THE UPPER PALAEOLITHIC OF THE JAPANESE ISLANDS: AN OVERVIEW

A JAPÁN SZIGETEK FELSŐ PALEOLITIKUMA: RÖVID ÁTTEKINTÉS

AKIRA ONO & MASAYOSHI YAMADA

Center for Obsidian and Lithic Studies, Meiji University

E-mail: onoak@meiji.ac.jp

Abstract

This paper focuses on general outline of the Upper Palaeolithic in the Japanese Islands with an introduction of characteristic features of early use of obsidian in the early Upper Palaeolithic. A brief historical sketch of archaeological heritage management and chronological summaries of human history developed in the Islands from the Palaeolithic through to the foundation of ancient state periods also introduced for better understanding of background of Japanese archaeology. The time range of the Upper Palaeolithic in the Islands estimated as ca. 40ka to 16ka by calibrated radiocarbon dates. The emergence of pottery in Japanese Islands date back as early as in ca. 15ka, therefore, incipient Jomon period began within the Late Glacial. Obsidian procurement in the early Upper Palaeolithic emerged in ca. 38,000 cal BP. The beginning of obsidian procurement evaluated as one of the indication of concrete evidence of modern human dispersal to the Japanese Islands from the Asian mainland through Korean Peninsula, with Edge-ground stone adzes. These two elements of cultural phenomena indicate an independent creation caused by modern humans.

Kivonat

Ez a tanulmány a Japán-szigetek felső paleolitikumát foglalja össze, különös tekintettel az obszidián korai felhasználására a felső paleolitikum elején. Röviden áttekintjük a régészeti örökség kutatásával és megőrzésével kapcsolatos tevékenység jellemzőit a paleolitikumtól a történeti periódusokig, hogy jobban be tudjuk mutatni a japán régészeti kutatások hátterét. A felső paleolitikum időbeli határait a Japán-szigeteken kb. 40 000 és 16 000 közé tehetjük a kalibrált radiokarbon adatok szerint. A kerámia megjelenése a Japán-szigeteken igen korai, kb. 15 000 évre datálható, azaz a korai Jomon periódus a kései jégkorszakban megkezdődik. Az obszidián felhasználása a korai felső paleolitikumban már megfigyelhető, kb. 38 000 cal BP-re keltezhetően. Az obszidián felhasználás kezdeteit az egyik olyan jelenségként értelmezhetjük, ami a szigetek korai benépesedését bizonyítja. A Japán-szigetek benépesedése az ázsiai szárazföld felől a Koreai-félsziget irányából történt. A korai felső paleolitikum jellemző eszközei az élükön csiszolt kőbalták is. Ez a két jelenség a modern ember sajátos, önálló kulturális fejlődését bizonyítja a Japán-szigeteken.

KEYWORDS: HERITAGE MANAGEMENT, JAPANESE ISLANDS, UPPER PALAEOLITHIC, OBSIDIAN, MODERN HUMAN DISPERSAL

KULCSSZAVAK: ÖRÖKSÉGVÉDELEM, JAPÁN SZIGETEK, FELSŐ PALEOLITIKUM, OBSZIDIÁN, MODERN EMBER

Introduction

This paper provides an overview of the Upper Palaeolithic of the Japanese Islands, with a brief description of the archaeological background expressed in heritage management.

Historically, the roots of present-day Japanese archaeology had to be re-started in the chaotic situation of the immediate post-World War II period. The Japanese military invasion of China, Korea, and other Asian countries during the 1930s and 1940s was ended by the acceptance of the Potsdam Declaration of 1945. Japanese archaeology in the immediate post-war period was, therefore, quite strictly limited in its scope and field to within the Japanese Islands, and began with chronological and descriptive studies of sites and artifacts, as well as so-called “production force”-oriented studies of both stone- and iron-age societies, which were mostly limited to a homogenous economic social formation (Ono, 1997). This is the definitive background of Japanese archaeology in the latter part of the 1940s. Systematic international academic exchange among Japan, Korea and China began only in the 1970s, and in the case of Russia, only in the 1990s, because of several political restrictions.

Archaeological heritage management in Japan

Rescue archaeology and archaeological heritage management are inseparable, because they are connected with administrative research organizations and the cultural policy of the Japanese government.

