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Number 16

PRECERAMIC JAPAN: SOURCE MATERIALS

Harumi Befu and Chester S. Chard

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INTRODUCTION

It is the aim of the present compilation to provide the Japanese-language source materials utilized in the editors' recent paper "Preceramic Cultures in Japan" (American Anthropologist, Vol. 62, No. 5, pp. 815-849, 1960). In conjunction with the western-language sources cited therein, the reader will therefore have at his disposal the necessary documentation both to amplify the summary picture presented and, if desired, to draw his own conclusions. We have omitted Japanese sources published prior to 1955 as of only historical interest at the present time; otherwise, all the Japanese references cited in our paper are reproduced here in translation, with the few exceptions explained below. We have also added a few supplementary items.

The best summary of current knowledge on the preceramic cultures of Japan is Chosuke SERIZAWA's 1957 work, Preceramic Culture (Mudoki Bunka), which includes a valuable bibliography. Our paper drew most heavily on this useful compendium, and it is therefore placed first among the appended translations. The rapid pace of research in this field makes it necessary, of course, to supplement any general treatment of this sort. We have therefore attempted to bring it up to date by incorporating, in the form of footnotes, the new data and interpretations contained in the same author's two subsequent but shorter surveys, Cultures Hidden in the Loam Formation: Pre-Jomon Period (Romu-so ni Hisomu Bunka: Sen-Jomon Jidai), 1959, and The Stone Age of Japan (Sekki Jidai no Nihon), 1960.

Sosuke SUGIHARA's earlier pioneer work on preceramic cultures, Stone Age Culture Before the Jomon Culture (Jomon Bunka Izen no Sekki Bunka),

1956, is still of value, especially for its fuller treatment of such important sites as Iwajuku and Takei. It is therefore reproduced here in full.

The information in these two general surveys was supplemented by the examination of site reports and discussions of particular topics. Those actually drawn on in writing our paper appear below, with five exceptions. Kodama and Oba's report on the Yubetsu site (Yubetsu Iseki no Hakkutsu ni tsuite) and Oba and Otani's report on the Kamitokoro site (Kitami-shi Kamitokoro Iseki) have been reserved for later publication in a volume of Hokkaido source materials. The Hakodate Municipal Museum's reports on the Tarukishi (1956) and Tachikawa (1960) sites, and Sugihara's report on the Iwajuku site (Gumma-ken Iwajuku Hakken no Sekki Bunka), have been omitted for the present since they contain extensive summaries in English.

The following three items, although not cited in our paper, provide supplementary information and serve to round out the documentation presented here: Kamaki's brief notice of the Kiyama site (Kagawa-ken Ayauta-gun Kiyama Iseki), Developments in Microlithic Problems: I. by Serizawa and Developments in Microlithic Problems: II -- Hokkaido by Yoshizaki.

Further editorial comment on the shorter papers seems unneeded, although we should particularly like to commend to the reader the one by Hayashi and Fujisawa as a vivid and charming picture of a field excavation in Japan. We should also mention that Kamaki's style is not always easy to understand; we hope that we have correctly conveyed his meaning.

In the eight months since our paper in the American Anthropologist was written a certain amount of new information has come to hand which amends, amplifies or elucidates various points in our discussion. Since

the present publication is designed to supplement the above-mentioned paper, this seems an appropriate place in which to bring it up to date (January, 1961) by setting forth these addenda in the form of a series of footnotes which the reader may insert in the text as indicated. We would also like to state that the Mikoshiba site (on pp. 823, 832, 837 and Plate 1) should be Kamikoshiba, and the Shiroyama site (pp. 823, 830, 833, 837 and Plate 1) Kiyama. Tachikarushinai (pp. 822, 823, 834, 839 and Plate 1) may be optionally read Tachikarushunai; Washiuzan (pp. 821, 823, 939, 833, 837 and Plate 1) may be optionally read Washuzan; and Ijima (pp. 820, 821, 823, 828, 830, 833, 837 and Plate 1) may be read Ishima.

(page 817, end of fourth paragraph)
Hisashi Suzuki has recently discovered human fossils at two sites in central Japan in indubitably Pleistocene deposits. At one of these sites (Ushikawa, Aichi Prefecture) a middle section of humerus was found. According to Suzuki it belonged to a mature female about 135cm tall. At the other (Mikkabi, Shizuoka Prefecture) portions of skull and a fragment of limb bone were found with Pleistocene fauna. (Suzuki 1960: 29-50)

(page 819, line 32)
For lack of any good illustration of the Araya burin from its type site at the time of writing, we used for illustration a specimen from the Tachikawa site which was labelled as the "Araya type" (See Pl. 3f). Yoshizaki, an investigator of the Tachikawa site, now seems inclined to retract his classification of Tachikawa burins as belonging to the Araya type. For this type of burin from the type site, see Serizawa, 1959, fig. 40a. (Personal communication from Yoshizaki)

(page 820, end of second paragraph)
To be more accurate, this implement from Shirataki Locality 13 should perhaps better be described as "resembling" a heart-shaped hand axe. (Personal communication from Yoshizaki)

(page 820, line 28)
There are actually two separate sites at Yadegawa, one yielding microblades and the other Serizawa's "geometric microliths." (Personal communication from Mitsunori Tozawa)

(page 820, line 34)
The characteristic which more than anything else distinguishes the kiridashi knife of the Inland Sea from others is that it is struck from the core by dealing a blow at about the midpoint of the length of a flake on which the knife is made, rather than at its end.

(page 831, end of first paragraph)
Sugihara has recently excavated a site (Sannenyama) in northern Kyushu which produced large points, up to 21cm long. They are bifacially retouched by the step-flaking technique (some possibly by pressure flaking) and are said to be thick and narrow. (Sugihara and Tozawa 1960)

(page 838, end of first paragraph of text)
Serizawa and Kamaki have recently excavated two stratified rock-shelter sites in northern Kyushu. These are noteworthy for three reasons: (1) they are the first pre-Jomon rock-shelter sites discovered in Japan; (2) they are among the few stratified preceramic sites; and (3) the stratification involves both preceramic and Jomon levels.

At one of the two (Fukui) nine layers were discerned, starting from the top: (1) Initial Jomon, rouletted pottery; (2)-(3) Hitherto unknown

types of Jomon pottery mixed with microblades and boat-shaped microcores (association of the pottery with stone tools still uncertain); (4) hardly any pottery; obsidian conical cores and microblades and sanukite points and scrapers; (5)-(6) hardly any artifacts; (7) small blades (larger than microblades) and their cores; (8) no artifacts; and (9) some sanukite flakes. (Personal communication from Serizawa)

The stratigraphy of the other site (Naoya) was as follows: (1) very thin humus containing some sherds and Chinese coins; (2) Jomon sherds, arrowheads, microblades, boat-shaped cores, points, and scrapers; (3) sanukite points and scrapers; (4) small blades and their cores, corresponding to Fukui (7), above. (Personal communication from Serizawa)

(page 840, end of fifth paragraph)
Yoshizaki, who has had a great deal to do with establishing the Hokkaido chronology proposed above, is now in favor of reversing the order of Shirataki Localities 33 (stage 3) and 30 (stage 4), making Locality 30 antedate Locality 33. He also proposes to place Tachikawa Locality I (stage 6) after the Tachikawa Locality III. (Personal communication from Yoshizaki)

(page 841, end of third paragraph)
Although it is technically correct to say that no artifact has been found below the Tachikawa formation, it should be noted that the level in which the Gongenyama I was found may possibly correlate with the Musashino formation which immediately underlies the Tachikawa. It still remains true that Middle Pleistocene finds are as yet non-existent in Japan, inasmuch as the Musashino formation is regarded as early Upper Pleistocene. (See Serizawa, 1957, for details of geological findings.)

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MATERIALS

Translations of the following Japanese publications are appended. These are full and complete except for a very few irrelevant sections, omission of which is clearly indicated. The majority of the translations were carried out by the junior editor, Harumi Befu, Project Assistant in the Department of Anthropology, University of Wisconsin. The remainder are by James Araki, then a graduate student in the Department of Oriental Languages, University of California (Berkeley); Hiroaki Okada, graduate student in the Department of Cultural Anthropology, Tokyo University; and Hiroko Sue, graduate student at Bryn Mawr College. All line illustrations and diagrams have been re-drawn. Half-tone illustrations have been reproduced by photocopying; the results in each case are determined by the quality of reproduction in the original source. Translations are listed below alphabetically by author, except that our primary source, Serizawa's Preceramic Culture (1957) is placed first.

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NOTE: Citations of sources in the Japanese texts translated here are almost always incomplete. No attempt has been made to supply bibliographic information in this translation series beyond what is provided in the original text. For complete citations, the reader is referred to the forthcoming annotated bibliography of source materials on Japanese preceramic culture edited by H. Befu, C. S. Chard and A. Okada in Arctic Anthropology.

PRECERAMIC CULTURE

(Mudoki Bunka)

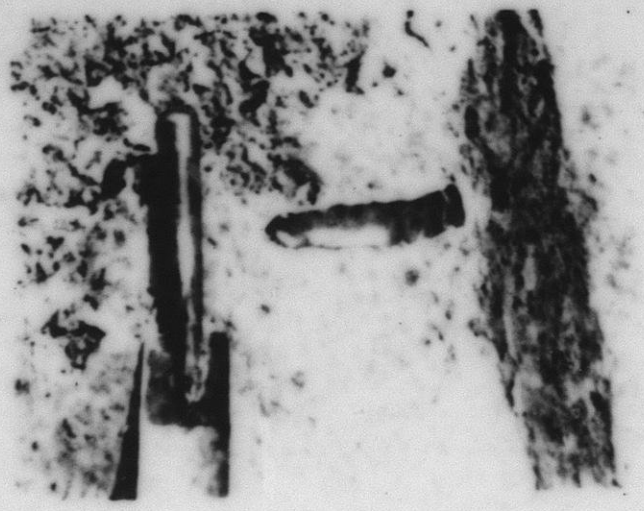
by Chosuke SERIZAWA

(Part 1 of Kazuchika Komai and Ichiro Yawata, eds., Kokogaku Noto /Notebooks in Archaeology/, Vol. 1: Senshi Jidai /Prehistoric Ages/, Tokyo, Nihon Hyoron Shinsha, 1957).

CHAPTER I

HISTORICAL PERSPECTIVE

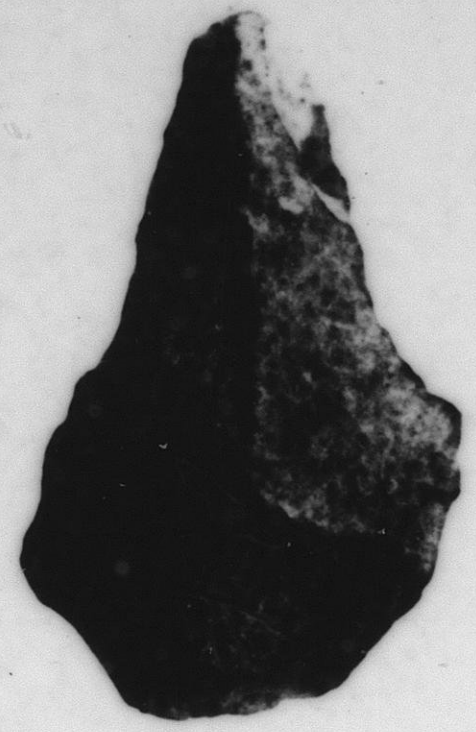
It has been the accepted notion in Japanese archaeology, at least until 1949 or 1950, that the oldest culture in Japan was the Jomon culture. The discovery of the Iwajuku site, however, suddenly raised problems concerning cultures older than Jomon. This discovery made it evident that there had been people in Japan without pottery or ground stone tools and that artifacts left by them are deposited in the so-called Kanto loam layers, which were formed toward the end of the Pleistocene period. It also demonstrated that, since all Jomon pottery is found in the black top soil, "cultures without pottery," which are found in the loam strata below it, must necessarily belong to an older period. During the seven years since then, interest in this new field has stimulated researchers all over the country. By now, almost nation-wide investigations of sites and artifacts of the preceramic era are being conducted from Hokkaido in the north to the Chugoku (Southwestern Honshu) and Kyushu to the south. Thus the history of research on preceramic cultures in Japan began for all practical purposes in 1949. However, problems regarding the possible presence of Palaeolithic culture in Japan had been raised, and some research done, long before this date. It is, therefore,



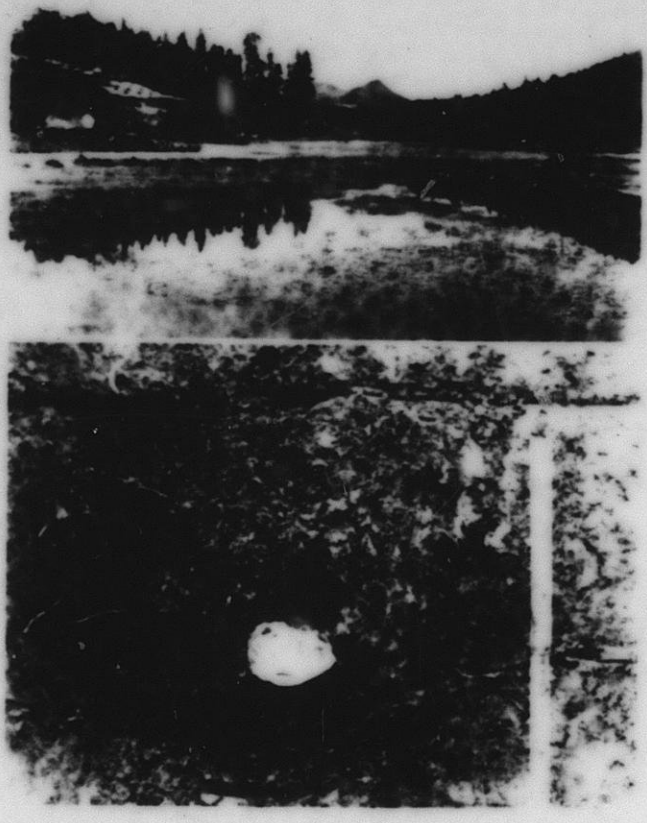
Frontispiece (originally in color): A blade *in situ* at the site of Shirataki, Mombetsu County, Hokkaido.



I. Core from Shirataki, Mombetsu County, Hokkaido. (Actual size) (Property of Yoshito Hiramatsu)



II. Hand-axe (Gongenyama I type) from Gongenyama, Isezaki City, Gumma Prefecture. (Property of Tadahiro Aizawa)



III. Top: The Iwajuku site in Kasagake Village, Nitta County, Gumma Prefecture, viewed from distance.

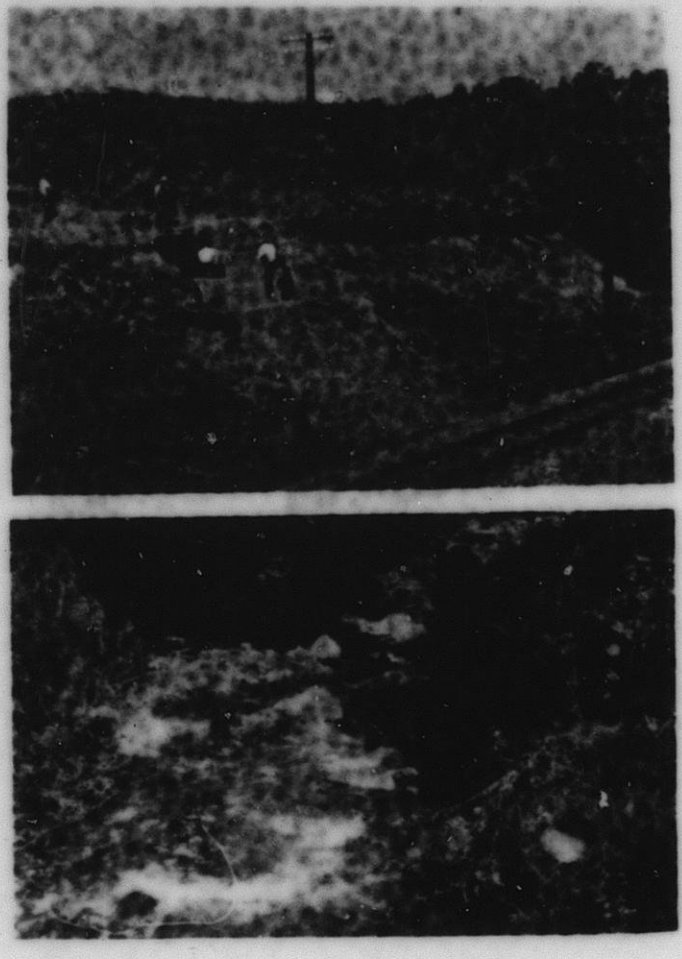
Bottom: Hand-axe *in situ* at the same site.



IV. Artifacts of Iwajuku I industry from Iwajuku, Kasagake Village, Nitta County, Gumma Prefecture. (Property of Meiji University)



V. Artifacts of Iwajuku II industry from Iwajuku. (Property of Meiji University)



VI. Top: Excavation in progress at Shirataki, Mombetsu County, Hokkaido.

Bottom: A location producing obsidian near the Shirataki site.



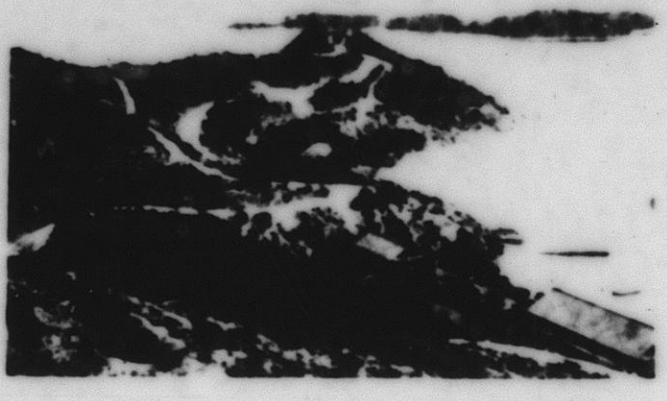
VII. Blades, gravers and spalls from Shirataki. (Property of Yoshito Matsudaira)



VIII. "Boat-shaped" tools from Shirataki. (Property of Yoshito Matsudaira)



IX. A recombined set of blades, showing the process of flaking in succession. Specimens are from Narita, Kagamiishi Village, Iwase County, Fukushima Prefecture. (Property of the Abukuma Archaeological Museum)





X. Top: The Washiuzan site in Shimotsui, Kojima City, Okayama Prefecture.

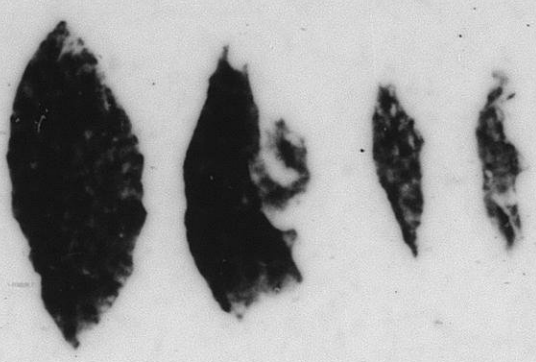
Bottom: Specimens from the same site. The left three are from the lower bed and the right two from the upper bed. (Property of the Kurashiki Archaeological Museum)



XI. Knife blades from the Nojiri Lake bottom, Shinanojiri Village, Shimominochi County, Nagano Prefecture. (Property of Toranosuke Ikeda)



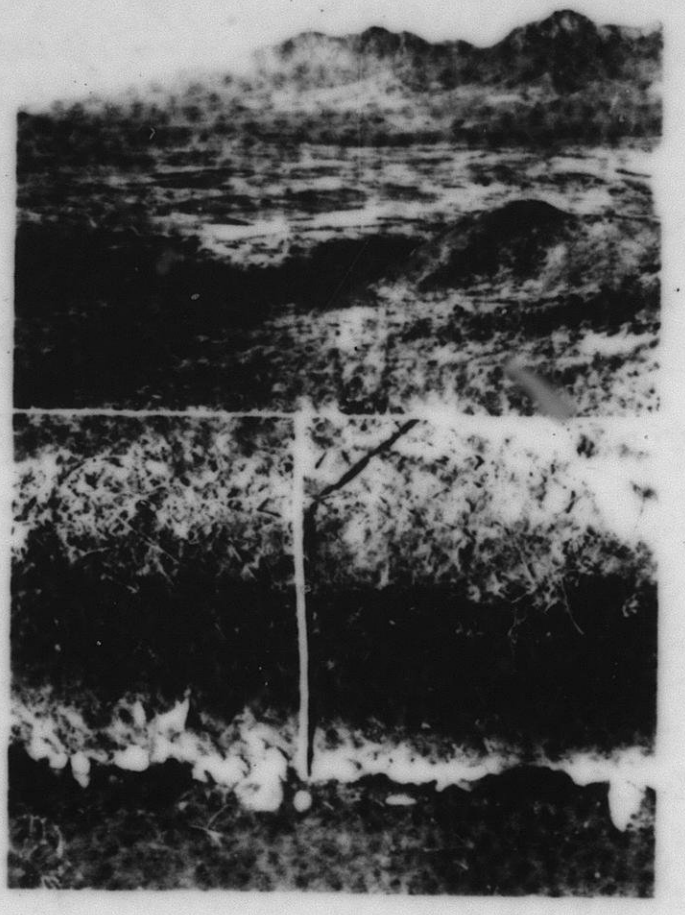
XII. Deliberately arranged pebbles found in loams at Tonogayato, Shimokokubunjicho, Tokyo. (Excavated by Itaru Yoshida)





XIII. Top: Points discovered at Babadaira, Kawakami Village, Minamisaku County, Nagano Prefecture.

Bottom: Erect pebble (left) found in the loam of the same site.



XIV. Top: The Yadegawa site from distance, Minamimaki Village, Minamisaku County, Nagano Prefecture.

Bottom: Stratigraphy of the same site.



XV. Micro-blades (top three rows) and micro-cores from the Yadegawa site. (Property of Meiji University)



XVI. Top: L. S. B. Leakey bisecting a flint rock.

Bottom: Leakey demonstrating the cylinder hammer technique.

convenient to divide the history of research on the preceramic culture in Japan into two periods, with the excavation of the Iwajuku site by Meiji University in 1949 as the point of demarcation.

During the Meiji era (1868-1912), some scholars were already discussing whether Japan had been occupied in the Palaeolithic period. In 1886 the first issue of the Reports of the Anthropological Society /Jinruigakkai Hokoku/, the forerunner of the current Journal of the Anthropological Society of Nippon /Jinruigaku Zasshi/, was published. There appeared on its last page six rubbings of stones reminiscent of spearheads, accompanied merely by a brief remark to the effect that these spearheads are not "natural." This was followed by an interesting article entitled "The Spearheads are Naturally Made," which appeared in the Journal of the Anthropological Society of Tokyo /Tokyo Jinruigaku Zasshi/, no. 131, 1897. It reads:

> "From strata of the Tertiary period in the provinces of Shinano, Echigo and Ishikari, a type of stones resembling spearheads has been found. (In Shinano these are called 'gennoishi' and in Echigo 'yariishi.') At the end of the first issue of the present journal, these stones were shown in rubbings, with Mr. Jimbo's remark that these spearheads are not natural. Several days ago an Englishman by the name of Holmes visited the Department of Anthropology in the Faculty of Science and proudly discussed his discovery of stone tools in Tertiary strata (by which tools he meant these spearheads). Dr. Tadashi Hiki has made a special study of

these spearheads and demonstrated that they are natural rocks called 'gay-lussite.' The result has been published in the Journal of Geology [Chishitsugaku Zasshi], no. 40. I shall present the result in the following with his permission."

Hiki's mineralogical findings of the rocks are then presented; according to him they were formed in lowland lakes and ponds of the Tertiary period, and are definitely the negative impressions of a certain type of minerals.

As the "spearheads" were shown to be a trick of nature, the question of Palaeolithic culture in Japan came to an end for the time being. Much later, a similar sort of stones was reported by Kashiwa Oyama in the August, 1941, issue of the Journal of Prehistory [Shizengaku Zasshi].

A scholar who deliberately took up the problem of the Palaeolithic culture of Japan was an English physician, N. G. Munro, who practised in Yokohama. The first chapter of his book, Prehistoric Japan, is on the Palaeolithic age, which he discussed roughly as follows.*

"The 'stone age' is found to present two aspects, an older or Palaeolithic, characterized by roughly flaked tools, found in Pleistocene deposits, and a

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*
In the Japanese text, the passage to follow is not a complete or accurate translation of Munro. It is, instead, a rough translation of excerpts from pp. 38-40 of the work cited. In order to be faithful to the Japanese text, the English passage to follow is not taken directly from Munro's work, but is translated from the paraphrased Japanese text.--tr.

newer or Neolithic, known chiefly by the finish of its implements, which are smoothed or chipped, and are found in alluvial deposits. In Japan, as in Denmark, however, implements of very rough finish are found in Neolithic strata. The impression from a hasty glance is that they are Palaeolithic implements. But crude finish does not necessarily imply a Palaeolithic tool. We may regard these implements as survivals of the Palaeolithic phase. Palaeolithic artifacts are those which are found in the Pleistocene deposits. In Japan, where these crude implements are found in post-Pleistocene, alluvial deposits and always with pottery and implements of polished stone, it cannot be maintained that they belong to the Palaeolithic period....

"In the summer of 1905 I observed that the breccia of conglomerate, in the basin of the Hayakawa, Kanagawa Prefecture and elsewhere, sometimes resembled in its fracture that of the eoliths or crude Palaeoliths found in Europe and America.... In the valley of the Sakawegawa, during the same summer, I found the stones here illustrated (in a photograph in the original work). Five of these I took from the gravel; one from the red clay immediately overlying the gravel. In the case of flint implements, the comparative ease with which flaking can be carried out renders the evidence of design less

difficult to decipher than in the case of igneous rock, of which these are made. These specimens are therefore not sufficient to definitely establish the existence of Palaeolithic man in this country, though I venture to think they are suggestive.

"My excavation was too limited to ascertain the co-existence of animal remains, but fossil bones of elephant, bear, deer, ox, horse, rhinoceros and other animals have been found in Japan. During the Tertiary period Japan must have been connected with the continent of Asia and it is highly probable that Java, where Pithecanthropus erectus was found, occupied the same relation to the mainland. These primitive offshoots from the anthropoid into humanity probably roamed along the coast of Asia and we may be sure that Japan received her quota in proto-lithic times."

Munro, then, believed in the existence of a Palaeolithic culture in Japan. Examination of the accompanying photograph makes it evident, however, that the specimens can hardly be artifacts and that they seem to be natural pebbles. Although he was correct in principle, his specimens were unfortunately not man-made.

In 1917 Teikichi Kita presented in the Report of the Committee on the Investigation of Historical Sites /Shiseki Chosa Iinkaiho/ the following findings on stone implements found at the Kokofu site.

"The most interesting, and scientifically the most valuable piece of information about this site is that,

implements of a different type found in a deeper stratum... This site was covered with ordinary top soil about 1 or 2 feet thick, in which were found ordinary stone arrowheads and dart points. These are rather well made. Underneath this level, there is a gravel layer about 5 or 6 feet thick, below which there is a clay layer. It is in this layer that large stone tools which are without detailed trimming and entirely different from those in the overlying layer were found. Examination of these implements shows that the manufacturing method is indeed immature and cannot be compared with that of the implements from the overlying level. This means that in the extremely distant past, when this clay layer was being formed, there had long been some primitive stone age people living here. Later this area became a river bed and was covered by gravels, which after several hundred or thousand years accumulated 5 or 6 feet. With a later change in the course of the river, a different soil layer was formed on top of it; and finally another, this time a more advanced, stone age people came to occupy this area. Sites of this sort are known in Europe, but are rare in Japan. This is a valuable site which serves to demonstrate the occupation by man of Japan from extremely ancient times."

Greatly impressed by Kita's report, Kosaku Hamada planned an investigation of this site. The Kokofu site excavation which resulted is

well known to all of us. Strangely, the clay layer underneath the gravel was never investigated. This was probably because, on the one hand, in accordance with the thinking current in those days, the investigators did not expect to find artifacts underneath the gravel layer, while on the other hand, the large number of human skeletons of the Early Jomon period which began to be unearthed at Loc. B of the site, doubtless served to divert the investigators' attention. In the Report of the Excavation of a Stone Age Site at Kokofu, Kawachi Province, and Other Matters /Kawachi Kokofu sekki jidai iseki hakkutsu hokoku to/, published in 1918, Hamada considered that, though the large, palaeolith-like pieces were very similar to those of the Acheulean implements of Europe, the discrepancies in time and the distance between the two render the resemblance purely coincidental. Visiting the site last year and inspecting the gravel layer in question, I came to the conclusion that it is quite possible to discover artifacts from the clay layer underneath. Had they been willing to dig several feet deeper, during the 1917 excavation, research on Palaeolithic problems in Japan might have taken an unexpected stride.

In the August, 1929, issue of the Journal of Geology (Chishitsugaku Zasshi) there is an article entitled "On an eolith-like stone fragment found on the Tsubakiyama Beach in the Province of Mutsu /Mutsu Tsubakiyama kaigan yori hakkutsu seru eorisu-yo no sekihen ni tsuite/." The term "eolith," referring to a proto-stone tool, has long been used in Europe to designate pre-Palaeolithic stone fragments whose human manufacture is of some doubt. Hiroshi Sone collected two stone specimens of seeming

human fabrication on the Tsubakiyama Beach at the tip of the Natsudomari Peninsula in Aomori Prefecture. Subsequently he collected additional similar specimens, which, to him, were clearly human artifacts. Unable to discern the stratigraphic position of these, he judged that they had been buried in Pleistocene deposits which were later covered up by the sea water, and had been washed ashore for some unknown reason. Like Munro, Sone also argued that Japan in the Pleistocene times was still connected with the continent and was occupied by Palaeolithic man. The eolith-like objects, however, remain eolith-like, and their stratigraphic position has never been ascertained.

About the same time Nobuo Naora independently began his research on Palaeolithic culture in Japan. In May and June of 1931 he published in the Journal of the Anthropological Society of Nippon an article entitled "Human remains discovered in the Pleistocene deposits on the Nishiyagi Beach in the Province of Harima /Harima no kuni Nishiyagi kaigan kosekiso-chu hakken no jinrui ibutsu/." The objects which he regarded as artifacts were found in gravel and clay layers of Pleistocene deposition on the Nishiyagi Beach. These gravel and clay layers lie in disconformity on top of a layer which has produced fossilized Stegodon parastegodon. Naora considered that his finds belonged to the Middle Pleistocene period. The same layer which produced the so-called "artifacts" also yielded parastegodon, Paleoloxodon Naumanni, deer horns and other animal fossils. There would have been no complaint had the "artifacts" been in fact artifacts. Examination of the illustrations and photographs of the objects in question, however, hardly convinces us of

their human fabrication.

On January 8, 1931, Naora discovered a "human bone" from an exposed gravel layer on the Nishiyagi Beach. This is the bone which was later christened Nipponanthropus akashiensis by Kotondo Hasebe. In the July, 1948 issue of the Journal of the Anthropological Society of Nippon, Hasebe wrote an article called "A human coxal bone from Lower Pleistocene deposits at Nishiyagi /Akashi-shi fukin Nishiyagi saishinsei taiseki shutsudo jinrui no yokotsu (sekko-gata) no genshisei ni tsuite/." The bone in question was destroyed with Naora's home during the war. But a cast of it was still preserved in the Department of Anthropology of Tokyo University. Hasebe's interest was aroused when he happened to come across this cast. He concludes his paper as follows: "This pelvic bone is definitely human and clearly differs from that of anthropoid apes. On the other hand it is considerably different from pelvic bones of modern man in having the above-stated primitive features, which are absent in Homo sapiens. Worthy of note is the great size of its major ischiatic notch. Among anthropoid apes, the angle of this is nearly 180°. In Homo sapiens it generally forms an acute angle, right angle or slightly larger than right angle for males, a fact which is related to man's erect posture. It may be inferred that the owner of the present bone had a slouched posture." Kenji Kiyono has expressed some doubts, on pathological grounds, regarding Hasebe's conclusion. As outsiders, we cannot judge the logic of this argument.

The crux of the problem lay in re-examination of the site and gathering of more evidence. Accordingly in April of 1948, in order to subject

this problem to a thorough investigation, a special committee was created in the Society for Scientific Research /Gakujutsu Kenkyu Kaigi/ to investigate the geological strata which had contained the problematic fossil in the western suburb of Akashi City. Investigation of the site continued for over a month, from mid-October to mid-November of 1948. The result was published in a report entitled "On the stratum which produced the so-called Nipponanthropus /Yuwayuru 'Nipponantoropusu' no sanshutsu chiso ni tsuite/," prepared by two geologists, Toji Takai and Toshio Tanai. Their conclusion was that "in sum, the greatest weakness is the fact that the fossil in question was collected from an exposed side of a cliff. We were not able to collect any data, through our present investigation, which might help discern the level from which the so-called Nipponanthropus had been produced. If Naora's statements were correct, it should have come from a level in strata (c)-(d); but here we are confronted with many doubts regarding the manner in which it might have been produced." Hitoshi Watanabe, who investigated the possibility of finding any artifacts in the gravel deposits, wrote a paper called "The naturally made pebbles in the Nipponanthropus level /Nipponantoropusu-so no shizen hasaireki/," in which he states that "thus, the fracturing of pebbles found in the Nipponanthropus level seems to be due to weathering and other mechanical processes. Moreover, nothing even seemingly man-made was found outside Locality 1." Naotsune Watanabe who investigated the question of whether preservation of fossils was likely in this level, presented a paper entitled "Possibility of preserving fossil bones in the fossiliferous bed in the western suburb of Akashi /Akashi kinko gankaseki-so ni okeru hone no hozon

kanosei/." His conclusion was a pessimistic one: "whether the problematic coxal bone was actually fossilized by limonite and other ferrous minerals or not, it is highly doubtful, judging from the soil characteristics and from the condition of the shells preserved in the level in question, that a bone could have remained in its original form, as seen in the plaster cast, in strata (c)-(d) or in the gravel stratum (d), from which the said pelvic bone is supposed to have been obtained." In short, the investigation only served to deepen the mystery surrounding the questionable Nipponanthropus.

In 1933 Kashiwa Oyama published a paper entitled "Palaeolithic controversies in Japan /Nihon Kyusekki bunka sompi kenkyu/." During his stay in Europe, Oyama devoted most his time to studying Palaeolithic culture. After his return to Japan, his interest in this field continued. It was indeed Oyama who made the Palaeolithic cultures of Europe first known to the Japanese. About this time the Journal of Prehistory /Shizengaku Zasshi/ (first published in 1927) carried many articles on Palaeolithic culture. "Palaeolithic controversies in Japan" was not a discussion of the possibilities of finding Palaeolithic culture in Japan, but was instead a summary of the European Palaeolithic cultures, understanding of which is of course basic to such a discussion. In those days, problems regarding a possible Palaeolithic culture were so vaguely defined that even specialists like Oyama were in fact groping in darkness. In order to investigate this problem, it is true, he did excavate a cave in Iwate Prefecture with Koganei and others--but without any substantial result.

In 1939 Joji Nagasawa published in Shigaku an article called "A Palaeolithic human artifact at Hiyoshi, Kanagawa Prefecture /Kanagawa-ken Hiyoshi

no kyusekki jidai jinrui ibutsu/." According to this, he had discovered a polished, spoon-shaped bone implement in gravel deposits in the upper part of a Pleistocene formation. As I have not seen the specimen, I cannot judge its authenticity. The general consensus, however, is that its human fabrication is at least questionable.

All of the studies discussed above seem to suffer from the same shortcomings. For one, they all lack any absolute certainty that the specimens discovered are man-made. Depending on who examines them, their human authorship seems "doubtful" or "questionable." Moreover, none was excavated scientifically, that is, with careful preparations and planning. As a result, some elements of fundamental importance have always been missing--such as discovery of a number of artifacts of similar type in a given stratum, or discovery of dwelling remains. In other words, methods used in these attempts to discover Palaeolithic culture in Japan were not strictly archaeological; instead, they were palaeontological, geological, or physical anthropological.

In 1920 Heijiro Nakayama published a series of articles called "Stone age sites with uncertain pottery association /Doki no umu misho naru sekki jidai no iseki/" in the Journal of the Archaeological Society of Nippon. He had noted that some of the sites in northern Kyushu are, curiously, hardly associated with pottery, while producing a large quantity of stone arrowheads and chipped pieces of stone. He considered that perhaps these potteryless sites belonged to the pre-Yayoi period. (In those days, it was considered that Jomon pottery did not exist in northern Kyushu.) He states: "It seems proper to regard them to be pre-agricultural. And it may very well be that

they are some of the oldest sites ever discovered in Japan." In our modern frame of reference, he was contemplating the possibility of the presence of a non- or pre-pottery culture. Though it was a suggestive foresight, unfortunately no follow-up investigation ensued.

The period up to this date may be called one of groping in the darkness in search of Palaeolithic culture in Japan. Many years elapsed during this period. Even with the earnest effort of such scholars as N. Naora, no substantial findings were made until the end of World War II. On the other hand, research on the Jomon culture rapidly progressed in the late 1920's. An adequate chronology had been formulated, on the basis of which problems centering around the origin and termination of the Jomon culture were investigated. Needless to say, this was due principally to the tireless effort of such dedicated scholars as Kiyoo Yamanouchi, Ichiro Yawata, Isamu Kono and others. Japanese archaeology may be proud of the refined quality of its scholarship and the systematism of its research in the field of Jomon culture. In the study of that portion of the Jomon period called "Initial," in particular, Takayasu Shirasaki's discovery in 1939 of Inaridai style pottery was significant. For this style turned out to be earlier than any hitherto known pottery style in Japan. This discovery thus laid the foundation on which research on the origin of Jomon culture could be investigated on a more solid basis. According to Shirasaki, the Inaridai pottery was found about 10 centimeters down into the Kanto loam. Although many believed this report, we now know that this was wrong. Moreover, Inaridai is no longer the oldest Jomon style. If this loam was deposited near the end of the Pleistocene, then it may be inferred that

the cultural remains found on top of the loam were left there near the beginning of the post-Pleistocene. And if there were a culture older than this, then it would have to be found in the Kanto loam. Unfortunately there was a strong pre-conceived notion among Japanese archaeologists in those days that no artifact was to be found in the Kanto loam, which led them to overlook many important problems. It was a young archaeologist, Tadahiro Aizawa, who was instrumental in eliminating this misconception. It was he who discovered the Iwajuku site, leading to its excavation by the Department of Archaeology of Meiji University and the unearthing of a "preceramic" culture which had existed before the Jomon period. Prior to this discovery, the search for Palaeolithic culture in Japan had consisted of trying to find human remains and fossils in deposits of clearly Pleistocene formation. Our new method consists in searching in loam formations for lithic implements not associated with pottery, which would presumably belong to cultures of the time prior to the origin of pottery. It is insisted that the research method be archaeological. Of course, whether the deposit containing a preceramic complex is of Pleistocene or of post-Pleistocene formation cannot be learned in any way except through the geological study of the Kanto loam. The problems for the archaeologist are, first, to classify preceramic implements, then to determine the cultural groupings of the artifacts, and finally to study their changes through time. Let us summarize, then, along these lines, the progress of research on preceramic culture in Japan in the past seven years.

From September to October, 1949, the Department of Archaeology, Meiji University, with Professor Sosuke Sugihara in charge, excavated

the site at Iwajuku in Gumma Prefecture. This excavation should be long recorded in academic history as the first scientific excavation of a preceramic site in Japan. It was through this excavation that the existence of preceramic culture in Japan and its priority to the Jomon culture were definitely established. Moreover, the Iwajuku site was found to be stratified. That is, two superimposed cultural strata were found in the loam formation, viz., Iwajuku I (hand-axe industry) and Iwajuku II (kiridashi knife industry).*

In 1950 T. Aizawa discovered several sites: one at Masugata, Seta County, Gumma Prefecture, which produced boat-shaped tools and blades; one at Mitsuya, Oko Town, Gumma Prefecture, which produced points; and one at Gongenyama, Isezaki Town, Gumma Prefecture. N. Naora contributed palaeontologically through his discovery in Kusu Town, Tochigi Prefecture, of the upper portions of right and left humeri, which he considered to be human, in Cave 1, Quarry 10 of the Yoshizawa Limestone Company. Also, two bone fragments with traces of human workmanship were reportedly found among many fossils in Takanosuzawa Cave on the southwestern shore of the Akiyama River in Tochigi Prefecture.

In July, 1951 the Musashino Museum and the Department of Archaeology of Meiji University jointly excavated a site at Moro in Itabashi Ward, Tokyo. Here a type of implement different from those found at Iwajuku--a knife blade industry--was uncovered. In September of the same year, the Kurihara site, across the Shakuji River from Moro, was excavated;

*These and other technical terms will be defined in Chapter III below.--tr.

this site yielded microlith-like specimens.

After the Moro excavation, Itaru Yoshida of the Musashino Museum excavated sites at Kumanogo and Tonogayato near Kokubunji, Tokyo. The former site produced pebble tools and the latter kiridashi knives. We thus learned that the southern Kanto preceramic culture, too, had the same type of tools as in Iwajuku II.

In 1952 Eiichi Fujimori found and investigated a large quantity of blades and knife-blades in loam deposits at Chausuyama, Suwa City, Nagano Prefecture. After having inspected this site, I came to the conclusion that the points which had been found in large numbers at the immediately adjacent Odoriba site should also be regarded as preceramic.

In 1953 the search for preceramic sites suddenly acquired a new vigor. Professor Sugihara of the Department of Archaeology, Meiji University, stimulated by the points found at the Odoriba site, discovered a similar site at Uenodaira, an isolated hill west of Odoriba. The site was excavated in July and, as at Odoriba, yielded an abundance of finely made obsidian points. In August, Masaru Aso and Serizawa examined some points, knife-blades, blades and other specimens which had been found in northern Shinano and in the vicinity of Lake Nojiri. In September, Serizawa excavated the Babadaira site in Kawakami Village, Minamisaku County, Nagano Prefecture. Here were found at separate locations, large, crude points and small finely made points, respectively. What seems to be an intentional arrangement of pebbles was also found in loam. This was the first clear demonstration of the presence of projectile points in loam layers of Shinshu Province (Nagano Prefecture).

Excavation of preceramic sites in the Inland Sea area, which began just a few years ago, is now fully under way with Yoshimasa Kamaki as the leading figure. Points and microliths are the major types of finds. It should also be noted that Masakazu Yoshizaki has discovered in several parts of Hokkaido sites belonging to the preceramic period. Thus, it may be safely said that the study of preceramic culture has become a nation-wide undertaking in the past few years.

In March, 1954, Tatsuo Sato and Shigeru Kobayashi reported on stone tools in a level which does not contain pottery at Yoshimaru in the Chichibu region. In June of the same year, Sugihara of the Department of Archaeology, Meiji University, conducted two excavations, one at Maruyama, Ichikawa City, Chiba Prefecture, which produced kiridashi knives, and another at Takei, Saha County, Gumma Prefecture which produced points. At the latter site, a group of crude tools resembling backed blades were found in a black soil level underlying the layer which produced a large number of points. While searching for microliths in Minamisaku County, Nagano Prefecture, I discovered at Yadegawa, Minamimaki Village, a number of small blades and microcores, unassociated with other tool types. We thus succeeded in locating on a plateau of Mt. Nobe, 4,000 feet above sea level, the first purely microlithic site ever to be found in Japan.

It was immediately after the tragic Doya-maru incident, in which the ferry boat connecting Honshu and Hokkaido sank in a storm, destroying hundreds of lives, that the Tarukishi site in Suttsu County, Hokkaido was excavated by the Hakodate Museum, assisted by Hiromichi Kono, Masao Minato,

Sosuke Sugihara and Toshio Oba. This preceramic site produced principally rather typical blades. The Sankakuyama site at Ochiai, Kume Village, Kitatamo County, Tokyo, which became a newspaper topic because of the painted pebbles it produced, was also excavated in May of the same year by N. Naora. In the Inland Sea area Y. Kamaki investigated a site on top of Mt. Washiuzan, Shimotsui, Kojima City, Okayama Prefecture, and furnished an important report on the nature of the lithic industry of this granite area. Implements found at this site included microliths, points and long flakes, and the site was stratified into at least two cultural levels.

After 1954, the study of preceramic culture was no longer a narrowly limited field of inquiry. Archaeologists throughout Japan began to turn their hands to preceramic problems. The time had long passed when the existence of preceramic culture was held suspect. Inquiry into preceramic culture has won recognition as a legitimate field of study in Japanese archaeology and as a field in which serious research is greatly needed.

Let us survey some of the preceramic excavations and discoveries since 1954, starting from the western portion of Japan. We note first of all that in Kyushu small cores and points are beginning to be discovered, although these discoveries are still in uncertain status. Y. Kamaki of the Kurashiki Archaeological Museum and his associates have surveyed all the known preceramic sites scattered on the islands and along the coasts of the Inland Sea. They have already begun classificatory and distributional as well as chronological analyses of the available materials. Investigation

of the Ijima site, Naoshima Village, Kagawa Prefecture, in particular, has contributed notably to the study of microliths. In the Kinki (Osaka-Kyoto area), there had not been any definitely preceramic site until microliths were found, together with microcores, at several locations in Shima County, Mie Prefecture. Very recently there has been another microlithic site discovered in Gifu Prefecture, which is now being excavated by Nagoya University. In Nagano Prefecture, the Shinshu Loam Society /Shinshu Romu Kenkyukai/ has investigated the Furuyashiki site in Nishitsukushi County, near the border of Gifu Prefecture, unearthing a quantity of large points. Mitsunori Tozawa excavated the Yashima site at Kirigamine, Suwa County, Nagano Prefecture and found mainly a large number of points. We are now in the process of investigating the terraces near Tsunan Town, Nakauonuma County, Niigata Prefecture, which produced points, blades and gravers. At Yonekurayama in Yamanashi Prefecture, Suzuo Yamamoto has found obsidian objects which seem to be knives and blades. N. Naora, Tamotsu Nakazawa, Sohei Sugiyama and others have investigated a site producing kiridashi knives in Musashinocho, Nerima Ward, Tokyo. Kinnoji Enomoto, Hiroshi Takizawa and others have found kiridashi knives, mainly at Tamaribuchi in Musashinocho, at Hashido in Kitaoizumi, Nerima Ward and at Sakashita in Hoyacho, Kitatama County, all in Tokyo. At one of these sites, projectile points have also been found in a superimposed level. The abundance of kiridashi knives on the Musashino plateau is a noteworthy fact. At the foot of Mt. Akagi, in the northern Kanto (Tokyo Plain), T. Aizawa continues his earnest work, unearthing blades, points and microliths.

There are few reports from the Tohoku (northeastern Honshu) as yet. The site at Narita, Iwashiro County, Fukushima Prefecture, however, has been the subject of my own investigations. I have ascertained it to be a site producing solely shale blades. At Minamishinden, Haranomachi City, in the same prefecture, Kunimoto Takeshima has collected blades of seemingly graver form; their stratigraphic position is uncertain, however. For the northern half of the Tohoku, there has not been discovered a specimen of any significance, except Teruya Esaka's discovery of a knife-blade; its stratigraphic position is, however, again uncertain.

As a result of M. Yoshizaki's active research, preceramic study in Hokkaido has made a rapid progress in recent years. In 1955 investigation of sites in Shirataki Village, Mombetsu County--a blade-producing locality--was begun by M. Kono, M. Minato and M. Yoshizaki. I have had an opportunity to participate in this excavation and was able to examine the site in detail. Results of the excavation will be reported soon. The large quantity of blades found in the gravel layer on the terrace and in the clay deposits should yield results which will prove to be epoch-making in many respects. Sakuzaemon Kodama and Toshio Oba, of the Medical School of Hokkaido University, are also conducting excavations in many parts of Hokkaido.

We are now in a position to understand the basis, the motivations, and the development of the study of preceramic culture in Japan. We must first briefly consider the present status and the future directions of this field. Such conventional aspects of research as classification of implements, formulation of categories of industries, analysis of distribution and establishment of chronology, must of course be continued. At

the same time, the physical plan of a site as a whole, details of various facets of life, geological problems, associated animals, reconstruction of the natural environment and the relationship to the Palaeolithic and Mesolithic cultures outside Japan are some of the aspects that need to be investigated. Of course, problems centering around these topics cannot be solved without the aid of related disciplines. On the other hand, the establishment of such an eminent organization as the Kanto Loam Society, which already has a distinguished array of accomplishments, was motivated by geologists' interest in preceramic problems.

Also in the past few years foreign scholars have been paying serious attention to the study of preceramic culture in Japan. Recently, Father Maringer, a prehistorian now resident in Japan, has described to foreign specialists on Palaeolithic culture the hand-axe and other implements found at Gongenyama, Isezaki City, Gumma Prefecture, calling attention to their similarities to the Levalloisian flakes. We must on the one hand improve our standard of scholarship and, on the other, have confidence that we are capable of contributing not a little to the Palaeolithic culture history of the world.

CHAPTER II

MANUFACTURE OF STONE TOOLS

(Since this is primarily a digest of standard western writings on the subject, it is being omitted here along with accompanying figs. 1-6).

CHAPTER III

CLASSIFICATION AND TERMINOLOGY

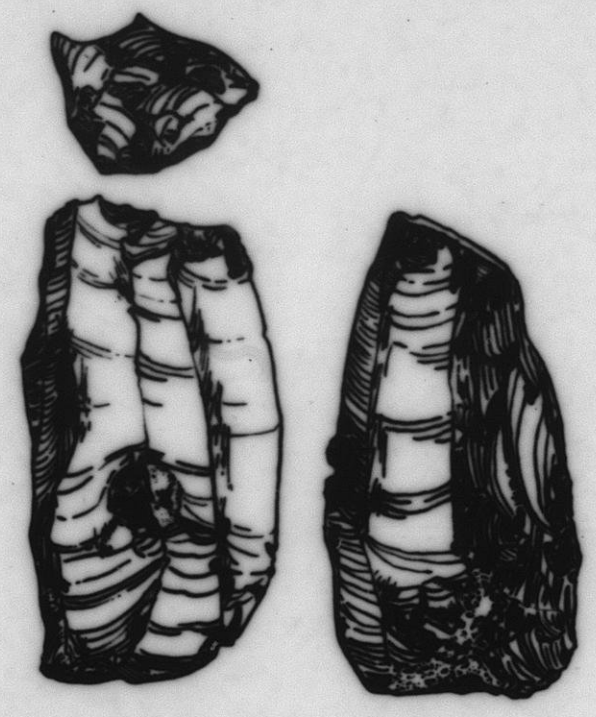
As far as we know, the inventory of Japanese preceramic cultures is limited to stone implements. Palaeolithic artifacts in other parts of the world do include, besides stone tools, bone and horn implements and even wooden tools. There are the well known female figurines carved out of stone and ivory; and everyone is familiar with the famous cave paintings. Foreign archaeologists are fortunate in being able to conduct their research with the aid of such abundant materials. European archaeology, of course, has a long history behind it and has produced excellent scientific studies on all aspects of stone age culture. It is about time that Japanese specialists on stone tools have proper understanding of the information accumulated in Europe. For this purpose, I must discuss various types of Palaeolithic and Mesolithic implements found outside Japan. And using these as standards, I shall discuss the nature of preceramic implements discovered in Japan. Until we can find proper translations of the European terms, preservation of the original, foreign terms, though somewhat pedantic to laymen, is less confusing and is necessary for clear understanding of concepts. Terms are arranged roughly alphabetically. Illustrations are taken from Japanese specimens as much as possible, resorting to foreign materials only when unavoidable.

Awl (Fig. 7)

An awl is, in essence, a large size needle, like the one used in making Japanese mats. It is made by creating a sharp point at one end of a small piece of a flake or blade. There are two varieties. In one



7. An awl from Shirataki, Hokkaido.



8. A blade core from Shirataki, Hokkaido.

the cross section is circular, with trimming all around the piece. In the other, the cross section is semi-circular and trimming extends only 180° around, leaving the flat surface unworked. The former is called a "true awl" and the latter a "pseudo-awl." The awl is also known as "drill" or "borer." In Japan only a small number of awls, all made on blades, have been found.

Blade (Fig. 8)

"Blade" etymologically means cutting portion of a knife or a leaf of grass. Here, it is used to mean a flat object with cutting edge. In France it is called "lame."

A blade is an elongated flake with two or three ridges running along the long axis. In order to make a typical blade, the core must be prepared in cylindrical form and the expected piece must flake off with a single blow. This type of core, called "blade core," has been found in quantity in Hokkaido, but only in small numbers in Honshu.[1] (Fig. 9)

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1. In Sekai Kokogaku Taikei (Tokyo, Heibonsha, 1959, vol. 1, pp. 17-38), Serizawa offers a considerable amount of additional information on the basis of the data accumulated since 1956, when the Japanese edition of the present work was published. The more important information will be presented in the footnotes (1-9) to follow.

Serizawa has divided blades into several subtypes. (pp.20-21)

(1) Large blades are over 15 centimeters in length and have been found at several sites in Hokkaido, such as Toyota in Kitami Province, Oketo in Tokoro County, Shirataki in Mombetsu County and Tarukishi in Suttsu County. Large blades are often associated with "boat-shaped" tools.

(footnote continued)

(2) Medium size blades are about 10 centimeters long and have been found at Kamiyama and Kaizaka in Niigata Prefecture, Sugikubo in Nagano Prefecture and Shiriyasaki in Aomori Prefecture.

(3) Small blades, about 5 centimeters long, are seldom found. Some of the surface-collected specimens at Tachikarushinai in Mombetsu County, Hokkaido are representative of this sub-type.

(4) Micro-blades are less than 3 centimeters long and are known from all over Japan. Sakkotsu, Mombetsu County, and Kombu-nishi, Isoya County (both in Hokkaido), Araya (Niigata Prefecture), Yadegawa (Nagano Prefecture), Washiuzan* (Okayama Prefecture) and Ijima** (Kagawa Prefecture) are some of the micro-blade sites.

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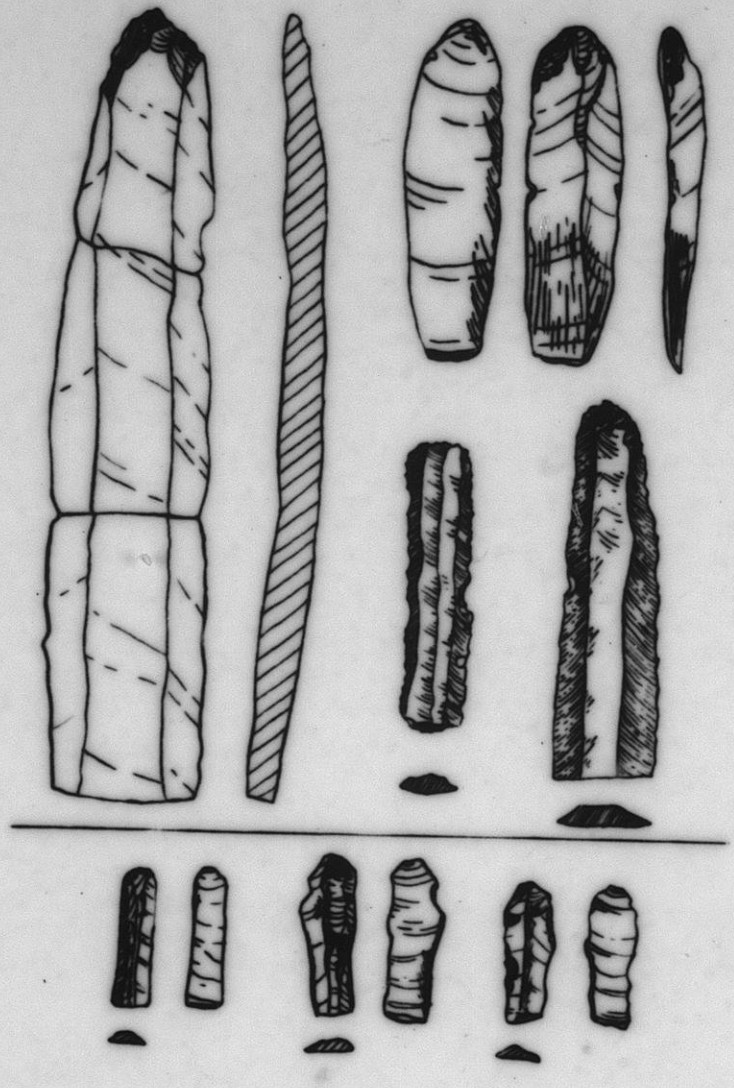
* or Washuzan
** or Ishima



9. Top: Blades from various sites in Hokkaido.

Bottom: Micro-blades from Yadegawa, Nagano Prefecture.

Chopper-Chopping Tool (Fig. 10, No. 4)

In this type, the tip of a pebble is only roughly trimmed. It was probably used for chopping. In Africa the industry characterized by this type of tools preceded the hand-axe industry. In East Asia, they have been found in China and Burma. Movius, accordingly, has formulated the "Chopper-chopping tool culture area." In Japan tools similar to these have been found in association with points and other types of implements. These facts necessitate consideration of the Japanese finds from a different point of view from that of Movius. However, should artifacts belonging to the Lower Palaeolithic period be found in Japan in the future, the situation would then resemble that in Africa, and this would throw additional light on Japan's position in the Far East.

Cleaver (Fig. 10, No. 3)

In Lower Palaeolithic sites in Europe and in Africa, flat, chipped axe-like tools with blunted tip are often found with hand-axes. These are called "cleavers." No. 3 in Figure 19 is a typical Acheulean cleaver. There has not been any sure find of this type in Japan. In China, however, a piece very much like this has been found recently from Tingts'un, Shansi Province. According to Breuil, cleavers were hafted like axes.

Core Tool or Core Implement

In contrast to those made from flakes, core tools are made by trimming either the entire surface or a portion of the surface of a rock nodule. Many of the European hand-axes are core tools made of flint. There have not been any definite finds of core tools in Japan.



10. (1) Acheulian hand-axe.

(2) Chellean hand-axe.

(3) Acheulian cleaver.

(4) Pre-Chellean chopping tool.

(After L. S. B. Leakey)

Crescent Microlith

Semi-lunar in shape, some are trimmed along the arc, others on the straight edge. A number of them may be hafted on a shaft, making a composite tool; or they may be used as arrowheads. There have been some crescent-like pieces found in the Inland Sea area.[2]

Boat-shaped Tool (Fig. 11)

The first piece of this type to be discovered in Japan came from Masugata, Gumma Prefecture; the credit of discovering it goes to T. Aizawa. It is made of a thick flake or a core by striking off edges of the flat surface in an oval shape. Some have beautiful flutings at one end. Though similar to the European "keeled scraper," the ridge is too high, and some of the Japanese specimens probably did not function as scrapers. For these reasons, I chose the name "boat-shaped /funazoko-gata/," rather than adopting the European term. A crude type without fluting and a refined, fluted type are generally not associated with each other. Perhaps

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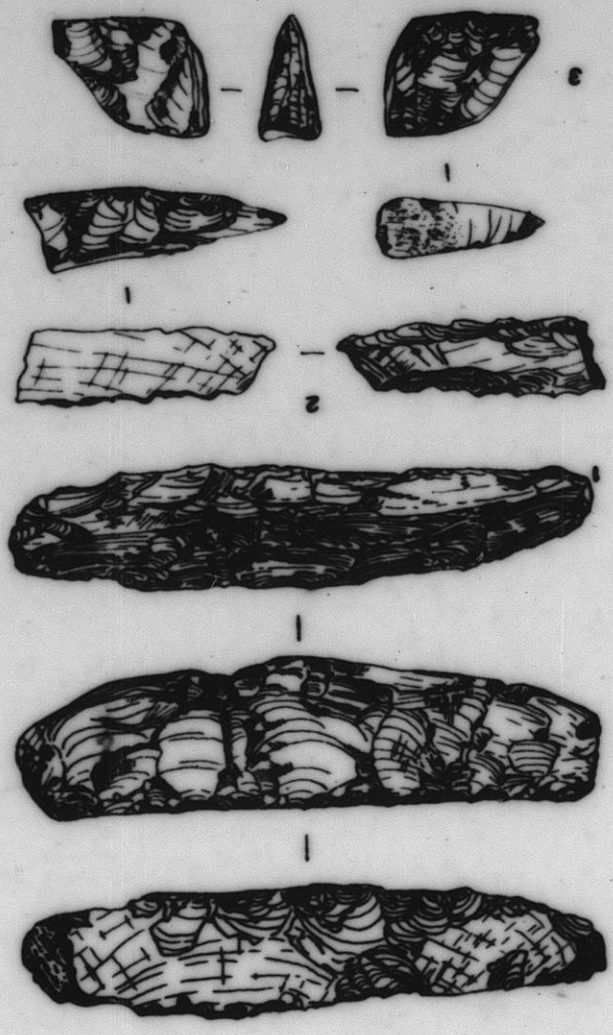
2. Serizawa introduces a new tool type, Blade Arrowhead. (1959, p. 21). Exclusively of obsidian, it is made by pressure-flaking one side of a medium size blade (unlike most arrowheads, which are flaked on both sides). They are distributed only in eastern Hokkaido, e.g. at the sites of Yoshinodai in Urahoro Town, Katayama in Abashiri City and Yubetsu in Mombetsu County. Being associated with blades and ground axes, this tool type probably immediately antedated the Jomon culture.



11. "Boat-shaped" tools from Shirataki, Hokkaido.

they should be considered separately. The former seems to be close to what is known as a "fabricator." This problem, however, is in need of further research.[3]

Flake Tool

Those tools which are made of pieces detached from a core are called "flake tools." Most of the preceramic finds in Japan have been flake tools.

Geometric Microlith (Fig. 12)

Microliths which have geometric shapes, such as triangle, trapezoid, lunate, are called "geometric microliths." They are widely distributed in Africa, Europe, India and Australia. A typical group of geometric microliths is the Tardenoisian of southern Europe, appearing in the first half of the Mesolithic period. In England, the broad-flake industry made its appearance before geometric microliths, the latter being considered more evolved than the former. Though geometric microliths have not yet been found in Japan with any degree of assurance, a few pieces of roughly geometric shape have been identified among the small tools found

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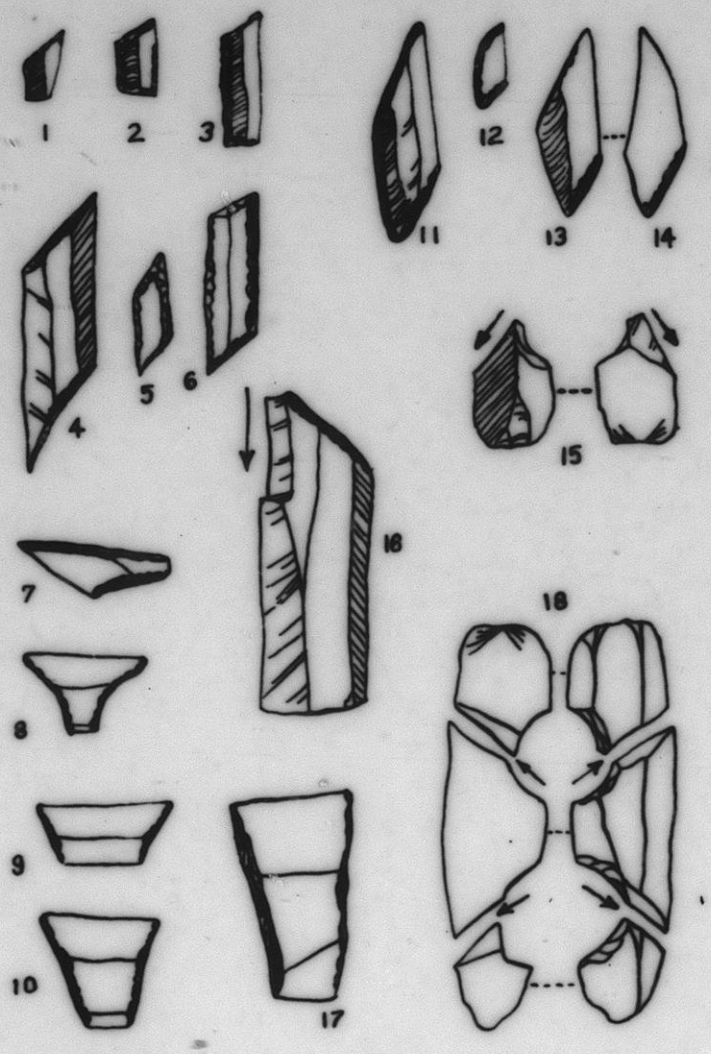
3. Serizawa adds a third sub-type, "Shirataki type of boat-shaped tool," so-named after the type site in Hokkaido. (1959, p. 25). It is small and fluted, made probably on a rather thick, spear-like bifacial tool. Unlike the other two sub-types of boat-shaped tools, the top surface, corresponding to the deck of a boat, forms a curvature and often shows traces of scratching. In the process of fashioning the top surface by means of several flakings, spalls of an unusual shape result. They are much like very thick, miniature skiis. Scratches and abrasions on the corners of these spalls suggest their probable use as tools.



12. Geometric microliths. (After J. G. D. Clark)

(1)-(3) Trapezoids.

(4)-(6) Rhomboids.

(7)-(10) Trapezes.

(11)-(14) Pen knife points.

(15) Micro-burin.

(16) Graver.

(17) Petit tranchet.

(18) Presumed process of manufacturing micro-burins.

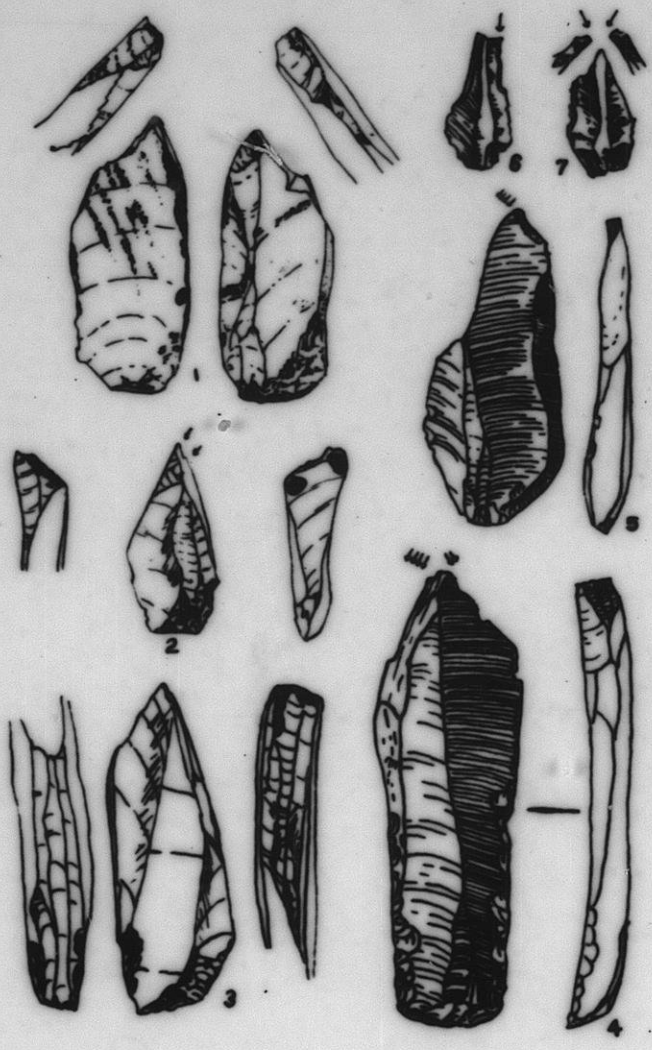
in the Inland Sea area. They have been designated as "Ijima I" by Y. Kamaki.

Graver (Fig. 13)

Also called "graving tool" or "burin," it is considered to serve for engraving purposes. Gravers were widely used in the Late Palaeolithic in Europe. In Japan there had not been any specimen of this type until M. Yoshizaki unearthed many find examples in Hokkaido. Since then there have been a few discovered in Honshu as well. This type of tool will most likely become an important one in Japan.

In making a tool, the flake or blade is ordinarily placed horizontally, and a blow is applied at right angles. In making a graver, however, the piece is held vertically, and struck at a right angle. (According to Leakey, this can be accomplished by holding the piece vertically on a stone platform and striking its base with a wooden baton.) The resultant edge is called "graver facet." At the base of the flake, where the graver facet is located, a negative bulb of percussion and concentric rings should be observable. For a piece to be accepted as a graver, these conditions--graver facet, negative bulb, and concentric rings--must be clearly present. Some persons, without taking these factors into consideration, make a quick judgement on the basis of superficial similarities.

Classification of gravers is a complex problem. It is not sufficient merely to base it on the form alone or on the manufacturing technique alone. I shall follow M. C. Burkitt in the brief presentation of the following conventional classification. The first division is



13. Gravers from various sites in Hokkaido.

into those whose working edge is like a screwdriver and those whose working edge is like a gouge. Next, gravers can be subdivided variously depending on the position of the facet as well as the manner in which several facets intersect. Taking the type of materials as the criterion, they can be divided into those made on cores and those made on flakes or blades.

Ordinary graver (Fig. 13, No. 7):

A thin flake or blade would have one burin facet on each side of the working edge. This is called "bec-de-flute." On the other hand, a thick piece, as it requires several strokes, would have more than two facets.

Angle graver (Fig. 13, No. 5):

In an angle graver, the facet is only on one side, the other side being finely retouched. Depending on the shape of the retouched edge, angle gravers are classified into: horizontal, slanted, concave, and convex sub-types.

Single blow graver (Fig. 13, No. 6):

If the tip of a blade breaks off at a right angle to the vertical axis, an efficient graver can be produced merely by applying a single blow, which creates the graver facet.

Polyhedric graver (Fig. 13, No. 3):

A polyhedric graver has many facets, one of which very often has a large negative bulb.

Beaked graver:

The tip of this type resembles a beak. There is one large graver facet on one side, and many small ones on the other. The resultant form has a beautiful appearance. Fluting technique is made use of in fabricating this type of graver.

Flat graver:

A piece is called a "flat graver" if it has many facets, one or more of which roughly parallels the main flake surface.

Core graver:

Core gravers are made on small cores. They are sometimes called "hand picks." The graver facet is at the tip of the triangular core--that is, at the opposite end from the striking platform. Specimens resembling this type have been found at the Yadegawa site.[4]

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4. Serizawa now classifies Japanese preceramic burins into the following sub-types (1959, pp. 23-24):

(1) The ordinary type is composed of the ordinary graver (see above) and the single blow graver (see above).

(2) The Kamiyama type has one or two graver facets on a medium size blade from the upper right to lower left.

(3) The Araya type is made on a relatively small flake by first fashioning it like a unifacial point and then by breaking off the tip with a single blow from the upper right to lower left.

Besides these four sub-types, Serizawa takes note of a specimen found in Nagano Prefecture as a possible candidate for a fifth sub-type. This piece has a semi-lunar indentation across the breadth of the blade, at the two corners of which are graver facets.

Hand-axe (Figs. 10 and 14)[5]

The hand-axe is a representative type of tool in the Lower Palaeolithic period in Europe and Africa. It is generally a core tool with its obverse and reverse faces covered with large flaking scars. The tip and the sides are sharply made, whereas the base is generally dull. Many varieties of hand-axes can be roughly classified into the following two types: the pear-shaped, pointed type and the flat, ovate type. Cleavers with flat tips also belong to the hand-axe family. A special type of hand-axes called "cordiform type" was used in early Mousterian times. These are relatively small and flat, and are close to an equilateral triangle in shape. Edges are straight and sharp, being trimmed by fine step-flaking.

The first group of hand-axes to be found in Japan (Plate IV), at the Iwajuku site, do not seem to be core tools; nor are they oval in shape. The examples which T. Aizawa found at Gongenyama (Plate II: bottom), however, are pear-shaped. The Lower Palaeolithic, Tingts'un site in China, of which there is a recent report, has produced excellent hand-axes. These facts suggest that we must carefully consider the possible presence of a hand-axe industry in East Asia.

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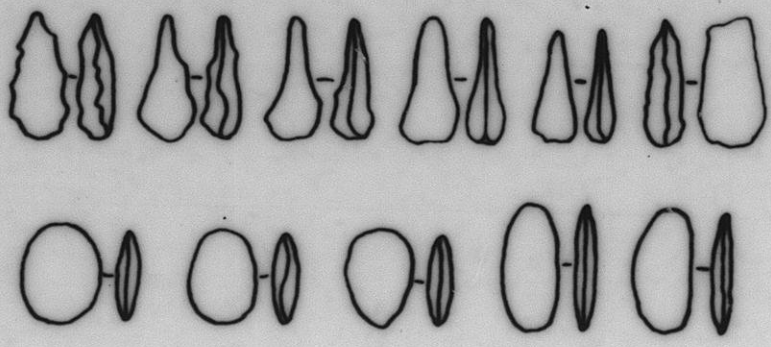
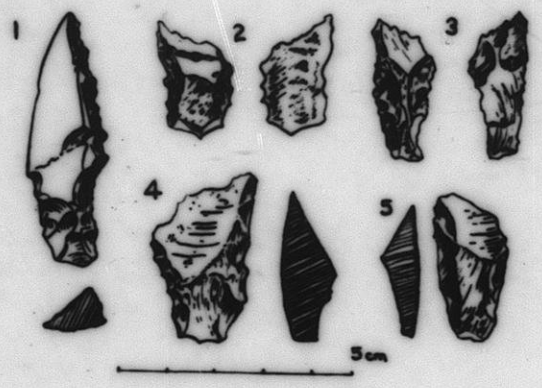
5. Serizawa introduces a new tool type, the grindstone (1959, p. 24), which we will insert here. It is usually made of hard sandstone. Most of the grindstones found have several grooves along which objects must have been ground. Several specimens have been found at the Shirataki site in Hokkaido (For illustration, see Yoshizaki 1959 below).



14. Morphological classification of hand-axes. (After William Watson)

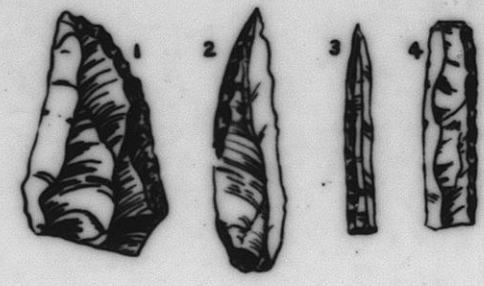


15. Kiridashi knives.

(1) from Tamaribuchi, Tokyo.

(2) and (3) from Iwajuku, Gumma Prefecture.

(4) and (5) from Tonogayato, Tokyo.



16. European knife blades. (After M. C. Burkitt)

(1) Audi knife blade.

(2) Chatelperron knife blade.

(3) and (4) Gravette knife blades.

Kiridashi Knife (Fig. 15)

The Japanese name, kiridashi-gata sekki, is taken from a form of Japanese knife used today which is called kiridashi kogatana. This type is not found in areas outside Japan; in Japan it is particularly prevalent in the Kanto. A kiridashi knife is made on a wide and thick flake, normally by carefully retouching the platform and its opposite end. The unretouched edge and the pointed end were probably the working edges. While resembling the knife blade in form and in manufacturing technique, it is characteristically smaller and thicker. Aside from these, there are also unifacial, point-like kiridashi knives, such as those of the Iwajuku II and Tamaribuchi.

Knife Blade (Fig. 16)[6]

A knife blade is manufactured by shaping a blade or an elongated flake into a knife-like form. European knife blades are divided into Audi, Chatelperron and Gravette types.

The Audi knife blade is made on a smaller flake. On one side is a plain flake surface while the other side shows a number of primary flake scars, one of which makes a sharp cutting edge. Opposite the cutting edge there are irregular, rough scars, produced by blunting on the back of the flake. The platform is left untrimmed. Experiments in skinning

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6. Serizawa distinguishes between two preceramic types of Japanese knife blades (1959, p. 24): (1) the Moro type, which has a blunted base and (2) the Sugikubo type, whose base is pointed just like the tip. The latter has been associated with conical blade cores, medium size blades,

(footnote continued)

gravers and scrapers, while the former has not been associated with tools of these types.

In his 1960 work, Sekki Jidai no Nihon (The Stone Age of Japan, Tokyo, Tsukiji Shokan), Serizawa adds a third, Ko type which he describes as follows. (1960, pp. 64-65). "The overall form is slender and is more similar to the Sugikubo type than the Moro. But the base tends to be rounded. I shall tentatively call it by this name because the first good material was obtained at the Ko site, Domyoji Town, Minami-Kawachi County, Osaka Prefecture. The characteristic of the Ko type knife is that the original flake is made by the 'lateral flaking' technique. Its distribution extends westward from Osaka Prefecture and seems to be concentrated in areas of the Inland Sea region, such as Okayama and Kagawa Prefectures. The material used is sanukite which is abundantly produced locally. I would like to call this lateral flaking technique 'the Inland Sea' technique."

an antelope with an Audi knife blade were carried out in East Africa, and the task was completed in an unbelievably short time. There has not been an appropriate example of this type found in Japan. The obsidian tools derived exclusively from a certain stratum at the Shirataki site in Hokkaido do, however, closely resemble the Audi variety.

The Chatelperron type is made roughly in the same manner as the Audi, save for a finer blunting on the back and a more refined overall shape. Blunting scars are observable at the base, also. The Chatelperron variety is much like an ordinary knife. The knife blades found at Moro, designated as "Moro type," have a general resemblance to the Chatelperron knife blade.

In the Gravette type, the back and the cutting edge are almost parallel. The tip is made into a point with considerable care. The base is sometimes fashioned into a square end by blunting. According to Burkitt, several of these were hafted in a groove in a handle to form a composite tool.

These types of knife blades are considered to be the representative implements of the Upper Palaeolithic culture in Europe. The relationships among them are shown in the following table:

Stages	Tool Types	Cultures
Font Robert	Font Robert Point	Gravettian
Upper Aurignacian	Gravette Knife Blade	
Middle Aurignacian	Beaked Graver Keeled Scraper Split Base Bone Lance Point	True Aurignacian
Lower Aurignacian	Chatelperron Knife Blade	Perigordian
Audi	Audi Knife Blade	

Micro-burin (Fig. 12, nos. 15-18)

Micro-burins are the typical tools of the Tardenoisian culture of the Mesolithic period in southern Europe. No. 15 in Fig. 12 is an example in actual size. Made of a portion of a blade or a flake, its tip consists of triangular burin facets which have small indentations and negative bulbs. Whether this small implement was purposely manufactured or whether it was a by-product in the process of making some other type of implement has been a topic of much discussion. J. G. D. Clark takes the view that micro-burins themselves are not implements but are probably by-products of microliths. He adds, however, that micro-burins often show traces of use, probably for carving out the grooves into which microliths were to be fitted. It has not been definitely established that the Tardenoisians produced trapezoid forms and micro-burins simultaneously, as shown in No. 18 of Fig. 12.

Because of this uncertainty concerning micro-burins as tools, the term should be prefixed with the word "so-called." Micro-burins have not yet been found in Japan.

Microlith

The term "microlith" refers to small stone tools. Its Japanese translation, saisekki, was introduced in 1930 by Komaki, Mizuno, Komai and Egami.

The term has been used very broadly, referring sometimes to Neolithic tools in general and at times to small varieties of Palaeolithic implements. The representative specimens are, however, those which characterize the Mesolithic period, such as the ones seen in the Tardenoisian and Azilian industries. In most cases, several of them are set into a shaft in a row to make a composite tool. In England, both geometric and non-geometric microliths are known, the former being older than the latter. Whether microliths can be found in Japan has long been a topic of debate. Recently a site known as Yadegawa was discovered and found to produce nothing but small blades. Besides these, microliths of a somewhat different type have been found in the Inland Sea area.

