THE MOVIE LINE: FACTOR FICTION?

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ABSTRACT
The debate about whether or not the Movius Line is a realistic representation of differences in stone tool technology between Western and Eastern Asia has been revived because of recent discoveries of bifaces in China, Korea and Japan. This paper reviews some of the pertinent artefactual and chronological evidence from Eastern Asia.

The Movius Line (Coon 1966:48) is thought to demarcate a geographic and cultural boundary between Acheulean (handaxe and cleaver) and non-Acheulean (chopper/chopping-tool) technologies (Movius 1944, 1949). It is important to remember that this hypothesis was developed at a time when far less was known of lithic assemblage variability in Eastern Asia (East and Southeast Asia) than is known now. Based on contemporary data, flake tools appear to be the characteristic tools rather than choppers or chopping-tools, although several authors have noted that Eastern Asian Palaeolithic technology continues to be classified as a chopper chopping-tool technology (e.g., Mulvaney 1970; Ikawa-Smith 1978; Yi and Clark 1983; Zhang 1985; Keates 1994, 1995, 1997). The belief that an absence of Acheulean bifaces in Eastern Asia denotes behavioural inferiority compared to regions where these do occur has persisted in the literature since Movius' (1944, 1949) examination of local artefact assemblages and collections. Lithic technology was interpreted as increasing in complexity west of the Movius line, while east of this hypothetical line a record of conservative, un specialised and 'non-progressive' core artefacts was to be found (Movius 1944:101, 1949:408, 411; see also Teilhard 1941:60, 86; Sjveking 1960; Coon 1962:48; Heekeuren 1972:76; contra, e.g., Bryan 1983; Pope 1988; Pope and Keates 1994).

This assumes that only standardised technologies producing symmetrical (and diagnostic) artefacts such as Acheulean bifaces (handaxes) are representative of advanced hominid behaviour. There is some recognition of this assumption in China and abroad (e.g., Huang 1987; Huang and Qi 1987; Renfrew and Bahn 1991:384; Hou et al. 2000), but bifaces are very rare artefacts in the Chinese Palaeolithic (Pope 1982:179; Keates 1994; and see Zhang 1985, 1989; An 1990) and no Acheulean assemblages have been discovered (Zhang 1985, 1989; Pope 1988; Pope and Keates 1994; and see Pei 1965; Aigner 1981). Yi and Clark (1983:190) proposed that the presence of handaxes in northeast Asia "allows us to reject conclusively the notion of a relatively homogeneous chopper-chopping-tool area". While this statement is to some extent true, especially in view of the greater exploitation of flake rather than core tools in the region, it is important to consider the number of bifaces compared to other artefacts in the individual assemblages.

It is also pertinent to carefully evaluate the depositional context and chronology of bifaces in order to study claims of early Pleistocene age and to monitor any temporal changes in their frequency. Huang (1987) claims that the majority of Chinese bifaces are Middle Pleistocene artefacts, but most specimens are surface discoveries (Pope and Keates 1994). Biface localities are most concentrated in central China (An 1990), for example in the Fenhe (Fen river) Valley, and less so in the south of North China and in the southern region of South China (and see Huang 1987).

A further point needs to be raised. As a result of recent radiometric dating of early hominid specimens from Java, it has been suggested that the Acheulean did not become established in Eastern Asia because hominids migrated from Africa to Eastern Asia prior to the development of the Acheulean at 1.4 mya (Swisher et al. 1994). However, the earliest known bifaces, from the Nape Formation in East Africa, are dated to about 1.65 mya (million years; Roche 1995; Roche and Kibunjia 1994). Leaving aside the issue of the controversial dating by Swisher et al. (1994; see Keates 1998 for a review), their opinion ignores the palaeo-environmental circumstances which pertained in Eastern
Asia. These need to be considered in interpretations of hominin behaviour in this (or any other) region (see, e.g., Ikawa-Smith 1978; Pope 1988; Keates 1998). It also presumes that early *Homo erectus* migrated only once from Africa to the East and that biface technology cannot develop independently.