HU ISSN 1786-271X; urn: nbn: hu-4106

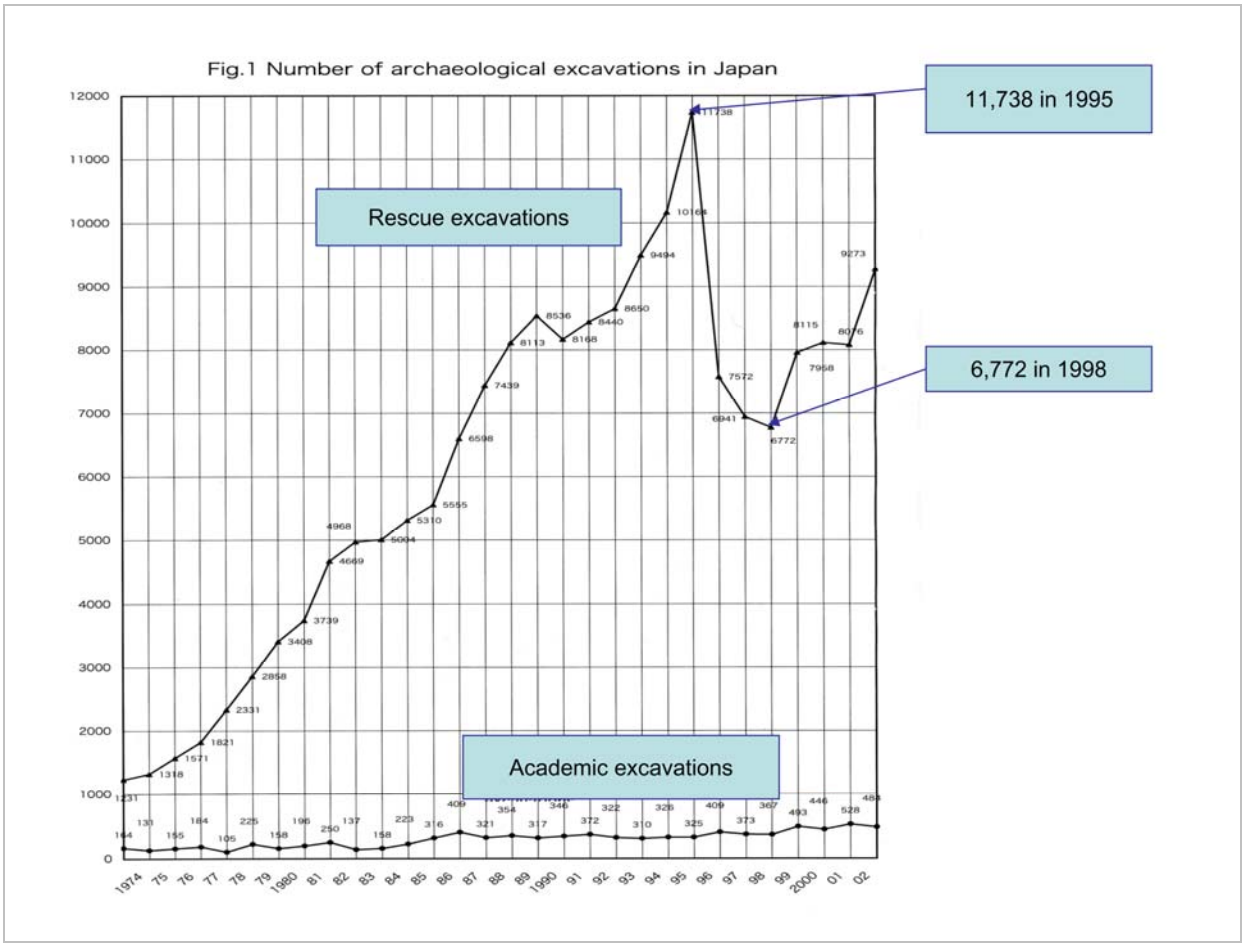

Fig. 1.: Number of archaeological excavations in Japan. (Agency for Cultural Affairs, 2004.)
1. ábra: Régészeti ásatások száma Japánban

Japanese archaeology can be characterized as "archaeology as history" or "historical science," and pursues a tradition that began in the 19th century and continues to the present. One document shows that 82 excavations had been carried out in 1950. The total number of excavations was 345 in 1959, of which 227 were conducted by universities, institutes, and museums. The other 118 excavations were done by so-called rescue or emergency excavations, mostly carried out by local administrative organizations, i.e., prefectural or municipal boards of education. The number of rescue excavations exceeded that of academic excavations in 1969. There were a total of 1,000 excavations, of which 200 were academic, and the remaining 800 were rescue excavations. A detailed chronology of artifacts and sites in every archaeological field had been re-established throughout the 1950s and 1960s, and large-scale rescue excavations supplied the base for chronological data.

Interdisciplinary collaboration of archaeological research among several natural sciences began in the early 1970s. Geological source identification of archaeological materials by way of radiometric methods has increased during the last three decades, as well as palaeoenvironmental reconstruction by several Quaternary disciplines.

Source identification of artifacts between widely separated locations broadened the scope of chronological network systems among the Japanese Islands. Since the 1970s, Japanese archaeology has been expanding the periods it covers, focusing not only on prehistory or early history but also on early modern or modern times.

One aspect of the background of Japanese archaeology is reflected in the increasing number of excavations from 1974 to 2002, which indicates that explicit correlations are visible between economic investment, irrespective of private or public sectors, and the number of excavations. For example, the peak in the number of excavations for all of Japan in a single year was 11,738 in 1995 (**Fig. 1**). This is a clear indication of the extensive investment and land development during what was known as the Japanese bubble economy in the mid-1990s. A depression in the number of excavations (6,772 in 1998) clearly reflects the collapse of the Japanese bubble economy.

HU ISSN 1786-271X; urn: nbn: hu-4106 © by the author(s)