Micró-scraper

A micro-scraper is made on an extremely small flake by roughly fashioning it into a rounded shape. It looks like a finger nail and is a common type of microlith. A number of them have been found in Mongolia. In Japan no example of this type has been discovered, except those found at the Sone site on Lake Suwa.

Pebble Tool (Fig. 10, No. 4)

Some of the oldest cultural remains in Africa are remains of the Kafuan and Oldowan I industries. According to L. S. B. Leakey, they belong to the Lower Pleistocene period and are geologically earlier than the Chellean and Acheulean cultures of the Middle Pleistocene. Implements of the Kafuan and Oldowan I cultures are pebble tools. A pebble tool, also called "chopper" or "chopping tool," is made by striking off a few pieces from one end of a pebble. It is said to be the typological ancestor of the Chellean hand-axe. We are all well acquainted with Movius' application of these terms to Burmese and Chinese Palaeolithic tools.

It is well known that in the first half of the Initial Jomon period, relatively small pebble tools are associated with pottery having string impression designs. Large pebble tools, on the other hand, are often found with projectile points of the preceramic era.

Pen-knife Point (Fig. 12, Nos. 11-14)

This is a microlith made on a blade. The curved side is finely retouched, while the straight side--with a sharp cutting edge--is left untreated. The base is blunted at a sharp angle. Some of the examples are struck from the front side at the base.

Pigmy Flints

As "pigmy" refers to small people, "pigmy tool" denotes a small implement. Though sometimes used to mean geometric microliths, it is not a proper scientific term.

Point (Fig. 17)

The term "point" is used very widely, referring sometimes to any stone



17. Various types of points. (All except Japanese specimens, after L. S. B. Leakey and K. MacGowan)

(1) and (2) from Babadaira, Negano Prefecture.

(3) from Odoriba, Nagano Prefecture.

(4) Mousterian point.

(5)-(7) Solutrean points.

(8) Sandia point.

(9) Yuman point.

(10) Folsom point.

(11) Blade arrowhead from Hokkaido.

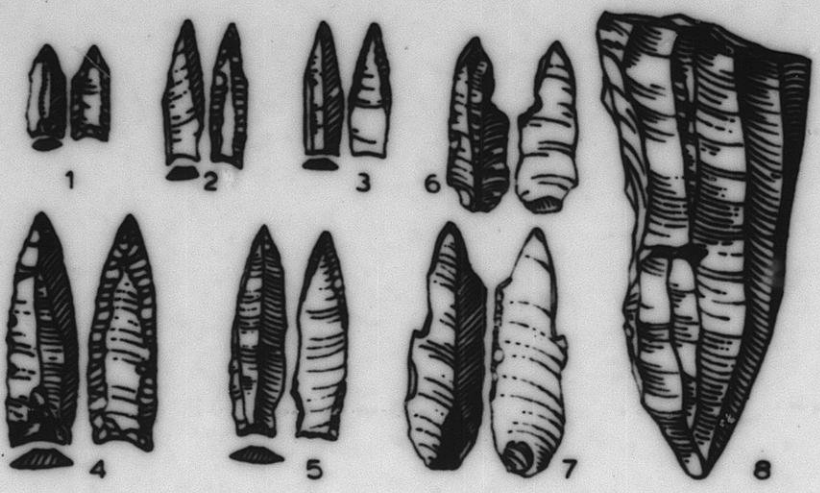

Fig. 17a. Blade arrowhead industry (after Toshio Oba). (Scale approx. 1/2)

tool which is pointed at one end and is thought to have been used for thrusting purposes. For example, some knife blades have been called "Chatelperron points" or "Mousterian points." In the study of preceramic tools of Japan, we try to restrict the use of the term mainly to spear-heads and implements of similar type, avoiding its use for other types of tools. Solutrean points of Europe are typical points in this restricted sense.

Points found in Japan can be divided into three sub-types on the basis of the manufacturing methods: biface, uniface and semi-biface, the last being intermediate between the first and the second. Morphologically, points can be classified into various groups, such as willow-leaf, laurel leaf, shouldered, triangular and diamond shapes. A systematic morphological classification is still lacking.[7]

Rhomboid (Fig. 12, Nos. 4-6)

The rhomboid is a rare type. It is found in England in association with more recent types of geometric microliths. Several varieties may be noted, such as ones with pitching along three or more sides, extremely small ones with thick base, and ones with trimming on two opposite sides.

Rostrocarinate (Fig. 18)

Tools of this type are on the whole found in tertiary deposits, but are sometimes seen in association with the Lower Palaeolithic hand-axe.

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7. While most of the points found in Honshu have been relatively small, being about 3 to 5 centimeters long, Hokkaido finds tend to be somewhat larger, and are associated with boat-shaped tools and gravers, according to Serizawa (1959, pp. 23-24).

(footnote continued)

One distinctive point type, the blade arrowhead, is illustrated (Fig. 17, No. 11) with other points in the present (1957) work but is not discussed. It is made by retouching the edges of a blade unifacially and making one tip pointed. Sometimes the obverse side is retouched to some extent, particularly near the tip. It is firmly documented only in eastern Hokkaido, though Serizawa has reports of arrowheads similar to the blade arrowhead in northern Kyushu. In Hokkaido it seems immediately to antedate the Jomon culture. Similar specimens are known from the Lake Baikal region in Siberia (Serizawa 1960, pp. 74-75 and fig. 28, reproduced here as fig. 17a).



18. Rostrocarinate. (After M. C. Burkitt)

Although R. J. Moir sees a morphological development from the rostrocarinate to the hand-axe, this view cannot be immediately accepted. Made of flint, it has an upper and a lower flat surface. In shape, it resembles half of a Canadian Indian canoe turned upside down.

Scraper (Fig. 19):

Scrapers are divided into many sub-types, such as end-scraper, side-scraper, core-scraper, nose-scraper, keeled-scraper, notched-scraper, round-scraper, and thumb-scraper. The cutting edge is formed at one end at a sharp angle. Scrapers are believed to have been used for scraping or scratching.

Side-scraper (Fig. 19, No. 5):

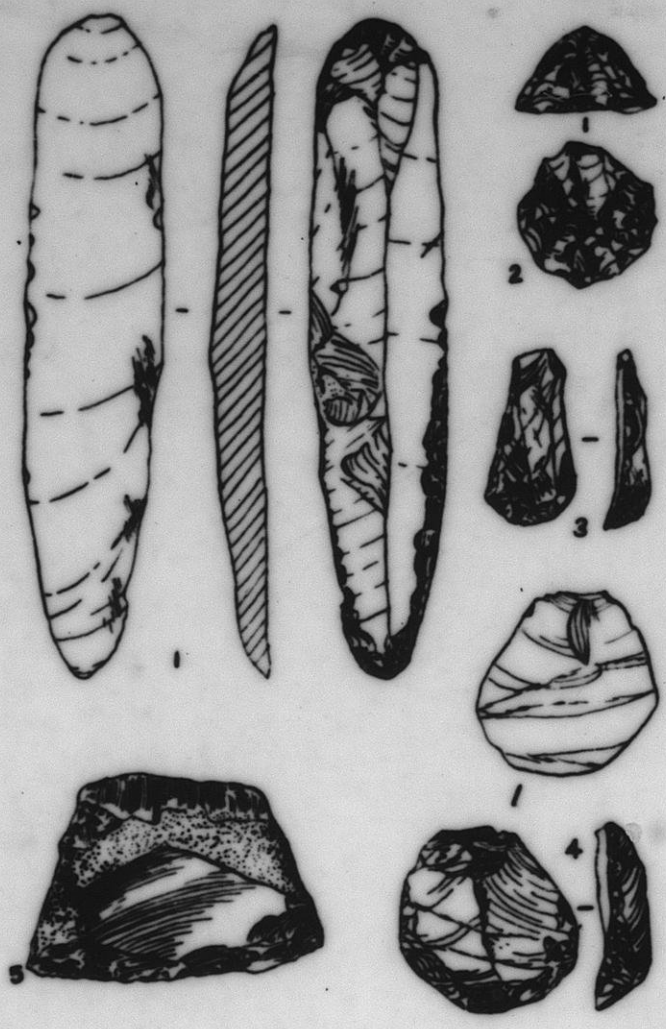
Made on a flake, it is a type of tool particularly prevalent in Mousterian times in Europe. The Mousterian side-scraper characteristically has a convex cutting edge. The step-flaking technique is used to produce this cutting edge. A side-scraper which is made of a thin flake and has a straight cutting edge is known as a "cutter."

End-scraper (Fig. 19, Nos. 1, 3 and 4):

As the name indicates, the cutting edge of this type is at one end of a flake or a blade. This cutting edge is convex and often fan-like in cross section. In Middle Aurignacian times, it was worked by fluting. Very often trimming is applied to both sides of the flake or blade probably in order to render the tool less brittle or to protect the haft from being damaged.

Core-scraper (Fig. 19, No. 2):

A core-scraper looks like a little core. The cutting edge consists of the intersection of irregular flutings and the main flake surface.



19. (1), (3) and (4) End-scrapers: (1) from Tarukishi, Hokkaido, (3) from Shirataki, Hokkaido and (4) from Odoriba, Nagano Prefecture. (2) Core scraper from Hokkaido. (5) Mousterian side-scraper.

Keeled scraper

In a keeled scraper, the fluting is narrow, flat and regular. One end of the flutings meet at one point like the frame of a fan. Very beautifully done, it requires a skill which is difficult for modern flint craftsmen to achieve. Like the beaked graver, it is a characteristic type of the Aurignacian period. The beaked graver and the keeled scraper are very much alike, except that in the former, fluting is applied to the thickness of the blade, and in the latter, to the breadth of it.

Tools closely resembling this type have been found in Japan among preceramic materials, such as the keeled scrapers found at the Masugata site in Gumma Prefecture and at the Shirataki site in Hokkaido. At both of these places, blades were associated with keeled scrapers.

Nose scraper

The nose-scraper has a nose-like protrusion.

Round scraper

A round scraper is small and either round or oval. It is trimmed almost all around. Sometimes the term "thumb-scraper" is used to designate a round scraper.

Small Blade (Fig. 9, bottom)

Small blades are also called "micro-blades" or "lamelles." The Yadegawa site in Nagano Prefecture produced small blades in quantity. It is noteworthy that no other type of small tools was found with them. The Yadegawa finds may be divided into two types: those which were simply struck off from the core and those which were finely trimmed on one or both sides.

Spall (Fig. 20)

Spalls are very narrow and, at times, extremely small pieces of stone. They are probably by-products resulting from the process of making flake surfaces on gravers. For this reason, they are also called burin spalls. Although they are not implements themselves, it is worth paying close attention to them.

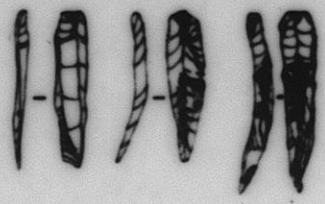
Tranchet (Fig. 21)

A tranchet resembles a chipped axe in appearance. The cutting edge, however, is formed by several flake surfaces. Shaping of the cutting edge seems to be done before the piece itself is flaked off from the core. But if the piece consists of a core, a blow is applied from a corner of the cutting edge, just as it is done with a graver. Since the tranchet is a characteristic feature of the Campignian culture of Mesolithic Europe, it is sometimes called "Campignian axe." Another name for it is "flat axe."

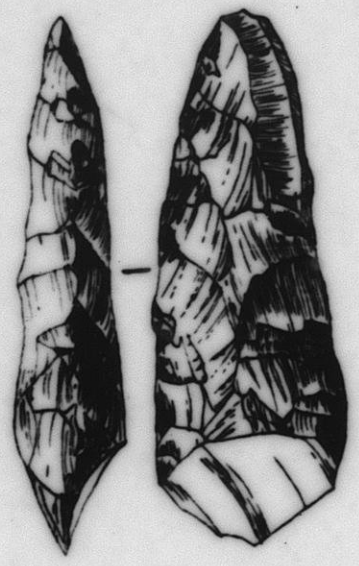
In Japan implements similar to the tranchet are said to be present in the Initial Jomon period of the Tohoku and Hokkaido. But the details are not yet known.

Trapeze (Fig. 12, Nos. 8-10)

The trapeze retains the parallel sides of the original flake or blade. The other, unparallel sides are made by means of sharp chipping--a characteristic retouching technique for microliths. These sides may be straight or concave. When straight, the retouched sides tend to be shorter than when concave. The trapeze often seems to have been used as an arrowhead. In Europe it is a characteristic type for the latter half of the



20. Spalls from Shirataki, Hokkaido.



21. Tranchet. (After J. G. D. Clark)

Mesolithic period. There has not been a genuine specimen of this type found in Japan. They are known in India, Ceylon and Australia, however.

Trapezoid (Fig. 12, Nos. 1-3)

Trapezoid, in contrast to trapeze, is a shape which has no parallel sides. Some of the geometric microliths from England are trapezoid. It is easily distinguished from the trapeze because in the trapezoid three of the sides are trimmed and the base is cut straight.

Triangle

There are many variations in triangles. In England, elongated ones are associated with non-geometric microliths and small ones with geometric microliths. In the latter type, there are scalene, equilateral, isosceles and other varieties of extremely small tools.

CHAPTER IV

INDUSTRIES, CHRONOLOGY AND DISTRIBUTION

1. Industries

In the preceding chapter, I have discussed types of tools, mainly of the Palaeolithic and Mesolithic periods of Europe, making frequent references, however, to preceramic implements of our country as well. Beginners among our readers may have been bewildered by the complexity of forms and variations in functions of the implements described. Implements found at one site or in one level of a site are regarded as a set of tools related to the life of a group of people living in a limited time span. It is not likely that all different types of tools will ever be found together; nor was there in most likelihood a time when only a single type of tool was used. To satisfy the needs of livelihood several different types of tools must have been used together. If a given period has a characteristic type of tool, this type may be taken to represent this period. Just as, in geology, a type fossil is selected to define a geological period, in archaeology, too, a certain kind of tool is chosen as a type tool for the purpose of defining a cultural period. When a site is excavated and tools discovered, the first task is to examine what kinds of tools are associated with one another and to decide the type tool. By this means piles of implements brought together from numerous sites can be separated out into several distinct groups, called "industries." Let us assume that four industries, A, B, C, and D, have been distinguished on the basis of four tool types, a, b, c, and d. Our next task is to determine the temporal order among these industries.

Common sense may lend us to think, merely on the basis of the form alone, that skillfully made, beautiful specimens are more recent than the large, crudely made ones. But the problem is not so simple. In studying the Jomon pottery, too, there have been scholars who determined the relative chronology merely on the basis of changes in form and design; but their views had to be corrected. The method of deciding the relative age of groups of tools is based on a very simple principle that today's snow falls on top of yesterday's. Chronology in archaeology, which seems forbidding, is in fact based on just such a simple idea. There are about thirty different types of pottery recognized in the Kanto region which are all neatly ordered in a chronological sequence. This is a result of many years of careful compilation of data from numerous sites on the basis of this principle.

Sometimes one sees several layers of earth on an exposed side of a hill or a mountain which has just been cut open, for example, for road construction. In the Kanto, the top soil is black; this is the level where vegetation grows. Below it is a red soil known as the "Kanto loam," underlying which is a layer of coarse gravel--the kind that may be found on the river bed of the Tamagawa. At first glance, the middle (Kanto loam) layer may seem one thick layer of red soil; but a closer observation will reveal a darker stratum one-half to one meter in thickness, something over two meters from the surface. With this intermediate layer as the division, the Kanto loam can be subdivided into three strata. Thus the total number of strata, from the surface to the gravels, is five. Suppose that at a certain place, stone tools of type A were found in the

black soil layer, type B in the top of the red soil, type C in the dark red soil, and type D in the bottom of the red soil. We can then arrange them in the order: A < B < C < D. Moreover, one may find in the top portion of the red soil tools which are different from type B and show finer variations, B_1, B_2 and B_3. For example, even though the top, black soil is usually relatively thin, being 40 to 50 centimeters thick, one finds in it at some sites three or four, or as many as ten cultural layers, each with artifacts of different periods. Therefore, it is possible that in the red soil, too, the thick, topmost stratum, known as the Tachikawa loam stratum, which is about two meters thick, may contain several cultural strata. It is, of course, difficult to discern them. But if one can find at a given site remnants of some aspects of life--such as a hearth or stone implements--superimposed one on top of another, then one can, only gradually to be sure, solve this problem. We shall return to this problem later.

Every stone tool has three aspects: purpose (function), method of manufacture and material used. The intimate relationship among these aspects determines the final form of a tool. Therefore, study of forms of tools should lead one to a consideration of conditions of life in prehistoric times. Every projectile point and every micro-core carries with it a certain historical necessity in the process of its production. Examination of forms of tools, therefore, should be done with the greatest of care.

When we began the study of preceramic culture accidentally in 1950, we had no idea at all as to the depth and the complexity of this terra

incognita. As data gradually accumulated in quantity in the past four or five years, we began to realize the tremendous complexity in tool forms. Critical examination of this complex set of tools does show, however, that a group of tools found at a given site or from a given level of a site is manufactured by means of a common technique and has a morphological uniformity. The enormous number of tools from dozens of sites can in this manner be divided roughly into six groups, each of which consists of a characteristic set of tools. These six groups, or industries, will now be discussed.

A. Hand-axe Industry (Plates I, II and IV)

During the excavation of the Iwajuku site by the Department of Archaeology, Meiji University, two shale hand-axes were unearthed from the dark layer ("Iwajuku stratum"), one and a half meters into the loam deposit. With one additional find later by T. Aizawa, we now have three specimens of this type. All three have an oval shape. The tip is somewhat pointed and the base is thick and obtuse. Sides are treated either with rough chipping or step-flaking. They seem to have been made from large flakes. In this respect they differ from the hand-axes made on cores. The size is about 10 centimeters by 5 centimeters and 2 centimeters thick.

At Iwajuku, several long flakes have been found with these hand-axes. Made of shale, they have a flat platform, the flaking angle being about 120°. These long flakes are functionally similar to a blade. They have sharp cutting edges on both sides. Other than these, one large side scraper, made on a large shale flake, was also found. This piece is only roughly retouched along the edges, which resemble a saw.

Hand-axes have also been found at Gongenyama in Isezaki City, Gumma Prefecture. According to T. Aizawa a thick, round hand-axe was found in a dark layer corresponding to the Iwajuku stratum, and an almond-shaped one from a deeper level in the dark layer. The former has been named "Gongenyama I" and the latter "Gongenyama II." Gongenyama I was associated with implements similar to the Mousterian scraper and the Levalloisian flake. Father Maringer has written on the Gongenyama specimens in Anthropos, calling attention to their similarities to the Acheulian hand-axe, Mousterian scraper and Levalloisian flake, and pointing out some important problems regarding them. According to a joint study made by Aizawa and F. Arai of Gumma University, there is a good chance that Gongenyama I in the northern Kanto occurs in the middle portion of the loam deposit, or even below it. Judging from the geological age of the level from which the Gongenyama specimens were found, the morphological similarities of these to the Acheulian hand-axe may be a pure coincidence.

Aside from the Iwajuku and Gongenyama finds, several examples which may possibly be called hand-axes have been noted recently. The finds from Shirataki in Mombetsu County, Hokkaido are some of these. They are made of obsidian and by the unmistakable cylinder-hammer technique. Shapes are various, including almond and oblong. Their stratigraphic positions, though not yet clear, should soon be ascertained. M. Aso has reported on an oblong hand-axe found at Omegura in Daimon Village, Chiisadata County in Nagano Prefecture, and Y. Kamaki on a similar hand-axe from Kiyama in Ayauta County, Kagawa Prefecture. In as much as Movius excludes East Asia from his hand-axe culture area, this problem requires a careful

consideration. It is definite, at any rate, that hand-axes are found in earlier periods of the preceramic era of Japan. Some scholar has equated the Iwajuku hand-axe with the Bacsonian pebble tool of Indo-China. Without adequate stratigraphic comparisons, however, such an hypothesis cannot be readily accepted.

B. Blade or Long Flake Industry (Figs. 8, 9 and 11)

The presence of a blade industry in Japan was first made known by T. Aizawa's excavation of the Masugata site at the foot of Mt. Akagi in Gumma Prefecture. The specimens from this site, however, cannot be said to be typical blades. Most of them are long flakes with a ridge on the front side and a pointed tip, forming an end-scraper. Another characteristic type is the boat-shaped tool. When I saw this for the first time, I was overwhelmed with surprise, though this type, with its beautiful fluting, has become a rather common occurrence.

Since the excavation of this site I have been informed that some extremely fine blades and boat-shaped tools have been obtained from the bottom of Lake Nojiri in Nagano Prefecture. Also, a large number of blades have been unearthed at Chausuyama in the same prefecture. M. Yoshizaki, learning of a large site at Shirataki in Hokkaido yielding blades, has ascertained the presence there of a quantity of fine boat-shaped tools. Also in Hokkaido, sites at Ainonai, Tokoro County, and at Tarukishi, Suttsu County, have produced blades and boat-shaped tools together.

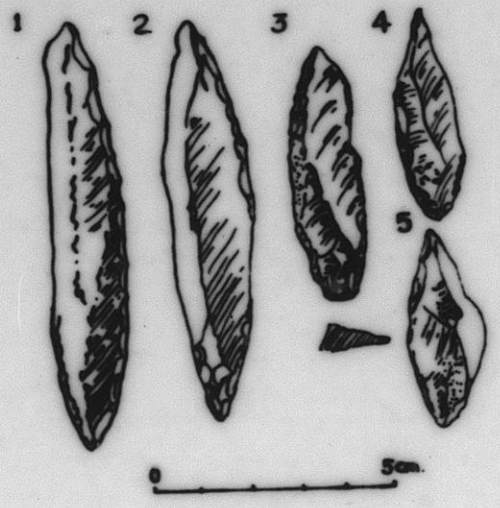
It should be noted that sites which primarily produce blades sometimes also yield gravers. At Shirataki, gravers were found in quantity only at some of the locations. These should be distinguished from such

sites as Tarukishi, Ainonai and Masugata, where no graver was unearthed at all. Also, blades themselves can be classified on the basis of the quality of the boat-shaped tool or the presence or absence of the typical blade cores. The Aurignacian period, as was noted, is subdivided into five sub-periods on the basis of various tool types.

C. Knife Blade Industry (Fig. 22 and Plate XI)

The first group of implements of this industry to be discovered came from Moro, Tokyo. Several typical knife blades were unearthed at this site. These were made on long obsidian flakes by trimming the base portion of the cutting edge and all along the opposite edge. The entire base is trimmed, leaving no trace of the platform. Knife blades of the Moro type have lately been discovered from the bottom of Lake Nojiri, from Sugikubo and from Chausuyama in Nagano Prefecture. At these sites, a considerable number of blades or slender flakes have been found with knife blades of the Moro types; at Moro, however, hardly any such blades or flakes were found. What the relationship of the Moro site to others might be has yet to be worked out.

The characteristic finds at Sugikubo were the beautifully fashioned, slender knife blades. Unlike the Moro type, these are made on blades, and the base as well as the tip is made into a point. This variety has not been found in any large number, specimens resembling it coming only from Takai County, Nagano Prefecture, and Shimokita County, Aomori Prefecture. Aside from these, two examples of knife blades made on relatively broad flakes have been found at Sugikubo. They have a rounded base and pointed tip. These bits of evidence suggest that implements



22. Knife-blades.

(1)-(3) from Lake Nojiri, Nagano Prefecture.

(4) and (5) from Moro, Tokyo.

of the knife blade form did exist in Japan and that they seem to be chronologically close to flakes and long flakes.

D. Kiridashi Knife Industry (Fig. 15 and Plate V)

Kiridashi knives were first discovered at the Iwajuku site. Recently, new finds have been added from Tonogayato in Tokyo and Maruyama in Ichikawa City. Some of the recent finds from Yonekurayama in Yamanashi Prefecture and from Tamaribuchi in Nerima Ward, Tokyo, may be considered as kiridashi knives. With all these discoveries, the nature of this type is beginning to be known better. We call this type "kiridashi-gata" in Japanese because of the morphological resemblance to the modern Japanese knife of the same name and also because of the probable functional similarities.

The flake to be used for the kiridashi knife seems to be broad. The sharp edge created by the primary flaking is left for cutting, while both sides are retouched. The pieces found recently at Yonekurayama and Tamaribuchi are made on flakes which are somewhat long and have bulbs at the butt. These are better made and seem to be more evolved than the others.

Artifacts associated with this type are end-scrapers, side-scrapers and forms which are elongated like a willow leaf and are almost like points. Kiridashi knives are worked only on one side, with the backed blade technique, and are associated with implements which closely resemble projectile points. These facts may suggest that the kiridashi knife is intermediate between the knife blade and the point.

E. Point Industry (Fig. 17 and Plate XIII)

Sites producing projectile points as the main body of the finds have been relatively well investigated. Consequently points have been studied

in considerably greater detail than any other tool type. The sites at Mitsuya and Takei in Gumma Prefecture, and at Odoriba, Uenodaira, Nakatsuhara and Yashima in Nagano Prefecture, have already been excavated. Inspecting the specimens from these sites, one notes a considerable variation in what are commonly lumped together as "points." For example, the Mitsuya points are characteristically retouched only on one side and have large shoulders, leaving the platform at the butt untrimmed. Most of the Takei and Yashima finds are semi-bifacial. That is, they are flaked on both sides in contrast to the unifacial Mitsuya points but not enough to be fully "bifacial." At Babadaira different trenches unearthed different types of points, Trench V producing large thick bifacial points while Trenches I and II producing small, willow-leaf points. At Uenodaira and Odoriba many almost completed bifacial points were found. All these facts, taken together, seem to indicate three stages in the manufacturing technique, unifacial, semi-bifacial and bifacial, which may suggest an evolutionary sequence from the unifacial to the bifacial.

F. Microliths (Plate XV)

Pieces of definitely "microlithic" character are beginning to be discovered in Japan. The Yadegawa site in Minamisaku County, Nagano Prefecture, is a representative microlithic site. Including the surface collection, this site has so far produced about seven hundred small blades and two hundred micro-cores. Small blades are, in general 20 millimeters long, 4 millimeters wide and 1 to 2 millimeters thick. Most of the micro-cores are about 25 millimeters long, 20 millimeters wide and 15 millimeters thick. Some of the small blades are finely trimmed along the edges. Geometric microliths are rarely found.

Cores are mostly semi-conical, rarely having cylindrical shape. The material is obsidian in the great majority of cases, followed by shale and crystal. The problematic finds of the Suwa Lake bed at Sone are not micro-cores or micro-blades of the Yadegawa type. The Sone pieces are, instead, finger nail-like micro-scrapers and small tools of various other types. They cannot be considered to belong to the Jomon culture, but should be included in the repertory of the preceramic microliths.

For several years Y. Kamaki has been calling attention to the presence of the Yadegawa type of micro-cores and small blades in the Inland Sea region of Okayama Prefecture. Other than these, a group of special tools which closely resemble small geometric microliths was found from the lower level of the Ijima site, Naoshima Village, Kagawa County, Kagawa Prefecture. There is a strong possibility that the microlithic industry which left its traces in the Japanese Archipelago is more complex than anyone has ever imagined.[8]

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8. The classification and definition of industries presented above is based almost entirely on the material found in Honshu, and consideration of data from other regions, e.g., Hokkaido, is conspicuously inadequate. On the basis of recent findings, Serizawa discusses the following preceramic industries of Hokkaido (1959, pp. 31-34):

(1) A blade industry associated with heart-shaped hand-axes and boat-shaped tools. The type site is Loc. 13 in Shirataki Village, Mombetsu County. Blades are relatively large, being from 2 to 5 centimeters wide and from 10 to 20 centimeters long. These blades are made into other types of tools, such as scrapers, gravers and pointed blades. Particularly

(footnote continued)

interesting is the last type, which looks like a unifacial point. Since this last type is associated only with this industry, it may be considered as a defining tool type. Tools made on thick flakes such as scrapers, much like the Mousterian ones, and implements resembling hand-axe were also found here. A complex combining all of these tool types has rarely been found. Pointed blades have been collected from Meto in Tokachi County and from the suburb of Kitami City. The Tarukishi site in Suttsu County and the Toyota site in Tokoro County have produced large blades and boat-shaped tools, but the pointed blade and graver were missing.

(2) A blade industry associated with boat-shaped tools, bifacial points of two different types, keeled scrapers, gravers of the Marunomi and Araya types. The type site is Loc. 33 in Shirataki Village. Pointed blades are absent. Blades are more crudely made than those of Loc. 13. Points range in length from 8 to 20 centimeters. Large bifacials are broad and well made. Three small points with triangular cross section--of the variety encountered in Iwajuku II and Takei II--have been found. These are made of agate, while all other specimens are obsidian, a point to be noted. This complex has been found elsewhere, but is limited to eastern Hokkaido.

(3) An industry characterized by the Shirataki type boat-shaped tools. The type site is Loc. 30 in Shirataki Village. Associated tools are points, large elongated scrapers, gravers and grindstones. Two varieties of points have been noted: a thin and finely made group and a thick and somewhat crudely made group. The latter, having about the same thickness as the

(footnote continued)

boat-shaped tool, may well have been in the process of being made into it. Except for the grindstones and a few flakes and spalls, all the specimens of this locality were made of obsidian. This complex has never been found elsewhere.

(4) An industry characterized by the Shirataki boat-shaped tool, the Araya graver and tools resembling the micro-blade. The type site is Loc. B of the Tachikarushinai site in Engaru Town.

(5) A micro-blade industry. The type site is Sakkotsu in Nishikoppe Village, Mombetsu County. One large scraper and another, unidentified tool have been found in association. Micro-blade sites are few and are limited to southern and eastern Hokkaido.

(6) An industry characterized by Araya gravers, but lacking Shirataki boat-shaped tools and micro-blades. The type site is Tachikawa in Rankoshi Town. Associated with Araya gravers are points of a special kind and elongated scrapers. This complex seems to be widely distributed throughout Hokkaido.

(7) A blade-arrowhead industry. Distributed in eastern Hokkaido, it is associated with gravers of several types and also medium size blades. These blades have been flaked off from a conical core whose platform is at a right angle to the direction of striking. Once thought to be possibly associated with pottery, the prevailing view now places this industry in the preceramic era.

(footnote continued)

On the basis of the sequence of Hokkaido industries presented above, Serizawa asserts (1960, p. 78) that the microblade technique had an independent origin and development in Japan, rather than having diffused from elsewhere. He also refers to Russian scholars as having arrived at a similar conclusion i.e., independent origin, with respect to microliths in the Crimean region.

2. Chronology and Distribution

I have classified preceramic implements into six groups, or industries, on the basis of morphology, method of manufacturing and association of tools at a given site or in a given stratum of a site. What are, then, the ages of these industries relative to each other? In answering this question, we must depend entirely on stratigraphic observations. This is difficult, however, because we have not been able to find any well preserved site, such as a cave or a rock shelter. It is not impossible, to be sure, to find stratified sites in the open field. In fact, the Iwajuku and the Takei sites, which the Department of Archaeology of Meiji University excavated, were stratified. In the bottom layer of the Iwajuku site were found elongated flakes and hand-axes (Iwajuku I), overlying which were relatively small tools mixed with kiridashi knives (Iwajuku II). Also, though a little uncertain, the point which T. Aizawa found on a cliff at the same site seems to have been in the top most layer. Even excluding this problematic point, we are certain of the following sequence at this site: hand-axe → kiridashi knife. At the Takei site, projectile points were found in a level ranging from 20 centimeters below the surface to 30 centimeters into the loam deposits under the top soil. A sterile loam layer 20 centimeters thick underlay this level, and below it a dark-colored bed contained crudely made tools resembling backed blades. These crude specimens in the lowest level do show the backed blade technique, while lacking the form of a knife blade. We thus have the sequence: backed blade → projectile point. Very recently K. Enomoto and H. Takizawa

found at Tamaribuchi in Nerima Ward, Tokyo, two bifacial points which overlay a group of kiridashi knives in the upper portion of the loam bed. This yields the sequence: kiridashi knife → projectile point. In sum, we have the following sequences.

Iwajuku	Tamaribuchi	Takei
	Point	Point
	↑	↑
Kiridashi knife	Kiridashi knife	Backed blade
↑		
Hand-axe and Flake blade		

If no other stratified site is known, can we find any clue by comparing the geological strata containing artifacts at several locations? Preceramic artifacts in the Kanto (Tokyo Plain) area have been found in the so-called Kanto loam, which is said to have been formed by the deposition of volcanic ashes. It is not too meaningful merely to compare the depths in the loam layer at which artifacts have been found at various localities. One useful index is the one or two dark layers, about two meters below the top of the loam bed, which, according to a recent analysis, were formed by the deposition of fossil soil. If an artifact is found in this dark layer, it may be considered to be older than that found in the overlying, "Tachikawa" loam bed. The Moro knife blades were found a little above the dark layer. In fact, hardly anything has been found from the dark layer or below it. A mere fragment of a large obsidian blade has been unearthed in the dark layer at one site in Koganeicho in Tokyo. Besides this, to strengthen the argument, the specimen which H. Toya found in the dark

soil in the vicinity of the Mitaka Observatory also seems to be a large blade. From these facts, we may infer the sequence:

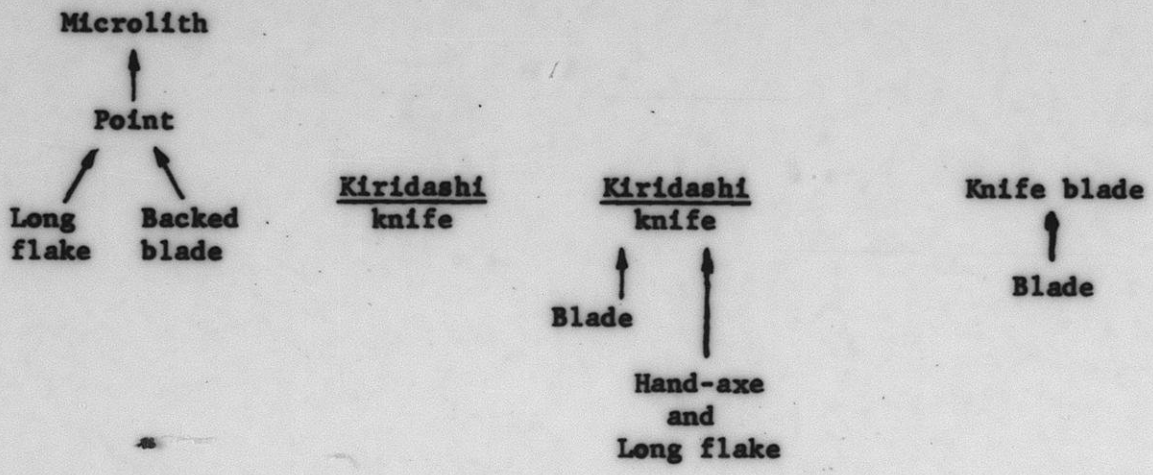
blade → { kiridashi knife / knife blade }

There are a number of sites on the Hachigatake Plateau in Nagano Prefecture which yield projectile points and microliths. Projectile points are found in a deposit of volcanic ashes which is commonly called "Shinshu loam" in this area. At Babadaira the original position of the bifacial points may be assumed to have been about 15 to 30 centimeters below the top of the loam bed, even after allowing for the erosion of the upper portion of the loam deposit. Also at Nishinokoshi, a site in the same village as Babadaira, semi-bifacial points were contained in a stratum about 1 meter below the top of the loam bed. On the other hand, the microliths from Yadegawa were found immediately above the mud deposit overlying the loam. To be sure, there seems to have been some, though not much, loam deposition on top of the mud. Thus, the mud may be thought to have been deposited toward the end of the loam formation. These microliths, then, were probably manufactured just before or after the end of the loam deposition. The logical sequence, then, would be: point → microlith.

Y. Kamaki, who is engaged in the investigation of the Inland Sea area, located a stratified site on Washiuzan in December, 1954. The Washiuzan implements were found in an eroded deposit of granite. Projectile points, together with a few microliths, were in a stratum overlying a hard, ferruginous layer near the bedrock, the latter layer producing

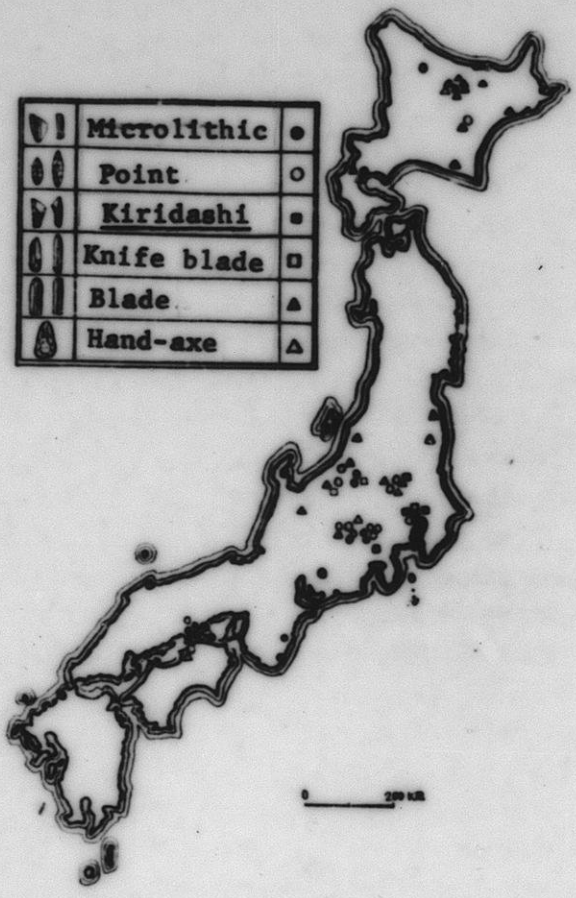
elongated flakes. Here we have the sequence: flake → {point / microlith.

Summing up the above discussion, we can roughly formulate sequences of various industries as follows.



When chronology cannot be determined by stratigraphy, relative age may be inferred by comparing forms and manufacturing methods of implements. For example, the association of the hand-axe with long flakes at Iwajuku I does indicate some sort of relationship between them.

In early phases of the blade or long flake industry, the hand-axe was probably still in existence side by side with blades and flakes. Also, unless the blade technique reappeared again and again intermittently, the sites yielding blades and long flakes can be assigned to the period immediately following the disappearance of the hand-axe. The common feature between the knife blade and the kiridashi knife is that in both the backed blade technique is employed. Knife blades, though having an intimate relation to blades and long flakes, are found above the dark layer, which is one of the reasons why knife blades are thought to have appeared after



23. Distribution of preceramic industries.

the blade and the long flake. Kiridashi knives, on the other hand, definitely come from below the layer containing points. Moreover, they manifest a considerable amount of similarities to unifacial points. At least, so far as the Kanto area is concerned, knife blades may be thought to be prior to kiridashi knives. As for the projectile points, morphological considerations may suggest their transitional status, though such a sequence has not been substantiated.

Finally, it is almost certain that microliths appeared after projectile points. While a finer classification of microliths is yet to be attempted, the last lithic complex to characterize the preceramic era in Japan was definitely the microlithic industry. The sequence of industries which we can infer for the Kanto area and vicinity, then, will be as follows.[8a]

8a. Serizawa now (1960) places Gongenyama I at a stage earlier than Iwajuku I. (See Serizawa 1957 below, for stratigraphic justification.) Moreover, a site older than Gongenyama I has recently been reported not too far from Gongenyama and Iwajuku. "Recently it has been said that implements have been unearthed from this lower loam. /See Section 3 of Chapter VI, below, for the definition of this and other geologic terms/. Reference here is to the specimens found at the Fujiyama site, Niizato Village, Seta County, Gumma Prefecture by Mr. Tadahiro Aizawa. The dark brown layer containing artifacts is exposed alongside a village road; above it one can clearly see the Yunokuchi pumice layer, a hallmark of the lower loam. Artifacts collected so far are pebble tools, adze-shaped unifaces made on a flake, and flakes; apparently andesite and

(footnote continued)

shale are utilized as materials. The method of manufacturing tools is evidently primitive, and the degree of surface weathering is considerable when compared with others. If one were to look for similar tool types, the former (Fig. 23a, bottom) are what Dr. Movius calls choppers and the latter (Fig. 23a, top) seems to be close to what is called a hand axe. Since the geological age of the lower loam is said to correlate with early Upper Pleistocene, some connection between the Fujiyama finds and Lower Palaeolithic cultures of the Asiatic continent can easily be envisioned. But since no systematic investigation has been carried out, we cannot state that we have definite conclusions." (Serizawa 1960, p. 48)



Fig. 23a. Artifacts from the Fujiyama Site.

Microlith

Point

Knife blade ; Kiridashi knife

Blade ; Long flake

Hand-axe ; Long flake

Would this sequence apply to Japan as a whole?[9] Consideration of this problem requires an examination of the distribution of each industry. Fig. 23 shows the distribution of industries so far known to us.

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9. Serizawa has now presented a tentative preceramic sequence for Hokkaido on the basis of the data accumulated recently (1959, pp. 37-38). According to him, the blade industry of Locality 13 of the Shirataki site is the oldest, followed by the other blade industry (Locality 33), with a different set of associated tools (see footnote 8, above). This was probably followed by the boat-shaped tool industry of Locality 30. The temporal relation between Locality 33 and Locality 30, however, is not yet certain. The other boat-shaped tool industry, of Tachikarushinai B, is considered later--closer to the microlithic industry--because of the small tools it possesses. The genuine micro-blade industry of Sakkotsu and of other southern and eastern Hokkaido sites probably succeeded the Tachikarushinai B industry. The blade-arrowhead industry is also very close to the Sakkotsu micro-blade industry and may have been immediately preceded by, or contemporaneous with, the ceramic, Jomon culture. The above discussion can be schematized into the following sequence.

(footnote continued)

Industry	Type site
Blade-arrowhead	Various sites
↑	↑
Micro-blade	Sakkotsu
↑	↑
Boat-shaped tool	Tachikarushinai B
↑	↑
Boat-shaped tool	Shirataki Loc. 30
↑	↑
Blade	Shirataki Loc. 33
↑	↑
Blade	Shirataki Loc. 13

Hand-axes are found in the Chubu (Tokyo-Osaka region), Kanto and Hokkaido, while western Japan produces tools resembling the hand-axe. Their distribution, then, may be said to be nation-wide. Next, blades and long flakes are hardly found in western Japan. They seem to have been widely used in areas north of the Chubu, particularly in Hokkaido. Knife blades, on the other hand, are limited to the Kanto and the Chubu. T. Esaka's discovery of knife blades in the Shimokita Peninsula, however, suggests need for further investigation in this regard. Distribution of kiridashi knives is even more limited--to the Kanto and the adjoining region to the southwest. This may suggest the presence of a localized culture in this area. The Kanto, especially its southern portion, does not have ready access to stone materials. It is possible that in this area a method of manufacturing different from that used in the Chubu, Tohoku (northeastern Honshu) and Hokkaido was employed. This is another of the problems which need be investigated.

Projectile points were widely in vogue only in the Chubu and the northern Kanto, the Kansai (Kyoto - Osaka) and Tohoku producing only a limited number of specimens. Hokkaido, however, abounds in sites yielding points. According to Oba's and Yoshizaki's investigations, the distribution is particularly heavy in northern Hokkaido. Lastly, microliths are widely distributed in the Inland Sea, Chubu, Kanto and Hokkaido. Moreover, according to I. Okamoto, there is a lone find of a small core in northern Kyushu. The Tohoku has not produced any microlithic specimen.

In sum, except for the kiridashi knife and the knife blade, which utilize the backed blade technique, other industries are all distributed

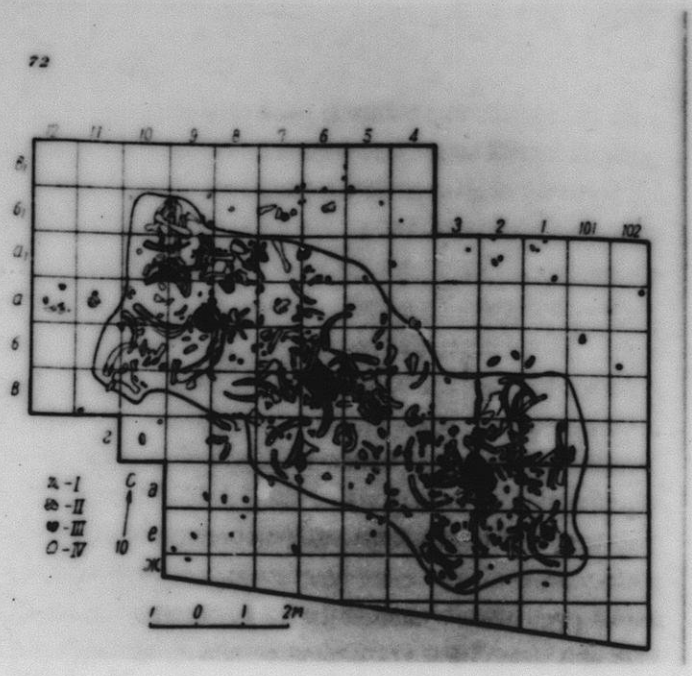
almost throughout Japan. The center of distribution for the blade industry is Hokkaido; for the point, the Chubu; and for microlithic, the Inland Sea and the Chubu. As for the stone materials used, northern Hokkaido is well known for the production of obsidian. Southern Hokkaido and the Tohoku yield shale. The Chubu produces obsidian, andesite and shale. The Chugoku (southwestern Hanshu) is abundant in sanukite.

We are not yet ready to discuss in any detail the relationship between specific types of implements, methods of manufacturing and the materials used. But some sort of functional relationship may very well exist between these factors and the distribution of industries.

CHAPTER V

DWELLING AND HABITAT

It is often supposed that Palaeolithic people ordinarily lived in caves. Being dark and damp as they are, however, caves are never fit for permanent human habitation. It is true that in Europe--especially in France and Italy--many Palaeolithic artifacts have been found in caves. Splendid murals, of course, have been discovered in the depths of such caves. But the places where people actually lived are the entrances of caves and sheltered areas underneath projecting rocks. Deep inside caves one only finds such special cultural remains as paintings. M. C. Burkitt distinguishes among three types of Palaeolithic sites in Europe: rock shelter, open station and settlement. He states that even in an area where open stations are found in countless number in gravel beds, only a few rock shelters have been located. For the solution of problems related to cultural continuity and chronological sequence, rock shelters and caves with successive human occupations are, indeed, the most valuable kinds of sites for archaeologists. If rock shelter and cave sites are so rare, then, where did people live? Recently there have been some good reports concerning this question. The Gagarino and Kostenki sites along the Don River and the Mal'ta and Buret' sites along the Angara River in Siberia are some of these. The Gagarino site, assigned to the Aurignacian period, has produced a large number of female figurines. Irregular dwelling pits were shaped in the form of a shallow dish and had been dug into the loess. The size is about 5 meters by 6 meters. The middle portion was unfortunately



24. A Late Aurignacian dwelling site at Pushkari on the Desna River. (After Boriskovsky)



25. Reconstruction of the dwelling site above.

destroyed when a farmer built a silo. Along the edge of the pits were found large slabs of stone and a mammoth tusk. According to the investigator, Zamiatnin, the artifacts excavated belonged to Gravettian mammoth humters who lived toward the end of the Aurignacian period. At the Kostenki site, which seems to belong to an early phase of the Magdalenian period, two house pits were found. One was 34 meters long and 5.5 meters wide, and had in the center nine hearths lined up in a row. The pit was divided up into three rooms by means of elevated walls. A large number of small holes, 20 to 35 centimeters in diameter and 30 to 40 centimeters deep, were found filled with rabbit bones, which made Rogachev think that they were storage holes. The other pit was 15 meters wide and 20 meters long. Again, a row of nine shallow hearths, 8 to 12 centimeters deep and 60 to 70 centimeters across, as well as small storage holes, were discovered. Also, there were two circular rooms overlying this pit, each with its own hearth. These small rooms were probably constructed on top of the old dwelling site.

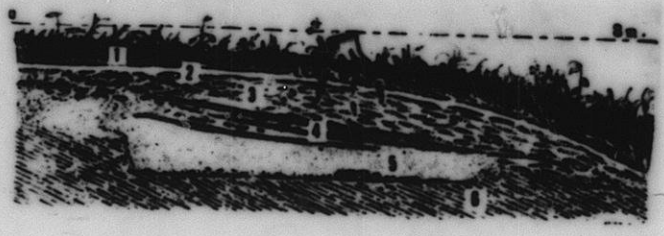
The Mal'ta site, famous for the female figurines unearthed there, contains an oval dwelling about 4 meters in width and about 6 meters in length, similar to that at the Gagarino site. The retaining wall is made of stone slabs, which are also used in constructing the sides and the bottom of the central hearth. This hearth was filled with burned bones and charcoal. At Buret', four Upper Palaeolithic house pits were examined. Mammoth leg bones were arranged around the pits and stone slabs had been placed on top of the bones at an equal distance from each other. Okladnikov thinks that these mammoth bones and stone slabs had supported house posts. Discovery

of many antlers on the floor, some of which were interlocked, suggested to Okladnikov that they might have been used to support a covering made of animal hides. Without discussing other excellent reports on dwelling sites, it may be surmized that most of the Upper Palaeolithic dwellings were probably of this sort.

These findings are valuable in the investigation of preceramic sites in Japan, where cave and rock shelter sites of this period have not been discovered. Last summer when I was investigating a preceramic site in Hokkaido, I happened to come across a feature which seemed like a house pit. Let me describe very briefly what was found.

The Tokachi River runs along the east side of Obihiro City in Hokkaido. Still further east of the Tokachi flows the Urahoro River, near the mouth of which is located the Urahoro railroad station, now known as "Shinyoshino." There is an important site here, known as either Urahoro or Shinyoshino. T. Natori of Hokkaido University has reported on this particular site which produced the so-called "Urahoro" style pottery and an abundance of blades, cores, blade-arrowheads and gravers.

On August 4, 1955, I visited this site with my friend M. Yoshizaki. On the way back, we saw to the west of the station, a cliff consisting of red soil, which was newly cut open on one side of a hill in order to extend a railroad track. Coming closer, we noted pieces of obsidian and potsherds. We decided to examine the exposed layers very carefully. The pottery was most likely that of the earliest phase of the Jomon period. The exposed side of the hill had about 15 centimeters of top soil containing organic materials. Below this was a layer of whitish volcanic ash, about 5 centimeters in thickness. Underlying the volcanic ash was a layer of dark brown



26. Exposed section near Shinyoshino RR station, Hokkaido.

(1) Top soil.

(2) Volcanic ashes.

(3) Dark brown layer.

(4) Dark colored (blackish) soil.

(5) Clay loam.

(6) Sandy loam.

soil about 30 centimeters deep. Initial Jomon sherds were present in the lower half of this layer, which gradually merged into the underlying loam bed. At a certain spot, the lower limit of this dark brown layer fell below the normal level. A closer inspection showed that a layer or two of thin black soil intruded here and there. These are the layers numbered 4 in Fig. 26. Here were also found some Initial Jomon sherds and pieces of obsidian. Below this was a loam bed, the upper portion of which was yellowish clay, gradually changing in the lower portion into reddish yellow loam with a high sand content. What was significant was the depressed portion of the black soil layer (4), where, between the loam consisting of clay and the loam with high sand content, an additional layer containing organic materials (dark layer), about 3 to 5 centimeters in thickness and 4 meters in length, was seen lying horizontally. Both edges of this layer were sharply cut off at the ends. This is the layer lying between the fifth and sixth stratum. When a handful of soil was taken out of this layer, we observed an innumerable number of obsidian fragments, including even some flakes of considerable size. As the railroad construction proceeded, this cliff was destroyed. But at the spot where the obsidian fragments were most concentrated, a rock about half the size of a pillow appeared as if it had been placed there as an anvil. Somewhat above this, near the clay-like loam, a fragment of a projectile point was discovered. Our inference is that the black soil in the loam is probably a preceramic dwelling site which had been dug to no great depth into the sandy loam, and that after its abandonment, it was covered by the clay-like loam, on top of which was formed a Jomon cultural stratum. Unfortunately the shape of the pit could

not be discovered, but the remaining portion was nearly circular. When the nature of the point industry in Hokkaido becomes better known, this dwelling pit, probably antedating the Initial Jomon period, will very likely assume major significance.

The Moro site in Itabashi Ward, which was excavated in 1951, produced obsidian knife blades as the main body of the finds. At the time of excavation a layer of pebbles laid horizontally in the loam bed was found at about the same depth as the location of the artifacts. Stone implements and fragments and fragments seemed to be concentrated particularly around this cluster of pebbles. Many of the pebbles seemed to show traces of fracture caused by fire. A similar situation was noted at the Tonogayato site, Kokubunjicho, Tokyo, where I.Yoshida found kiridashi knives. M. Fujisawa also discovered similar remains recently at Furuyashiki in Nagano Prefecture where projectile points and other specimens were unearthed. If it could be demonstrated that the gravels had in fact been subjected to heat, then these remains could be interpreted as hearths. Although minute carbonized objects have indeed been found, discovery of charcoal or ashes in or around these pebble clusters has not been reported.

At Babadaira in Kawakami Village, Minamisaku County, Nagano Prefecture, granite rocks the size of a pillow and large unifacial hand-axes have been found standing erect in the loam deposits which contained projectile points (Plate XIII). The roughly horizontal position of these implements, and the relative abundance of complete specimens compared with flakes and fragments, seem to indicate some aspect of the life of preceramic man. The large erect hand-axes with their cutting edge facing upward were probably used to cut and break objects, and the pillow-like granite was in most likelihood a platform to grind things on.

Among preceramic sites, presumably of the same age, there are some which contain mostly finished implements, whereas others produce a great many flakes and fragments. These may represent dwelling sites as against workshops, in the narrower sense of the term. Gorodtsov reports that at Timonovka on the Desna River in the Ukraine there were deep rectangular house pits, a separate manufacturing site and small circular storage-like holes. Since this site belongs to the Upper Palaeolithic period, sites of this sort may be discovered in the not too distant future in Japan also as systematic research proceeds.

So far as we know, preceramic sites in Japan tend to be concentrated along streams and around lakes. The easy access of these locations to stone materials, as well as to acquisition of food supplies, was probably the natural factor in the choice of these sites. Representative areas of this sort include the vicinity of Okayama City on the Inland Sea, the area of Lake Suwa, the region of the upper Chikuma River in the Chubu and the basin of the Yubetsu River. As for the strata of preceramic significance, the eroded soil on the granite bed rock in the Inland Sea area, the loam or sand strata on river terraces in the Chubu and the clay or sand layers on river terrains in Hokkaido may be cited as areas productive of artifacts. In the Kanto, remains have been found in loam deposits on the terraces of the Musashino plateau. Considerable progress has been realized in the study of the relationship between terraces and loam deposits: herein lie the clues to the geological age of preceramic cultures. Problems of the geological age and of the natural habitat of preceramic man require the knowledge of specialists in geology and geography, which are outside the province of archaeologists.

Preceramic sites in the Kanto are, so far as presently known, found in the Tachikawa loam bed and in the stratum immediately above it. The immediate problem is to discover through geological methods what the natural environment was in preceramic times. The Pleistocene period is also called the glacial age. Europe experienced four periods of glaciation: Günz, Mindel, Riss and Würm. The Upper Palaeolithic period is assigned to the third interglacial (Riss-Würm) and Würm. During this time man produced the Upper Acheulian, Mousterian, Aurignacian, Solutrean and Magdalenian cultures. It was the most productive time in the Palaeolithic period. To what portion of this Palaeolithic period would the preceramic period of Japan--principally the time of the Tachikawa loam deposition--correspond?

N. Yabe has attempted to correlate the European quarternary with that of Japan on the basis of changes in sea level as caused by climatic change and glaciation. He places the borderline between the Pleistocene and the post-Pleistocene in between the Egota Conifer bed formation and the Numa Coral bed formation. The latter, belonging to the early post-Pleistocene, was a time of warm climate, whereas in the former the climate was as cold as that prevailing today at an altitude of 1,500 meters. A similar observation was made at Nishinomiya in Osaka by S. Miki. We may conclude from these facts that at the end of the Pleistocene the climate in Japan was very cold. In conformity with this, lignite obtained from the late Pleistocene deposits in the Tohoku has been found to contain anathermal plants such as those now extant in Sakhalin. Plants of similar geological age found in Hokkaido are also very much like those of Sakhalin.

The preceramic industry which existed during the formation of the Egota Conifer bed probably consisted mainly of projectile points or microliths. The nature of lithic culture in Japan will be further clarified if it is seen against such a cold climatic background.

M. Minato hypothesizes three glacial periods for the Pleistocene in Hokkaido: Poroshiri, Tottabetsu I and Tottabetsu II. The mammoth fossil which was discovered last year at Erimo Point belongs to the Tottabetsu II. Sites such as Tarukishi and Shirataki, which have produced some of the most representative blades, are said to belong to a period of somewhat warmer climate, i.e., between the Tottabetsu I and II. Since the blade industry in Honshu is found in the lowest portion of the Tachikawa loam, it is likely that during the deposition of the Tachikawa loam there were cold and warm periods. In any case, solution of these problems must be made by specialists and accumulation of a sufficient amount of data.

The world-wide lowering of sea level towards the end of the Pleistocene was followed by a radical rise in sea level at the beginning of the post-glacial. When glaciers spread over the land, the sea level was lowered in proportion to the amount of water incorporated in the ice sheets; and by the same logic deglaciation caused a rise in sea level. According to S. Kaizuka, the depth of the alluvial deposits at the mouths of the Edo and Tama Rivers is about 60 meters, at the Sagami River mouth about 80 meters, at the Tokachi River mouth about 60 meters and in the vicinities of Abashiri and Kushiro about 70 meters. Now since alluvial deposits were formed by filling up valleys in the late Pleistocene period,

the sea level in those days must have been several tens of meters or perhaps even 100 meters below the present level. The outline of Japan in preceramic times, then, must have been quite different from what it is now. It was after the beginning of the alluvial deposition, according to Mitoshi Tokuda, that the sea water invaded the Inland Sea region. This geological age probably corresponds, archaeologically, to the mid-Initial Jomon period. According to Y. Kamaki and others, in the shellmounds which produce the mid-Initial Jomon pottery with its characteristic roulette designs, the only species of shell contained in lower levels is Corbicura strata (a fresh water species). These levels are covered up by a more recent layer containing sea shells, such as the arc shell. Since the pottery of both the lower and upper levels has roulette designs typical of the Initial Jomon period, it may be inferred that the invasion of the sea water in this area took place about this time. Moreover, since the separation of Kyushu and Shikoku Islands from Honshu was also completed after the inception of the alluvial formation, according to Tokuda, preceramic people must have been able to travel freely by land between Honshu, Kyushu and Shikoku. Whether or not Japan was connected in those days to the Asiatic continent cannot be substantiated at the present stage of research. The discovery of a mammoth fossil in Hokkaido by M. Minato has demonstrated that Hokkaido was part of the continent until quite late--probably until about the time of the blade industry. When was Honshu separated from Hokkaido, and when from Korea and China? These are crucial questions in relation to population migration and cultural diffusion. Since Palaeolithic people probably did not possess the knowledge of

constructing boats, unless Japan was connected to the continent by land, any intercourse between them would have been impossible. The most effective method of investigating this problem is considered to be the discovery and examination of fossil animals. But analysis of stone implements and other human remains may also contribute to the solution of this problem. Active cooperation between archaeology and geology, then should be the most appropriate approach to the problem.



27. Tadahiro Aizawa showing the stratigraphy at Iwajuku.

CHAPTER VI

GEOLOGICAL PROBLEMS

It was in the red soil of Iwajuku in Gumma Prefecture that T. Aizawa first discovered preceramic tools. Shortly thereafter, H. Takizawa also discovered an implement in the red soil at Moro in Itabashi Ward, Tokyo. In Suwa City, Nagano Prefecture, T. Matsuzawa called our attention to his discovery of a stone implement in the red soil at Chausuyama. It is an interesting fact that all these discoveries were made by young men of about twenty years of age. A more important common feature among these discoveries is that the artifacts were all found in the red soil. This red soil of the Kanto region is called the "Kanto loam" (also "Kanto volcanic ash" or "Kanto red soil") by geologists. Its age has long been established to be late Pleistocene. This is the reason why, when the existence of the preceramic culture in Japan was still unknown, archaeologists had been swayed by the preconceived notion that the Kanto loam was an archaeologically sterile (non-cultural) layer. About 1939, my friend, T. Shirasaki, then a high school student, discovered Inaridai pottery at Itabashi, Tokyo, the Inaridai being the oldest of the Jomon pottery styles known at that time. It was reported that some of this newly discovered Inaridai pottery was found in the Kanto loam deposits. Because Jomon pottery is ordinarily contained in the black soil overlying the Kanto loam, this new discovery of Shirasaki's caused a certain amount of repercussions among archaeologists. Shirasaki assigned the Inaridai pottery, which he had found in the loam, to the period immediately after the deposition of the loam, that is, before any substantial deposition

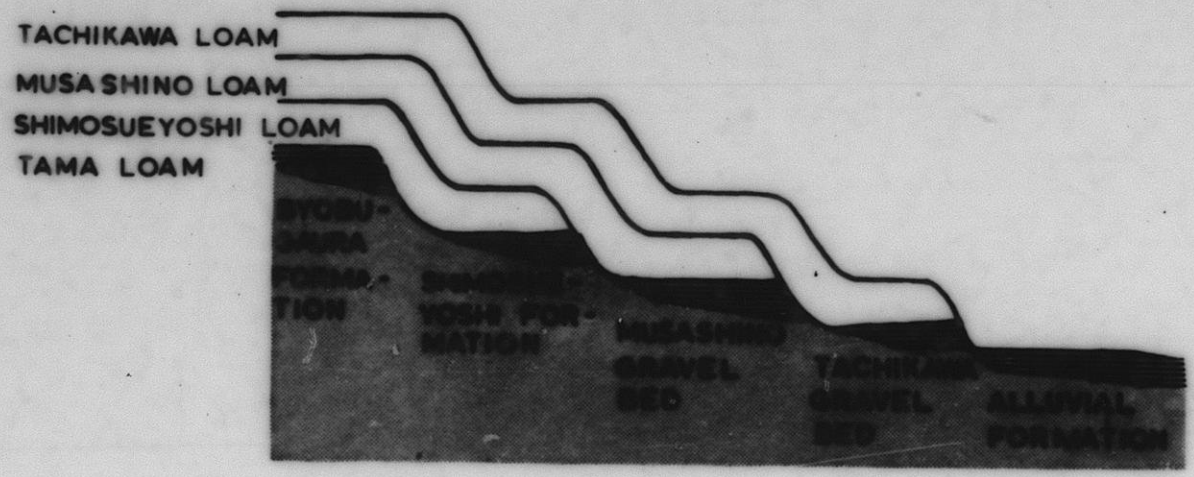
of the top, black soil. In other words, he considered the Inaridai pottery to be almost as old as the beginning of the post-Pleistocene. Although this view had to be somewhat revised later, it is significant as the first instance in which a question was ever raised regarding the relationship between the Kanto loam and human remains. Before this time, O. Ema also had noted a similar phenomenon when he excavated pottery with roulette designs at the Hijiyama site, Enako, Takayama City, Gifu Prefecture, and he discussed the age of this pottery type on a geological basis. Back in those days, I was interested in the study of the Initial Jomon pottery and used to spend every spare moment exploring the plateaus around Tokyo and collecting potsherds. Because of the misconception that artifacts cannot be found in loam deposits, I had no inclination to stop and examine the exposed red soil, although I passed by such places countless numbers of times. I naively believed that since the loam is a deposit of volcanic ash, the Musashino Plateau, covered in those days with volcanic ashes several meters deep, had to be devoid of grass, trees and, certainly, people.

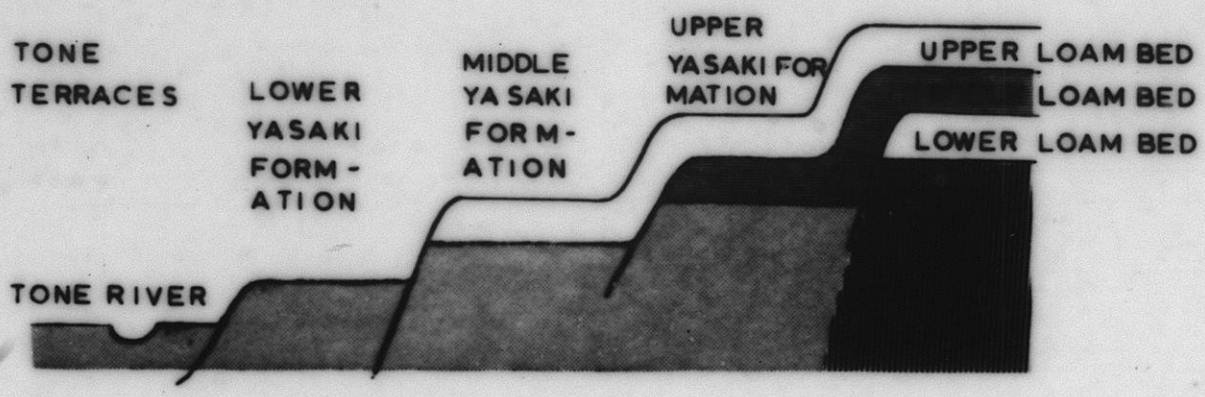
In the summer of 1950 I met T. Aizawa for the first time at T. Esaka's home and learned that stone tools had been unearthed from the red soil zone. I had an exhilarating sensation as if mist was all of a sudden clearing up in front of my eyes. I came to a realization that the red soil, which we had simply dismissed as sterile, might very well contain unrevealed secrets of a long human history.

1. The Kanto Loam Bed and the Terrace Formation

The Kanto loam is deposited widely in the Kanto plain and vicinity. The number of geological studies concerning it are considerable. In 1888 Bin Suzuki inspected the mineralogical properties and the stratigraphy of the loam deposits and suggested that the Kanto loam was formed, like the Chinese loess, by the deposition of volcanic ashes blown over from surrounding volcanoes. In 1918, in opposition to this wind-blown hypothesis, T. Wakimizu presented an aqueous hypothesis. According to him, loam deposits around Mishuku in Setagaya Ward contain round gravels in the lower portion, indicating partial formation by means of flood water, streams and ocean water. Since then many geologists have been carrying on research concerning the Kanto loam; and ever since the presence of artifacts in the loam became established, study of the loam entered a new stage. A Kanto Loam Society /Kanto Romu Dantai Kenkyukai/ was organized in 1953 by young geologists. It publishes a journal, Kanto Loam, sponsors field trips and holds discussions and meetings to read research papers. The discussion to follow, then, is based on the valuable findings resulting from research carried out by members of the Kanto Loam Society.

After the great Kanto Earthquake of 1923, geological and topographical studies of the Kanto lowland became popular. It was about this time that R. Aoki and R. Tayama classified plateaus in the Kanto area into (starting from the oldest) Pre-Tama, Tama, Musashino and Post-Loam. J. Makiyama later subdivided the Musashino plateau into three: first, second, and third. Still later, F. Tada and S. Juen, discovering that the loam





28. Loam layers and terraces in the southern (top) and northern Kanto (bottom). (After the Kanto Loam Society)

layer of the first plateau was thicker than that of the second plateau, stated that the loam of the first plateau began to be deposited when the second plateau was still on the alluvial plain, and continued its deposition after the second plateau level had risen. Among southern Kanto plateaus, those which are covered with loam are, as shown in Fig. 28, Tama, Shimosueyoshi, Musashino and Tachikawa; others belong to the so-called post-loam period. Until recently "Kanto loam" designated only those formations which are covered by the Musashino and Tachikawa plateaus, but the research of the Kanto Loam Society has revealed older loam beds. Let us consider the relation of the plateau gravel beds to specific loam deposits. The first is the Tama loam, which is best observable near Noborito in Kawasaki City where it is exposed to the surface. Here the Iimuro silt bed of the Miura formation, which comprises the Tama plateau, underlies, in discomformity, a gravel bed (the "Oshinuma" gravel bed), which is covered by a clay layer. This clay layer is covered by a loam bed of pumice-like material, nearly 20 centimeters deep, containing three distinct layers of pumice. The relation of the Tama loam to the Shimosueyoshi loam is observable near Ikuta and seems to be one of discomformity. Depositions corresponding to the Tama loam have not been found in the Boso Peninsula. The next, Shimosueyoshi loam often overlies the Shimosueyoshi gravel bed and is in a transitional relation to the Shimosueyoshi stratum. Since the Shimosueyoshi loam and the upper limits of the Shimosueyoshi gravel bed together constitute the Shimosueyoshi formation, the Shimosueyoshi loam, in conjunction with the Tachikawa and the Musashino loam, can be used in topographic comparisons (Cf. Fig. 29). The Shimosueyoshi loam is deposited in the valley which cuts into the Tama

formation. Moreover, in Chiba the Shimosueyoshi loam is to the Narita loam as it is to the Shimosueyoshi plateau; the deposition of the Narita bed thus corresponds to the Shimosueyoshi formation. The third, Musashino loam covers the Musashino gravel bed and the Itabashi clay bed. It is about 6 to 10 meters thick and contains a layer of the "Tokyo" pumice, about 10 centimeters thick, roughly 1 meter above the bottom limit. The Musashino loam and the Musashino gravel bed are, according to W. Fukuda and K. Hatori, in discomformity. The fourth, Tachikawa, loam is about 2 meters thick and lies over the Tachikawa gravel layer, which is about 2 to 7 meters thick. These two are in perfect conformity. Loam deposition seems to have terminated with the completion of the Tachikawa loam. The thin layer of loam on top of the following, Aoyagi plateau, according to a recent analysis, has been found to be a secondary formation caused by weathering.

We may summarize the process of deposition of the Kanto loam in light of the above discussion. In the late Lower Pleistocene (dl 2), the Shimosueyoshi loam was deposited on the old Tokyo Bay and gradually filled up the remaining portion of the bay. Later, movements of the bedrock caused development of alluvial fans and deltas at the foot of the mountains. The Musashino loam was then deposited on old river beds and on plains, on which the Shimosueyoshi loam had formed. This was during the early Upper Pleistocene (du 1). Then in the late Upper Pleistocene, the Tachikawa plateau rose, on which the Tachikawa loam was deposited.

2. Fossil Soil and the Kanto Loam

When we began to investigate cross sections of loam beds, we noted a dark band or two in the loam about two meters from the surface.

Geologists did not tell us what it was and we of course did not know. Its ubiquitous presence in practically all the loam sections, in varying thickness to be sure, did suggest that these bands possibly serve as stratigraphic markers. As the research of the Kanto Loam Society has been making great strides, it seems that their usefulness will be shown

Geological Bed	Topographic Formation	Culture	Volcanic Activities
Yurakucho Shell Bed		Jomon	
?			
Ekota Fossil Plant Bed	Tachikawa (Du 2)		Completion of the Present Mt. Fuji
?			
Tachikawa Loam Bed		Preceramic	
Tachikawa Gravel Bed			
Musashino Loam Bed	Musashino (Du 2)		Hakone Central Volcanic Cone Archaic Fuji
?			
Itabashi Clay Bed			
Musashino Gravel Bed	Shimosueyoshi (Dula)		Hakone Volcano
Shomosueyoshi Loam Bed			
Shimosueyoshi Bed	Tama (Dl)		
Tama Loam Bed			
Byobugaura Bed			

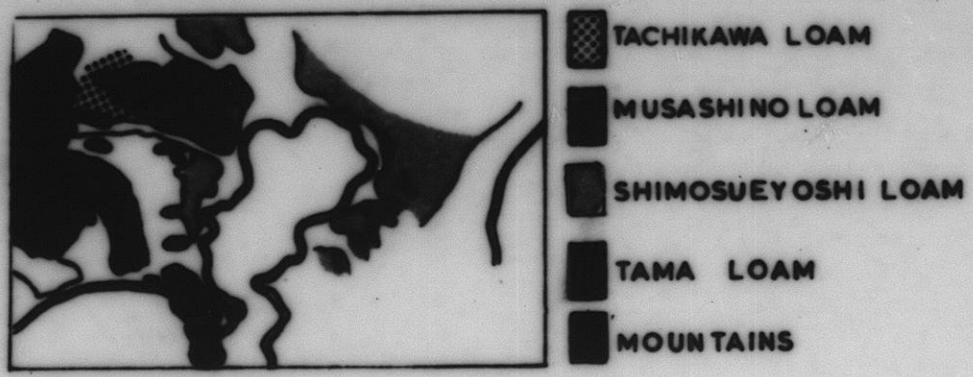
sooner than we have expected. The efforts of H. Toya and S. Kaizuka, in particular, are responsible for bringing this to fruition. The result of their analysis of the dark belt is as follows. They first tested to see if the dark color was due to the presence of such primary colored rock as scoria. Their analysis showed that colored rock was not present in any large quantity and therefore that the dark color was not due to scoria. The unconsolidated weathered matter of dark brown color, which is the agent of the dark color, would lose its coloring when placed in a 6% solution of H_2O_2. Next, in order to determine what the soil color of the unconsolidated matter might be, a quantitative analysis of carbon and nitrogen was carried out. As a result, organic carbon and organic nitrogen were shown to be present in the maximum amount in the dark belt. Also, the proportion between the two was fairly constant at 10:1, suggesting that the organic matter was caused by rotting of plants. There remained the possibility that colloid, produced by rotted vegetable matter, seeped through from the surface and collected in large quantities in the unconsolidated section of the loam bed; analysis of the degree of consolidation, however, showed this factor to be negligible. This dark band, then, was most likely formed in large part by the accumulation of vegetable matter while deposition of ashes has been interrupted, and was later covered up by additional deposition of ash. The number of these dark bands is not always one or two; it increases as we go westward, due in most likelihood to the decreasing distance from the point of origin of the ashes. Aside from these dark bands, one can recognize several weathered strata, suggesting disconformity of the loam bed. Weathered

strata are seen below the Tachikawa loam, in the Musashino, Shimosueyoshi and Tama loam beds.

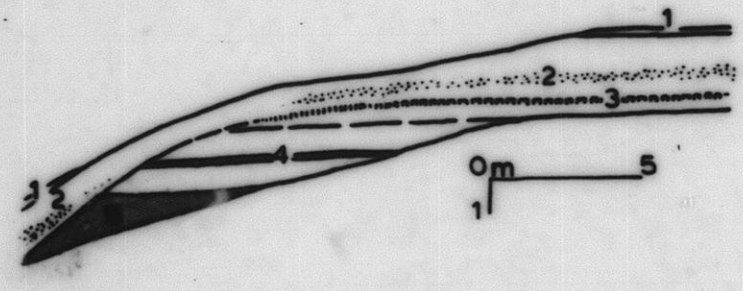
Thus we can infer several periods of soil formation during the long period of loam deposition, and also infer the presence of minute disconformities. Contrary to conventional thinking, the Kanto loam was not all deposited in a single time span; nor were conditions then so unfavorable that no human or other animals and plants could live. I have seen a vertical section of the Shimosueyoshi loam, created by a large river 100 meters wide cutting through the loam formation near Makuhara railroad station in Chiba Prefecture. On both sides of the river were seen a good deal of limonite, indicating possible presence of plants. Toya also has noted traces of vegetable roots in the lower portion of the Tachikawa loam. He believes that they probably belong to some sort of grass. The small bits of charcoal found at the Moro site are said to be chestnuts, according to S. Watari. Reconstruction of the natural environment of the preceramic era should materialize in the near future. Only when man and his life are considered in such a context can we learn the cultural significance of the stone implements.

3. The Kanto Loam and Stone Tools

In the southern Kanto, stone tools coming from the Kanto loam deposits have so far all been found in the Tachikawa loam bed. As far as we know, such sites as Moro, Koigakubo, Tonogayato, and Tamaribuchi without doubt belong to the Tachikawa loam bed. Artifacts coming from the deepest level in the southern Kanto were found by I. Yoshida at the Koganei site.



29. Distribution of the Kanto loam. (By Ishihara, Kaizuka, Juen, Toya and Naruse)



30. Relationship between the Tachikawa loam and the Musashino loam. (On the estate of Mr. Iwasaki in Tamagawa)

(1) Red-orange colored section.

(2) Dark soil bed.

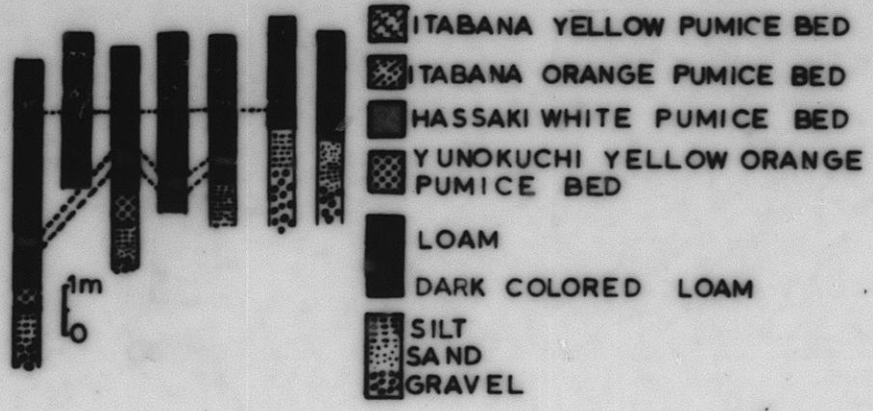
(3) Cleavage.

(4) Tokyo pumice.

(5) Musashino gravel bed.

Unfortunately the excavation was inadequately done; but it did yield a relatively large obsidian blade from a lower portion of the dark band about two meters below the top of the loam bed. This may be considered near the bottom of the Tachikawa loam. H. Toya also found a flake of almost blade form in a weathered stratum formed in the Tachikawa loam bed, perhaps close to its bottom, in the vicinity of the Mitaka Observatory. At Furuyama and Shimohara in Sagamihara he also found, in a dark band in the lower part of the Musashino loam bed, large pebbles which cannot possibly be accounted for except by having been transported there. Although unfortunately no artifact was found, this area still promises future possibilities of unearthing implements belonging to pre-Tachikawa times (du 1).

If the loam beds of the southern and northern Kanto can be correlated, then such a correlation would be extremely convenient in matching geological layers containing artifacts, such as those of the Iwajuku and Gongenyama sites. Fortunately F. Arai and others of Gumma University have recently been cooperating with T. Aizawa in research on this problem. Fig. 31 shows stratigraphic columns made by Arai. As the figure clearly indicates, the loam formation at the foot of Mt. Akagi consists of several beds of pumice and dark soils, on the basis of which the loam can be divided into three levels: upper, middle and lower. The Itabana pumice level characterizes the upper loam bed, being widely found in the western and southern foot of Mt. Akagi. There is a strong possibility that it is a deposit of Asama volcanic ash. The Yasaki white pumice level is found particularly at the western and southern foot of Mt. Akagi and



31. Stratigraphic columns of northern Kanto loams. (After Fusao Arai)

marks the bottom of the middle loam level. The lower loam level is found below the Yasaki white pumice level, its lowest extent being unknown (Cf. Fig. 31).

S. Kaizuka has discovered in Chiba Prefecture an exposed area where the Yasaki white pumice, corresponding to the middle portion of the Akagi loam, overlies the Tokyo pumice level, the latter being in the lower portion of the southern Kanto, Musashino loam layer. The Yasaki white pumice, according to Kaizuka's report, was found there lying slightly above the Tokyo pumice level. On the basis of these facts, we might match the Tachikawa loam with the upper Akagi, the Musashino loam with the middle Akagi and the Shimosueyoshi loam with the lower Akagi loam.

