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EMERGENCE AND MOBILITY OF MICROBLADE INDUSTRIES IN THE JAPANESE ISLANDS

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INTRODUCTION

Microblade industries spread over the Japanese Islands during the terminal Pleistocene, and these industries share technological characteristics with Siberia, Northeast Asia, and Northwest America (Kato 1976, 1989; West 1967). Up to the present, about 1800 sites have been discovered (Tsutsumi 2003a, 2003b), and a chronological framework of microblade industries in the Japanese Palaeolithic has been established (Ono 2004).

Japanese archaeologists have defined a number of different types of microblade cores with particular attention to their morphology and manufacturing processes (Yoshizaki 1961; Tsurumaru 1979; Tachibana 1979). Typological-chronological studies have been made repeatedly on the basis of these types of microblade cores; however, researchers have not yet been able to establish a definite chronology for all of the Japanese Islands. The microblade industries in Japan show wide differences depending on the geographical region. On the other hand, the sites dated by the radiocarbon method have increased recently, and it is possible to estimate the approximate duration of microblade industries.

A large number of microblade sites have been discovered on the islands of Hokkaido and Kyushu (Figure 5.1). The microblade industries in both of these regions show a great degree of assemblage variation. It is difficult to confirm a definitive chronology of these complex assemblages because there are few sites where we can recognize a diachronic relationship between assemblages and the multi-layered stratigraphy. The microblade industries of Honshu Island show various tendencies between different geographical areas. Microblade assemblages with wedge-shaped microblade cores made using the Yubetsu technique (Yoshizaki 1961) have been found in northeastern Honshu. In the central part of Honshu, there are many sites with subconical microblade cores. In southwestern Honshu, microblade assemblages with subconical microblade cores and boat-shaped microblade cores have been found, though analyses of these assemblages are limited because of the insufficient number of excavations conducted there.

With regard to wedge-shaped microblade cores in northeastern Honshu, the chronological framework is more secure because of tephrochronology and radiocarbon dates. Additionally, substantive information on lithic raw materials has been presented, and refitted lithic artifacts provide an exact reconstruction of reduction sequences of the given assemblages. Analyses of lithic raw material acquisition, transportation, and use, allow us to evaluate hominid mobility in prehistory. This paper, therefore, focuses on the mobility of microblade industries with particular reference to northern Honshu. In order to clarify the characteristics of microblade industries, a comparative analysis is attempted between microblade industries and the succeeding bifacial point industries.

RADIOCARBON DATES

Radiocarbon dates of microblade industries in the Japanese Islands range from c. 20,790 BP to c. 8300 BP (Kudo 2003). The oldest dates are from the Kashiwadai 1 site on Hokkaido Island, where charcoal samples have been dated to between 20,790 ± 160 BP (Beta–126175) and 18,830 ± 150 BP (Beta–126177) (Fukui and Koshida 1999), and charcoal samples from the Pirika 1 site, also on Hokkaido, date to between 20,100 ± 335 BP (N–4937) and 19,800 ± 380 BP (KSU–687) (Naganuma 1985). The youngest date is from the Shinmichi 4 site on Hokkaido at 8320 ± 280 BP (KSU–1430) (Onuma *et al.* 1988).

The radiocarbon dates in other parts of Japan are a few thousand years younger than those from Hokkaido (Ono *et al.* 2002). The Araya site on Honshu, where pits and "pit-dwelling-like features" were identified, is dated to between 14,250 ± 105 BP (GrA–5713) and 13,690 ± 80 BP (GrA–5715) (Kitagawa 2003). At the Yasumiba site in central Honshu, some charcoal samples recovered from a hearth associated with a lithic concentration, are dated to 14,300 ± 700 BP (Gak–604) (Sugihara and Ono 1965). At the Yoshioka B site, Honshu, dates for the upper part of layer L1H and for layer L1H are between 16,860 ± 160 BP (Tka–11599) and 12,960 ± 120 BP (NUTA–3035) (Kato *et al.* 1999). Additionally, there are radiocarbon dates for the central Honshu sites of Miyanomae with an age of 14,550 ± 160 BP (NUTA–3637) (Kawano *et al.* 1998) and Tsukimino-Kamino dated to 13,570 ± 410 BP (Gak–10545) (Aida 1986). On Kyushu Island, the Chaen