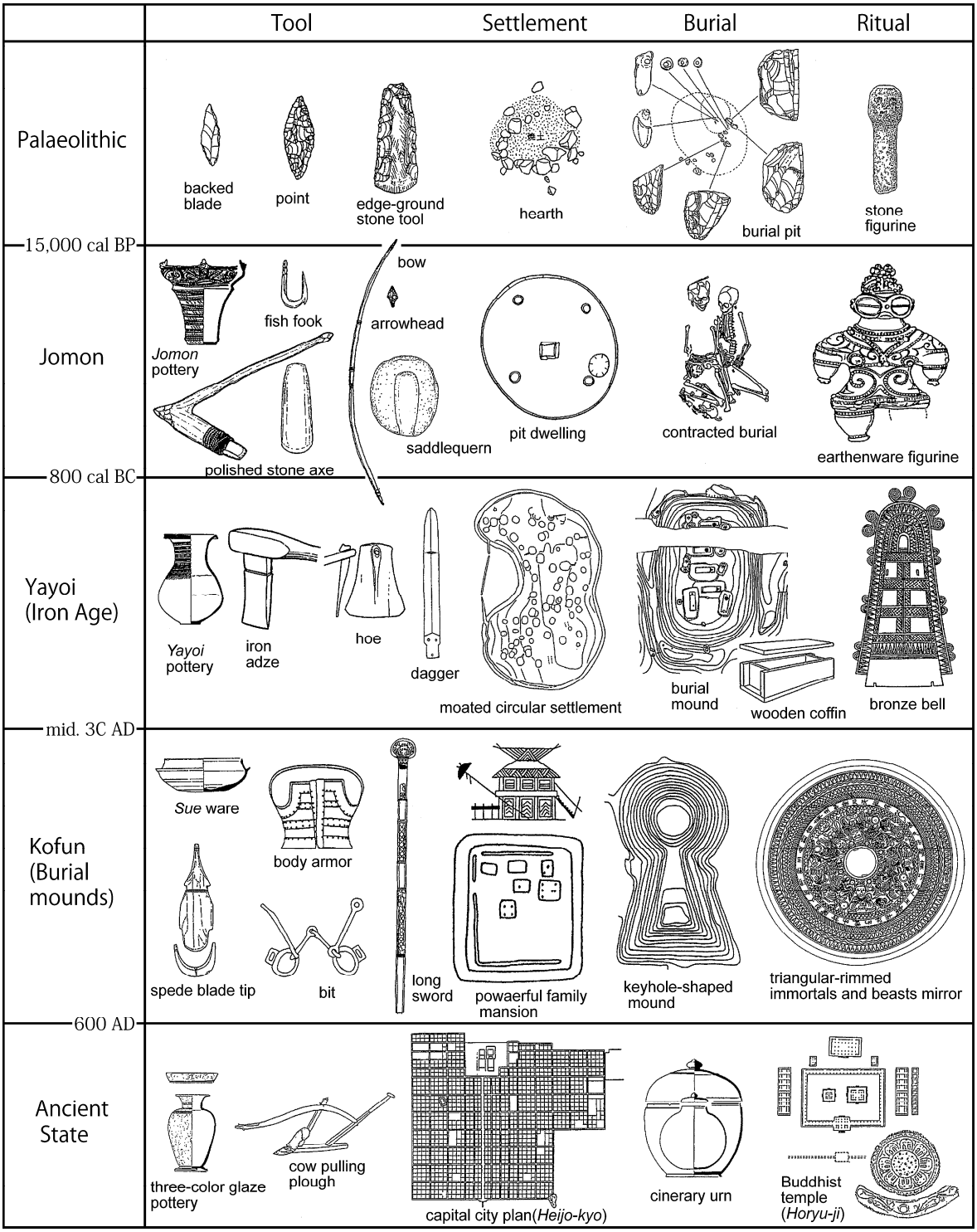

Fig. 2.: General chronological chart of Japanese archaeology. (Ono et al., 1992)

2. ábra: Kronológiai táblázat japán őstörténetéhez

Contrary to this, the number of academic excavations has remained relatively stable over time.

General chronologies

A chronological chart showing the typical features from the Palaeolithic through to the foundations of the ancient state, including tools, settlements, burials, and rituals, is provided in **Fig. 2.** The emergence of pottery, or the incipient Jomon period, began as early as 15000 cal BP. The latest stage of the Jomon period ended more or less around 800 cal BC. The Yayoi Iron Age began with the new technologies of metal working and

agriculture which had been brought from the Korean Peninsula. Bronze and iron appeared essentially simultaneously; therefore, there was no independent Bronze Age in Japan. Periods of ancient burial mounds began in the middle of the 3rd century AD and lasted until the beginning of the 7th century AD. This period was characterized by the building of many keyhole-shaped burial mounds and defined the formation of states/kingdoms. In the middle of the 7th century, the castle-town system was introduced from the Tang dynasty in China, and then the Japanese ancient state was founded in its full sense. The capital of that state was Nara, in the same geographic location as present-day Nara City in western Japan (Ono et al., 1992).

The Upper Palaeolithic

The framework of Japanese Palaeolithic studies has many aspects. Explicit evidence of human occupation that is based on both the stratigraphy and morphotypology of lithic artifacts can be traced back to the middle of MIS3 (Kudo and Kumon, 2012; Kudo, 2012; Kumon et al., 2012).

Discussions of the Lower and Middle Palaeolithic in the Japanese Islands began at the end of the 1950s. However, quite strictly speaking, no single site is available standing both on sound stratigraphy and morphotypology of lithic artifacts up to the present. It is possible, therefore, to set out a robust hypothesis that the earliest human occupation of the Japanese Islands began after ca. 40,000 yr BP (Ono, 2011; Suwama, 2003).

Traces of Upper Palaeolithic people are available all over the Japanese Islands, from northern Hokkaido to southern Okinawa, since the first discovery of the lithic industries of the Palaeolithic at the Iwajuku site in Gunma Prefecture, central Japan, in 1949. According to the recent database which was published by the Japanese Palaeolithic Research Association in 2010, there are about 10,150 Palaeolithic sites throughout the Japanese Islands (Japanese Palaeolithic Research Association, 2010).

For the verification of the attributes of archaeological finds, it would be ideal if we could obtain matching results from four different sources, namely from lithostratigraphy, biostratigraphy, archaeo-stratigraphy, and numerical dates. However, because of the acidic soil layers, we have no organic material finds such as mammal fossils and wooden objects belonging to the Palaeolithic period in aeolian deposits, with some exceptions.

Land-bridges and faunal remains

Land-bridges between the Korean peninsula and the Japanese Islands appeared at least twice in the Middle Pleistocene, i.e., MIS 16 (ca. 0.63 Ma) and MIS 12 (ca. 0.43 Ma). No land-bridge existed in the Late Pleistocene, even in the Last Glacial Maximum (LGM) period.