According to F. Arai, the stratum containing Iwajuku I can definitely be matched with the first black band. And the Gongenyama II stratum can possibly be matched with the second. Also, the Iwajuku points were found between two Itabana pumice layers in the upper loam level. These bits of evidence strengthen the possibility that implements belonging to the period of the Musashino loam, which have not been found in the southern Kanto, would be those of a hand-axe complex, such as the Gongenyama I, Gongenyama II or Iwajuku I.

CHAPTER VII

CONCLUSION

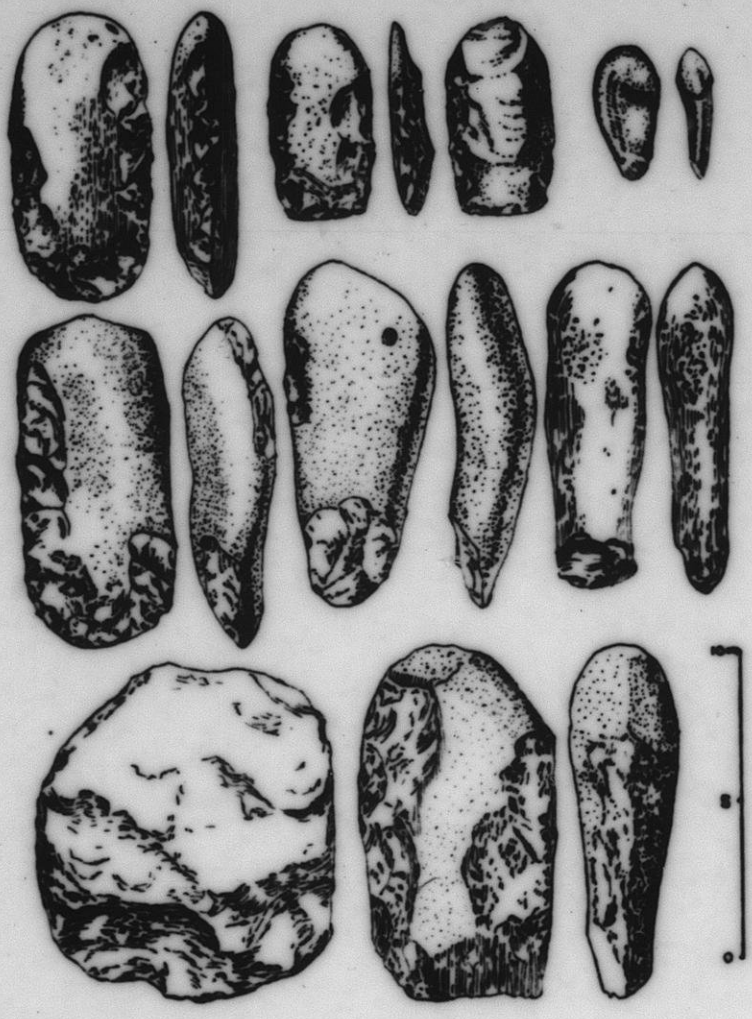
1. Relationship between the Preceramic and Jomon Cultures

One of our first tasks is to ascertain the nature of the transition from the end of the preceramic to the beginning of the Jomon periods. In order to do this, it is necessary to examine the microlithic industry very closely, as it marks the terminus of the preceramic era. Until two or three years ago it was not known whether a microlithic industry did exist in Japan. Through the discovery of the Yadegawa site and the rich microlithic sites in the Inland Sea area we are gradually learning not only that the microlithic industry lasted for a considerable time in Japan but also that in addition to micro-cores and small blades, almost geometric microliths seem also to have been used. According to Y. Kamaki, at the Ijima site in Naojima Village, Kagawa Prefecture, small blades and micro-cores were unearthed from an upper level and almost geometric forms (Ijima I) from a lower level. If this is true, then the terminal industry of the preceramic era in Japan probably was the small blade industry commonly called "Yadegawa." It is thought that a number of the small blades were inserted into a shaft, thus making a composite tool. Composite tools began to appear in Europe toward the end of the Palaeolithic, were most widely used in the Mesolithic and continued to be used in the Neolithic. That they appeared at the end of the preceramic era in Japan is a significant fact. The relation of the microlithic industry to early Jomon stone tools should be considered in terms of whether or not composite tools can be found in Jomon sites. We have no evidence that the preceramic

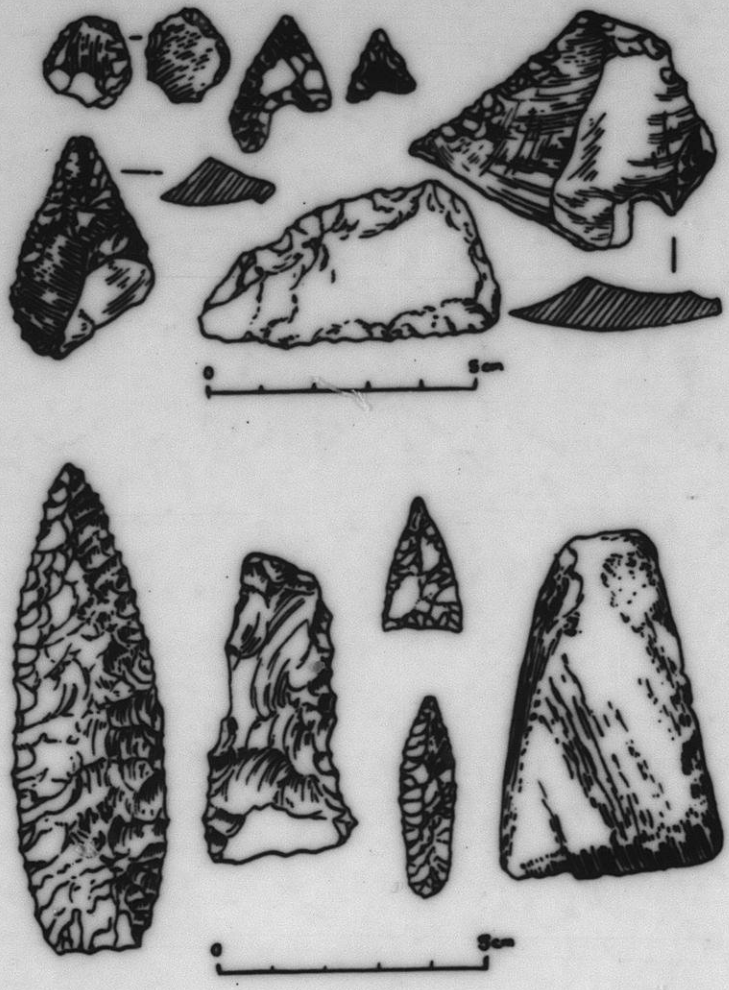
culture continued on after the time of the Yadegawa industry.

Now, the oldest cultural traces of the Jomon culture are found, as far as we know, in the tradition associated with string-impressed pottery which is distributed in a small area centering around the southern Kanto. This tradition is characterized by pottery with a bottom pointed like a bullet and by "pebble tools," made by roughly chipping or grinding pebbles that are found, for example, in river beds. It should be noted that hardly any implement made of efficient materials such as obsidian or chert has ever been found in this tradition. It cannot be maintained, however, that the latter are never so associated, since scrapers and tips either of spear-heads or arrowheads have been found with obsidian fragments from the level which contained Inaridai style pottery at the Daimaru site in Yokohama. Nevertheless, such an association is certainly rare. (Fig. 32)

As the string-impression design approached its end, a roulette design came into vogue in a wider area--from the Chubu to Kyushu. To make this design, wavy, oval or lattice design is first engraved on a cylindrical stick of wood or bone, the size of a pencil, and then the stick is rolled over the surface of a vessel. The shape of the ware is still bullet-like, with pointed bottom, but is somewhat more evolved than the string-impressed type. Stone tools associated with this pottery tradition are principally arrowheads made of small but sharp blades and scrapers; but mortars, grinding stones and, though infrequently, ground axes are also sometimes associated. It should be noted that these are made of efficient materials, such as obsidian, andesite and chert and that they are mainly of the flake variety. (Fig. 33, top)



32. Stone tools associated with the string-impressed style pottery from Daimaru, Kanagawa Prefecture. (Property of the Archaeological Museum, Meiji University)



33. Top: Stone tools associated with roulette style pottery (from various sites).

Bottom: Stone tools associated with incised style pottery (from Shirahama, Aomori Prefecture). (Property of the Department of Archaeology, Keio University)

From the Tohoku to Hokkaido another pottery style prevailed, in which incised designs were made with shell and other instruments. The bottom is pointed, but has either a nipple-like protrusion or the shape of a slender cone. Stone implements associated with this tradition are ground stone axes, made by the sawing technique, notched scrapers, arrowheads, spearheads, mortars, grinding stones, etc. Compared with the former two pottery styles, this style is associated with much more varied types of stone tools. (Cf. Fig. 33, bottom)

In which of the traditions represented by the above three pottery styles did the preceramic culture survive, if it did at all? This is an extremely important problem, to which a solution cannot readily be offered without further and more detailed examination of the earliest Jomon culture. As far as we know now, however, the kind of composite tool tradition which we see in the terminal preceramic Yadegawa industry cannot be found at all at the beginning of the Jomon culture. As soon as the Jomon culture began--with pottery--new elements, such as stone arrowheads, axes and mortars suddenly made their appearance, differing in their techniques of manufacture and their functions. At present, then, there is no way of narrowing the gulf between the two cultures. Judging from the distribution and the characteristic features of stone tools, however, the pottery tradition with roulette designs, which is widely distributed from the Chubu to Kyushu, seems to have the closest relationship to the preceramic culture. More detailed investigation in the future may be able to bridge the gap.[10]

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10. Serizawa (1960) presents new data which throws light on the problem of the transition from the preceramic to Jomon. (pp. 80-82)

(footnote continued)

"Excavation of the Kamikoshiba site, Minami-Minowa Village, Kami-Ina County, Nagano Prefecture was conducted in the middle of November, 1958. Artifacts uncovered at this site are: 17 large points, 11 large axes, 6 long scrapers, 1 awl, 6 cores, 3 pieces of rock material (for tool-making), 6 flakes and others, totalling 57 specimens. The stratigraphy of the site, beginning from the top, consists of 20cm of black, decomposed organic soil, 20-25cm of dark brown soil, 40cm of soft yellowish brown soil, and over 3m of hard yellowish brown soil. Implements were found in the soft yellowish brown layer, from which no pottery was recovered. From the overlying dark brown layer, however, 32 potsherds of the Initial and Early Jomon periods were uncovered. Excluding the Jomon pottery of the upper layer, the nature of the Kamikoshiba site can be summarized as follows:

(1) No pottery has so far been found in association [with the stone tools.]

(2) The largest point is 25cm long and 5cm at the maximum width and might perhaps better be called a short sword.

(3) The true blade technique is used.

(4) Half of the large axes are triangular in cross section and the cutting edge is ground. Moreover, the cutting edge of several specimens is almost convex.

(5) No Jomon type of stone tools, such as arrowheads and notched knives, has been found in association.

(6) The artifact-bearing level is in the so-called soft loam layer. Since Initial Jomon pottery has been found from an overlying layer, it is at least prior to the Kayayama style pottery.

(footnote continued)

(7) Implements were piled up roughly on the same level and found lying within an oval area 5m x 3m in extent.

(8) Scarcely any waste flakes or fragments of implements were found, artifacts being limited to finished pieces.

"On the basis of the points enumerated, we cannot at present include the Kamikoshiba implements in the Jomon culture. Moreover, we have not recognized these characteristics in the hitherto known preceramic cultures. If we take only the partially ground large axes, /this complex/ should be included in the Neolithic Age. However, because of the lack of pottery association, it belongs to the non-pottery period, according to our terminology. Also strange is the fact that microliths, which were so prevalent at the terminal stage of the preceramic period, are not found. At present, there appears to be no way of interpreting this find except to regard it as a transitional culture between the microlithic and the Jomon; but let us leave this to future research. If the Kamikoshiba site should turn out to be a special feature--such as a grave--and if the dwellings of the same people should be discovered nearby, the problem would develop in a new direction.

"An unexpected discovery was also reported from the Tachikawa site, Rankoshi Town, Isoya County, Hokkaido, as a result of the investigation by the Hakodate Museum in the fall of 1958. Mr. Yoshita Matsudaira and others had once found Araya-type burins and microblades in surface collections from this site, and we had been devoting attention to it. Upon excavation, a combination of tanged points, scrapers and Araya burins were unexpectedly found in one of the localities at the Tachikawa site.

(footnote continued)

The tanged points were completely bifacially retouched, a type hitherto unknown among the preceramic collections in Japan. Using the Araya burin as the clue, we can infer that this group is quite closely related to the microliths from Sakkotsu and the implements of Locality B at Tachikarushinai. Whether or not Hokkaido tools changed from microliths to tanged points is an interesting problem for the future. If an implement such as a harpoon head, which had been made by inserting microblades into a shaft, came to be made entirely of stone, including the shaft, it might appear as a spearhead-like implement with a tang. The level from which the finds were recovered was a layer of volcanic ashes, much like the loam of Honshu. The date is thus unmistakably before the Jomon period.

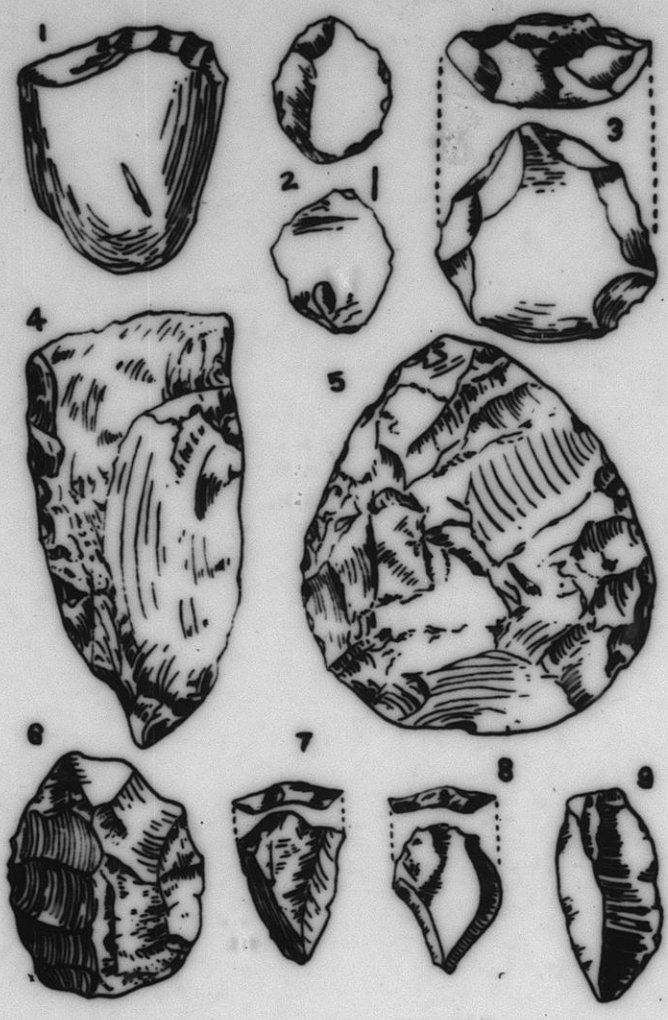
"Both the Kamikoshiba site and the Tachikawa site represent industries characterized by tools which consist mainly of points. It is becoming increasingly probable that a special type of points filled the gap between microliths and the Jomon culture."

2. Relationships of Preceramic Industries of Japan to the Palaeolithic and Mesolithic Industries of the Asiatic Continent

I have never expressed my views regarding this problem. Well-planned, systematic research will be required in order to formulate even a tentative view concerning this huge problem. At present, neither the chronology, distribution, nor the geological position of the preceramic culture of Japan can be said to be on any secure basis. Nor can research on the Palaeolithic and Mesolithic industries on the Asiatic continent be said to have progressed sufficiently to permit adequate comparisons with Japanese data.

Asia west of India has been relatively well studied. But in areas east thereof, data are not sufficient. This is particularly true of the areas surrounding Japan. Let us review the progress of research from west to east.

V. D. Krishnaswamy published in 1947 an article entitled "Stone Age India" in Ancient India, No.3, in which he presents an outline of the Indian prehistory from the Palaeolithic to the Neolithic. According to the article, analyses of the Himalayan glacial periods and of the plateaus along the upper Siwalik River enable us to divide the Palaeolithic Indian culture into several periods. No sure evidence has been found in India for Lower Pleistocene occupation by man. The oldest culture in India is the middle Pleistocene, pre-Soan culture, which is a flake tradition using the Clactonian technique, just like the English Cromer industry. Stratigraphically speaking, this pre-Soan culture is found in the Siwalik gravel bed which corresponds to the second glacial, or the first half of the Middle Pleistocene. The next industries to appear are the Early Soan,



34. Paleoliths from India and Pakistan. (After V. D. Krishnaswamy)

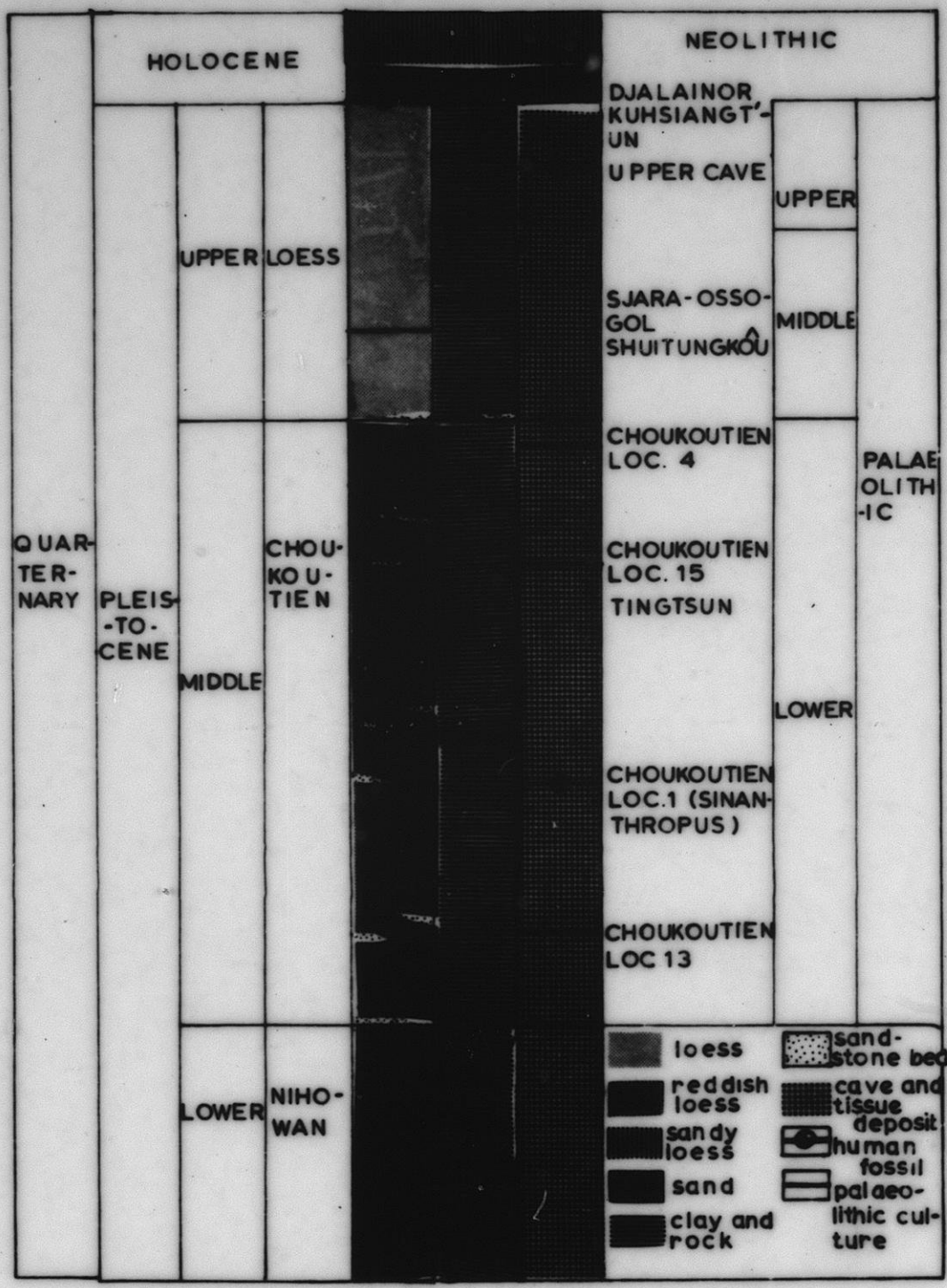
which consists mainly of choppers and flakes, and the Madras, which is characterized by hand-axes. Both these are found on Terrace I, which is said to have been formed in the second interglacial. Thus, though the manufacturing techniques are different, they are both thought to belong to the last half of the Middle Pleistocene. Coming to the Upper Pleistocene, the Late Soan industry is found on Terrace II, a third glacial formation. This industry is divided into Group A, found in the Potwar gravel bed and Group B, found in the Potwar clay bed. Group A consists principally of more evolved choppers but also contains Levalloisian and Clactonian flake tools. Group B also still retains choppers but no longer contains any hand-axes; moreover, flakes with prepared platform (i.e., Levalloisian flakes) appear more prominently and blades are also now found in some number. It probably corresponds to the Late Levalloisian industry of Europe. Concerning industries later than this, that is, Upper Palaeolithic industries, data seem to be scarce in India. The "evolved Soan," so named by Movius, is assigned to the Late Pleistocene, i.e., the fourth interglacial. This industry still retains choppers of the Soan tradition and contains a number of flakes similar to those of Group A of the Late Soan. While industries similar to the Solutrean and Magdalenian of Europe have not been discovered, what might be termed "Asiatic Aurignacian"--an industry with gravers and flakes--is definitely present. The last of the Palaeolithic traditions to be found here is, as elsewhere, microlithic and it shows affinities to the Capsian industry of Syria and Africa. A post-glacial product, this microlithic industry was soon replaced by a more typical Neolithic culture, as all of India entered upon an agricultural economy.

Palaeolithic industries in Burma have been studied by Movius. According to him, there is a complex called "Anyathian," which is found at many locations on the left bank of the Irrawaddy River. Older portions of the Anyathian industry correspond to the Lower and Middle Palaeolithic and have the following characteristics. The Madras type of hand-axe, typical of southern India, is completely absent in this Anyathian industry. The principal tools are hand-adzes, choppers and chopping tools. Silicified wood and silicified tuff are used as materials. Hand-adzes are made out of roughly rectangular silicified wood, the cutting tip being almost at a right angle to the long axis. These features characterize the Early Anyathian, the geological position of which is said to extend from the second pluvial through the second interpluvial to the third pluvial. The Late Anyathian is a direct outgrowth from the Early Anyathian, equipped, however, with better made implements. Typical Upper Pleistocene industries like those of Europe have not been discovered.

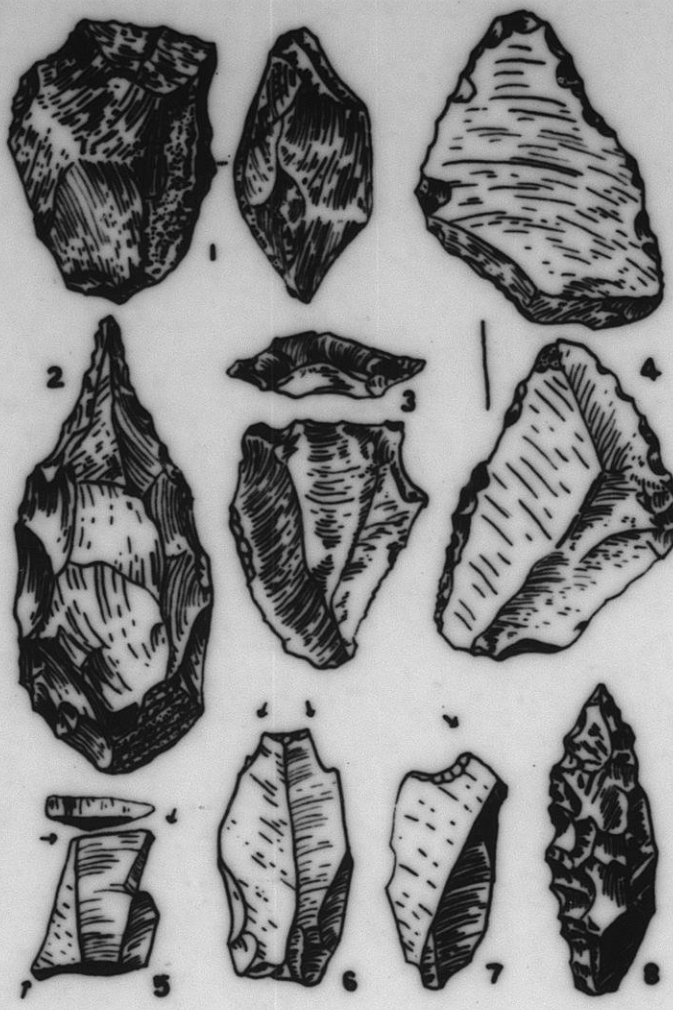
The Patjitanian assemblage of Java is well known through the investigations of Dr. von Koenigswald who collected approximately 2,500 specimens at this site. They consist of Anyathian-type chopping tools and numerous cores and flakes, including Levalloisian flakes. Hand-axes were also found, to be sure, but they amount only to 6.2% of the entire collection. Geologically, the Patjitanian culture is said to belong to the Middle Pleistocene.

In China, four Middle Pleistocene cultural levels have been discovered at the Choukoutien site which produced Pekin Man. The suggested chronological order, beginning with the oldest, is: Localities 13, 1 (Sinanthropus),

15 and 4. Since at the time of the initial excavation the forty meters of the geological deposit at Choukoutien was considered to belong to a single period, no chronological classification of tools was of course made. With the progress in research methods, variations have been recognized in the manufacturing methods, and at present the divisions shown in Figure 35 have been proposed. The tool from Locality 13, supposedly the oldest in China, is a core tool made of flint, according to P'ei Wen-chung, and was associated with quartz flakes, apparently of the Clactonian technique. No human fossil was found with this assemblage. The number of implements found at Locality 1 with Sinanthropus pekinensis is enormous, amounting to over 100,000 if stone fragments are included. A systematic study of these finds is yet to be completed. Roughly speaking, they can be divided into pebble tools and flake tools. Pebble tools vary in length and size; most of them appear to be unifacial choppers. Some of the pebbles have a concave hole chipped on the surface, like the so-called "holed stone." Flake tools are relatively small. Their platforms are not treated and retouching is rarely seen. Traces of their use are evident. Quartz is the material most often used, other materials being flint, lithomarge, crystal, and limestone. The artifacts at Locality 15 are quite different, and much better made, than those of Locality 1. Tools made of flint are relatively abundant. A definite technique of striking had developed and was used side by side with the Levalloisian [sic] technique. Large, cleaver-like tools made their appearance, and scrapers made out of flakes resembling anvils also had become standardized. Objects--both implements and animal fossils--found at Locality 4 resemble those of the period of the loess deposition (the Upper Pleistocene) and are intermediate in form.



35. Chronology of the Quarternary in China. (After Chou Ming-chen)



36. Chinese palaeoliths. (After P'ei Wen-chung and Ku Lan-p'o)

(1) from Choukoutien, Loc. 13.

(2) from Tingtsun.

(3) and (4) from Choukoutien, Loc. 15.

(5)-(7) from Shuitungkou.

(8) from Sjara-osso-gol.

A new site of the Middle Pleistocene was recently (1954) found at Tingts'un in Siangfen District, Shansi Province. The stratum which contained artifacts was a gravel bed below loess, in most likelihood corresponding to the time of Choukoutien or the red soil deposition in northern China. The number of implements and fragments found here total 2,000. Fragments all assume a certain shape, suggesting a uniformity in the method of striking. The platform of the core is flat and unprepared, the flaking angle being about 120° in most cases. This technique may be called "Clactonian." Most of the flakes show traces of retouching and evidence of use. P'ei Wen-chung classifies them into hand-axes, scrapers, and a third group (points?). Aside from these there also seem to be full-fledged cleavers. In short, this is an industry which includes hand-axes and cleavers made on flakes but which apparently lacks the Levalloisian technique.

The assemblages discussed above are assigned by P'ei to the early Palaeolithic. These were followed by several industries of the Middle Palaeolithic. The most representative among them is the so-called "Ho-t'ao," which has been found at the Sjara-ossogol site in Inner Mongolia, discovered by Andersson in 1922-23 and at the Shuitungkou site, southeast of Yinch'uan in Kansu Province. Although the deposits containing artifacts at both these sites belong to the period of loess formation, they are by no means geologically contemporaneous.

Teilhard de Chardin, Licent and Breuil have studied the Shuitungkou site and its artifacts. Ku Lam-p'o in his recently published Ho-t'ao-jen has expressed a new view. He divided the stone tools of Shuitungkou into four types: points, scrapers, gravers and choppers. Some of the points

resemble the Mousterian point while some others are like the Chatelperronian knife blades. All of them leave the primary flake surface on one side, while the other side is roughly worked along one edge. The platform is treated with the technique of the Levalloisian tradition. Some of the scrapers are keeled and some notched; some of them are side scrapers. Gravers are in most instances rather small, but are present in a variety of forms. It should be noted that they are all made on blades. Choppers are large pebbles with both sides worked on; in other words, they are so-called chopping tools. Materials are red quartz, mica-sandstone and a certain type of limestone; of these, quartz is used most frequently. Thus comparison of the Shuitungkou tools with those of the European Palaeolithic shows that the former share features with traditions all the way from the Mousterian to the Aurignacian, a fact which led Breuil to place the Shuitungkou intermediate between these two European traditions.

The Sjara-osso-gol finds are much smaller than the Shuitungkou artifacts. So much so that the appellation "microliths" has sometimes been used. But they were made small probably because of the difficulty in obtaining sizable materials. Quartz is normally used, but some objects are made of flint. There are three types of tools: points, scrapers and gravers, a combination encountered also at Shuitungkou. Points are like the Mousterian, having one side left untreated. Scrapers are of various forms, such descriptive terms as "convex," "concave" and "double" cutting edges being used. Gravers are also varied in form, but they are not made on fine blades as were the Shuitungkou examples.

Comparing the industry of Shuitungkou with that of Sjara-osso-gol, the differences in the material and in the size become quite evident. Both being found in loess deposits, it is difficult to determine the relative age. According to Ku Lan-p'o and P'ei Wen-chung, the Sjara-osso-gol assemblage contains many specimens which are small enough to be called "microliths," and the manufacturing method is superior to that of the Shuitungkou examples. Therefore, they seem to consider that Shuitungkou should be older. The discovery of Chatelperron-like knife blades and "true" blades at Shuitungkou also seems to render this hypothesis plausible. However, it is also true that the Sjara-osso-gol specimens are not genuine microliths. Solution of this problem must await further analysis of the assemblages of the two sites and stratigraphic studies of the loess itself.

For the Late Palaeolithic in China we only have the Upper Cave industry of Choukoutien. This cave produced three complete human skulls, many skull fragments, bones from other parts of the body and teeth, as well as bone implements and ornaments. As for stone implements, only a few pebble tools and flakes were found--too few to serve as chronological markers. This is probably because it was a burial rather than a dwelling site. P'ei Wen-chung, in the chapter on "the Upper Cave Industry of Choukoutien /Chou-k'ou-tien Shan-ting chih Wen-hua/," in his Stone Age Cultures of China describes flint end-scrapers, side-scrapers, large double-bladed pebble tools, and flakes. Considering the technique of grinding stone tools, drilling holes, painting and fishing, as well as the large quantity of ornaments, the Upper Cave

people must have been at quite an advanced stage. The associated animal remains make it clear that the assemblage belongs to the Late Pleistocene. It is, therefore, proper to regard this industry as a Late Palaeolithic culture of China. The important problem of the future is to analyze the stone industry of this culture.

The Kuhsiangt'un site near Harbin, which was excavated by S. Tokunaga and N. Naora, has been assigned to the period of loess formation by the excavators and is considered to correspond to the Mousterian or Aurignacian industry. It is not difficult to see, even without P'ei Wen-chung's counter-argument, that most of the bone fragments described in their report were caused by natural fracturing, whereas the stone tools, with one or two exceptions, are all flakes with secondary working. It is not safe to discuss the cultural stage of the assemblage on the basis of only these data. The age of the associated fossil animals, which was the key to the determination of the age, also seems now to be problematic.

Tolmachev and others have brought forth cultural remains and fossil animals from clay and gravel deposits at Djalainor near Manchuli. There was a later discovery of human skulls at this site. E. Akabori has assigned this site to the late Palaeolithic. Two well-known artifacts from this site are an antler with traces of carving and a thong stropper. P'ei Wen-chung thinks that the carving was made by an otter gnawing at it and that the thong stropper shows use of metal implements in manufacturing. Since the tools found in this vicinity are typically microliths, some authorities regard this site as Mesolithic.

As for Siberian Palaeolithic and Mesolithic cultures, there are very good studies and data are abundant. Though no Lower Palaeolithic find

has been reported, the development of Upper Palaeolithic industries seems to have been considerable.

According to Okladnikov's "Palaeolithic and Neolithic Ages in the USSR" (Materialy i Issledovaniia po Arkheologii SSSR, No. 39), published in 1953, Upper Palaeolithic sites in Siberia number as many as 53: 27 in the upper Lena, 13 around Lake Baikal and 13 in the upper Yenisei and Ob. The best known among them are the Afontova Gora site and the Mal'ta site. The former is southwest of Krasnoyarsk on the upper Yenisei River. It was discovered in 1884 by Savenkov and later investigated by Sosnovskii, Auerbakh and Gromov. The site apparently is an open station. Two layers containing cultural remains, separated by a clay stratum, were found one superimposed on top of the other. The upper level produced fossils of mammoth and reindeer and also stone implements, the lower level yielding stone, bone and horn tools, together with fossils of mammoth, reindeer, bison, antelope, fox, cat and bear. The most remarkable artifact among them was a baton made out of an antler, a characteristic implement of the Magdalenian 1 and 2 of the European Upper Palaeolithic. Stone implements include many slender and well made blades. Some of the ornaments show resemblance to pendants and beads of the upper cave of Choukoutien.

The Mal'ta site is located near Irkutsk, west of Lake Baikal. This site was discovered in 1927 and excavated by Gerasimov. Blades comprise the majority of the stone tools. Ivory and bone implements include awls, knives and needles. There were also many stone and bone ornaments. Excavation of an ivory plate with a mammoth carving and of 11 female figurines has indicated a close affinity of this assemblage with the European Upper Palaeolithic. Female figurines carved from ivory are a characteristic



37. Bone and ivory implements from Mal'ta. (After Boriskovsy)

feature of the Aurignacian culture in Europe. This and the baton from Afontova Gora have great significance. Fossilized animals associated with the cultural remains include bison, rhinoceros and polar fox.

3. Future Leads

I have presented a very rough outline of the Palaeolithic cultures of Asia. Aside from these, we are greatly interested in the preceramic cultures of the Aleutians and the American continent. During the past thirty years a new field of "pre-pottery culture" has been developed in North America. The oldest preceramic cultures are represented by the Sandia, Folsom and Yuma complexes. Their association with extinct animal fossils has been ascertained. According to some recent creditable reports, the Sandia complex is about 30,000 years old and the Folsom complex 10,000 years old. In the Arctic and the Aleutians, too, preceramic cultures with micro-blades have been prevalent, their probable age going at least as far back as the pre-Christian era.

What is the place of Japan's preceramic cultures to these surrounding Palaeolithic and Mesolithic cultures? This is an extremely interesting problem. As was stated above, adequate solution to this problem cannot be expected without detailed analyses of the Palaeolithic and Mesolithic, or preceramic cultures, formulation of chronology and ascertaining of the geological positions of cultural remains for each area. Just as the study of the Jomon culture in Japan is based on precise chronologies of pottery in various areas, so detailed sequences of industries are the prerequisite to the study of preceramic cultures. Viewing the situation in India, China and USSR (Siberia), researches have by no means progressed far enough to

compare the sequences with advantage. In India, Lower Palaeolithic industries have been relatively well studied, compared with the Upper Palaeolithic industries, which are not very well known. In China, too, Lower Palaeolithic data are accumulating, while the Upper Palaeolithic is only poorly documented. On the other hand, in Siberia only the Upper Palaeolithic materials are adequate--at least sufficiently to be compared with European findings. Surrounded by these areas, the study of preceramic cultures of Japan has just begun. The number of sites and specimens, to be sure, has accumulated to a remarkable extent, most of them geologically assigned to the period of the Tachikawa Loam deposition (Late Upper Pleistocene). The hand-axe industry has the possibility of being older than this geological date, while the microlithic complex might be placed at the beginning of the post-Pleistocene. Such findings do not contradict the general views on Palaeolithic and Mesolithic cultures demonstrated in Europe and Africa. The hand-axe industry of Japan is most likely derived from the same tradition as that of southern Asia or China. The blade industry of Japan is probably related to that of Siberia and northern China. But traditions similar to the kiridashi knife and point industries of Japan have not been found in areas surrounding Japan. These might be autochthonous Japanese developments; or their counterpart may very well be found in the future in Siberia or China. Examination of diagrams and photographs indicates that some of the smaller pieces of the Sjara-osso-gol site seem to share common features in form and technique of manufacture with the Japanese kiridashi knife. Here perhaps the study of the stone industries of Japan may contribute in an unexpected area. Up until recently the period between the Upper Cave of Choukoutien

and the Painted Pottery of Yang-shao, that is, the cultural period at the beginning of the post-Pleistocene in China, has been a complete blank. According to a recent issue of K'aoku Tj'ungjen, however, a microlithic industry not associated with pottery or ground stone tools has been found near the Yellow River at about 35° N. This complex has tentatively been called "Shayuan." The investigator considers it a Mesolithic or proto-Neolithic culture of the beginning of the post-Pleistocene. This probably corresponds to the Yadegawa industry of Japan. We look forward to future investigation of this industry. Also, when the chronology of microlithic and point industries in America is formulated, their relation to Japanese industries can be discussed. This is another area which arouses our interest.

Ironically, there are very few palaeontological data, that is, fossils of animals which were living when preceramic cultures prevailed in Japan. On the question as to when the Japanese archipelago was formed, becoming separated from the continent, we know nothing at all about the most crucial matter, i.e., the geological age of the separation. For without fossils, geologists cannot discuss the problem. We must complete sequences of industries in various areas by means of archaeological methods and, with the information thus obtained, cooperate with geologists. Only by such collaboration, can cultures of the preceramic era be reconstructed. It is reversing the logical procedure to infer, from the meager palaeontological data, that Japan was not connected with the continent at the end of the Pleistocene and then to argue that, therefore, the existence of Palaeolithic culture in Japan is debatable. Before the Jomon period, preceramic culture did in fact persist for a long period of time in Japan,

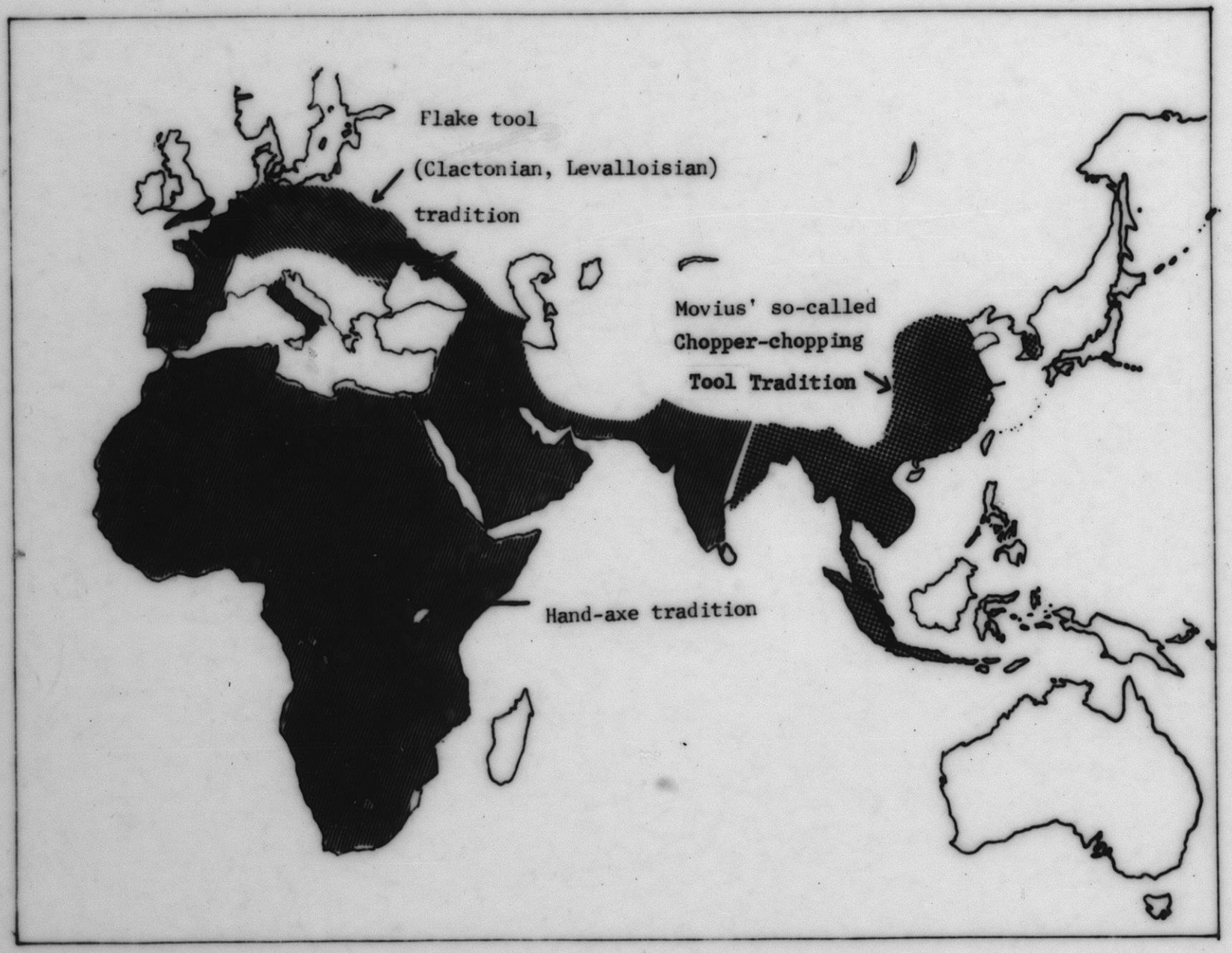
and it went through many transformations through the ages. All is dependent on how this fact is to be interpreted. It will not be too far in the future when the role of the preceramic culture of Japan as a link in the chain of the stone age history of the world will be made clear.

38a. Distribution of industries in the Middle Pleistocene.

(Europe: Flake--Clactonian and Levalloisian--industry)

(Africa: Hand-axe industry)

(Asia: Movius' so-called "chopper-chopping tool" industry)


Flake tool
(Clactonian, Levalloisian)
tradition
Movius' so-called
Chopper-chopping
Tool Tradition
Hand-axe tradition

38b. Distribution of industries in the Upper Pleistocene.

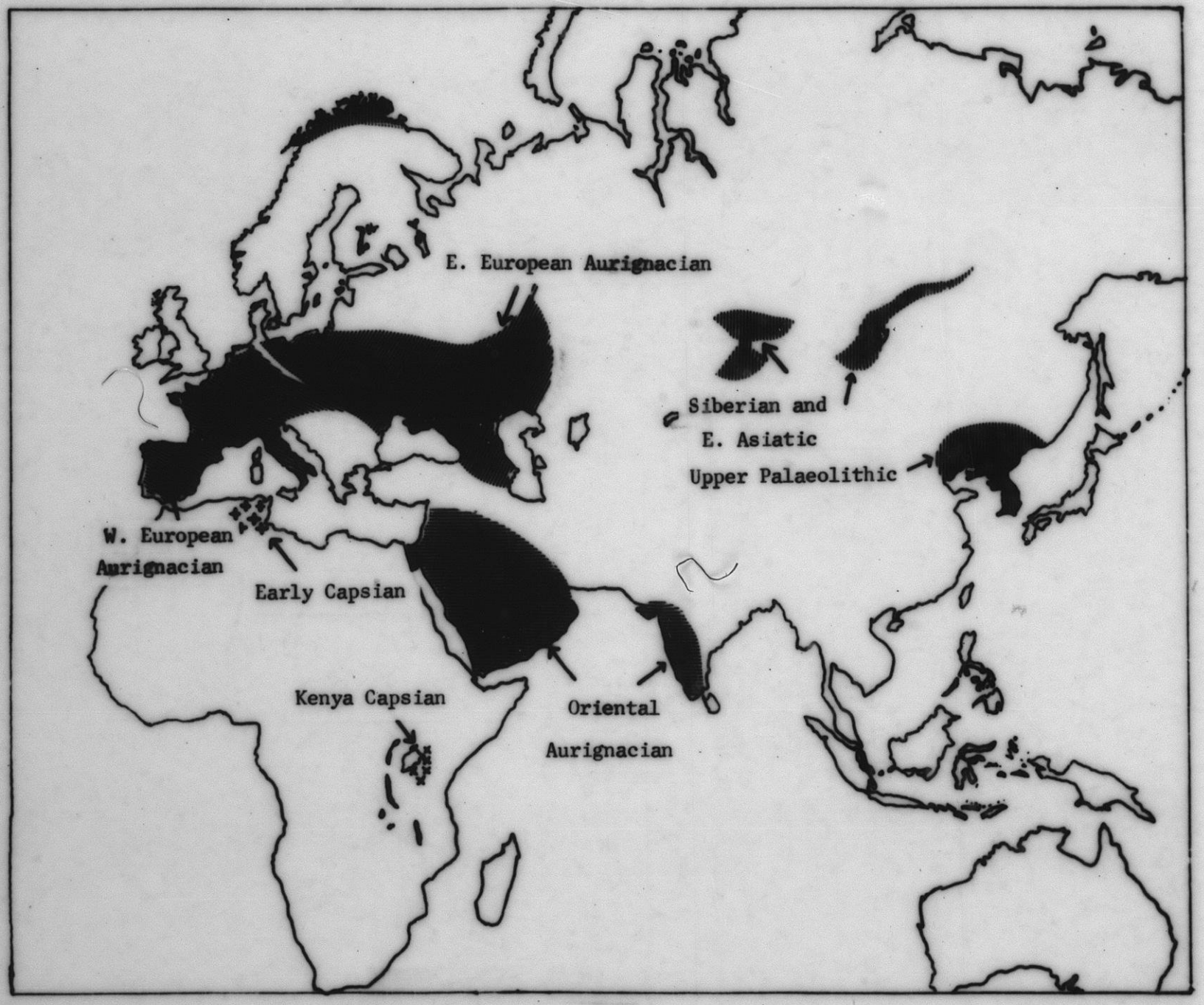
(East Europe: Aurignacian)

(Siberia and East Asia: Upper Palaeolithic)

(Western Europe: Aurignacian)

(North Africa: Capsian)

(Middle East and western India: Aurignacian)


E. European Aurignacian
Siberian and
E. Asiatic
Upper Palaeolithic
W. European
Aurignacian
Early Capsian
Kenya Capsian
Oriental
Aurignacian

38b.

APPENDIX

MICROLITHIC INDUSTRIES IN JAPAN

1. The Japanese term saisekki is a translation of microlith. S. Komaki, N. Egami, S. Misuno and K. Komai, who undertook an archaeological investigation in the late 1920's in Manchuria and Mongolia are regarded to be the first to use the Japanese translation. Mongolian microliths are small blades and small cores. They seem to be associated with pottery and ground stone tools. While the precise age is not known, they are assigned to the Neolithic period.

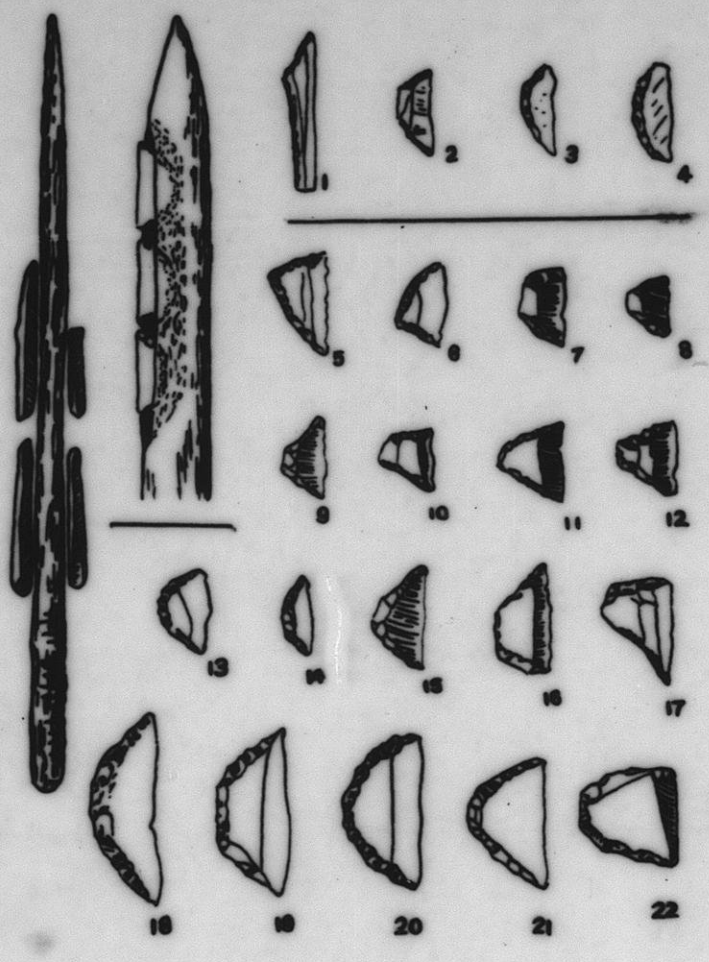
The so-called microliths which are distributed widely in Africa, Europe and India are extremely small pieces which were used from the end of the Pleistocene to the beginning of the post-Pleistocene. The representative types are found in the Azilian-Capsian and Tardenoisian cultures. Shapes are geometric, being triangular, lunate or crescent. A little later trapezes appeared, which are not true Tardenoisian. Presence of micro-burins is very often an indicator of the Tardenoisian culture. On the other hand, Tardenoisian assemblages are not invariably associated with micro-burins.

Microliths are made in a special way. Ordinarily, when stone implements are manufactured, secondary flaking is applied in order to sharpen the cutting edge. When manufacturing a microlith, however, flaking is applied, instead, to sharpen edges which are not used for cutting. For cutting, the thin sharp edge produced by the primary flaking is used, secondary flaking being employed to shape other edges.

Small, sharp flakes, though fitted for cutting and scraping, have the shortcoming of being brittle. But if these flakes are inserted in a row into a wooden or bone shaft, arranging them like a saw, then they make a very useful tool (Figure 39, top left). This sort of idea may have originated at different places in the world independently. They are in fact found in Europe (including England), Africa, India, Ceylon and Australia (Figure 39). The precise relationship between the microlithic industries in these areas is still unknown. That many micro-burins are found among African microliths (of the Capsian variety) strongly indicates their connection with the Tardenoisian culture. But no definite conclusion seems to have been reached as regards the relationships among the microlithic industries ranging from India to Australia.

It should be noted that microliths were used not only at the end of the Pleistocene and the beginning of the post-Pleistocene, but that the tradition still remained in certain areas also in the Neolithic or even in the metal age. For example, from the Fayum desert in Egypt and Yangshao, China, composite tools made of microliths have been found which were used as Neolithic sickles. Again, according to Burkitt, microliths survived into the Bronze Age in England.

2. I believe that it was I. Yawata who was the first to discuss whether Japan had a microlithic industry. R. Torii, who had examined the Sone site on the lake bed of Suwa, noted the presence of a certain type of tools, resembling those found in Swiss Lakes, among many obsidian fragments. He was probably referring to what we now call blades. His analysis was made at that time not because of any particular interest in the resemblance to microliths but because of interest in connection with the singu-



39. Microliths and their use.

(1)-(3) from India.

(4) from Ceylon. (After M. C. Burkitt)

(5)-(22) from Australia. (After F. B. McCarthy)

From about 1935 I. Yawata strongly argued that some Mesolithic features can be observed in older assemblages of the Jomon culture of Japan. He regarded the Sone pieces as evidence in favor of his argument, principal elements of the Sone finds being, according to him, lunates, animal-shaped tools, spatulas and blade-like tools. He also presented to archaeologists some fine obsidian blades and cores which were beginning to be discovered about that time in various parts of Hokkaido. While admitting ignorance of the time depth, he emphasized their connection with the microlithic industries of Mongolia and Siberia.

Later, H. Watanabe also took up the same problem. On the ground that the Sone finds lack true blades and polyhedral cores, however, he judged that they are only like, but not real, microliths. As for the Hokkaido blades and cores, he considered them to belong to the Jomon period. He also considered that they may be included in the microlithic culture area extending north of 20° N., which includes Mongolia and Siberia.

M. Toyo has also attempted to demonstrate the presence of microliths in Japan. He found small blades and cores at an Initial Jomon site in Ashishina County, Hiroshima Prefecture, which produced pottery with roulette designs. On this basis, he speculated on the relation of the Initial Jomon pottery, especially of the roulette design pottery, to microliths. No similar stone tools have thereafter been discovered in association with roulette design pottery. On the contrary, an opposite conclusion that this type of pottery is not associated with blades or cores is becoming more and more convincing.

3. It has already been stated that in August, 1949, T. Aizawa discovered stone tools and fragments from the loam deposits at Iwajuku, Gumma Prefecture. He found among them small points and objects resembling microblades, which he considered possibly to be a type of microliths.

Professor S. Sugihara of Meiji University, who conducted the systematic excavation of the Iwajuku site in September and October of the same year, later remarked that he, too, had expected to find microliths from the loam deposits. The expected microliths finally did not make their appearance; instead two industries, Iwajuku I (hand-axe industry) and Iwajuku II (kiridashi knife industry), were discovered. Problems regarding microliths, which had seemed to be nearly solved, again had to remain in darkness.

About this time I learned that the Department of Archaeology of Meiji University possessed a well-made small obsidian core. It came from Nenogami, Itabashi Ward, Tokyo and the discoverer was the late K. Otomo. Nenogami is a site which has produced roulette design pottery, presumed to be the oldest pottery type in Japan. It was naturally wondered whether this core was to be associated with pottery. About the same time, excavation of the Fumonji site in Tochigi Prefecture, which yielded the same type of pottery, was being conducted by the Department of Anthropology of Tokyo University. But nothing like the core in question was discovered, leaving the Nenogami specimen in mystery. The discovery of the Iwajuku site opened up our eyes to a new field, and as search for the preceramic culture of Japan began, views on the Initial Jomon stone tools began little by little to alter. However, because the Nenogami core has such a perfect form, we are baffled as to its provenience, even considered the possibility

that some collector might have brought it back from Mongolia and discarded it.

In August 1950, Komai reported on an obsidian core from Naoetsu in Niigata Prefecture.

In July, 1951, Y. Kamaki, after having witnessed the excavation of the Moro site, returned to Okayama Prefecture and concerned himself with finding preceramic materials in that area. To be sure, before this date, many stone tools had been collected from Washiuzan in Okayama Prefecture; but it took the investigation of Kamaki and M Takahoshi to demonstrate the presence of points and small cores. Later, after inspecting several of the fine cores which had presumably been found at the Washiuzan site, I began to be convinced that the Nenogami core is after all not an accidental find. This conviction was strengthened by the news brought by H. Takizawa of the discovery of a second small core at Nenogami. The two Nenogami finds and the several Washiuzan specimens were sufficient to suggest the presence in Japan proper of a microlithic industry not associated with pottery. In the little essay, "Preliminary observations concerning the termination of the preceramic culture and the origin of the Jomon culture in the Kanto and Chubu [Kanto oyobi Chubu ni okeru mudoki bunka no shumatsu to Jomon bunka no hassei to ni kansuru yosatsu]," which was finished in the winter of 1953, I stated that the series of small implements from Sone, Kurihara and Nenogami constitute part of the very culture which should come at the borderline between the preceramic and Jomon cultures.

Twice in 1953, in September and November, we conducted excavations, on the basis of M Yui's suggestion, at Yadegawa in Minamimaki Village,

Minamisaku County, Nagano Prefecture. We were able to ascertain that Yadegawa is a preceramic site chiefly producing micro-blades and micro-cores and confirm our hypothesis regarding its age, namely that it is before the Jomon culture but after the preceramic, point industry.

Y. Kamaki has recently come to the realization that microliths distributed in the Inland Sea area are of two kinds. Analyzing the materials obtained from Washiuzan in December, 1954 and from Ijima in Kagawa Prefecture in August of 1954, he formulated two groups: Ijima I, in which the forms are close to geometric shapes, and Ijima II, which consists of the Yadegawa type of micro-blades and micro-cores. Stratigraphically, Ijima I was found below Ijima II. It has thus only recently become clear that microlithic industries of Japan have an unexpectedly complex character.

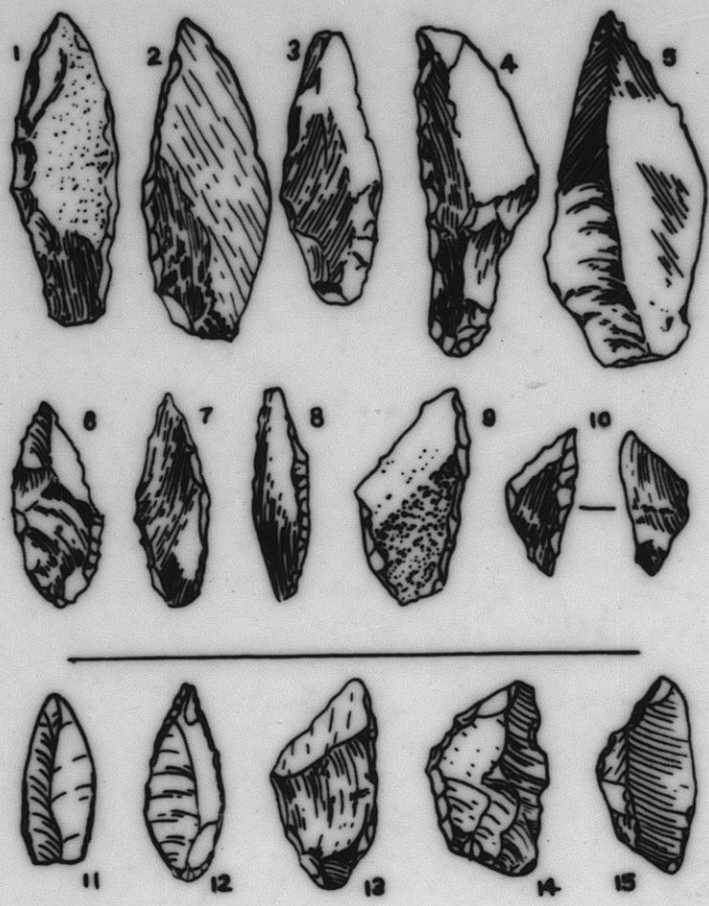
4. In the following I shall summarize the finds of microlithic industries in Japan.

Group 1; consisting of micro-cores and micro-blades. (Yadegawa and Ijima II) (Plate XV and Fig. 9, bottom).

Yadegawa, Nobeyama, Minamimaki Village, Minamisaku County, Nagano Prefecture, is a representative site of this type. Obsidian micro-blades being the principal finds, many micro-cores are also found. Micro-blades are either retouched or show traces of use. Otherwise they are just as they were flakes off from the core. The great majority of the cores are semi-conical. Cylindrical ones are rare. Platforms are either plain or faceted. Other than these, there are irregular scrapers, crude point-like tools and large unifacial hand-axes. The geological bed from which they were secured is immediately above a muddy stream in Mt. Hachigatake, and was formed in all probability soon after the loam deposition or in the

Group 2: consisting of quasi-geometric microliths. (Ijima I) (Fig. 40).

The finds from the lower stratum of the Ijima site are the type specimens. This type is distributed heavily in the Inland Sea area. A few pieces similar to this type have been found in Shima County in Mie Prefecture and also at above-noted Yadegawa site. The main feature is the absence of the Yadegawa type of blades and cores. The flakes out of which tools were made are often laterally wide; the bulb is, therefore, not on the long axis, but is on one side. Nos. 1 to 8 in Fig. 40 are points from the lower level of the Ijima site. They are all unifacial, and are simply made, with only slight trimmings on both sides. Pressure flaking is completely absent. Nos. 1 to 5 are of medium size. Nos. 6 to 8 are small, being the arrowhead size. No. 9 looks very much like a kiridashi knife at the first glance, but is is thinner and the trimming on it simpler. Perhaps it may be called a knife-point. No. 10 is nicely shaped into a triangular form. In both nos. 9 and 10, the sharp edge made by the primary flaking was probably the cutting edge, while the side with secondary trimmings was the back. The reverse side is not retouched at all. Sanukite being the rock material, weathering is considerable, and many pieces are worn off along the edges. Nos. 11 to 15 were found at the Yadegawa site; but their stratigraphic relation to blades is still unknown. The great similarity between these five pieces and the Ijima I is simply amazing. Nos. 11 and 12 are carefully trimmed, flat points, the former being made of obsidian and the latter crystal. The trimmings on the latter piece, especially, are almost at right angle to the main flake surface, a typical microlithic technique. Nos. 13 to 15 are either shaped like a knife-point



40. Ijima I type of microliths.

(1)-(10) from Ijima. (Property of the Kurashiki Archaeological Museum)

(11)-(15) from Yadegawa. (Property of Shigeya Yui)

or in a trapeze form. In all, the sharp edge made by primary flaking is left untreated--to be used for cutting purposes. All three are made of obsidian.

Group 3: consisting principally of micro-scrapers. (The Sone Specimens).

The Sone specimens from the Suwa Lake bed have caused a great many debates. Re-examining this group with a new frame of reference, I have come to the conclusion that they should be grouped separately from the Yadegawa and the Ijima I groups. Typical examples are micro-scrapers (Fig. 41, Nos. 1-9). Using circular or oval obsidian flakes of fingernail size, the tip is made into a curved cutting edge. They are authentic end-scrapers, functionally as well as morphologically. About one hundred of these have been found at Sone. A few more have been noted at Kurihara in Itabashi Ward, Tokyo, and also recently in the Tatsukami area in Shima County, Mie Prefecture, the latter having been reported by K. Iwano. Nos. 10 and 11 are very much like unifacial points. The cross section along the long axis is thick and a little curved--features of divergence from the Ijima I points. Nos. 12 to 14 are blade-like flakes. Nos. 15 and 16 are crude micro-cores. The platform does not have a standardized form, unlike the standardized Yadegawa cores. These characteristics of micro-scrapers and micro-cores make Sone pieces a special group. Being a lake-bottom site and having intrusive Jomon pottery with associated lithic implements, it has only been possible to infer the presence of this special microlithic group, besides the Yadegawa and the Ijima I groups. Nothing about its age is as yet known.[11]

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11. Besides these three groups, various microlithic industries of Hokkaido should be added (See footnotes 8 and 9). Hokkaido microliths

(footnote continued)

are mostly small blades struck from boat shaped cores. The Araya site in Central Honshu also belongs to this general category (Serizawa 1960, p. 73; Idem, A new microblade industry discovered at the Araya site and the Araya-type graver, in Quaternary Research, Vol. 1, no. 5, pp. 174-181, 1959.) (Fig. 40a is reproduced here from the latter).

Aside from these, there have been discovered in northern Kyushu forms that appear to be extremely close to geometric microliths, including trapezoids and lunates. Evidently distinct from these geometric microliths is a group of microblades which might be associated with boat shaped cores like those found in Hokkaido (1960, p. 74, Fig. 27 is reproduced here as Fig. 40b).

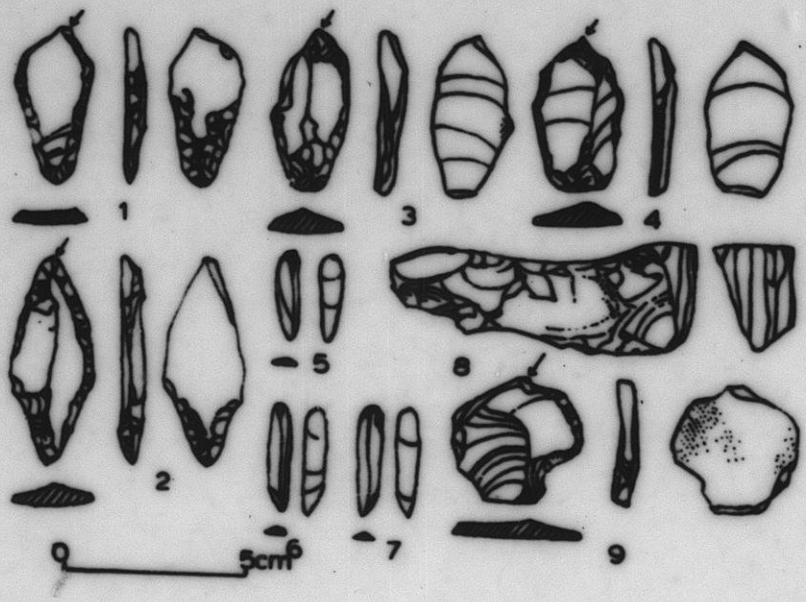


Fig. 40a. Stone Tools from the Araya Site.

1-4 and 9: gravers; 5-7: microblades

8: keel-shaped microcore

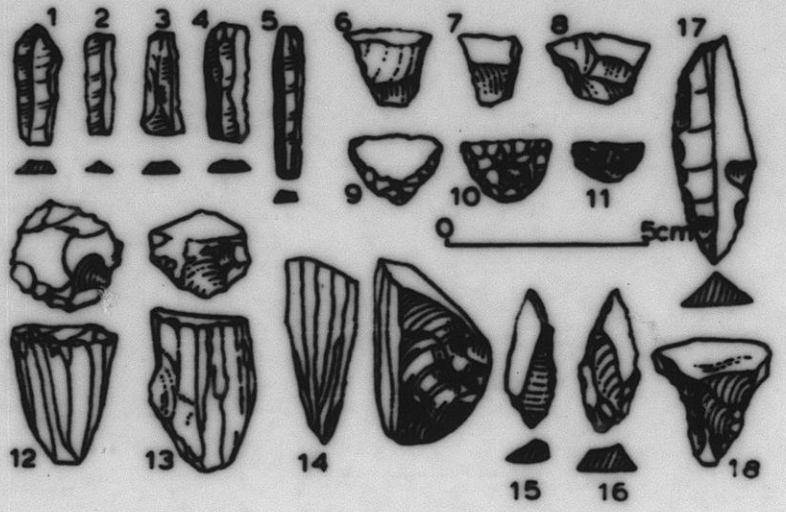
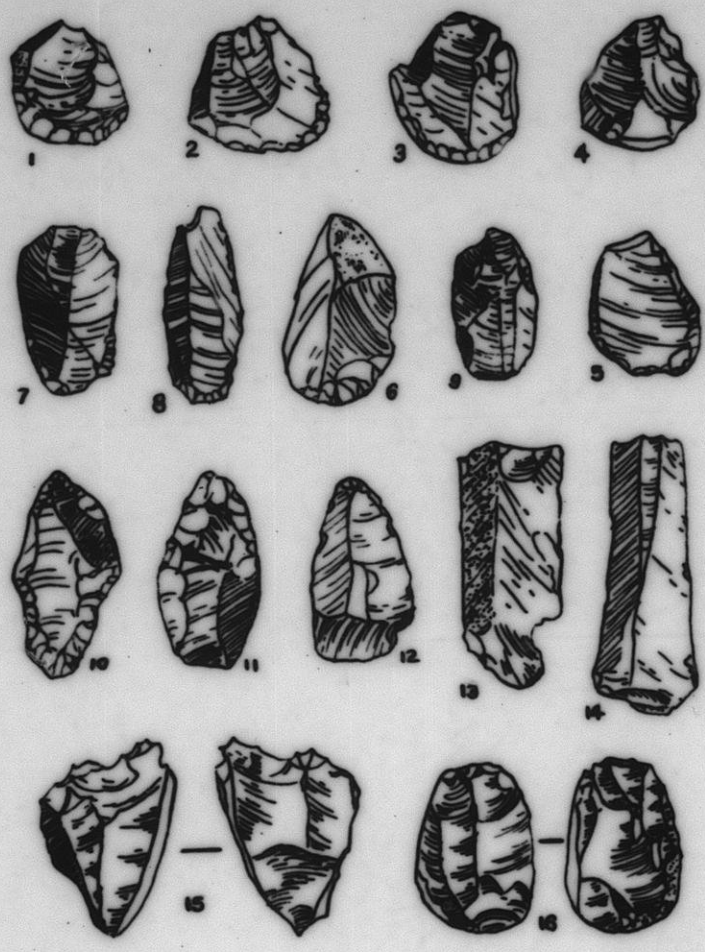


Fig. 40b. Microliths from northern Kyushu. (Scale approx. 3/5)



41. Microliths from Sone, Suwa Lake. (Property of the Department of Archaeology, Tokyo University)

5. What is the place of the microlithic industry of Japan in the culture history of the world? Although, in view of the preliminary nature of our research, it is still premature to discuss such a problem, it is necessary to make a tentative assessment. It has already been stated that geometric microliths are distributed in India, Ceylon and Australia. These, however, are not associated with micro-burins as in Europe and in Africa; moreover, chronologically, except for the Indian microliths, we are not sure if they go as far back as the beginning of the post-Pleistocene.

Microlithic industries consisting mainly of blades and cores are found in Mongolia and in Manchuria, in other words, in the northern periphery of China. Komaki, Egami, Mizuno and Komai, who have been mentioned above, included them in the Neolithic culture. Pottery and polished tools were said to have been associated with these industries. With the recent progress of archaeology in China, a microlithic industry not associated with pottery or ground implements (the "Shayüan" culture) has been found. Although details are still unknown, it is a promising candidate for filling the gap between the Upper Cave of Choukoutien (end of the Upper Pleistocene) and the Yangshao culture (beginning of the Neolithic). Also, from the Aleutians to Arctic Alaska, a lamellar industry is clearly distributed. The Cape Denbigh site, in particular, is said to go as far back as five to six thousand years before the time of Christ.[12]

Of the microlithic industries in areas surrounding Japan, those related to the Yadegawa industry are probably the micro-blade industries

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12. In addition to the microblades of Alaska, Serizawa (1960) notes the presence of a certain type of burin there which resembles the Araya burin.

of China, Siberia and Alaska, rather than those of India or Australia. When the cultural sequence of each area is completed, this tantalizing problem can find its solution. The Tohoku region and Hokkaido must be thoroughly investigated in the future. What is the significance of the Ijima I, which is not a micro-blade industry? This question also presents a great problem.

6. I have presented an outline of the microlithic industries of Japan. In sum, we noted three representative groups: the Yadegawa industry (of Ijima II), principally consisting of micro-blades and micro-cores; the Ijima I industry, composed mainly of points, knife-points and triangles; and, though not very certain, the Sone industry, with an abundance of micro-scrapers. The Yadegawa group is much later than the Ijima I, and both seem to be more recent than points. All of them are judged to have been current from the terminal Pleistocene to the early post-Pleistocene. The last of the preceramic culture in Japan, too, as elsewhere, was characterized by microliths.

Setting the problematic Sone finds aside, if the Yadegawa industry was the last in the preceramic era, then what is its relation to the following, Jomon culture? In Europe, Africa, India and China, the prevailing situation was for microlithic traditions to persist into the beginning period of the Neolithic era. In Japan, however, the lithic industry of the Initial Jomon period indicates no trace whatsoever of the Yadegawa industry. Micro-blades and micro-cores disappeared all of a sudden, to be replaced by entirely different types of implements, such as arrowheads, scrapers, axes, mortar, grinding stone, etc. How this fact should be interpreted is a problem of the future.

In writing the present volume, I am indebted to many individuals, but particularly to Professors Shuichi Goto, Ichiro Yawata, Kiyoo Yamanouchi, Sosuke Sugihara, Michihiro Kono and Masao Minato and also to Yoshito Matsudaira, Tadahiro Aizawa, Yoshimasa Kamaki, Itaru Yoshida, Teruya Esaka, Masaru Aso, Masakuzu Yoshizaki, Mitsunori Tozawa, Tsugio Matsuzawa and Keiko Oyama, to whom I would like to express my gratitude.

APPENDIX I

Lists of Preceramic Sites

Location	Investigator	Remarks
1. Hand-axe Sites		
1. Shirataki Vill., Mombetsu Co., Hokkaido	Masakazu Yoshizaki and others	Unreported
2. Iwajuku, Kasagake Vill., Nitta Co., Gumma Pref.	Sosuke Sugihara	Reported
3. Gongenyama, Isezaki City, Gumma Pref.	Tadahiro Aizawa	Brief report
4. Omegura, Daimon Vill., Chiisadata Co., Nagano Pref.	Masaru Aso	Brief report
5. Kiyama, Saijo Vill., Ayauta Co., Kagawa Pref.	Yoshiaki Kamaki	Uncertain stratigraphy
2. Blade Sites		
1. Toyoda, Ainonai Vill., Tokoro Co., Hokkaido.	M. Yoshizaki and Kioe Yonemura	Brief report
2. Shirataki, Shirataki Vill., Mombetsu Co., Hokkaido.	M. Yoshizaki and others	Report unfinished
3. Takinoue, Takinoue Vill., Mombetsu Co., Hokkaido.	M. Yoshizaki	Uncertain stratigraphy
4. Ikutahara, Ikutahara Vill., Mombetsu Co., Hokkaido.	Tadashi Kondo	Uncertain stratigraphy
5. Oketo, Tokoro Co., Hokkaido.	Toshio Oba	Report unfinished
6. Sites in Kushiro Co., Hokkaido.	Kanji Abe	Uncertain stratigraphy
7. Loc. A, Kombu-katsurazawa, Abuta Co., Hokkaido.	M. Yoshizaki and M. Aso	Report unfinished
8. Kaributo Town, Isoya Co., Hokkaido.	Sakuzaemon Kodama	Report unfinished
9. Tarukishi, Tarukishi Vill., Suttsu Co., Hokkaido.	Hakodate Museum	Reported

10. Narita, Kagamiishi Vill., Iwase Co., Fukushima Pref.	Yasunosuke Shudo Hisao Torihata	Brief report
11. Daini Grade School, Motoharacho, Ohashi, Shinden, Haranomachi City, Fukushima Pref.	Kunimoto Takeshima	No report
12. Akagi-masugata, Miyagi Vill., Seta Co., Gumma Pref.	T. Aizawa	Report unfinished
13. Shimo-koganeicho, Tokyo.	Itaru Yoshida	Brief report
14. Shirahata-numagami, Urawa City, Saitama Pref.	Kemeshige Tsuburaya	Uncertain stratigraphy
15. Chausuyama, Suwa City, Nagano Pref.	Eiichi Fujimori and others	Brief report
16. Lake Nojiri, Shinanojiri Vill., Shimo-minochi Co., Nagano Pref.	Chosuke Serizawa M. Aso	Reported
17. Sugadaira, Osa Vill., Nagano Pref.	Koichi Nagamine	Brief report
18. Kiyama, Saijo Vill., Ayauta Co., Kagawa Pref.	Y. Kamaki	Uncertain stratigraphy
19. Kusumihana, Washiuzan, Kojima City, Okayama Pref.	M. Kamaki	Reported

3. Knife Blade Sites

1. Shiriyasaki, Shimokita Co., Aomori Pref.	Teruya Esaka	Uncertain stratigraphy
2. Moro, Itabashi Ward, Tokyo.	S. Sugihara and others	Brief report
3. Chausuyama, Suwa City, Nagano Pref.	E. Fujimoto and others	Brief report
4. Lake Nojiri, Shinanojiri Vill., Shimo-minochi Co., Nagano Pref.	C. Serizawa and M. Aso	Brief report
5. Ikenohira, Kitayama, Kayano Town, Suwa Co., Nagano Pref.	Fusakazu Miyagi	Unreported
6. Tsumetayama, Kayano Town, Suwa Co., Nagano Pref.	F. Miyagi	Unreported

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1. Hashido, Kita-oizumi, Nerima Ward, Tokyo.	Kinnojo Enomoto	Report unfinished
2. Tamaribuchi, Sekimachi, Nerima Ward, Tokyo.	E. Enomoto	Report unfinished
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4. Koganeicho, Tokyo.	I. Yoshida	Report unfinished
5. Sakashita, Yoyacho, Kitatama Co., Tokyo.	K. Enomoto	Report unfinished
6. Maruyama, Ichikawa City, Chiba Pref.	S. Sugihara	Reported
7. Iwajuku, Kasagake Vill., Nitta Co., Gumma Pref.	S. Sugihara	Reported

5. Point Sites

1. Katei School ground, Engaru Town, Mombetsu Co., Hokkaido.	T. Oba and Yoshita Matsudaira	Uncertain stratigraphy
2. Shihoro Town, Kato Co., Hokkaido.	Zenji Tanase	
3. Motonoki, Tsunan Town, Nakauonuma Co., Niigata Pref.	Toraji Ishikawa C. Serizawa	Unreported
4. Miyanohara, Tsunan Town, Nakauonuma Co., Niigata Pref.	T. Ishikawa C. Serizawa	Uncertain stratigraphy
5. Mitsuya, Oko Town, Seta Co., Gumma Pref.	T. Aizawa	Unreported
6. Takei, Niizato Vill., Seta Co., Gumma Pref.	S. Sugihara	Brief report
7. Motojuku, Shinkawa, Niizato Vill., Seta Co., Gumma Pref.	T. Aizawa	Unreported
8. Tamaribuchi, Sekimachi, Nerima Ward, Tokyo.	K. Enomoto	Unreported
9. Lake Nojiri, Shinanojiri Vill., Shimominochi Co., Nagano Pref.	C. Serizawa	Brief report
10. Babadaira, Minamimaki Vill., Minamisaku Co., Nagano Pref.	C. Serizawa	Reported

11. Nakatsuhara, Minamimaki Vill., Minamisaku Co., Nagano Pref.	C. Serizawa	Reported
12. Kashiwadare, Kawakami Vill., Minamisaku Co., Nagano Pref.	C. Serizawa	Unreported
13. Nishinokoshi, Kawakami Vill., Minamisaku Co., Nagano Pref.	C. Serizawa	Unreported
14. Omegura, Daimon Vill., Chiisadata Co., Nagano Pref.	M. Aso	Brief report
15. Odoriba, Suwa City, Nagano Pref.	E. Fujimori and others	Unreported
16. Uenodaira, Suwa City, Nagano Pref.	S. Sugihara	Brief report
17. Loc. 1, Yashima, Shimosuwa Town, Suwa Co., Nagano Pref.	E. Fujimori and others	Brief report
18. Furuyashiki, Kaida Vill., Nishichikuma Co., Nagano Pref.	S. Fujisawa and others	Brief report
19. Ikenohira Pasture, Minamisaku Co., Nagano Pref.	Toshio Okimizu	Uncertain stratigraphy
20. Kusumihana, Mt. Washiu, Kojima City, Okayama Pref.	Y. Kamaki	Reported
21. Ijima, Naoshima Vill., Kagawa Co., Kagawa Pref.	Y. Kamaki	Reported
22. Kiyama, Saijo Vill., Ayauta Co., Kagawa Pref.	Y. Kamaki	Uncertain stratigraphy

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1. Loc. B, Kombu-katsurazawa, Abuta Co., Hokkaido.	M. Yoshizaki and M. Aso	Unreported
2. Takei, Niizato Vill., Seta Co., Gumma Pref.	T. Aizawa and S. Sugihara	Brief report
3. Hiroma, Niizato Vill., Seta Co., Gumma Pref.	T. Aizawa	Brief report
4. Nenogami, Itabashi Ward, Tokyo.	Meiji Univ.	Brief report
5. Kurihara, Itabashi Ward, Tokyo.	Meiji Univ.	Brief report

6. Yadegawa, Minamimaki Vill., Minamisaku Co., Nagano Pref.	C Serizawa	Brief report
7. Yasuda Shrine, Kishima, Iiyama City, Nagano Pref.	Goroku Kanda	Brief report
8. Sone, Suwa City, Nagano Pref.	E. Fujimori	Unreported
9. Orihanza, Okayama, Shimominouchi, Co., Nagano Pref.	M. Aso and Shoichi Higuchi	Brief report
10. Tatsukami, Ago Town, Shima Co., Mie Pref.	Bumon Sasaki and Kenji Iwano	Brief report
11. Moto Vill., Isshi Co., Mie Pref.	Toshio Suzuki	Brief report
12. Kusumihana, St. Washiu, Kojima City, Okayama Pref.	Y Kamaki	Brief report
13. Ijima, Naoshima Vill., Kagawa Co., Kagawa Pref.	Y. Kamaki	Brief report

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Translator's Notes on Bibliographies

1. Because of the inadequate method of bibliographical citation in the Japanese text, some information, such as pages and places of publication, is missing in the following bibliographies in APPENDICES III, IV and V, in spite of much effort directed toward making them as complete as possible.