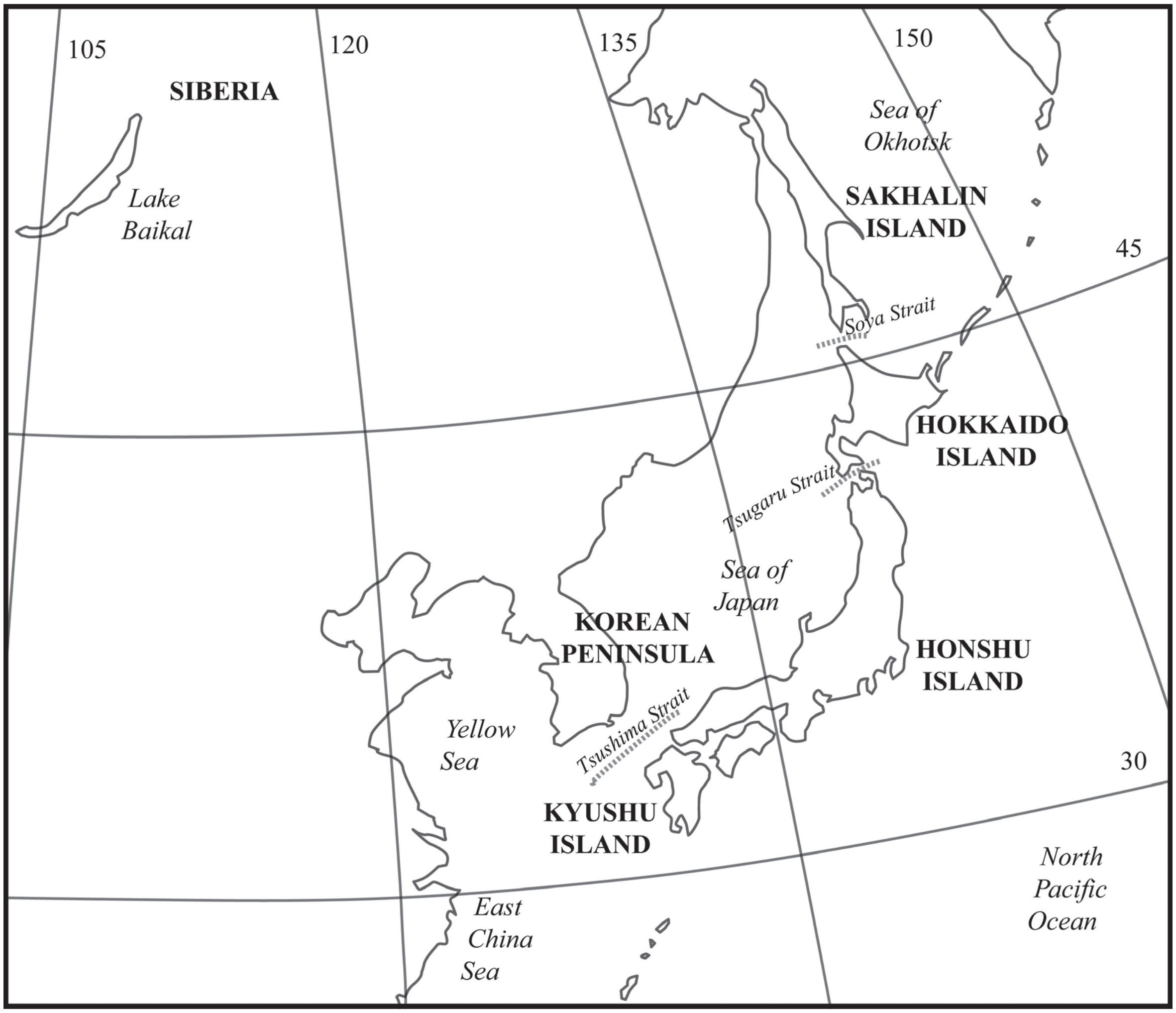

Figure 5.1: Map showing the location of the Japanese Islands and Northeast Asia.

site is dated to 15,470 ± 190 BP (Beta–107730) (Kawamichi 1998), and layer 2 of Fukui Cave is dated to 12,400 ± 350 BP (GaK–949) (Kamaki and Serizawa 1965). In the Fukui Cave, nail-impressed Incipient Jomon pottery has been recovered from layer 2 associated with microblade assemblages.

These results suggest that humans with microblade industries moved to Hokkaido Island earlier than to other parts of the Japanese Islands. Nevertheless, Late Pleistocene deposits on Hokkaido are not well developed, and the sedimentary layers have been modified by periglacial activity. Careful consideration is needed for assessing the association of lithic assemblages and the dates of collected samples. However, the charcoal samples from the Kashiwadai 1 site were recovered from fireplaces associated with lithic concentrations, making these dates quite reliable.

The emergence of microblade industries in Japan, therefore, dates back to around 20,000 BP based on the evidence from Hokkaido. Hokkaido is the northernmost of the Japanese Islands. A landbridge between Hokkaido and the Eurasian continent existed through Sakhalin Island in OIS 2 (Ono 1990). In contrast, the sill depth of the Tsugaru and Tsuhima straits between Hokkaido and Honshu and between Korea and Kyushu, respectively, is approximately 130 m. This depth is close to the sea level drop during the Last Glacial Maximum (hereafter LGM), and it has been suggested that no landbridge was formed between Hokkaido and Honshu. The landbridge between the Korean Peninsula and Kyushu is estimated to have existed for a very short duration in the LGM (Matsui *et al.* 1998). This geographical disconnection may have caused the earlier appearance of microblade industries on Hokkaido compared to other parts of the Japanese Islands (Figure 5.1).

CHRONOLOGY

Various types of microblade cores have been identified in Japan. Nevertheless, not all microblade core types are chronologically equivalent because some types of microblade cores were found together in the same spatial areas of sites. Some researchers regard the different types of microblade cores as the result of adapting to the form and quality of lithic raw materials (Shiraishi 1993; Tamura 1994). A comprehensive chronology, however, has been established for several of the main areas of Japan.

On Hokkaido, the Rankoshi, Togeshita, and Pirika types of microblade cores were recovered below the En-a tephra (Yamahara 2003; Terasaki and Miyamoto 2003) dated to about 18,000 BP. On the other hand, the Sakkotsu, Shirataki, Oshorokko, and Hirosato microblade core types have not been found below the En-a tephra. It has been argued that the Oshorokko and Hirosato microblade core types are from a later phase because they are found in concentrations with stemmed points that also date to a later phase. Togeshita and Pirika types of microblade cores have also been discovered in sites with the Sakkotsu microblade core type (Obihiro-Akira site), and the radiocarbon date is 10,900 ± 500 BP (KSU–889) (Sato and Kitazawa 1987).