The timing of mega-fauna migration from the Chinese mainland to the Japanese Islands along a land-bridge, such as the Stegodon elephant (*Stegodon orientalis*) and Naumann's elephant (*Palaeoloxodon naumanni*), is evaluated to have occurred in MIS 16 and MIS 12, respectively. No exact traces of hominid occupation in the Japanese Islands, neither lithic nor skeletal remains, were available corresponding to those mega-fauna migrations.

Well-preserved hominid fossils that belong to the latter phase of the Late Pleistocene are those from the fissure of the Minatogawa limestone quarry in the Okinawa islands, ca. 19,900 cal BP and ca. 21,800 cal BP (Kaifu and Fujita, 2012). The fissure deposits, however, have yielded no remains of occupation and artifacts.

In the LGM, a subarctic coniferous forest sharply extended southward down to present-day north-central Japan. In the latter half of the LGM, the northern part of the Japanese Islands was influenced strongly by Siberian cultural traditions via Sakhalin, and northern microblade industries appeared first in Hokkaido, which were represented by wedge-shaped micro-cores in a broad sense (Kimura, 2006; Izuho et al., 2012).

Upper Palaeolithic chronological sequence

Upper Palaeolithic chronological studies have been advanced in most areas where well-stratified thick loam layers of volcanic ash were accumulated, including aeolian dust or loess from China (Ono et al. 2002).

The central part of the Japanese Islands offers fine chronologies for advancing both stratigraphic and morphotypological studies (**Fig. 3**). The basic chronological sequence of the Upper Palaeolithic follows four stages of lithic industries:

- In the early phase, trapezoid industries exist across all of the Japanese Islands and include edge-round stone tools.
- Backed-blade industries are common and stable during the early to later phases of the Upper Palaeolithic.
- Point-tool industries developed particularly in Central Japan.
- Microblade industries successfully spread over the Japanese Islands until the advent of so-called Incipient Jomon cultural elements began to appear.

HU ISSN 1786-271X; urn: nbn: hu-4106 © by the author(s)

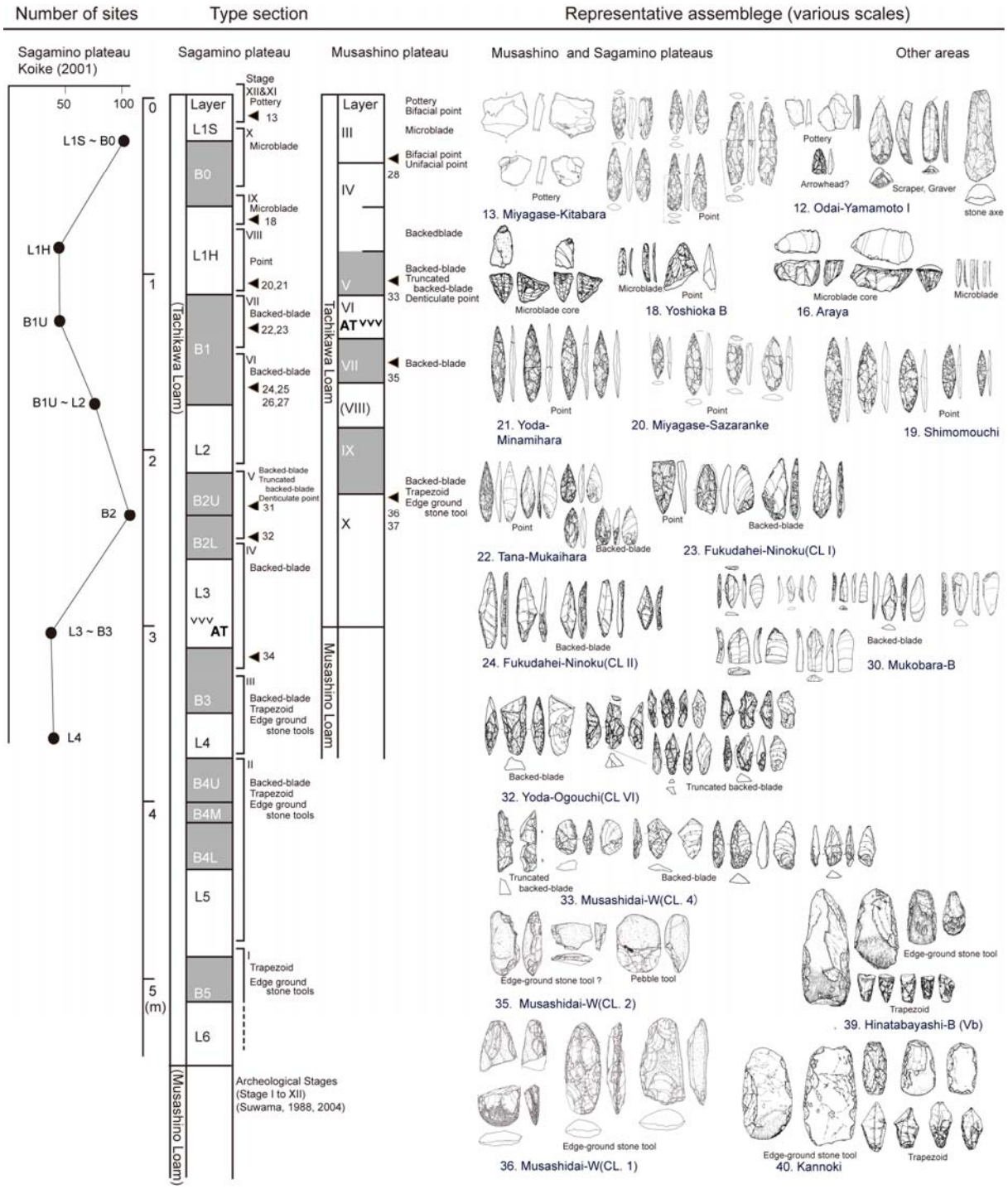

Fig. 3.: Upper Palaeolithic chronology of Musashino and Sagamino Uplands, Central Japanese Islands and their typical artifacts. (Kudo, 2012)