2. The following abbreviations are used for journals containing works listed in APPENDICES III, IV and V. Unabbreviated Japanese journals are romanized and identified with Japanese characters and places of publication.

AN — Antoroposu あんとろぽす (Anthropos), Tokyo.

CB — Chichibu Bonchi 秩父盆地 (Chichibu Basin), ?

CH — Chirigaku Hyoron 地理学評論 (Geographical Review), Tokyo.

CK — Chikyu Kagaku 地球科学 (Earth Science), Tokyo.

CSK — Chihoshi Kenkyu 地方史研究 (Studies in Local History), Tokyo.

CZ — Chishitsugaku Zasshi 地質学雑誌 (Journal of Geology), Tokyo.

HQKR — Hokkaido Dai-Yon-ki Kenkyukai Renrakushi 北海道第四紀研究会連絡紙 (Bulletin of the Research Society of the Hokkaido Quartenary), Sapporo.

JB — Jodai Bunka 上代文化 (Japanese Ancient Culture), Tokyo.

JGZ — Jinruigaku Zasshi 人類学雑誌 (Journal of the Anthropological Society of Nippon), Tokyo.

KA — Kagaku Asahi 科学朝日 (Asahi Science), Tokyo.

KC — Kagaku Chishiki 科学知識 (Scientific Knowledge), Tokyo.

KGZ — Kokogaku Zasshi 考古学雑誌 (Journal of the Archaeological Society of Nippon), Tokyo.

KR — Kanto Romu 関東ローム (Kanto Loam), Tokyo.

KY — Kagaku Yomiuri 科学讀賣 (Yomiuri Science), Tokyo, Osaka.

NKI — Nihon Kokogaku Kyokai Iho 日本考古学協会彙報 (Bulletin of the Japanese Archaeologists Association), Kyoto.

NKN Nihon Kokogaku Nempo 日本考古学年報 (Annual Report of the Japanese Archaeologists Association, also known as Archaeologia Japonica)

NKSKY Nihon Kokogaku Kyokai Sokai Kenkyu Happyo Yoshi 日本考古学協会総会研究発表要旨 (Digests of Papers Read at the Annual Meeting of the Japanese Archaeologists Association), Tokyo.

RR Rekishi Kyoiku 歴史教育 (History Education), Tokyo.

SB Seiko Bunka 西郊文化 (Culture of Western Tokyo), Tokyo.

SJ Sekki Jidai 石器時代 (Stone Age), Tokyo.

SK Suwa Kokogaku 諏訪考古学 (Suwa Archaeology), Suwa.

SR Shinshu Romu 信州ローム (Shinshu Loam), Matsumoto.

SS Sundai Shigaku 駿台史学 (Sundai Historical Review, also known as the Journal of the Historical Association of Meiji University), Tokyo.

SSJ Senshi Jidai 先史時代 (Prehistoric Age), Sapporo.

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3. Works with astrisks preceding the title in APPENDICES III, IV and V have English summaries.

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APPENDIX VI

Chronology of Preceramic Industries in Japan

Chronology of Chubu and Kanto	Chugoku and Shikoku	Kinki	Chubu	Kanto	Tohoku	Hokkaido
Microlith	Ijima II	Tatsukami	Yadegawa ?	Nenogami ?	?	(Katsurazawa)
	Ijima I		[Odoriba Uenodaira Babadaira Lake Nojiri Yashima]	[Motojuku Takei Mitsuya]	?	?
Point	Washiuzan	?		[Tamaribuchi Maruyama Tonogayato Iwajuku II]		(Engaru: Shihoro)
Kiridashi knife	?		(Babadaira)			?
Knife blade			[Ikenodaira Lake Nojiri Chausuyama]	Moro	Shiriyasaki	(Shirataki)
Blade	Washiuzan I (Shiroyama)		[Lake Nojiri Sugadaira Chausuyama]	Masugata	[Narita Haranomachi]	[Tarukishi Ainonai Oketo Shirataki]
Hand-axe	(Shiroyama)		(Omegura)	Iwajuku I Gongenyama		(Shirataki)

Notes:

1. Those in parentheses are of uncertain chronological status.
2. Variations within each region are still not well known.
3. There are a few other industries not indicated here because of unknown chronological status.
4. Those in brachets are either contemporaneous or their relative priority is unknown.

THE KAMIKOSHIBA SITE, MINAMIMINOWA VILLAGE, KAMIINA COUNTY, NAGANO PREFECTURE

(Nagano-ken Kamiina-gun Minamiminowa-mura Kamikoshiba Iseki)

by Shigeki HAYASHI and Sohei FUJISAWA

(Inaji, Vol. 3, No. 3, pp. 1-21. Ina, 1959)

Excavation of the Kamikoshiba Site

by Sohei Fujisawa

As preceramic sites have been discovered one after another in many areas of Shinano Province (Nagano Prefecture), I should expect that preceramic implements would also be discovered in the Ina Valley. In particular, the point said to have been unearthed at Katsuma, Kanami Village (cf. Plate 21 in Senshi oyobi genshi jidai no Kamiina) was constantly in mind. The terraces formed on both sides of the Tenryu River and its tributaries and the foothills of the mountains to the east and west must have been the habitat of man. In this frame of mind, a point was accidentally discovered on the location of an abandoned house /dwelling pit?/ during the excavation of the Miyata-Nishihara site. Though this artifact may have fallen into this dwelling pit /?/ by accident or for some other reason, its original location did not seem too far away. As I was thinking that the terrace itself might be the locale of the site, /I learned that/ there was a fragment of a point, which had been discovered on a terrace in Ina City, among the surface collection of Mr. Yasutada Mikoshiba.

When it became fairly certain that there was a preceramic site on the terrace, we had an opportunity to excavate it.



Plate 1: Stone tools excavated at the Kamikoshiba site

No.	Tool Types	Characteristics	Rock material	Specimen No.
1.	Axe-shaped tool	Small, partially ground, resembling a point	[?]*	A43
2.	End scraper	Unifacial	Oil shale	A32
3.	End scraper	Long flake, unifacial	Red chert	A8
4.	End scraper on blade	Long flake, unifacial	Obsidian	E40
5.	Point	Laurel-leaf-shaped lance head, bifacial	Obsidian	A49
6.	Point	Laurel-leaf-shaped lance head, bifacial	Flint (white)	A16
7.	Point	Laurel-leaf-shaped lance head, bifacial	Hard sandstone	A23
8.	Axe-shaped tool	made by chipping	Clay slate	A6
9.	Axe-shaped tool	Biconvex cutting edge, partial grinding	Andesite	A17

(*Japanese term is kuketsugan for which translation cannot be found.--tr)



Plate 2: Photographing trenches A and E

The noteworthy discovery at this site was the presence of stone axes in addition to points and scrapers. When I discovered this, I thought that I should not carelessly excavate. Mr. Shigeki Hayashi contacted Mr. Chosuke Serizawa and it was very fortunate that he was able to come.

The association of these tool types must be said to be a new discovery. It poses a problem for us to ponder regarding its relationship to preceramic cultures and to the Jomon culture. It was becoming an accepted view that the preceramic culture, particularly the stone age culture correlated with the Palaeolithic age, terminated with a culture composed mainly of points. Also, the existence of a microlithic culture to succeed this culture has been established to some extent. However, it has been argued that it is possible that some points are associated with Jomon pottery, and so it became necessary to examine the cultural content of the point industry itself. Just then it was ascertained that points are associated with stone axes. Their discovery in a loam layer has presented a major obstacle to the hypothesis that a point industry was followed by microlithic culture. If this latter hypothesis is admissible, then the artifacts discovered at this new site would have to be placed in between these two traditions; and if this is true we must also give thought to the content of the microlithic culture. Is it possible for the ground axe to appear once and disappear with the coming of the microlithic culture? As for the relation of these artifacts to Jomon pottery, no such association was found at the present excavation. The situation, however, was such that it did not allow a categorical denial of association. True, these artifacts were found in a loam layer and the Jomon pottery in blackish soil. But it seems difficult to assume that a long period of time was required for the deposition of this

soil, and I could not consider the two completely unrelated and deny any relationship. I cannot eliminate the feeling that at least older Jomon pottery might belong with these stone tools or immediately succeed them. What would be the content of the microlithic culture in that case?

Let us assume that the microlithic culture itself is a product of the Mesolithic. Artifacts discovered at this site also seem to represent a portion of the content of Mesolithic culture. From such a point of view as this, the Mesolithic age must have begun at least toward the end of the loam deposition. This alone indicates the time of the end of the loam deposition.

As I think of one thing and another, I begin to feel that the present excavation is in many ways the starting point for future ones. I am driven by the desire to ascertain one important fact with future excavations.

There are many problems to be solved, such as various combinations of these tool types, content of the point industry, relationship between the so-called point industry and the microlithic culture, and relation of these to the Jomon pottery.

(February 17, 1959)

Postscript: I should have mentioned the relationship with artifacts (especially points) of other areas; but being rushed, I just wrote down what came to my mind.

(Instructor at
Shinshi High School)

Notes on the Excavation of the Kamikoshiba Site, Minamiminowa Village, Kamiina County, Nagano Prefecture

by Shigeki Hayashi

1. Introduction

Excavation of the Kamikoshiba site, which was conducted in November, 1958, yielded results beyond our expectation. It has made available important material bearing on a problem which confronts Japanese archaeology, namely, the problem of the nature of the period of contact and transition between the termination of the preceramic culture and the beginning of the Jomon. Whether the Kamikoshiba site will establish a new industry which does not belong either to the preceramic culture or to the Jomon culture will largely depend on future investigation and research. As an individual who has come in contact with such an important site I have felt it my duty to record the manner of excavation in as much detail and as realistically as possible, and hence wrote this clumsy article on the basis of my field notes. For this reason it has not assumed the format of a formal report but is rather a miscellaneous reportage. I hope the reader will be able to grasp the outline of the Kamikoshiba site from this inept writing. Incidentally, this paper was originally to have been written with Mr. Sohei Fujisawa; but for various reasons I alone wrote it. Omissions, errors and all other matters with regard to the excavation are, therefore, the responsibility of the author. I am glad that Mr. Fujisawa has added as a summary his views regarding the present status /of the Kamikoshiba site/ in the form of a preface, because it complements this inadequate paper.

In writing this paper I would like to express my deepest thanks to Prof. Chosuke Serizawa, who has provided valuable guidance for the excavation, came all the way to witness the excavation and moreover took technicolor photographs; to Mr. Eiichi Fujimori, who supplied encouragement all the way from Suwa; to the many participants in the excavation who are mentioned in the text; and to the Kamiina Board of Education, Minamiminowa Village, Kamiina senior high schools and Ina Junior High School which all extended generous assistance.

2. Discovery of the Site

Once in 1956 on a postcard to Mr. Taisuke Ito, who was in charge of the Inaji, I had written my joy at being able to have hopes for the existence of preceramic sites in Ina Valley, where my home is located, following the investigation of the preceramic site on the Tenagayama Plateau of the Suwa Lake shore and of the lake bottom site at Sone. Herein lay one of the motivations for my transfer to Ina Junior High School in 1958. After my arrival in Ina I belonged, with Mr. Hideaki Honda, to the Primitive and Ancient Section of the Historical Department in the Special Committee on the Investigation of Kamiina Ethnology and thus was able to begin the work which I had much hoped to do. I happened to become acquainted with Mr. Yasutada Mikoshiba of Ina City. And among the numerous primitive and ancient artifacts which he had eagerly collected from within the municipality of Ina, I recognized some obsidian implements which were reminiscent of preceramic stone tools, and I began investigating. The principal locales where they were discovered are Isenami (Oguro, Ina City) and Tsukiminomatsu

(Ozawa, Ina City). Isenami is situated on the second terrace of the Tenryu River. Because of its proximity to the school, I began with this site. The result of surface collection was, including some which had been collected previously, fifty some specimens including backed blades which are close to microliths, points, and flake tools resembling those of Level II at Hananoko. I got to know Mr. Kiyoshi Nezu who had been collecting artifacts at this place and was able to recognize in his collection points and scrapers. On June 21, in order to find the cultural layer of this site, I dug a test pit and found a stone hearth within a dwelling pit of Kasori E type. Because this was not what I had been looking for I covered up the pit--because of the necessity of cultivation--and searched other places but was not able to discover an artifact level. I have published in the Ina Koko my views on the specimens from the surface and drawings of them. Also noting the stone lance unearthed in Kanan Village, illustrated on a plate in Senshi oyobi genshi jidai no Kamiina (Kamiina in prehistoric and protohistoric ages) I searched for its location in the Koen area without avail. Thereafter I looked in areas of Tsukiminomatsu and Wakimizu, Imaizumi, Gyoen, but in the end was not able to discover any preceramic artifact. I also walked around the topographically promising Tenjinyama in Mitoku with the same result. With regard to the stone awl uncovered in Nakasawa Village, illustrated on a plate in Kamiina-gun Shi (History of Kamiina County), I had some suspicions about its form and looked for the specimen but could not find its whereabouts.

This was the state of affairs at the beginning of August, when for five days starting the 11th a field project was to be carried out throughout

Kamiina County in order to collect material for compiling an ethnology of the county. On the last day, the 15th, when a meeting was held in Miyata Village by four individuals--Mr. Sohei Fujisawa as the principal figure, plus Messrs. Hideaki Honda and Tamotsu Ota and Shigeki Hayashi--for the purpose of recapitulating the results of the field work, we rejoiced over the discovery, through the present project, of twice as many sites yielding Initial Jomon artifacts as before, totalling 11 sites altogether. Then, the matter of pursuing preceramic sites, which had never been found in Ina Valley, inevitably became the topic of conversation. At this time Mr. Hideaki Honda showed all of us a drawing of a point-like implement which had been preserved in Minamiminowa Grade School about two years before. Being a rough drawing, we could not tell the details, but it did look like a lance in outline.

On August 16, I was sleeping in the morning, having been exhausted by the continuous investigation over several days. But I could not forget about the previous day's point. At 4:00 p.m. I visited Minamiminowa Grade School and found Mr. Yoshimura on overnight duty. Having just moved into a new building, the large quantity of pottery and stone tools in the storage room as teaching materials for social studies were all thrown into several wooden crates. After an hour and a half's search I was able to find in one of the crates two obsidian lance-shaped points. 10cm long and triangular in cross section, it was a leaf-shaped lance with beautiful retouch on both sides. But the place of discovery, the collector's name and the date of discovery were completely unknown. I asked Mr. Kurokawachi, who is in charge of social studies, to find out the place of discovery, returned home, and immediately reported to Mr. Fujisawa. On my way, I stopped at the Village office, but got no information.

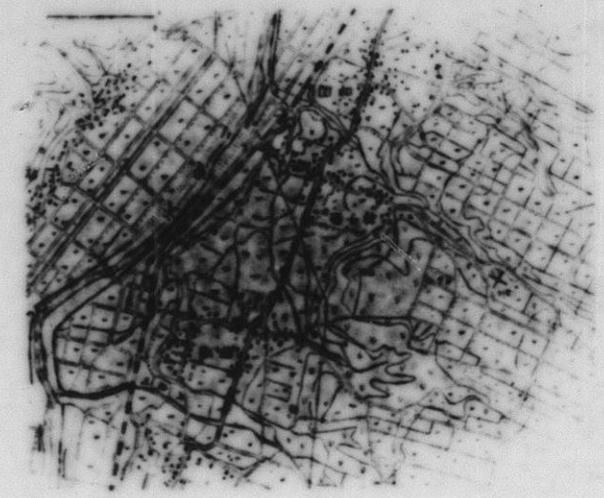

Fig. 1: Location of the Kamikoshiba site (elevation at site should read 714.7)

August 20. I looked in the list of place names in the Shinano Shiryo (Shinano Historical Materials) for the place where the point had been found, but there was no record. If unearthed in the village, it might have been after 1952. In the afternoon I searched for Hill 711 /hill having an altitude of 711 meters/ on the third terrace in Kamikoshiba which topographically forms a lone hill. But differing from the contour lines of the map, no lone hill could be seen. I asked around in the hamlet of Kamikoshiba until evening but the place of discovery remained unknown. In the afternoon of the 21st and the 22nd, too, I asked around until night, but again with no avail.

August 23. Mr. Yasutada Mikoshiba informed me of a place where a large obsidian nodule had been found, and I searched in the Osuga area of Nishiminowa. With Mr. Mikoshiba we looked in an area centering around Nishiminowa Grade School, but without any success. Suspecting that it might have been mistaken for Minamiminowa Village, we visited Minamiminowa Grade School, meanwhile surface-collecting on the way in Osuga, Oizumi in Minamiminowa and Kitadono. Mr. Kurokawachi suggested Mieko Kitahara of Kamikoshiba, saying that she might be the person who brought the stone lance to school. Her sister, a pupil in his class, said that she once brought such a thing to school. Immediately going over to Kamikoshiba, we visited Kitahara's, but she was not home. We asked a boy playing outside the house who attends grade school /about the implement/. He replied that it was his sister who took the specimen to school. Since he said that he knew where the object had been found, we asked him to take us there. Crossing a prefectural road, our path divided into three at the foot of the second terrace. We took the path along the left bank of an

unnamed river (commonly known as the Okiyomizu) which cuts through the second terrace. About midway up the second terrace was the Kamikoshiba Shrine. Going about 600 meters along the Okiyomizu, we could see a small hill in front. To the right of the river is Gyoen of Ina City. On the slope of the terrace is a luxuriant growth of cedars whose verdent color was shining against the summer sun. Right at the foot of the small hill the path divides up to the small valleys to the right and to the left. Fresh water springs up at the foot of the hill. There is a horseradish field here. A small hill of about 15 meters rises steeply from this field. The implement had been found in this field. As we went through a growth of miscellaneous trees and to the top of the hill, a wide scene suddenly opened up. To the west, the southern ridge of Mt. Kyogatake slopes down toward Gombe Path and beyond slopes down southward until it reaches Mt. Komagatake in Kiso where it suddenly rises. The evening cloud is beautiful. The slopes of Mt. Kyogatake gradually spread out in fan-shape in Osuga where we searched in the morning and disappear near the west of this hill. The hill is 3-4m higher than this alluvial plain. It is a long hill 300 meters east-west and 100 meters north-south. It has therefore never been made into wet rice fields; instead mulberry, radish, corn, etc. have been cultuvated. Mr. Kitahara's field occupies the tongue-shaped eastern end of this hill. To the east, the Tenryu River shines white beyond where the Oizumi opens up into a meadow; far beyond the Tenryu are the steep peaks of Mt. Senjo and Mt. Higashikomagatake of the Akaishi Mountain Range. To the south spread dry and wet fields of Gyoen beyond a meadow and far away rises Mt. Minamikomagatake. To the north wet fields spread over the broad

alluvial plain along the Nishi-Tenryu Railway and the mountains of Suwa can be seen far away. Red soil is exposed on the southern slope of the hill but the northern slope is covered with black soil in which corn and potatoes are planted. We noticed potsherds scattered on the surface and collected them. We were able to collect two shreds with stamped design, three fiber-tempered sherd, six plain sherds, three Sue sherds and six obsidian fragments. A lone hill and a spring seem to be favorable conditions for a preceramic site. We left the hill with hopes for this location.

September 3. I found out that the large obsidian nodule of the other day had been unearthed from a red soil layer about two meters below the surface during repair work on the housing units of the South Shinano Teachers Training Station at Osuga in Nishiminowa Village. Mr. Kiyoshi Nezu was directly informed by his friend the contractor, Mr. Shigeo Hosoda, and obtained the nodule. This was in June, 1956. I visited Mr. Hosoda right away and ascertained the fact. After school, I visited the site in Osuga by bus. The head of the Station, Mr. Kondo, gladly gave me permission for a trial dig. Mr. Yoshimi Momose, who is in charge of the branch of Nishiminowa Grade School at this Station, agreed to cooperate with us.

September 6. Mr. Nezu, the Mikoshiba brothers, Mr. Yoshimi Momose and I, went to the South Shinano Teachers Training Station and dug a test pit about 10 meters north of the place where the obsidian piece had been unearthed. After digging two meters we were unable to find any artifact but could ascertain the stratigraphy. Starting from the surface, there were a black soil layer (including angular pebbles) 50cm deep, a gravel layer 20cm deep, a black soil layer 45cm deep, a yellowish brown soil layer



Fig. 2: The Kamikoshiba site seen at a distance from the southeast. In the foreground is a horseradish field where the spring is located



Fig. 3: Looking north from the Kamikoshiba site. Mr. Kesao Kitahara who collected the artifact /initially, is shown at the right/

45cm deep, a gravel layer 5cm deep and a hard yellowish brown soil layer below, whose depth is unknown. There is a small brook running south of this locality but it is almost completely dry. The bottom of this river is very hard reddish brown loam. This unnamed river is the headwaters of the afore-mentioned Okiyomizu. We expected artifacts to be buried, and left.

September 8. I visited Kitahara's in Kamikoshiba and met Mieko to hear how the artifact came to be discovered. She said that her father had found it and that when she was in the fourth grade she presented several stone lances to her teacher. Since I was able to ascertain that the place of discovery was in the field by the Okiyomizu, on September 13 I visited Mr. Kitahara. But he was away and his wife was home. I learned that the field by the Okiyomizu was reclaimed during the war by soldiers, that the owner of the property is Mr. Tokuto Ota living in the neighborhood and that her family has been renting the land since about 1946. I also learned the names of owners of surrounding fields. On September 15 I visited the owner of the property by the Okiyomizu, Mr. Tokuto Ota, made sure of the ownership and went to the actual locale to surface collect and to observe the topographic conditions. In the rustling of maize leaves autumnal atmosphere is deeply felt.

September 28. I visited Messrs. Kitahara and Ota of Kamikoshiba and obtained their signatures /actually, their personal stamps/ on a document indicating their agreement on the excavation. Mr. Kitahara showed me the obsidian pieces he had recently found. They seemed to be in the process of being made into points. On October 10 after school I went to the hill by the Okiyomizu and surface-collected. Potsherds were not much in evidence,

but I found three pieces of obsidian. They were circular flakes with some uniformity. They were found more on the southern slope. When I dug about 30cm in the central area, I found a lance-shaped obsidian point. 12cm long and triangular in cross section, it retains the natural surface in part. Retouch is skillfully executed by pressure flaking. There might be an important artifact layer in this area, but equipped only with a bamboo spatula I was not able to dig too deeply or to ascertain the stratigraphy.

October 18. We began surveying the Okiyomizu Hill. We borrowed surveying equipment from Minamiminowa Village Office. The surveyor was Mr. Takumi Kasuga of Tatsuno Town. As a result of the surveying we learned that the area planned for excavation was about 600 square meters. On October 15 I filed with the Prefectural Board of Education a request for a permit to excavate. Excavation was planned for the two days of October 22 and 23.

October 26. With the map sent from Mr. Takumi Kasuga I climbed the Okiyomizu Hill, selected a place for the test pit and recorded it on the map. At the southeastern end of the hill there was a place where dirt had been removed, exposing a portion of the cross section of the earth strata. This was recorded. It was found that the loam is divided into two layers and that it appears to be water-formed loam. I stopped by at Mr. Kokichi Uehara's and Mr. Hachiryo Kato's by the river and obtained their permission to excavate. I decided on executing the excavation on the two days of November 8 and 9 and reported accordingly to Mr. Sohei Fujisawa and to Mr. Honda and Mr. Ota on the committee on Kamiina ethnology and to Mr. Mukaiyama, chairman of the committee.

3. Excavation

November 8 (Saturday). Clear. This is the first day for the trial digging. No class was held at school today since the Prefectural Librarians Association meeting was to be held at school. I had notified Mr. Sohei Fujisawa but have not received any reply. I was a little worried. Thinking that he might arrive by the 9:00 a.m. express, I waited at Ina City Station, but he did not arrive. Mr. Ota is not in sight, either. When I went to the Kamiina Library, a librarian told me that a young man had been waiting for me. I went back to the station without finding anyone. Mr. Mikoshiba, I was told, was busy harvesting rice today and could not join. I decided to go by myself. I secured color films and a camera at Makida Camera Shop and headed for Kamikoshiba. After I got off the bus and walked a little, a farmer stopped me. "Heading for the site?" he asked me, and said, "There is a man waiting for you. He went to that house to make a phone call." I waited outside thinking that he might be Mr. Fujisawa. The man who came from the house was Mr. Heiji Fujisawa, a student at Kokugakuin University. Not knowing where the site was, he was calling my school. Now I knew that the man waiting for me at the library was also this Fujisawa. I felt as if I had gained a million men to help me. I asked him to carry tools for excavation and we proceeded along the meadow. Leaves in the meadow of Okiyomizu have all turned red, and even the grasses growing on the cliff on the north side of the road give autumnal atmosphere. On the Okiyomizu River bank which goes along the southern side of the road are thick growths of miscanthus whose white flowers were shining in the late fall sun. At places on the cliff fresh and clean water is running.

The dark growth of the cedar forest across the river presents a beautiful contrast with deciduous trees. The autumn sun filled this small valley with light. Soon the hill where the site is located was seen yonder. At this point I took a color picture of the scene and looked at my watch, which indicated 11:00 a.m. No war can be fought with an empty stomach. So we settled down by a spring in the horseradish field. As we were looking after lunch at the points and pottery collected from the surface, a car with a bride passed by, followed by another, indicating this was a day of good luck. We should have luck with our excavation. As we were toasting with the water from the spring, Messrs. Yasutada and Hiroshi Mikoshiba--brothers--arrived. They said that they had been winnowing rice but with the noon break they could hardly rest and came. Getting unexpected help, we climbed the hill with much encouragement. The entire hill was already filled with the colors of the late fall. The green color of radishes and Chinese cabbages alone struck our eyes. We began from Pit A which I had chosen on a previous day. An inaugural ceremony with only four men was a bit lonely, but at least our enthusiasm equaled more than eight men. The pit is located on a slope a little north of the center of the ridge of the hill along which runs a farm road. We removed black soil 1 meter in east-west direction, 2 meters in north-south direction and 30cm thick. No artifact was found. After removing 15cm of the underlying mixed soil, a yellowish brown soil layer appears. It is somewhat soft and not very sticky. Now began our main task. There must be 30 to 50cm more down to the layer yielding points. As I was thinking this, Mr. Mikoshiba's shovel felt something, something stony. When we removed 10cm of dirt with spatulas we

found a large obsidian nodule. 14cm long, 8cm wide and 5cm thick, its flake surfaces glittered against the sun in purple color. A small obsidian nodule was then uncovered side by side. Though resembling a stone axe, it shows no uniformity in the retouch. It was oriented toward the northeast from the southern side. We designated these A1 and A2. Removing the dirt around, we dug toward the north. 30cm north of A1 we found an axe-shaped tool, A3. It was lying in the same level oriented in an east-west direction with its side in a slanted position. The material is like andesite with heavy augite content. It is 21cm long and 8cm wide. The base is thick, being 3.5cm. It has a high central ridge and triangular cross section. The cutting edge is thin and is biconvex, clearly showing several flake surfaces. The obverse side shows flakings in oval shaped from both edges. The alternate and parallel flakings present beautiful outlines in the afternoon sun. We were surprised by the unexpected appearance of an axe and at the same time sorry that it was not a point. An oval implement, A4, was soon discovered north of A3. It is made from reddish chert with green portions. It is 11cm across and 3cm thick and has rough flake scars. It might be a core. Then a sandstone nodule, A5, was found. Its form and size are roughly the same as A1. It is weathered all over the surface. Opening up on the side of the farm road, we found an axe-shaped tool (A6) about 30cm west of the midpoint between A1 and A3. It was lying in a northeast-southwest direction with its obverse side up, showing flat and orderly flake surfaces. The form and the size are both the same as A3, but the retouch is more beautiful than A3. It seems to be andesite. Continuing digging northward, we found a large obsidian nodule 75cm north-northeast of A6. Removing the sticky dirt, we found it to be an oval implement, 13cm across, with rough and irregular

flake scars all over. 3cm thick, it resembles a hand-axe. [Someone said,] "It is an African hand-axe." With the appearance of this peculiar implement, our tense feeling was relaxed. Turning it over, we could see six slender parallel flake surfaces and bulbs. It is a flat core. At one end is orderly retouch which seems secondarily applied. Perhaps it might have been used as a tool. If it is a core, flake tools should be found. In the middle of our surprise and rejoicing came Mr. Makoto Kitahara and Mr. Hideaki Honda. I decided to take pictures while the sun was shining in the trench. When we were digging toward the north, after taking pictures, we heard someone calling from afar. It sounded like Mr. Fujisawa's voice. Approaching closer, he did turn out to be Mr. Fujisawa. He had notified me of his arrival time; but I did not receive the message. I was glad that he came in time to observe the excavation. With this moral support we dug further but did not find any tool or even a single flake. Digging southward, an end scraper, A8, was found lying parallelto Al about 10cm southeast of Al. Made of chert, it had a reddish brown color and was a large object 18cm by 4cm, lying with its front side up in an east-west direction. Messrs. Honda and Fujisawa set up Pit Nos. 2 and 3 about 5 meters south on top of the hill and on the southerly slope, but did not find any artifacts. The stratigraphy of the area in Pit 1 from which artifacts have been found is as follows: Layer I, starting from the surface, is black soil, 30cm thick; Layer II, dark brown soil 15cm thick; Layer III, soft yellowish brown soil 40cm thick; and, below it, Layer IV, hard yellowish brown soil whose depth beyond 2 meters is unknown. The yellowish brown layer is what is known as loam. Thus there are four distinguishable levels in the

stratigraphy. Artifacts were contained in the soft yellowish brown layer, the third from the surface, at about 12-51cm from its upper limit. Whether this was the level at which Mr. Kitahara had found his points we could not ascertain today. The stratigraphy of Pit 2 consisted of a black soil 25cm thick, dark brown soil 18cm thick and a third layer of soft yellowish brown soil 35cm thick. As it was approaching dusk, we made plans for the following day to enlarge Pit 1 toward the east and to set up a Pit 4 to investigate the southerly slope; then we descended the hill in darkness. In Ina City we toasted hoping for success in the excavation.

November 9 (Sunday). Cloudy with occasional rain. There was an overcast in the morning and it was warm. We arrived at the site at 9:00 a.m. There were eight of us with Mr. Sohei Fujisawa as the principal figure, plus Messrs. Makoto Kitahara, Tamotsu Ota, Yasutada and Hiroshi Mikoshiba, Kiyoshi Nezu and Heiji Fujisawa and myself, constituting an ideal number for test-digging. We set up a pit, 2 meters long and 1 meter wide, at right angles to the farm road east-northeast from the point where specimen A1 had been found. I went down to Kamikoshiba hamlet in order to contact Mr. Takanori Kojima, who cultivates in the area. He consented to our disposal of the radishes by the pit. Just before returning, he told me that there are five five-story monuments on the way to the site which are said to be graves of Prince Munenaga. He had looked into this but had not been successful and asked me to study them in detail. He insisted so much that I decided to stop by. Going up the second terrace, in a sparsely wooded grove of red pines west of the Hill 711 where I had walked the other day, I found five moss-covered five-leveled towers facing south. Mr. Kojima

came with me as the guide and explained to me about various details. They are badly weather-beaten, with their tops and foundation rocks much deformed. Whose grave could it be? It might be interesting to dig them, but not today. I promised to come back at a later date and hurried to the site. Going through a flat field and coming out to wet paddies, I could see the Okiyomizu Hill where the site is. Perhaps they spotted me; they are calling me. "Points....," it seemed they were shouting. I felt something cold running through my spine. I ran up the road to the hill and looked at the red soil in the pit. There it was, the much-anticipated point. It was a laurel-leaf-shaped obsidian point at 13cm down into the loam with its tip pointing towards east, 10cm east of A8 which we had found on the day before. The pressure flaking could be seen beautifully against the sunlight. It is a 10cm lance head. Designating this as A9, we proceeded farther east. 15cm southeast we found another obsidian point, A10. The size and the form are the same as A9, but the latter's tip pointed toward the south, at right angle to A10. At a position 60cm south from here near the south wall of the pit a point of the same type was found with its tip pointing towards south. The level was higher than that of A9 or A10, being on the upper surface of Layer III. There seems to be some significance in its relation with A10. As the soft loam of Layer III was removed, about 10cm from its top a yellowish white object showed up. Everyone watched Mr. Fujisawa's spatula. As the spatula removed dirt bit by bit, a very sharp point, about 17cm long, was lying in a slanted position oriented toward the east. As more dirt was removed from north of this, an obsidian object 4mm /long?/ was found. It might be the tip of a point. Then a chalcedony

point, Al4, just like Al2, was found underneath the latter in a cross position with it. The same type of point, Al5, of the same material, appeared parallel to Al2. "Another point," someone muttered with amazement. Mr. Fujisawa's spatula is trembling. The same type of point, Al6, of the same color, 18cm long, turned up crossing Al4 and Al5. "A point, again." "No kidding?" It was no joke. Four yellowish white willow-leaf-shaped points, 5cm wide and 15-18cm long were found piled up one on top of another and crossing each other radially (Cf. Fig. 4). Made thin and sharp, they are indeed smart-looking lance heads. My watch indicated 11:40. "This is the first time I have ever dug points," Mr. Fujisawa said and everyone laughed. Light yellow to white lance heads were lying there in a radial formation in the yellowish brown soil. This is a first experience for anyone. Everyone is just looking at the solemn sight in silence without reaching out. There is something mystic about it. One might say that it is a festival of the loam and the points. Sporadic rain comes from the direction of Mt. Komagatake and splashes on radish leaves and leaves. "Let's have lunch." Since the ground was wet, we ate standing or squatting. Bread was busily shuffled into mouths; but everyone's eyes were fixed on the points. The relationship with points A9, Al0 and All, the relative position and direction must also have special meaning. The situation with the group of white lance heads is also extraordinary. Clearly, the arrangement must have some meaning. "Why did they leave such wonderful things?" "They must have forgotten them here." We exchanged words such as these. Once in a while the sunlight came through between clouds. Taking these chances I took color pictures. Surrounding the points



Fig. 4: Cluster of points

with four cameras, we took pictures from all angles. We resumed work about 1:00 p.m. 40cm south of the clustering of points, we found an obsidian nodule, A13, 8cm across. 50cm north of the clustering of points, near the north wall of the pit, an axe-shaped implement (A17) 20cm long was found lying with its back side up and its length in an east-west direction. Its depth was the same as the point, A16. The cutting edge is bifacially ground, bringing out the grain pattern clearly. The material seemed to be andesite. It is an axe-shaped tool associated with points. Everyone was amazed at this, too. As we extended this Pit 1 further toward the north from the position where the core, A7, had been found on the previous day, we found axe-shaped implements, A17 and A18, along the east wall side by side in slanted positions, with their length in an east-west position. West of these was an obsidian nodule (A20) the size of a brick. The level is 12cm below the top of Layer III. A18 is 20cm long and 7cm wide. A19 is somewhat larger than this. It is a chipped tool with orderly arranged flake surfaces on both sides, has a triangular cross section and a high ridge on the back side and shows uniformity with the axe-shaped tools found so far. This time, after lance heads, it is a festival of stone axes. What is signified by this joint drama of points and axes? And how can we interpret this assemblage equipped with grinding technique? One meter south of the clustering of the points in the lower portion of the black soil layer two potsherds were found. Though a small piece, one shows the irregular impressions characteristic of the Kayayama style, and contains fiber. The second sherd showed Shiboguchi style design and also contained fiber. Nothing was found in Layer II and below from this area. Spreading out the

measuring rods in a radial formation, we recorded the locations of the clustering of points and axes. Then, removing these mysterious stone tools which had been sleeping in the ground for the past several thousands of years from the loam layer, we labeled them, put them in plastic bags, marked them, put them in my knapsack and started back home.

The weight of the knapsack was considerable, but my joy was even greater. In Ina City, we discussed the excavation of the day, with Mr. Fujisawa as the principal figure, and made plans for the excavation proper. (1) The axe-shaped tools, points and the end scraper were all contained in the same Layer III of soft yellowish brown soil and their positions had a peculiar character. (2) The ground tools are ground partially and they are a new type of find. (3) Pottery was found in the lower part of the black soil (Layer I) and does not appear to have any relation to the stone implements. But this matter must be pursued critically. (4) We would conduct the excavation proper on the 22nd and 23rd. But in preparation for it, we shall continue the test digging on the 15th as the result of which we would decide on the trenches. These matters were discussed and then we disbanded.

November 15 (Saturday). Clear. No school today since the completion ceremony for the Mibu River Development Program was to be held. It is fortunate that there is no class to worry about. The third day of test digging. With much hope for success from the start we gathered in front of Ina City Station at 8:40. From the main office of Kamiina Ethnology Mr. Harushige Mukaiyama came to help us with photography. Three of us, including Mr. Tamotsu Ota, headed toward the site, arriving at Okiyomizu

Hill at 9:20 a.m. We put back the excavated pottery to restore the original position, using our map and sign posts and took pictures. The weather is clear, and Mt. Senjogatake, covered with snow for the first time, rises high into the late fall sky. By observing the restored arrangement, it became clear that artifacts are concentrated around pit 1. We decided to set up the principal trenches in this area. We called pit 1 trench A, pit 2 trench B and an eastern extension of pit 1 trench C. Mr. Makoto Kitahara arrived at 11:30 in the morning.

We extended eastward about 2 meters from the clustering of points in trench C but finds were few here. A hard sandstone tip of a point, A23, was found pointing eastward 10cm into the loam, and 80cm east of it an axe-shaped tool of mudstone, A24, was unearthed lying in north-south direction. While removing the soil of Layer I we found two potsherds in this layer, both of them resembling the Kayayama style. Digging another meter farther from A24 we found at a depth of 11-20cm into layer III (loam) points, blades and scrapers piled up on top of each other. An obsidian point, A25, lay horizontally, being a thin leaf-shaped lance head 8.5cm in length and 4cm in width. 4cm north of it was found point A26. Willow-leaf-shaped, it has a sharp point, but is broken in half. 14cm east was unearthed another obsidian point, A27. Adjacent to this blade, A28 lay in a north-south direction. It has a beautiful calcareous, ivory-like color. 4cm north of it a blade, A29 was found. It is a flake with a sharp tip and of reddish brown stone. At the base of it, blade A30 and right below it, blade A37 were found one on top of the other with their cutting edge downward. Then underneath the blades, A30 and A28, a point (A34) and adjacent and west of it an odd-shaped implement (A33) were found. Immediately south of it was an end scraper, A32.

It is of very yellowish color and "oil shell" [transliterated thus in Japanese] material. It is an oval scraper, 9cm across the longest diameter, and was found with its back side, which shows only the primary flake surface, facing upward. A scraper (A35) was found underneath A29; A36 underneath A35; a blade (A30) of yellowish white stone north of A29 near the north wall of the trench; and a point (A38) west of A29 and adjacent to the obsidian point A26. This pile of artifacts in a radial formation resembles the group All-16, but the combination of the implements--6 points, 5 blades, 3 end scrapers and 1 irregular piece, totalling 15 specimens--is different and more complex. The point (A36) found at the greatest depth was recorded at 18cm into Layer III. Through the investigation so far we found out that these artifacts come roughly from the same level. We took pictures, and with the help of Mr. Ota and Mr. Mikoshiba we recorded the positions of the artifacts. As it was getting dark, we did not collect the artifacts but buried the trenches leaving them in. We discussed in Ina City preparation for the excavation proper and disbanded.

November 16 (Sunday). Clear. I went to the site by myself. I set up the trenches and the grid work. I borrowed sticks from Mr. Uehara. Mr. Kokichi Uehara kindly helped me with his saw. Trench A was set up, 16 meters long, parallel to the farm road. The northern portion of the trench, 10 meters from the base point, was designated as section A-1 and the southern 6 meters section A-2. From the southern end of section A-1, going east at right angles to the trench, a trench B was set up. A trench C was made starting from the base point at right angles to trench A and parallel to trench B. North of trench C and parallel to it, an 8 meter trench E, and

a parallel trench F still further north were marked. A trench connecting a point 5 meters from the base point on trench C with a similar point on trench B was designated as trench D. A trench G was set up, paralleling trench D, on the easterly slope. On the southerly slope, 10 meters southeast of trench B, a trench H and, at right angles to it in an east-west direction, trench I were set up. Pits 3 and 4 of the other day were to be used for geological studies. All the trenches were either 1.5 meters or 2 meters wide. At 2:00 p.m. I finished stretching out the rope and returned.

November 17 (Monday). Cloudy. 4:00 p.m. in the editorial room of Kamiina Ethnology, Mr. Mukaiyama, the chairman of the committee, Mr. Oguchi, vice-chairman, and I worked out the composition of the excavation party.

Excavation was to be carried out on November 22 and 23, from 9:00 a.m. to 3:00 p.m.

Location of excavation: 7888 Okiyomizu, Kamikoshiba, Minamiminowa Village, Kamiina County, Nagano Prefecture.

Duty Assignments: Leader: Sohei Fujisawa. General managers: Ichiro Miyashita and Makoto Kitahara. General affairs officers: Harushige Mukaiyama and [illegible] Oguchi. In charge of trenches: A--Shigeki Hayashi, Kiyoshi Nezu and Yasutada Mikoshiba; B--Hideaki Honda; C--Tamotsu Ota, Toru Matsushima and Hiroshi Mikoshiba; D--Heiji Fujisawa; E--Kei Komatsu. Geological analysis: Yoshimi Momose.

Cooperating parties: three or less from: Inakita, Yayoi, Kamino, Akaho, Tatsuno, Takato and Nakaminowa High Schools. 15 members of the Archaeology Club of Ina Junior High School.

Official body of investigation: Special Committee on the Investigation of Kamiina Ethnology (Primitive and Ancient Section).

Supporting Institution: Kamiina Board of Education.

The above was to be printed and distributed to various concerns.

November 19 (Wednesday). Cloudy. Ever since the excavation of the Kamikoshiba site was broadcast in the NHK news in the morning of the first of this month, newspaper reporters have come to me several times. I decided to run an article in the newspapers to educate the public. I chose the Chubu Nihon and the Shinano Mainichi and conducted an interview with reporters at 4:00 p.m. I announced a preliminary forecast that this was probably the first preceramic site in the Tenryu River basin.

November 21 (Friday). Clear. I received a telegram to the effect that Mr. Chosuke Serizawa of the Archaeological Institute of Meiji University, who had wished to inspect the excavation of the Kamikoshiba site, was to arrive by an express at 6:00 p.m. After school, I made arrangements to transport excavation equipment and other field gear by automobile and went to the station. Mr. Soehi Fujisawa was also supposed to arrive about the same time. At Ina City Station Messrs. Kitahara and Mukaiyama were also there to welcome Mr. Serizawa. Mr. Fujisawa arrived on the 5:40 "Up" train and Mr. Serizawa on the 6:00 "Up" train. We discussed the excavation plans briefly at the station and went to Aiya Hotel. About 8:00 p.m. Prof. Kunio Kobayashi of the College of Letters and Science, Shinshu University, arrived.

November 22 (Saturday). Clear and fine. Splendid weather. Thick mist is whirling around over the Tenryu River. At 7:30 I waited at a Torimachi Street corner for Kagaya's three-wheeled truck to come with

equipment from school, but it did not arrive. I contacted Kagaya shortly after eight and was told that the truck had left. I called a taxi and loaded it with shovels and probes. Appeasing the driver who complained that his car was not a truck, Mr. Yasudata Mikoshiba and I got in and headed for the site. We made route markers from the Kamikoshiba bus stop. The valley of Okiyomizu shows deep imprints of the late fall. Roadside springs were filled with fallen leaves and the green leaves of the horseradish field appeared a little yellow. On the way, we encountered the Kagaya's car coming back. We carried the camping equipment and shovels which lay on the roadside as if they had been thrown out there, up the steep hill through oak trees. The cold perspiration of the morning now turned to hot sweat. Several high school students helped us. We removed the dirt from the clustering of A25-A39 in trench C and cleaned the area. I was glad that it was found just as we had buried them the other day. This is the joy of reunion. The ground is covered with tall frost columns which the morning sun is beginning to melt. We pitched a tent on a protrusion on the southerly slope and started a bonfire.

At 9:00 a.m. Messrs. Serizawa, Fujisawa, Kobayashi and Nakaji arrived in a Shinshu University jeep. Kitahara, Mukaiyama and Oguchi of the editorial office also arrived at the same time. Honda, Ota, Fujisawa, Nezu and Mikoshiba brothers arrived about then. 18 students--members of Local History Clubs of various high schools--and others, totaling 30, began the excavation. The time was 9:30 a.m. According to the plan stated above, everyone went to the assigned trench. Prof. Kobayashi and Prof. Nakaji of the College of Letters and Science of Shinshu University deepened pits 3 and 4 for geological analysis.

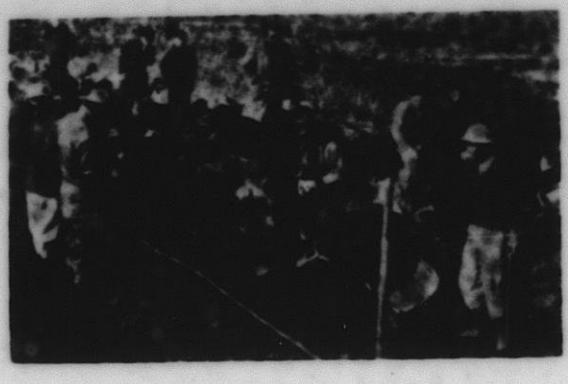

Fig. 5: Excavation of trenches A, C and E

Section A-1 was extended 6 meters north, but no artifact was seen and no change in the stratigraphy observed. In section A-2 in the lower portion of the black soil layer three Jomon sherds were recognized. A closer look showed irregular cord-mark designs resembling the Hananoko style. No fiber was seen. From the surface down to 40cm, Layers II and III had been disturbed, being mixed with black soil. An agate awl and a small number of obsidian chips were found near the north wall in its lower part. According to the farmer cultivating this area, long yams /a species which grows two to three feet into the ground/ had been grown for about two years. Trench B did not yield any artifact, and its stratigraphy was natural.

In section C-1, time was taken up in measuring and photographing the area where the cluster of blades and points had been found on the third day of the trial digging, and work did not progress. Newspaper reporters from the Asahi, Chubu Nihon, Shinshu Mainichi, Mainichi and Yomiuri arrived and were eagerly asking questions of Prof. Serizawa and Fujisawa. At 11:00 Mr. Kei Komatsu of Matsumoto arrived and began excavating trench E. Mr. Yasusuke Ito, in charge of the Inaji, Mr. Shitaichiro Nagamiya, the head of Historical Department of the Kamiina Ethnology, Mr. Kairu Kigasawa, principal of Tomigata Junior High School, Messrs. Kokichi Uehara and Hachiryo Kato, residents in the vicinity of the site, Mr. Takanori Kojima who cultivates the land where the site is, and many other villagers came to observe. We took a break at 11:00 a.m. and then continued the work. The cluster of A25-A39 in trench C was removed by Mr. Serizawa after recording the position. As I touched the implements with my hands, I was indeed impressed that they and their position in the ground were significant. About noon Mr. Toru

Matsushima of Shimoina arrived and took charge of an eastern section of trench C. 30cm east of the cluster which had just been removed, A48 was discovered, 15cm from the top of Layer III. 7cm long and 3cm at its maximum width, it has the base pointed and the tip sharply retouched, secondary chipping being applied all over the surface. On the obverse side, the prepared platform is ground. The cutting edge is biconvex, forming a thin edge. I cannot judge whether it is an axe or a point. It might be an intermediate form, suggesting a transition from point to axe. 30cm east of A48 a chipped axe-shaped tool, A46, was found. Being made of mudstone, it is badly weathered and looks as though it was partly ground. Like A48, it is pointed at the base and looks like a point. 1 meter north of the cluster of A25-A39, A45 was discovered. It is an andesite axe-shaped tool, 21cm by 8cm, lying at the base of the north wall. The cutting edge is ground and the form is the same as the previous one.

From the black soil layer of section C-2 several sherds was uncovered. They were very tiny pieces resembling the Kayayama style and the Moroiso C style. A depression 25cm deep into the loam was found at 9 meters from the base point. A careful examination showed many rotten roots. The horizontal line of the yellowish brown layer (III) in this section inclines about 40cm at 9 meters east of the base point. The borderline between the black layer and the dark brown soil layer is quite irregular, but that between the latter and the soft yellowish brown soil layer is relatively flat and forms a gradual slope.

The time was close to one o'clock. We had our lunch, gathering on a protruding place on the hill where the weak sun of the late fall was

shining. I was sorry that there were not enough tea cups to go around. 15 students from Ina Junior High School arrived. We resumed work at 1:20.

Three sherds were found in the morning from the top, black soil and the mixed soil (II) layers of trench E. They were small pieces with cord-marked herringbone design and the typical Kayayama style impressions. Coming to the soft loam layer (III), an axe-shaped tool, E1, was found at the north end. 21cm long and 7.5cm wide, it is of the same type as those already found. The cutting edge is biconvex and ground. 50cm east of E1 an obsidian core, E5, was found standing vertically. South-west of it in the center of the trench, obsidian flakes (E11, E12, E13, E14 and E15) were found scattered on the same level. This was the first time anything that can be called a flake was found. No artifact was found in trenches B and D and in section C-2. The time was three o'clock. I collected the participating senior and junior high school students around Mr. Fujisawa, who gave a talk on the day's excavation. Cold wind blew down from Mt. Kyogatake. At 4:00 p.m. we assembled the equipment, left it at Kato's and Uehara's and disbanded. At five, we held a round-table discussion with Mr. Serizawa and Mr. Fujisawa and heard useful ideas and suggestions. I went to the sleeping quarters of the Kamiina Board of Education with Mr. Matsushima to spend the night. I discussed the day's digging with Mikoshiba brothers until after ten. Perhaps a little excited, I could not fall asleep for a long time, even though I was tired.

November 23 (Sunday). Clear. At 7:30 a.m. I had breakfast with Mr. Matsushima at Akabane Restaurant and headed for the site, arriving at the hill of Okiyomizu about 8:30 a.m. It was colder than yesterday, but the

weather was splendid. The peaks of the southern Alps and the mountains of the central Alps are seen clearly, as if to congratulate our excavation today. We climbed to the top of the hill, stepping on fallen leaves. We got the equipment ready. The ground was deeply frosted, and the interior of the trenches was covered with tall columns of frost. When the frost melts, the ground becomes muddy. So we decided to collect the frost columns now and throw them out of the trenches. This is the first time I have collected frost columns with a shovel. High school students arrived early and helped. Messrs. Ota, Mikoshiba and Nezu also arrived and began work. An obsidian point hidden at 30cm from the surface on the south wall where trenches A and C meet showed up during the frost removal operation. 14cm long and 4cm wide, it was the largest of the obsidian specimens. Both sides are finished with beautiful pressure flaking. This was close to the place where A40 had been found, and disturbance of the ground due to cultivation of long yams was evident. This was probably not the original situation.

At 9:00 a.m. Messrs. Serizawa, Fujisawa, Kobayashi, Nakaji, Kitahara and Muakiyama arrived. We discussed the removal of artifacts in trenches A, C and D and the plotting of all the trenches on the map and began work at 9:20.

Trench C, which yielded more artifacts than any other, had Layer I, black soil, 20cm; Layer II, dark brown soil, 20-30cm; Layer III, soft yellowish brown soil, 40cm; underlain by Layer IV, hard yellowish brown soil, whose depth was estimated to be more than 3 meters. The slope measured at 6 meters in the direction of N 58° W was 2° down grade toward

southeast on the surface, 2.5° at the upper limit of Layer II and 5° at the upper limit of Layer III. This probably indicates that mainly Layer I but also the upper portion of Layer II had been disturbed and transported by cultivation and that the top soil had been washed away toward the valley. Layer III showed hardly any disturbance, retaining its original condition.

In trench A Layer I was 40cm thick, Layer II 15cm thick, and Layer III 40cm thick with a slope of 7° in the direction of N 3° W. Trench B had Layer I, 40cm thick; Layer II, 20cm thick; and Layer III, 45cm thick, its slope being about the same as that of trench C. Trench H, which was set up on the southerly slope, had Layer I almost completely washed away, exposing Layer II, 20cm thick. Layer III, 30cm thick, was thinner than in trench C. Its slope was about 10° toward the south. Three plain sherds were uncovered from Layers I and II of trench H and four sherds from trench I. But they must have been transported there.

At 10:00 a.m. we received a telegram from Mr. Eiichi Fujimori. While directing an excavation of an unnamed tomb in Shiga, Suwa City, yesterday, he injured himself badly by accident. He was supposed to come today on the 10:00 a.m. express and inspect the excavation of this site. The telegram arrived just when we had been expecting him. We deeply sympathized and were sorry that we could not have him today to observe the excavation.

Mr. Matsushima and others now took measurements of relative depths of artifacts. At the place where trenches A and C meet, 30cm below the surface in the lower portion of a mixed layer on the north wall of the trench, a sherd (A47) with cord marks resembling the Hananoko II style was found and diagonally below this, 11cm from the upper limit of the soft yellow brown soil an axe-shaped tool (A46) was found. This is the closest

distance /between stone tools and sherds/ found here, and is 15cm. The layers are different; but what do they indicate? A46 is of the same type as those already found (21cm by 8cm) and has the cutting edge beautifully ground. Since it is an important datum, I took measurements and photographed it (Cf. Figure 6).

Excavation was continued with emphasis on trench E. At 11:00 a.m., near the position where a group of obsidian flakes had been found the day before and to the southeast of it at slightly lower level, an axe-shaped tool (E23) was found. Made of chlorite-schist, it is 21cm long and its cutting edge pointed toward the north. Crossing it at right angles, a blade (E24), and crossing this another blade (E25) and adjacent to this still another blade (E26) appeared one after another. The material is like hard precious stone and is beautiful, but I could not identify it. Immediately south of this group of piled up objects, obsidian flakes (E27, E28, E29, E30, E31, E32, E33, E34, E35, E36, E37, E38 and E39) were found scattered in an area within 50cm. (After being washed it was found that all these flakes had formed a single rock; and they were put together with the flakes of the previous day, making up a giant obsidian core.) This group of flakes represented debris which had scattered in the process of primary flaking. This was a new discovery at this site.

30cm south of the axe-shaped tool (E5) an obsidian end scraper on a blade was found. This is E40. 18cm long and 4cm wide (Cf. No. 4 on the plate), it is made on a large and long flake. It was lying in a south-north direction with its obverse side up, showing the glittering primary flake surface. Both edges are very sharp, giving an impression of a dagger. At 12:30 we had lunch.

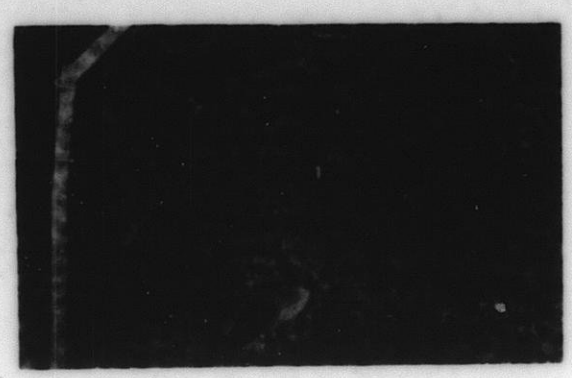

Fig. 6: Relative positions of a sherd and a stone tool. Pottery resembles the Hananoko style and the stone tool is a partially ground axe-shaped tool

At 1:20 p.m. we resumed work. The geology group is digging down pits 3 and 4 to 4 meters and analyzing Layer IV, but the expected gravel layer had not shown up.

The walls left between trenches C, E and A were removed. And at the same time the dirt thrown up on the north side of trench E was thrown further north to set up a trench F here. Mr. Kohei Isawa of Koto High School directed students of this high school and dug this trench. Two sherds were found in Layers I and II, but no artifact was found in the yellowish brown soil, yielding only an obsidian flake in a lower part of the border with trench E. There was no artifact between trenches C and E. When the wall between the western side of trench E and trench A was removed, three obsidian cores (E41, E42 and E43) were found 70cm east of the stone axes A18 and A19, lying in a southeast-northwest direction. E41 is 15cm by 9cm by 4cm and has several distinctive flake surfaces. The other two are of the same form but somewhat smaller.

These specimens with red soil adhering, glittering in dark purple color, are even mysterious. Oblivious of our fatigue, we took measurements and photographed. At half past two, the walls between trenches A, E and C were removed, giving a clearer view in a single glimpse. All the artifacts from the previous trial digging were put back in their original position on the basis of the map and photographs, and then further photographs were taken (Cf. Fig. 7 and 8).

Artifacts were found in a large oval area 5 meters across north and south and 3 meters across east and west. Generally speaking, relatively large implements, such as axe-shaped tools, were found in the northern part and cores in the northern half of the eastern part. Blades and

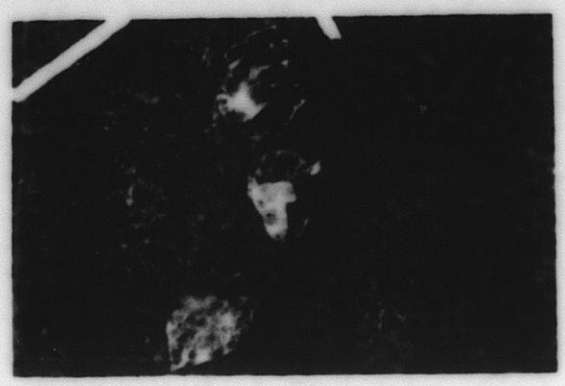

Fig. 7: Group of cores



Fig. 8: Artifacts from trenches A and E

scrapers, and obsidian flakes in between, were found in the southern half of the eastern portion. To the south were blades, points and a scraper. To the west were points. Axe-shaped tools are scattered all over. The southeastern and southwestern sections are not yet excavated but seem to contain artifacts. The artifact stratum is about the same, between 10cm and 20cm from the top of the soft yellowish brown soil. The oval arrangement of tools, the south-north orientation of the maximum diameter, and the separate arrangement by tool types all go to indicate some purpose for the arrangement.

Fortunately the sun was now descending toward the horizon. When the dirt on the south side was removed, direct light shone on the trenches. We arranged cameras on the west side. Messrs. Serizawa, Mukaiyama and Kitahara and reporters of the newspaper companies took pictures. The sound of shutters vibrated through the evening air.

At 2:30 p.m. Prof. Serizawa and Mr. Toru Matsushima headed their way back. The five students of the College of Agriculture, Shinshu University, who had agreed to do the surveying of the hill of Okiyomizu, were busy with their transits. The geology party departed for a geological survey of the area around the site. These men standing on the hill and in the valley make black silhouettes against the evening sun. Finishing recording the positions of artifacts, we collected them and put them away. We began examining the levels below the artifact layer. Hardly any artifact was found for the first 10cm. To be sure, 15cm below the position of A23, a base of a large point was found in a slanted position. This could be matched with A23, making a willow leaf-shaped point of 25cm in length and 5cm in the maximum width. In size and beauty it is probably unsurpassed

(Cf. plate). It was found in the center of the southern half of the oval arrangement of implements. There being no other artifact nearby, probably it was placed there by itself. The changed color and the relatively greater amount of oxidization of the tip portion and the discovery of the base from the bottom-most layer suggest that the piece was standing vertically with its tip pointing upward.

We nominally disbanded at 4:00 p.m. Students of Ina Junior High School began covering up the trenches. Messrs. Fujisawa, Kobayashi, Nakaji, Mukaiyama and Kitahara helped with shovels. As the sun had set behind Mt. Komagatake and darkness was approaching, the work continued. It took an hour to finish. Existence of artifacts was suspected east of trench E and south of the middle of trench C, but unfortunately they had to be reserved for the next time. As the work ended, I suddenly felt the fatigue. We removed the tents, counted the equipment and divided it among ourselves to be carried back. We presented gifts to the Katos and the Ueharas, paid our respects to Messrs. Kitahara and Kojima who till the land where trenches were dug, and bid farewell to the hill of Okiyomizu. The frequented valley path was full of memories as I walked with heavy stone implements on my back. About 7 o'clock Mr. Fujisawa, Mr. Kobayashi and others discussed the excavation, made plans for analysis and care of the data, thanked one another and disbanded.

4. Summary

1. The Kamikoshiba site is located at 1888 Okiyomizu, Kamikoshiba, Minaminowa Village, Kamiina County, Nagano Prefecture and is situated on the northeasterly slope of a tongue-shaped portion at the eastern end of a lone hill at an altitude of 714 meters.

2. Excavation was conducted on the five days of November 8, 9, 15, 22, and 23. The excavated area was about 132 square meters, reaching a depth of 80cm.

3. The excavating organization was the Special Committee on the Investigation of Kamiina Ethnology.

4. The stratigraphy of the site was as follows, starting from the surface: Humus, black soil, 20cm deep; dark brown soil, 20-25cm deep; soft yellowish brown soil, 40cm deep; hard yellowish brown soil, over 300cm deep. The yellowish brown soil layers appear to be the so-called loam layer. Their correlations with the Kanto loam and the Shinshu loam are being analyzed at the Department of Geology, College of Letters and Science, Shinshu University.

5. The principal artifact level for stone tools was 10-20cm, most frequently 15cm, below the upper limit of Layer III, the soft yellowish-brown soil.

6. Pottery found was in the black soil (I) and the dark brown soil (II).

Stone implements totalled 57 specimens. They were: 17 points, 11 axe-shaped tools, 7 blades, 6 end scrapers, 1 awl, 6 cores, 3 nodules and 6 flakes. Potsherds totalled 32. Some were undecorated. Others resembled the Initial Jomon, Hananoko and Kayayama styles and the Early Jomon Moroiso style.

7. Rock materials were mainly andesite, obsidian and chert, but contained many others, and the composition of the rocks was very complex. I hope to have the minerals analyzed and publish the results.

8. The principal tool type was the lance-shaped point, but there were many blades and end scrapers also. They possess the morphological characters of preceramic culture. Large axe-shaped tools occupy a dominant place, quantitatively, in this assemblage. In this respect this is the first such occurrence in Japan. There are important problems of chronological nature in that one half of them are partially ground.

9. Stone tools were found roughly on the same level in the yellowish brown soil layer (III). They were horizontally arranged or piled up one on top of another, and distributed in an oval area 5 meters across the longest distance and 3 meters across the shortest. The site is a special feature with some purpose in that flakes and waste flakes were rare and that practically all specimens were complete implements. Such a feature in the loam layer is a new discovery in this country. (January 10, 1959)

(Instructor at Ina Junior High School)

PRECERAMIC CULTURE IN THE ISE AND SHIMA REGIONS

(Ise Shima ni Okeru Mudoki Bunka)

by Kenji IWANO

(Sekki Jidai, No. 4, pp. 43-46. Tokyo, 1957)

1

Last spring Mr. Chosuke Serizawa and I visited the Shima region (Mie Prefecture) and studied many non-ceramic implements. Following Mr. Serizawa's suggestion, I would like to present some of the material here.

2

When I visited Mr. Toshio Suzuki in Koshiga, Shima Province, on October 9, 1954, he showed me a stone implement found in Hon Village, Hisai Town, Isshi County, Ise Province and asked me what it was. My knowledge of stone tools was poor. On the basis of the notes I fortunately had taken of lectures Messrs. Serizawa and Kamaki delivered at a meeting of the Jomon Culture Study Group, I told him that the specimen shown to me was a microlith of the terminal period of the preceramic culture. I also met Mr. Takekado Sasaki of the same place, and as the topic of conversation extended to microliths, I urged him to collect even flakes which may seem to be waste material as it seemed entirely possible that this type of tools should be unearthed in Shima where the topography is similar to that of the Inland Sea.

For over three years since then, Messrs. Susuki and Sasaki's diligent search has continued and brought about the results reported below. I would like to take this occasion to thank heartily Messrs. Toshio

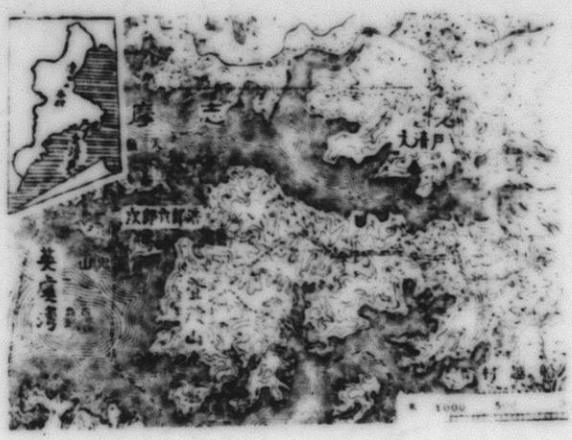

Fig. 1. Map [of the area under discussion] (Scale is in meters)

Suzuki and Takekado Sasaki, who permitted me to make this material public, for their scholarly favor and express my deep appreciation to Messrs. Chosuke Serizawa and Masaru Aso, who instructed me on various matters, and also to the former and Teruo Takeda, who liberally assisted me in making the line drawings.

I would like to note here that all the material from Shima Province is Mr. Takekado Sasaki's property.

3

1. Higashide [?], Hon Village, Hisai Town, Isshi County, Ise Province

Site. Situated on a terrace overlooking to the south the Kumozu River, occupied by a mulberry and vegetable farm. The artifact was collected in November, 1929. The condition of the site when visited last fall was different from some twenty years ago. That is, dirt has been brought in to raise the elevation of the land. It is said that the site was then about one meter lower than now. The vertical section nearby shows about 50cm of top soil besides which there is the so-called loam layer of about 2 meters. The bottom-most portion is a gravel layer with high sand content. The area in which the artifact was found gradually slopes toward south. The contour line indicates 20 meters.

Artifact. One microcore is shown in Fig. 2 which is almost cylindrical. The platform is a prepared one and slender flake scars, struck from one direction, are seen parallel to one another. The material used is flint.



Fig. 2. Core from Hon Village, Ise Province

2. 大清戸
Okiyoto [?], Tategami Village, Shima Province

Site. Situated on a slope facing south on a tongue-shaped plateau protruding from the north into Ago Bay. The contour line indicates 10 meters. Toward the end of last year, I went to the site with Mr. Sasaki as guide and examined the details. The top soil has thinned out at places through erosion due to wind and rain. Some areas have one meter of the so-called loam deposit. The specimen owned by Mr. Sasaki was discovered when the loam was removed for use elsewhere. The tongue-shaped plateau is similar to the Inland Sea topography, the surface being covered all over with sand and pebbles due to erosion.

Artifacts. Several microcores, shown in Fig. 3, nos. 1-3, have been uncovered. No. 1 is a conical core made of iron-quartz [quartz with high iron content?], 30mm wide, 36mm long and 29mm thick. It has more than ten slender flake surfaces of about 3-5mm wide running along the vertical axis all around. No. 2 is made of flint. No. 3 has rings on the obverse side, but the positive bulb is not observable. No. 4 might be considered an end scraper. It has rings on the back side and is retouched on the front side at the tip. The total length is 40mm, width 22mm and thickness 8mm, it is made of flint. No. 5 is made of sanukite and is 22mm long, 15mm wide and 5mm thick. It seems to be a type of "Knife-point".

3. 登残山
Tomoyama [?], Daio Town (former Funakoshi Village), Shima Province

Site. Located at the tip of a narrow plateau which protrudes far into Ago Bay from east. The scenery is like that of Okiyoto discussed above. Small pine trees grow in groups and sand and gravels cover the ground; but there are patches of soil. The site is on a slope at about a ten meter elevation.

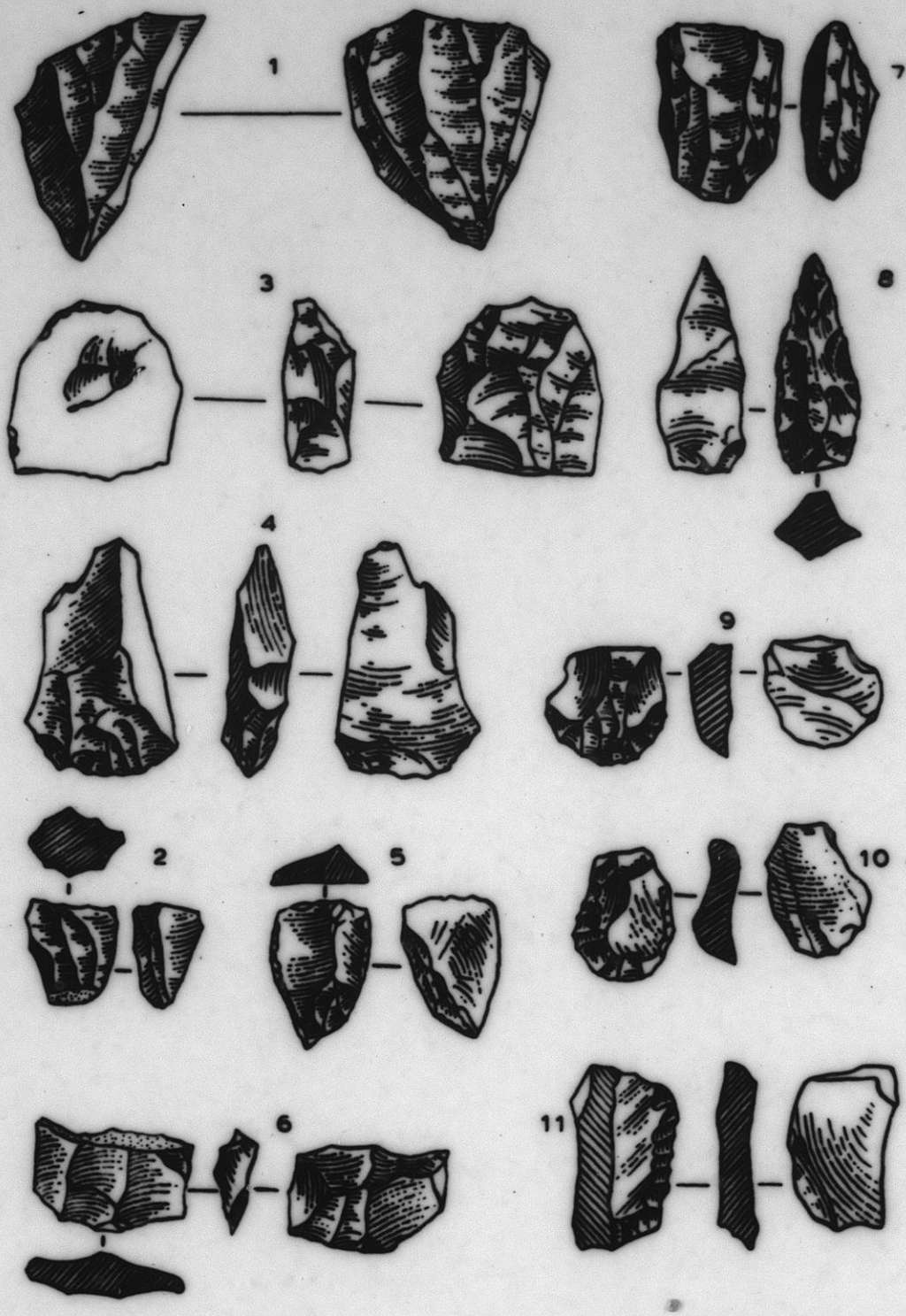

Fig. 3. nos. 1-5: Okiyoto, Shima; nos. 6-8: Shima; 9-11: Jirorokurohama, Shima

Artifacts. Fig. 2, nos. 6 and 7 are both microcores. No. 8 leaves a central ridge on the front side and has retouches along one edge of one side. It is a point-like tool which is bulged a little in the middle of the back side and retains the bulb. Besides this, two points, 58mm and 42mm long, respectively, have also been found at Tomoyama. But I would like to avoid treating them as being products of the preceramic culture at this time, and wait for a finer analysis at a later date.

4. Jirorokuro-hama, Daio Town, Shima Province

Site. This is a beach in the form of a levee, less than 50 meters wide, adjoining Tomoyama to the northwest. The site is along the shore line. Artifacts were found among small pebbles on the shore. It is probably difficult to discover anything except at low tide.

Artifacts. Nos. 9 and 10 are microscrapers made on circular flakes by retouching minutely along the edges. The platform bulb remains distinct and there is no retouch on the back side. The materials are flint and chert. No. 11 is probably a side scraper made on a long flake by applying retouch along one edge. The total length is 28mm, width 16mm and thickness 16mm, the material being chert. [The thickness, judging from the illustration, seems to be 6mm, rather than 16mm, contrary to the text - Eds.] Jomon arrowheads, knives and pottery are also found on the beach of Jirorokurohama, but they belong to periods after the Middle Jomon.

I have described the sites and artifacts discovered so far in Mie Prefecture. I shall discuss them further.

Recently this [preceramic] culture of the Inland Sea region has increasingly come to be known through the investigations of Mr. Yoshimasa Kamaki and others.[2] In the mountainous areas of the Chubu, furthermore,

many sites have been discovered.[3] But in the Kinai and vicinity, the area between these two, discoveries have not been made.[4] For this reason the above-mentioned sites serve considerably to fill the gap. Because none of the sites has been excavated, stratigraphic information is completely lacking. Sites at Okiyoto and Tomoyama in Shima Province are to be systematically investigated in the near future.

All the sites must be assigned to the microlithic industry. Implements belonging to a cultural stage prior to this have not been discovered. The points from Tomoyama, however, leave much to be considered.

Microcores have been found in some number right in Shima at various sites. But no small blade, such as seen at Washiuzan[5] and Yadegawa[6] has yet been discovered. Nodules to serve as cores, except sanukite, are scattered around sites. Also, obsidian tools have not yet been unearthed, although many chips and flakes have been recognized at Tomoyama.

Jirorokurohama reminds one of Sone in Shinano. To be noted about this site is that the uncovered implements are not weathered. Arrowheads found on the neighboring Tomoyama beach have become like pieces for the go game by wave action. Of course this is partly due to the fact that Jirorokurohama is located within the bay; nevertheless this fact should be noted in studying the nature of the site. When I reported on a Jomon site facing Ago Bay,[7] I touched on the fact that the area facing this bay is sinking year after year and forming the rias type beach line. We must find out the difference in the shore line between the present and the preceramic period geologically on the basis of the rise and fall of the land. Finds similar to the microscrapers of Jirorokuro Bay are few in number and are known only

from Kurihara[8] in Musashino and from Sone[9] in Shinano. What the relationship of this type of implement is to the microcores of Tomoyama and Okiyoto as Mr. Serizawa states, is a problem for the future.[10]

It will not be long before other industries which are not well understood will be known through investigation of other areas. I have set forth some points to be noticed in studying preceramic culture in this area, as well as presenting data.

Notes

1. Suzuki, Toshio, Kokogaku kara mita Isshi-gun (Isshi County as seen archaeologically), in Isshi-gun shi, 1955.
2. Kamaki, Yoshimasa, Okayama-ken Washiuzan iseki chosa ryakuho (Preliminary report of the excavations at the Washiuzan site, Okayama Prefecture), Sekki Jidai, no. 3, 1956.
3. Sites in Nagano Prefecture have been reported in various places by Messrs. Chosuke Serizawa and Masaru Aso.
4. A site has been discovered in 1956 by Assistant Professor Shoichi Sumida of Nagoya University.
5. Kamaki, op. cit.
6. Serizawa, Chosuke, Shinano Yadegawa iseki no chosa (Investigation of the Yadegawa site, Shinano Province), Nihon Kokogaku Kyokai Dai 14 kai Kenkyu Happyo Yoshi, 1954.
7. Iwano, Kenji, Shima no kuni Shima-cho Koshiga aza Maruda shutsudo no Zenki Jomon-shiki doki ni tsuite (Concerning Early Jomon pottery uncovered at Maruda, Koshiga, Shima Town, Shima Province), Jodai Bunka, no. 26, 1956.

8 and 9. Serizawa, Chosuke, Kanto Chubu chiho ni okeru mudoki bunka no shumatsu to Jomon bunka no hassei toni kansuru yosatsu (Preliminary observations concerning the termination of the preceramic culture and the origin of the Jomon culture in the Kanto and the Chubu), Sundai Shigaku, no. 4, 1954.

10. Serizawa, Chosuke, Jomon bunka, in Nihon Kokogaku Koza, vol. 3, 1956.

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Postscript. Mr. Toshio Suzuki has a summary discussion under the title of "Ise Shima ni okeru Jomon izen no bunka (Pre-Jomon culture in the provinces of Ise and Shima)," in which he takes up some other sites and artifacts from Shima [than those discussed here]. These, however, have been eliminated from this paper because they include some which are not very distinct. It is not difficult to see that there are sites in Shima Province other than those discussed above. I end this postscript while hoping for Messrs. Suzuki and Sasaki's continued search.

EXCAVATIONS AT THE WASHIUZAN SITE, OKAYAMA PREFECTURE

(Okayama-ken Washiuzan Iseki Chosa Ryakuho)

by Yoshimasa KAMAKI

(Sekki Jidai, No. 3, pp. 1-11. Tokyo, 1956)

Introduction

The official name of the location of this site is Kusumibana, Washiuzan, Shimotsui, Kojima City, Okayama Prefecture.

On the basis of the fact that pottery is not found here and that implements are different from those associated with the Jomon or Yayoi culture, we had been able to make a tentative guess that the majority of the stone implements recovered from the top soil of this site belong to the preceramic culture. Because of the number and heterogeneity of the tool types, we had been confronted with great difficulties in discerning the relationship among them and in seeing whether it is possible to divide them into several industries which show temporal development. Only sheer speculation had been possible.

As the first step toward removing these difficulties, we planned to excavate this site.

Excavation was conducted for five days, from December 24, 1954 to December 28, with the assistance of the Kojima City Board of Education.

Participants of the excavation were Masakazu Yoshizaki, Hiroshi Nishikawa, Keiichi Yamamoto, Kazuhiko Tawa [?], Mitsuru Kuroda, Takashi Miyake, Noboru Takada, Mamoru Takahashi, Tadahiko Makabe and Yoshimasa

Kamaki, these ten individuals plus students of the local Kotoura High School, Tamano High School, Amashiro High School and Funaho Junior High School.