**WHAT IS A BIFACE? WHAT IS A HANDAXE?**

In discussions about bifacial artefacts it is necessary to include a review of the literature because the terms biface and handaxe are often used interchangeably to refer to the same kind of artefact type. Leakey (1971) uses the term biface at Olduvai in preference to handaxe because it can describe a wider range of specimens. Other authors refer to the Olduvai bifaces as both handaxes and cleavers (e.g., Roe 1994:149), while Inizan et al. (1992) use the term Acheulean biface to refer to artefacts of handaxe morphology. It has also been pointed out that the bifaces in Developed Oldowan B assemblages (Middle and Upper Bed II) "... differ from the Acheulean bifaces by being more variable in morphology within each site..." (Jones 1994:261).

Chinese workers also vary in their terminology for bifaces. Hou et al. (2000:1622) refer to "Acheulean bifacial handaxes" and, in the same paper, also to "Acheulean-like tools" found at the Bose localities in southern China. This terminology of Acheulean artefacts is inconsistent and confusing, and, moreover, handaxes are by definition bifacial. An artefact from Liangshan (Shaanxi province) is described as a handaxe by Huang and Qi (1987) in the Chinese text and as a biface in the English abstract, while An (1990) identifies bifaces in China as primary (yuàn, also meaning original/ primitive) handaxes in the Chinese text and as proto-handaxes in the English abstract. An (1990) defines proto-handaxes as bifaces, unifaces and also those specimens with a triangular cross-section, also called heavy trihedral points by other authors (e.g., Qiu 1985; Wang et al. 1994). Li et al. (1998) refer to two bifaces from Yunxian (Hubei province) as bifacially pointed cobbles tools, one of which they compare to a partial handaxe. According to Li (1997), if a rigorous standard is applied, one and not several specimens can be classified as a handaxe at Dingcun (Shanxi province). In island southeast Asia two kinds of bifaces have been distinguished by Keates and Bartstra (2001): pointed partial bifaces and pointed bifaces. Most of the former derive from southwest Sulawesi and one specimen is from southwest Halmahera, while the latter are mostly from Java. The pointed partial bifaces resemble less extensively flaked bifaces from several localities in China and Africa, while the more extensively modified pointed bifaces show some similarities to Acheulean bifaces.

The terminology applied to bifaces reflects variations in biface morphology and variations in lithic classification of different authors. From this short review it is apparent that further comparisons of bifaces from the various Eastern Asian localities and from Africa and Europe are necessary if we are to achieve a standardised definition of bifaces and handaxes, and thus promote clearer communication between researchers. For now, I would propose to refer to bifaces which conform to the classic symmetrical Acheulean morphology as Acheulean bifaces, while those which do not should be called bifaces.

**EAST ASIA**

**China**

Bifaces in China are either single occurrences or, in most cases, occur in low frequencies. Examples (Figure 1) include a bifacially flaked pointed specimen from Liangshan, in the upper reaches of the Han river in Shaanxi province (Huang 1989). This bifacially flaked pointed specimen can also be described as a pic (see Huang 1989, Figure 8). Another biface from the Liangshan area is compared to bifaces from Olduvai Gorge in East Africa (Huang and Qi 1987). Liangshan is thought to date to the Middle Pleistocene (Huang 1989), but no radiometric dates are available. Two bifaces were recovered from the Qianxian and Laochihe localities in Shaanxi province (Figure 1), the former found on the loess surface and the latter perhaps derived from a Middle Pleistocene deposit (Huang 1987, 1989: Figures 5 and 2). These specimens show more extensive flaking than some others referred to as bifaces, and are examples of the wide range of morphological variation of bifaces in Eastern Asia. Of the five proto-handaxes from Hunan province illustrated by An (1990), one represents a biface, while the other specimens resemble picks in their less extensive modification.

![Figure 1: Some localities in East Asia with bifaces.](image-url)
and general morphology. Two bifaces from the Middle Pleistocene Yunxian hominid fossil locality (Figure 1) are surface discoveries, one of which with its pointed and partially flaked morphology could be called a pick, while the second specimen can be classified as a biface (see Figures 18, 19 and Plate 1, 2a, b in Li et al. 1998). There are also a number of localities in central China where bifaces have been found more recently, and which may date to the Late Pleistocene (Wei Qi pers. comm. 1999; Wang Youping pers. comm. 1999).