3. ábra: A Musashino és Sagamino Hegyvidék (Közép-Japán) felső paleolit kronológiai vázlata a jellemző eszköztípusokkal

The huge eruption from the Aira caldera in southern Kyushu occurred in the chronological sequence of the backed-blade industries. This eruption spread volcanic ash not only over most of the Japanese Islands but also over the Korean peninsula, part of eastern China and the southern Primorye of the Russian Far East. This key tephra is called the Aira-Tn tephra (abbr., AT), and it is a critical transregional marker tephra for the Upper Palaeolithic chronology in East Asia (Machida and Arai, 2003). Recent AMS radiocarbon determination indicates that the AT dates back to ca. 30,000-29,000 cal BP. This time range coincides approximately with the transition from MIS3 to MIS2.

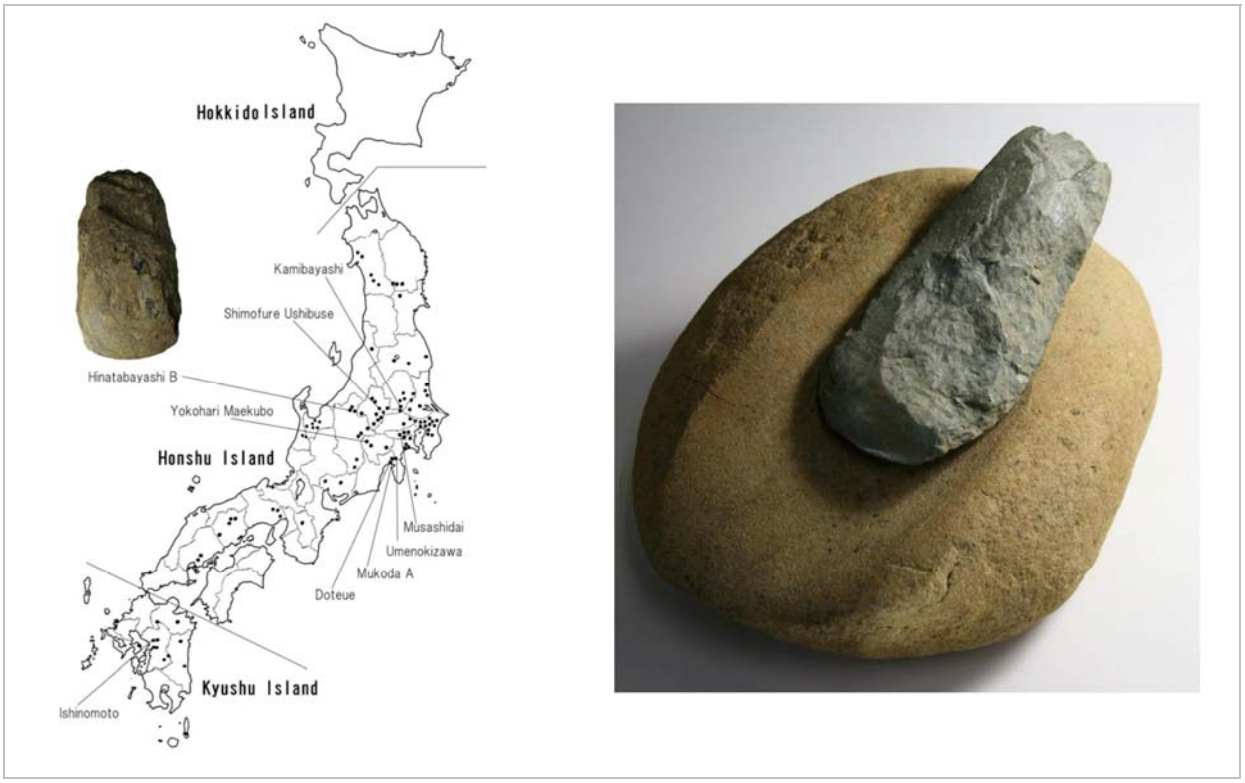

Fig. 4.: Distribution of early Upper Palaeolithic sites (left), and the Edge-ground adze and whetstone form the Hinatabayashi B site, Nagano Prefecture, central north Japan (right). (Tsutsumi, 2012; and Tani, 2000)

4. ábra: Korai felső paleolit lelőhelyek elterjedése (balra), élén csiszolt balta és csiszolókő Hinatabayashi B lelőhelyről, Nagano prefektúra, Észak-Közép Japán (jobbra).

Edge-ground stone adzes

One of the characteristic features of the Early Upper Palaeolithic in the Japanese Islands is represented by both edge-ground stone adzes, and the whetstones that were used to produce sharp blades on the working edge of the stone adzes. A total of 896 edge-ground and blanks of stone adzes have been found at 224 sites belonging to the beginning of the Early Upper Palaeolithic in all of the Japanese Islands (**Fig. 4**). Similar tools, however, have not been found in China, Korea or the Russian Far East. At present, these stone tools appear to be an independent creation in the Japanese islands (Tsutsumi, 2012).