On Kyushu, it is possible to confirm the stratigraphic sequence of different types of microblade cores from the Fukui and Senpukuji cave sites. Sugihara (2003) established a chronology in which the Nodake-Yasumiba type (subconical microblade cores) was succeeded by the Funano type (boat-shaped microblade cores) and later by the Fukui type (wedge-shaped microblade cores) on the basis of the stratigraphic and morpho-typological relationship observed at several sites. The appearance of subconical microblade cores, regarded as the oldest phase, is dated to approximately 15,000 BP based on radiocarbon dates from the Chaen site. Subconical microblade cores appear to have been produced in the later phase too. Boat-shaped microblade cores are associated with Incipient Jomon pottery at a number of sites. Additionally, microblade assemblages have been found with arrowheads in some sites. This pattern reveals that the microblade industries of Kyushu continued until a later phase than on Honshu.

While less information is available from western Honshu, a transition from subconical and boat-shaped microblade cores to wedge-shaped microblade cores made with the Yubetsu technique, has been established (Suwama 1988) for central Honshu. The relationship between boat-shaped and wedge-shaped microblade cores is not always chronologically distinct, and some researchers have suggested that the knappers of both assemblage types lived in the same period. At the Yoshioka B site subconical microblade cores are dated to c. 17,000–14,000 BP, but a more precise date is not available because of the large fluctuations in radiocarbon dates. Wedge-shaped microblade cores have been recovered from under and within the As-YP tephra (Maehara and Sekine 1988; Sato and Sano 2002), which is dated to c. 14,000–13,000 BP (Machida and Arai 1992). Considering that the Araya site dates to c. 14,250–13,690 BP (see above), the manufacture of Yubetsu technique wedge-shaped microblade cores in northeastern Honshu possibly emerged about 14,000 BP.

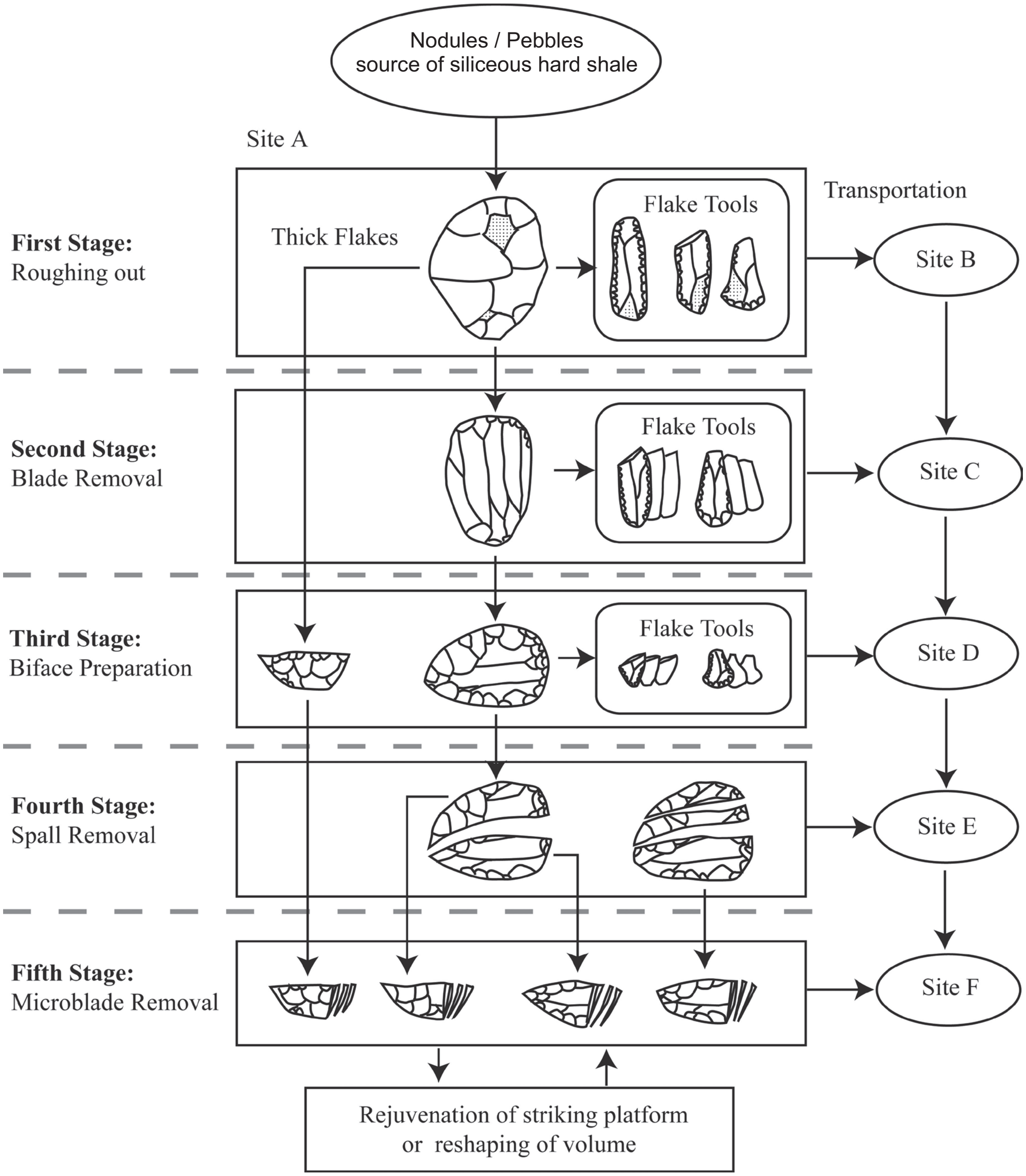

Figure 5.2: Reduction sequences of the microblade industries: The Yubetsu technique, northeastern Honshu.