Throughout the duration of the excavation we received sincere assistance from Mr. Kakuyu Inoue, priest of Taihoji Temple and owner of the land, Mr. Ryusho Tsuda, priest of Kosenji Temple (which served as our living quarters), Mr. Toshio Kosaka, member of the Kojima City Board of Education, and Mr. Akira Akaboshi of the Kojima City Sight-Seeing Association. I would like to take this opportunity to express my gratitude to all those who have cooperated with us.

In preparing this preliminary report, Mr. Tadahiko Makabe was in charge of most of the line drawings.

Present State of Preceramic Research in the Inland Sea

I presented a brief report at the 14th Meetings of the Japanese Archaeologists' Association[1] concerning the outline of preceramic research in the Inland Sea region. Research in this region is confronted with difficulties beyond imagination, together with geologically bad conditions.

Our research at first chiefly consisted in a distributional survey of sites at which appropriate [preceramic] types of implements are unearthed. We discovered several dozen sites in the three prefectures of Okayama, Hiroshima and Kagawa, most of them located on islands in the Inland Sea or on plateaus protruding into it, showing topographic similarities with sites yielding roulette pottery and sometimes being overlain by the latter. Along with these investigations, we carried out a classification into several industries, using as the basis materials collected at the Washiuzan site;

this was primarily on grounds of morphology, but taking manufacturing processes into consideration. The following hypothetical formulation resulted:

(1) An industry associated with long flakes.
This is concentrated in the Washiuzan site and is scarcely found at other sites.

(2) An industry associated chiefly with projectile points.
(A) Broad and relatively flat spearhead-like artifacts mainly found at Washiuzan and the Toyoshima Plateau.
(B) Small, slender spearhead-like artifacts, mostly unearthed at Washiuzan.
(C) Relatively large, long and thick spearhead-like artifacts most of which are again, so far, found at Washiuzan.
(D) Other spearhead-like objects.

(3) An industry chiefly associated with knife-like implements and accompanied by many small side-blow flakes.
This group is most widely distributed in the Inland Sea. Since inventories of tools differ from one site to another, there is a strong possibility that it may be divided into several units, chief among which are:
(A) A group consisting of small side-blow flakes whose platform is minutely retouched, leaving the sharp edge created at the time of flaking as it is. This is found at many sites, such as Washiuzan and Kurakake Plateau I at Ijima.
(B) A group consisting of very small side-blow flakes. Portions of both edges are minutely retouched, leaving part of the

sharp edge made by flaking as it is. Morphologically they resemble the trapezoid, but the method of manufacture is entirely different. A considerable number of them was found together at Kurakake Plateau I at Ijima.[2] They are also found in some number at Washiuzan and other sites. They are similar to the group among the collection from Trench III at the Babadaira site in Shinshu,[3] which has been discussed as being not associated with points.

(4) A group of microcores and small blades which seem to have been obtained from them.

In addition to the groups above, we have collected certain other specimens. We are not certain as to whether they should be treated separately or included in some of the groups discussed above.

Topography and Environment

The Kojima mountain mass, on the north coast of the Inland Sea and in southern Okayama Prefecture, is south of the Kibi Plateau, which is a semi-plain, and is separated from it by the alluvial plain of Bizen and Bitchu.

Whereas this mountain mass forms a gradual slope northward toward the alluvial plain, to the south it forms a steep cliff and disappears into the ocean. Many of the islands to the south, scattered in the Inland Sea, also have steep cliffs on the south side, creating the characteristic Inland Sea scenery.

A geological map with the scale of 1/75,000 shows through the area exposure of granite, which is considered to be of Tertiary formation, with



1. Overall view of Kusumibana, Washiuzan



2. Map of Washiuzan area

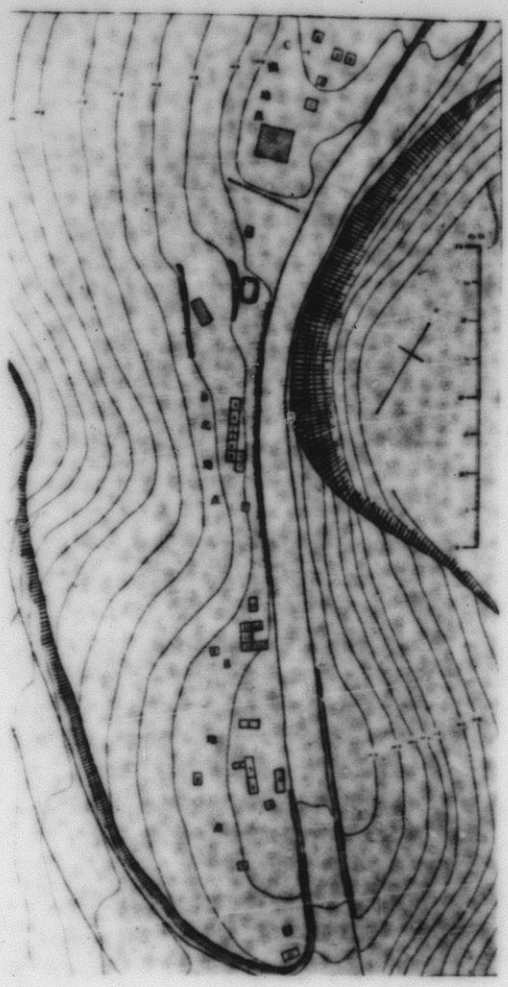
a few remnants of aqueous rock seen in low areas. That is to say, various types of rocks which had once covered the top portion of the granite, which is plutonic, seem to have been removed by later erosion.

On the slopes on the south side of the Kojima mountain mass there are many tongue-shaped plateaus, with steep cliffs, extending southward. Islands having plateaus with southerly slopes also have a similar situation. The upper portion of the granite foundation is covered with a secondary deposition of eroded soil, although there is a difference in the thickness on plateaus. Erosion has been going on under the action of continuous rain and wind, often exposing implements and flakes in the deposits.

Many of the sites of preceramic culture in the Inland Sea, including the Washiuzan site, are situated in such topography and on such a foundation. Growth of trees on these sites is sparse, particularly at Washiuzan.

Excavation Procedure

Throughout Kusumibana the distribution of flakes hardly showed any variation in density, making the selection of a site for excavation difficult. On several past occasions of surface collecting we divided the area into 6 localities labelled A to F for the convenience of analysis. Localities other than A, B and C are on extremely steep slopes, making excavation impossible. Since localities A and C also seemed somewhat difficult, we selected three points, with Locality B as the southernmost one, setting up a Locality B-North (north of Locality B) and still further north, a Locality C-South. We decided to dig test trenches at these points. The excavations are described below.

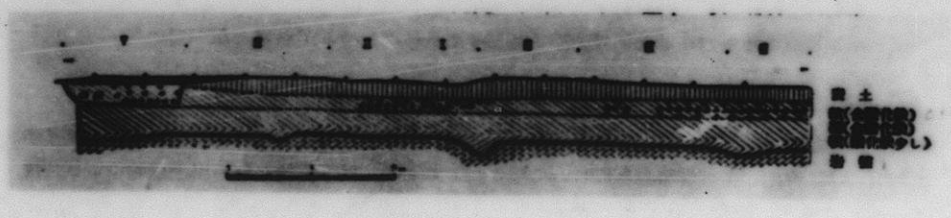


3. Map of the excavation areas

Mr. Masakazu Yoshizaki was in charge of Locality B. This is the flattest point in the area. Apparently once cultivated, the top soil of at least 20cm is well disturbed. Test pits were dug in this locality at 9 places from Section 1 to Section 9 in areas close to the central road. The thickness of the top soil differed from section to section. It was clearly disturbed, stone tools and flakes being found mostly in this layer. The top soil has a brown layer with some iron content, the iron content increasing toward the lower portion and the soil becoming harder toward the lower part. Stone finds are seen only in the upper half of this layer and only in a small quantity. Below this layer is a relatively soft layer with less iron content, underlain by the bedrock. The top soil is relatively small grained and seems to have been plowed. In it were found a lance-like point, a knife-like tool and microcores. The situation at Sections 20 and 21 was about the same.

Sections 10, 11, 12, 13, 14 and 15 are located much further north from the former /Sects. 20 and 21/, the plow zone of the top soil being about 20cm. Flakes and implements were numerous at the border between this top soil and the underlying brown soil. This area especially produced comparatively many microcores and small blades. The brown soil below the top soil has high iron content, its top half being relatively soft and the bottom half hard. Other than the few lances found in the top half, even flakes were hardly found from the bottom part. The soft top half portion is about 15cm, and the hard portion about 60cm, below which is the bedrock.

Mr. Mamoru Takahashi was in charge of Locality B-North. This locality is on the line connecting the flat Locality B and Locality C-South, but on



4. Section of Locality B. Names for the five layers read: (from top) Top Soil; Soft (contains oxidized iron); Hard (contains oxidized iron); Soft (contained little oxidized iron); Bed Rock



5. Section of Locality B

a slightly lower level. To the east of the trench and parallel to it is an automobile road made by piling up dirt.

Throughout all the sections of the trench, the top soil is about 20cm thick and consists of relatively small grains; it is underlain by a layer of decomposed granite in which iron is concentrated in scattered spots: this is the principal artifact-bearing layer. It contains granite pebbles in the east half of the trench, probably in an increasing amount underneath the automobile road to the east.

This layer gradually merges into the underlying layer of extremely hard decomposed soil with high oxidized iron content. Although in general flakes were very rarely encountered here, in Section 7 a relatively large number of flakes were found. Then after going through a soft sterile layer, one reaches the bedrock.

Layer 1 of top soil was very much disturbed. Stone tools and flakes were relatively abundant. Microcores, knife-like tools, lance-like points and long flakes were found mixed together. Layer 2 of granite-decomposed soil with iron concentrations had many lance-like points and appeared to be a relatively pure artifact-bearing layer. The artifacts from Layer 3 of extremely hardened soil are chiefly large, long flakes of the type found in Section 7. The degree of weathering on the flakes is considerable.

Flakes are distributed heavily in Sections 1, 2 and 3 and sparsely in Sections 4 and 5. Also, in all sections, they were more numerous on the east side, that is, toward the road, than on the opposite side. A little way from this trench Section 9 was dug separately without finding any artifact worthy of special mention. The stratigraphic situation was about the same as that of the trench.

Messrs. Tadahiko Makabe and Takashi Miyake were in charge of Locality C-South.

The top soil here was about 30cm thick from Section 1 to Section 6, although the thickness varies somewhat from section to section. Underneath it was a hard layer with some iron content, the top half of which was relatively soft in some sections. This layer was about 40cm thick, gradually changing into a somewhat softer layer of less iron content, and soon reaching, after 20cm, the bedrock.

Throughout all the sections artifacts were most numerous in the top soil, which yielded microcores, knife-like tools and lance-like points. From the brown soil layer of high iron content below this, lance-like points and small number of flakes were found in the top half. From the bottom half to the bedrock, hardly a flake was found.

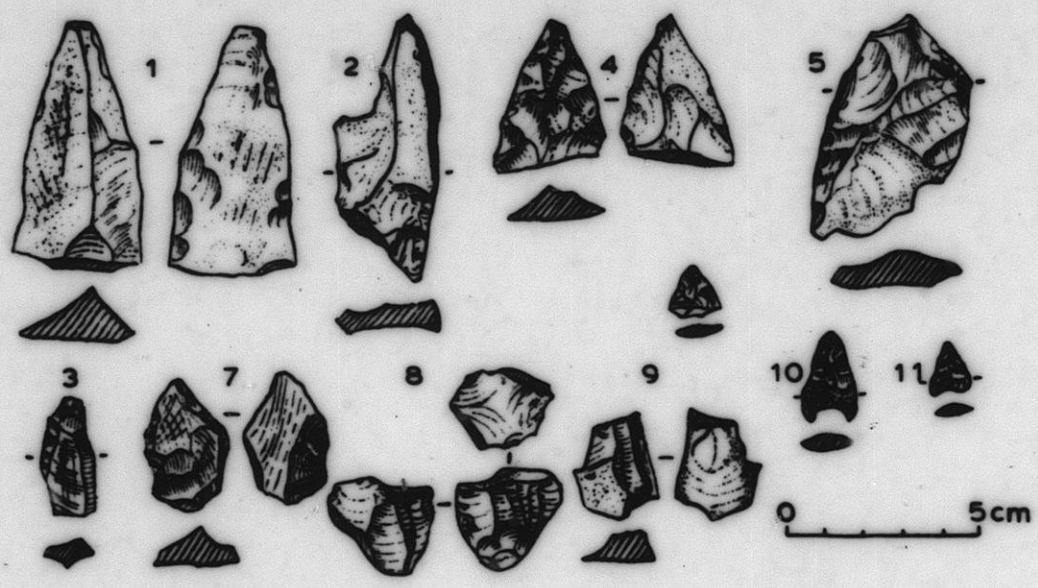
Through all sections the bedrock was a granite rock mass or a rock mass which has decomposed but has not moved. The granite-decomposed soil deposited on top of it has in principle the same vertical arrangement. That is, the top soil consists of minute grains which have moved considerably since the decomposition. At Locality B this is the plow zone. Layer 2 consists of somewhat coarse grained relatively soft soil with some iron content, and contains lance-like points. Layer 2 gradually changes into the hardened Layer 3, which at places contains large, badly weathered flakes. Layer 4 is soft and contains less iron. No flakes are found. It appears to be a layer of decomposed granite which has never moved. Below this is the bedrock.

Artifacts

Artifacts found consist entirely of stone tools and flakes. Although there is a considerable quantity of implements which had been surface-collected previously, we shall report here only on the material excavated on this occasion. The artifacts will be described below by locality.

Locality B, Sections 1-9, 20 and 21.

The great majority of stone tools and flakes were found in the top soil: one long flake with a bulb of percussion, one fragment with retouch (the rock material is fine sanukite), one long obsidian flake with retouch at the tip; three pointed tools, one of which is made of fine sanukite; two microcores, both made of fine sanukite; one obsidian knife-like tool; two arrowheads. Unless otherwise noted, the material is all sanukite. Flakes, both of side-blow and of end-blow types are found in some numbers, also many flakes with scale-like chippings. The flakes are considerably weathered. One longitudinal flake (Fig. 6, no. 1) has the platform end broken off; it is a blade with retouch or what seem to be traces of use along both edges on the side on which the bulb of percussion should be. The one shown in Fig. 6, no. 2 is irregularly shaped but has well executed retouch on oneside at the tip. It is not clear whether it is an implement or an unfinished tool. Fig. 6, no. 3 is a longitudinal flake with a good portion of its length gone, having retouch at the tip applied from one direction. Of the three pointed tools, one of them (Fig. 6, no. 4) is made of fine sanukite. It seems to be a lance head of a somewhat broader type. One side is flaked so as to leave a central ridge; and the other side is



6. Artifacts from Sections 1-9, 20 and 21, Locality B

flaked in a relatively flat manner. Although a portion of it is missing, the form was probably like the one in Fig. 7 no. 6. Specimens of this form were treated as point type D for the purposes of classification.

The point shown in Fig. 6, no. 5 is flat, broad and bifacial. The retouch is rough and portions of the edge are not retouched. The point shown in Fig. 6, no. 6 is considered to be a small tip fragment of a point belonging to this group. This group is treated as point type A.

Fig. 6, no. 7 is a knife-like tool, its bulb of percussion having been secondarily removed. Unifacially retouched, it is forcibly trimmed along most of both edges, a portion of the tip being left as cutting edge. Although at first we considered the possibility of treating it as a point, we later decided to regard it a knife-like tool.

Fig. 6, nos. 8 and 9 are microcores. No. 8 is a semiconical core. Its platform has been prepared. There are long, narrow, parallel facets made by striking from one direction. Since no. 9 has a positive bulb of percussion on the obverse side, perhaps, strictly speaking, it should be treated as a flake. But since it has several flakings, we are tentatively including it here.

Lastly there are the arrowheads shown in Fig. 6, nos. 10 and 11. They were discovered in sections 4 and 20, which are at one end of Locality B. Morphologically, the in-curving of both shoulders and the technique of making a concavity between them are characteristic. Along the edges of this Locality B a few arrowheads have been surface-collected. Their forms display the same tendencies. Especially noteworthy is the fact that this type of arrowheads has not been found at Jomon or Yayoi sites of the

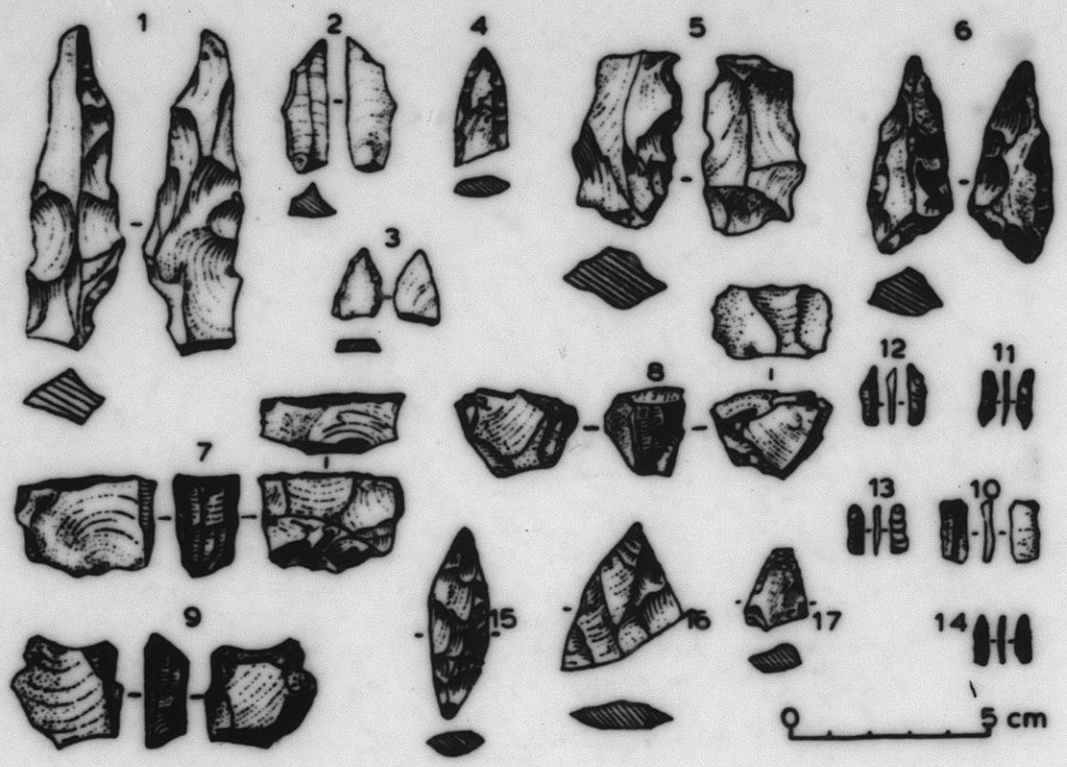
southern Kibi area. I would like to await future empirical research [for all interpretations].

Locality B, Sections 10, 11, 12, 13, 14 and 15.

Since we found somewhat more microcores and small blades in the upper layer at this locality, we decided to treat them separately.

From the upper layer were found three knife-like tools, three pointed tools, four microcores and five small blades. Only three pointed tools were found in the brown iron-containing layer, which is Layer 2. Other than these a small number of flakes and many small scale-like chips have been found. Any marked difference between the flakes of the upper and lower layers was hardly recognizable. Among specimens from the top soil, Fig. 7, no. 1 is a large flake with retouch along one edge, the other edge being left as it was flaked off. It is not clear whether this flake is longitudinal or lateral. Considering it to be a large knife-like tool, I classified it as a knife-like tool type C. But it might be considered to belong to the group of Fig. 6, no. 1. The material is sanukite. Fig. 7, no. 2 is a knife-like tool type A; the material is sanukite. Being a small longitudinal flake, it is unifacially trimmed along one edge, the other retaining its original sharp form. This group generally consists of lateral flakes, but at present I am treating them all together.

Fig. 7, no. 3 is also classified as a knife-like tool. Since it is a small object, its characteristics are difficult to see. The rock material is sanukite. It is unifacially retouched along both edges. Fig. 7, nos.4, 5 and 6 are pointed tools. The material is sanukite. No. 4 is a small



7. Artifacts from Sections 10-15, Locality B

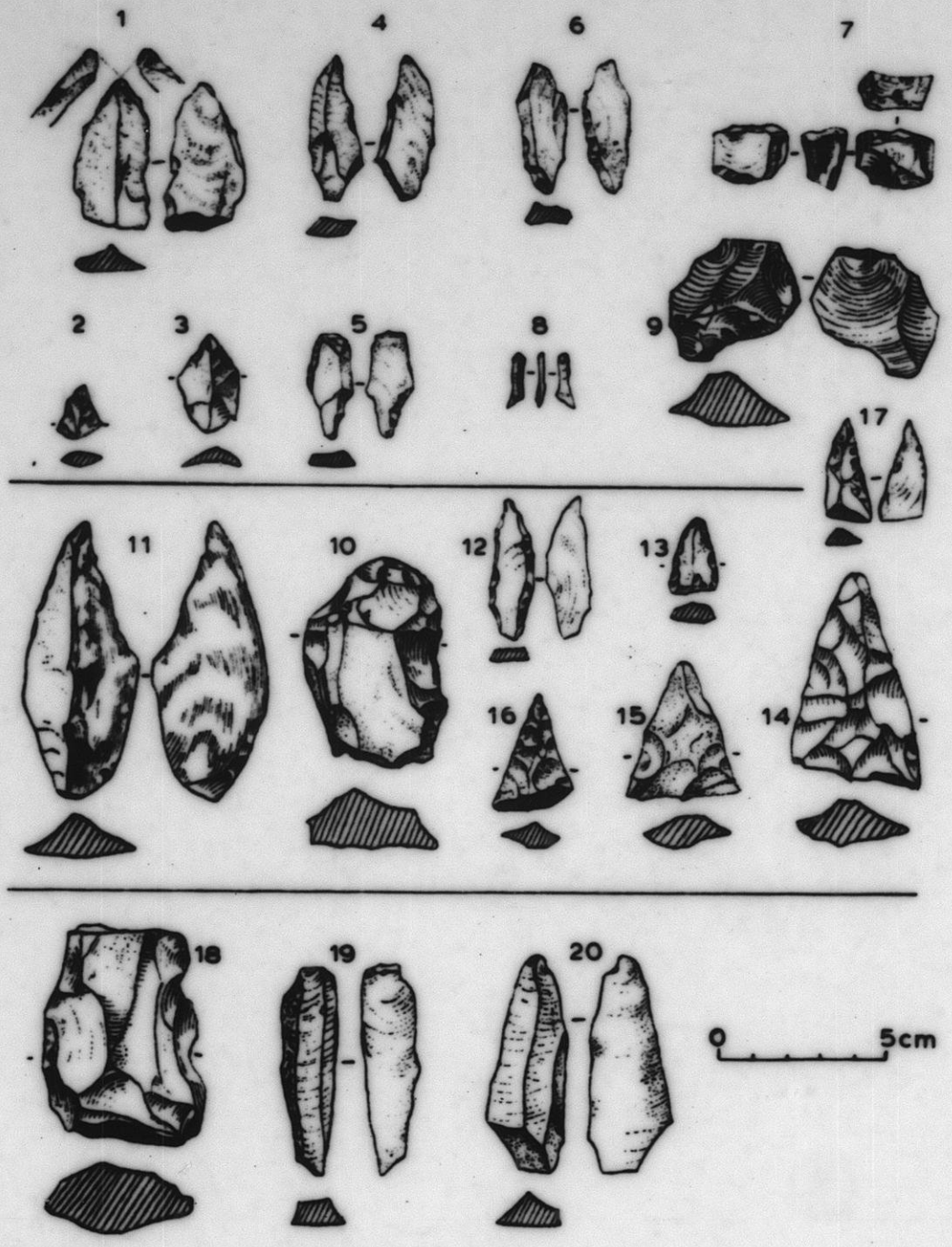
willow leaf bifacial point (Type B). No. 5 is a thick, relatively large bifacial point with rough retouch (Type C). No. 6 is a point retouched so as to leave a central ridge on one side and to make the obverse side flat. The length of the two edges is unequal and the base is peculiar (Type D). Fig. 7, nos. 7, 8 and 9 are microcores of extremely fine sanukite. All of them have prepared platforms. No. 7 has several flake scars on one side but not on the other. Retouch has been applied to the side opposite the platform in one direction, suggesting that this core itself might have been an implement (serving as an end-scraper). Several similar specimens are seen in the surface collection as well. No. 8 appears to be a semi-conical core, with flake scars seen only on the right and left sides. No. 9 shows flake scars only on one side.

Fig. 7, nos. 10, 11, 12, 13 and 14 seem to be small blades struck off from the cores described above. Nos. 10, 11, 12 and 13 are made of fine sanukite and no. 14 of obsidian. All of them retain the bulb relatively well, no. 10 in particular showing the negative bulb clearly on the front side as well. All of them have one or two ridges which indicate the original flake scars. No. 14 shows very minute retouches along the edges, which might be evidence of use.

Specimens unearthed from Layer 2, below the top soil, were all pointed tools. The willow leaf-shaped point of Fig. 7, no. 15 (Type B) comes from the upper part of the lower layer of Section 15. No. 16 is a flat, broad point (Type A). The fragment no. 17, might also be included in the flat and broad group (Type A).

Locality B-North

From the top soil were found: a burin-like tool (Fig. 8, no. 1) which is a longitudinal flake with a slender flake scar along one edge near the tip and small retouch along the other from the side of the flake surface, made of sanukite; and three small knife-like tools of sanukite (Fig. 8, nos. 4, 5 and 6), of which nos. 4 and 5 do not show the position of the bulb distinctly but have retouch along portions of both edges, leaving, however, the original sharp edge near the tip. No. 6 is a lateral flake from which the platform and the bulb have been removed. Fig. 8, no. 7, is a microcore of fine sanukite. Several slender flake scars are seen at one end of the prepared platform. Other than these there is one piece which seems to be a small blade (Fig. 8, no. 8). One last specimen is obsidian, apparently like an end scraper because of the retouch on one side; but the position of its bulb cannot be determined. Implements from Layer 2 were all points, except Fig. 8, nos. 10, 11 and 12. No. 10 is a unifacially retouched side scraper. No. 11 seems to be a blade, made on a longitudinal flake, with retouches near the platform, and appears to be of the same nature as the specimen in Fig. 6, no. 1. No. 12 is a unifacially retouched knife-like tool made on a lateral flake by retouching along both edges. Of the five points, Fig. 8, no. 13, is a willow-leaf bifacial point (Type B). Nos. 14, 15 and 16 are flat, broad bifacial points (Type A). No. 17 (broken) seems to belong to Type D, although it is narrow. Implements from Layer 2 are all sanukite. Of the stone fragments from Layers 1 and 2, those that may be considered flakes were few in number and badly weathered, most of the others being relatively well preserved scale-like



8. Artifacts from Locality B-North (from top, Layers 1, 2 and 3)

chips. Scarcely anything resembling an implement was found in Layer 3. Most of the finds were large fragments and large longitudinal flakes, such as Fig. 8, nos. 18, 19 and 20. The extent of weathering was great.

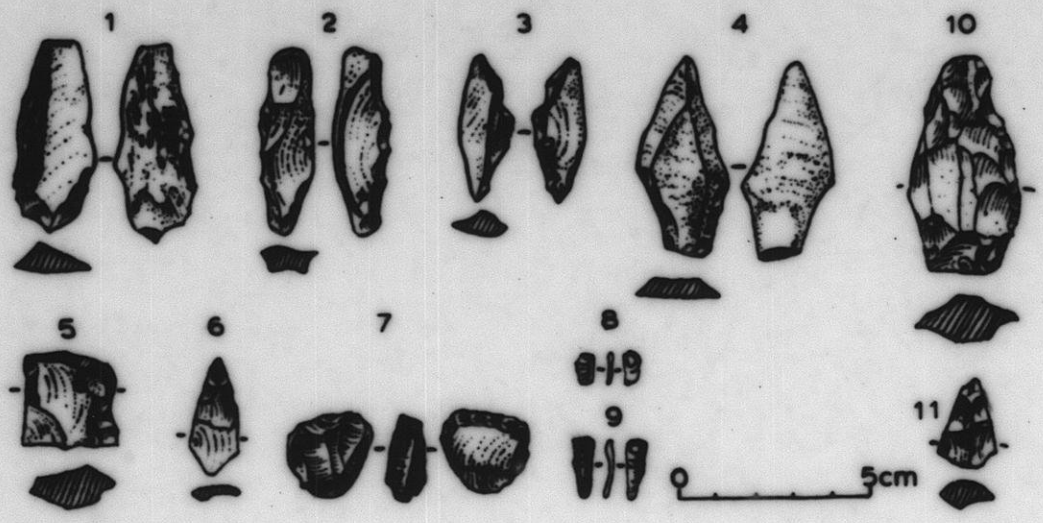
Locality C-South

In the top soil were found: an extremely weathered longitudinal blade (Fig. 9, no. 1), two small lateral flakes whose platforms have been removed (Knife-like tool, Type A) (Fig. 9, nos. 2 and 3), a pointed tool made on a longitudinal flake by retouching along both edges toward the base but leaving the tip naturally pointed (Fig. 9, no. 4), a point which belongs to the thick Type C (Fig. 9, no. 5), and a pointed flake (Fig. 9, no. 6). These are made of ordinary sanukite. Also there were a semiconical microcore (Fig. 9, no. 7) of fine material, two objects which seem to be small blades of the same material (Fig. 9, nos. 8 and 9), a small number of flakes and relatively many chips.

Implements from Layer 2 were: a thick, large point (Type C) (Fig. 9, no. 10) and a small fragment belonging to Type D (Fig. 9, no. 11); also a few flakes, all made of sanukite.

Discussion

I have given a rough description of the excavation and artifacts above. Finally, I would like to say a few words about the relationship between the artifacts and the cultural layers on this Kusumibana Plateau. That the soft sterile layer with little iron content, overlying the granite bedrock, has hardly moved since the erosion of the bedrock was ascertained during the excavation through such means as examination of the arrangement of grains;



9. Artifacts from Locality C-South [Caption reads "C-North", but this must be a mistake]

it is thus a matter of little question, as is the fact that the top soil is a result of repeated redeposition. But as for Layers 2 and 3, with high iron content, it is difficult to decide to what extent secondary movement has taken place. However, the fact that the artifacts in Layer 2, consisting mainly of points, constitute a relatively undisturbed assemblage, seems to indicate that what is found in Layer 2 and below has hardly moved after the time of the point industry. The flakes found in Layer 3 are mostly longitudinal flakes exhibiting extreme weathering, indicating a situation different from Layer 2. But the fact that some badly weathered flakes are found in Layer 2 also allows the possibility that in the process of the formation of Layer 2, the top portion of Layer 3 was disturbed. (This might be a matter related to excavation technique, since the change from Layer 2 to Layer 3 is a gradual one.) Since the transformation processes from Layer 3 to Layer 2 involve very important problems, I would like to refrain from drawing definitive conclusions on the basis of the conditions and materials described above.

Now, related to this is the relationship of the stratigraphy to the artifacts. I have shown in the table below the way in which artifacts have been found.

Looking at this table one notes that the principal elements of Layer 2 are points, and those of Layer 3 large longitudinal flakes. The side scraper and the large blade found in Layer 2 at Locality B-North, because they are much weathered like the flakes of Layer 3, may belong with them. Among the specimens from Layer 2, microcores, small blades and knife-like tools, which scarcely occur in Layer 2 or below, may be considered to be later than points. At Locality B-North and at Sections 10-15, Locality B, the principal type of point from Layer 2 is the broad variety; its

relationship to the willow-leaf type is unknown. Although we were not able to discern the relationship between the microcore and the knife-like tool at Washiuzan, at the Ijima site the former has been unearthed from an upper layer.[4] Summarizing the above discussion, we may say that Layer 3 contained large longitudinal flakes. They, together with the end-scrapers obtained by surface collecting and objects with standardized retouch at the tip, seem to constitute an industry, and for purposes of analysis I have called this Washiuzan I. Layer 2 chiefly consists of points, which I have called Washiuzan II. Similarly, the knife-like tools from the top soil I have called Washiuzan III, and the microcores and small blades, Washiuzan IV.

Finally, one point to be remembered is that the rocks used for the microcores and small blades are a very fine material. Although I called them tentatively a type of sanukite, they are at present being analyzed by mineralogists. Results should be known by the time a formal report is ready.

I have outlined the results of the investigation above. Since this type of investigation has just begun in this area it should be understood that unexpected results may appear with the progress of future research.

Notes

1. Kamaki, Yoshimasa, "Setouchi engan ni okeru mudoki bunka no sompi ni tsuite (Is there preceramic culture in the Inland Sea coasts?)," Nihon Kokogaku Kyokai Iho, Supplement 3, 1954.
2. In January, 1954 when Mr. Chosuke Serizawa, myself and several others surface-collected at Kurakake Plateau I at Ijima, we found a considerable number of specimens of this type.

3. Serizawa, Chosuke, "Nagano-ken Babadaira iseki ryakuho (A preliminary report on the Babadaira site in Nagano Prefecture)," Sekki Jidai No. 1, 1955.

4. At the time of the trial excavation in the fall of 1954, small blades were found from an upper layer and knife-like tools from a lower layer. Without formal excavation, however, this cannot be considered definite.

(The longitudinal and lateral flakes discussed in this paper are the same as what are referred to elsewhere as end-blow and side-blow flakes or end-flaked and side-flaked knife, respectively.--Eds)

	Locality B Sections 1-9, 20, 21		Locality B Sections 10-15		Locality B-North		Locality C-South	
Layer 1	Point (Type A)	2	Point (Type B)	1	Point	2	Point (Type C)	1
	Point (Type B)	1	Point (Type C)	1	End scraper?	1	Point	1
	Large blade	1	Point (Type D)	1	Knife-like tool	3	Knife-like tool (Type A)	1
	Knife-like tool	1	Knife-like tool (Type A)	1	Graver?-like tool	1	Knife-like tool	1
	Microcore	1	Knife-like tool (Type C)	1	Microcore	1	Point?	1
	Arrowhead	2	Knife-like tool	1	Small blade	1	Blade?	1
	Retouched tool	2	Microcore	3			Microcore	1
			Small blade	5			Small blade	1
Layer 2			Point (Type A)	2	Point (Type A)	3	Point (Type C)	1
			Point (Type B)	1	Point (Type B)	1	Point (Type D)	1
					Point (Type D)	1		
					Large blade	1		
					Side scraper	1		
					Knife-like tool	1		
Layer 3					Large longitudinal flakes (many)			

THE IJIMA SITE IN KAGAWA PREFECTURE: MICROLITHIC CULTURE IN THE SETOUCHI REGION

(Kagawa-ken Ijima Iseki: Setouchi ni Okeru Saisekki Bunka)

by Yoshimasa KAMAKI

(Sekki Jidai, No. 4, pp. 1-11. Tokyo, 1957)

Introduction

The location of the site, officially, is Kurakake, Ijima (Ishima), Naoshima Town, Kagawa County, Kagawa Prefecture. When we collected artifacts on the surface of this plateau at the southern end of Ijima, we divided the area for the sake of convenience into Locality I and Locality II. The object of investigation in this report is Locality I. I have decided not to touch on the investigation of Locality II.

It was about 1951 that this site first came to be known. Since then surface collection has been carried out several times by the discoverers, Kenko Misugi, Tadahiko Makabe and other members of the Setouchi Archaeological Society.

The two excavations, conducted in 1954 and 1955, were also done in collaboration with these people. As the man in charge, I am writing this report merely as a representative of the group.

In January, 1954, Mr. Chosuke Serizawa and Kamaki, who had been concentrating their efforts on the study of another preceramic culture in Shinshu, carried out a surface collection in this area and collected a few specimens of the Ijima II group, to be discussed later, at a certain location and specimens of the Ijima I at another and realized that there was scope for analysis /in the relationship/ between the two.

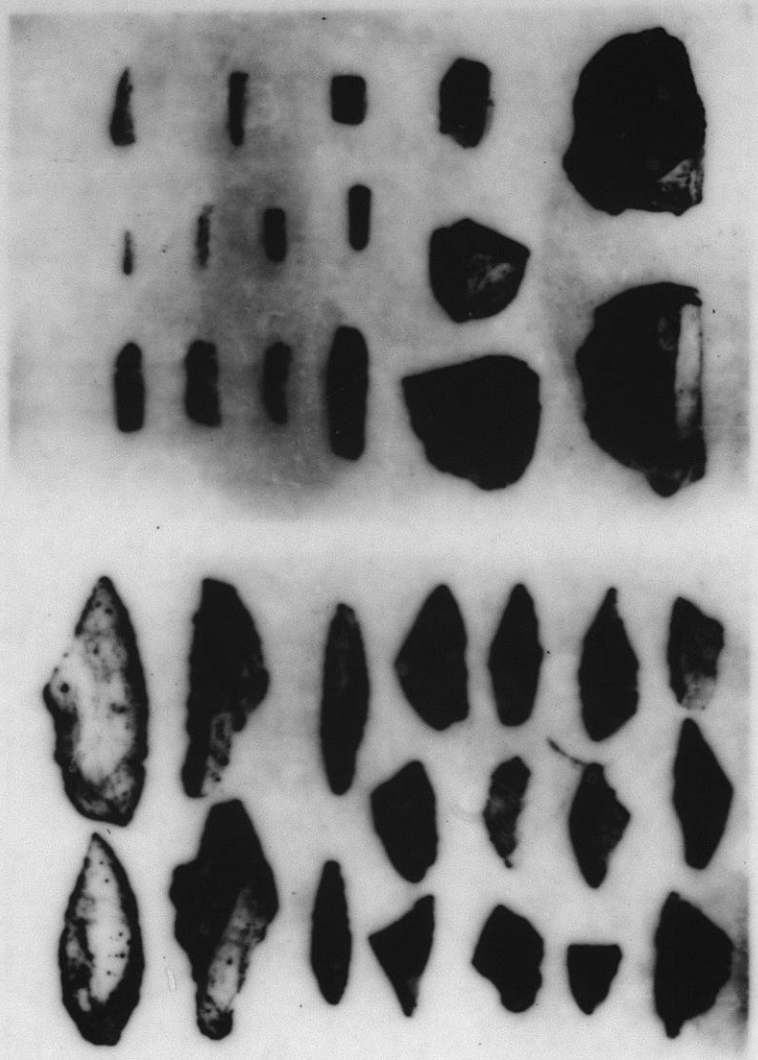


Plate: Artifacts found at Locality I, Kurakake, Ijima, Naoshima Town, Kagawa County, Kagawa Prefecture (actual size)

Upper: Artifacts of Ijima II
Lower: Artifacts of Ijima I

Our two investigations were planned on the basis of these facts. As a result we were able to obtain what is outlined below.

I received much assistance from Mr. Chosuke Serizawa, who was involved from the beginning, Messrs. Kaneyuki Misugi, Tadahiko Makabe, Hikaru Kuroda, Mamoru Takahashi and members of the Setouchi Archaeological Society. I am especially indebted to Messrs. Masakazu Yoshizaki, Tadahiko Makabe and Mamoru Takahashi for drawing the illustrations used in this report. I would like to express my gratitudes at this occasion.

1. The Site

In the Inland Sea adjacent to Tamano City, Okayama Prefecture, there are many islands belonging to Kagawa Prefecture. The Ijima of this report is one of them. At the northern tip, on the side nearer Okayama Prefecture, there is a certain number of houses; but the greater part of the island to the south is entirely uninhabited, though people are occasionally seen in the area around the site. The island is long from north to south and the mountain mass lying in the center at many places forms steep cliffs and disappears into the ocean. Only a portion of the western slope and the southern tip form small tongue-shaped terraces. Vegetation is scanty on the island, and granite, which forms the bedrock, is exposed everywhere, creating scenery characteristic of the Inland Sea islands (Fig. 1).

The top part of these tongue-shaped terraces is covered with secondary depositions of decomposed granite. Artifact-containing layers are lost through continuous erosion. The ground is completely exposed.

Tall trees are hardly to be seen. Low bushes and grasses grow sparsely, and these portions alone show a somewhat retarded rate of erosion.

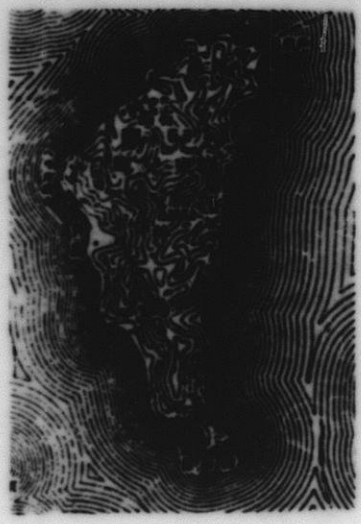


Fig. 1. Map of Ijima (Scale: 1/50,000)



Fig. 2. Distant view of the site

Distribution of flakes is dense on slopes, probably having been exposed through erosion (Fig. 2).

2. Excavations

Excavations were conducted twice. I shall start with the first year's excavation--the summer of 1954.

In January of the same year Mr. Chosuke Serizawa and I made surface collections and set up trenches numbered from I to V [actually, these are sections - see map. Ed] at the base of the tongue-shaped area on the southern tip of Ijima, where we had collected the Ijima II assemblage to be described below. On a line with these trenches and about 15 meters distant from Trench V we set up Trench VI (Fig. 3).

In all of the trenches it was about 70 to 80cm from the surface to the bedrock, which is not solid rock but decomposed granite. Immediately above this bedrock is a hard brownish layer about 20cm in thickness; the boundary between this and the overlying 50cm of humus is not distinct. The humus is less brown nearer the surface and is correspondingly softer. It is difficult to subdivide the humus with the naked eye. Near the south wall of Trench IV and the north wall of Trench V a dark brown depression was seen, toward the top of which were found badly weathered small potsherds. They totally lacked decoration but gave the impression of being the undecorated pottery which is associated with rouletted pottery (Fig. 4).

Flakes and implements were relatively numerous in the top soil and very scarce in the second layer right above the bedrock; nothing was found in the lower layer, which was assumed to represent the bedrock. In addition

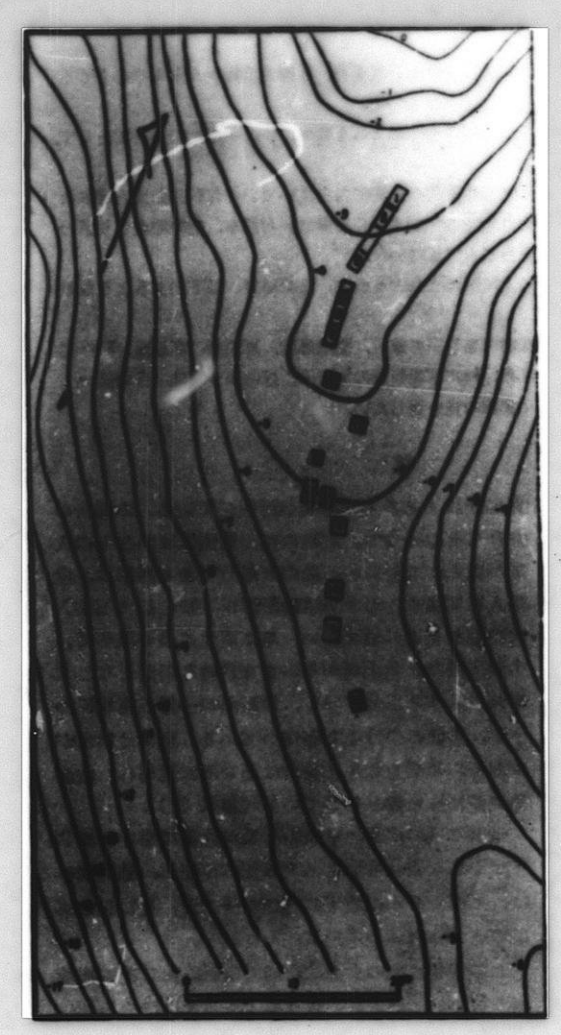


Fig. 3. Map of the excavated area

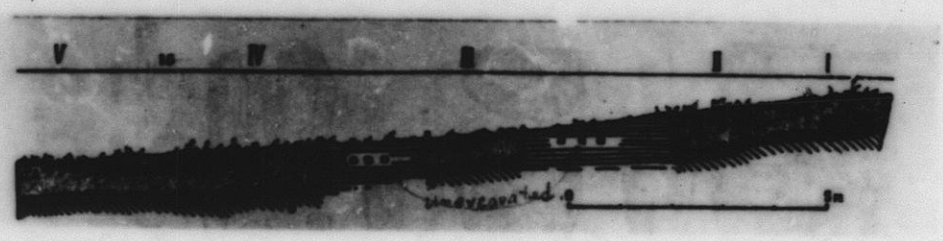


Fig. 4. Cross section of Trenches I-V. A: Decomposed layer of granite I
B: Dark brown layer C: Decomposed layer of granite II
D: Granite bed rock

to the implements belonging to assemblages I and II, arrowheads were also found in the top soil.

In Trench I the top soil was arbitrarily divided into levels A, B, and C and excavated. Other than three small blades in level B, nothing resembling an artifact was found in these or lower strata (Fig. 5, nos. 9, 11 and 15).

The top soil of Trench II was also divided into levels A, B and C. Level A produced a side-flaked knife (Fig. 5, no. 20), level B an arrowhead (Fig. 5, no. 18) and level C an arrowhead (Fig. 5, no. 17). From the underlying second layer, adjacent to the bedrock, we obtained a large side-flaked knife (Fig. 5, no. 24).

The top soil of Trench III was divided into levels A, B, C, and D and excavated without discovering any implement. One side-flaked knife (Fig. 5, no. 22) was unearthed from the underlying second layer.

The top soil of Trench IV was divided into two levels: A, a dark brown layer producing potsherds, and B, the layer underneath. No artifacts other than potsherds were found in level A. In level B were found 3 small blades (Fig. 5, nos. 12, 13 and 19), 1 arrowhead (Fig. 5, no. 16) and 1 side-flaked knife (Fig. 5, no. 19) [Fig. 5, no. 19 is not a small blade but a side-flaked knife - Eds]. A side-flaked knife (Fig. 5, no. 21) was found in the underlying second layer.

The top soil of Trench V was divided into levels A and B (representing the dark brown sherd-producing layer) and C and D below this. From A and B only potsherds were obtained, and from D two small blades (Fig. 5, nos. 7 and 10). One side-flaked knife was the only implement in the underlying second layer (Fig. 5, no. 23).



Fig. 5. Specimens excavated in the summer of 1954

Trench IV is situated lower and considerably apart from the above-mentioned trenches. We found two side-flaked knives (Fig. 6, nos. 2 and 3) in the top soil and three side-flaked knives in the second layer (Fig. 6, nos. 10, 14 and 15), of which the first two came from near the borderline with the top soil.

Flakes discovered throughout all trenches were mostly very small. From Trench I through Trench V small blades were numerous in the top soil and side-flaked knives occurred in the second layer. The flakes used for the small blades were of a sanukite which contains relatively large amounts of garnet, whereas the side-flaked knives were of ordinary sanukite, the distinction being easily made with the naked eye.

Microcores, such as the one found in surface collecting at the beginning of 1954, were unfortunately not found at all during the present investigation.

The second excavation was conducted from July 28 to 31 of the following year, 1955. We set up a Trench 15 between Trenches IV and V (in which sherds had been discovered in the previous year), and a little apart from it on the ridge of the plateau we set up Trenches 8, 9, 10, 11, 12, 13, 14 and 16 at arbitrary positions (Fig. 3).

Generally speaking, throughout all the trenches in this season's excavation we called the upper (soft) part of the top soil Layer A and the lower (somewhat harder) part Layer B, while the underlying stratum corresponding to the second layer [of the year before] became Layer C. The artifacts discovered belong almost entirely to the top soil, the second layer producing only a very small quantity.

Starting with Trench 15: Layer A corresponds to the zone in which sherds had been discovered in the previous year. This year, too, minute sherds were collected. One small blade (Fig. 5, no. 8) was found in Layer B. No implements were found in Layer C.

Trench 8 has produced one large side-flaked knife (Fig. 6, no. 1) from Layer A and a small side-flaked knife (Fig. 6, no. 5) from Layer B.

No implements at all were found in Layers A and C of Trench 9, but from Layer B we obtained one arrowhead (Fig. 6, no. 4) and four small side-flaked knives (Fig. 6, nos. 6, 7, 9 and 12).

One small side-flaked knife (Fig. 6, no. 11) came from Layer B of Trench 10.

Trench 11 produced, again from Layer B, one small side-flaked knife (Fig. 6, no. 13) and one large side-flaked knife (Fig. 6, no. 8).

Nothing resembling an artifact was unearthed from Trenches 12 and 13.

Trench 14 produced no artifact from the top soil--Layers A and B--and only one side-flaked knife from Layer C (Fig. 6, no. 16).

Thus throughout the second year's excavation, scarcely any artifacts were found in the relatively hard second layer, being mostly from the top soil.

The fact that the small blades seen in the first year were not found at all during the second agrees with our observation during surface collecting when we were not able to find any microcore or small blade outside the areas covered by the first year's excavations.

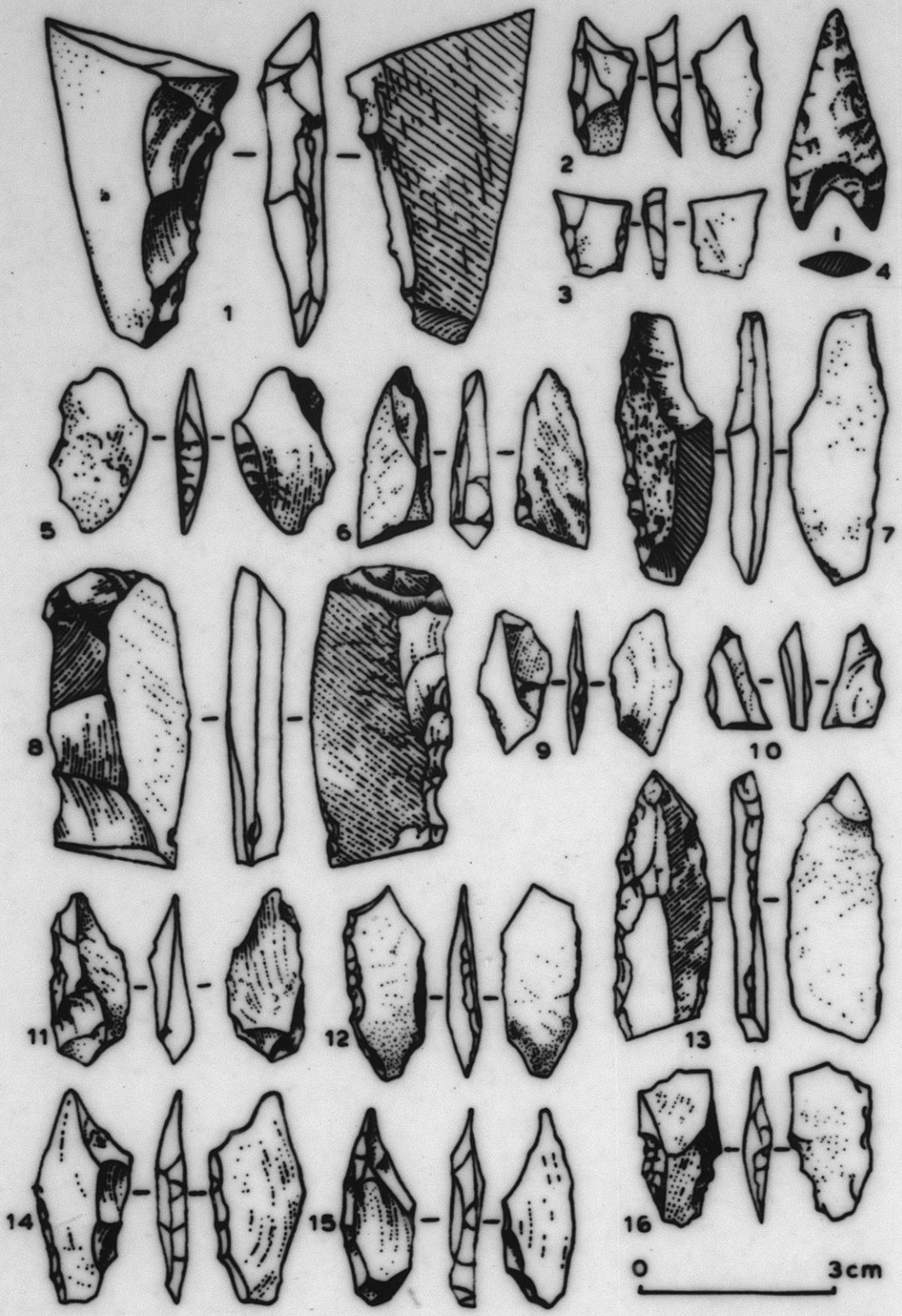


Fig. 6. Specimens excavated in the summer of 1955

3. Artifacts

Artifacts consist mostly of stone implements. Other than these there are only a small number of potsherds. Artifacts excavated on the two occasions may be tabulated as follows.

Table 1. Artifacts from Trenches I-V

	Top Soil	Layer II
Potsherds	(small pieces) a few	
Arrowhead	3	
Small core		
Small blade	9	
Small side-flaked knife	2	3
Large side-flaked knife		1

Table 2. Artifacts from Trenches VI, 8-14

	Top Soil		Layer II
	Upper Level	Lower Level	
Potsherds			
Arrowhead		1	
Small core			
Small blade			
Small side-flaked knife	2	9	2
Large side-flaked knife	1	1	

Artifacts excavated in the first year chiefly consist of small blades coming from the top soil, with a mixture of potsherds, arrowheads and small side-flaked knives. Because the top soil itself was in a condition which forces us to think that it had been continuously disturbed by human or natural forces, such a mixture of artifacts as this might be considered natural. The fact that small side-flaked knives, though small in number,

had been preserved in the second layer in a relatively pure state may be considered to be the result of the fact that the second layer had been little disturbed. If so, there arises the possibility that the group of small side-flaked knives should be considered separate from the group of small blades.

In the second year, perhaps because different locations were excavated, hardly any small blades were discovered, perhaps further substantiating the above-stated hypothesis. To be sure, implements uncovered from the second layer were very few, most of the artifacts belonging to the top soil. The position of the artifacts thus cannot be said to be in its original state.

In the following the characteristic features of the artifacts discovered will be briefly described.

The three microcores collected on the surface are all sanukite of garnet content, among which the core, Fig. 5, no. 1 has its platform consisting of scale-like flake scars. Long and slender flake scars run parallel in one direction from this platform. These flake scars are restricted to one side only. Besides these flake scars, there are scale-like flake scars lined up at the opposite end from the flat surface. Microcores having these characteristics are often seen at sites of similar type. The platform of the microcore, no. 2, also consist of scale-like scars. But the long and slender flake scars extend all around except for one side, forming a semi-conical core. No. 3 is somewhat different in form but has both the slender flake scars and scale-like flakes, reminiscent of no. 1. Three of the small blades collected on the surface are illustrated; of

these, nos. 4 and 5 have relatively distinct bulbs but lack their tips. No. 6, on the other hand, lacks the platform. The material for all these three specimens is sanukite with a high garnet content.

The small blades uncovered from the top soil are nos. 7-15, of Fig. 5, most of which do not show the bulb very clearly. But the presence of the platform can be inferred on the whole. Several flake scars running in the same direction on the opposite side from the bulb are arranged side by side making ridges. Nos. 16, 17 and 18 are arrowheads, each having a different form. These are rare among the excavated material, but a considerable number of them were found by surface collection. In principle, I do not think that they are associated with microcores and small blades. I should like to take this up in the section on the surface collection. Nos. 19 and 20 are small side-flaked knives. Regularized trimming is applied from the side of the main flake surface to the platform of an irregularly rectangular side-blow flake obtained from a nodule. A little bit of trimming is applied to the opposite edge, leaving one edge unretouched. Those of the Ijima site mostly have the form of the kiridashi knife, but there are sites which in the main produce semi-lunar shaped implements with retouch along only one edge. These perhaps had best be considered separately.

Implements unearthed from the second layer are confined to the above-mentioned side-flaked tools, such as nos. 21-23. The large semi-lunate tool (no. 24) which was found stuck to the bedrock in Trench II should be considered separately. All three instances above show the trimming quite clearly on the platform. The rock material is the commonly available sanukite for all of them. The large semi-lunar implement (no. 24) is badly weathered compared with the tools above, and the ridge at the flake scar is quite dull.

Of the tools discussed above, I would like to treat the small side-flaked tools which were uncovered from the second layer in a relatively undisturbed state as Ijima I tools, and the group of microcores and small blades which constitute the main body of the finds from the top soil and the surface as Ijima II.

The great majority of the collection from the second excavation, both from the top soil and the second layer, are implements of Ijima II.

That is, Fig. 6, nos. 1 and 8 are large side-flaked knives. No. 4 is an arrowhead. Nos. 6, 7 and 13 are tentatively included in Ijima I. But they should be treated as belonging to the unifacially-worked implements which constitute the bulk of the finds from the Miyatayama site, Okayama Prefecture. Nos. 2, 3, 5, 9, 10, 11, 12, 14, 15 and 16 may be called small side-flaked knives of Ijima I type.

The large side-flaked knife and the Miyatayama type knife are in principle unifacially worked along one edge.

The arrowhead, no. 4, has a form which was frequently seen in the surface collection as well. Its characteristic features are the in-curving barbs, standardized retouch and pointed tip.

Implements belonging to Ijima I will not be described individually, but discussed together. On the whole, an irregularly rectangular, side-blow flake is utilized. The platform is trimmed from one side until the bulb is hardly recognizable. The opposite side of the platform is trimmed from the same direction to a considerable extent, although not as much as the platform side. When considerable retouch is applied, three sides of the rectangle may show traces of this; but the sharpest edge, created at the time when the flake was removed, is left as it is without being retouched.

4. Surface Collection

Tools representative of the Ijima site are the group I of the small side-flaked tools and the group II mainly consisting of microcores and small blades. But an examination of the surface-collected material reveals, besides, a considerable number of arrowheads and a few points. Surface specimens belonging to group I display a great variety of forms.

On the basis of the findings from other sites, it is hardly possible to think that points are associated either with group I or group II, leaving a strong possibility of the existence at some other location of an artifactual level mainly consisting of points.

Among the points and point-like artifacts shown in Fig. 7, no. 1 is a bifacial point, a slender and thick implement. There is a central ridge with many curves, due to the retouches applied to both edges. This portion is the thickest. No. 2, in contrast, is a relatively thin bifacial point. Greatly worn, its flake scar is not clear. No. 3 is a unifacial point which leaves one side as it was flaked off and has parallel retouches on the front side. It cannot be considered a lance. It is weathered and very much worn.

Implements shown in the upper two rows in Fig. 8 are of Ijima I. Including those shown here there are 33 specimens in the surface collection. Those in the third row of Fig. 8 are somewhat larger and, on the whole, retouched along one edge. Strictly speaking, they cannot be classed in Ijima I. They are the principal finds of Ijima Plateau II and of a site in Tamano City, Okayama Prefecture. Including those shown, a total of 15 has been collected.

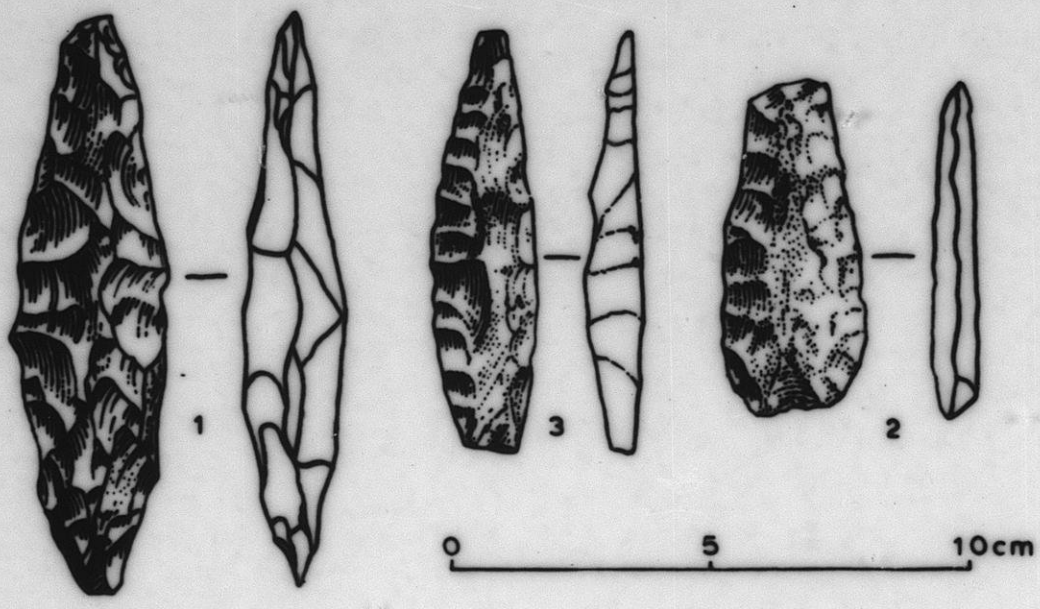


Fig. 7. Points collected on the surface

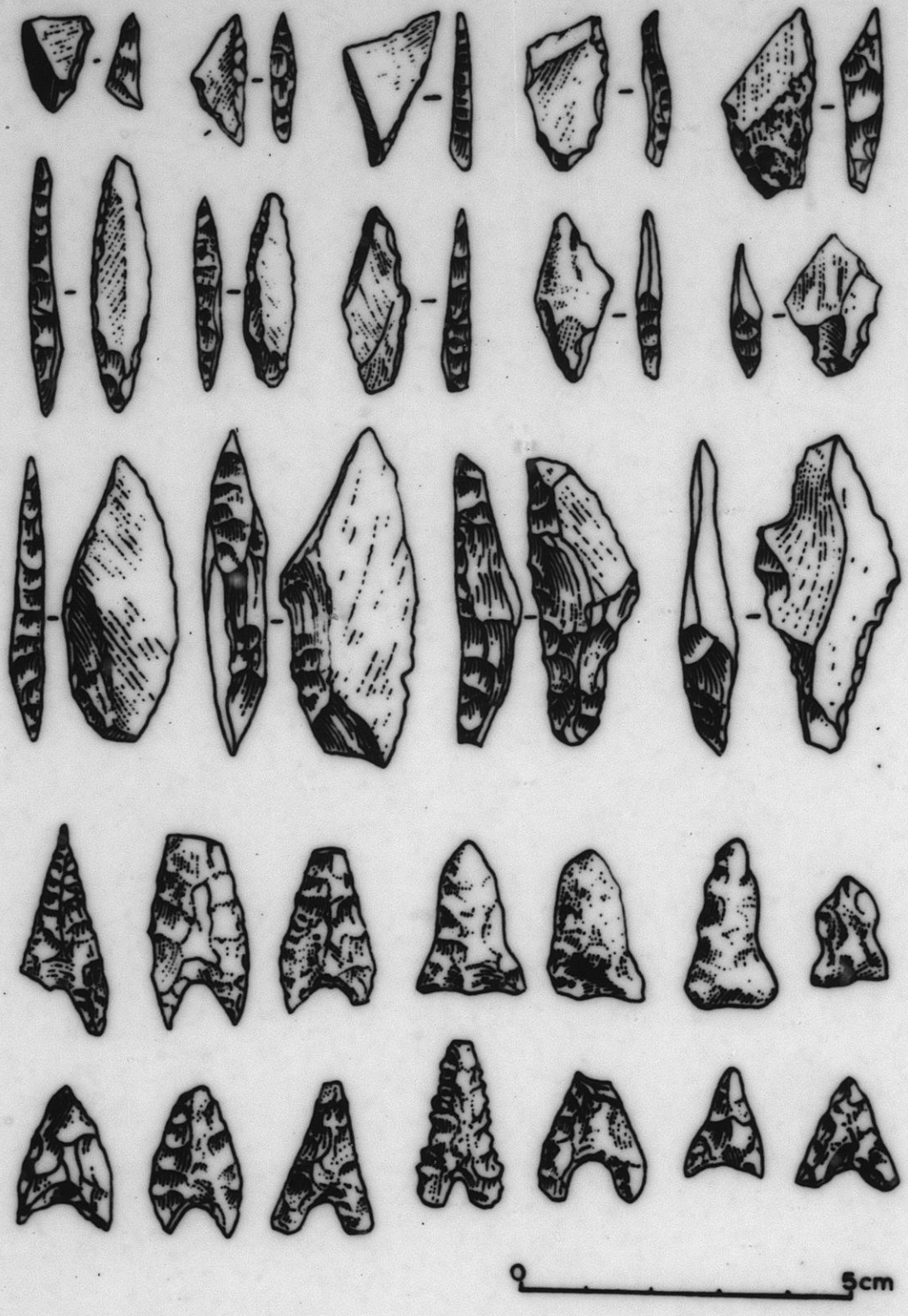


Fig. 8. Small side-flaked knives and arrowheads from the surface

Whether these two groups existed at different times or were contemporaneous must await future investigation. The fact that the former are rare and the latter numerous at the Washiuzan site[1], Okayama Prefecture, and that there exist single-component sites almost entirely consisting of the latter, such as the Miyatayama site, Okayama Prefecture, and Kurakake Plateau II of Ijima, suggests the possibility of treating the two as temporally different groups.

The presence of the arrowheads shown in the fourth and the fifth rows of Fig. 8 raises many problems. Looking at the form of the arrowheads first, the left three in the fourth row have relatively long barbs which are in-curving with fairly sharp tips. Very small retouch is applied on the surface of the specimens in a regular fashion. The raw material seems to be chert in the majority of cases. It is a form hardly found in Jomon or Yayoi sites of the Inland Sea region. Specimens collected on the surface total 6.

The four specimens to the right in the fourth row have a peculiar shape: the middle portion is narrow and the barbs suddenly flare out. The total number of arrowheads of this type is 12. Compared with other arrowheads, weathering is very extreme, retouch being hardly observable on some of them. Like the previous type, this one is hardly seen in Jomon or Yayoi sites of the Inland Sea.

The three specimens on the left in the fifth row are short arrowheads with in-curving barbs. The curvature of the outline is great. Five specimens were discovered. The arrowheads among the surface material at the Washiuzan site are mainly of this type. Again it is hardly seen in Jomon or Yayoi sites of the Inland Sea.

The center two specimens in the fifth row are not especially different, but they are shown because each is a unique type. The two specimens to the right in the fifth row are peculiar in having pointed barbs. There are a few examples similar to these at other sites in the Inland Sea. Specimens collected total 5.

In addition to those described above, there are four other specimens, including a hoe-shaped arrowhead associated with the roulette design pottery, and objects the original form of which it is difficult to discern because they are fragmentary.

To what period these arrowheads belong is an extremely difficult problem to solve. But at least it seems appropriate to assume that they are not associated with Ijima I or II on the basis of the fact that they are almost never found in what seems to be a relatively uncontaminated layer of the Ijima I group and that they were hardly seen at locations where microcores and small blades were unearthed at the Washiuzan site. The microcores and small blades at the Yadegawa site[2], Nagano Prefecture, which Mr. Chosuke Serizawa excavated, also do not seem to be associated with arrowheads. This can be a basis to deny the association of Ijima II group /with arrowheads/.

Now, if the above reasoning is correct, what sort of culture produced these arrowheads?

Inasmuch as they have forms which scarcely occur among the known Jomon and Yayoi arrowheads of the Inland Sea region, it is difficult to relate them to the Jomon or Yayoi culture.

The forms of arrowheads associated with the roulette design pottery, which is considered to be the oldest pottery in western Japan, are already

known (e.g. the hoe-shaped form). It is possible to relate a small portion of the Ijima arrowheads to these; but it is difficult in the case of most of them.

Especially problematic in this connection are the small sherds found in the depression of the top soil in Trenches IV, V and 15. I considered that these might be the undecorated pottery associated with the roulette design pottery; but they might instead be pottery associated with these arrowheads. If this is true, then this pottery which is associated with arrowheads strikingly different from those found with the roulette design pottery might be a special ware hitherto unknown.

Or on the other hand, the arrowheads associated with this pottery might be merely a part of the above-mentioned hoe-shaped arrowhead group, and there seems to be a possibility of placing most of them outside Ijima I and II groups as products of a third preceramic complex. However, in view of the world-wide phenomenon that the origin of the arrowhead and the origin of pottery are very closely related, there remain many problems which need be examined in the future.

5. Discussion

I have outlined the major findings of the excavation at the Ijima site. At last, as a conclusion let me point out a few problems.

First is the chronological position of the Ijima industries. Results of the excavations at the Washiuzan site necessitate the placement of Ijima I and II at least above the point horizon, that is, in a period more recent than the point. This placement leaves some problems when one considers the implements of group I. That is, the characteristics of group I

are that the implements, including the somewhat larger variety of the Miyatayama type, are knife-like or have the form of the kiridashi knife and also that they are side-blow flakes. What immediately comes to one's mind is the group known as Iwajuku II, excavated at the famous Iwajuku site.[3] It is characteristic of this group that it consists principally of kiridashi knives made on side-blow flakes. This characteristic seems directly to coincide with that of the Ijima I group. In other words, if the implements of Ijima I and of Iwajuku II are products of one and the same culture, then there must be a mistake somewhere in the chronological placement. If these two were to be compared and analyzed in detail, one might arrive at the conclusion that although there are morphological similarities, fundamentally they are different. This, however, is a problem for the future. For the time being, leaving this unresolved, I would like to carry on research by tentatively treating them as being separate. As a result of the excavation of the Ijima site, there arose the possibility of separating groups I and II. And through the first year's investigation, we were able to infer that group I antedates group II. We were not yet able, however, to obtain definite conclusions as to whether implements purely of group I and those of the Miyatayama type are products of different cultures and if they are products of different cultures, then what the temporal relationship is between the two. However, the fact that the Miyatayama type is seen at other sites in a relatively unmixed state and that morphological features make it easier to regard the Miyatayama type as older seem to permit the hypothesis that the two be separated and the Miyatayama type be treated as being older than the pure Ijima I. Whether or not the arrowheads are associated with pottery, we may be fairly certain,

as it was said in a preceding section, that they would be placed after these industries.

The above considerations regarding the Ijima site can be shown as follows:

Table 3

(1) Point (Washiuzan II)
(2) Miyatayama type (Miyatayama industry)
(3) Ijima I industry
(4) Ijima II industry
(5) Industry mainly of arrowheads?
(6) Roulette design pottery

Among the industries listed above (Table 3), distribution of (2), (3), (4) and (5) is quite wide in areas around the Inland Sea. Among the principal sites of these, (2) is known at Tatebajima, Okayama Prefecture, Ijima Plateau II and the Washiuzan site, besides Miyatayama. Washiuzan is particularly well known for (3), (4) and (5).

Distribution of group II in areas outside the Inland Sea is not clear. If the implements of the above-mentioned Iwajuku II are to be treated as being separate, some of the material from Nagano Prefecture investigated by Mr. Chosuke Serizawa is problematic. He reports two instances of tools resembling the trapeze which were found with points in the top soil of Trench II at Babadaira.[4] These may be considered very similar to the implements of Ijima I.

Distribution of implements similar to those of group II is known, aside from the Yadegawa site in Nagano Prefecture, from Hokkaido[5] and Shima Peninsula[6].

Comparative analysis is necessary with microliths of Mongolia, which have been known for a long time, and with similar finds from northern areas, such as the microliths of the Aleutians and Alaska, which are discussed in recent issues of American Antiquity.

I have briefly discussed above the chronology and distribution of the Ijima industries. A majority of Inland Sea preceramic sites contain industries of small tools such as these. Investigation having just taken its first step, it is difficult to demonstrate anything conclusive. I would like to direct our future research in the direction mentioned above.

Notes

(1) Kamaki, Yoshimasa, Okayama-ken Washiuzan iseki chosa ryakuho (Preliminary report of the excavations at the Washiuzan site, Okayama Prefecture), Sekki Jidai, no. 3.

(2) Serizawa, Chosuke, Shinano Yadegawa iseki no chosa (Investigation of the Yadegawa site, Shinano Province), Nihon Kokogaku Kyokai Iho, Supplement no. 3.

(3) Sugihara, Sosuke, Gumma-ken Iwajuku hakken no sekki bunka (Lithic culture discovered at Iwajuku, Gumma Prefecture).

(4) Serizawa, Chosuke, Nagano-ken Babadaira iseki ryakuho (Preliminary report of the Babadaira site, Nagano Prefecture), Sekki Jidai, no. 1.

(5) Yoshizaki, Masakazu, Higashi Nihon no blade industry (Blade industry in eastern Japan), Seiko Bunka, no. 14.

(6) Communication from Messrs. Chosuke Serizawa and Kenji Iwano. A preliminary report is to appear in this issue.

ON THE PRECERAMIC CULTURES OF WESTERN JAPAN, WITH SPECIAL EMPHASIS ON THE INLAND SEA AREA

(Nishi Nihon no Mudoki Bunka ni Tsuite, Tokuni Setouchi o Chushin to Shite)

by Yoshimasa KAMAKI

(Watakushitachi no Kokogaku, Vol. 4, No. 3, pp. 15-22. Okayama, 1957)

1. History of the research

The general trend of research on the preceramic cultures of western Japan is directed toward [the study of] Japan's microlithic cultures.

We realize that this is not merely because of the fact that there are many microlithic sites [in this area], but because in the history of the research there occurred something which might be called predestination. It was an incident which can never be forgotten. Had we progressed another step at that time, study of these [preceramic] cultures of western Japan might have taken a different form than at present.

In March, 1947, in order to assist in the excavation conducted by Mr. Motokuni Toyo and others, I was at an Initial Jomon site on the premises of Shinajibetsu Shrine at Asahara, Tsume, Tsunekanemaru Village, Ashishina County, Hiroshima Prefecture. Mr. Motokuni Toyo was then carrying on a difficult investigation in an effort to demonstrate a thesis that microliths are found in complexes associated with the roulette design pottery, which is the oldest [Jomon culture] in western Japan. And the investigation of this site was the starting point [of his research].[1]

Research findings at that time were poor as we think of them now. They could not free themselves from the assumption that microliths were associated with roulette design pottery, and in spite of the fact that the material [which they gathered there] was merely a surface collection, they did not take care to separate out the associated arrowheads. [I fail to see why arrowheads should have been "separated out."--tr.] Because the thesis stood on such a feeble ground, naturally the scholarly world was critical. Added to this was the unfavorable fact that microliths had scarcely been found at other sites of the roulette design pottery, resulting in a temporary termination of the research without the thesis receiving an acceptance from the scholarly world. In this material were, however, some of the specimens which we are now calling "Ijima I" and "Ijima II"[2] and treating as microliths.

In other words, it may be said that the general situation at that time was not yet ripe, and it still required some time before the opportunity for the discovery of microlithic culture could come.

But it must not be forgotten that the stimulation discussed above aroused some fervor among students resident in the Inland Sea and Shikoku regions who were interested in this topic and that it served as a basis for the preceramic research in the Inland Sea region after 1951.

Since the 1949 investigation of the Iwajuku site, preceramic research in the Kanto region made rapid strides. In the Inland Sea region, too, stimulated by this, some efforts began to be exerted in this direction after 1951. Acting upon the fact that pottery had not been found, several sites at which stone flakes alone had been unearthed became objects [of investigation.][3]

It was about this time, too, that we discovered that the stone flakes with traces of retouch, which are found at this sort of site, had standardized forms, that such flakes are not found among flakes from Jomon or Yayoi sites, that projectile points from these sites are different from those associated with Yayoi pottery and that points are rarely found in Jomon sites. The fact that the standardized implements discovered at the Washiuzan site[4] had forms similar to the tools from the Iwajuku II or Moro of the Kanto was also instrumental in activating preceramic research in the Inland Sea region.

As chronological studies of the industries of western Japan progressed, it became clear that tools found at Washiuzan resembling those of Iwajuku II are very different in their chronological position from those of Iwajuku II. Nonetheless, in getting the Inland Sea preceramic research under way, the similarity between the two may be considered to have been a valuable factor.

It was also about this time that microcores unearthed at Washiuzan became an issue, and in western Japan the study of microcores, which had once ceased, was taken up again as a topic in [the study of] preceramic culture.

From 1952 to 1954 all efforts were directed toward discovery of sites and typological separation of industries. Re-examination of hand axe-like tools from the Kiyama (Shiroyama) site, Kagawa Prefecture, and a similar specimen from the Ko site, Osaka Prefecture (the latter having been an issue since long ago), showed how deep-rooted the preceramic culture of western Japan was. Blade-like tools of the above-mentioned Yamashiro site, spearheads of Washiuzan II, blades of lunate shape of the Miyata site, the trapeze-shaped tools of Ijima II, and a questionable group of tools

consisting chiefly of arrowheads, were all taken up as definitive criteria of basic industries.

From August, 1954, to 1955 excavations were conducted once at Washiuzan and twice at Ijima, and efforts were made to study the chronology, that is, the temporal relationship between the above-mentioned industries. As a result, a tentative chronology was established.

Continuing from 1955 on until today we have studied the distribution of sites principally in the Inland Sea and discovered several dozen sites in Hiroshima, Ehime, Kagawa and Okayama Prefectures.[5]

In addition to these, a few sites have been known in Yamaguchi Prefecture through the investigations of Mr. Tadamitsu [?] Ono.[6] In Kyushu a spearhead site has been noted by Mr. Takeshi Kagamiyama and Mr. Tadanori Kawaguchi. In the Kinki (Kyoto-Osaka region), too, sites have been found along the Hidaka River in Shima Peninsula.[7]

Thus far the history of preceramic studies in western Japan, compared with researches in the Kanto and other areas, has shown a vital defect in omitting basic geological considerations. Future progress, I think, will depend greatly on whether or not sufficient efforts are made to remedy this defect in our future research.

2. Summary of accomplishments.

The basis for considering the tools to be discussed below as being preceramic (pre-Jomon) is as follows:

(1) They were found at sites which have long been called workshop sites in western Japan, where pottery has not been discovered.

(2) These types are hardly ever found in Jomon or Yayoi sites of western Japan. (In the case of arrowheads, they have a certain form which is not shared with arrowheads of the Yayoi or Jomon culture.)

(3) The Ijima I group, to be discussed below, was found beneath the shell layer at the Dabukasu site, Toyoshima, Kagawa Prefecture; that is, below the level in which the roulette design pottery was found.

(4) They are morphologically similar to the preceramic tools of the Kanto and Shinshu (Nagano Prefecture), and in spite of the stratigraphy which was found, through excavation, to be unique to western Japan, the chronological outline almost perfectly matches [that of the Kanto].

We are conducting our research mainly on such bases as these at present. If geological analysis of the soil formed by the erosion of granite can sufficiently fulfill our desires, then, I believe, better results can be obtained. As was stated in the section of the history of researches, I have distinguished seven industries. I consider the relationship among them to be as follows:

Principal Tool Types	Names of Industries
(1) Hand-axe	Kiyama (Shiroyama)
(2) Large long flake	Washiuzan I
(3) Point	Washiuzan II
(4) Small lunate blade	Miyatayama
(5) Small "laterally flaked" tool	Ijima I
(6) Microcore and small blade	Ijima II
(7) Arrowhead?	Ijima III?