Dwelling features

The dwelling structures of the Upper Palaeolithic are difficult to clarify because of the preservation issues in aeolian loam sediments. Acidic sediments preserve no organic materials such as animal bones and wooden materials from the Pleistocene. In most cases we had to recognize dwellings by lithic clusters and the distribution patterns of lithic artifacts and debris. A typical and exceptionally well-preserved example from about 20,000 to 21,500 cal BP was found at the Tana-Mukaihara site near present-day Tokyo. It has a diameter of about 10 m, with fireplaces, post-holes, relatively large river gravels arranged circularly, and many obsidian point tools and debris inside the dwelling structure (**Fig. 5**) (Sagamihara City Board of Education, 2004). The living floor is generally flat. No artificial depression or digging evidence on the floor is visible.

Fig. 5.: Typical dwelling features of the Palaeolithic at Tana-mukaihara site. (Sagamihra City Board of Education, 1998)

5. ábra: Települési felszín feltárása, Tana-mukaihara paleolit lelőhely

HU ISSN 1786-271X; urn: nbn: hu-4106 © by the author(s)

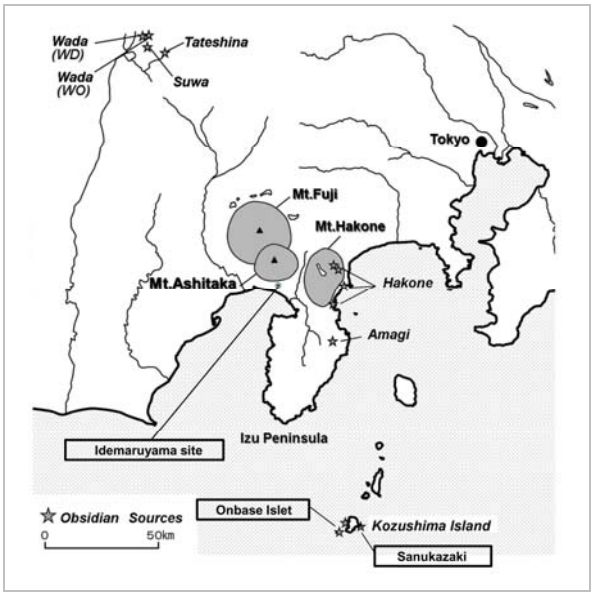

Fig. 6.: Location map of obsidian in central Japan. *The name "Kozushima Island" stated in the map is a synonym of "Kozu Island" (Ikeya, 2012)

6. ábra: Obszidián előfordulások Japán középső részén

Beginning of obsidian procurement in the early Upper Palaeolithic

Another characteristic feature of the Early Upper Palaeolithic is the emergence of obsidian exploitation other than the early use of edge-ground stone adzes. More than 160 geologic obsidian sources are recognized throughout the Japanese Islands, from Hokkaido to Kyushu, all located within the volcanic belt of the Pacific Rim (Sugihara, ed., 2009; Tsutsumi, 2010). Many obsidian source clusters are concentrated in three blocks in the central part of the Japanese Islands. One of these is located in the central mountainous Shinshu area at Wada, Suwa and Tateshina; the second is near the Izu Peninsula, Hakone and Amagi; and the last is on Kozu Island, including the Onbase Islet (**Fig. 6**).

Two geologic sources of obsidian on Kozu Island were used in prehistory. Onbase Islet obsidian was used in the Early Upper Palaeolithic, ca. 38,000 – 35,000 cal BP, and again in the Late Upper Palaeolithic, ca. 20,000 – 15,000 cal BP. Now outcrops at Onbase are found around reefs of about 3 to 6 meters beneath the present sea level, indicated by a red oval line in **Fig. 7**. Contrary to that of the Onbase Islet, Sanukazaki obsidian was not used in the Palaeolithic and only began to be used in the final Jomon period, ca. 3,000 cal BP (**Fig. 8**).

Fig. 7.: Distant view of the Onbase Islet, facing East (Photo: Ono, 2010). Location of obsidian layers marked red.

7. ábra: Az Onbase szirtek látképe kelet felől. Az obszidián rétegek helyét pirossal jeleztük.

Fig. 8.: Obsidian outcrops at Sanukazaki (Sanuka Cape), facing East. (Photo: Ono, 2010) Location of obsidian layers marked red.

8. ábra: Obszidiános láva rétegek, Sanukazaki (Sanuka fok), kelet felől. Az obszidián rétegek helyét pirossal jeleztük.

Kozu Island is located in the chain of Izu Islands in the Pacific Ocean, about 170 km southwest of central Tokyo and about 50 km off the coast of the Izu Peninsula. The procurement of obsidian from the Onbase Islet source located in the open sea suggests that the early Upper Palaeolithic people could not access it without seafaring means and skills. Even with a sea-level drop of about 100 m during the LGM, this source was still 30 km away from the nearest part of the main Japanese island, at the southern tip of the Izu Peninsula (**Fig. 6**).

The earliest evidence of obsidian procurement activities in the Japanese Islands was recognized at the Idemaruyama site, Cultural Layer I, from geologic layer BBVII (black band VII) at the foot of the Ashitaka Mountain region of Numazu City in Shizuoka Prefecture, Central Japan.