Nevertheless, a large number of microblade assemblages are found as palimpsests. This means that the chronology based on the archaeological context of individual distribution layers is still open to further discussion. In order to establish a more certain chronology, the correlation between the quality and forms of lithic raw materials and microblade cores has to be evaluated within distinctive geographical settings.

REDUCTION SEQUENCES

The characteristics of lithic assemblages reconstructed from one site represent an expressed pattern derived from various factors. Lithic artifacts were formed by human behaviour from the acquisition of raw materials to the discard of lithic artifacts, and finally affected by post-depositional changes (Butzer 1982; Schiffer 1987).

In general, lithic artifacts are transported to a site in various forms, such as pebbles, cores, flake blanks, and shaped tool blanks. The transported forms of lithic artifacts can be reconstructed by refitting tools and waste flakes. Additionally, the refitted blocks enable us to trace the different stages of core preparation. Reduction sequences can be reconstructed by the synthesis of information from different sites.

A reconstruction of the reduction sequences of microblade industries with wedge-shaped microblade cores manufactured with the Yubetsu technique in northeastern Honshu is illustrated in Figure 5.2. Yubetsu technique wedge-shaped type cores were prepared on bifacial microblade core blanks. The flakes that were produced in the process of preparing the bifaces were exploited as tool blanks. This exploitation of by-products is demonstrated by examples of refitted materials (Sakurai 1992; Serizawa and Sudo 1992). In some instances there is evidence that knappers rejuvenated and reshaped wedge-shaped microblade cores. The reduction sequences of wedged-shaped microblade cores are very systematic and economic.

LITHIC RAW MATERIAL COMPOSITION

Siliceous hard shale, which is one of the sedimentary rocks distributed in northern Honshu (Figure 5.3), was the main raw material used in wedge-shaped microblade core manufacture in northeastern Honshu (Sato 1992b; Nagatsuka 1997; Sano 2002). Here, the composition of raw materials and the distance between sites and the geologic sources of siliceous hard shale are discussed.

Figure 5.4 is a comparison of siliceous hard shale and the amount of other raw materials in conjunction with distance from sites to the sources of siliceous hard shale. The proportion of siliceous hard shale in the microblade industries comprises up to 70% of lithic raw material except for three sites which are the most distant from the sources.

The sites located at a distance of more than 100–200 km from the sources have a high proportion of siliceous hard shale artifacts. At the Nakappara 5B, Nakappara 1G, and Yanagimata A sites, which are the most distant from the sources, this raw material has a frequency of only 5% (Figure 5.4). Sites can be divided into two groups, with Group A showing a high proportion of siliceous hard shale (Nakatsuchi, Shomen-Nakajima (M), Ushirono B, Uenohara, Kashiranashi, Shirakusa, Kashiwahara, Higashimine-Miyukibatake-Nishi, Kidoba, and Oami-Yamadadai No. 8) and Group B with a very low proportion of siliceous hard shale (Nakappara 5B, Nakappara 1G, and Yanagimata A) (Table 5.1).

In the bifacial point industries, the proportion of siliceous hard shale is 30% at the Uenotaira C site, located within 100 km from the sources, but at sites more than 100 km away from the sources, this raw material is rare except at Ushirono A and Karasawa B (Figure 5.5). It is apparent that siliceous hard shale was exploited at bifacial point sites located closer to sources and that local raw materials are dominant.

The average number of different types of raw material in the microblade industries is 6.7, and that of the bifacial point industries is 7.9 (Table 5.1). In particular, Group A microblade industries are less varied with an average number of only 4.8. This indicates uniformity of lithic raw materials in the microblade industries, in contrast to a high degree of diversity in the bifacial point industries.