The earliest bifaces from China, one of which could be compared to a handaxe, derive from Donggutuo (locality T1), a late Early Pleistocene (at least 1 mya) open-air locality in the Nihewan Basin, northern China (Keates 1995, 2000a; Pope and Keates 1994:Figure 1). The Donggutuo specimens are two pointed bifaces of small dimensions (49 x 42 x 19 mm and 63 x 40 x 33 mm) and in chert (Keates 1995, 2000a:Figure 62:5, 6). A large pointed biface in quartzite (170 x 90 x 62 mm) from Piagliang, a locality 2 km east of the hominid locality of Lantian, Shaanxi province, central China (Tai 1966; see, e.g., Zhang 1985; Figure 9.3 A) (Figure 1) is thought to derive from the same red clay layer as the Gongwangling Homo erectus and other artefacts (Tai 1966). This would date the specimen to c.1 mya (Wei 1995), but it appears not to have been excavated from the deposit (see Tai 1966) and it seems uncertain if it was a surface find or if it was found in direct association with the red clay (see Zhang 1985, 1989; Keates 1995), although Huang and Hou (1997) argue that it was found in situ. The Piagliang biface has also been classified as a protobiface or pointed chopper (Zhang 1985, 1989), as a „partial biface“ (Freeman 1977:100), and as “…a (quartzite biface resembling an early Acheulian handaxe from Africa)…” (Clark and Schick 1988:443). Huang and Hou (1997:4) refer to the specimen as “A handaxe … showing Acheulian affinity, [which] may be the oldest handaxe reported from East Asia …”.

Bifaces have also been recovered from the river terrace localities of Bose (also: Baise) in western Guangxi Zhuang Autonomous Region, southern China (Figure 1). Archaeological investigations of the Youjiang river terraces since 1973 (Li and You 1975) have found flakes, choppers, chopping-tools, bifaces and other lithic artefacts (Huang et al. 1988, 1990; Huang Weiwen pers. comm. 1989). Artefacts were discovered in terrace III (Huang 1989). The majority of the Bose artefacts collected from about 100 localities (n > 6,000) are surface finds (Huang and Hou 1997). The artefact bearing portion is the upper part of Terrace IV (there are a total of seven river terraces) which has also produced tectites (Yuan et al. 1999). This upper part is formed of laterised soil and clay and shows evidence of widespread faulting producing several platforms (Yuan et al. 1999; Hou et al. 2000). The upper part of terrace IV is 7-10 m thick and artefacts occur with tectites within 0.2-1 m soil thickness (Hou et al. 2000). The lower part is basal gravel (Yuan et al. 1999). At the Lakui locality artefacts were found in reworked sediments and considered to be contemporary, being found in situ in the gravel and also distributed over four of the faulted platforms (Yuan et al. 1999). The Bose artefacts were manufactured in quartzite, quartz, sandstone and other materials (Huang and Hou 1997).

In excess of 100 bifaces had been found up to 1989 in the Bose area and all bifaces were surface finds (Huang Weiwien pers. comm. 1989). Some years later Huang and Hou (1997) refer to “More than 100 handaxes …” from Bose, i.e., the frequency established in 1989. After enquiries as to how many of these artefacts could be classified as handaxes, it was found that there were less than about four, with other bifaces perhaps best described as picks, choppers and chopping-tools (pers. observ.; see, for example, Huang and You 1997:Figure 7). One of the bifaces recovered from Bose resembles an Acheulean handaxe (Keates 1996) and was found on the surface (Huang Weiwien pers. comm; Keates 1996). Huang Weiwien (pers. comm. 1999) has stated that “The handaxes from [the] Bose sites are similar with Western Acheulean [handaxes] technologically and typologically.” There are few illustrations in the literature of the Bose handaxes, and those which have been published are repeatedly shown (cf., Huang 1992:Figure 273:3; Huang and Wang 1995:Figure 9; Huang and Hou 1997:Figure 7). It is conceivable, based on this author’s research of Chinese Pleistocene archaeology, that only the “best”, that is the most convincing, but not necessarily representative, specimens have been published.