In the excavation of the Washiuzan site, we found (2) from the lowest level, (3) from the middle level and (3), (4), (5), (6) and (7) from the top level. Through this investigation we grasped the general idea that (2) was old, followed by (3) and that (4), (5), (6) and (7) were more recent. Next, through the excavation of the Ijima site we arrived at a hypothesis that (5) was older than (6) and (7) on the basis of the fact that (5) was found below (6) and (7). If we put together the results of the excavations at the Washiuzan and the Ijima sites, we can think of the order, from the oldest: (2)-(3)-(5)-(6). If it is most appropriate to treat (7) as following (6) on the basis of its character, then we can think of the order: (2)-(3)-(5)-(6)-(7). Although the separation between (4) and (5) has not been satisfactorily made, emphasizing the fact that (4) has been found almost by itself at such sites as Miyatayama and Loc. 2, Ijima, and stressing the morphological crudeness of (4), I have considered (4) to be older than (5). In considering (1)--hand axe-like tools--as being older than (2), I merely follow world-wide common sense; there is no strong stratigraphic basis known, at least in western Japan.

Chiefly on such a basis as this, I have listed them from oldest to youngest in the order (1)-(2)-(3)-(4)-(5)-(6)-(7). The most problematic, when compared with the Kanto and Chubu chronologies, is the similarity between the Iwajuku II implements and the Ijima I tools. As long as in the Kanto points are found overlying kiridashi knives (Iwajuku II), it is impossible to date the kiridashi knife as being more recent than the point. Similarly, results of the excavation at Washiuzan make it impossible to place Ijima I tools prior to points. If this is so, then there is no

appropriate solution at present unless Iwajuku II and Ijima I are treated as being only accidentally similar. Mr. Serizawa discusses the relation of the Yadegawa site with Ijima I in terms of the trapeze-shaped tools of Yadegawa.[8] Perhaps such an interpretation might be appropriate.

In the order given above, each group will now be briefly discussed.

(1) Hand-axe. The one illustrated in Fig. 1a was found at the Kiyama (Shiroyama) site, Kagawa Prefecture. It is made by applying a great deal of retouch to both sides of a flake taken from a rather large nodule. The platform is still intact. It is the most regular and beautiful among the hand-axe-like tools excavated at the Shiroyama site.

The one unearthed at the Ko site, Kawachi Province, has been discussed a great deal by many people for quite a while; I should like to expect careful, future investigations [to yield some results].

(2) Large and long flakes. Those in the upper part of Fig. 2 were found at Washiuzan. The ones obtained from this site on the whole have the platform intact, secondary retouch being applied almost always from the flaked surfaces. Other than those illustrated here, there were implements which might be thought to be end scrapers and gravers.

Those found at the Kiyama (Shiroyama) site mostly have the platforms prepared. Two specimens which are clearly blade cores were also surface-collected.

(3) Points. Those in the lower part of Fig. 2 were found at the Washiuzan site. They are all excavated specimens. As illustrated, there are broad ones, slender ones and some with special forms. Whether there is any temporal relationship among them is unknown. Most of them are bifacial. What sort of flakes was retouched to make them is equally unknown.



Fig. 1: Map showing the distribution of sites in Okayama and Kagawa Prefectures (+: Location of site)



Fig. 1a: Stone tool from Kiyama (Shiroyama), Kagawa Prefecture

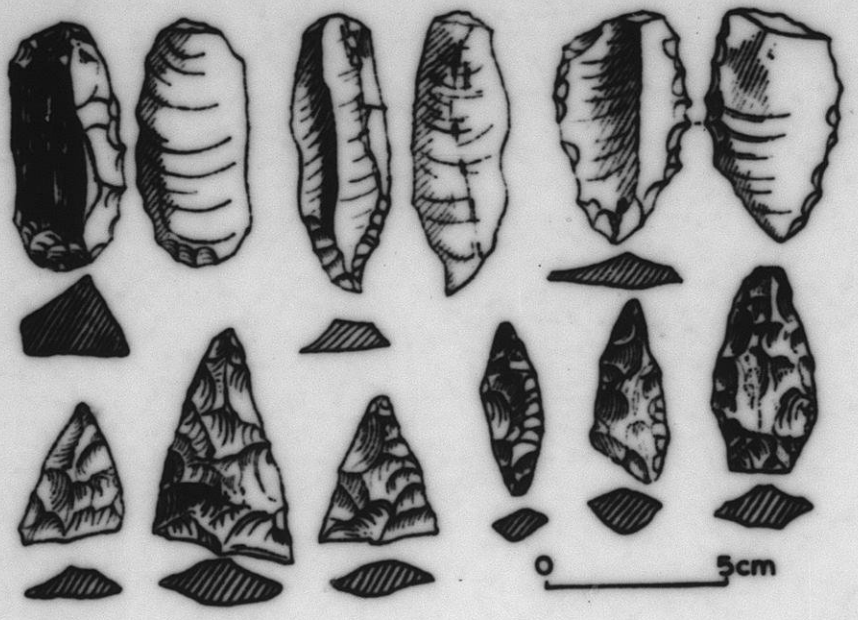


Fig. 2: Artifacts from the Washiuzan site

Upper: Long (longitudinal?) flakes
Lower: Points

(4) Small lunate [half-moon shaped] blades. These are shown in the upper part of Figure 3. They are surface-collected specimens from the Ijima site. They are made on small side-flaked pieces. [By "side-flaking," the author seems to mean a technique whereby a piece is struck off at a point along one edge roughly midway between the two ends.] Both the platform and the bulb of percussion are almost gone as a result of secondary retouch.

What the core for these implements might be is as yet unknown. In most cases they are retouched only along one edge; but at times there are some which are retouched also along the opposite edge, like the kiridashi knife. Other than Miyatayama and the plateau of Locality 2 at Ijima, they have been discovered in considerable numbers at Washiuzan.

(5) Side-flaked small blades. (Ijima I). As shown in the lower part of Fig. 3, they are quite small, laterally flaked blades. As in the preceding type, the platform and the bulb of percussion are almost gone. Having a very geometric form, they remind us of trapezes. Basically they have the form of the kiridashi knife. They are also known from the Washiuzan site.

(6) Microcores and small blades. (Ijima II) (Fig. 4). Whereas the great majority of the above-mentioned implements were made of a very common type of sanukite, the material for this group of tools is sanukite with a high garnet content, the flake surface having a characteristic which reminds one of obsidian flake surfaces. As shown in the illustration, cores display slender flake surfaces, caused by flaking of pieces in the same direction. They do not extent all around the core on any of them, but leave the natural surface somewhere.

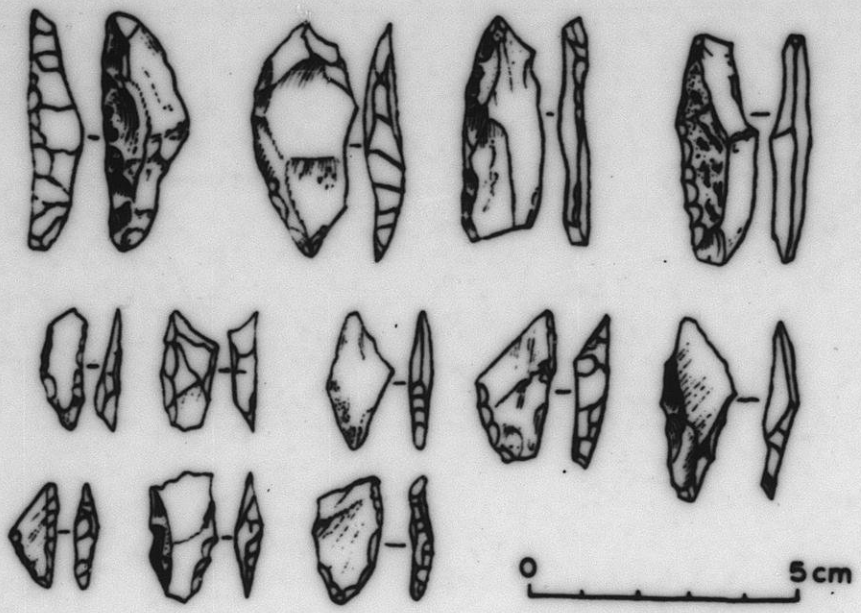


Fig. 3: Artifacts from the Ijima site

Upper: The Miyatayama type
Middle and Lower: Ijima I

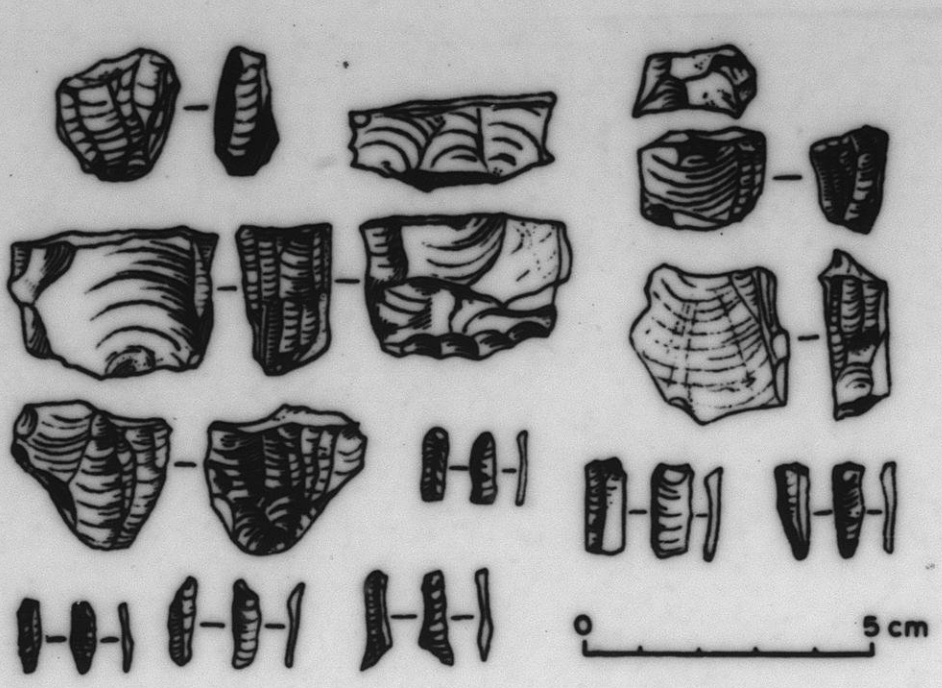


Fig. 4: Artifacts from the Washiuzan site: cores and blades of Ijima II industry



Fig. 5: Arrowheads from the Ijima site (Ijima III industry)

(7) Arrowheads. (Ijima III). These are shown in Fig. 5. A very peculiar group of arrowheads such as these is clearly different from the arrowheads commonly associated with the roulette design pottery of western Japan. They have long inverted barbs and a sharp point. The retouch is very regular and beautiful. The material seems to be chert in most cases. Those with narrow midportion and protruding shoulders are extremely weathered and are peculiar in these respects.

It is possible that the types of industries described above may be subdivided in the future; but on the whole, they will probably serve as the basis for future investigation and research.

3. Distribution of sites.

The extent of our investigation has not gone much beyond the prefectures of Hiroshima, Ehime, Kagawa and Okayama. At the 1956 distributional survey, I was surprised how few sites there were in Ehime and Hiroshima Prefectures.

Fig. 1 is a rough map showing the distribution of only the most important sites in Okayama and Kagawa Prefectures. Other than those shown in this distribution map, sites in western Japan are found only in Shima Peninsula, along the Hidaka River, near Ko, at the Tsunekanemaru site in Hiroshima prefecture, at the Yumisorishima site in Ehime Prefecture, at projectile point sites in Kyushu and at sites in Yamaguchi Prefecture which Mr. Ono has investigated.

Reviewing these sites, [we note that] most of them are restricted to the islands in the Inland Sea or areas directly adjacent to the Inland Sea.

Moreover, the sites shown in Fig. 1 are almost all located on plateaus which extend out into the sea like a tongue. The tongue-shaped topography, which is common to several tens of sites in Okayama and Kagawa Prefectures, provided a favorite place of occupation for the preceramic inhabitants. Moreover, most of these sites are those of industries (4), (5), (6) or (7), discussed above; while sites of industries (1) or (2) are limited to the Kiyama (Shiroyama) site, Kagawa Prefecture and the Washiuzan site, Okayama Prefecture. Sites belonging to (3) are somewhat numerous, but are far less than those of (4), (5), (6) or (7). Preceramic archaeology in the Inland Sea region has been centered around the study of microliths, such as those of (4), (5) and (6). I have said that the reason for this was the abundance [of microlithic sites]. No one looking at this distributional situation would deny this.

4. Environment at that time.

I do not have enough data to discuss the environmental changes through all periods of a preceramic culture extending over several tens of thousands of years. But some inferences are possible.

On islands in the Inland Sea there are many sites producing roulette design pottery. The Kijima shellmound, the Kuroshima shellmound, the Namiharisaki shellmound, the Ijima shellmound and the Toyoshima shellmound are some of these. Except for the Kijima shellmound, all these shellmounds consist largely of yamatoshijimi [Corbicula japonica]. From this fact we can infer the salt content of the sea in this area in those days. The sea in which yamatoshijimi lives is not one which has high salt content. In the lower level of the Kijima shellmound, too, there is a layer of yamatoshijimi, but as one goes nearer to the top, the layer changes to one of

haigai [Anadara granosa]. From this we can infer a situation in which the salt content increased from the lower level to the upper level. If we go backward in time, we can conjecture that the salt content of the sea was even less before the lower level of the Kijima shellmound or other above-mentioned shellmounds was formed. Even the most recent preceramic culture must clearly be older than the shellmounds mentioned above. Would it not be possible to imagine that the preceramic culture existed, prior to the Jomon culture, in some such natural environment as a body of water with very low salt content, fresh water, or a marshy area?

The age of the Jomon culture has been asserted to be 8,000 years. At least, recent scientific work tends to confirm this. Proceeding on such an assumption, if the phenomena of invasion [of the land] by the ocean during the post-glacial period in Europe is applied to the Japanese archpelago, then the hypothesis that the Inland Sea might have been a marshy area or a fresh water lake during the preceramic period would not be so unreasonable.

From the bottom of the Inland Sea, fossils of the nauman elephant [Paleoloxodon naumanni] or of the bison are very often collected. There are many problems remaining concerning the age of the most ancient preceramic culture of the Inland Sea. Once there was in the Inland Sea a climate of the sort suggested by the presence of the nauman elephant or of the bison, and also there was then the dry land which permitted their existence. The relationship between these facts and the age of preceramic cultures will be important problems of future research.

5. Roulette design pottery and the preceramic culture.

How the preceramic cultures discussed above were transformed into the succeeding Jomon culture is a problem which will be long argued in the future.

According to recent studies of the Jomon culture, just about the time when the twined cord design pottery terminated, at least in the Kanto, the roulette design pottery is supposed to have made its appearance for the first time. Also, according to researches on the roulette design pottery, the predominant thinking is that even the oldest roulette design pottery in western Japan could not have preceded the oldest roulette design pottery of the northern Kanto. If this is so, then, when the roulette design pottery existed in the Kanto, what sort of culture was prevalent in its vicinity or in western Japan? /A different and/ special culture could have existed in its vicinity and in western Japan, although it, of course, did not exist in the southern Kanto, since the culture associated with the roulette design pottery was so predominant in the southern Kanto. (It is not insisted that the vicinities of the southern Kanto and western Japan must have had the same culture.) Of course, it might have been one which strongly retained the tradition of a culture which immediately preceded the roulette design pottery. If there had been such a culture, it would be very convenient. /I do not understand what would be convenient.--tr./

Let us look at lithic implements during the terminal preceramic period in areas west of the Kanto from such a point of view. The first problem is concerned with the group of tools which have geometric forms and which we have named Ijima I, and the small cores and blades (resembling our Ijima II) which Mr. Chosuke Serizawa named the Yadegawa industry.

The former is distributed in the Inland Sea, Kinki (Kyoto-Osaka) and Shinshu (Nagano), but is not evident in the southern Kanto as yet. As for the latter, if one takes small cores and blades as the characteristic features,

then they are found almost everywhere--in the Inland Sea, Kinki, Shinshu (at Yadegawa) and southern Kanto (at Nenokami). Clear-cut, convenient results do not seem to appear very easily. What we must think about here is this: if these small cores and blades could have been contemporaneous with the culture associated with the roulette design pottery, then, why did this tradition not influence the stone implements of the culture associated with the roulette design pottery? To be sure, both [groups of stone tools] share a common element in having been made on flakes; but if one takes into consideration the process of using blades, the similarity might be negligible. [I do not understand this sentence.--tr.] After such considerations, what I would like to discuss is the problem concerning arrowheads which I noted above.

Any argument based on the fact that arrowheads of this form are not found at sites of the Jomon or Yayoi culture is weak indeed. But I think that the fact that there are many islands in the Inland Sea on which are found sites with arrowheads but without pottery, or that at the excavation of the Washiuzan site there was a separate locality where arrowheads were found alone, is worth considering. Among the arrowheads discovered at the Sone site, Shinshu Province, there were some with a peculiar form having long in-curving barbs. At the present stage where, due to the complex situation of the Sone site, we have difficulty deciding its cultural affinity, there is ample basis to consider that both of them necessitate investigation.

Only with such an assumption in mind, it seems, can we understand the arrowheads associated with the roulette design pottery.

On the basis of these doubts, I wish to try to understand the relationship between the terminal preceramic culture and the initial Jomon culture, in which we have a deep interest.

Finally, I would like to acknowledge that all the illustrations utilized in this article are due to the efforts of Mr. Tadahiko Makabe and express my thanks to him.

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DEVELOPMENTS IN MICROLITHIC PROBLEMS, III: WESTERN JAPAN

(Saisekki Mondai no Shinten, Sono San: Nishi-Nihon Chiku)

by Yoshimasa KAMAKI

(Kaizuka, No. 88, p. 1. Tokyo, 1959)

It is an undeniable fact that the manufacturing technique and the form of stone tools are subject to certain limitations depending on the nature of the material that can be obtained. So far as microlithic problems of western Japan are concerned, it seems most appropriate to consider separately the Inland Sea region where sanukite was principally used, and Kyushu where obsidian was used.

1. Inland Sea microliths.

There was a time when microlithic problems of western Japan centered around the Inland Sea. Since this situation was discussed by Mr. Chosuke Serizawa in his article in this journal (no. 82) [translated below], I shall not discuss it except to say that attention had been called to the presence at Inland Sea sites such as Ijima and Washiuzan of the Ijima I industry which has tools of trapeze-like form and the Ijima II industry which mainly consists of microblades and microcores.

Of the two industries, however, among the materials which were grouped together as Ijima II, there remained some doubts as to whether some of them, if further analyzed, should really be included in the same category. In other words, Ijima II microcores basically have the form of unifacial boat-shaped tools with several flutings at one end only. But from some other

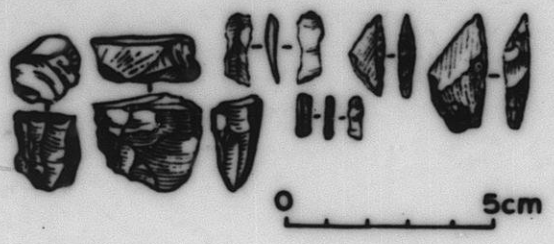

Fig. 1: Stone tools from the Inland Sea

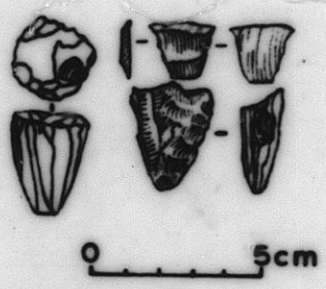

Fig. 2: Stone tools from Kyushu

sites there have been discovered conical or semi-conical microcores with flutings all around. Whether it is proper to group these two types together is the first question and, as a second question, we can raise the point that very few specimens excavated at Ijima and Washiuzan could be treated as microblades.

These questions have come to be stressed even more as a result of the excavation of the Yadegawa site by Mr. Serizawa and others. The microcores unearthed there are mainly in the form of semi-trigonal pyramids and are associated with a large quantity of microblades. This fact differs considerably from the conditions obtaining with the Ijima II industry. A new problem is posed as to whether the difference between the two should be interpreted as being regional or whether they should be treated as showing temporal differences.

While there has not been any discovery of new data since then in the Inland Sea region itself which might help solve the above-mentioned problem, the investigation of the Araya site in 1958 by Mr. Serizawa gave us a hint. That is, the fact that within relatively close areas heterogeneous microlithic industries, which might be called "Yadegawa" and "Araya", exist, suggests the possibility that within the Inland Sea, too, two different industries -- of Ijima II and of semi-conical artifacts -- may exist.

Also, in the Kyushu region, to be discussed below, more than two kinds of microcores are similarly known, affording affirmative support for our inference.

I have discussed the principal microlithic tools of the Inland Sea region. In this connection, an industry which cannot be overlooked in this region is that of Ijima I. At the time of the investigation of the Ijima site, this

was discovered separately from Ijima II; but another investigation at different sites seems necessary. This group of small tools called Ijima I is made by minutely retouching edges of laterally flaked pieces. The shape is like a trapeze, but they seem to be a type of backed blade. This type of stone tool is common in the Inland Sea region. Whether they are products of a long tradition of backed blades made on side-flaked pieces or whether they have a relationship with the trapezoid tools frequently seen in Kyushu is an interesting problem.

2. Kyushu microliths.

As for materials related to preceramic cultures of Kyushu, I had heard that Mr. Matsuoka had been collecting around Karatsu City. It was in the fall of 1957 that I first had the chance to see the collection. In the summer of 1958, re-examining his collection at his home, I strengthened my conviction that microlithic cultures existed in Kyushu, too, and was astonished by the presence of trapezoid implements which seem to have been made on blades. I later exchanged opinions with Mr. Chosuke Serizawa concerning this matter, and we made concrete plans to go to Kyushu together. In April, 1959, our plans materialized. As a result, we discovered that microlithic cultures in Kyushu are at present known to be concentrated in Saga and Nagasaki Prefectures, while some sites are also known in Fukuoka and Kumamoto Prefectures.

Since Mr. Matsuoka, I understand, is preparing a detailed report concerning the materials collected around Karatsu City, I shall remark on the general nature of microliths in Kyushu chiefly on the basis of the materials from Nagasaki Prefecture where Mr. Serizawa and I investigated.

As a first group, there are the obsidian boat-shaped microcore and a small number of microblades. [Whether the number of the core is one or more than one cannot be discovered from the context; I shall translate as if there is only one core of this type.--tr] A striking characteristic of this microcore is that its height is greater than the boat-shaped tools of Hokkaido or of Araya. Well executed flutings are seen on one end and beautiful flake scars are left on both sides, differing radically in these respects from cores of the Ijima II industry of the Inland Sea region in which flake scars are seen only on one side. Also, among the boat-shaped tools found in Hokkaido, some are known to have scratches on the platform; the Kyushu specimen does not have them. Instead of this, evidence of much abrasion is seen on the two sides which show flake scars; thus there is a strong possibility of having been used as a tool.

It is noteworthy that apart from certain differences the boat-shaped microcores of Kyushu are more like those of Hokuriku and Hokkaido than like those of the Inland Sea. If the presence of these similarities is due to the common element of using obsidian, then the peculiarities of the implements in the sanukite region are understandable. However, perhaps the problem lies beyond such a simple interpretation.

There have been some microblades discovered which are thought to be associated with this microcore. But since they were surface-collected, it is advisable to say that the details are as yet unknown.

The second group consists of conical or semi-conical cores and microblades. The material is unknown, though to the naked eye it seems similar to the material used for the Inland Sea microcores. As far as the specimens which we examined are concerned, most of the microcores have a perfectly

conical shape, and they seem to have been found at sites different from the boat-shaped microcore. There are many microblades in the surface collection, some of which show traces of use. The fact that the two groups of implements have been found in close proximity in northern Kyushu will probably strengthen the inference that they did not exist contemporaneously.

Further stone tools related to the microlithic industries discussed above are a group of obsidian implements. In the finished form they are trapezoid and seem to have been made on blades.

Since their cores have not yet been unearthed, I shall avoid any definite statement. They await future investigation.

I have run out of space with just the description of stone tools from Kyushu. There are many problems whose solutions depend on future research, such as the relationship between the above-mentioned stone tools, relations with implements of other areas, the nature of the trapezoid tools, etc.

THE KIYAMA SITE, AYAUTA COUNTY, KAGAWA PREFECTURE

(Kagawa-ken Ayauta-gun Kiyama Iseki)

by Yoshimasa KAMAKI

(Archaeologia Japonica. Annual Report of the Japanese Archaeological Association, No. 8 (1955), p. 38. Tokyo, 1959)

Location: Kiyama, Ayauta County, Kagawa Prefecture (Sanuki Province)

Dates of investigation: March 31 and April 11

Investigators: Yoshimasa Kamaki and Tadahiko Makabe

Summary of the investigation: A stone tool resembling a hand-axe has been preserved among the collections of a museum in Sakaide City, awaiting an opportunity for investigation. We visited the site under the guidance of a local resident, Mr. Soe Fukuya [reading uncertain--tr.]. Near the evening of March 31 we discovered the locale which we were looking for where stone tools were scattered on the surface. We designated the areas of scattered sanukite at Sakayama Localities 1, 2 and 3. Few of the flakes in areas other than Locality 2 had bulbs of percussion or fissures, probably not being man-made flakes. Stone fragments of Locality 3, however, included flakes of standardized form which were struck from a given angle (such as wing-shaped flakes and long blade-like flakes), what may be inferred to be stone tools with standard forms and cores from which long flakes had been struck off. We thus judged this to be a preceramic site.

The collected material is now being analyzed by Kamaki.

A PRELIMINARY REPORT ON THE BABADAIRA SITE, NAGANO PREFECTURE

(Nagano-ken Babadaira Iseki Ryakuho)

by Chosuke SERIZAWA

(Sekki Jidai, No. 1, pp. 15-22. Tokyo, 1955)

Introduction

Investigation of the Babadaira site has been going on through our efforts since August, 1953. Participants in the investigation are: Shigeya Yui, Mitsunori Tozawa, Masaru Aso, Masakazu Yoshizaki, Takuya Iwasaki, Mamoru Takahashi, Yuichi Kamisawa and Chosuke Serizawa. The first excavation lasted for five days from November 2 to November 6, 1953. Many areas of the site remain unexcavated, and investigation of these may be expected to produce many new facts. Not far in the future reclamation work will be carried out in the Babadaira area to make rice paddies, and before this time we would like to have the second and third excavation completed. This report, therefore, is of a preliminary nature; we intend to prepare a formal report upon the completion of the investigation. We are greatly indebted to Professors Kiyoo Yamanouchi and Ichiro Yawata for making the excavation plans. We also must not forget the assistance which we received from the mayor of Kawakami Village, Mr. Gen Yui, and from Akira Yui, Mitsufumi Yui and Yutaro Yui. I would like to express our gratitude toward them on this occasion. In writing this report, Shigeya Yui wrote the section on "Events leading up to the excavation" and Masaru Aso described the excavation of each trench, the rest being written by Serizawa. Line drawings were done with the collaboration of Yuichi Kamisawa, Mamoru Takahashi, Masakazu Yoshizaki and Masaru Aso.

Events Leading up to the Excavation

(Shigeya Yui)

Babadaira is dialectically known as Bappadeira, which is often abbreviated Bappa.

Babadaira, which is shown on the map, is situated at the western end of a plateau which rises toward the north and which is located southeast of Goshodaira hamlet, seen right below the site. At present the term is also used to designate the upper and lower plateaus collectively.

While there is no way of finding out how long the name Babadaira has been used, together with such other names of surrounding settlements as Fujitsuka, Tsumebori, Hyobu, Takaage, Takatsukai, Tenshunodai and Goshodaira, it might perhaps have connections with the legend that some time in the past a certain warrior clan settled here.

Whether or not this is the remains of a horse race track as the name Babadaira indicates, a large number of stone implements have been exposed in a few dry field plots here.

The Babadaira site, which does not show any connection with artifacts of the Jomon sites of this area (such as Midonokubo, San'yashiki, Mizunomoto, Fukayamaguchi or Futatsuyama), is a puzzling one in that its form is almost unique, that any sort of pottery is entirely lacking and that streams, which might be said to be a prerequisite for a site, are far away.

Until Mr. Serizawa came in August, 1953, and noted this group of artifacts to be preceramic, we had wondered whether this was a quarry of some Jomon site.

It has been said that the implements uncovered at Babadaira were called, because of their form, stone leaves. It is difficult to believe this since ordinarily fossilized leaves are more often so called. There is a ground stone axe preserved in the home I was born in. And writings of the Edo period about thunder axes seem to be known. Nonetheless, while the fields at Babadaira have been cultivated for many generations, no one seems to have noticed the artifacts here.

To be sure, obsidian rocks occasionally unearthed have been called star-feces, probably mistaking them for meteorites.

The artifacts of Babadaira were brought to scientific attention as remains of the prehistoric inhabitants by Professor Ichiro Yawata, who was engaged in archaeological investigation of Minami-Saku.

Since then, such a great quantity of artifacts have been collected that they have all but disappeared from the surface.

On Professor Yawata's advice, most of the artifacts were deposited in the grade school then; but these are all without exception lost.

At present, through the earnest efforts of Akira Yui and Yutaro Yui, and adding my own collection, there are nearly 300 specimens preserved. These were practically all obtained by surface collection.

Artifacts clearly of the same type as those of Babadaira which have been found elsewhere in this area are: one uncovered while constructing a charcoal oven at Anasawayama about 2 kilometers away across a river, and another, tightly embedded in shells, found during transplantation of a mulberry farm at Fujitsuka.

The one found in shells was supposed to be brought to me, but had unfortunately been lost and could not be found.

On November 2, 1953, a scientific investigation of this Babadaira site was begun by Mr. Serizawa and others.

This study of sites before the Jomon culture is the most recent field. We deeply are thankful for this opportunity to solve the question we have had for the past 20 years. I wish success.

Babadaira has long been cultivated as a dry, upland field. Since 1943 or '44, reclamation programs have been carried on and some parts have already become wet fields.

When the reservoir near Fujitsuka, which is under construction, is completed, the entire Babadaira will become wet rice fields. It is fortunate for the site and for us, local residents, that an excavation of epoch-making importance in archaeology was conducted when this site was to be buried underground for ever. As for the artifacts which we have collected, we would like to think of some method to permanently preserve them.

Site (Fig. 1)

The site is located at Babadaira, Goshodaira, Kawakami Village, Minamisaku County, Nagano Prefecture. As stated on the previous page, at first the name, Babadaira, seems to have designated only a portion of the site; but at present it refers to the entire area of the plateau. The common term of reference is Bappa or Bappadera. To the north of the site, the main stream of the Chikuma River runs northwestward. To the west, its tributary, the Kurosawa River runs toward the north. The terrace which the site is located on has a yellow-brownish loam layer of about 1 meter thick. But loam is not observable on a terrace below it which is closer to the present river bed. Artifacts are most heavily distributed near an end of the terrace,



Fig. 1: Topographic map of the Babadaira site

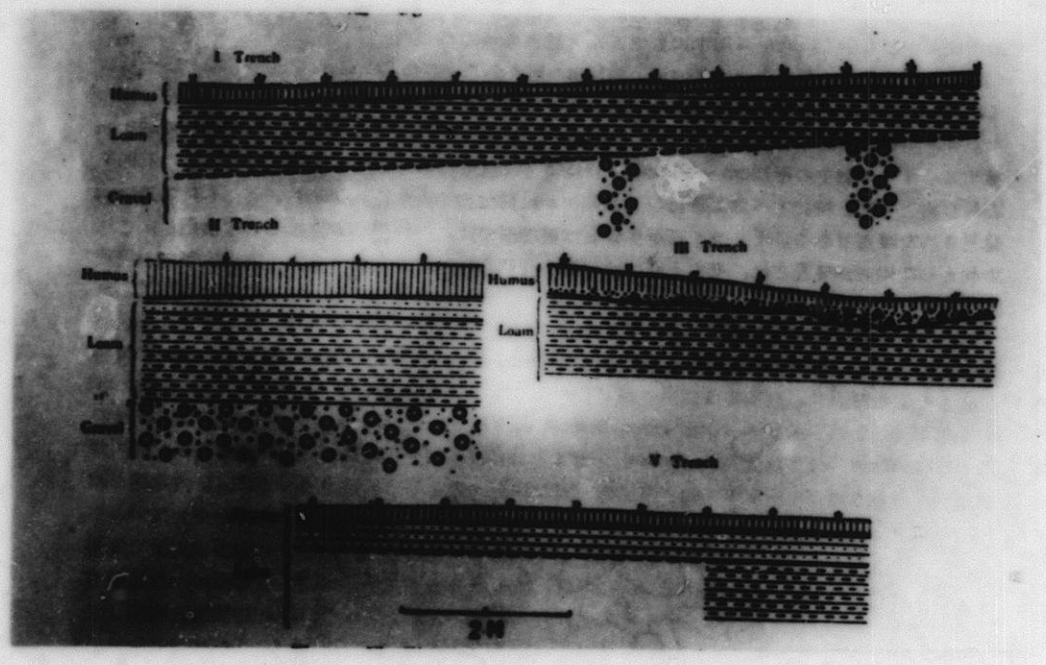

Fig. 2: Profiles of trenches

but they are found scattered throughout an area covered by a diameter of 2-300 meters, suggesting that they are buried over a rather wide area. The upper part of the loam layer seems to have many portions which do not preserve the original condition either due to erosion after the deposition or to cultivation. The fact that over 300 specimens, which had been contained in the loam, were collected on the surface seems to indicate the degree of erosion, which is apparently substantiated by the excavation. That is, at the places where implements and flakes are scattered in a large number, weathered implements and flakes are found in the top soil, sometimes mixed with small pebbles and sand, artifacts hardly being in the underlying loam layer. On the other hand, at relatively high locations where distribution of artifacts is sparse and erosion does not seem to have taken place, artifacts in the top soil were very few, and instead in the loam layer were found completely unweathered, fresh implements and flakes. About 30 or 40cm into the loam layer, white granules are mixed with the loam; these white granules are already found immediately below the top soil at the places which have suffered such erosion. It may be said therefore that artifacts are present in the upper part of the loam which does not contain white granules. This is the upper half of the loam of Trenches II and III shown in Fig. 2. There was hardly any layer containing artifacts in Trenches I, III and IV. In the following, each of the trenches will be described.

Choosing an area of dense distribution of artifacts at about 60 meters north of an end of the terrace, Trench I was laid out 10 meters by 2 meters in north-south orientation and excavated. The top soil was very thin, being about 10-15cm in thickness, from which weathered implements and flakes were found mixed with angular and rounded pebbles. This was probably a mixed,

secondary condition. Below the top soil is a hard loam layer which either immediately or 10-15cm below has white granules mixed in. No artifacts were recognized in the loam layer at all. The loam layer gradually begins to contain sand and pebbles from the depth of 70-80cm and soon becomes a layer of sand and pebbles. This is probably the terraced gravel bed of the old Chikuma River.

Trench II of 2 meters by 6 meters was laid out also north-south at about 10 meters north of Trench I. The top soil consists of a black soil layer, having a thickness of about 20cm; it hardly contained any artifacts. Below this was a loam layer in the top ten centimeters of which a considerable number of flakes and some implements were recognized, and in the next 30cm a small number of flakes was contained. Mixture of white granules began at the depth of 20-30cm. At about 1 meter a sand and gravel layer is encountered. Implements and flakes in the loam are not weathered at all.

Trench III was set up 6 meters by 2 meters in an east-west direction at a right angle to Trench II from its center. As shown in Fig. 2, the surface sloped somewhat downward toward the east. At the east end of the trench we encountered a section with a heavy sand and gravel mixture which fell into the loam layer. This seemed to be a remnant of a ditch caused by water cutting through the loam formation. Relatively numerous implements and flakes were found mixed with sand and gravels, all of which were badly weathered. Implements in the loam layer were probably washed out by running water and brought to this slough. The top soil generally contained sand and gravels and was about 30-45cm thick. Hardly any artifacts were contained in the loam layer. Occasionally implements were found in the top portion

of the loam; but because of the unevenness of the top of the loam, it is difficult to consider this a primary condition. White granules in the loam were recognizable from immediately below the top soil.

Trench IV, 5 meters by 1 meter, was selected about 20m west of Trench I in an east-west direction. The humus is thin, being a black soil layer of about 15cm, below which is the loam layer. Implements and flakes in the top soil were very few. The loam layer began to contain white granules from the depth of 40-50cm and gradually changed to a layer of sand and gravels at about 1.5m. Many implements and flakes were uncovered from the level between 15-30cm into the loam (in the section with the white granules.). Noteworthy is the fact that a structure which seems to indicate some aspect of the aboriginal life was discovered at this level. At the east and west ends of the trench were found granite rocks of about the size of a pillow either standing upright or lying flat with traces of chipping showing on the top surface. Moreover, in the trench round pebbles of the size of a fist were found scattered, among which were four chopper-like pebble tools, all with their cutting edge facing upward placed apart from one another. We were able to infer the deliberate arrangement of these implements by the discovery of several more instances of pebble tools standing upright adjacent to a group of broken pebbles in a small pit west of Trench V.

Fig. 3 is a diagram showing the pebbles found in the pit west of Trench V. About a dozen natural pebbles of the size which could be seized with one or both hands were placed close to one another, some of which were broken into two or three pieces. Somewhat apart from these was a large basalt pebble tool with its sharp cutting edge facing up and its dull end down. A few shale and chert flakes were found near by, but they do not

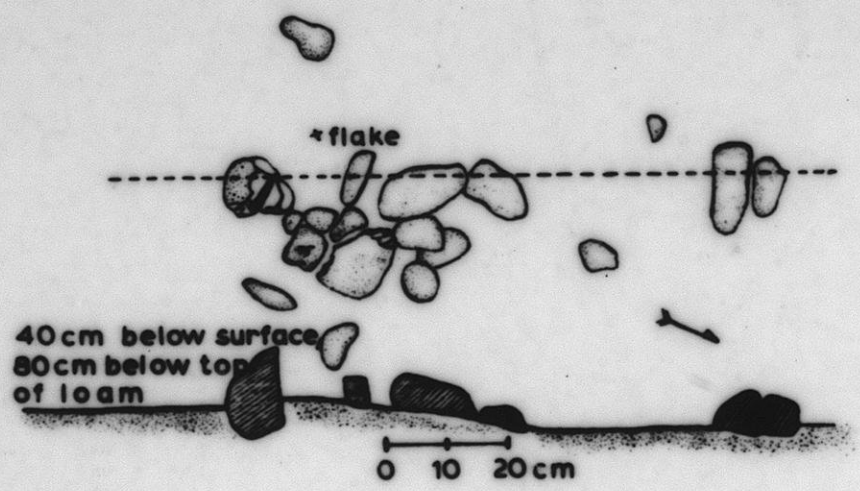

Fig. 3: Erect pebbles in Trench V

seem to have any relationship to the group of pebbles. Also, the material of the pebbles is relatively soft andesite, which can be obtained in abundance from the river bed of the Chikuma whereas the pebble tools standing upright are made of hard basalt. It was found that the broken pieces in the group of pebbles, when examined closely, could be pieced together to reconstruct several round pebbles. Putting these facts together we arrived at the conclusion that the upright pebble tools were put there as anvils on which to break bones and wood and that pebbles were used as hammers to apply blows. The fact that no flakes were made of the same material as the pebble tools themselves indicates that they were set there in their finished form and were not cores. After drawing the diagram, we removed the pebbles and dug under them, to find only 4 or 5 pieces of shale flakes.

Artifacts

Except for the several instances of some carbonized substance about the size of the head of a match which came from the artifact-bearing loam layer of Trench V, stone remains were limited to stone implements, flakes and natural pebbles. In the following artifacts will be described trench by trench.

Implements and flakes from Trench I. 7 points, 31 flakes and about 50 chips. Points are characteristically small willow-leafed bifaces (Fig. 4, no. 1). Fig. 4, no. 2, partially retains the natural surface of the pebble and is retouched along one edge and at the tip. These are both made of andesite. Fig. 4, no. 3, is what might be called a beaked point, its tip slanting toward one side like a beak. The obverse side retains the original flake surface and leaves the bulbar scar, being a uniface; it is

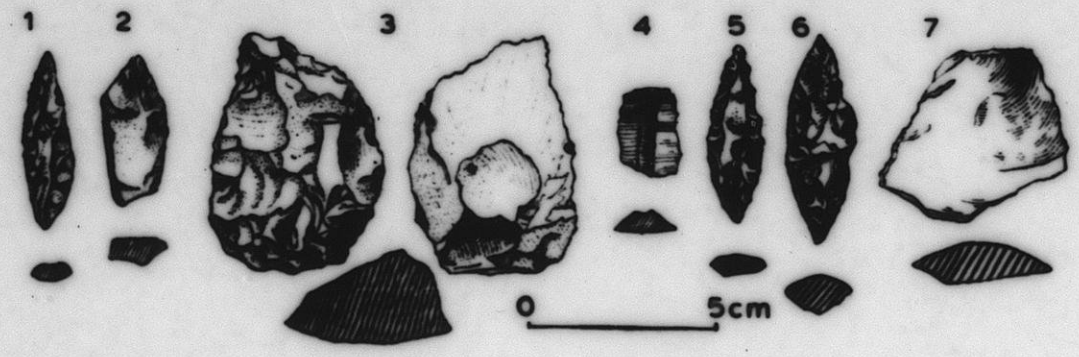

Fig. 4: Artifacts from Trenches I and II
Nos. 1-3: from Trench I
Nos. 4-7: from Trench II

made of shale. Six flakes are of obsidian, 1 of crystal, 12 of shale, 1 of andesite and 11 of chert. Chips coming from these would amount to a considerable number of those that escaped our eyes were to be added. As discussed in the section on trenches, because this level was formed by a secondary deposition, practically all implements and flakes have traces of weathering.

Implements and flakes from Trench II. From the top soil 1 core, 11 shale flakes and about 40 obsidian, shale and chert chips were found. From the depth of 0-30cm in the loam layer 4 points, 1 scraper, 1 core, 1 crystal flake, 13 shale flakes and about 60 obsidian and shale chips were found. Fig. 4, nos. 4-7, are specimens unearthed from Trench II. No. 4 is a crystal flake, whose obverse side is a very uneven flake surface. But the front side has, as shown in the drawing, two crystal surfaces and a narrow flake scar running vertically between them. It may seem like a type of blade; but whether it was used or not is unclear. Nos. 5 and 6 are small willow-leaf points of shale and are similar to the one from Trench I. Both of them are bifaces with quite careful retouch and have fresh edges which do not show any indication of weathering. No. 7 is a relatively large shale flake with retouch along the edges. Minute chipping is applied to both edges of the obverse side. As a general rule, implements and flakes of Trench II came mostly from the depth of 0-10cm in the loam layer. The points, nos. 5 and 6 shown in the figure, were both found close to the top of the loam layer.

Implements and flakes from Trench III. Here many artifacts were embedded in the top soil with sand and gravels, all of which were badly weathered, probably having been transported here. We counted 7 bifacial points, 8 unifacial points, 3 scrapers, 2 cores, 2 small tools, 1 obsidian flake, 3 crystal flakes, 24 shale flakes, 1 chert flake and numerous chips.

Artifacts in the loam layer were few, 4 points and several flakes and chips having been found near the top of the loam layer. Fig. 5, nos. 1-11, and Fig. 6, no. 2, are some of these. Fig. 5, nos. 1 and 2, are shale cores. They are flat in form and have received blows from various directions. Nos. 3 and 4 are willow-leaf points of shale which might be unfinished specimens since they still retain the surface of the original pebble along their edges. The tips are not sharp, either. Nos. 5, 6 and 7 are large willow-leaf points of shale which are thickly shaped by rough percussion. No. 8 is probably a unifacial point of andesite. The obverse side retains the primary flake surface while the front side is trimmed along both edges. A low ridge runs medially, and the base is relatively flat, retaining the platform there. No. 9 is a unifacial point of obsidian, the lower half of which is broken off. Nos. 10 and 11 are points made on crystal flakes. Because of the difficulty in shaping them, the forms are irregular. Edges are partially trimmed. They might be called unifaces. No. 11 is made of fufu-suishō /ā type of crystal/. Nos. 12 and 13 are small implements of peculiar shape made of obsidian. They are very close to the trapeze, even though the method of manufacture is entirely different. They are made on small shell-shaped flakes by retouching both edges minutely and leaving the original sharp edge untouched. In the instance of no. 12, in particular, a negative bulb is seen on the right side of the illustration and there seems to have been a positive bulb on the left side. Moreover, there is a sufficient amount of minute retouching to remove the protruding portion of the positive bulb. It is difficult to believe that these latter two are associated with points; it may be better to consider them to be somewhat later /than points/. I plan to discuss this at a later date. Fig. 6, no. 2,

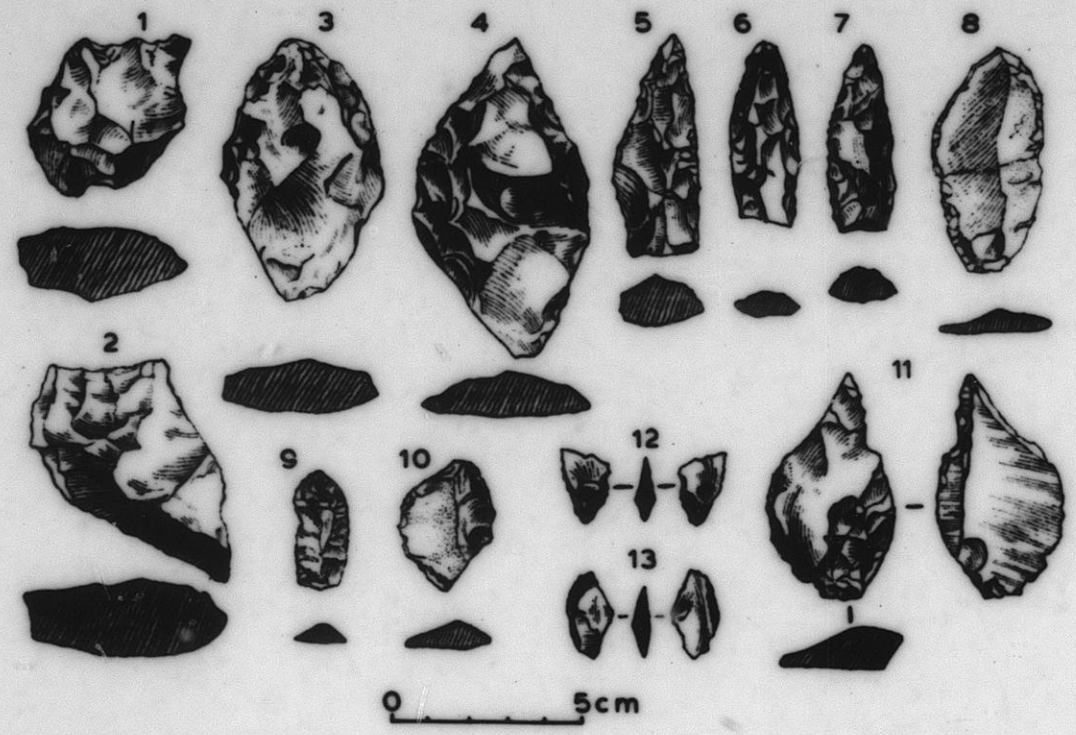

Fig. 5: Artifacts from Trench III

was discovered at the top of the loam layer. It is a shale biface, and does not show any weathering.

Implements and flakes of Trench V. From the top soil were unearthed 1 small willow-leaf bifacial point, 2 shale flakes and a few obsidian and shale chips; but from the loam layer we were able to recover a good collection in its original condition: i.e. 11 points (4 large bifacial points, 2 large willow-leaf bifaces, 1 large uniface, 1 beaked uniface and others), 1 scraper, 2 cores, 5 large pebble tools, 1 irregular flake, 2 obsidian flakes, 1 crystal flake, 26 shale flakes, 6 andesite flakes, 5 chert flakes and a quantity of chips of these materials. The most representative were the large, relatively thick bifacial points of shale or andesite (Fig. 6, nos. 1, 3, 4, 5, and 7). These are skillfully made by rough percussion flaking either in the form of those with both ends pointed (no. 5) or of those with blunted base (nos. 1 and 7). The edges are fresh and not weathered at all. The large unifacial point (no. 6) is made on a shale flake which retains the original surface of the pebble on the backside by roughly retouching both edges, leaving the base untreated. The large willow-leaf points are fragments, but they are on the whole similar to the finds from Trench III (Fig. 5, nos. 5-7) and are made of andesite. The unifacial beaked points consist of a small shale specimen (Fig. 6, no. 3) and a relatively large obsidian one. It should be noted that the former was found at a depth of 28cm in the loam layer, a position deeper than other points. It retains the main flake surface on the backside and the original pebble surface on the front, while a shoulder is formed by minute trimming. The cores are not polyhedral or cylindrical but have an irregular form, blows having been applied from many angles. One of the large

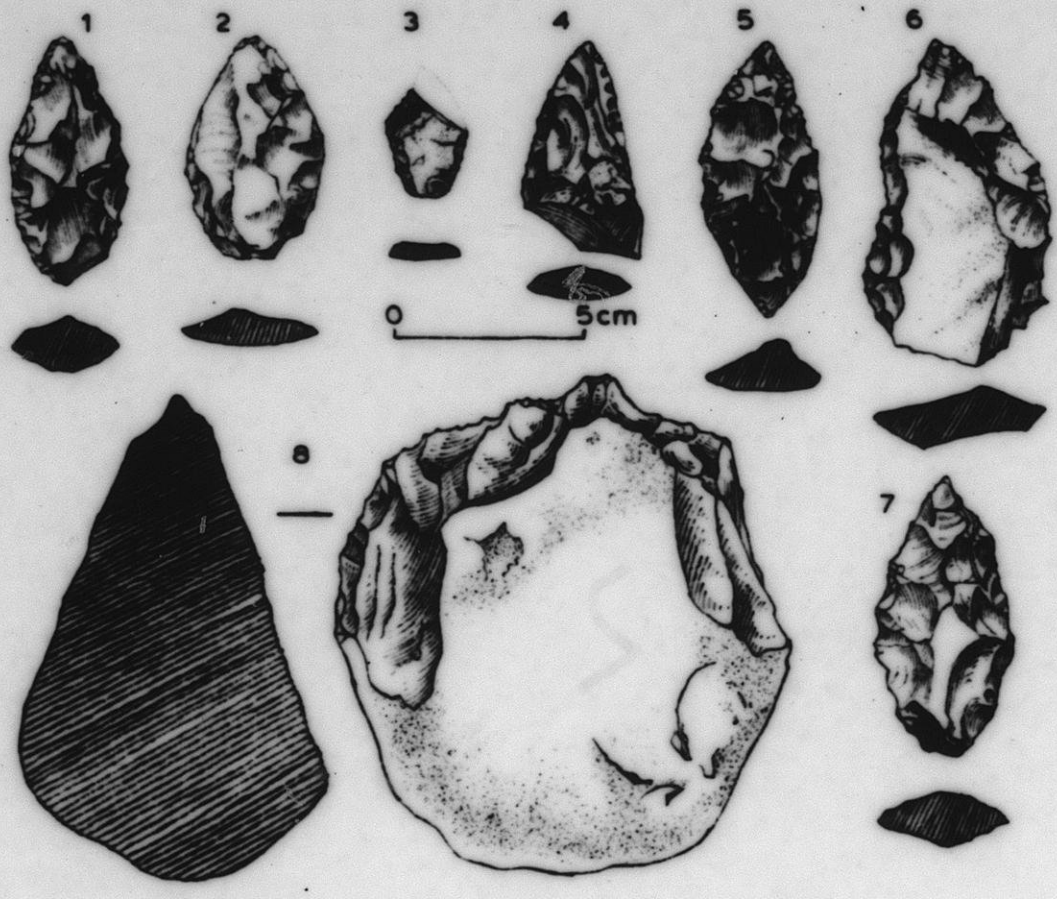

Fig. 6: Artifacts from Trench V (No. 2 is from Trench IV)

pebble tools (Fig. 6, no. 8) was made by removing one side with blows applied to a round pebble of hard basalt material and then unifacially retouching from the opposite side a little more minutely along the sharp edge thus created. If this was set upright, burying the blunt end into the ground, and objects were broken on it, a considerable degree of effectiveness must have been obtained.

Discussion

The excavation of the Babadaira site and its results have been outlined above. Because the excavation did not go beyond trial digging, satisfactory results are of course not evident. However, the primary significance of this report lies in demonstrating the fact that preceramic artifacts (chiefly consisting of points) were discovered in the loam layer -- in so far as they did not suffer later disturbance. Up until now, sites producing points in Shinshu did not have good stratigraphy. Babadaira effectively obviated this difficulty. The weathered implements and flakes in the top soil, when compared with the fresh implements and flakes of the loam layer, did indicate that they had been moved. Also, it may be noted that the artifact level in the loam was limited to its top 30cm or so, and that below this, in the loam containing white granules, hardly any artifact was found. When the relationship between tool types, stratigraphy and locations is considered, the small willow-leaf points of Trenches I and II clearly form one group, and the combination of leaf-shaped, flat points and large willow-leaf points in Trench III, and the large, thick points of Trench V, must be regarded as constituting separate groups. The fact that small willow-leaf points were found in the top soil in Trench V, and also the fact that points in Trench II were found

closer to the top of the loam than those in Trench V, provide evidence for the relative antiquity of the large, thick points as compared with the small willow-leaf points. Also, the points of Trench III have an intermediate character, and even though stratigraphic evidence is lacking, it might be appropriate to regard them as being between the two. The fact that unifacial points are always associated with every period of bifacial points also poses an interesting problem. In particular, at the deepest level of Trench V, a unifacial beaked point was discovered, which suggests the antiquity of the beaked point and might serve as a clue in searching for points prior to this. Lastly, the erect pebble tool found in Trench V has a great significance in indicating the function of this type of tools and at the same time gives us a basis for inferring the life in those days. Comparison of this with the Lower Palaeolithic pebble tool (chopper or chopping tool) merely on the basis of morphological similarities is absurd and should be strictly avoided.

Postscript

Regarding the surface collection (amounting to over 300 specimens) and a large number of flakes, I would like to report later on a separate occasion. Also, because of the space limitations a map of the site was omitted, and arguments may often have been inadequate. After the completion of the investigation I would like to make a more adequate report. Literature concerning the Babadaira site is scanty, but the following have some discussion of it:

Yawata, Ichiro, Minami-Saku-gun no kokogaku-teki chosa (Archaeological investigation of Minami-Saku County), 1937

Serizawa, Chosuke, Kanto oyobi Chubu chiho ni okeru mudoki bunka no shumatsu to Jomon bunka no hassei toni kansuru yosatsu (Preliminary observations concerning the termination of the preceramic culture and the origin of the Jomon culture in the Kanto and the Chubu), Sundai Shigaku, no. 4, 1954

Serizawa, Chosuke, Mudoki bunka sekki kaisetsu (Guides to preceramic stone tools), Seiko Bunka, no. 10, 1954

REMARKS ON THE ORIGIN AND TERMINATION OF THE PRECERAMIC CULTURES OF JAPAN

(Nihon ni Okeru Mudoki Bunka no Kigen to Shumatsu ni Tsuite no Oboegaki)

by Chosuke SERIZAWA

(Watakushitachi no Kokogaku, Vol. 4, Whole No. 13, pp. 4-13. Okayama, 1957)

1

There has not been any study worthy of attention concerning either the origin or the upper limits of the preceramic cultures of Japan. The oldest traces of human culture found in Japan up to now are the hand-axe industry discovered in the lowest level at Gongenyama, Isezaki City, Gumma Prefecture, and in the lower level at Iwajuku, Kasakake Village, Seta County, of the same prefecture. As the study of the Kanto loam of the northern Kanto develops, a rather detailed analysis of the geological status of the strata containing hand-axes at these two sites is in progress. These accomplishments are the efforts of Mr. Fusao Arai of Gumma University and also of Mr. Tadahiro Aizawa, the latter cooperating from the archaeological side. According to Mr. Arai, loams of the Tone River terraces can be subdivided into three parts: upper, middle and lower. The upper loam overlies the middle Yasaki formation and contains in it two layers of pumice, viz., Itabana Yellow and Brown pumice. Beds with points at Motojuku, Shinkawa, Sanami County, Gumma Prefecture, which Mr. Aizawa investigated, are said to lie between these two pumice layers. With this fact we were thus able to obtain a bit of definite evidence regarding the position of the point culture. The middle loam overlies the upper Yasaki formation and has a blackish portion

(Black Band No. 1) in its uppermost part. In its lower portion is seen a layer of pumice (Yasaki White pumice). The cultural level of Iwajuku I (Iwajuku formation), which produced hand-axes, and the middle level at Gongenyama (Gongenyama II), are said to correlate with this Black Band No. 1. The lower loam overlies the formation on a cliff at the foot of the volcano, Mt. Akagi. It has a black band (Black Band No. 2) in its upper portion and contains a yellow pumice layer (Yunokuchi Yellow pumice layer) roughly in the middle. According to Mr. Aizawa, the stratigraphic position of Gongenyama I, which produced pear-shaped hand-axes, correlates with the Black Band No. 2 of this lower loam. Thus, if we correlate the subdivided loam layers with industries, the principal tools of the upper loam seem to be points, and of the middle and lower loams, hand-axes. The hand-axe of Iwajuku I is associated with long flakes which are close to being blades; also at the Takei site, not far from Iwajuku, crude, broad tools which seem to be knife-blades have been found in a black band underlying the level containing points. In all likelihood, a whole series of tools, such as the blade, knife-blade, and kiridashi knife, is also present in the upper loam. It is noteworthy that in the northern Kanto hand-axes are present both in the middle and lower loams.

It is well known that the loams of the southern Kanto have been studied in detail by members of the Kanto Loam Society with a considerable amount of success. Accordingly, what has simply been called up until recently the Kanto loam is now understood to consist of four layers: Tama loam, Shimosueyoshi loam, Musashino loam and Tachikawa loam, in the order of the age of the terraces on which they lie. The Tachikawa loam overlies the Tachikawa gravel and is about two meters thick. It has from one to several

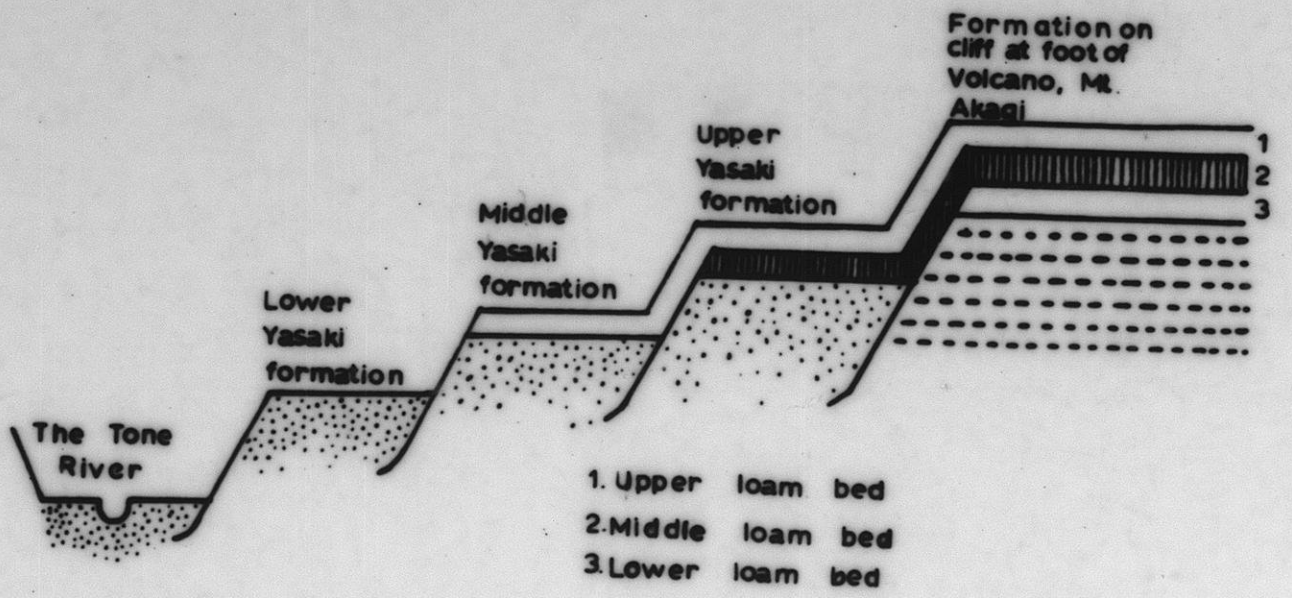

Fig. 1. Tone river terraces and loam beds (after Mr. Fusao Arai)

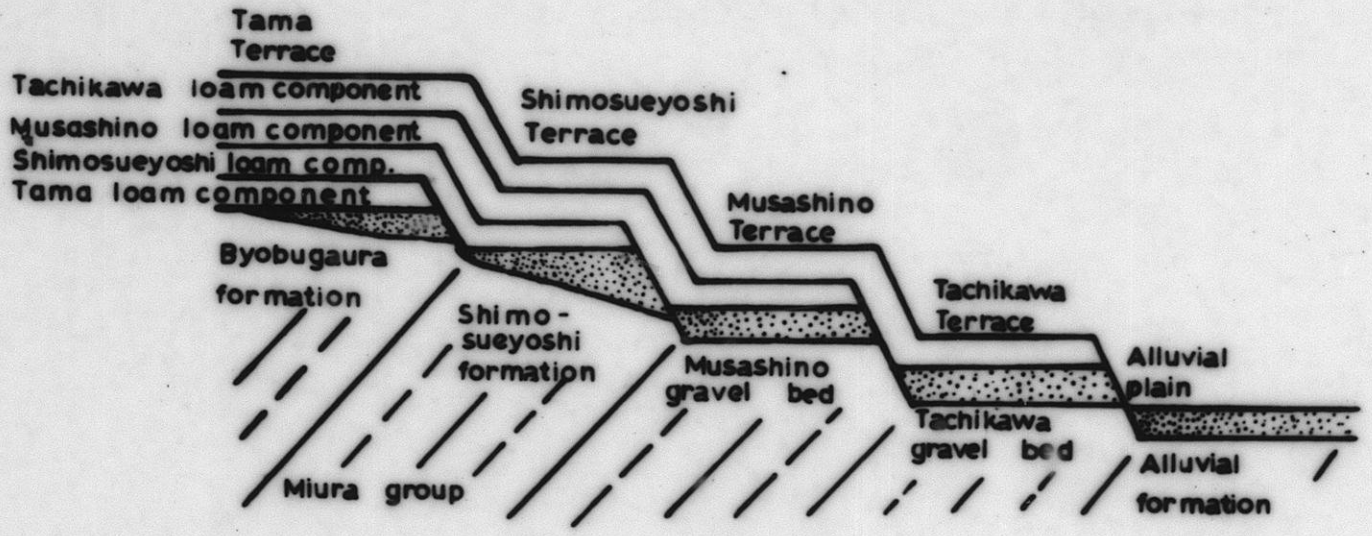

Fig. 2. Terraces and loam bed of the southern Kanto

layers of black bands in the lower portion. Points, kiridashi knives, and knife blades are all contained in that portion of the Tachikawa loam which is above these black bands. Specimens from the black bands are still scarce in some instances, but some, though few, blades have been unearthed. Upon the Musashino gravel bed, loam of about 8 meters in thickness has accumulated, and toward its bottom there is a layer of pumice (Tokyo pumice). The Shimosueyoshi loam and the Tama loam, respectively, lie on the two terraces above these. But there has not been any indubitable discovery of implements from loams antedating the Musashino loam. This seems to be intimately related to the fact that no hand-axe has been found in the southern Kanto.

If the northern Kanto loam and the southern Kanto loam can be correlated, the stratigraphic position of the hand-axes of Gongenyama I and II and of Iwajuku I can be much better understood. At the present state of knowledge we do not have sufficient data to make a definite correlation. Mr. Sohei Kaizuka, however, claims to have discovered an exposed area in which the Yasaki pumice bed of the northern Kanto lies somewhat above the Tokyo pumice of the southern Kanto. Also, there is said to be a strong possibility that the Iwajuku formation probably correlates with the bottom part of the Tachikawa loam (or the upper portion of the Musashino loam?) and the Gongenyama I formation with the lower part of the Musashino loam.

According to the diagram made available by the Kanto Loam Society, the Tachikawa loam belongs to the late Upper Pleistocene, the Musashino loam to the early Upper Pleistocene and the Lower, Shimosueyoshi and Tama loams, to Lower Pleistocene. Even from the limited material available up to now, we may suppose that the geological positions of these hand-axes are concentrated in the first half of the upper Pleistocene and that they almost completely

disappear thereafter. We must again remind ourselves of the fact that hand-axes have not been found from the Tachikawa loam. That is to say, the oldest tools of the preceramic culture are those associated with hand-axes, and their geological data seems to go back beyond the Tachikawa loam. If anyone is to discuss the origin of the preceramic culture of Japan, he must first be aware of this fact.

Now in the proper order of things, the next problem we naturally come to is that of the relation between Japan and the continent during the Pleistocene. If all of the preceramic cultures of Japan diffused from the continent or other areas, then people without boats would have had the opportunity of coming only when there was a land bridge between the continent and Japan. There are several methods of studying such a geological history as this--through geology and topography, through fossils and through contemporary living species. Dr. Nagakatsu Yabe took note of the two land shelves formed off the coasts of Japan--terraces which sunk below the ocean surface with the advance of sea level. One of the land shelves shows a depth of 150 meters, and the other 540 meters to 720 meters. Dr. Yabe correlated these with the Tama terrace and the pre-Narita terrace respectively and dated them to the early Pleistocene and Lower Pleistocene. Thus, the land area of Japan would be very great when the area covered by both terraces is included, and the Asiatic continent and Japan, he thought, were then connected by land. At that time, all the areas of Formosa, the Ryukyus, Kyushu, Shikoku, Honshu, Hokkaido and the Kuriles seem to have been connected, with the Japan Sea forming a large lake. However, what we are concerned with is the culture which man left behind. Since there have been no artifacts discovered in the

Table 1*

Geologic divisions	Topography	Cultures	Volcanic Activities
Yurakucho shell formation		Jomon	
?			
Ekota plant fossil formation			Formation of the present Mt. Fuji
	Tachikawa formation (du2)		
Tachikawa loam component		Preceramic	
Tachikawa gravel bed			
Musashino loam component			Hakone central volcanic cone — Old Fuji
	Musashino formation (du1)		
Itabashi clay bed			
Musashino gravel bed			New
	Shimosueyoshi formation (du1a)		
Shimosueyoshi loam component			Hakone
Shimosueyoshi formation			Calderaic
	Tama formation (d1)		
Tama loam component			period
Byobugaura formation			

*After the Kanto Loam Society

early Pleistocene, it will be time enough to discuss /this period/ after implements belonging to it have been found. Whether there are any artifacts in the Tama loam or the Shimosueyoshi loam must of course be investigated.

Dr. Yabe's theory has since then been examined in further detail by a number of scholars. Among them, Mr. Minoru Tokuda has published a detailed study concerning the Cenozoic history of Japan on the basis of contemporary species--particularly through the distribution of Asiatic rodents. Table 2 shows the history of the Japanese archipelago based on Mr. Tokuda's conclusion.

Table 2

Formation of the old Ryukyu land mass	end of the Middle Cenozoic or early Pliocene
Formation of the old Honshu land mass (including Shikoku and Kyushu)	early Pleistocene
Beginning of the high altitude life on Formosa	
Formation of the old Hokkaido land mass (including portion of the southern Kuriles)	Middle Pleistocene
Formation of Shikotan Island	
Formation of Formosa, Oki Is., Tsushima Is.	end of the Pleistocene
Formation of Sakhalin and the Kuriles; separation of Honshu, Shikoku and Kyushu; formation of adjacent islands	...Holocene

Table 3

Quaternary	Holocene	K_2	aII	Formation of Sakhalin, Kuriles; separation of Honshu, Shikoku, Kyushu; formation of adjacent islands		
		K_2	aI			
	Pleistocene	J_3 c		Formation of Formosa, Oki Is. and Tsushima Is.		
		J_3 b	duII	Formation of the old Hokkaido land mass (including a portion of southern Kuriles); formation of Shikotan I.		
		J_3 a				
		J_2 b	duI	Formation of the old Honshu land mass (including Shikoku and Kyushu); beginning of high altitude life on Formosa	Korean land bridge II Ryukyu land bridge II	Invasion by northern Chinese and Manchurian mammals
		J_2 a				
		J_1 c				
		J_1 b	dl			
		J_1 a				
						Invasion by southern Chinese mammals
		I_2	pd		Korean land bridge I Ryukyu land bridge I	Invasion by Malaysian mammals
		I_1		Formation of the old Ryukyu land mass		

Dr. Tokio Shikama, who has examined the history of the Japanese archipelago on the basis of mammalian fossils, has added his own material to the results which Mr. Tokuda obtained and inferred the connection between Japan and the continent as shown in Table 3.

According to this mode of thinking, therefore, Japan and the continent have twice been connected by a land bridge, in the beginning of the Pleistocene and in the early Upper Pleistocene. If the period of the Tachikawa loam formation, during which preceramic cultures prevailed in Japan, was du II, and the period of the Musashino loam formation corresponds to du I, then the stone tools of the latter period might have had direct relationship with the continent. However, no stone implements have been found from the Musashino loam, and as was said, only the hand-axes of Gongenyama I of the northern Kanto have the bare possibility of belonging to it. If Dr. Shikama's reasoning is correct, the preceramic culture of Japan must have come across, with the animals, either during the time of the first land bridge or of the second land bridge. Of the two, the period of the second land bridge (du I) probably fits in better with other factors.

There were altogether four glaciations during the Pleistocene. With the formation of glaciers, the sea level decreased, and with the disappearance of glaciers, the sea level increased. It is suggested that during the last (Würm) glaciation, the sea level was about 100 meters lower, and during the preceding (Riss) glaciation about 200 meters lower than the present level. Thus, if Japan were connected with the continent in the past, this event must have had an intimate relationship with these decreases in sea level during the respective glaciations, and the problem becomes one of correlating the

geological chronology of Japan with the latter. Research has been conducted for many years by a number of geologists as to whether there are remnants of glaciers in Japan, as well. As a result, it has become clear that topographies and morains formed by glacial erosion are observable in the high altitudes of the Japan Alps and the Hidaka Mountain Range of Hokkaido. According to Mr. Kunio Kobayashi, in the Japan Alps traces of two successive glaciations all told are visible, which have been named the Hida Glaciation I and II. Also, according to Dr. Masao Minato and others, erosion due to two periods of glaciation is observable in the Hidaka Mountain Range of Hokkaido; these are named Poroshiri Glaciation and Tottabetsu Glaciation. According to research by Dr. Minato and others, the third European glaciation (Riss) is correlated with the Hida Glaciation I of the Japan Alps and the Poroshiri Glaciation of the Hidaka Range; and the fourth glaciation (Würm) with the Hida Glaciation II and the Tottabetsu Glaciation.

If in Japan as well there were glaciations corresponding to Riss and Würm, as stated above, then what are their relations to man's culture? These can be immediately phrased in the relationship of the Tachikawa loam and the Musashino loam to glaciation. If, as was discussed before, the Tachikawa loam was formed during the du II period, then there should be no argument in including it in the Würm Glaciation. The Würm Glaciation is further subdivided into I, II and III, and there is a problem of determining what correlates with which subdivision. Mr. Kobayashi places the Shinshu loam, which is considered to parallel the Tachikawa loam, immediately after Hida Glaciation II and correlates it with Würm III. Moreover, since Dr. Minato places the blade culture of Hokkaido (such as that of Tarukishi and Shirataki) between Tottabetsu I and II, this, too, then is correlated with a period more recent than Würm I. In Honshu, also, the blade culture is placed in the lower

portion of the Tachikawa loam; thus there is no contradiction with Mr. Kobayashi's reasoning. Next, the position of the Musashino loam arises as a problem, but there seems to be no accepted view concerning this among geologists. Would the Musashino loam go as far back as the third glaciation (Riss), or would it come down to the fourth glaciation (Würm), or would it correlate with the interglacial between Riss and Würm? If the Musashino loam is to be placed in the Hidaka Glaciation I-Poroshiri Glaciation or immediately thereafter, stone tools found in the Musashino loam would have the possibility of having direct relationship with the Lower Palaeolithic of the continent. On the other hand, if the period of the Musashino loam correlates with the Würm Glaciation, then artifacts contained in it must be placed in an indirect relationship with the Lower Palaeolithic of the continent. Thus there are two possible interpretations concerning the Gongenyama I specimens, which show very close resemblances to the middle Acheulean hand-axe.

I do not have the capacity to discuss the origin of preceramic culture of Japan; and there is hardly any material available on the subject. This is a large problem which must be investigated with caution in close cooperation between geologists and archaeologists. Recently Father Maringer, professor at Nanzan University, has published a number of articles in Anthropos, Man, Kokogaku Zasshi, etc. on the basis of the artifacts unearthed at Gongenyama, Isezaki City, Gumma Prefecture, which had been studied by Mr. Tadanori Aizawa. He has quite boldly discussed the relationships between the preceramic cultures of Japan and Palaeolithic and Mesolithic cultures

of other areas. According to him, the Patjitanian culture (of the early Palaeolithic) of Java, which is characterized by chopper-chopping tools, entered Japan during the middle Pleistocene, and the artifacts of Gongenyama I and II are its remnants in much later times. Also, /according to him/ the Gongenyama III specimens have close relationship with the Indochinese Hoabinhian culture (of the early Holocene), which is characterized by pebble tools. Although it is understandable that foreign scholars, who are unable to read Japanese scholarly works in detail, cannot help placing emphasis on interpreting Japan on the basis of their research findings abroad, there is something I cannot agree with in Father Maringer's statement that "the greatest weakness of Japanese scholars is that they idly concern themselves with typological classification of artifacts and that they ignore the relationships with Palaeolithic and Mesolithic cultures of other regions." We have no need whatsoever to rush to conclusions. About the origin of the Jomon culture, too, several foreign scholars have expressed their opinions; but because they have lacked sufficient knowledge concerning the Jomon culture itself, they have resulted in something far from the truth. We must first establish subdivisions and chronology of preceramic cultures of Japan and determine their geological positions. Correlations with continental Palaeolithic cultures will indeed be meaningful only after these fundamental problems will have been solved.

2

What were the processes involved as the preceramic culture of Japan became transformed into the Jomon culture? In order to solve this difficult problem, accomplishment of several preliminary tasks is necessary. These have been reiterated many times before. They are:

1. to have detailed knowledge of the cultures which appeared last in the preceramic period;
2. to have clear and definite understanding, region by region, of the oldest traditions of the Jomon period; and
3. to see, by comparing the results of (1) and (2) above, if the preceramic tradition is observable in the Jomon culture.

Research findings to date have not provided an answer to satisfy any of the above requirements. Although compared with the past, we have come closer to the heart of the problem and been able to narrow down the area of study, theory on the origin of the Jomon culture cannot be readily developed.

Among the preceramic cultures of Japan, those which are considered most recent are the industries characterized by microliths, such as the Yadegawa, represented by small blades and small cores; the Ijima I, which has tools somewhat similar to geometric microliths; and, though not definite, the Sone, which has many microscrapers. Judging from the results of excavation at the Ijima site, Kagawa Prefecture, conducted by Mr. Yoshimasa Kamaki and others, Ijima I is thought to underlie small blades and cores (Ijima II) like those of Yadegawa. Therefore, setting aside the status of the Sone for the time being, among the microliths, the most recent ones are those of the Yadegawa culture. The microliths at Yadegawa mainly consist of very small blades, which must of course be considered to have been made into composite tools. In a composite tool, a vertical groove is carved on a wooden or bone shaft, into which small blades or flakes are fixed so as not to move, and the whole thing is made like a saw. In Europe and in Africa this technique began toward the end of the Palaeolithic and prevailed in the early Mesolithic. Therefore, the appearance of this composite tool at the end of the preceramic era of Japan is extremely significant.

If a microlithic culture such as seen at Yadegawa later incorporated or invented new elements like pottery or ground stone tools, then at the earliest stage of the Jomon culture, microlithic technique should naturally be retained. In fact, in Europe and other areas, the microlithic tradition did not disappear in the Neolithic and thereafter but long persisted. In Japan on the other hand, microlithic technique hardly ever survived in the oldest Jomon traditions hitherto known. This is an important fact.

At the beginning of the Jomon period, three principal traditions*, adjacent to one another, are known throughout the whole area from Hokkaido to Kyushu. [* Serizawa uses here and in the following the term bunka, meaning "culture", to refer to the cultural complex associated with a given pottery style and also sometimes to little more than pottery styles. I shall take the liberty of using terms such as tradition, style, etc., when Serizawa uses the term bunka.--tr.] They are associated, respectively, with the pottery style with incision and shell designs, distributed from Hokkaido through the Tohoku and Kanto; with the pottery style with string impression and cord impression, which has a limited distribution in the Kanto; and with the pottery style with roulette design, taking in the northern Kanto and the Chubu through Kyushu. In addition to these, as peripheral traditions, there are those of the Urahoro style pottery and a special roulette style pottery, both of Hokkaido, and pottery with punctate and incised design, typified by the Sobata style, which is known in western Kyushu, Goto Islands and other southerly islands. Among them, the pottery with string and cord impression of the Kanto region is considered to be the oldest; nothing as old as this has been recognized elsewhere. Thus a diagramatic presentation of this situation would be as shown in Fig. 3.

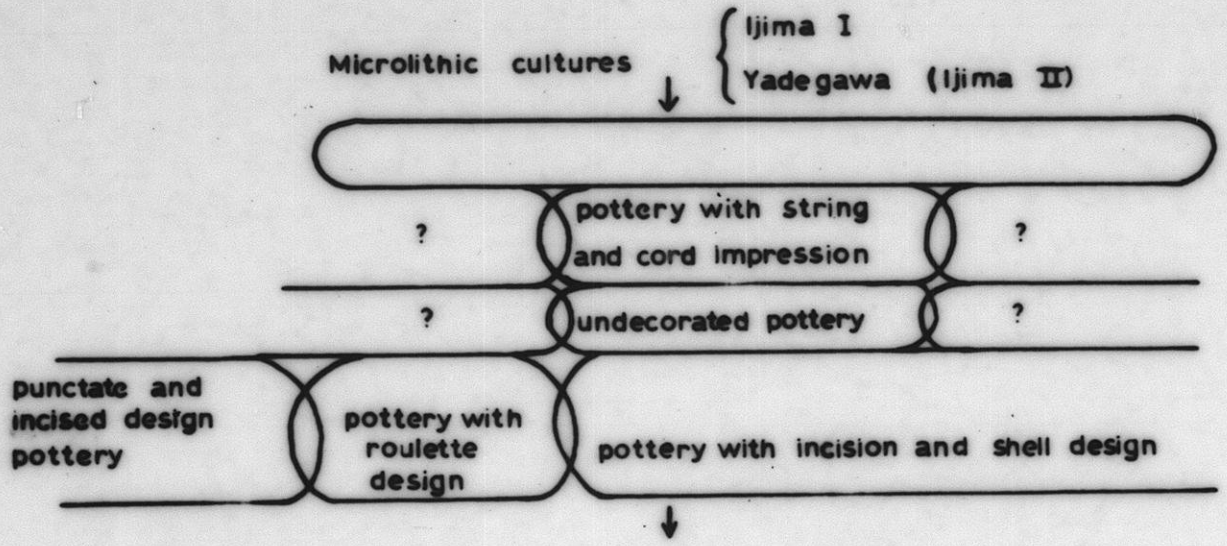

Fig. 3. Model showing the terminal period of the preceramic culture (proceeding from top to bottom)

What is strange about this diagram is that the oldest parts, to be correlated with the string impressed pottery of the Kanto, are still blanks in the Tohoku and the north and in the Chubu and the west. How can we interpret this fact for areas other than the Kanto?