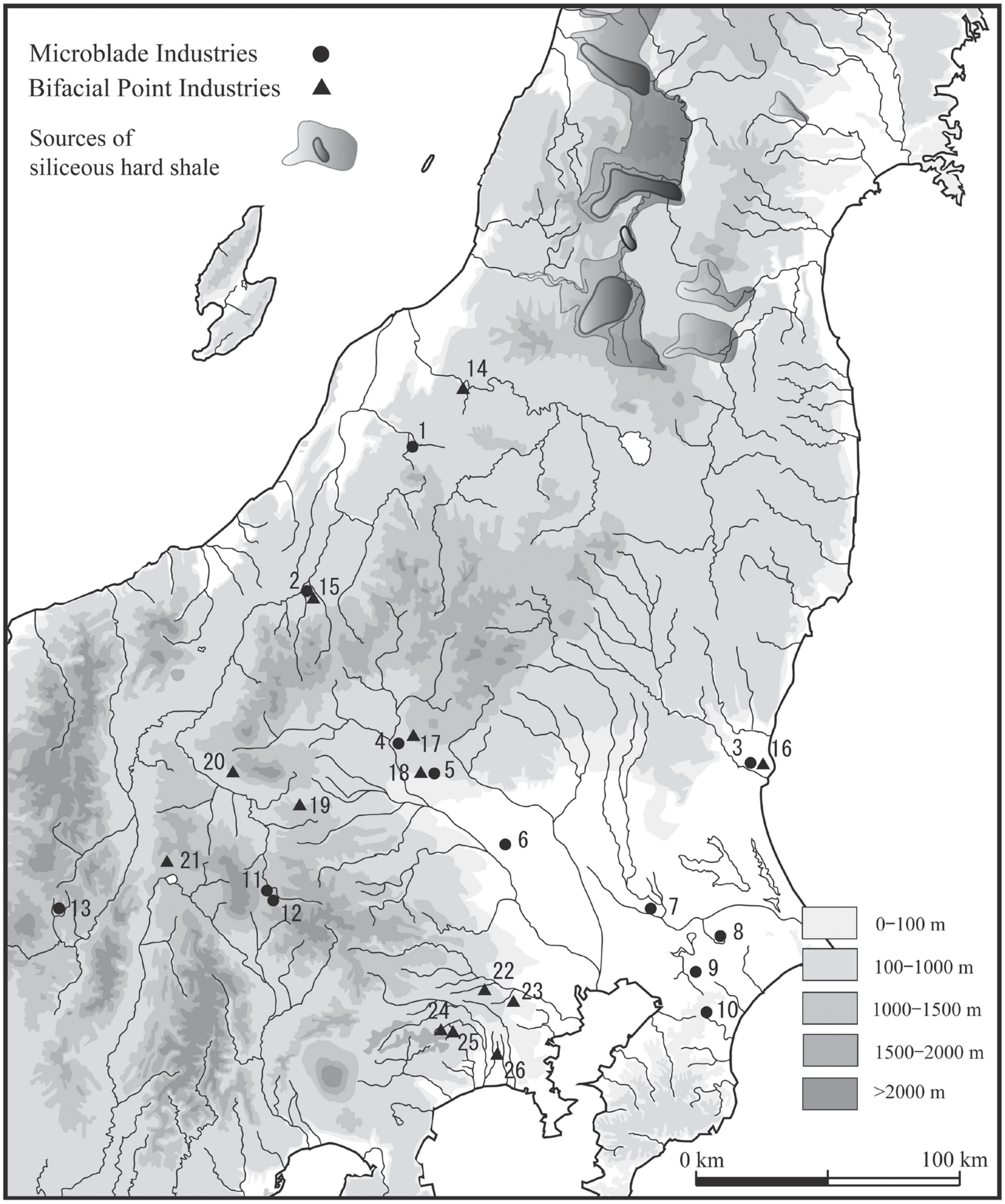

Figure 5.3: Topographic map of northeastern Honshu showing the distribution of the sources of siliceous hard shale and location of sites of the microblade industries and the bifacial point industries.

Microblade Industries: 1. Nakatsuchi; 2. Shomen-Nakajima (M); 3. Ushirono B; 4. Uenohara; 5. Kashiranashi; 6. Shirakusa; 7. Kashiwahara; 8. Higashimine-Miyukibatake-Nishi; 9. Kidoba; 10. Oami-Yamadadai No. 8; 11. Nakappara 5B; 12. Nakappara 1G; 13. Yanagimata A.
Bifacial Point Industries: 14. Uenotaira C; 15. Shomen-Nakajima (B); 16. Ushirono A; 17. Bogaito; 18. Arato-Kita-Sankido; 19. Happusan VI; 20. Karasawa B; 21. Nakajima B; 22. TNT No. 426; 23. TNT No. 27; 24. Kitahara (No. 10/11 North); 25. Minami (No. 2); 26. Yoshioka A.