HU ISSN 1786-271X; urn: nbn: hu-4106 © by the author(s)

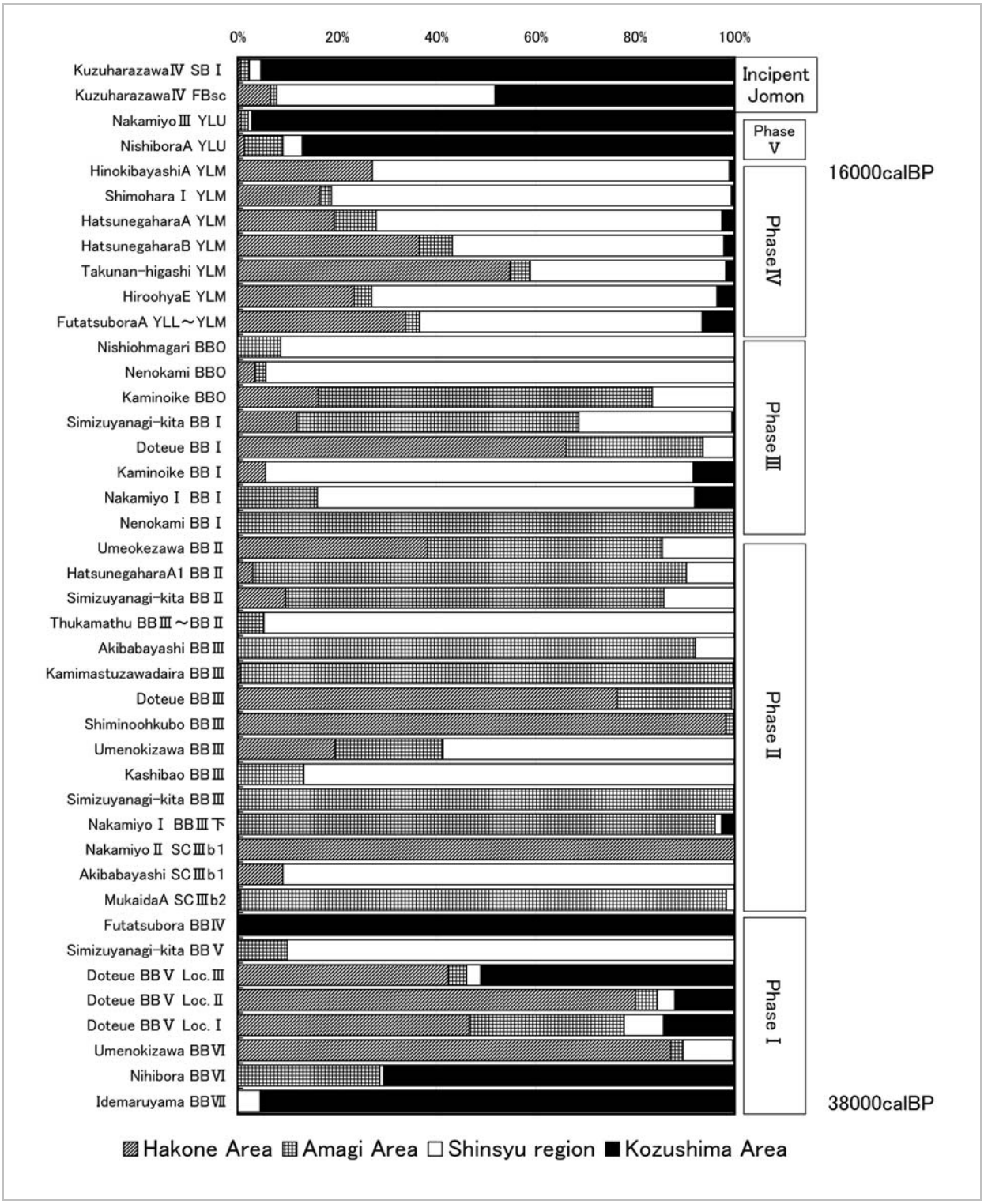

Fig. 9.: Changes of obsidian source exploitation through the cultural sequence in Mt. Ashitka and Mt. Hakone area, central Japan. Black bars indicate that these obsidian were transported from Kozu Island, i.e., exclusively from the Onbase Islet. (Ikyea, 2012)

9. ábra: Az obszidián források kitermelésének változása az Ashitka és a Hakone hegységek körzetében, Közép-Japán. A fekete csík a Kozu szigetről (=Onbase szirtek) felől érkező nyersanyagot mutatja

It was dated as early as ca. 38,000 cal BP (Takao and Harada, 2011; Nakamura, 2012). The provenance analysis on the obsidian from the Idemaruyama site, Cultural Layer I, has clarified that a total of 21 from 24 samples were from the Onbase Islet (Ikeya, 2011) (**Fig. 9**).

As the distribution pattern of the early Upper Palaeolithic sites moves from Kyushu in the south to the northern part of Honshu, but is not found in northernmost Hokkaido, the first peopling of the Japanese Islands indicates a migration from the Asian mainland through the Korean Peninsula. This is explicit evidence that modern hominids expanded into East Asia, and they reached the Japanese Islands by crossing the Tsushima Strait. In the process of expansion from west to east within the Japanese Islands, it would be highly possible that they found and developed obsidian as a quite suitable lithic raw material for tool production, as well as having invented edge-ground stone adzes.

Acknowledgement

Sincere thanks are due to Dr. K. Biro for her kind arrangement of our lecture in Budapest and for giving us the opportunity to submit this manuscript. Thanks are also due to Mr. Y. Nakamura who kindly made arrangements on the Figure 2.

References

Agency for Cultural Affairs (ed.) (2004): Buried Cultural Properties Statistical Data. (http://www.bunka.go.jp/bunkazai/shoukai/pdf/toukei_2012.pdf#search)

IKEYA, N. (2011): Provenance of obsidian from the Idemaruyama site by X-ray fluorescence analysis. (in Japanese) In: Y. Takao and Y. Harada (eds.) *Idemaruyama Excavation Report*, Cultural Properties Research Report of the Numazu City, **100** 111–116.