Many situations can be hypothesized. First of all, the most appropriate one is that the pottery which should be there has not been discovered due to insufficient investigation. A second interpretation is that in areas outside the Kanto, preceramic cultures persisted and existed contemporaneously with the string impressed pottery. A third is that these areas were uninhabited, leaving no human artifacts.

Leaving the second and the third possibility aside, interesting new materials are beginning to be discovered from many areas regarding the first one. In the first part of December of last year, as part of Prof. Kiyoo Yamanouchi's research project, we excavated the Motonoki site in Tsunan Town, Nakauonuma County, Niigata Prefecture. The Motonoki site contained a quantity of points which are specially slender for preceramic specimens; and from the top soil were found thin potsherds which all seem to belong to one vessel. This pottery has a very small, flat bottom and a peculiar design formed by making a series of cord impressions horizontally on the surface, belonging probably to a new style hardly noticed before. About half a year before the Motonoki excavation, Mr. Kozaburo Nakamura and others of the Nagaoka Municipal Museum of Science studied the Unoki site, located on one terrace lower than the Motonoki site. While the Unoki site mainly contained roulette design pottery, at places sherds of a new style--the same as that of Motonoki--are said to have been also discovered. Pottery with similar design is known only from Gumma Prefecture (in Mr. Tadanori Aizawa's collection) and one or

two other places, and details about it are not yet known. However, in the Chubu there is a good possibility that this pottery may antedate the roulette design pottery. For in the Chubu there is evidence that until fairly close to the second half of the Initial period the roulette design pottery prevailed and that thereafter until the end of the Initial period /the sequence/ is filled with pottery similar to the Shiboguchi style and styles contemporaneous with the Kayayama. The pottery discovered at Motonoki does not correspond with any of these and may be thought to parallel some style belonging to the string-impressed design of the Kanto. At a site in Gifu Prefecture, which is now being investigated by Mr. Hiroshi Komura, a special pottery with cord design has been found together with many scrapers and arrowheads. Interestingly, this pottery again has the strong possibility of antedating the roulette design pottery. In Fukushima Prefecture, the pottery which has been thought to be the oldest is that parallelling the Lower Tado style; Mr. Kunimoto Aota has detected the presence of a still older style and is now analyzing it. Thus we may say that in the Tohoku, too, the search for older pottery has begun.

Mr. Yoshimasa Kamaki, who is continuing his research principally in the Chugoku region, has noticed that there are sites which, while producing many arrowheads, have yielded very few sherds. According to him, arrowheads found in these sites (such as Ijima, Kagawa Prefecture, and Tateba I., Okayama Prefecture) have a special form which is not seen in any of the periods throughout Jomon or Yayoi. In the rare cases of pottery association the sherds are worn and small, rendering identification of their character difficult. But Mr. Kamaki thinks that this pottery might be one to fill the gap between microliths and the roulette design pottery in the Inland Sea.

A similar situation is known in Nagano Prefecture, also. From the lake bottom site, Sone, in Lake Suwa, a large number of arrowheads with special forms have been found besides what is thought to be microliths. Among them are some whose form shares common elements with arrowheads of Ijima and Tateba I, and which Mr. Eiichi Fujimori and others are considering possibly placing before the roulette design pottery.

When we realize these situations, we see that pottery styles of the Initial Jomon period which once seemed to have all been discovered have ample possibilities in the future of being supplemented with yet unknown styles. In particular, there is an urgent need to focus our attention on the blank periods prior to the roulette design pottery of the Chubu and west thereof and prior to the incised design pottery of the Tohoku and Hokkaido. Will pottery styles as old as the string impressed pottery of the Kanto be discovered in all parts of Japan? Our immediate objective lies, it may be said, in the solution of this problem. In Volume III: Jomon Culture of Nihon Kokogaku Koza, published last year, I wrote as follows: 'Whatever the relation may be, several large cultural currents of different pottery and stone tool traditions came in contact with one another all over the Japanese Archipelago and soon merged into one Jomon culture. The truth of the matter is, however, that with the knowledge available at present, we cannot say anything definite. Lastly, if there were any region where the former, preceramic culture had remained, then it is also important to know where and in relation to which pottery styles this happened. Judging from manufacturing techniques, forms and distribution of stone tools, my present thinking is that the pottery tradition with roulette design of the Chubu through northern Kyushu might be a likely candidate; but the nature of the relationship is very obscure. For

this to be clarified, the lower limits of the rouletting tradition and the upper limit of the small tool traditions must be known."

Progress in archaeology is slow, indeed. Even then, one might say that our thinking has progressed somewhat since last year. Problems of the origin of the Jomon culture and the termination of the preceramic culture, however, remain in the earth beyond reach of our spade, in darkness beyond reach of our reasoning. Therefore, hypotheses such as discussed in "Study of the Origin of the Jomon culture," which Mr. Teruya Esaka published last year, must be admitted only as being an interpretation with a premature conclusion. "The culture associated with pottery having roulette style design is the first ceramic culture which, after preceramic man had accepted the Igusa style tradition, he developed on his own. His own traditional stone tools--small flake tools--were more efficient and convenient than those which diffused with the Igusa style pottery tradition, and for this reason they [small flake tools] were perhaps preferred."

The study of the earliest Jomon pottery styles must be backed up by the associated lithic assemblages, and only when the nature of their respective bone-antler tools are also known, comparison of the triad groups becomes possible. There has not been a sufficient amount of bone-antler tools of the Initial Jomon culture for mutual comparison; but as for stone tools, somewhat coherent results have been available. Starting our overall view from the north, the Urahoro style pottery of northern Hokkaido has been abundantly associated with blades, blade cores, blade arrowheads and burins, as has been made clear through investigations of Mr. Yonetaro Saito and Mr. Takemitsu Natori. Also, the roulette design pottery which Mr. Toshio Oba studied was associated with pebble tools and oval scrapers. Pottery having

incised and shell decorations, represented by the Sumiyoshicho style pottery of Hakodate, is associated with axes made by sawing, arrowheads, notched long scrapers and stone bowls. With the Shirahama style pottery, which is said to be the oldest in the Tohoku, were found arrowheads, ground axes and lance-heads. The string-impressed pottery of the Kanto is so far the oldest pottery tradition in Japan. This is typically associated with partially ground and partially chipped pebble tools, stone bowls and mortars, implements made on flakes being hardly known. The roulette design pottery, which is distributed from the Chubu through eastern Kyushu, is found with arrowheads, broad scrapers, crude points, grinding stones, mortars and (though only rarely) ground axes.

Thus surveying the stone implements of various regions of the Initial Jomon period, it is clear that all of them had rid themselves of the preceramic traditions and transformed themselves into new forms. It is first of all noteworthy that the microlithic technique is nowhere observable. The blade technique associated with the Urahoro style pottery is problematic; but since this is limited to northern Hokkaido and moreover since its dating lacks accuracy, I would like to postpone this problem. Apart from this, the culture associated with roulette design pottery, whose stone inventory consists mainly of flake tools and which, besides, is widely distributed from the Chubu to eastern Kyushu may be given some consideration in relation to preceramic cultures. This, however, necessarily requires the hypothesis that the roulette design pottery is the oldest style in the area from the Chubu to Kyushu. When a pottery antedating the roulette design pottery is recognized--which possibility is ever increasing--thus proving this hypothesis false, it must be revised.

The problem of the termination of the preceramic culture, just as that of its origin, imposes several fundamental tasks which must be accomplished. Proper understanding will become possible only after this is done. It is for this reason that I intentionally entitled this paper "remarks."

Note: For details concerning preceramic cultures, please refer to: Chosuke Serizawa, Kokogaku Noto, vol. 1: Mudoki Bunka, Nihon Hyoron Shinsha, 1957. [Translated above].

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JAPANESE VIEWPOINTS AND FOREIGN VIEWPOINTS

(Nihon no Me to Gaikoku no Me)

by Chosuke SERIZAWA

(Kaizuka, No. 72, pp. 1-2. Tokyo, 1958)

There seems to remain among some Japanese a peculiar custom of not easily believing their own eyes until their attention has been called by foreigners. Without resorting to the famous story about ukiyoe and the Kyusei Kannon at the Yumedono whose beauty, it is said, was rediscovered by Fenolosa, we can find many examples such as these all around us. In the field of archaeology, too, the tendency is not lacking gladly to listen to opinions of foreign scholars but not to show any inclination to understand works by Japanese researchers regarding the same matters. Progress in Japanese archaeology cannot easily be hoped for if one were to show interest in research within Japan only after evaluations by scholars of foreign countries. I am extremely well aware of this in the field of preceramic research.

There is an article written by Mr. Shoichiro Yoshida published in Vol. 43, No. 1, of Kokogaku Zasshi. This is a review of Senshi Shuei written by Father John Maringer of S. V. D. Archaeological Institute. This work of Father Maringer's deals with artifacts of the Palaeolithic period of Europe and its discussions are detailed. I believe that it is an appropriate book for us to keep beside ourselves and use as our research guide. The problem lies in Mr. Yoshida's manner of thinking which is expressed in the review.

That "before we claim the ignorance of foreigners about Japan, we Japanese should accept foreign knowledge" is Mr. Yoshida's advice to preceramic specialists. Apparently accepting in toto the theses presented in the several papers which Father Maringer has published, he also states that he cannot comprehend the writer's view expressed in Vol. 66, no. 5 of Shigaku Zasshi (section on prehistory).

It goes without saying that research concerning preceramic culture of Japan has not seen many days since its beginning and that sufficiently satisfactory results have not been produced. As I have reiterated several times, we must first solve problems concerning typological classification of tools, association of tool types, chronology of industries, spatial distribution and geological status. Only after these basic studies have progressed to a certain extent, can the relationship with Palaeolithic and Mesolithic cultures of continental areas be topics of discussion. Without such foundations no matter how many works may appear and no matter how famous a foreign scholar may write them, they will inevitably result in an empty, armchair argument. The history of research regarding the origin of the Jomon culture and the beginning of the Yayoi culture has continually provided us with silent warnings. The similarities between New Guinea pottery and Middle Jomon pottery did not finally nurture development of a southern origin hypothesis. Nor did the resemblance between the stone axes of the Kikuna Shellmound and those of the Hoabinhian culture result in demonstrating the connection between Indochinese culture and the Early Jomon culture. These are merely comparisons of superficial phenomena. The contemporary Japanese archaeology, it may be said, has raised its standard to a level

where such easy speculations are completely inadmissible. As for the origin of the Jomon culture, recognition of pottery types of the early Initial period, which is the first task to be accomplished, is as yet incomplete, and its solution is an urgent necessity at present. Also, concerning the beginning of the Yayoi culture, in spite of the fact that a special committee of the Japanese Archaeologists Association has been carrying out investigations for the past several years, we still cannot say that the sequence and regionalism of Early pottery types have been worked out. Should anyone argue the origin of the Jomon culture or of the Yayoi culture superficially without taking these matters into consideration, the result is self-evident. And the situation is the same also for the preceramic culture. What I note, seeing the three articles by Father Maringer reporting on the stone tools unearthed at Gongenyama, Gumma Prefecture, is that his knowledge of research findings concerning preceramic cultures of Japan and the Kanto loam layer is insufficient, probably due to the difficulty of the Japanese language. If three cultural strata or industries are recognizable at the Gongenyama site, the first consideration should be: what are their respective positions among preceramic cultures of Japan? Secondly, careful examinations must be made of research findings concerning the positions of several industries in the Kanto loam layer and concerning the Kanto loam formation itself. Father Maringer has completely ignored the first problem, and as for the second problem, he did not attempt to go deeply into recent research results. Moreover, he tried to argue first the relationship with outside, a problem which we carefully guard against and do not approach. The observation that the pear-shaped hand-axe of the Gongenyama I and the tools of the Gongenyama II are derivative of the chopper-chopping tool industry, which is said to be

distributed in Burma, Indochina, Java, etc., or more specifically the Patjitanian tradition, can be made only by Father Maringer and it probably is true. But I am singularly amazed by his boldness in arguing that the Gongenyama III tools probably have relationship with the Indochinese Hoabinhian culture. I have some doubts as to whether the Gongenyama III implements are sufficient to compose a single industry. And, in more than a hundred preceramic sites, I do not know of the existence of similar implements. Even if an industry called Gongenyama III should be recognized in the beginning of the Post-Pleistocene, we should first examine its mutual relationship to point or microlithic industries which clearly exist in Japan. Also, we cannot ignore its relationship to the twined cord design pottery tradition which is placed at the beginning of the Initial period of the Jomon culture. It is in this sense that we desire foreign scholars to learn the internal situation of Japan. If they are to express their opinions about the Stone Age of Japan, I wish that they would pay careful attention to researches being conducted in Japan. I would like them to know that we never disregard relationships with the outside world but that because we have a deep interest in this we are making careful preparations.

That the Hoabinhian culture discovered in Indochina consists mainly of large, crude chipped implements made of pebbles and that it seems to date from the beginning of the Post-Pleistocene, was long ago argued by Miss Colani and Mr. Mansuy. Implements belonging to this Hoabinhian culture have been compared several times in the past with tools found in Japan from many points of view. The first to propose this was probably Dr. Van Stein Callenfels. Visiting Japan in 1922, he was amazed at the pebble tools found at the Shibuguchi Shellmound. Following this, he visited the excavation

of the Kikuna Shellmound, Kanagawa Prefecture, which belongs to the Early Jomon period, and observing the crude, partially ground stone axes or pebble tools uncovered there he pointed out their similarities with the Hoabinhian II culture. About 1940 the Inaridai pottery, which was then the oldest pottery in Japan, was discovered. Mr. Teruya Egami inferred that the associated partially ground stone axes and pebble tools were related to those of the Hoabinhian culture. He has not abandoned this idea and after returning from southeast Asia recently he has stated a similar hypothesis in the Yomiuri (January 3). Again, Mr. Masao Oka has shown his inclination (in Zusetsu Nihon Bunkashi Taikei Vol. 1) to see in the hand-axes excavated from the lowest level at the Iwajuku site, Gumma Prefecture (Iwajuku I) Hoabinhian cultural tradition. Therefore, the above-mentioned thesis of Father Maringer's is the fourth which tries to see influence of the Hoabinhian culture on stone tools of Japan. If the geological date of the Hoabinhian culture is immutable, what is the meaning of the opinions of the scholars who attempt to correlate it with the Early Jomon period and Initial Jomon period or with the preceramic Iwajuku I and Gongenyama III, respectively? The only way out of this confusion is through accumulation of basic work in Japan.

There is a similar problem with regard to the microlithic culture. Mr. Hitoshi Watanabe has written an article called "The so-called lames in Japan" in Vol. 60, No. 2, of Jinruigaku Zasshi [1948] and discussed the microlithic problem of East Asia. He was not mistaken in denying the so-called blades from Sone. But problematic was his further discussion of distribution of microblades in northeast Asia. According to his opinion, the microblade technique is limited to the 40th parallel, south of which it did not extend.

He concludes that the fact that the microblade technique "is found in Hokkaido but not in Honshu will provide a clue to the understanding of Japan's Stone Age." According to our study, not only Hokkaido but the Chubu, Kinki, Chugoku and Kyushu are all included in the distributional sphere of microblades, and we cannot so easily determine the boundaries. Moreover, Japanese microblades are characterized by their lack of association with pottery, that is, by their being preceramic. They do not, it should be noted, appear to be products of the more recent, Neolithic period, as Mr. Watanabe thinks. In China, the blank between the Upper Cave of Choukoutien and the Painted Pottery culture has not been filled until recently. But in the past year or so a non-ceramic culture associated with microblades (Shayüan culture) has been discovered along the Yellow River. Investigators seem to regard this as Mesolithic or proto-Neolithic. It is a joy that Japanese and Chinese archaeology is progressing in the same direction.

Dr. Kazuchika Komai has mentioned Chinese and Japanese microliths in Vol. 2, No. 3, of Rekishi Kyoiku and made the following inference. That is, whereas the exact age to which Chinese microliths belong is not clear, in Japan, microlithic technique can be recognized in the Jomon culture but it is not seen in the Yayoi culture. Therefore, the microlithic culture in the northern periphery of China probably has some connection with the Jomon culture of Japan. I do not know the details of the basis on which Dr. Komai is inclined to recognize microlithic technique in the Jomon culture. As far as our investigations are concerned, this has never been substantiated. If one were to compare Chinese microblades with those of Japan, one should first take those which are not associated with pottery, such as the Yadegawa industry.

It goes without saying that students of Japanese archaeology should have a "world-wide perspective." But we must not forget to try to advance in Japanese archaeology from the point of view of Japan without being bound by established theories on world history. Incidentally, among the young people studying preceramic cultures, the problems of core tool and flake tool and of the use of the hand-axe, are already common sense without being explained by Mr. Yoshida. A writer of Watakushitachi no Kokogaku (No. 13, p. 17),* I imagine, cannot help laughing at this.

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*Reference here is to Kamaki, Yoshimasa: Nishi Nihon no mudoki bunka, Watakushitachi no Kokogaku 4:1 (whole no. 13): 15-22, 1957.

DEVELOPMENTS IN MICROLITHIC PROBLEMS, I.

(Saisekki Mondai no Shinten, Sono Ichi)

by Chosuke SERIZAWA

(Kaizuka, No. 82, p. 1. Tokyo, 1958)

Did the so-called microlithic culture exist in Japan? Conscious search to solve this problem began only after the beginning of the Showa Era when arguments regarding the origin of the Jomon pottery became popular. It was the theory of Prof. Ichiro Yawata in his youth that the culture at the very beginning of the Jomon period had Mesolithic characteristics, as one of which microlithic techniques were to be found. Rereading his papers on this theory, we realize that among the data he used are many specimens which are not necessarily microlithic; but we must not forget him as a forerunner of microlithic research. Prof. Kiyoo Yamanouchi, who has always played a leading role in the study of Jomon pottery, on the other hand, took a definitely negative stand regarding this matter. That microlithic techniques are not at all observable in the Initial Jomon stone tools of the Kanto, Tohoku and Hokkaido was the basis of his objection. This was also true. When two scholars propound contradictory views, the data at the disposal of each of them play a large part. Interestingly, Prof. Yawata was born in Shinano Province and has long regarded the Chubu region as his specialty whereas Prof. Yamanouchi was born in Tokyo and has made the Kanto and Tohoku his fields of specialization. Their respective methodologies aside, behind the formulation of these two contrasting views I would like

to think that the difference in the geographical areas of specialization played an important role. Although after twenty years, microlithic problems of Japan now have an entirely fresh outlook, it cannot be regarded entirely a coincidence that the distribution of microblades is, so far, densest in the Chubu whereas they are hardly found in the Kanto and Tohoku.

Soon after we discovered that there had been an age before the Jomon in which pottery was unknown, we began to suspect that microliths might be included in this preceramic period. This suspicion was motivated by the discoveries of two microcores at the Nenokami site, Itabashi Ward, Tokyo and of several microcores at the Washiuzan site, Okayama Prefecture. About this time Mr. Yoshimasa Kamaki, Mr. Naohiko Makabe and Mr. Mamoru Takahashi had just begun a general survey of the Washiuzan site. It is interesting that at about the same time microcores began to have significance both in Tokyo and in Okayama. But it was through the excavations of the Yadegawa site at Nobeyama, Minamimaki Village, Minamisaku County, Nagano Prefecture, conducted twice, in September and November of 1954, that decisive materials were revealed. Mr. Kamaki, too, excavated the Washiuzan site at Shimotsui, Kojima City, Okayama Prefecture in December, 1954 and also the Ijima site, Naoshima Village, Kagawa Prefecture in August, 1955, ascertaining the presence of microlithic culture along the Inland Sea coast. Let me present a brief summary of the findings.

From the Yadegawa site several hundreds each of microblades and microcores were found, together with a few points retouched along edges of one side, scrapers and other tools. The material used is mostly obsidian, but some shale, crystal and other materials are also present. The level from

which they were found was a layer of blackish decomposed organic matter and the uppermost portion of a loam layer. The level in which artifacts were primarily contained was the uppermost portion of the loam and immediately above the loam. Most of the microblades were 2 to 4mm wide, 1 to 3cm long and 1 to 2mm thick. Microcores were in most cases conical, being about 1 to 3cm long.

Artifacts from the Ijima site can be divided into two groups, which Mr. Kamaki distinguishes as Ijima I and Ijima II. Those belonging to Ijima I are made by minutely retouching along the side of a small laterally long flake. [What is meant by this term is not very clear. Apparently they were struck off from a core roughly at the midpoint of the length of the flake, rather than from one end of it. "Side-blow flake" is the term used by Serizawa and Ikawa.--tr.] Shapes are various, some being similar to the willow-leaf shape and the kiridashi knife and some others being triangular and like a pen-point. Most of them are made by the backed blade technique. A great majority of them are made from andesite. Among those belonging to Ijima II are microblades and microcores. An examination of the form of the microcores, in particular, shows that they are the boat-shaped variety with flutings at one end, unlike the conical type of the Yadegawa site. Moreover, not infrequently the edge opposite to the platform is made sharp, like an end scraper. According to the investigation by Mr. Kamaki and others, Ijima I antedates Ijima II. Microliths from the Washiuzan site (Washiuzan III) have the same characteristics as Ijima II. Their description will therefore be omitted here.

Late in the fall of 1957 the Araya site at Kawaguchi-cho, Kitauonuma County, Niigata Prefecture was discovered by Mr. Michiyasu Iguchi and Mr. Yoshiro Hoshino, whereupon microlithic problems appear to have developed

into a new phase. With the cooperation of Mr. Iguchi and Mr. Hoshino, I conducted the first excavation of the Araya site in June, 1958. As a result the following interesting facts have been revealed.

The principal tool types of the Araya site are microblades and Araya type burins. With them, boat-shaped tools, long scrapers, arrowhead-like tools and pebble tools are found in some number. The microblades are somewhat more slender than those of Yadegawa. They have a pointed end and are beautiful. Also, the main flake surface is characteristically curved inward. Retouch is applied all around one side and to a portion of the other. What has been called the Araya type burin is made generally by taking a rather long flake, preparing it like a unifacial point and making a graver facet on the left shoulder. Very often they are minutely retouched at the base of the main flake surface. The boat-shaped tool has a form which, at the first glance, is like a large-headed whale, at the head of which are beautiful flutings. The platform is flat and has no trace of use or scratches. The arrowhead-like implements are small unifacial points and are very much like the stemmed arrowheads of the Jomon period. All the implements described above are made of shale.

Tools of the newly discovered Araya site, when compared with materials known until then, have strange characteristics, namely that there are over 400 burins, that more than 1,000 microblades were unearthed in spite of the fact that no microcores of the Yadegawa type were associated, and that instead a small number of boat-shaped tools was found. Implements were found in a sand layer containing loam which overlies a hard, light bluish sand layer. According to Mr. Kazuaki Nakamura this was formed in a period immediately after the loam deposition had been completed.

Now, the above discussion has made it clear that three preceramic cultures primarily characterized by microblades have existed in Honshu, typified by Yadegawa, Ijima II and Araya. Next, it is necessary to review the situation outside Honshu. I was long concerned with the fact that there were some peculiar burins among the stone tools which Mr. Yoshindo Matsudaira had collected from Hokkaido. It was early in the last winter that I came upon the idea that the form /of these burins/ had all the characteristics of the Araya burin. Suspecting, therefore, that the distribution of implement types of Araya might extend over to Hokkaido, I made it the objective of this past summer to carry out research in Hokkaido. Because Mr. Matsudaira's material suggested that the Tachikarushunai site in Engaru Town, Mombetsu County and the Tachikawa site at Kombu, Rankoshi Town, Isoya County seem to be very hopeful in producing Araya type burins, I decided to do trial excavations at these two sites. The result of the excavation ascertained the association of Araya burins, microblades and the boat-shaped tools in Hokkaido. Microlithic problems are thus proving to have a more and more strange and complex character.

(Note) I have thus far used the terms "small blade" and "small core" as against ordinary blade. Recently, however, I am considering it convenient to establish subdivisions, on the basis of size, of microblade, small blade, medium size blade and large blade. I, therefore, used the term "microblade" in this paper.

DEVELOPMENTS IN MICROLITHIC PROBLEMS, IV.

(Saisekki Mondai no Shinten, Sono Shi)

by Chosuke SERIZAWA

(Kaizuka, No. 96, pp. 1-2. Tokyo, 1960)

I. Affinity of the characteristic features of microliths of northern Japan.

Microliths seem to have been used only in the preceramic period in Japan. This fact is quite important. Disregarding distant regions for the time being, in Siberia and China -- which are adjacent to Japan -- microliths are thought to have been very often associated with pottery. In particular, in the Trans-Baikal area, through the Isakovo, Serovo and Kitoi periods, they were used with pottery, ground stone tools and stone arrowheads. The fact that both in Serovo and Kitoi times bifacial side blades, rather than microblades, are numerous is also noteworthy. Thus it may be said that microlithic traditions lasted from about 4,000 B.C. to 2,000 B.C. Before the Isakovo, that is, during the Khina period, pottery has not been found to have been used. But the bow and arrow are said to have first appeared during this time. Khina stone tools are made by a technique similar to that of the blade arrowhead of Japan, being characterized by retouch on the back of the blade. Discovery of microblades, end-points (bifacially retouched tool of arrowhead shape), blade arrowheads, and shouldered blade arrowheads is reported. The shape of the microcore is unknown. The distribution of such blade arrowheads has been traced as far as Ladefuskaya in the Amur

Valley and they have been unearthed at Hulunbuit and Angangchi in China. Since the Khina culture is dated to 5,000 B.C. [?], the blade arrowhead industry, which is found only in northern Hokkaido, probably is part of this group.

But the industry which principally consists of microblades and the Araya type burins--for example the assemblages typified by those of Sakkotsu and Araya--has not been discovered in China or Siberia yet. If we consider the origin of the Jomon culture to be about 7,000 B.C., the time when the industry of Araya and Sakkotsu was prevalent must have been about 8,000 B.C.

Before the appearance of the microblade industry in Hokkaido, an industry characterized by the boat-shaped tool, blades, burins (including the Araya type) and bifacial points, such as seen at Locality 33 and Locality 30 at Shirataki or Localities B and C at Tachikarushinai, is thought to have existed. The assemblages at these sites have resemblances to that at Verkholenskaia Gora, as Masakazu Yoshizaki has pointed out. Boat-shaped tools with scratches, in particular, will probably play an important role in inferring the relationship between the two areas. We would especially like to know whether the boat-shaped tools of Verkholenskaia Gora have scratches.

Boat-shaped tools with scratches have been found in quantities at Locality B of Tachikarushinai and Locality 30 of Shirataki mentioned above. Since well executed fluting is done at one end of this tool, many spalls of the same shape as microblades are left. But on these spalls there is hardly any trace of secondary retouch. Therefore we cannot definitely say that these microblades were used as tools. We think that out of an industry having boat-shaped tools was born the microblade industry. If so, the

microblade industry of Japan--at least in Hokkaido--must have enjoyed conditions which enabled indigenous growth, rather than having been diffused from outside. Since no pure microblade industry, from which the Sakkotsu industry might be derived, is known in Siberia, at present it may be permissible to claim an autochthonous hypothesis.

II. Characteristic features and derivation of microliths in western Japan.

We cannot help saying that the study of microliths in western Japan is retarded when compared with northern Japan. This is particularly true of Kyushu. In April of this year Mr. Yoshiaki Kamaki and the writer took a short trip in search of microliths in Kyushu. At that time we were given the chance to examine in detail the microliths which for several years Mr. Matsuoka and others of Karatsu city, Saga Prefecture, have been collecting, and we were able to assess their general nature. While there, we were able to get some information on the subject in Nagasaki, as well. The result of pooling together all this information was unexpectedly complex and we were impressed with the fact that the Kyushu microlithic situation was entirely different from that of northern Japan.

Northern Kyushu microliths have many typological peculiarities, as Mr. Kamaki has written in this journal. They are characterized by beautiful microcores with scratches, conical microcores, semiconical microcores, knife-shaped tools (resembling the Ijima I of the Inland Sea), trapezoids and crescents. There is a possibility that they might be grouped into several industries. Since Mr. Matsuoka has never done excavation and since there

is no report of the surface-collected materials, we have no detailed information. At present perhaps we can say the following.

First, concerning the microcores with scratches, we cannot decide whether they are simply cores or whether they were themselves used as tools. Cores of this kind have never been found east of the Inland Sea region. And, interestingly, they are similar to the scratched boat-shaped tools of Hokkaido insofar as they are scratched, and the form is similar, too. But whereas in Hokkaido they are made by breaking a bifacially retouched point, in Kyushu they seem to have been made from small obsidian nodules. In China (Mongolia), too, morphologically rather similar microcores have been found, though we do not know whether scratches are present.

Conical and semiconical microcores can be found distributed east of the Inland Sea as far as the Chubu region, although there is a difference in the material used--between obsidian and andesite. However, typical trapezoids and crescents are so far limited only to Kyushu. Of course they are unknown in China on the continent.

The technique of making a tool by breaking a blade in trapezoid shape becomes prevalent from the latter half of the European Mesolithic. But the so-called geometric microliths, such as triangle, crescent and others, are characteristic of the Tardenoisian culture of early Mesolithic times. Geometric microliths similar to these reached India, Ceylon, Indonesia and finally Australia. In particular, the middle (second) layer of the Toala cave on Celebes contained crescent tools and many other geometric tools and knives; and it belongs to the preceramic period. It is dated to after the beginning of the Post-Pleistocene and before 4,000 B.C. To be sure,

in Indonesia and Malay Peninsula the Bacsonian culture, with partially ground pebble tools, was known at the beginning of the Post-Pleistocene, and microliths are considered to have appeared after this.

Among Mesolithic Siberian sites, too, there are some which have produced pieces similar to the geometric microliths of the Tardenoisian. In the Trans-Baikal area, blades with the tips cut off in an angle, those close to the trapezoid shape and microblades are found with blade arrowheads. Similar pieces have been found in central Asia and are suspected to have had widespread relationships in the steppe region. The northern Kyushu microliths, it seems, are far more geometric than the so-called geometric microliths of the Trans-Baikal area.

III. Conclusion

Study of microlithic problems in Japan has been progressing year by year. If one recalls that only about ten years ago it was seriously argued whether or not there were any microliths, one cannot help but affirm this. The conclusions we have obtained so far are: in Japanese microlithic industries, too, there are radical regional differences; the Araya type burin has been added as an important member of the microlithic industry of northern Japan; insofar as Hokkaido is concerned, an hypothesis of indigenous origin of the microblade industry became possible; in northern Kyushu a group of tools very much like geometric microliths has been recognized; and the date of Japanese microliths probably goes beyond 7,000 B.C. On the basis of such information we must tackle future problems. Due to the limitations of space, I was not able to review the microliths of the Aleutians and Alaska or to include illustrations. Somewhat detailed writing on the stone tools of Hokkaido is available in Volume I of SEKAI KOKOGAKU TAIKEI, to which I refer the reader.

KAMIYAMA -- REPORT OF THE INVESTIGATION OF THE KAMIYAMA SITE, TSUNAN TOWN, NAKAUONUMA COUNTY, NIIGATA PREFECTURE

(Kamiyama -- Niigata-ken Nakauonuma-gun Tsunan-cho Kamiyama Iseki Chosa Hokoku)

by Chosuke SERIZAWA, Kazuaki NAKAMURA and Masaru ASO

(Tsunan, Town Board of Education, 1959)

I. INTRODUCTION

A series of important discoveries and investigations have recently been conducted in Tsunan town, Niigata Prefecture. In May, 1956, the Unoki Site, which yielded Initial Jomon culture remains, was excavated by Kozaburo Nakamura of the Nagaoka Municipal Museum under the guidance of Prof. Ichiro Yawata (University of Tokyo). In December in the same year, the author investigated the Motonoki Site, at which the type artifact is a projectile point of the preceramic stage; this forms a part of the study by Prof. Sugao Yamanouchi (University of Tokyo). Subsequently in June, 1957, an excavation was carried out by Mr. K. Nakamura at the Kosakabira Site, which yielded knife blades. As a result of the ample new materials unearthed through these investigations, a comprehensive research program in the general area of Nakauonuma county was instituted by the Educational Committee of Niigata Prefecture. A general survey was carried out in June, 1957, by the Archaeology Section of this research program, and some of the results are already published in the form of journal articles, reports, or books.

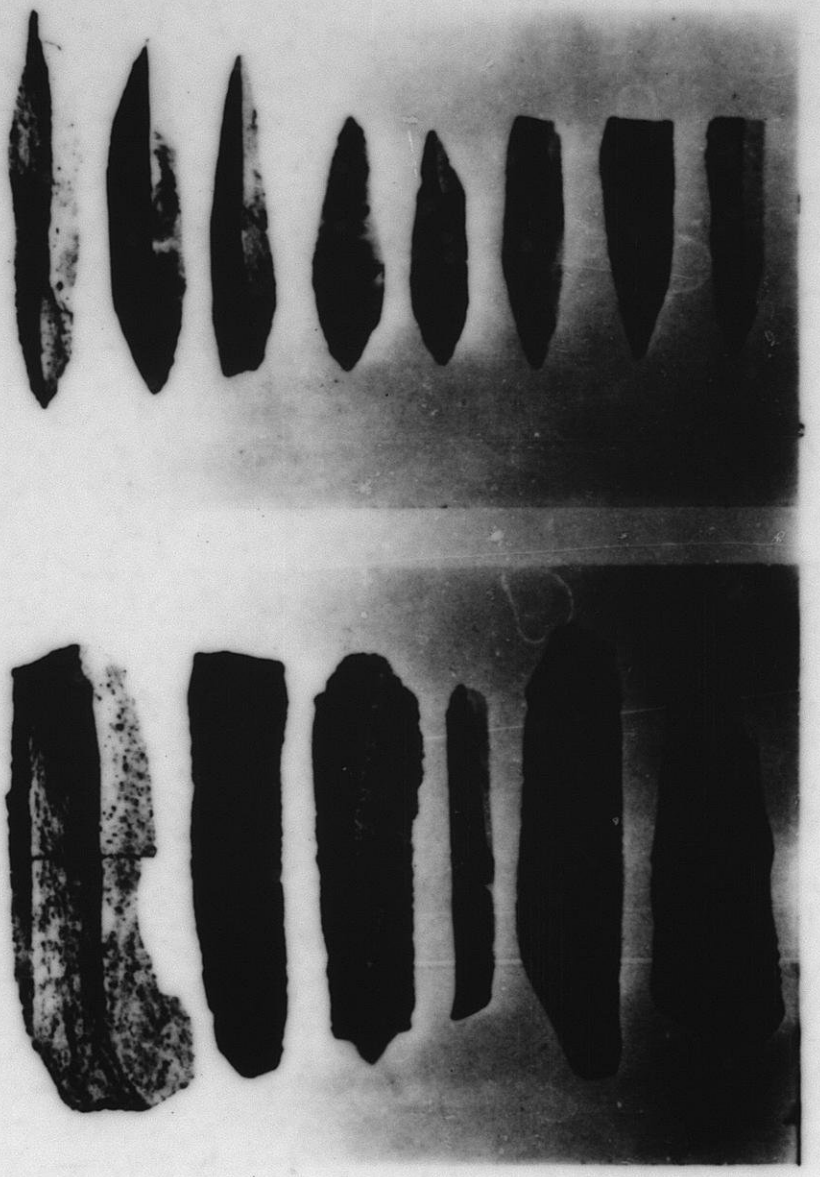

Plate 1: Top--Knife-shaped tools (Specimen numbers, from left to right, 16, 8, 9, 10, 1, 4, 20, 5). Scale--about 4/5
Bottom--Blades (Specimen numbers, from left to right, 57, 60, 65, 89, 26, 84). Scale--about 3/5



Plate 2: Top--Cores (Specimen numbers, from left to right, 100, 103, 104). Scale--about 2/3
Bottom--Burins (Specimen numbers, from left to right, 29, 55, 52, 37). Scale--about 4/5

These archaeological sites and remains would never have attracted the attention of academic scientists without the very painstaking efforts of the local volunteers who searched for them. Messrs. Toraji Ishizawa, Masashi Onozuka, Naganori Hirota and others have contributed much to the discovery and preservation of important sites and remains. We are particularly indebted to Mr. Toraji Ishizawa for finding such valuable artifacts as vessels of roulette design, projectile points, blades and knife blades. He undoubtedly deserves the title of the foremost pioneer in Tsunan town prehistory.

An open ear-ring like a Chinese Ketsu (玦) and some ceramic fragments, which are dated at the beginning of early Jomon period, had been known from the Kamiyama Site, but it was in the middle of May, 1957, that some blades and knife blades were first collected there by Mr. T. Ishizawa. On receiving this information, the author immediately visited Tsunan town with Mamoru Takahashi, a student at Meiji University, and examined the site under the guidance of Mr. Ishizawa. At that time, the site was on the verge of destruction on account of a paddy-field construction program. Notwithstanding Mr. Ishizawa's recommendation for an immediate investigation, the author took no further action, because he failed to confirm the presence of a definite cultural layer. Afterwards, through Mr. Ishizawa's continuous efforts for preservation of the site, a research project was instituted by the Educational Committee of Tsunan town. Preliminary arrangements were made by Masaru Aso in place of the author, who was then in Hokkaido. Thus the investigation was begun on September 8, 1958, and ended on September 14 with unexpected success.

We cannot thank too much the Education Committee of Tsunan town and Mr. T. Ishizawa, without whose help the research and, consequently, this

report could never have been realized. We are deeply indebted to Messrs. Shuichi Takizawa and Sashichi Nezu of the Educational Committee of Tsunan town. We cannot overlook also the kind help by Mr. Teiichi Kubota, owner of the site, who gave us permission to open up excavation trenches at will.

The excavation work was aided by members of the Educational Committee, volunteers of the Youth's Association, and Messrs. T. Ishizawa, N Hirota and Y. Adachi, but was mainly carried out by students of Meiji University (Y. Horie, T. Taguchi, T. Ueno, T. Furuoya) and a student of Kokugakuin University, T. Kobayashi.

In this report, Chapters 1, 4 and 6 were written by C. Serizawa, Chapters 2 and 5 by M. Aso and Chapter 3 by K. Nakamura. Figures of stone artifacts were drawn by four Meiji University students, (T. Ueno, T. Furuoya, Y. Horie, T. Matsuzawa) and Masakazu Yoshizaki. We express our thanks here to M. Yoshizaki for his useful comments on part of Chapter 5, as well as for the section profiles. All the photographs were taken by C. Serizawa.

(C. Serizawa)

II. DESCRIPTION OF THE EXCAVATIONS

This site, which is located at Nakatsurune, Shimofunato, Tsunan town, Nakauonuma county, Niigata Prefecture, is usually known by the name of "Kamiyama". Hence we named the site after the popular name.

The Kamiyama Site stands on the right terrace of the Shinano River, about 300 meters south of the Echigo-kazawa Station on the Iiyama line. The Motonoki Site, which produced numbers of projectile points during the

recent excavation, is near the Kamiyama Site, but the latter is situated on a higher terrace than the former, separated by another on which the bus road runs. While the Motonoki Site is 220 meters above sea level, the Kamiyama terrace is 319 meters, and is accordingly 100 meters higher than Motonoki (See Fig. 1). A high-voltage cable running from north to south across the side of the site serves as a good landmark for the visitor in spite of advance in the paddy field construction program. The terrace slopes gently down to the north, and to the east of the site runs a quiet stream, the result of erosion. Remains of preceramic age are scattered within a limited area of roughly 300 square meters, in which our excavation was done.

Paying attention to the land features as well as the farm sections, we set up three test trenches. Trench A is 20 meters from east to west, and 2 meters in width. Trench B, running parallel to Trench A, is 10 meters long and 2 meters wide. Trench C was placed at a short distance from the above two. For convenience in excavation, each trench was divided into small sections of two square meters, which were named Section 1, Section 2 and so forth from east to west. Excavated specimens were put in order on the basis of these small sections, while, at the same time, their stratigraphic relations were closely examined. On the top of this site is a humus layer of about 20cm.; next lies a black soil layer of 20 to 30cm., in which remains of the Jomon era were discovered. The third layer is a mixed one of black soil and loam. Such disturbance must have been caused by large-scale work for construction of paddy fields, since both preceramic and Jomon remains were found together in the same layer.

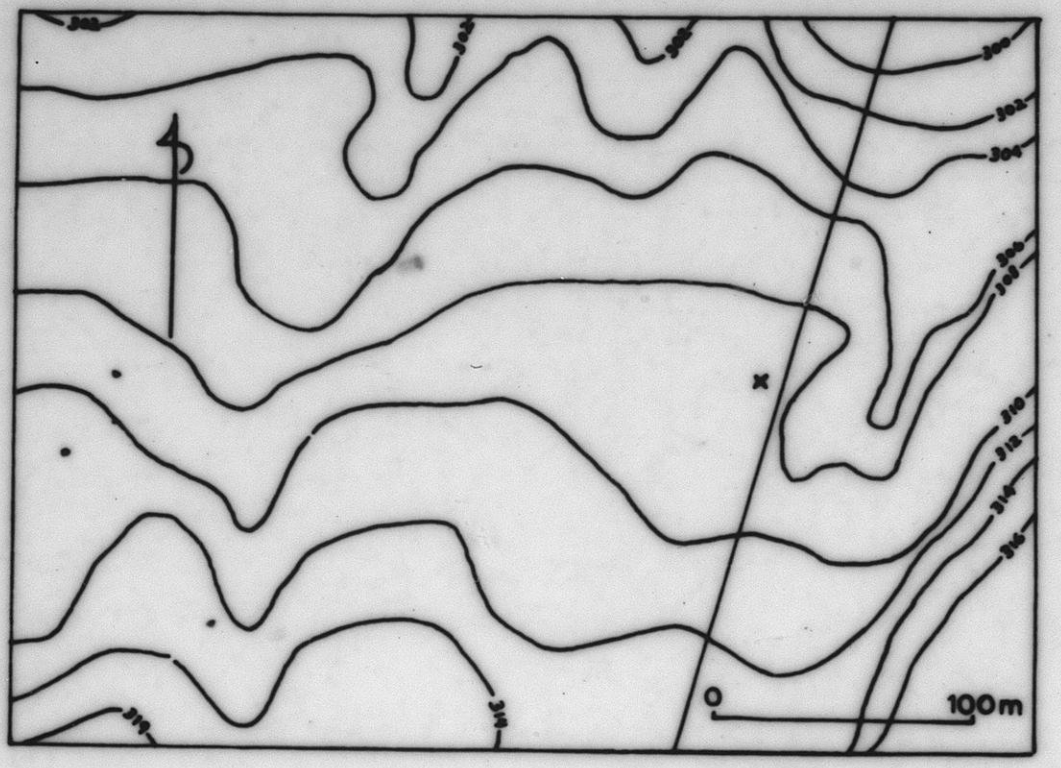

Fig. 1: Topographic map of the area in the vicinity of the Kamiyama site (x = the site)

The bottom layer at this site is composed of pure loam, from which only preceramic artifacts were unearthed. A test boring in a part of Trench A failed to reach river gravels at a depth of 4 meters, while loam gradually changed into clay. Preceramic artifacts were included in the upper part of the loam layer, to a depth of 30 to 40cm. from the top of this layer (See Fig. 2). Stone artifacts appeared to be concentrated in some three spots of about 4 meters in diameter. Trenches A and B were extended to clarify the nature of these groups of remains.

As a result of this, the three groups proved to be independent of each other, and were named Group A-1, Group A-2 and Group B. On the other hand, the exact depth and position of every specimen was recorded so that we might clarify the nature of the respective group. It could be ascertained that they lay in a nearly circular arrangement, but it was not clear as to whether there was a pit, or anything in the nature of a semi-subterranean dwelling site. The depth of artifacts of Group A-1 is described in the a-b section profile (Fig. 2). As shown in the profile, stone artifacts were found in the upper part of the loam layer of 30 to 40cm. in depth. Not a sign of construction, however, such as a house floor, fireplace or burned earth could be observed.

(M. Aso)

III. GEOLOGICAL SETTING OF THE LOCALITY

The writer studied this area merely as a part of the investigation of the synclinal structure of the Shinano River,* and therefore the following

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* A large-scale synclinal structure beginning in Nagano Prefecture and leading to the west of Niigata City, running west of Tokamachi, Ojiya and Nagaoka.

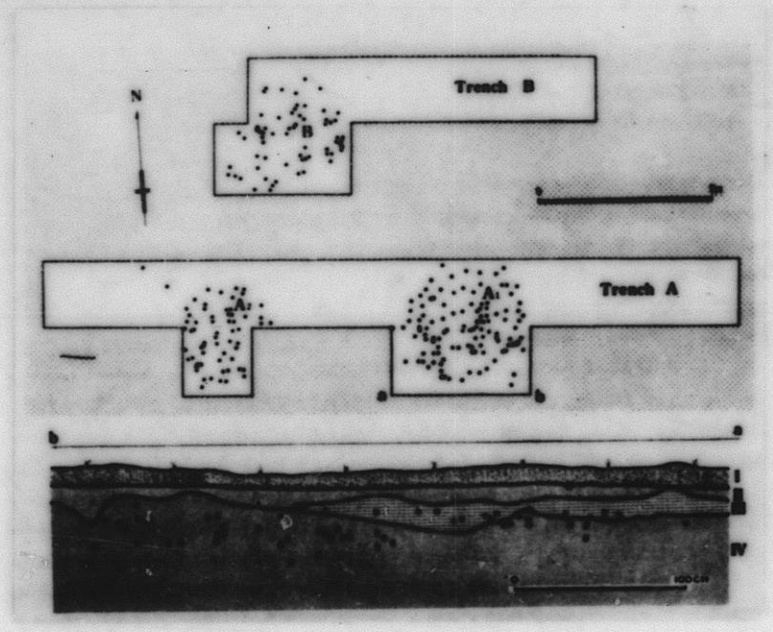

Fig. 2: Plan (top) and section (bottom) of the excavated area.

argument does not go into detail, but will present a broad outline which must be substantiated by future surveys. An area of several kilometers around the Site will be covered and mainly the topographic features will be described.*

Basement Complex:

The basement complex in this area is made up of the Oguni formation, namely the upper half of the Uonuma group [Plio-Pleistocene in age-T.N.] which is an alternation of cobble conglomerate and tuff breccia attaining a thickness of several meters. The former was deposited under flowing water and shows a definite structure of imbrication (mostly northward). The latter, on the other hand, consists of layers of massive volcanic mud flow containing abundant angular rocks. Rock facies is not uniform. Sometimes lignite beds are intercalated. There are huge cobble deposits of more than 200 meters thick, mostly consisting of granitic rock in the Osawa valley, a tributary on the right bank of the Kiyotsu River. In general, finer deposits increase to the north along the lower stream of the Shinano River.

The Oguni formation shows a synclinal structure of more than 10 kilometers in wave length, the folding axis of which runs roughly parallel to the national road on the right bank of the Shinano River. As may be distinctly observed on its northern extension to the west of Ojiya City[1] or at the Niigata gas field,[2] it is remarkably asymmetric in structure with a steeply

* See maps on the scale of 1:25000 "Owarino", "Akazawa", etc. published by the Geographical Survey of Japan.

1. Maps of Japanese oil field published by the Geological Survey, etc.
2. Niigata Prefecture; Report on natural gas, 1957.

sloping western wing. The asymmetric structure is well reflected on such topography as questas and younger depositional planes. The formation of this synclinal structure, which is observable at the Niigata gas field[3] and near Ojiya City[4] and which may well be traced back to the time of Oguni formation and is still now in action, has controlled the drainages of the Shinano River and in that way complicated the topographic features of the area. It seems highly probable that a fault is located under the steeply sloping western wing.

Geomorphic Planes:

(1) Questa: a group of questas on the left bank of the Shinano River is the oldest depositional plane in this area. Being formed by highly resistant rocks such as tuff breccia where the western wing of the Shinano syncline dips steeply southeastward by 20 to 40 degrees, they may well be regarded as bedding planes.

(2) The plane of low relief to the west of Atemayama. The summit level of it takes the form of a plane dipping northwestward by 10 degrees.[5] A

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3. Kazuyoshi Ida, Geology of the Niigata Oil Field, Bulletin of the Geological Survey of Japan, Vol. 6, No. 6, 1951.

4. Yanosuke Otsuka, The Investigation of Structural Geology, p. 179, Hobundo, Tokyo, 1952.

Setsumi Miyamura; Present Movement of Earthcrust in Japan, Chiri (Geography), Vol. 2, No. 10, 1957.

5. Sohei Kaizuka, Landform Evolution of the Kanto Plain, Chirigaku Hyoron, Vol. 31, No. 2, 1958.

gravel bed in the underlying Oguni formation is severely weathered, reddish in color and dead. (The direction of flow indicated by the imbricated structure is north- to northwestward.) In Japan, similar gravels are often found in the formations of the early half of the diluvium and they appear to be characteristic of those which have long been kept above the underground water level. Moreover, the gravel bed of the Oguni formation is not overlain by any terrace gravels and the dip of the plane is roughly parallel to that of the Oguni formation. All this indicates that the summit level of the plane of low relief is the depositional plane of the Oguni formation.

In the area between the Nakatsu and the Kiyotsu rivers, a low relief plane is lying to the southwest of a line, which connects Gennayama with Dobira and reaches Taniage. This plane may reasonably be correlated with that lying west of Atemayama, since they are quite similar in every situation. They can easily be distinguished from the following (3) plane in both relief and the direction and degree of dipping.

(3) The highest terrace plane: This plane dips down northwestward concordantly with the synclinal structure. Terrace scarps are about 330 meters high in the area between the Atema and the Nakatsu rivers and 430 meters at Okinohara.

Terrace gravels are found near Ichinokoshi--a gravel bed of more than 4 meters thick with the flow oriented northward--but it is hardly distinguishable from the (2) plane. The boundary might be delineated along the 490 meter contour.

In the area between the Nakatsu and the Kiyotsu rivers the boundary line between this and the (2) plane is clearly visible, yet no distinct terrace scarps are formed between.

At Okinohara, two planes of high relief are found above this one, and they are both underlain by lava flows. Judging from the reliefs and outlines, they are presumably the surfaces of lava flows, which might have flowed down from the south after the formation of the (3) planes.

The (3) planes are widely distributed in both lower and upper streams, on both right and left banks, and can be traced further to Nagano Prefecture. Terrace gravels are usually more than 10 meters thick, sometimes attaining 20 meters as in the case of those to the west of Gennayama. The underlying Oguni formation bears an almost complete similarity to that of the (2) plane and is possibly the highest horizon of the formation. It follows that the Oguni formation under this plane may not have been eroded to any extent.

The (3) plane, therefore, seems to indicate a certain stage immediately before the starting of down-cutting by the Shinano River.

(4) Terrace planes along the Nakatsu River: The Nakatsu terrace planes, which radiate like a fan from Funayama, are divided into five, and at the northern ends continue to the terraces of the Shinano River. The Shinano terraces, in contrast to those of the Nakatsu River, are underdeveloped in this area. An exact correlation of these terrace planes is not yet available, for they are very poorly surveyed. Hence we have to leave aside the question of correlating them with that of the Yokokura Site upstream in Nagano Prefecture, that of the Araya Site downstream near the junction with the Uono River, or with the structure of the Niigata gas field. The main difficulties in correlation are the different number of terraces in various regions, the difference in elevation from the present river floor and the underdeveloped terraces in gorge regions. Furthermore, they are

repeatedly cut off by meanders to the north of the junction with the Uono River and continue downstream to the underground structure known at the Niigata gas field.

Each terrace bears deposits less than 10 meters thick, the basement complex of which is the Oguni formation. The thickness suggests no down-cutting. Within a circle of at least several kilometers from the junction, a gradual decrease in sloping is shown by the longitudinal profiles of terrace planes from the two degrees of the (3) planes to the one degree of the present river floor. This implies that the Nakatsu terrace planes have been formed by uniform down-cutting from the time of the formation of the (3) planes. It is true that a volcanic ash bed overlies the terrace deposit on any of the planes higher than the Shomen terrace and this bed becomes thicker on the higher terraces. At the time when the present terrace on which the Kamiyama Site and Honoki Settlement are situated was a river floor, sand bars were formed just as are seen in the present lower-lying streams; these sand bars turned into islets, when the lower terrace of Kaisaka subsequently became the river floor; and when the Unoki terrace ceased to be a trunk stream, the Nakatsu River moved westward from the junction and began to flow on the Shomen terrace. It cannot be concluded from these data that the Nakatsu terraces are divisible into groups of essentially different characters.

The junction point of the Nakatsu River has gradually moved westward in the course of development of down-cutting, the traces of which are left on any of the terrace planes. All the planes including the present river floor are made up of smaller strips 200 to 300 meters wide separated by scarps some 5 meters high. Along the scarps of these smaller terraces are

developed small valleys, which are the abandoned drainages, as is also the case in the greater five terraces. A small stream running by the eastern side of the Kamiyama Site is an example of these small valleys. The process of terrace development is represented by features near the present junction point. A river floor developed with drainages on both sides, and every time that the western drainage became decisively advantageous through the westward movement of junction, the eastern one turned into a small valley, and a new river floor was formed to the west of the western drainage. The continuous formation of terraces in this way does not always correspond to the rapid uplift of land like that of the smaller terraces bearing small valleys in front of the back scarps, which are formed by development and cut-off of meander as seen near the junction with the Uono River. The five terrace scarps are more than several times thicker than those of smaller terraces, which means that the drainages remained considerably longer in the former than in the latter. This may be due to the greater stability of the trunk stream. Peculiar conditions of the tributaries, however, should be taken into consideration, since the Nakatsu terraces cannot be immediately correlated with those of the adjacent Kiyotsu River. Some of the five terraces might have been formed only by the agency of the Nakatsu River, which offers an explanation for the lack of areal distribution of the five terraces along the trunk stream.

Concerning the "Loam" (A volcanic ash)

"Loam" develops on the terrace planes older than the Shomen terrace. On the (2) plane, or that of low relief, it attains its maximum thickness and exceeds seven meters. On the (3) plane, or that of the highest terrace,

the thickness increases westward. On the younger terraces it becomes thinner. The intermittent fall of volcanic ash, therefore, must have been taking place from the time of the formation of the (2) plane up to that of the Shomen terrace.

On the Shomen terrace is a loam layer one meter thick, with humus concentrated in the upper half, above the flood plain deposits of sandy loam, which is again one meter thick and underlain by the gravel bed.

The surface profile near the Site is as follows [in descending order]:

about 30cm. thick	Artificially disturbed soil.
" 20 " "	A-horizon. This horizon is thicker under natural conditions. (30-40cm.)
" 300 " "	B-C horizon. Yellowish brown in color on the upper half, but becomes paler and more clayey downward. Cultural remains occurred in a level 10-20cm. from the top of this horizon. 40-50cm. below the level of cultural remains lies a volcanic lapilli layer of 3-5cm. thick, pale in color and lenticular in section. As principal heavy minerals, it contains hypersthene and hornblende,* and the mode of occurrence suggests an aeolian deposit. Both the existence of such a lapilli bed and the thickness of 'loam' layer on the Shomen terrace enables us to suppose the thickness of 'loam' on this site to be more than 2 meters.

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* They are also contained in the volcanic ash bed above and under the lapilli bed.

The Age of the Remains

The absolute date of the Kamiyama Site can merely be supposed to be at the latest stage of the diluvium, and nothing more. It is ascertained, however, that the site in question is older than the Motonoki Site,[6] which was recently excavated. This is because the Motonoki terrace had not been formed at the time when the Kamiyama Site was occupied by early hunters.

On the Shomen terrace, the next younger one to the Kamiyama terrace, there is a volcanic ash bed of the same thickness as the level of cultural remains, while on the Owarino terrace corresponding to that of Motonoki, such a bed is completely lacking. The Nakatsu River, therefore, must have been flowing on the Owarino terrace at that time, and similarly the Motonoki terrace must have been the river floor.*

The author is delighted to thank Dr. Kazuya Chihara of the Faculty of Science, Niigata University, for his valuable discussions; and also to Mr. Toraji Ishizawa and members of the Educational Committee of Tsunan town for their kind help in the field survey.

(Kazuaki Nakamura)

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6. Chosuke Serizawa and Atsuko Nakayama, The Motonoki Site, Preliminary Report of Excavation, Essa Kenkyu 12: 1-19, 1957.

* At the Motonoki Site, a flood plain deposit is lying over the lowest level of the cultural remains. It follows that the people inhabited banks and bars, which might have been flooded. Opinion is divided on this problem. At any rate, the antiquity of a terrace gives the lower limit of the age of a site.

IV. REMAINS OF PRECERAMIC AGE

All the stone artifacts and flakes unearthed from the loam layer are treated here as belonging to the preceramic stage of cultural development. Among those which were obtained by surface collection or discovered in the humus and black soil layers, only characteristic specimens were picked up, for they were found mixed with Jomon culture remains. These are, for example, knife blades, burins or blades. Thus 259 specimens were given catalogue numbers after excavation, but 53 spalls and fragments from the loam layer were not included among them. From the typological point of view, they could be divided into knife blades, burins, blades, cores, scrapers, irregular shaped artifacts and grinding stones. Each of these types will be described below.

1. Knife Blades.

The following explanation will be keyed to the illustrations. Knife blades discovered at this site are shown in Fig. 3, Nos. 1-22. While Nos. 2, 6, 7, 11, 13, 17 and 22 were obtained by surface collection, all the other specimens were excavated from the loam layer.

No. 1. Skillfully utilizes the sharply pointed end of a blade flake, whose bulbar projection was removed in advance. Trimmed on the base into a pointed butt, retouched only on the upper surface. /Blows of retouch were applied on the lower surface and a scar is produced on the upper surface -- T.N./. No further working on side edges except fine traces of nicks and abrasion on a part of the tip, which can hardly be observed unless closely viewed. 45mm. long, 11mm. wide and 3mm. thick. Made of hard shale.

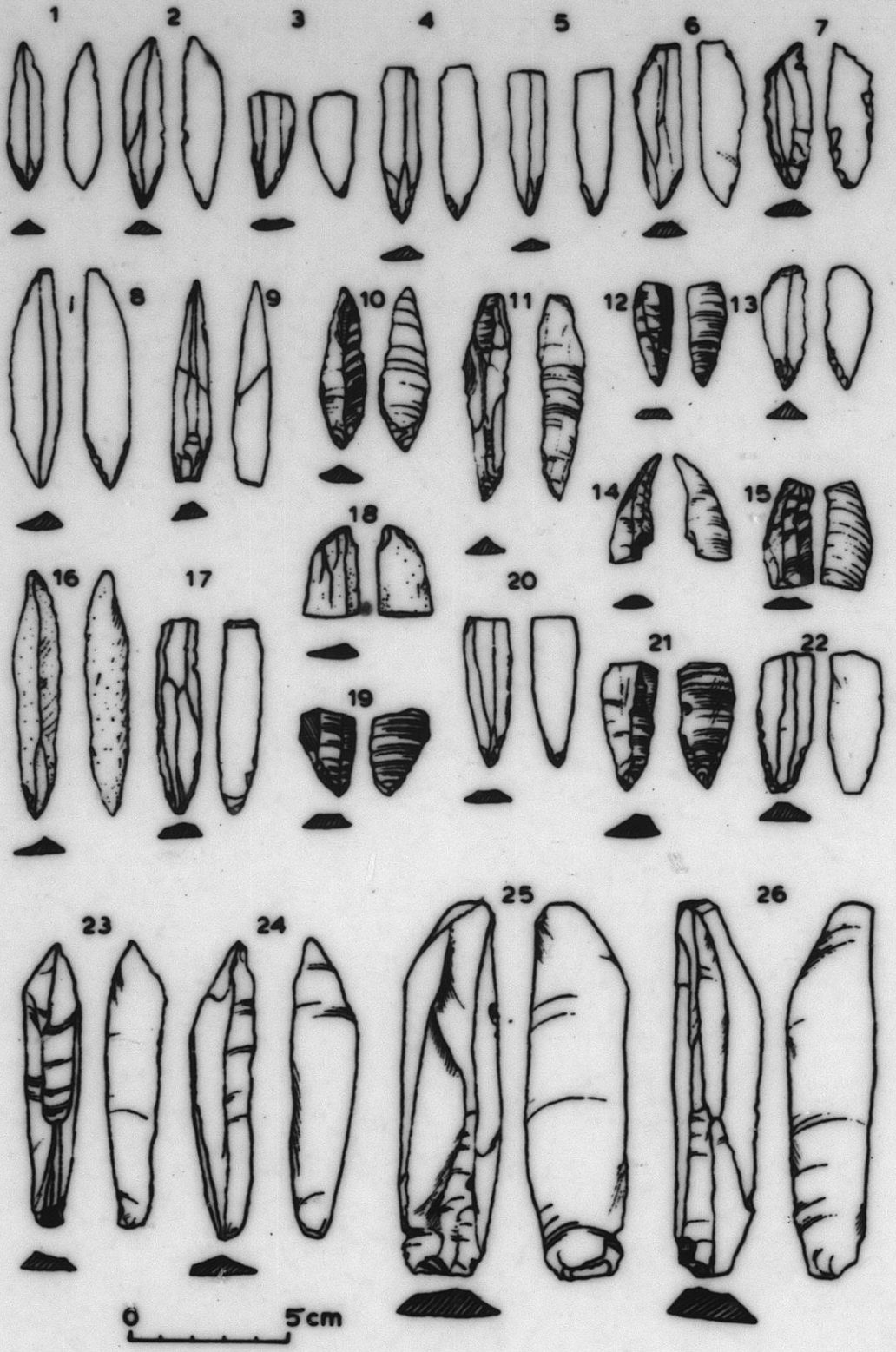

Fig. 3: Knife-shaped tools and blades

No. 2. A tipped willow leaf blade flake is utilized. Trimmed on the base on the upper surface only, and made into a pointed butt. Bulb and striking platform taken away in the course of trimming on base. No retouch on side edges, but slight traces of use on the tip part. 54mm. long, 12mm. wide and 4mm. thick. Hard shale.

No. 3. Broken. Upper half missing. Probably a utilized willow leaf blade flake. Trimmed on base on the upper surface only, and made into a pointed back. Horizontal retouch applied on the part of bulbar protuberance so as to make a thin base. 33mm. long, 14mm. wide and 2mm. thick. Hard shale.

No. 4. Lacks the tip. Supposedly a willow leaf blade flake utilized, worked on base only. Bulb and striking platform knocked off. Further working on the upper surface other than trimming on base. Meager traces of use on left edge for 5mm. from the broken end, but no such traces on right edge. 49mm. long, 12mm. wide and 4.5mm. thick. Hard shale.

No. 5. Lacks the tip. Made on a blade flake. The whole shape could be reconstructed only by supposition. Slight traces of retouch on left edge near the broken end, which appear to give a blunted back as will be seen in No. 6. Trimmed on base on the upper surface into a pointed butt. Further working on the lower surface to remove bulbar swelling. Slight nicks on right edge, though not yet confirmed as traces of use. 44mm. long, 12mm. wide and 3mm. thick. Hard shale.

No. 6. A backed knife, for which a blade flake of somewhat irregular shape was utilized. Bulb and striking platform knocked off in the course of working on the base. The upper half of left edge is trimmed on the upper

surface and made into a blunted back. The tip of this specimen looks as though broken at first sight, but it is not a product of mere accident, since a definite mark of trimming is shown on the very tip part. Actually it is worked into a slanting tip; this sort of technique also occurs in No. 7 and No. 8, and can be considered one of the distinguishing traits of the Kamiyama knife blades. The right side of the base is trimmed on the upper surface, the end intersecting with the left side at the pointed butt. 52mm. long, 14mm. wide and 4mm. thick. Hard shale.

No. 7. A backed knife similar to No. 6, the left edge also trimmed on the upper surface. This differs from No. 6, however, in that the whole left edge, instead of the upper half, is worked. An angle is formed between the tip part and the left edge, which apparently shows the same technique as seen in the slanting tips of No. 6 and No. 8. Bulb and striking platform knocked off in the course of working on the base. Further removal of some two flakes on the lower surface to take away bulbar protuberance. Dim traces of use and abrasion on the tip part on both edges around the tip for about 5mm. 46mm. long, 14mm. wide and 4.5mm. thick. Hard shale.

No. 8. A characteristic knife blade worked on both tip and base, for which a well-shaped blade flake is utilized. Trimmed on base on the lower surface only, and made into a pointed butt. Greater part of bulbar projection taken away in the course of this working. Seemingly broken, but actually a slanting tip is formed, similar to No. 6. This slanting tip joins the blunted back on the left edge at an obtuse angle, as in the case in other specimens. The tip and the back are made exclusively on the upper surface. Slight traces of use on right edge, but this is not so conspicuous. 70mm. long, 15mm. wide and 5mm. thick. Hard shale.

No. 9. A pointed blade flake utilized. Trimmed on left edge of the tip part for about 5mm., and worked on both sides of base. The base looks very similar to the other examples, though it is broken at the end. Two fragments were collected separately in the excavation, and later joined together. 63mm. long, 12mm. wide and 35mm. thick. Hard shale.

No. 10. A willow-leaf blade flake utilized. Worked on the tip part to make a blunted back, similar to Nos. 6, 7 and 8, but this differs from them in that it is on the right edge near the tip. In this case, therefore, the left edge, instead of the right one, is serviceable as a cutting edge. Trimmed on both surfaces into a pointed butt. Bulbar swelling is removed by blows applied parallel to the lower surface, for which flake scars made by trimming at the base are used as striking platforms. While the material employed is obsidian, it is quite lusterless and looks like frosted glass. Abraded especially on the tip part, and cutting edges or small flake scars are rounded off. 50mm. long, 13mm. wide and 4mm. thick. Obsidian.

No. 11. A poorly-shaped blade flake is utilized. The left side of the upper surface retains the natural one. Lacks the tip. Trimmed on the upper surface into a pointed butt. Bulbar swelling knocked off. Faint traces of trimming on left edge, but no such trace on right edge. A blunted back is formed on the left edge of the tip part. Every flake scar is preserved fresh unlike No. 9, and scarcely any trace of use observable. 65mm. long, 13mm. wide and 5.5mm. thick. Obsidian.

No. 12. A willow-leaf blade flake is utilized. Lacks the upper half, but trimmed on left edge for about 9mm. from the broken end to make a blunted back. Striking platform and bulb taken away, trimmed on the upper

surface into a pointed butt. Trimming is also marked on the lower surface on the right side of the base, but not on the left side. Faint traces of nicks on the right edge, but cannot be confirmed as traces of use. 33mm. long, 12mm. wide and 1.5mm. thick. Obsidian.

No. 13. A blade flake intentionally broken on both tip and base and retouched into a knife. Trimmed on base on the upper and lower surfaces into a pointed butt. The tip part is blunted in a gentle curve, which reminds us of the curved working edge of a longitudinal scraper. Slight traces of use on the left edge. 39mm. long, 14mm. wide and 6mm. thick. Hard shale.

No. 14. Broken half of a knife, for which a poorly-shaped blade flake is utilized. A concave cutting edge is formed on left side, and a blunted back is made on the opposite side. Noticeable traces of use on the cutting edge. 30mm. long, 13mm. wide and 3mm. thick. Hard shale.

No. 15. A poorly-shaped blade flake is utilized. Lacking both tip and base. Retouched on the upper surface on the upper part of left edge into a blunted back. Irregular traces of nicks on the lower part of left edge and on right edge, but not certainly traces of use. 36mm. long, 16mm. wide and 3mm. thick. Obsidian.

No. 16. A characteristic knife, for which is utilized a willow-leaf blade flake. Trimmed on base on the upper surface into a pointed butt. Greater part of striking platform and bulb taken away in the process. A blunted back is formed by trimming on the upper surface on the right edge of the tip part. The left side, therefore, was certainly a cutting edge as seen in No. 10. Trace of use could not be found on account of the material employed. 79mm. long, 15.5mm. wide and 5mm. thick. Andesite.

No. 17. A blade flake is utilized. Lacks the upper half. Trimmed on base on both the upper and the lower surface into a blunted butt. It must be noted that the blow is applied horizontally on the lower surface, small flake scar caused by trimming being used as a striking platform. Several slight traces of nicks on right edge as well as on left edge, which are likely to have been made at the time of use. 61mm. long, 14mm. wide and 4mm. thick. Hard shale.

No. 18. A blade flake utilized. Only the tip part preserved. Retouched from the left edge to the end of right edge into a gently curved blunted back. No trace of use or abrasion can be observed on account of the material used, except for two small flake scars on left edge on the lower surface. 27mm. long, 17mm. wide and 5mm. thick. Andesite.

No. 19. The basal part of a knife, whose upper half is broken. It appears to have been cut off transversely from the left edge to the right one. An oblique side of the base thus formed is trimmed on the upper surface, but a small flake resembling a graver facet has been removed from the lowest part of the right edge, a trimming scar on the left edge being used as a striking platform. As the similar technique of horizontal blow, however, is surely employed in manufacturing such specimens as No. 10 or No. 17, this cannot be considered a graver facet. Hardly any trace of use observed. 27mm. long, 16mm. wide and 3mm. thick. Obsidian.

No. 20. A willow-leaf blade flake was utilized. Lacks the tip part. A blunted back is formed on the upper part of left edge for 7mm. from the broken end. Trimmed on base on both the upper and the lower surface into a pointed butt. Like the examples just mentioned, a horizontal blow is

applied on the base on the lower surface. Many traces of nicks and abrasion on the whole right edge, which can safely be considered as traces of use. 47mm. long, 14mm. wide and 3mm. thick. Hard shale.

No. 21. A knife presumably similar to No. 10 in form, though lacking the upper half. Retouched mostly on the lower surface into a pointed butt, and as a result, the bulb and striking platform have been removed. It is noticed that this specimen is retouched on the upper surface only on the right side of base. 39mm. long, 16mm. wide and 6mm. thick. Obsidian.

No. 22. A blade flake utilized. Lacks the upper half. Bulb and striking platform knocked off. Trimmed on the upper surface on the lower halves of both left and right edge, and made into a rounded butt. No working on the lower surface. 44mm. long, 16mm. wide and 5mm. thick. Hard shale.

Typology of knife blades

The above 22 specimens of knife blade can be classified broadly into the following three groups;

1) Type A. A sharply pointed blade flake is chosen as the material, and it is worked on the base only into a knife. Nos. 1 and 2 and possibly Nos. 3 and 4 can be included in this type.

2) Type B. This type of knife is readily distinguishable by the fact that a blunted back is formed on one edge of the tip part, though it is also worked on the base. Nos. 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21 and 22 belong to this group. It can be divided into "left edge" and "right edge" groups depending upon whether it has a blunted back on the right side or on the left side.

3) Type C. This may be grouped together with Type B. It is essentially similar to Type B in the worked base and blunted back, and yet it can be distinguished since it has a slanting tip as if it were cut off transversely. Nos. 6, 7 and 8 belong to this type.

Each group can possibly be divided through closer observation. Let us concentrate our attention, for example, on the way of working on the basal part. The workmanship on the basal part is divisible into the following three techniques. First, it is trimmed on the base on the upper surface only. Second, the trimming is made on both the upper and the lower surfaces. Third, it is trimmed on the base on the lower surface only. These differences in the way of working on the base might be explained by the different kinds of material employed. Those specimens from which the bulbs and striking platforms were knocked off in advance are inclined to be worked by the first method; the second and the third are commonly employed in those cases where the bulbs and striking platforms are retained and must be worked in that condition. The different ways of working on the base have not been firmly correlated with distinctive types of knife blade as yet, and, therefore, the author cannot go into the details of it. He will be able to discuss the question again in the future, when knife blades are discovered in much bigger quantities.

2. Burins

Various burins from Kamiyama are illustrated in Fig. 4 and Fig. 5 (No. 27 to No. 56), and in Fig. 6 (No. 134). They amount to 31 specimens in all. Several questionable specimens, however, were ruled out here. While Nos. 27, 28 and 43 were obtained by surface collection, all the other examples were unearthed during the excavations.

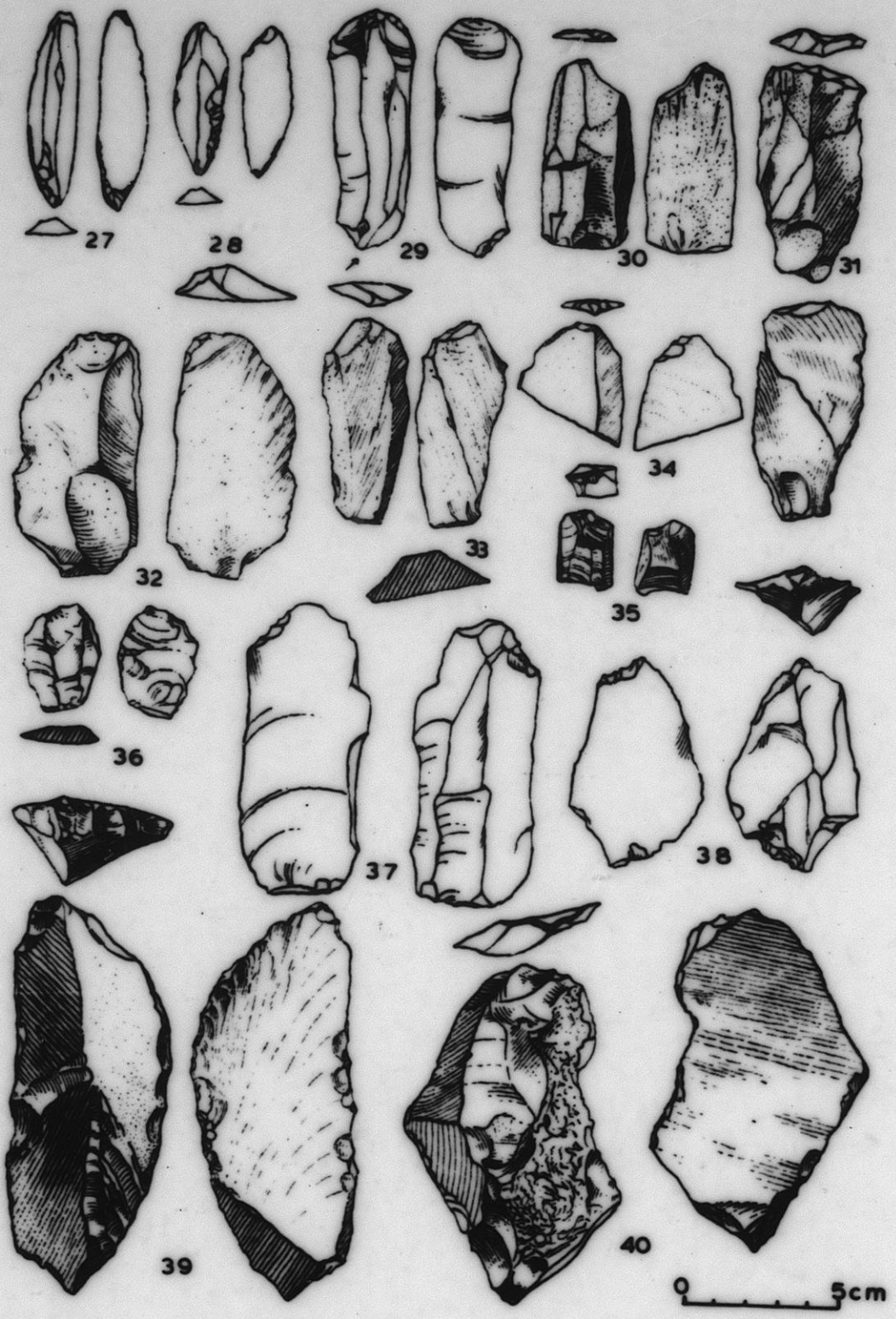

Fig. 4: Burins (1)

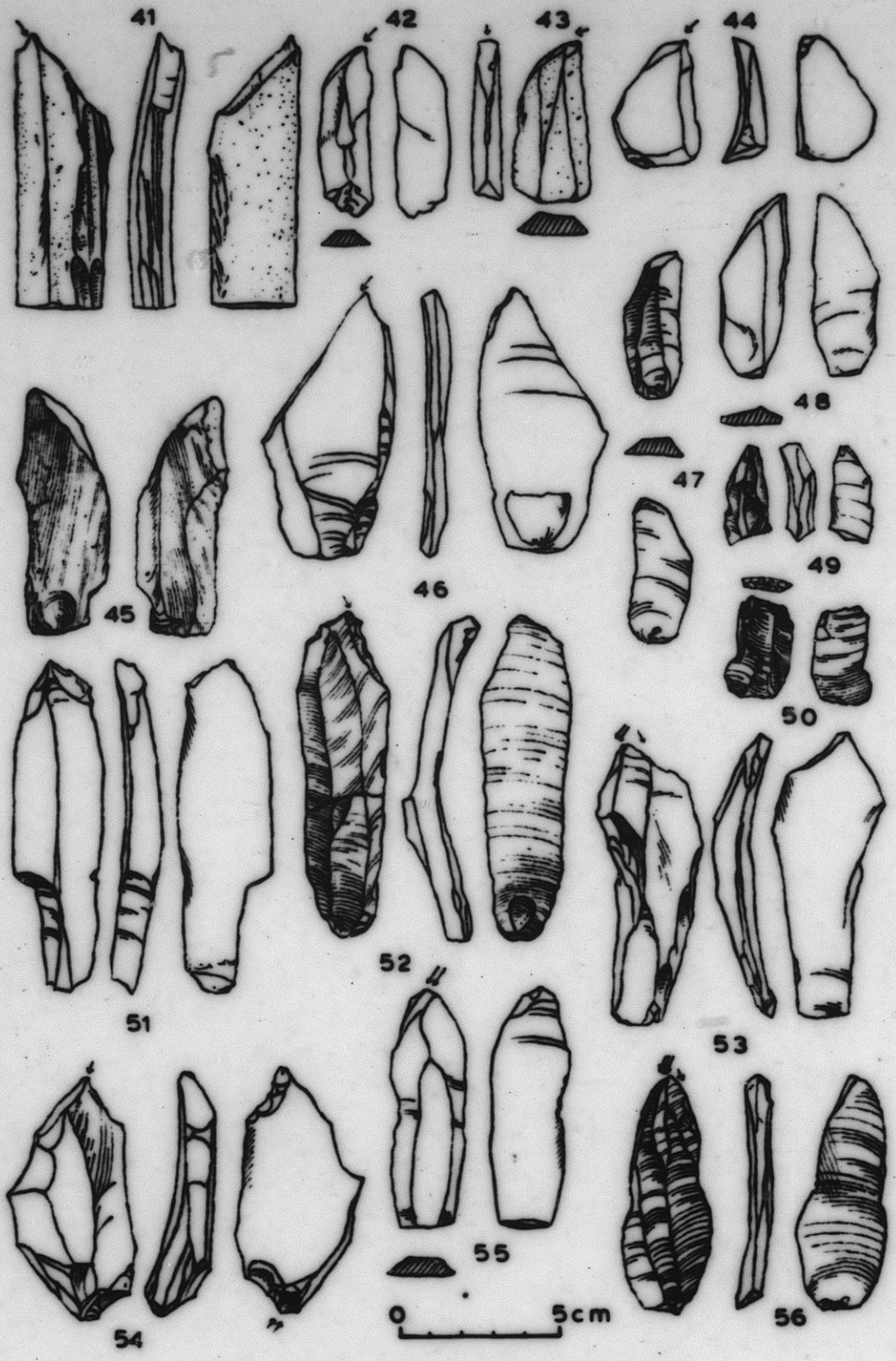

Fig. 5: Burins (2)

No. 27. This specimen was once illustrated as a knife blade in Reference No. 1 [See the references listed at the end of the paper--T.N.]. From a functional point of view, it may well be a burin; in other words, it might be a dual purpose tool. A well-shaped blade flake was utilized, trimmed on the left side of the base on the upper surface as well as on the corresponding part of the lower surface; and, naturally, made into a sharply pointed butt. Furthermore it has trimming on the right side of the tip on the lower surface, and a small burin facet is struck on the corresponding part of the upper surface. This kind of manufacturing technique is also seen on No. 28, which will be described below. The original bulb and striking platform might be situated on the extension of base. 62mm. long, 15mm. wide and 5mm. thick. Hard shale.