Investigations in the years from 1988 to 1996 at three localities in the Bose area by Hou et al. (2000:1625) recovered 991 artefacts from “Gaoligong (n = 770 in situ artifacts), Bogu (n = 26), and Xiaomei (n = 36),” and from other localities (24 localities have been recorded in the Bose area), of which most are from excavations (84%). The majority (91%) “of the bifacial LCT [“evate large cutting tools”] sample (n = 35 specimens) was from the western third of the Bose basin” … “sites 1 through 14)” (Hou et al. 2000:1622, 1623, 1625). Unifacial LCTs total 64 specimens, bifacial LCTs total 35 and non-LCTs total 74 specimens; no data have been published on the overall composition of the assemblages (Hou et al. 2000). Bose biface technology is considered “Acheulean-like” and is linked to the selection of large-sized clasts of raw material which Hou et al. (2000:1622) suggest became available as the result of the tectite fall and subsequent environmental changes, including forest burning. This hypothetical scenario is, however, unconvincing. For example, it seems unrealistic to assume that
raw material of dimensions large enough to make the bifaces was not available and visible in this river area "previous" (see below) to hypothetical dramatic habitat changes.

The age of Boze was initially based on linking the artefact-bearing laterised soil with an earlier Pleistocene antiquity (e.g., Huang et al. 1988). More recently, the tektites found in association with the Boze artefacts have been dated to 0.732±0.039 mya (Guo et al. 1996) and to 0.803±0.03 mya (Hou et al. 2000). Any evidence of associating tektites with archaeological materials in stream deposits should, however, be carefully weighed. In island Southeast Asia, redeposition of tektites has repeatedly been demonstrated, including tektites from the Sangiran hominid locality in central Java. The isotopic determinations date the tektites and not the deposits from which they were recovered or the archaeological materials (see Harrison 1975, 1978; Bartrum 1983 and pers. comm. 2000; Pope 1988 and pers. comm. 2000; Keates 2000b). The Boze tektites shown to this author by Huang Weiven, the principal investigator of the Boze localities, show signs of what appears to be fluvial abrasion, in contrast to the artefacts which are in very good condition (Keates 2000b). Moreover, the Boze tektites are small and light (pers. observ.), which would make movement of these specimens within and between deposits more likely compared to the artefacts. Moreover, small lithic debitage or refits have not been reported.

Hou et al. (2000:1622) believe that "...the targeted manufacture of LCTs signifies an important advance in hominin behavior (enhanced planning and technical competence) for which evidence has been lacking in the early stone technology of East Asia." Firstly, LCTs seem a rather loaded term for what in fact are artefacts with less elaborate modification compared to later European handaxes. Secondly, by accepting that only stone tool technology which produces Achulean artefacts is indicative of early hominid behavioural complexity, Hou et al. (2000) adopt an Afro-centric position, and disregard the evidence of a continuous and generally informal Pleistocene technology in China (e.g., Pope and Keates 1994). This, moreover, ignores the palaeoenvironmental conditions in which Eastern Asian hominids lived (Keates 1998). Whatever their age may be, what the bifaces from Boze demonstrate is simply that where large classes of raw material were available, hominids in some places made large tools, including bifaces. This is also indicated at Dingcun (see below). However, although there were constraints on clast size at Donggunguo (Keates 1995, 2000a), hominids manufactured bifaces.

Bifaces were recovered during investigations of the river terrace locality complex of Dingcun in the Fenhe Valley, Shanxi province, beginning in the 1950s (Pei et al. 1958) (Figure 1) The age of the Dingcun localities is late Middle Pleistocene based on uranium-series dates of Dingcun hominid locality 100 (0.160-0.210 mya; Chen et al. 1984; Chen and Yuen 1988; Wang 1989) and palaeomagnetic dating of locality 97 and locality 100 (c. 0.120 mya; Liu et al. 1995; Keates 2001a). Some of the localities are earlier (e.g., Pei and Chia 1958; Jia 1980:85; Keates 2001). The radiocarbon (>0.041 mya) and amino-acid racemization evaluations (0.070-0.090 mya; Wang 1989; Zhou 1989) of locality 100 may be interpreted as minimum ages.