IKEYA, N. (2012): Identifying the Sources of Archeological Obsidian in Chubu and Kanto, Japan by EDXRF Analysis. *Natural Resource Environment and Humans*, Proceeding of the Center for Obsidian and Lithic Studies, Meiji University. **2** 94–97.

IZUHO, M., FUMITO, A., NAKAZAWA, Y., IWASE, A. (2012): The Upper Palaeolithic of Hokkaido: Current evidence and its geochronological framework. In: A.Ono and M. Izuho (eds.) *Environmental Changes and Human Occupation in East Asia during OIS3 and OIS2*. BAR International Series, Archaeopress, Oxford **2352** 109–128.

Japanese Palaeolithic Research Association. (2010): *Palaeolithic Sites in the Japanese Islands: A Database*, Japanese Palaeolithic Research Association. (in Japanese) 377 p.

KAIFU, Y. & FUJITA, M. (2012): Fossil record of early modern humans in East Asia. *Quaternary International* **248** 2–11.

KIMURA, H. (2006): The Shirataki obsidian mine area and the Yubetsu-Horokazawa technological complex. *Current Research in the Pleistocene* **23** 9–11.

KONISHI, S. & YOSHIKAWA, S. (1999): Immigration times of the two proboscidean species, *Stegodon orientalis* and *Palaeoloxodon naumanni*, into the Japanese Islands and the formation of land bridge. (in Japanese with English abstract) *Earth Science (Chikyu Kagaku)*, **53** 125–134.

KUDO, Y. (2012): Absolute chronology of archaeological and paleoenvironmental records from the Japanese Islands, 40-15ka BP. In: A.Ono and M. Izuho (eds.) *Environmental Changes and Human Occupation in East Asia during OIS3 and OIS2*. BAR International Series, Archaeopress, Oxford **2352** 13–32.

KUDO, Y. & KUMON, F. (2012): Palaeolithic cultures of MIS3 to MIS1 in relation to climate changes in the central Japanese islands. *Quaternary International* **248** 22–31.

KUMON, F., KAWAI, S., INOUCHI, Y. (2012): High-resolution climate reconstruction for the past 72ka from pollen, total organic carbon (TOC) and total nitrogen (TN) analysis of cored sediments from Lake Nojiri, Central Japan. In: A.Ono and M. Izuho (eds.) *Environmental Changes and Human Occupation in East Asia during OIS3 and OIS2*. BAR International Series, Archaeopress, Oxford **2352** 1–12.

MACHIDA, H. & ARAI, F. (2003): *Atlas of tephra in and around Japan*. University of Tokyo Press.

NAKAMURA, Y. (2012): The Chronological Study of the Initial Upper Palaeolithic Industries around Mt. Ashitaka and Mt. Hakone (Central Japan). (in Japanese with English abstract) *Palaeolithic Research* **8** 105–122.

ONO, A. (1997): Self-reflection on archaeology: a Japanese perspective since 1945. *In* Beat Sitter-Liver and Christoph Uehlinger (eds.) *Partnership in Archaeology: Perspectives of a Cross-Cultural Dialogue*, 14th Symposium (1994) of the Swiss Academy of Humanities and Social Sciences in Cooperation with the Swiss-Lichtenstein Foundation for Archaeological Research Abroad, Fribourg University Press, Switzerland. 75–79.

ONO, A. (2011): Frameworks and the present state of Palaeolithic studies in Japan. (in Japanese with English abstract). *Anthropological Science (Japanese Series)*, **119/1** 1–8.

ONO, A., HARUNARI, H., & ODA, S. eds. (1992): *Atlas of Japanese Archaeology.* University of Tokyo Press.

ONO, A., SATO, H., TSUTSUMI, T., KUDO, Y. (2002): Radiocarbon dates and archaeology of the Late Pleistocene in the Japanese Islands. *Radiocarbon* **44/2** 477–494.

Sagamihara City Board of Education ed. (1998): *Excavations of Tana-mukaihara Palaeolithic site*. An illustrated pamphlet.

Sagamihara City Board of Education (ed.) 2004. *Tana-mukaihara site II*. Sagamihara City Archaeological Excavation Report **31**.

SUWAMA, J. (2003): Palaeolithic industries of the lowermost part of the Tachikawa Loam layer in South Kanto. (in Japanese). *Abstract volume of the 1st Symposium of the Japanese Palaeolithic Research Association* 42–52.

SUGIHARA, S. ed. (2009): *Geologic source identification of archaeological obsidian by X-ray Fluorescence Analyzer: A data book*, (in Japanese). Meiji University Cultural Properties Laboratory, **Vol. 1** 1–294.

TAKAO, Y. & HARADA Y. (eds.) (2011): *Idemaruyama Excavation Report*, (in Japanese). Cultural Properties Research Report of the Numazu City, **100** 1–120.

TANI, K. (ed.) (2000): *The Hinatabayashi B Site; The Hinatabayashi A Site; The Nanatsuguri Site; The Ohira B Site*, (in Japanese). Nagano Prefectural Archaeological Center. 1–275.

TSUTSUMI, T. (2010): Prehistoric Procurement of Obsidian from Sources on Honshu Island (Japan). Archaeopress, Oxford. In: Y. V. Kuzmin and M. D. Glascock (eds.), *Crossing the Straits: Prehistoric Obsidian Source Exploitation in the North Pacific Rim*. BAR International Series, **2152** 27–55.

TSUTSUMI, T. (2012): MIS3 edge-ground axes and the arrival of the first *Homo sapiens* in the Japanese archipelago. *Quaternary International* **248** 70–78.

HU ISSN 1786-271X; urn: nbn: hu-4106 © by the author(s)