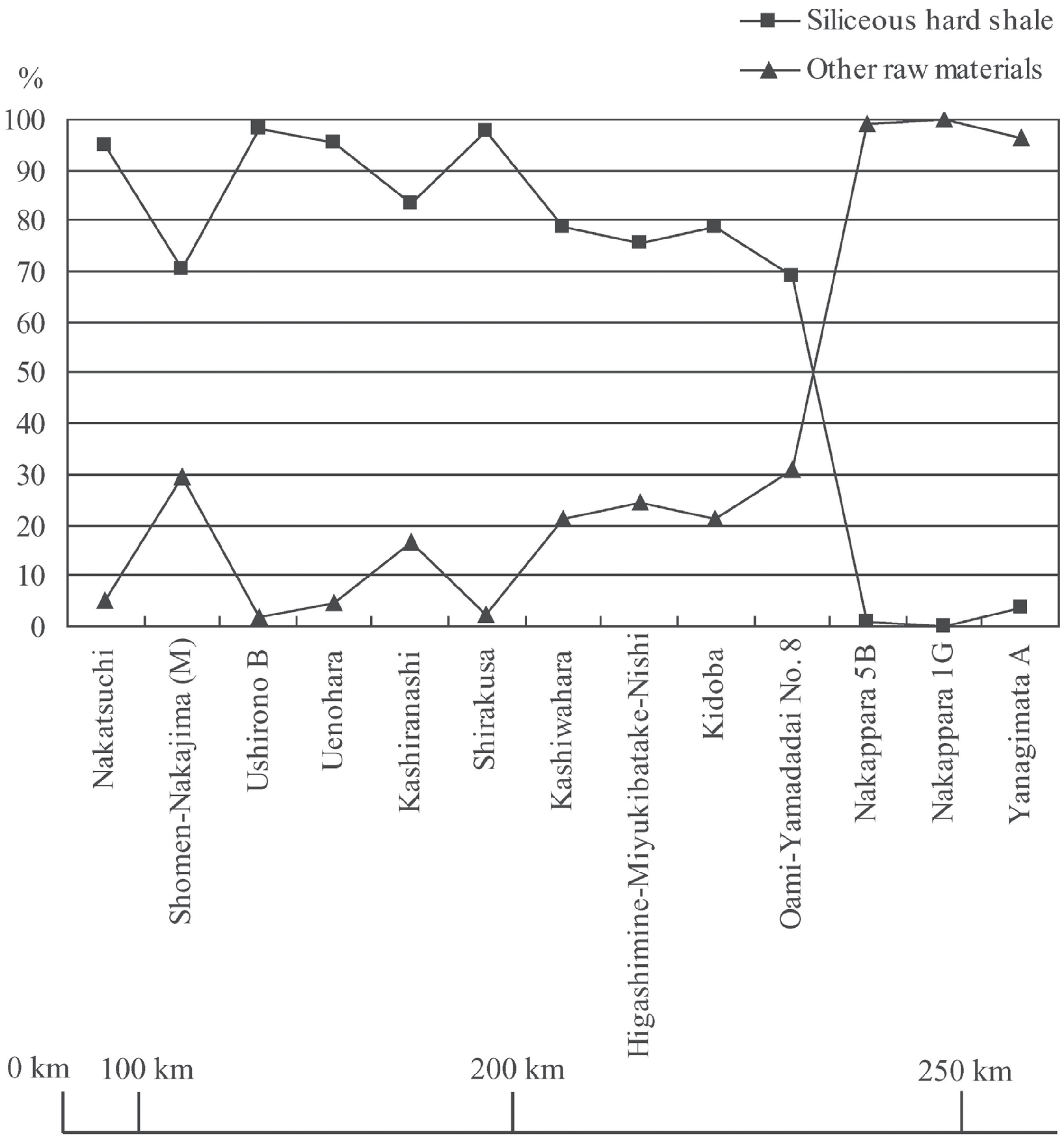

Figure 5.4: Comparison between percentages of siliceous hard shale and other raw materials in conjunction with distance from sites to the sources of siliceous hard shale in microblade industries.

TRANSPORTED FORMS

In excavation reports, researchers divide raw materials into subgroups according to homogeneity, texture, colour, and other characteristics. They assume that a subgroup is identifiable from an individual nodule, and also that different parts of blocks derive from the same parent rock. The same parent rock is usually recognized in the form of pieces of rock, which together are regarded as an approximate transported block. This assumption, however, lacks concrete evidence. The parent rock is not always identical to the actual transported block. There is still a certain degree of methodological flexibility to estimate whether or not homogeneous

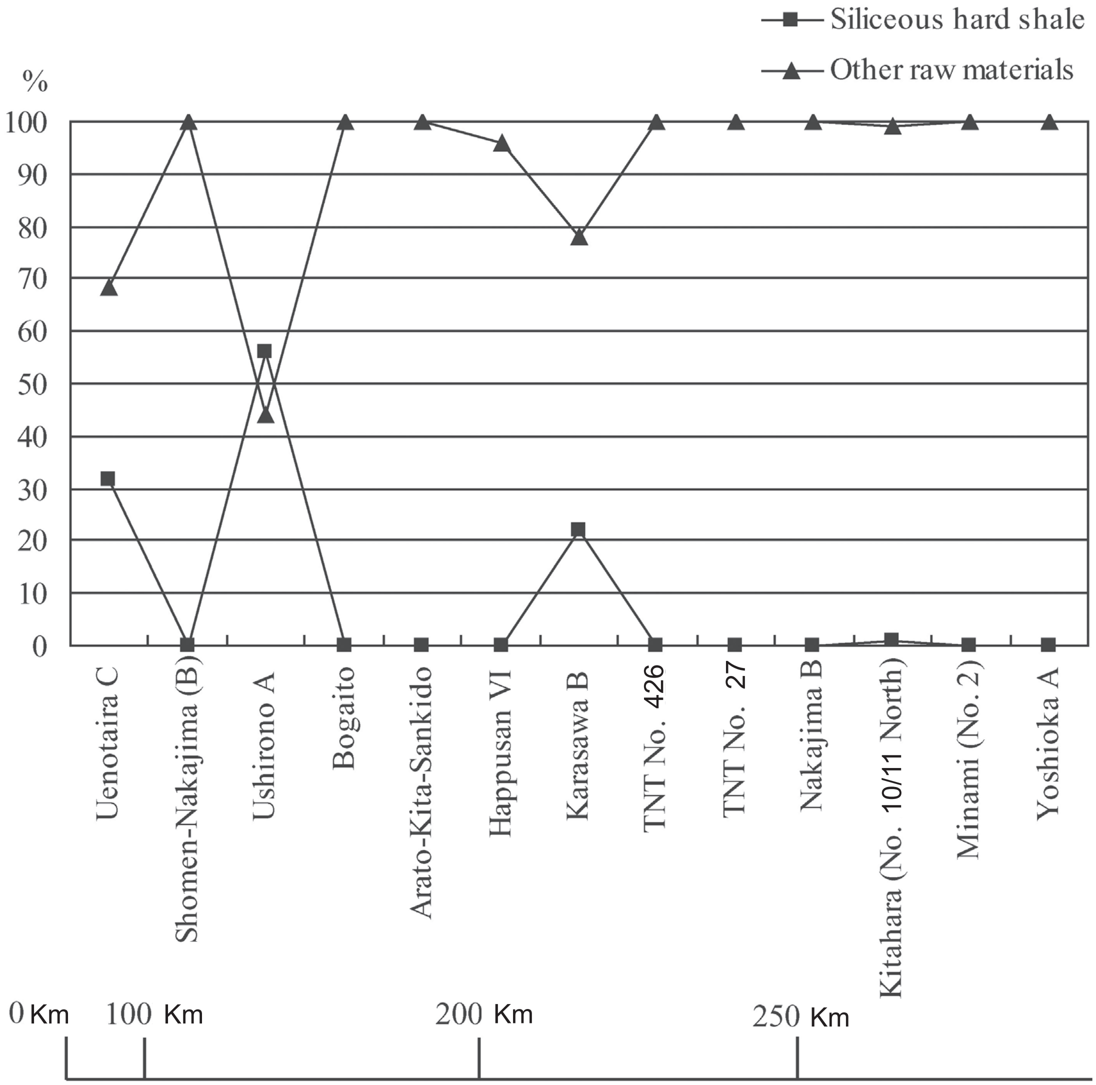

Figure 5.5: Comparison between percentages of siliceous hard shale and other raw materials in conjunction with distance from sites to the sources of siliceous hard shale in bifacial point industries.

broken pebbles are traceable to the same block of rock.