Liu's (1988) analysis of 1932 artefacts from Dingcun describes 10.7% as handaxes and trihedral points (total tool frequency is 149). The handaxes may be the "handaxe-like implements" of Qiu (1985:193). Renewed investigations of the Dingcun area have recovered a small number of bifaces, and Wang et al. (1994); and see Qiu 1985) refer to these as big points and heavy trihedral points. Some of these are similar to Achulean bifaces (Wang et al. 1994:Figures 10.1, 3, 30.2, 32.5; and see Qiu 1985: Figure 10.6), but are perhaps best compared to bifaces from Olduvai and Stellenbosch (eastern and southern Africa; pers. observ.). This can also be said with reference to one of the most frequently illustrated bifaces from Dingcun, which, incidentally, is a surface find (see, for example, Qiu 1985:Figure 10.7). The eleven large points from Dingcun include five large trihedral points and six pick-like specimens (Aigner 1981:211; Qiu 1985). The availability of fine grains in the area (sourced from 7 km distance) of relatively large clast size, which was used to manufacture most of the Dingcun artefacts (e.g., Qiu 1985; Liu 1988) may have been an important contributing factor in producing the bifaces.

Korea

Bifaces have been recovered from Chongok-Ri (Chongok-i) in the northern part of Korea (e.g., Chung 1984; Choi 1987; Figure 1). Chung (1984:895) refers to a "Mindel-Riss Interglacial or Riss Interstadial" age estimates of this river terrace locality, but the Chongok-Ri artefacts are now thought to have been redeposited and are younger in age (Pope and Keates 1994). Most of the "Achulean type stone artefacts" (n = 686) were found on the surface of five localities in clay (Chung 1984:895). Of these specimens, 37 are referred to as bifaces and also as "Achulean type handaxes", and eight as cleavers (Chung 1984:897). Other artefacts include polyhedral stones, choppers and chopping-tools, scrapers, flakes and "other shapes" (Chung 1984:901). Excavated artefacts (n = 1851) include five handaxes, five cleavers, seven picks as well as flakes, spalls, points and other tools (Chung 1984). The artefacts were manufactured in quartz and quartzite (Chung 1984). Of the 14 bifaces illustrated in Chung (1984), three can be classified as bifaces (see Chung 1984:Figures 2:1, 4:1, 12:2), while others resemble pick-like specimens. This indicates an independent assessment.
of those bifaces which have not been illustrated may not identify significantly more specimens which could be described as bifaces (and see below: Bae 1999). Neison (1983) writes, based on data by Bae (1980), that only four specimens out of a total of 1,418 lithic artefacts from Chongok-Ri are handaxes and that artefacts within the deposit are widely dispersed. Sohn (1983:196) makes the observation that most of the 50 bifaces referred to by Yi and Clark (1983) are surface finds, and that most of these bifaces are “flake cores” with a ratio of 5 bifaces to 85 choppers and chopping-tools.

