992), in the Tueil and Ailu valleys in the Altai (Krylova and Pavlyuchenko 1962, Kungurov 1987), and in the Sagly region of Tuva (Astakhov 1986). Discovery of the open site of Tyumechun I in the Altai was regarded as important since some "typical" Mousterian pieces were found there in good stratigraphic context (Shur'kov 1990). But more detailed data began to be known from cave and rock-shelter sites in the Altai. There are no credible cave or rock-shelter localities outside of the Altai. As a result, the Altai region has become the natural center for research since the 1980s (e.g., Derevianko 1975), with systematic investigation of cave sites like Denisova, Strashnaya and Okladnikov, and at the Kara-bom open site.

Taken together, these discoveries indicate the existence of a palaeolithic stage roughly comparable to the European Middle Palaeolithic. From the 1970s on, the term "Mousterian" came to acquire all the traditional French connotations for the description of the Siberian Middle Palaeolithic. However, up to the present, there is no evidence of levallois technique east of Lake Baikal, and it shows up only in the area north and west of the Gobi Desert in Mongolia (Yi 1993).
Research in Siberia is difficult in large part because of the poor condition of preservation. This is not a problem confined to the Middle Palaeolithic. In fact, in Siberia it is hard to document human presence prior to the Upper Palaeolithic (but see Waters, Foreman and Pierson 1997 for possible Middle Pleistocene hominid presence). The most critical problem for palaeolithic research generally lies in the repeated destruction of early deposits by geological activities associated with subsequent glaciations (cf. Goebel 1999). Consequently, with one or two possible exceptions, only the evidence pertaining to the very last part of Pleistocene is preserved for open-air sites.

There is a belief that the overall characteristics of the Siberian Mousterian are not significantly different from those of the "classic" Mousterian of western Europe, although absolute dates from Siberia tend to be much younger. The oldest estimates for Mousterian assemblages are TL dates of about 130,000 to 90,000 from Ust'Karakol I and ESR dates of about 72,000 to 62,000 from two levels at Kara-bom. However, there is a large discrepancy between them and C-14 dates whenever comparison is possible, as seen in the case of the layer 21 at Denisova Cave (155,000 by TL versus <40,000 by C-14; Derevyanko et al. 1998). Radiocarbon dates on most of the Mousterian levels in the Altai range from about 44,000 to 32,000 years ago (see Derevyanko et al. 1998, pp.167-168, for a complete list of absolute dates for these and other Altai sites up till 1997, cf. Goebel, Derevianko and Petrin 1993). Because of these chronological problems, there is no consensus on the boundary between the Lower and the Middle Palaeolithic. It might be the case that the whole of the Mousterian actually falls in OIS 3, from 60,000 to 28,000 years ago, and the age of the earliest Mousterian layers is yet to be clarified.
Problems of chronology aside, while the Siberian Mousterian had long been regarded as a homogeneous industry, reports from the Altai are beginning to suggest otherwise. At least two variants of "Typical" and "Levallois" Mousterian are recognized there, especially at Denisova Cave, the former subdivided into a number of facies (Derevyanko et al. 1998). Interestingly, one cannot fail to notice that, at most of the sites, only a single facies is defined throughout the long stratigraphic sequences. The existence of multiple facies might not be surprising in itself, but a careful reading of the source materials suggests that the database is probably too small as yet to reach secure conclusions. Anyhow, with such a pattern of assemblage variation, the Altai Mousterian is considered to have affinities with more westerly locales. Many seem to think that such a notion is also supported by paleoanthropological data - scarce hominid remains from Denisova and Okladnikov cave are sometimes compared to European neandertals (Turner 1990).

Regarding the nature of the Middle-Upper Palaeolithic transition, there has been a tendency among the researchers of Siberian palaeolithic to emphasize the persistence of Mousterian elements in typologically Upper Palaeolithic assemblages (e.g., Okladnikov 1974, Vasil'evskii 1983). It is further believed that the transition to the Upper Palaeolithic was not accompanied by any abrupt changes in lithic typology or technology. The only changes acknowledged to have occurred are gradual changes in the size and shape of the tools in what is usually taken to be an in situ transition, both biologically and culturally. In addition to the persistence of typically Middle Palaeolithic pieces like levallois points into the early Upper Palaeolithic (EUP), some Mousterian layers immediately below the
Upper Palaeolithic produced the so-called "foliated bifaces" found in EUP contexts, as in Layer 4 at Ust’Karakol. C-14 dates from these EUP layers range from about 35,000 to 31,000 years ago, with the implication that the transition probably occurred during the Kargin interstadiad, not before 40,000, nor after 30,000 bp. Similarly, the replacement of the EUP by "typical" Upper Palaeolithic blade assemblages would have occurred by 28,000 years ago, at the beginning of the late Sartan Glacial (Derevyanko et al. 1998; cf. Goebel 1999). So far, no evidence from other parts of Siberia seems to contradict the pattern seen in the Altai.