Table 5.2 shows lithic artifact assemblages according to parent rocks of siliceous hard shale. The characteristics of most parent rocks indicate that a high frequency of tools were manufactured from them except for parent Rock No. 108 of the Shomen-Nakajima site (M); Nos. 1, 2, 4, and 7 of Ushirono B site; Nos. 1 and 2 of Uenohara site; and Nos. A6 and A10 of Higashimine-Miyukibatake-Nishi site. Although these parent rocks indicate that a low frequency of retouched flake tools were manufactured from them, they include microblades, and in some cases the total number of unretouched and retouched flakes is very low. Therefore, there is little possibility that the siliceous hard shale was transported as pebbles or roughly prepared forms and that flake blanks were then produced from the primary stage. The the siliceous hard shale was transported to the sites in the form of microblade cores, tools, and flake blanks, and the reduction sequences of microblade cores show different stages among sites. In contrast, the other raw materials were

Table 5.1: Raw material variety of microblade and bifacial point industries.

Microblade Industries		**Bifacial Point Industries**	
Site	**Number of Raw Material Types**	**Site**	**Number of Raw Material Types**
Nakatsuchi	3	Uenotaira C	12
Shomen-Nakajima (M)	4	Shomen-Nakajima (B)	8
Ushirono B	2	Ushirono A	5
Uenohara	3	Bogaito	3
Kashiranashi	7	Arato-Kita-Sankido	13
Shirakusa	4	Happusan VI	1
Kashiwahara	7	Karasawa B	11
Higashimine-Miyukibatake-Nishi	6	TNT No. 426	8
Kidoba	4	TNT No. 27	11
Oami-Yamadadai No. 8	8	Nakajima B	6
Nakappara 5B	8	Kitahara (No. 10/11 North)	15
Nakappara 1G	5	Minami (No. 2)	3
Yanagimata A	16	Yoshioka A	7
Average Number	**6.7**	**Average Number**	**7.9**
Average (Group A)	**4.8**		
Average (Group B)	**13.0**		

transported as pebbles, pebble tools, and less-prepared blocks. Cores and tools with cortex are dominant in the latter.

Furthermore, in Group A of the microblade industries, the average weight of siliceous hard shale is 696 grams (g) and of the other raw materials it is 905 g (Table 5.3). Though siliceous hard shale is more frequent than other raw materials, the weight of siliceous hard shale is less. This demonstrates that siliceous hard shale was imported as well-prepared small forms, compared to other raw materials that were transported as less-prepared large forms.

It is suggested here that two different raw material acquisition strategies were adopted in the manufacture of microblade industries. In one strategy, raw material was transported in the form of microblade cores, tools, and flake blanks made on siliceous hard shale derived from distant sources, and in the other, pebbles, pebble tools, and less-prepared blocks were brought to sites made on other raw materials derived from local sources.

With regard to the bifacial point industries, large quantities of lithic artifacts have been discovered. The average weight of siliceous hard shale is 321 g, while the mean weight of other raw materials is 21,407 g (Table 5.4). The average weight of siliceous hard shale at the Uenotaira C site, which is within 100 km distance from the sources, is over 1000 g, but for sites located at more than 100 km distance from the sources it is less than 1 g, except for the Uenotaira C and Karasawa B sites. A variety of parent rocks have been identified in the bifacial point assemblages. Parent rock No. 407 from the Shomen-Nakajima (M) site was transported in the form of a pebble, parent rock No. 219 as a roughly prepared large flake, and No. 405 as a tool. At the Uenotaira C site, parent rocks Nos. 1, 3, and 4 were transported in the form of a pebble or as roughly trimmed artifacts. The No. 7 material, the only non-local stone, was imported as a core and as three bifacial points which had been shaped. These results suggest that the raw materials were transported in various forms to the bifacial point sites.

Table 5.2: Lithic artifact assemblages by parent rocks of siliceous hard shale.

Site	Parent Rock No.	MB	MC (Co) + MC Sp	Number of Tools	Number of Flakes	Percent of Tools (Tools:Flakes)
Shomen-Nakajima (M)	101	9	1	24	5	**83**
	102	6	1	9	17	**35**
	103	1	0	1	2	**33**
	104	0	0	1	0	**100**
	105	0	0	1	0	**100**
	106	0	0	1	0	**100**
	107	2	0	8	4	**67**
	108	1	0	0	12	**0**
Ushirono B	1	90	1	5	277	**2**
	2	38	2	1	168	**1**
	3	0	0	4	37	**10**
	4	37	1	1	67	**1**
	6	1	0	0	0	**-**
	7	0	0	0	2	**0**
	8	0	0	1	0	**100**
	9	0	1	0	0	**-**
	10	1	0	0	0	**-**
Uenohara	1	14	0	0	24	**0**
	2	27	2	4	65	**6**
	3	0	0	1	5	**17**
Higashimine-Miyukibatake-Nishi	A1	0	3	0	0	**-**
	A2	1	1	1	5	**17**
	A3	0	1	0	0	**-**
	A4	0	0	2	0	**100**
	A5	0	0	2	0	**100**
	A6	0	0	0	2	**0**
	A7	0	0	1	0	**100**
	A8	0	0	1	0	**100**
	A9	0	0	1	0	**100**
	A10	0	0	0	1	**0**
	Aa	1	0	6	2	**75**
	Ab	2	0	19	24	**44**
	Ac	5	1	16	16	**50**
	Ad	2	1	7	16	**30**
	Ae	4	0	2	8	**20**
	Af	0	0	3	11	**21**

MB = Microblade,   MC = Microblade Core,   Co = Core,   MC Sp = Microblade Core Spall

Table 5.3: The number and weight of siliceous hard shale and other raw materials in the microblade industries.