At Kumpari in central Korea (Figure 1), unifacial (sic) and bifacial handaxes have been recorded in frequencies of two and six specimens, respectively; a total of 1,230 artefacts were found at locality A and 1,177 artefacts at locality B (Bae 1999:231, 258). The artefacts also include cores, choppers, picks, cleavers, flake and other tools such as scrapers (Bae 1999:231). They derive from fluvial deposits and may date to the early part of the Late Pleistocene (Bae 1999:254, 260). Quartzite and vein quartz were the major raw materials selected for artefact manufacture and the bifaces were made in fine grain quartzite (Bae 1999:258, 259). Two of the specimens are described as “handaxe, uniface” and as “handaxe, biface”, but should be called picks (see figures in Bae 1999:179). More extensively modified specimens are described as “handaxe, biface” (n = 3) and one “handaxe, pointed” (Bae 1999:214). Two of these are bifaces, while one is a triangular point and the other a bifacially flaked and pointed artefact resembling a trihedral point (see figures in Bae 1999:214). In their morphology and low frequency, Bae (1999:259, 261) compares the Kumpari handaxes to those from Chongok-Ri. The bifaces from Chongok-Ri (Pope and Keates 1994) and Kumpari resemble bifaces from Lantian and Yuxian and some are similar to pick-like artefacts from Dingcun (cf. Tai i966; Aigner 1981; Li 1991; Li et al. 1991). Gai (1983) compares the Chongok-Ri artefacts to those from Kehe (of late Middle or early Late Pleistocene age) and Dingcun.

Japan

The bifaces believed to be of Middle Pleistocene age and presumed to represent evidence of the earliest hominin occupation of the island chain were discovered at, among other localities, Kamitakamori, Miyagi prefecture, in northern Japan, where research has been conducted since 1992 (Kajiwara et al. 1999; Figure 1). Palaeomagnetic stratigraphy and TL and ESR dates of tephra layers dated the Kamitakamori bifaces to approximately 430,000-610,000 years (Kajiwara et al. 1999). However, because one of the investigators at Kamitakamori and other early Japanese sites, Shinichi Fujimura (former deputy director of the Tohoku Paleolithic Institute), produced fake caches and planted a number or all of the artefacts, the government has launched an official investigation. Since this investigation was launched, Fujimura has admitted to planting artefacts at 33 sites in Japan (Yomiuri Shimbun 2001). A re-excavation of the Kamitakamori locality was scheduled for November 2001 (Tsutomu Soda pers. comm. 2001). Based on my recent research visit to Japan, there appears to be no evidence for hominid activity on the islands that pre-dates c.100,000 years ago.

CONCLUDING REMARKS

The number of localities in East Asia where bifaces have been recorded are still few and biface frequencies are low in contrast to flake tool assemblages. The occurrence of bifaces does not invalidate the Movius Line, but indicates a more complex pattern of regional hominin behaviour than previously thought. What needs to be addressed is why standardised tools (including bifaces) were manufactured and what they were used for. One factor which may be involved is the quality of the raw materials available for tool manufacture (e.g., Zhang 1990). Both the size and tractability of raw materials used for tool manufacture at a number of northern Chinese localities dating to the late Early Pleistocene (Donggutuo and Xiaochangliang) and early Late Pleistocene (Xujiaoyao) indicate that the selection of fine-grained materials such as chert appears to be significant in explaining the manufacture of the small frequencies of standardised tools (Keates 1995; Pope and Keates 1994). Yet, of at least 14,000 stone artefacts from Donggutuo and Xiaochangliang, only two are bifaces. It has been suggested that standardised lithic technology in Eastern Asia was a behavioural response to open environments (Pope 1988), but more substantial research needs to be conducted for a comprehensive reconstruction of palaeoenvironmental variation in this region (Keates in prep.). A factor relevant in trying to explain the generally unstandardised stone tool assemblages in Eastern Asia is the hypothesis of predominantly non-lithic tool technology, especially in the more forested regions of Southeast Asia (e.g., Gorman 1970; Heekeren 1972:77, 82; White 1977; Ikawa-Smith 1978; Pope 1988; and see Forde 1934:17).

It has been suggested with reference to early Homo sapiens from China and possible bifaces at Dingcun that biface technique could have diffused from Europe to northern Asia (Foley and Lahr 1997). This ignores the possibility that the technique of producing bifaces (or any other technique) could have developed from indigenous technology in Eastern Asia. This is not to deny the possibility that during the later Pleistocene hominids migrated from Europe to China (and vice versa) based on hominid morphology (especially the Jinniushan Homo sapiens: Pope 1989, 1991). One final comment. Small
frequencies of bifaces from Indonesia (see above) appear to be Late Pleistocene in age (Keates and Bartstra 2001), and of later age in Australia (Rainey 1991).

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