6. Summary

To summarize, in Northeast Asia, intra-regional variation in the composition of palaeolithic assemblage is observable at least from the early Upper Pleistocene. The Middle to Upper Palaeolithic transition is usually regarded as a continuous process of change at sub-regional level. However, details are not clear at all and it is difficult to conclude that Upper Palaeolithic in Northeast Asia represents an indigenous development from the earlier period.

"Acheulian-like" industry from Korea continued to be made during the Upper Pleistocene, probably even during the OIS 5a (ca. 85 to 75 kya) and after. During the OIS 3 (ca. 60 to 28 kya), change in the assemblage composition is first hinted by increase of smaller, "expedient" pieces. Upper Palaeolithic in Korea could have been shaped sometime during this stage. While the Middle Palaeolithic remains obscure in China, the Siberian Middle Palaeolithic is usually characterized as Mousterian due to the findings from caves and
rock-shelters in the Altai. The distribution of Mousterian traits seems to be limited to the west of a N/S line running through Lake Baikal and Mongolia's Gobi Desert. Moreover, this contrast persists throughout the Upper Palaeolithic. Absolute dates of Mousterian layers center around 40 kya. EUP assemblages are also with Mousterian elements, associated with C-14 dates ranging between 35,000 to 31,000 bp. By 28,000 to 27,000 bp, "typical" blade industry was well established. With such observation, and keeping in mind that information is far from adequate over this vast area, several points may be made.

First, the regional Palaeolithic shows an interesting pattern of variation in the early Upper Pleistocene, and possibly even earlier. While there are heavy, archaic-looking bifaces in Korea, however, Middle Palaeolithic assemblages in Siberia have characteristics unknown in other areas, namely, Mousterian elements. For north China, although it is hard to generalize because of ambiguities in stratigraphy and chronology, there appears to be some shared characteristics between Korean and Chinese early Upper Pleistocene data.

Second, for any given region, continuity in assemblage composition might be the rule, rather than the exception. That is, some Upper Palaeolithic characteristics are foreshadowed among earlier assemblages, suggesting an indigenous origin for the Upper Palaeolithic. Be that as it may, it is not clear how useful these traits actually are for assessing continuity since some very likely were shared more widely in the region than commonly thought. In fact, it is probably true that "origins hypotheses" have only limited utility for understanding the nature of adaptation in the Asian Palaeolithic. Nevertheless, it is also
fair to say that no evidence of abrupt and discontinuous change is found anywhere in the region throughout the Upper Pleistocene.

A third point is that a higher degree of formality in shape and technology of Middle Palaeolithic stone tools is evident as we move to the north. That is, stone implements from Korea and China look cruder, less refined and more "casual" or "expedient" than those from Siberia. Such formal difference in lithic technology probably reflects differences in adaptation, survival strategies, and raw material differences more than any hypothetical "cultural" component.

Finally, with the beginning of the Upper Palaeolithic, little difference can be discerned in the degree of refinement in lithic morphology throughout the region. With a decrease in formal variation among the various regions, the transition from the Middle to the Upper Palaeolithic could be accurately described as a process of "homogenization". Of course, it does not mean that the same types of lithics are found everywhere — on the contrary, tool types diversified in time at regional and sub-regional scales. It simply indicates that, although there are differences in form and in manufacturing techniques, stone tools everywhere exhibit about the same kinds of technological complexity and sophistication as those seen in the West. Just how these pattern changes over the Middle-Upper Palaeolithic transition might be related to the hominids involved is a moot point, given the general scarcity of hominid fossils from the region.

What we think of as palaeolithic adaptations in Northeast Asia almost certainly constituted a range of options very broadly distributed in space and time, held in common by all contemporary Asian hominids, and invoked differentially according to context.
challenge of future work is to determine what general contextual factors might have constrained choice amongst these options. Such factors probably include range and size of and distance to raw materials, distribution of food resources in the landscape, forager mobility strategies, anticipated tasks, group size and composition, structural pose of the occupants of a site in an annual round, and, more generally, duration of site occupation.
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While the patterning in the assemblage composition during the Upper Pleistocene is only vaguely understood in Northeast Asia, Korean evidence suggests the possibility of change in the stone tool industry around ca. 75,000 and 40,000 bp, which might serve as temporal boundaries for an adoption of the three-stage scheme of the regional palaeolithic. While the 'Middle Palaeolithic' may be characterized with the appearance of Mousterian-like elements in more northerly locales, their distribution is limited. To the south, the period might be characterized with heavier, less formalized, and more or less 'expedient' pieces made on 'resilient' raw materials. Nevertheless, Upper Pleistocene assemblages may show continuity in their composition through time. Differences in the degree of morphological refinement of stone tools decrease markedly with the beginning of the Upper Palaeolithic, during which lithic manufacture was done with the same kinds of technological complexity and sophistication as one may observe at other parts of the world.