Distance	Site	SHS (n)	ORM (n)	SHS (g)	ORM (g)
80 km	Nakatsuchi	75	4	1121	832
140 km	Shomen-Nakajima (M)	110	46	719	934
150 km	Ushirono B	733	13	-	-
170 km	Uenohara	165	8	436	156
170 km	Kashiranashi	354	71	-	-
190 km	Shirakusa	1769	38	1155	1258
200 km	Kashiwahara	158	43	-	-
220 km	Higashimine-Miyukibatake-Nishi	166	54	499	1527
230 km	Kidoba	79	21	285	855
240 km	Oami-Yamadadai No. 8	121	54	660	771
240 km	Nakappara 5B	11	1043	23	6120
240 km	Nakappara 1G	0	1616	0	3548
290 km	Yanagimata A	141	3633	183	28,253
	Average	**299**	**511**	**508**	**4425**
	Average (Group A)	**373**	**35**	**696**	**905**
	Average (Group B)	**51**	**2097**	**69**	**12,640**

SHS = Siliceous Hard Shale
ORM= Other Raw Materials

Table 5.4: The number and weight of siliceous hard shale and other raw materials in the bifacial point industries.

Distance	Site	SHS (n)	ORM (n)	SHS (g)	ORM (g)
50 km	Uenotaira C	292	630	1995	9408
140 km	Shomen-Nakajima (B)	0	1467	0	24,354
140 km	Ushirono A	50	39	-	-
160 km	Bogaito	0	8173	0	14,503
170 km	Arato-Kita-Sankido	0	2107	-	-
210 km	Happusan VI	0	48,549	0	99,126
210 km	Karasawa B	8	28	574	10,430
240 km	TNT No. 426	0	960	0	7465
240 km	TNT No. 27	0	2279	-	-
250 km	Nakajima B	0	4698	-	-
260 km	Kitahara (No. 10/11 North)	7	891	0.9	11,508
260 km	Minami (No. 2)	0	172	0	14,305
260 km	Yoshioka A	0	862	0	1560
	Average	**27**	**5450**	**321**	**21,407**

SHS = Siliceous Hard Shale
ORM = Other Raw Materials

MOBILITY

The people who produced microblade industries in Japan moved exotic lithic raw materials over long distances. They seem not to have spent long periods of time exploiting the resources around sites considering the small quantities and low degree of variety of lithic raw materials that have been found. The light inventories of the microblade industries are suitable to high mobility (Fujimoto 1997), and the systematic and economic exploitation of lithic raw materials effectively reduced the quantity of exploited raw materials.

Studies of the bifacial point industries have determined that siliceous hard shale was not transported to sites located far from the sources. However, about 10 to 100 exotic varieties of obsidian were recovered from several sites. This, therefore, suggests that humans who manufactured bifacial point industries also moved relatively long distances. They may have acquired raw materials at several locations near the sites because large quantities and varieties of raw materials were abandoned. All these factors make it clear that inhabitants of the bifacial point industries' sites spent long periods of time exploiting the resources in the vicinity of their sites and that these sites were occupied for longer periods than microblade sites.

Limited information is available to interpret the transformation of human settlement patterns from the microblade industries and the bifacial point industries. The period of the microblade industries with wedge-shaped microblade cores in northeastern Honshu is dated to approximately 14,000 BP as mentioned above. The radiocarbon age of the Araya site (c. 14,000–13,000 BP), calibrated to c. 16,000–17,000 cal BP (Kitagawa 2003), is just before the Older Dryas. The succeeding period of bifacial point industries is dated to and after the Older Dryas. It has been suggested that the transition from microblade industries to bifacial point industries occurred during a climatic amelioration (Nakagawa *et al.* 2002), with a decrease of the dominant vegetation of conifer forests and a gradual increase of deciduous forests (Tsuji *et al.* 1985; Tsuji 1997).

Nevertheless, it does not necessarily follow that the cause of transformation in mobility is directly linked to the ecological changes. The extreme long distance movement of microblade industries is a unique characteristic of the Japanese Palaeolithic. One phase of the backed blade industries is dated to around the LGM, and had a transportation strategy more similar to that of the bifacial point industries than to the microblade industries. If the change in mobility from microblade industries to bifacial point industries was caused by a climatic oscillation, it should be confirmed by more environmental and archaeological data.

CONCLUSION

The emergence of microblade industries in the Japanese islands is dated to c. 20,000 BP. This date is in accord with the results of tephrochronology. The appearance of microblade industries on Hokkaido is earlier than in other parts of Japan. On Honshu and Kyushu, the oldest dates are c. 17,000–15,000 BP, and these dates are from sites with subconical microblade cores. Wedge-shaped microblade cores spread over northeastern Honshu at c. 14,000 BP, and their manufacture is associated with a particular strategy of raw material exploitation.

Hominids transported siliceous hard shale as the dominant raw material over a distance of more than 200 km for the manufacture of microblade industries in northeastern Honshu. This raw material was transported to sites in the form of microblade cores, tools, and flake blanks, although the total weight of these artifacts was very small. Limited amounts of local raw materials were introduced to sites in the form of pebbles, roughly prepared cores, and cortical flakes. These raw materials indicate a low degree of diversity.

The people who manufactured microblade industries might have moved long distances and occupied residential camps for short durations. They had only a light set of inventories and exploited lithic raw materials systematically and economically. This strategy of raw material exploitation was advantageous to the highly mobile adaptation of the microblade industries.

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