No. 28. This, too, was illustrated in Reference No. 1 as a knife blade, but, from a functional viewpoint, it is more likely to be a burin. A somewhat poorly-shaped blade flake was utilized, and the bulb and striking platform knocked off. The waves on the lower surface indicate that the bulb was originally located on the extension of the base. Secondarily worked on the greater part of the right side on the upper surface and on the same side of the base on the lower surface, following which a burin facet was made by a single blow on the corresponding part of the opposite surface. The burin facet in this case inclines at 45 degrees to the lower surface, while the ordinary ones [i.e. in Japan -- T.N.] are inclined approximately at a right angle. 49mm. long, 16mm. wide and 5mm. thick. Hard shale.

No. 29. A double-ended burin. Utilized a well shaped blade flake with three ridges on the upper surface. Bulb and striking platform knocked off;

these might have been located on the extension of tip. The tip part is trimmed into a round edge like that of a scraper, and a burin facet is made on the left shoulder of it, which inclines at 45 degrees to the lower surface. The working edge is far from fresh, being abraded by many slight traces of use. On the corresponding part of the lower surface, one large flake was removed. It is further retouched on the right side of the base on the lower surface, and from its lowest part a burin facet was struck on the right side of the base on the upper surface. This burin facet shows a typical Z-shaped ridge in side view. Slight traces of a break are left not only on the burin facets, but on the left side on the upper surface. 77mm. long, 27mm. wide and 8mm. thick. Hard shale.

No. 30. Utilized a three-ridged blade flake with a large striking platform. Trimmed on the lower surface into a concave left shoulder like that of a notched scraper, with a small burin facet on the corresponding part of the opposite surface. 63mm. long, 28mm. wide and 6.5mm. thick. Andesite.

No. 31. Single-ridged blade flake utilized. Z-shaped ridge of burin facet in side view. Retouched by several blows on left shoulder on the lower surface, with a burin facet struck on the right shoulder on the upper surface. This intersects with the lower surface approximately at 45 degrees. Broken halves were discovered separately and later joined into a complete specimen 71mm. long, 33mm. wide and 9.5mm. thick.

No. 32. Z-shaped ridge of burin facet in side view. Poorly-shaped thick material used. Retouched by several blows on both the lower and the upper surface, and a burin facet made on the latter which inclines to the

lower surface at about 45 degrees. A sharp working edge was also made on the left shoulder on the upper surface, on which are shown traces of use. 77mm. long, 39mm. wide and 14.5mm. thick.

No. 33. Z-shaped ridge of burin facet in side view. Two-ridged blade flake is utilized, and the same working method is employed as in Nos. 30 and 31. The burin facet is skillfully made by a single blow. 63mm. long, 26mm. wide and 10mm. thick. Andesite.

No. 34. A broken tip with a Z-shaped ridge in side view. A single-ridged thin flake is utilized. Retouched by three blows on left shoulder of both the lower and the upper surface and a burin facet is made on the former. A sharp working edge is also made on the left side on the upper surface, which possibly shows traces of abrasion. 37mm. long, 34mm. wide and 6mm. thick. Hard shale.

No. 35. Impossible to reconstruct the original form. A small obsidian breccia presumably used, for a natural face is left in the middle of one surface (left on the figure). A single flake scar runs from tip to right shoulder on that surface, while more than seven scars are seen on the opposite surface (right on the figure). This may well be a 'flat graver' , too. 36mm. long, 24mm. wide and 6mm. thick.

No. 37. A rather broad flake was utilized, with the bulb and striking platform retained on the lower part, as seen on the figure. First trimmed by three blows on the left shoulder on the lower surface, than a burin working edge, Z-shaped in side view, was formed by two blows on left shoulder on the upper surface. The burin facet intersects with the lower surface at 45 degrees or less. Flake scars clustered on the right shoulder on the

upper surface may well be traces of frequent use. 93mm. long, 39mm. wide and 14.5mm. thick.

No. 38. A poorly-shaped, thick material was utilized. Retouched by five blows on the tip on the lower surface, with a burin facet formed by two blows on the left shoulder on the upper surface. It inclines to the lower surface at 45 degrees, and has a Z-shaped ridge in side view. 79mm. long, 43mm. wide and 15mm. thick. Hard shale.

No. 39. Made on a single-ridged flake, fairly thick and large. Broken at the lower end (i.e. the bulbar part) which might have been secondarily worked. Trimmed by several blows on the tip on the upper surface, but the direction of impact is not so clear. This may represent a variety of Kamiyama burins. 126mm. long, 61mm. wide and 38mm. thick. Hard shale.

No. 40. Made on a large flake retaining a natural face, to which breccia adheres. Burin facets are made on both tip and base. In addition, what are doubtless traces of use or slight flake scars are visible on both right and left edges. Finely trimmed on the tip by three blows on the left shoulder on the lower surface, with a burin facet formed by two coarse scars on the same part of the opposite surface. It intersects with the working edge at less than 45 degrees. The same kind of technique is employed in making another burin facet on the base. There are fairly clear traces of use on both tip and base. Ridges of both facets are Z-shaped in side view. 110mm. long, 60mm. wide and 20mm. thick. Hard shale.

No. 41. A blade flake was utilized, the natural face of the original pebble remaining in the center of the upper surface between the two parallel ridges. The striking platform, which appears to have been on the extension of the base, is skillfully cut off. A burin facet was formed by a single

blow. No evidence of further retouch. 86mm. long, 28.5mm. wide and 14mm. thick. Andesite.

No. 42. A poorly-shaped blade flake was used, retaining the original face of the pebble on the basal part of the upper surface. Bulb and striking platform might have been on the extension of the tip. A remarkable burin facet was struck on the left side of the tip, while a vague one is seen on the right side. The latter could have been made by accident. Very fine traces of use on the sharp edges of either side. 52mm. long, 16.5mm. wide and 6mm. thick. Hard shale.

No. 43. Utilized a blade flake with two ridges on the upper surface. The lower half is broken. A burin facet was created by a single blow. The direction of impact is from right to left as shown on the figure. 50mm. long, 23mm. wide and 9mm. thick. Andesite. Obtained by surface collection.

No. 44. Made on a flake with a thickened end; the bulb and striking platform cannot be defined. Trimmed on the base into a cutting edge for a scraper, but, at the same time, a burin facet was made on top. Three small scars are noticable on top on the lower surface, the end of which was used as a platform for striking a burin facet from right to left. Being on the upper surface, it intersects with the lower surface at about 45 degrees. Definite traces of use are concentrated on the top left side of the burin facet. 40mm. long, 28.5mm. wide and 10.5mm. thick. Hard shale.

No. 45. A burin facet has been struck on the top of a two-ridged flake, from the right shoulder to the left side of the blade. It inclines to the lower surface approximately at a right angle. There is no further retouch. 75mm. long, 28mm. wide and 9mm. thick. Andesite.

No. 46. A broad and thin blade flake is used and the projection of the bulb is secondarily removed. Several small scars on the right shoulder on the upper surface are used as a platform to strike a rather long burin facet leading to the left side. The tip of the facet is clearly preserved, but slightly abraded. It intersects with the lower surface at a right angle. 82mm. long, 40mm. wide and 6mm. thick. Hard shale.

No. 47. A flake thickened and curved on top was utilized. The striking platform has been knocked off, but the greater part of the bulbar protuberance is retained. A burin facet was formed on the left shoulder on the upper surface, the blow being applied on small trimming scars at the top left of the lower surface. Possible traces of use are recognizable on the left side of the burin facet. The latter inclines to the lower surface at nearly 45 degrees. 46mm. long, 16.5mm. wide and 6mm. thick. Obsidian.

No. 48. A burin facet is formed by two blows on a thin blade flake from the right shoulder to the left side of the blade. This is the simplest type of burin, with no further retouch. 57mm. long, 20mm. wide and 4mm. thick. Shale.

No. 49. Burin facets are made on the tip on an obsidian flake, triangular in section. The impact is applied on both sides of the tip. This may well be defined as a fluted burin, with the facets inclining roughly at a right angle to the lower surface. It is broken in the middle of base. 41mm. long, 12mm. wide and 6mm. thick. Obsidian.

No. 50. Made on a small obsidian blade flake which had been trimmed by several blows on top on the lower surface, and then a small burin facet struck on the left shoulder on the upper surface. It would be better to

say that this has a Z-shaped burin facet. A rather long scar on the right side at the base represents a probable burin facet. 39mm. long, 15mm. wide and 5mm. thick. Obsidian.

No. 51. A large flake with a high ridge is used. The bulb and striking platform might have been located on the extension of the base. Two burin facets intersect at the tip like those of No. 49, but the one on the left shoulder has been made by three repeated blows. The burin facets incline to the lower surface approximately at a right angle. 104mm. long, 28mm. wide and 11mm. thick. Hard shale.

No. 52. Broken into two halves. Made on a blade flake, the ridges on the upper surface of which join together in the upper half. Slight traces of use on both sides indicate that it may have served as a knife. The bulb is located at the basal end. Trimming was by several blows on the left shoulder on the upper surface, and a burin facet was made on the right shoulder. It intersects with the lower surface at less than 90 degrees. Rather abraded at the right side on the burin facet. 99mm. long, 30mm. wide and 9mm. thick. Hard shale.

No. 53. The material is a flake broadening toward the top. The striking platform is hardly identifiable, but the bulb is perfectly preserved. Two intersecting facets make a sharp edge as seen on Nos. 49 and 51. Accordingly, the burin facets incline to the lower surface approximately at a right angle. There are considerable traces of nicks and abrasion on either side adjacent to each burin facet. 88mm. long, 32mm. wide and 10.5mm. thick. Hard shale.

No. 54. A rather thick and irregular-shaped flake was used. The striking platform might have been on the extension of the tip, but was removed so

perfectly as to retain hardly any trace of bulbar protuberance. The upper half was trimmed by several blows on the left shoulder on the lower surface, and then very small burin facets were struck on the left shoulder on the same surface. The same workmanship can be recognized on the lower half, but the burin facets are made by four repeated blows into gouge-shaped ones. It may better be explained, however, by the width of the base of this specimen. 75mm. long, 36mm. wide and 15mm. thick. Hard shale.

No. 55. Utilized a blade flake with two ridges joining at the base and broadening at the tip. The bulb and striking platform were knocked off. Trimmed by three blows on the tip on the lower surface, with two burin facets struck on the tip on the upper surface from upper right to lower left. They incline to the lower surface at nearly 45 degrees and naturally show Z-shaped ridges in side view. Small traces of use appear on both sides of the blade that are not immediately related to the burin facets. 74mm. long, 21.5mm. wide and 9mm. thick. Hard shale.

No. 56. A blade flake was utilized. Striking platform partially retained. Two intersecting facets incline to the lower surface roughly at a right angle. The one on the left shoulder is made by three scars, the first one large and the next two are small. The other on the right shoulder is merely a small scar from a single blow. Slight traces of use are left on both sides of the blade adjacent to the burin facets, but there is also abrasion on the facets themselves. Innumerable scratches, moreover, are recognizable through a magnifying glass. 74mm. long, 28mm. wide and 6mm. thick. Obsidian.

Note on Figure 6 (No. 134)

A burin and a spall, which were found among the A-1 group, happened to be joined together. The material used is hard shale, whitish in color, and the burin is made of a thick flake. It is trimmed by several blows on the left shoulder on the lower surface, and burin facets are made also by repeated blows on the left shoulder on the upper surface. The spall fits in with the burin on its shaded side shown on the right of the figure, leaving less than a quarter of its own side on the upper end unfitted. This indicates that the burin facets were retouched several times after the removal of the spall. Naturally with a Z-shaped ridge in side view. 65.5mm. long, 28mm. wide and 17mm. thick.

Typology of burins

The thirty-one burins described above are divisible into two large groups on the basis of the difference in the degree of the angle between the burin facet and the lower surface. This is approximately a right angle in one group, and about forty-five degrees in the other. The commonest type of burin in Japan belongs with the former group. For convenience' sake, this will be termed here Type A and the latter Type B.

Type A. Ten specimens are included in this type: Nos. 41, 42, 43, 45, 46, 49, 51, 52, 53, 56 (all in Fig. 5). They are single-blow, screw driver or single-facetted burins, which may well be the ordinary forms. The burin facet inclines to the lower surface roughly at a right angle, and very rarely is there retouch on the lower surface.

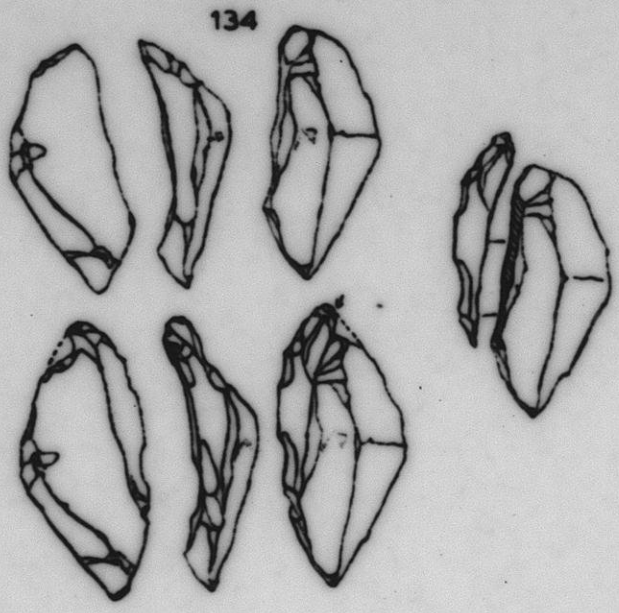

Fig. 6: Burin and its spall (Scale--1/2)

Type B. Twenty examples of this type, comprising all the specimens in Fig. 4 (except No. 39), Nos. 44, 47, 48?, 54, 55 (Fig. 5), and No. 134 (Fig. 6). The burin facet inclines to the lower surface approximately at forty-five degrees and there is often trimming on the lower surface. The latter might be done to prepare a striking platform for the burin facets. A burin facet made in this way shows a Z-shaped ridge in side view. This group may well be called the Kamiyama-type burin, since we have found very few preceramic sites that produced a similar type of burin. The following four sites are the only ones that we know at present: 1) Kaisaka Site, Tsunan town, Niigata. 2) Sugikubo Site, Lake Nojiri, Nagano. 3) Chausuyama Site, Suwa City, Nagano. 4) Kunimi Site, Chokai Village, Yuri County, Akita.

3. Blades (Nos. 23 to 26, 57 to 94)

A hundred and twenty-six blades were recovered, comprising roughly two-thirds of the total number of stone artifacts from Kamiyama. Among them, sixty-one specimens are perfect or nearly perfect in form and the others are fragments. They are divided into the following four groups.

a) Relatively large ones. More than 100mm. long, 25 to 30mm. wide and 7 to 10mm. thick on the average. Twelve of them are made of andesite, ten of shale and two of obsidian. (Nos. 57, 59, 60, 63, 64, 83, 84, 90, etc.).

b) Relatively small ones. 80mm. long, 15 to 20mm. wide and 5 to 7mm. thick on the average. Twenty of them are made of obsidian, fifteen of shale and none of obsidian. (All in Fig. 8 except Nos. 72, 73 and 78).

c) Small, narrow and thin blades. 60mm. long, less than 15mm. wide and 3 to 5mm. thick on the average. Sixteen of them are made of andesite,

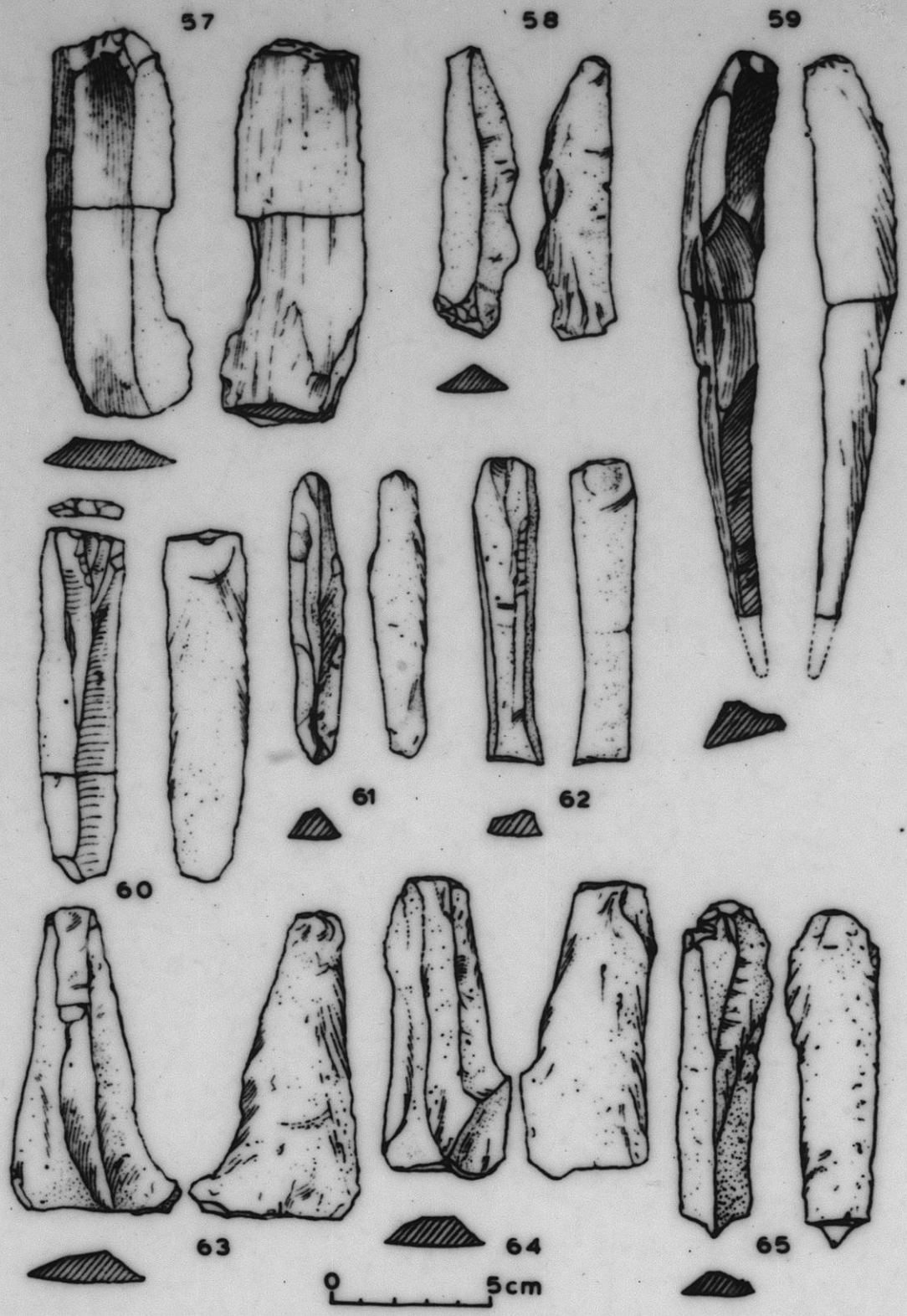

Fig. 7: Blades (1)

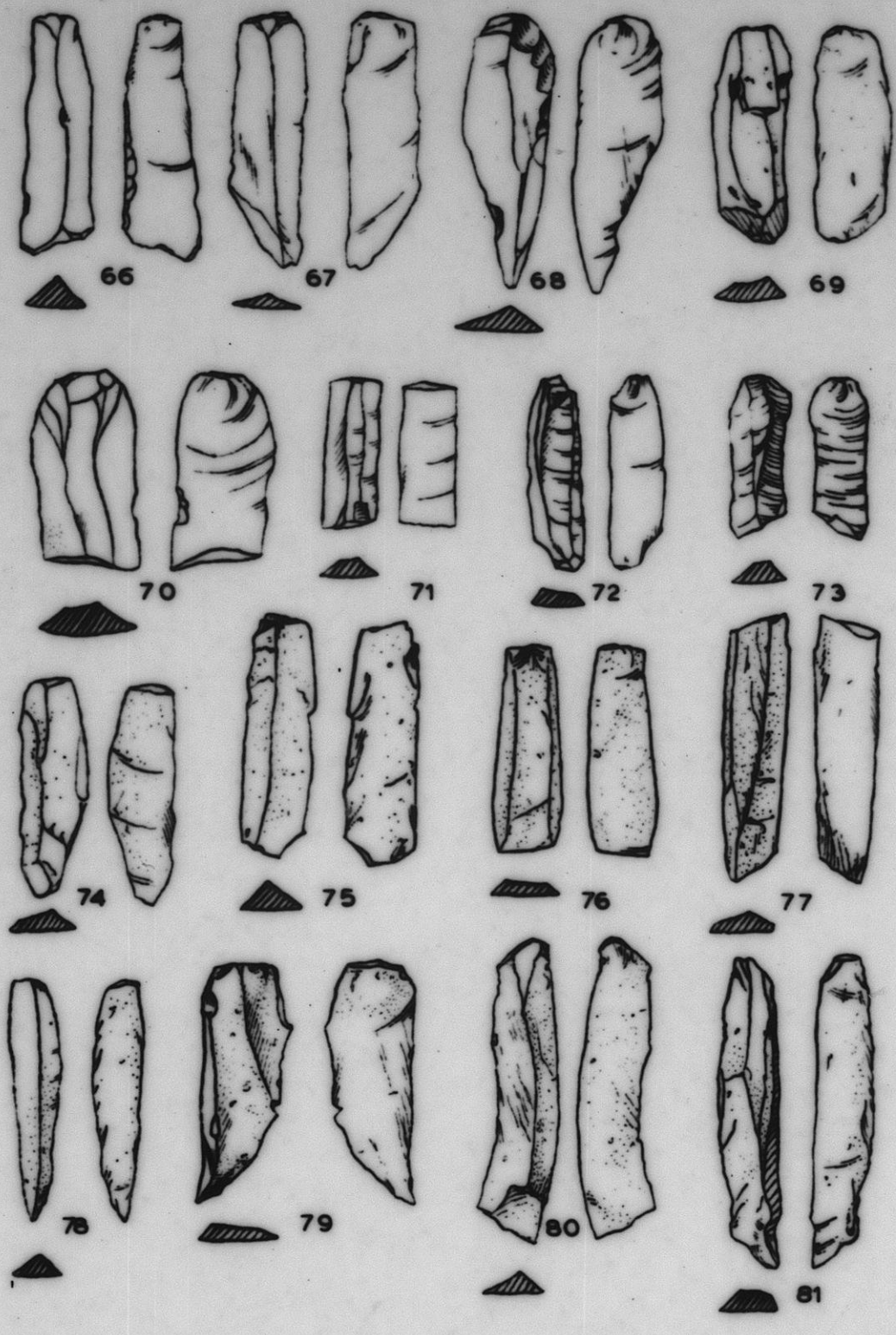

Fig. 8: Blades (2)

twenty-six of shale, ten of obsidian and a few of schalstein. (Nos. 72, 73, 78, 87 to 89, 91 to 94, etc.).

d) 'Longitudinal' flakes rather than blades. Broader and more irregularly shaped than the other groups. Less than 80mm. long and more than 25mm. wide on the average. The tip part is mostly curved to the left or to the right. Five of them are made of andesite, five of shale and three of schalstein.

All of these blades have a prepared platform which inclines to the lower surface nearly at a right angle. Platforms are mostly small in the specimens made of shale, and mostly large in the andesite specimens. The difference might be explained by the material used.

That they were actually used as cutting implements is clearly indicated by the nicks frequently seen on the working edges. Some of them, however, are doubtless blanks for making other tools. Judging from the size, groups (a) and (b) might be intended for burins, and group (c) for knives.

4. Cores

Among the eight cores discovered at Kamiyama, one was obtained by surface collection but the other seven were all excavated. As for the material used, all of them are of shale except for a single example of andesite. The preference in the material of these cores seems rather strange, for both andesite and shale were almost equally chosen for the other tools or fragments. It must be noted that these cores were found concentrated in one group of finds, i.e., in Group B, except Nos. 101 and 104.

No. 97 (Fig. 10). Not so sharp in appearance, as if rounded off by weathering. The existing platform is narrow but well prepared. Blows

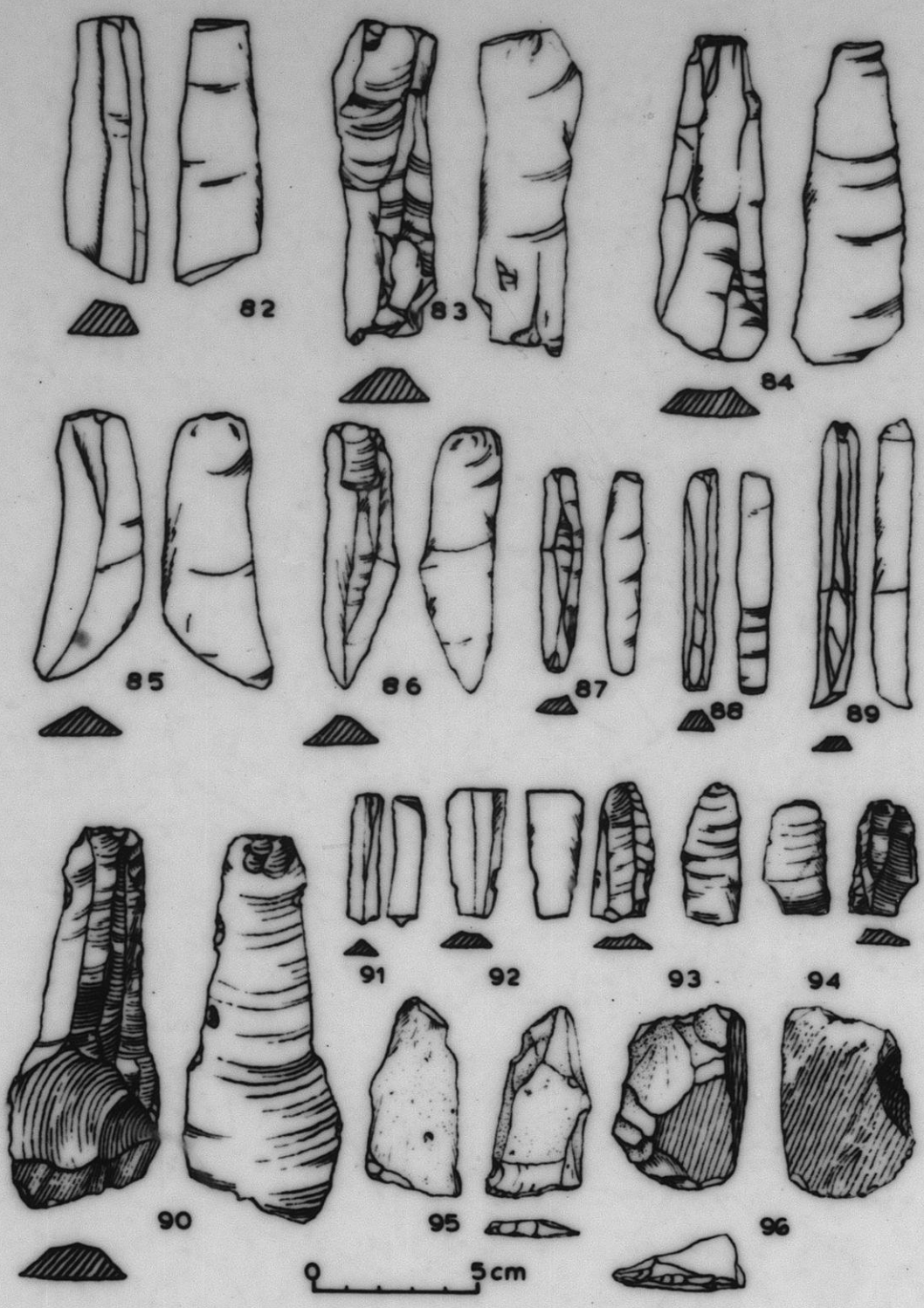

Fig. 9: Blades and scrapers

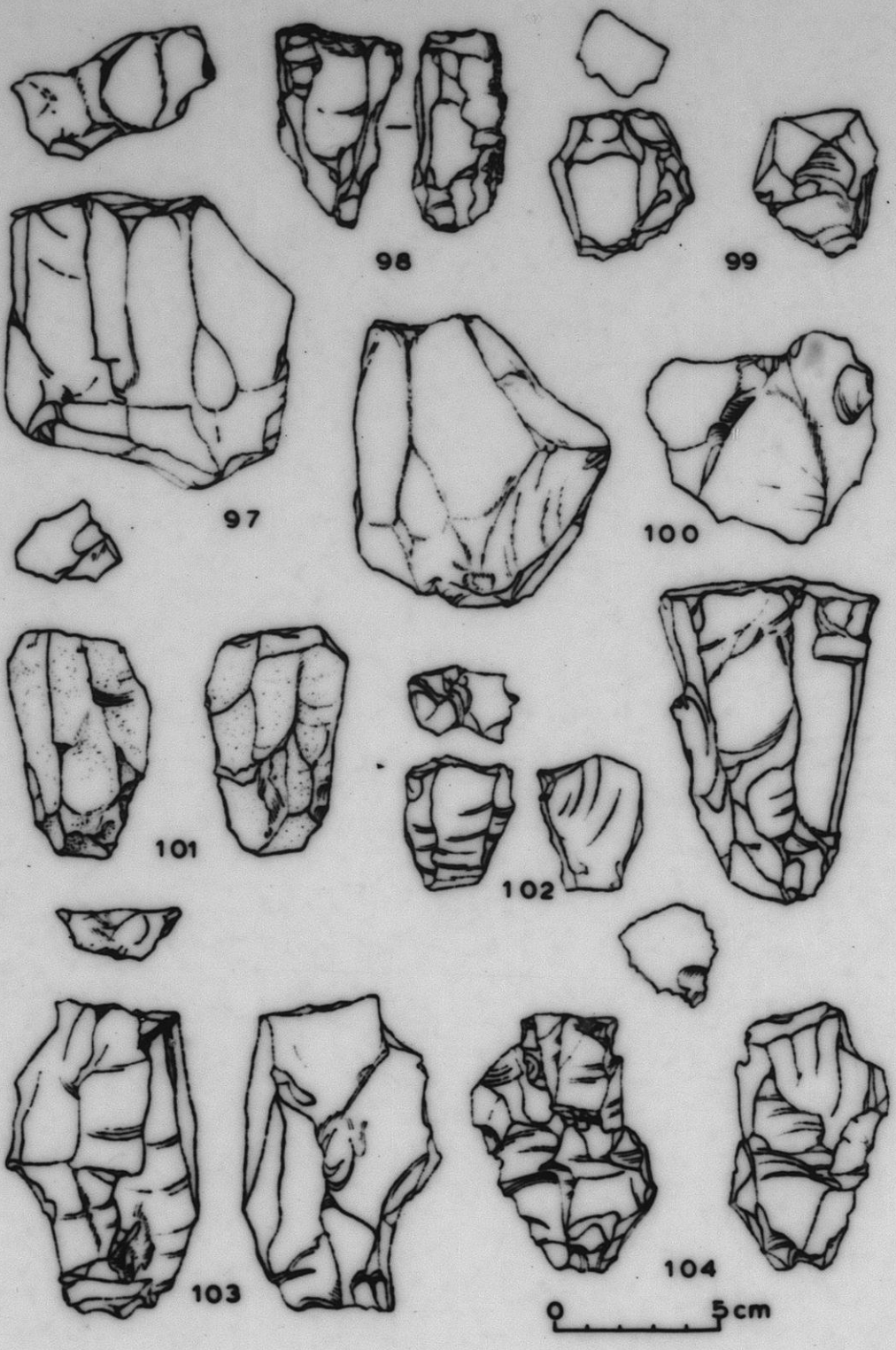

Fig. 10: Cores

were applied approximately at a right angle to the platform. Four distinct flake scars parallel to each other were visible on the frontal surface, but it is covered with many ragged, irregular ones on the other surfaces, the points of impact of which cannot be identified. 101mm. tall, 78mm. wide and 74mm. thick.

No. 98 (Reported in Reference No. 1). [See the references listed at the end of the paper -- T.N.]. Made of shale. Obtained by surface collection. 63mm. tall, 37mm. wide and 27mm. thick.

No. 99. A small core, which seems to be no longer usable. The platform is a single flake scar. The blows were directed at a little more than a right angle to the platform. Many blows were also applied on the base. The general form is polyhedral. 44mm. tall, 43mm. wide and 32mm. thick. Hard shale.

No. 100. The best-shaped specimen. The platform, consisting of cleavages in the center and of flake scars on both ends, is also prepared. It has seven flake scars parallel to each other and, partially, two cleavages. No impact has been applied on the base which takes the form of a cylinder with a blunted tip. Therefore, the impact was directed at 100 to 110 degrees to the platform. A part of the platform projects like a nose (top left on the figure), and some flutings have been made on it. Judging from this part only, it retains a function of a scraper. This view may well be supported by some traces of abrasion, which are observable through a magnifying glass. It was discovered in two separate pieces in Section 6, Trench B, and later happened to be joined into one. 103mm. tall, 73mm. in the longer diameter of the platform and 52mm. in the shorter diameter. Hard shale.

No. 101. Made of andesite. Three parallel flake scars on each of the frontal and the back surface. It has a well-prepared platform. The blow was applied roughly at an angle of 100 degrees to the platform. 67mm. tall, 41mm. wide and 27mm. thick.

No. 102. Two flake scars on the frontal surface and three in all on both the left and the right surfaces. The back surface is a part of a large flake scar, which might have been made by some natural agency. The platform is very ragged, being well prepared. The impact was directed at roughly 100 degrees to the platform. 38mm. tall, 32mm. wide and 21mm. thick. Shale.

No. 103. A core with two platforms, both top and bottom. On the top of the figure is shown a small prepared platform, semicircular in shape, from which four flake scars run down. On the base is also a small semicircular one, from which six scars run down. The flake scars of each do not cross those of the other, since they are symmetric in their positions. The blows were directed roughly at a right angle on the top, and at a little more than a right angle on the base. 93mm. tall, 56mm. wide and 40mm. thick. Hard shale.

No. 104. Also has two platforms, both top and base. The one on the base, however, has been exhausted by flaking. A small triangular platform is left on top. The impact might have been directed at about 100 degrees to the platform. 80mm. tall, 38mm. wide and 29mm. thick. Hard shale.

5. Scrapers

Scrapers are generally associated with all of the stone assemblages of preceramic age in Japan, but, strangely enough, hardly any were found

at the Kamiyama Site. Only the following two were discovered during the entire course of the investigations.

No. 96 (Fig. 9). A thick flake trimmed on one end into a convex working edge. A rather delicate workmanship was applied on the edge, which forms a sharp angle in its vertical section. Not worked on the lower surface other than a few flakings at the tip. 58mm. long, 38mm. wide and 18mm. thick. Andesite.

No. 95 (Fig. 9). Made from a thin flake; a straight edge was made on the lower end. This specimen differs markedly from the one above in that its vertical section forms as much as a right angle to the lower surface. It cannot be called a typical end-scraper. A long scar runs transversely from left to right at the base on the lower surface. It might be a variety of burin. 58mm. long, 25mm. wide and 5mm. thick. Andesite.

6. Irregularly-shaped tools

There are some seven tools of irregular shape. It is true that they are retouched, but they do not assume any particular forms. They are mainly thick flakes of shale more or less retouched on their sharp ends. It must be noticed, however, that traces of nicks through use are evident on a greater part of the fragments and spalls of shale or obsidian. Delicate traces are hard to recognize on the andesite spalls and implements since they are badly weathered. This is not to say that the sharp edges of andesite spalls were not used as much as shale or obsidian ones. The reverse would be the case.

7. Ground stone tools

Two ground stones were found about 10 centimeters deep from the top of the loam layer in the extended part of Trench A, i.e., in Group A-2.

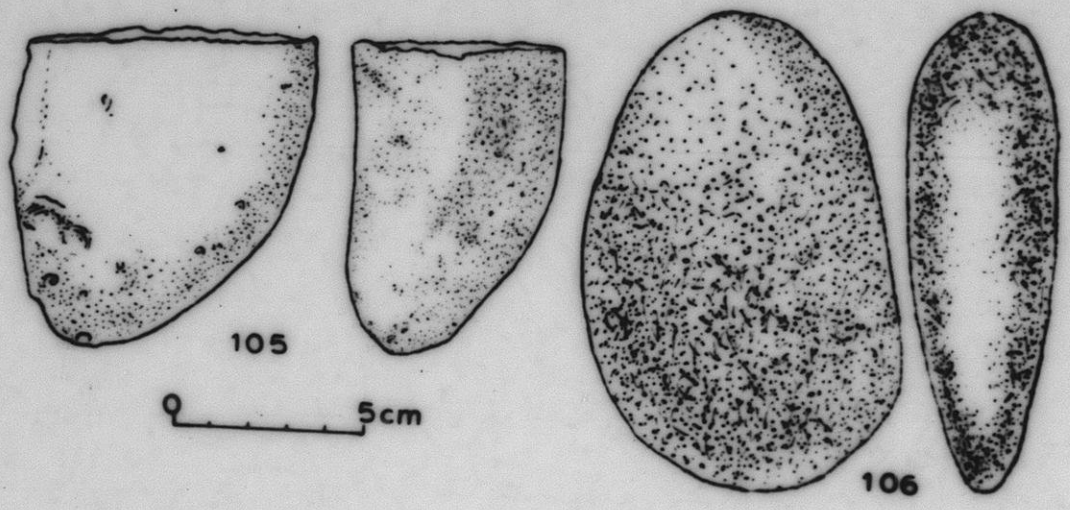

Fig. 11: Ground stones

They were found close to each other, as if placed there side by side. The loam layer did not produce any remains of the Jomon Age. The author believes that they were found in association with the other preceramic stone tools, although there has been no precedent for them in Japan. Not to mention the African examples, scores of similar ground stones have been discovered in Kostenki IV of the Ukrainian Upper Palaeolithic (the Aleksandrovskaya Site). Blades and knife-like tools are also the main artifacts found at this site. It would not be unwarranted, therefore, to believe that the ground stones from Kamiyama are actually associated with the other preceramic artifacts.

No. 105 (Fig. 11). A pebble of andesite (?). On one end of its triangular section traces of use are recognizable. The face is more or less coarse, which suggests hammering rather than grinding. Broken at the upper end as shown on the figure. Perhaps 12 to 13cm. long in original form. 7cm. x 4.6cm. in thickness.

No. 107 (Fig. 11). A flat pebble of andesite, with traces of use on the thinner end. The face is so smooth that this might correctly be attributed to grinding action. 12.7cm. long, 8.7cm. wide and 3.9cm. thick.

8. Distribution of stone artifacts

It was already explained in Section II that the remains were not evenly distributed in the excavated area; this is clearly shown on Fig. 2. In Trench A, the stone artifacts and the spalls were densely distributed in a circle four meters in diameter (Group A-1) and another three meters in diameter (Group A-2). And in trench B, the remains were found concentrated in an irregular circle less than four meters in diameter (Group B). These

groups are situated three to five meters from each other. It is a remarkable fact that hardly any stone artifacts or spalls could be found outside of these circles. It is true that neither house floors nor pits had been found in the loam layer; the vertical distribution of remains did not allow the presumed existence of such features. And yet, the remains were horizontally distributed in three distinct circles of three to four meters in diameter. The artifacts from the loam layer were certainly discovered in situ, free from secondary movement. It is quite unlikely, too, that those from the brown soil layer had been removed beyond their original circles. Therefore, the three distinct groups would have been somehow related to the dwellings of the time.

It should be important to examine the composition of the three groups. This is shown in the following table.

Group		Knife	Burin	Blade	Core	Scraper	Irregular	Ground Stone	Total
A-1	Schalstein								
	Obsidian	5	3	5					13
	Shale	3	10	31			3		47
	Andesite		3	35	1	1	1		41
A-2	Schalstein								
	Obsidian	1	2	6					9
	Shale	5	4	12	1		1		23
	Andesite	2		12				2	16
B	Schalstein		1	5					6
	Obsidian			1					1
	Shale		3	13	5		1		22
	Andesite		2	6		1	1		10
	Total	16	28	126	7	2	7	2	188

Group A-1: 8 knives, 16 burins, 7 blades, 1 core, 1 scraper, 4 tools of irregular shape, etc. 101 specimens in all, more than a half of the total number. The knives number roughly 10 percent of the blades and the burins 20 percent. It must be emphasized that only a single core of andesite was found. Many andesite blades, thirty-five in number, were also unearthed in this circle. They vary from long ones exceeding 10cm. to small ones of about 6cm, which seem as if flaked in succession from the same core. Only two examples, however, actually happened to be joined together. The materials used are obsidian (10), shale (47) and andesite (41).

Group A-2: 8 knives, 6 burins (and 2 burin spalls), 30 blades, 1 core, 2 ground stones, etc. Forty-eight specimens in all. The total is less than a half of that of Group A-1. Knives outnumber burins. A core of shale is also the sole example. On this account, shale was perhaps preferred to obsidian or andesite. The materials used are obsidian (9), shale (23) and andesite (16).

Group B: no knives, 6 burins, 25 blades, 5 cores, 1 scraper, etc. Thirty-nine specimens in all. It deserves special mention that five cores, all of shale, were found in this group, along with the complete lack of any knives. The materials used are obsidian (1), shale (22), andesite (10) and schalstein (6).

What is the meaning of the differences among the three distinct groups of stone artifacts? Does it mean a difference in time? From the standpoint of the vertical distribution of the remains, they were contained uniformly in the loam layer up to a depth of thirty or forty cm. from its top. It is hard to speak of any chronological difference from the stratigraphic

data. From a typological point of view, they are much alike except that knives are lacking and cores are numerous in Group B. The burins in Group B, however, are very similar to those in Groups A-1 and A-2. Furthermore, two specimens in Group A-1 (No. 40 and a spall) were certainly struck from the same pebbles that could be found in Group B. Eight such pebbles with breccia adhering to their faces are seen in the latter. This possibly testifies to their contemporaneity. In the following table, all the specimens are divided into the three groups, in which they belong.

Surface collection: Nos. 2, 6, 7, 11, 13, 17, 22, 27, 28, 43, 70 and 98.

Group A-1: Nos. 1, 3, 10, 12, 15, 19, 20, 21, 24, 25, 27, 32, 35, 37, 38, 40, 41, 45, 46, 47, 48, 49, 50, 51, 52, 54, 55, 57, 58, 60, 61, 62, 64, 65, 66, 67, 71, 73, 74, 75, 76, 77, 78, 79, 81, 82, 83, 84, 85, 87, 88, 89, 93, 95, 101 and 105.

Group A-2: Nos. 4, 5, 8, 9, 14, 16, 18, 23, 29, 35, 36, 44, 56, 59, 63, 68, 80, 90, 92 and 104.

Group B: Nos. 30, 31, 33, 39, 42, 53, 67, 69, 72, 86, 91, (94 by surface collection), 96, 97, 99, 100, 102 and 103.

V. REMAINS OF THE JOMON AGE

The remains of Jomon age excavated at the Kamiyama Site comprise about two hundred potsherds together with a few arrowheads, scrapers and axes. Most of them were included in the humus and the black soil layers, but some were in a mixed layer of humus and loam. They were found concentrated in Trench C, since the remains of the early Jomon age are distributed in a

circle, the center of which lies roughly five hundred meters northeast of the excavated area. However, even in Trenches A and B, sherds were more frequent in the eastern parts, but relatively large fragments were also secured in Section 8 of Trench B, which lies on the western side.

Potsherds

Some typical examples of potsherds are shown on Fig. 12, since no complete vessels could be discovered. All of them are cord marked in the broader sense of the term. Over ninety per cent of the sherds are certainly fiber-tempered, and they are generally pointed on the base. They presumably take the form of a deep bowl, although we do not have a sufficiently large sherd to indicate the whole shape. In most cases, they have flat rims like No. 107, but wavy ones as in No. 114 are sometimes noted. A rising part of the wavy rim is seen on the rubbed copy of No. 114. Rims are often somewhat flared or even thickened into a twofold rim like that of No. 112. Cord and twine marks are the only designs impressed on rim, body and base. Cords are usually in LR type /i.e. twisted from left to right -- Eds./ (Nos. 107, 120 and 122), consisting of two different finer cords. The cord marks thus made are very unique in form as well as feather-shaped ones. Feather-shaped cord impressions are marked by two different original cords, LR and RL. The commonest type of design is an obliquely running cord impression, mostly in LR. Besides that, a line of knots' impression is recognized. (No. 118). Another example has small swollen bands, upon which are pressed thick twines. This design is somewhat similar to that of Lower Hanazumi in the Tokyo Plain. A small spiral mark of twine is impressed on a fragment, although it is too small to be illustrated. Much



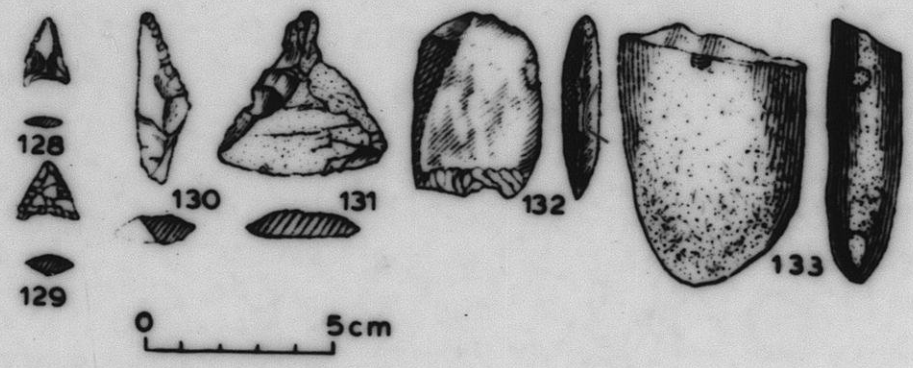

Fig. 12: Artifacts of the Jomon period

the same twine mark is seen on No. 117, but this may have been impressed by rotation. Cords in LR are sometimes marked inside of the rim (No. 107). A perforation for repairing exists on the same specimen on both sides of the wall. Basal fragments were recovered, three of which show a gentle curve in a vertical section, and only one has a nipple-like projection. It should be emphasized that the bases discovered from Kamiyama are all pointed ones.

From a chronological point of view, these potsherds are possibly comparable with the Lower Hanazumi type in the Tokyo Plain, since they have similar designs of cord impression, feather-shaped ones, twine impression and twofold rims. The author cannot draw any conclusion, however, from these fragmentary materials, which are entirely lacking in shell or bamboo impressions as well as a particular form of flat base. Nevertheless, a new type of pottery will be accepted in the Niigata region, if the potsherds of this kind are increasingly discovered in the future.

Stone artifacts

The stone artifacts found together with the Jomon potsherds are flake tools including two arrowheads, a scraper, an axe and a grinding stone. Most of them are associated with the potsherds stated above, but a scraper from Trench B (No. 131) is somewhat unique in shape and should be related to another group of Jomon pottery from the nearby site. It takes the form of an isosceles triangle, made of andesite and retouched on top into a tang, but not much worked on the edges. Two arrowheads of perfect form are illustrated here. One in shale (No. 128) and the other in obsidian (No. 129).

They are both triangular in form, with concave bases. No. 130 is a flake tool in shale, which is finely trimmed on one end into a straight edge. Larger flake tools somewhat similar to a triangular arrowhead in form were discovered, but they are not illustrated here since their functions are quite uncertain. No. 132 is an axe of serpentine. It is polished over its entire face and some nicks possibly from use are visible on the edge. The ground stone tool (No. 133) is made of sandstone and shows clear traces of grinding on the lower end.

VI. CONCLUSION

It was first ascertained at Moro, Itabashi-ku, Tokyo, in July, 1951, that a knife blade culture had actually existed in the preceramic age of Mainland Japan. A sharp edge left by the primary flaking is left untouched on one side of a long flake, and fine trimming is done on both the other side and the base. This technique is basically similar to that of the "backed blade", which was also first recognized at that time. In November, 1952, a group of stone tools including Moro-like knife blades were found at Chausuyama, Suwa City, Nagano Prefecture, which testified to the further extension of their area of distribution. And again in August, 1953, the author happened to visit the Sugikubo Site, Lake Nijiri, Shimo-minochi County, Nagano Prefecture, and found an entirely different type of knife blade. The knives from Sugikubo are made on typical blades, of very slender willow-leaf shape and skillfully pointed on both tip and base. This new type of knife was called "Sugikubo knife" in distinction from the "Moro knife". As the data increases, it has been made clear that these two are

different not only in the composition of the associated tools but also in the areas of distribution.

Moro knives were found at Ohatake, Taira City, Fukushima Prefecture (by Wararu Nagayama); at Moro, Itabashi-ku, Tokyo (by Itaru Yoshida and Meiji University); at Chausuyama, Suwa City, Nagano Prefecture (by Eiichi Fujimori); at Tenagaoka, Suwa City, Nagano Prefecture (by Shigeki Hayashi); at Shibukawa, Chino City, Nagano Prefecture (by Fusakazu Miyasaka); and at Sugikubo, Lake Nojiri, Shimo-minochi county, Nagano Prefecture (by Toranosuke Ikeda). Broadly speaking, they are distributed in the Nagano-Tokyo-Fukushima area.

Sugikubo knives have been increasingly discovered in recent years. They were found at Sugikubo, Nagano Prefecture (by Toranosuke Ikeda); at Kosaka, Sakae village, Kamitakai county, Nagano Prefecture (by Mitsukazu Nagamine); at Kaisaka, Tsunan town, Nakauonuma county, Niigata Prefecture (by Kozaburo Nakamura of the Nagaoka Museum); at Kamiyama, Tsunan town, Nakauonuma county, Niigata Prefecture; and at Shiriyazaki, Nigashi-toori village, Shimokita county, Aomori Prefecture (by Teruya Esaka). If the Kamiyama-type burin from the Kunimi Site, Chokai village, Yuri county, Akita Prefecture (by Giichi Kyono) is to be included in this group, they are distributed in the North Nagano-Niigata-Akita-Aomori area.

It is one of the most interesting facts for the author that Sugikubo and Moro knives have been so far found in these two distinct areas. Blades, blade cores and burins have been discovered in association with the former, but are almost entirely lacking in the latter. Fragmentary as they are, true blades are widely distributed from the Tohoku region to the northern part of the Chubu region, while there are very few examples of them in the

Tokyo Plain and in the southern part of the Chubu region. And again, it must be very important that Moro knives, kiridashi knives and points (from Uenodaira or Babadaira) have been found in the same area. As for the knives from western Japan, clarification of their chronological position as well as the composition of their associated tools is urgently needed.

As outlined above, many questions should arise on the knife blade cultures in Mainland Japan. The discovery of Kamiyama knives at this time in association with many other stone tools has surely contributed much towards the study of the preceramic cultures in Japan. Results of excavation at the Kamiyama Site will be summarized as follows:

1. The Kamiyama Site is situated on the Shomen terrace 319 meters above sea level, which is one of the river terraces of the Shinano River.

2. Remains of preceramic age are included without any disturbance in the loam layer up to the depth of thirty to forty centimeters from the top of the layer. There is no room for doubt that they were produced and left by the Late Pleistocene inhabitants there.

3. Stone artifacts were found grouped in three irregular circles, three to four meters in diameter and three to four and a half meters from each other. They must be somehow related with the dwellings of the time.

4. Knife blades, burins, blades, cores, scrapers, ground stone tools and irregular-shaped tools were found together. The blade technique is clearly recognizable on them.

5. The knife blades are comparable with the Sugikubo knives, for which long blade flakes are utilized. Some burins are so unique in form that they may well be called "Kamiyama burins".

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THE MOTONOKI SITE, TSUNAN TOWN, NAKAUONUMA COUNTY, NIIGATA PREFECTURE: PRELIMINARY REPORT OF THE EXCAVATION

(Niigata-ken Nakauonuma-gun Tsunan-cho Motonoki Iseki Chosa Yoho)

by Chosuke SERIZAWA and Atsuko NAKAYAMA

(Essa Kenkyu, No. 12, pp. 1-19. 1957)

I. Preface

Early in the spring in 1956, Mr. Shoichi Higuchi told me that a few noteworthy stone implements and stone flakes were excavated near Tsunan town, Niigata. Before long Mr. Toraji Ishizawa, a resident of the town, sent the stone implements and flakes to Mr. Higuchi. I borrowed and examined them in detail. Among the artifacts, there were points and blades which evidently belong to the pre-pottery age. There were also some other important stone flakes. On my way back from a trip to Kansai (western part of Japan) in April, 1956, I wanted to visit the site, but Mr. Ishizawa told me that the examination was impossible because of deep snow. About the same time, it was decided that both Atsuko Nakayama and I were to work for Dr. Kiyoo Yamanouchi of the Department of Anthropology, University of Tokyo. As a candidate for the place to be examined, we chose a pre-pottery age site near Tsunan town. For three days, May 25, 26, and 27, Dr. Yamanouchi, Nakayama and I went to Tsunan town, examined the material that Mr. Ishizawa had collected, and took a look at a few actual sites. We, however, could not determine the location of the layer containing stone

implements, and came back to Tokyo planning another visit to the place. At the beginning of August, 1956, Mr. Kozaburo Nakamura of the Nagaoka Museum, under the guidance of Dr. Ichiro Yawata, was excavating at the Unoki Site, Tsunan town, where roulette type pottery was found. While observing the excavation, Mr. Ishizawa found on a terrace a little above the Unoki site a spot where a number of points and flakes were scattered. He notified me of it. It was very possible that the place was a pre-pottery age site for the following three reasons: almost no potsherds were found at the spot; no stone implement of Jomon type was noted; there was a characteristic shape to the flakes. Mr. Ishizawa continued the examination and in November he arrived at the conclusion that a pretty good layer of artifacts, including points and stone flakes, should exist in the loam stratum. Upon receiving the report, I decided to do the excavation of the site. On the 16th and 17th of November, I made a preliminary examination of the place, which was already covered with the first snow. At that time Dr. Yamanouchi had to stay in Kyoto to give lectures at the University of Kyoto, and, thus, Nakayama and I alone made plans for the preparation and the excavation. During three days in December, the 5th, 6th and 7th, we did the first excavation. We could not do a satisfactory excavation because of the snow, and were forced to discontinue. We would like to make the second excavation after the thawing of the snow and examine what we could not at this time.

First, I would like to express my sincere gratitude to Mr. Toraji Ishizawa, who so kindly helped us from the time of the discovery of the Motonoki Site to the excavation. I shall be more than happy if the

examination will contribute to the study of the long history of Tsunan town where he lives. I also would like to express my thanks to Dr. Ichiro Yawata, Yoshiharu Homma, Kozaburo Nakamura, Kojiro Uehara, Tadashi Onodera, Masaru Aso, Hiroaki Okada, Masahiko Isozaki, Tadahiro Aizawa, Tsugio Matsuzawa, Kazuaki Nakamura, and Shoichi Higuchi, who helped us directly and indirectly, and to those of the town who volunteered to work for us.

II. Location of the Site

This site, where many points were excavated, is at Unoki, Tsunan town, Nakauonuma County, Niigata Prefecture. According to the 1:50,000 stratigraphic map of the Institute of Geographical Investigation, the place is located at Matsunoyama Hot-Spring; according to the 1:25,000 map, it is in Ojiya. The area is on the right bank of the Shinano River where the terraces are quite pronounced. We can find here and there 'Taira' (flat) and 'Saka' (slope) as a place name. We named the site the 'Motonoki Site' after the place of the same name nearby. The site is at 220 meters above sea-level and on a terrace which is at 50 meters above the water-level of the present Shinano River. It is only 200 meters in a straight line from the river. The terrace is the third terrace from the shore of the river and is used for vegetable and rice fields. It is on the second terrace, one step below this site, that people from the Nagaoka Museum under the guidance of Dr. Yawata excavated remains of the roulette type pottery last summer. (Figs. 1 and 6).

Also drawn to our attention was the surface collection of blades from a terrace above this one and the discovery of a large irregular tool from another terrace over 400 meters in elevation.



Fig. 1

III. Description of the Excavation

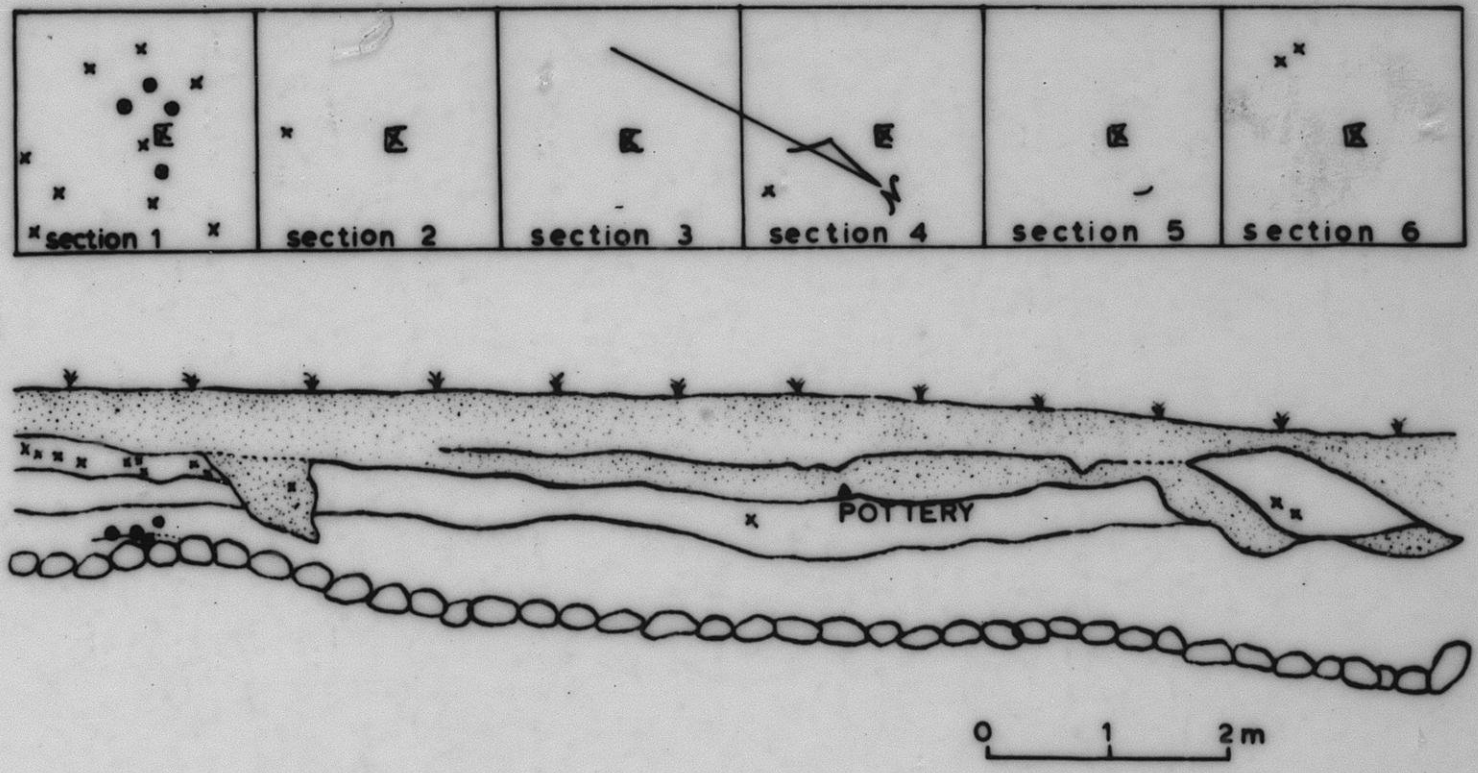
In the morning of December 5, 1956, we arrived at the place, and did the excavation during 3 days, the 5th, 6th and 7th, and discontinued it because of the weather.

We dug a trench, calling it trench No. 1, about 12 meters in length and 2 meters in width from north to south. We divided it starting from the south into six sections, two meters each in length; section No. 1 at the south end and section No. 6 at the north end. We had snow storms during the excavation which was done in snow 50cm. deep. Still, we came up with unexpectedly successful results. While getting rid of the surface earth, we excavated many flakes, and an average of 20 to 30 points in each section. According to our previous experience points are often excavated from black top-soil only. However, it is proved that artifacts are buried originally in the loam stratum. Artifacts are found in surface earth when the loam layer containing the artifacts has been washed away or when implements are raised up in some natural or artificial process. It was thus predicted that this site is another example of these cases. Therefore, we decided to get rid of the surface earth and dig the west half of the trench deeper. We started this process on the second day. When we reached the loam stratum, the remains became very scarce and, moreover, were found almost entirely in sections Nos. 1 and 6. In all other sections except in section No. 1, right below the alternating bands of loam and sand we reached the gravel layer which we think was the shore of the river at that time. In section No. 1 right above the gravel layer of the river shore there was, in contrast to yellow loam, black earth in the shape of an oval whose longer

diameter measured about 1 meter. It was to be noted that we found from this black earth a scraper and a few stone flakes, and three points from nearby earth. On the third day we carefully excavated the black earth and then dug down to the gravel layer in the other sections. Thus, we completed the excavation of the first trench. Stone flakes amounted to about a mandarin orange boxfull. We also have to mention the discovery of pottery at this point. A potsherd was found at the bottom part of the surface earth. It was a piece about one sixth of a whole pot, retaining the part from the mouth to the bottom. It was very thin and fragile and had the shape of a bowl with a small, flat bottom. It had an impressed rope design 1.5 to 2cm. long. It is said that pots of the same type were found at the time of the Nagaoka Museum excavation. However, I do not know the reason why only one potsherd was found at this spot. Because of the deep snow we had to discontinue our excavation without determining the distribution of the remains and doing the topographical survey. We are planning to do these when the snow thaws. (Fig. 2).

IV. Description of the Site

So far as we were able to find out by the excavation at that time, the stratigraphy of the place is as shown in Fig. 2: surface earth, a loam layer, alternating bands of loam and s[illegible], and a gravel layer. As for the gravel layer, each particle is superimposed over the other in the same direction, thus showing that it is a natural gravel bed. The alternating bands of loam and sand are composed of thin layers of five to ten cm., proving that the loam and the sand alternately were carried in the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POTTERY
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Fig. 2

river and accumulated in the area. There were hardly any remains found in these bands. Next is a layer of soft loam for about 50cm. In section No. 1, there was a layer of loam of a little different color right above this layer of loam. Nine points were found in it. In some areas we can divide the surface earth into two parts, a brown one and a little blacker one. It is, I think, the difference between a part cultivated all the time and one left uncultivated. The potsherd was excavated from the blacker part. Almost all the stone implements came from the surface earth. The amount is:

Section No. 1:	point---	5;	other	stone	implements---	7
Section No. 2:	" ---	12;	"	"	"	---10
Section No. 3:	" ---	41;	"	"	"	--- 5
Section No. 4:	" ---	42;	"	"	"	--- 1
Section No. 5:	" ---	60;	"	"	"	--- 5
Section No. 6:	" ---	27;	"	"	"	--- 0
Total :	" ---187;	"	"	"	---28

In contrast to these figures, the remains from the loam layer are 25 points and 1 other implement. We found that two stone implements from this layer fit together with the stone implements from the surface earth. This fact denotes that some implements from the loam stratum and the implements from the surface earth were used at the same time. Examining the stone implements from the loam stratum, we can divide them into two categories: the one found near the gravel layer and the other from the upper part of the layer. Those which fit together with the ones from the surface earth belong to this upper group. Remains that are left in situ are, thus, only those found near the gravel layer and comprise 4 points, 1 scraper-like

stone implement, and 15 to 16 stone flakes. Hence, we can assume that the black earth of an oval shape, which I mentioned before, has some connection with the life of the people at that time. We can recognize no difference whatsoever in shape and the kind of stone as well as in the way they are made between this scraper-like stone implement and the stone implements from the upper part of the layer. Therefore, we can conclude that the stone implements from the upper part of the layer were left at the same time as those near the conglomerate stratum, but were somehow raised up.

V. Remains

The majority of the remains are points, but there are some notched implements and scrapers in non-uniform shape. The amount of them is:

(1) Points --- 210

a. Those which seem to be finished --- 128

(unbroken --- 25; broken --- 103)

b. Those that seem to be unfinished --- 82

(2) Notched stone implements --- 9

(3) Stone implements of non-uniform shape --- 28

We can say that the number of artifacts is extremely large in proportion to the area of excavation. We also excavated a great amount of stone flakes, a little less than an apple box full. However, it is to be borne in mind that we could not find any stone cores.

Shapes and Process of Manufacture of the Points

Both sides of all the points are worked. We can divide them into six groups according to the shape.

A. Narrow, long but thick ones --- 11% (Figure 3:1 & 2)

B. Rather wide and thick ones --- 44% (Figure 3:3 to 5)

C. Those of even width --- 8% (Figure 3:8)

D. Those with a pointed tip --- 7% (Figure 3:6 & 7)

E. Large wide ones --- 9% (Figure 3:9)

F. Small ones --- 5% (Figure 3:10 & 11)

Broken ones whose shape cannot be determined --- 17%

A --- Perhaps because of their narrowness, none are whole. Therefore, we cannot determine the entire shape. As far as we can tell from the broken pieces, the width is largest at two to three cm. from the tip and the tip is flat with the shape of an isosceles triangle. From the tip it gradually gets wider till the center and then again gets narrower and makes a round end. We cannot tell the whole length, but we can imagine that it varies. Up to now, none of this kind have been discovered at any of the other sites.

B --- This kind comprises the largest number among the points found 'n this site, about half of the remains. The length is 10 to 15cm., the width is a little over 2cm. and the broadest part is near the center, with pointed tips at both ends. Though there are small differences in length and width among the points, we can perhaps group all these together. In some of these points, we can see a small bump near the end. It might have been made quite accidentally during the process of making or it might have been intentionally shaped so that it is easy to attach the shaft.

C --- Points in this category are broader but similar to A. However, since all of them are broken, we cannot tell the entire shape. The

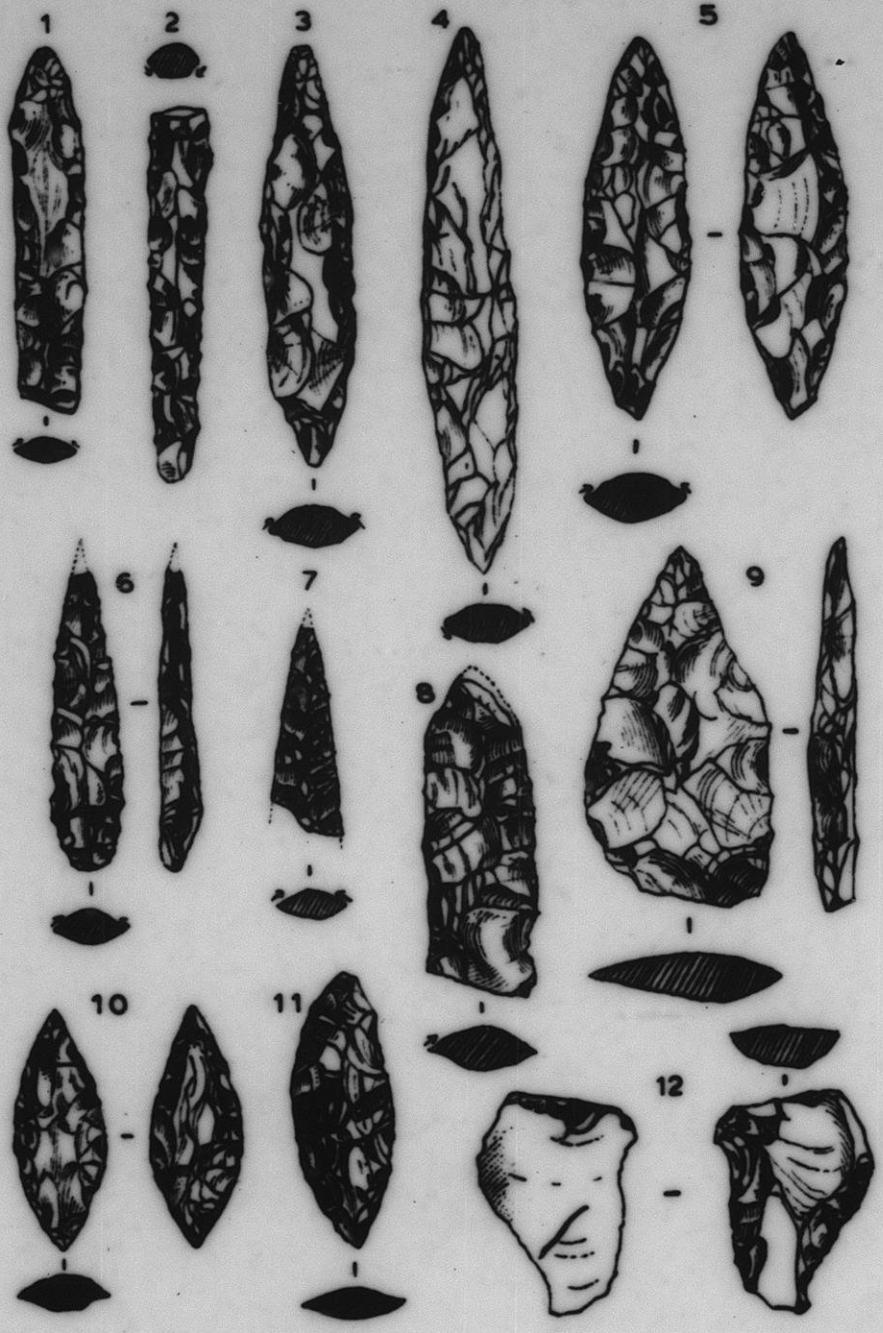

Fig. 3: (Scale--1/2)

characteristics are that they are not thick and that the width of the body part remains even.

D --- The tip is thin and pointed. All of them are small. Perhaps because the tip is narrow, we could not find any complete one. They perhaps used them with the pointed end to the front. Up to now this kind of shape has never been recognized.

E --- These are the points whose width is extremely large in comparison with its thickness. Again we could not find any complete one, but we would imagine they are not too long. The tip is pointed and the end is dull. It has an almond shape as a whole. The circumference is carefully made.

F --- These are small ones. The length is about 6cm. They are thin with a wide center, shaped like a leaf. Though there are only 5 in all, we placed them into a separate group because of these characteristics.

The above is the description of the six forms tentatively categorized. Common characteristics of each group seem to be due to the way of making them. When we see these points group by group, we see quite a difference in the shape among the groups. There are, on the other hand, points whose shape lies in between groups and are hard to categorize. At this point in the study we cannot tell the chronological relationship among the groups; whether all of them were used simultaneously or which one precedes the other. Only when we find the answer to this problem, can we really categorize them definitely. In the meantime we must be satisfied with this tentative grouping.

I have already mentioned that all these points are bifacially worked and seem to be core artifacts. Next, we would like to touch briefly on the process of making. When we examine the finished points, some of them have the final touch on one side while others have it on both sides. The former is larger in number. We cannot infer anything from those unfinished, since they are in the process of being made. However, as far as we can tell, many of them have the final preparation on one side, and in some of them only one side and the tip of the other side is shaped. These facts well denote the order in the process of making. Among some which look as if the shaping process had just started, we find thin, long and flat stones both of whose sides are shaped by chipping. We can say that the shaping process for these core artifacts is: chipping the circumference, first on one side and then on the other, making the edge, turning it over again, shaping it again, and repeating this process. The edges are worked by removing chips alternately from one face or the other (Fig. 4).

To support this assumption about the process of making the points, there are stone flakes. Some of the flakes are large but some of them are thin and about the size of the tip of the little finger. The typical shapes are the curved shoe shape and the fan shape. On the chipped surface of most of these flakes we can see the prepared platform, and we can consider these flakes as edges of stone implements that were shaped at a previous stage. In chipping stones, it seems that they did not use pressure-flaking but used free-flaking and step-flaking. Another characteristic about their method is that bulbs are not high, perhaps, because they either used something softer like wood or bone, rather than hard stones in flaking, or they

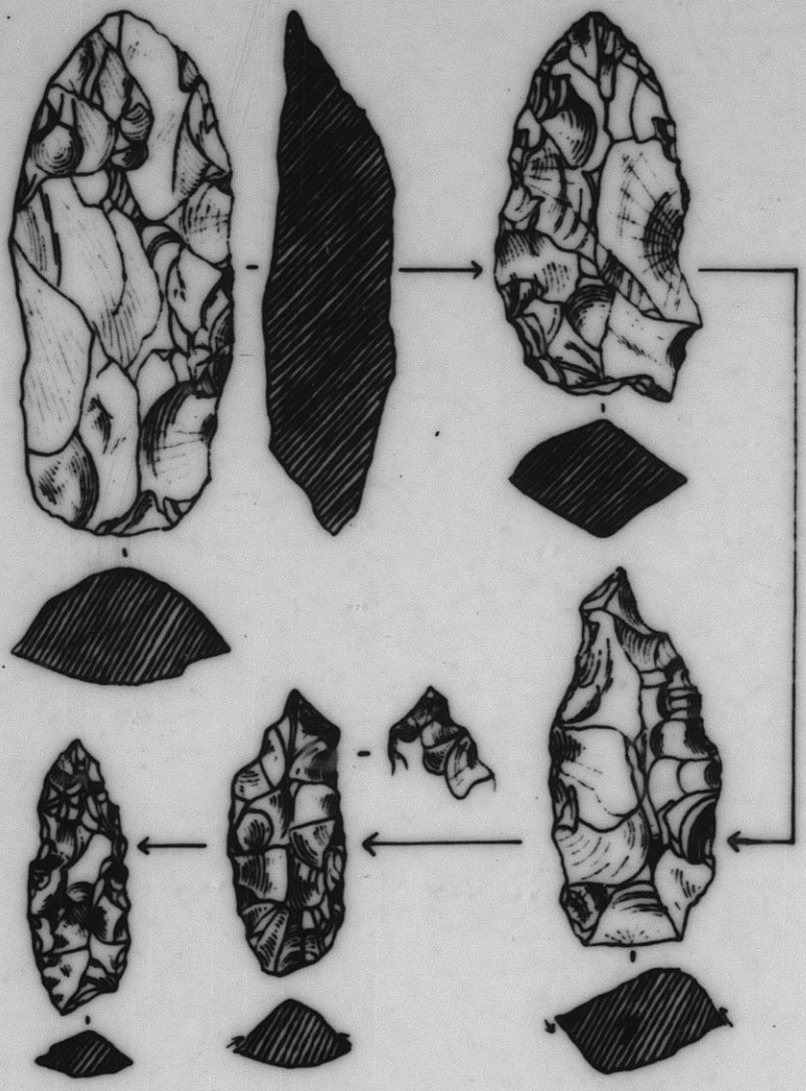

Fig. 4: (Scale--1/2) Showing process of manufacture

used a cylindrical hammer, which is said to produce flat bulbs rather than pointed bulbs.

Other Stone Implements

Notched Implements /Concave Scrapers? -- Eds./ -- The notched forms found at this site are flake tools. Some of them have efflorescent stone as an outer cover. They made a concave cutting edge on flakes that came from the core in the process of making points, and perhaps used it as a scraper. Most of the flakes are thick. In most cases the outer surface is left as it was chipped off the core and the other side is retouched. A distinguishing characteristic about their shape is that when you put the cutting edge of the notched implement on the left with the chipped side down, then there is always an ear-like tip sticking out on the upper left. It is to be noted that the length of the cutting edge is about 3 to 5cm., and they are larger than any similar implement so far found in Japan. Of the notched implements found in Japan up to now, the length of the cutting edge is about 1cm. and there is an additional scraper edge on one end. Moreover, it is very rare to find as many as nine notched implements at one site, which is the case here. This larger number denotes the fact that the culture concerned required the use of these implements. We can think of a curved knife as one use for a notched implement. In this case also they perhaps used the notch to make shafts for points which also came from the site in abundance. As shown in Fig. 5, there is one which also is a notched implement but has the secondary working on both sides and has a pointed tip. This perhaps was used more as a gimlet rather than as a knife. In case of points, different kinds of stone are used. But in the

case of the notched implement, only one kind is used -- silicate rock, which is the hardest among the rocks found at this site. We can see the correlation between the choice of the rock and the use of the notched implements (Fig. 5)

Scrapers -- The number of scrapers found is less than one ninth of the number of points found. They are made by chipping one side of the edge of a flake. Among them there are some shaped rather well, with a triangular tip and careful retouch on both sides of the tip. In this case the tip is always curved to the left. Perhaps the tip and the sides were used for scraping. The rest of the scrapers found have various shapes, but as tools they are of poor quality. They seem to have chosen rather thin flakes. It is interesting that one of them can be fitted with one of the unfinished points. (Fig. 3, No. 12).

Kind of Stone Used

(Identified by Mr. Kazuaki Nakamura of the Department of Geology, Division of Natural Sciences, University of Tokyo.)

1.	Andesite	--- 10%	Volcanic rocks
2.	Plagioclase rhyolite	--- 1.4%	
3.	Medium-Rough Sandstone	--- 2.4%	Sedimentary rocks
4.	Granular Sandstone with patches of black clay	--- 5.7%	
5.	Mudstone	--- 4.3%	
6.	Silicate Rock	--- 18.5%	
7.	Quartz Rock	--- 1.9%	
8.	Granular Rock	--- 55.9%	



Fig. 5: (Scale--1/2)

As material used for making stone implements, they used both volcanic rocks and moraine. The amount of each rock used is shown by percentage. They chose hard stone of even quality and did not use, for example, plutonic rocks, rough moraine or volcanic rocks with many phenocrysts. Judging from flakes and those stone implements whose shaping process has just started, we can tell that they used stones from the river shore. They perhaps picked up stones of suitable shape from the river shore near the site.

VI. Conclusion

We believe that by the discovery of the Motonoki Site we revealed for the first time remains of the pre-pottery culture in Niigata Prefecture. However, upon examination, new problems to be answered have arisen adding to the previous problems left to be solved. I shall discuss them in this conclusion.

The fundamental problem is whether the point culture revealed at the Motonoki Site actually belongs to the pre-pottery age. On examining the remains, we found many points and flakes from the black top soil, which is supposed to be the surface earth, and pieces forming one pot, which is rare in this layer. The pot is considered a new type which has not yet been categorized. Some may think that the points and this pot were used simultaneously. If we look at only the remains from the surface earth, this assumption has a pretty good basis. However, if we take into consideration stone implements from the loam layer and other layers deeper, then we cannot but come to the conclusion arrived at in section IV. A large number of potsherds are found in the lower part of the surface earth (just above the loam layer) and not at all in the loam stratum. Therefore, the

surface earth at the time when the pot was used should be some time after the loam stratum had moved somewhat or had been eroded and became somewhat exposed. With this secondary movement of the loam stratum the stone points and stone flakes now found in the surface earth were moved into their present position. We can assume this since points and flakes found in the loam layer itself and from layers further down do not show any differences from those found in the surface earth. These three levels show stratigraphic differences, but they were at one time, we can assume, in a single culture stratum. This assumption is clearly proved by the fact that a piece of point from the loam stratum and another piece from the surface earth can be fitted together to make one complete point. It is rare that remains are left undisturbed in the layer in which they were originally put, regardless of whether they are of Yayoi or Jomon or Pre-pottery age. It is usual that remains in some areas may stay in the original place but in other areas may change site or layer due to some derangement in the later period. Therefore, in excavation of sites it is necessary to determine first which remains preserve their original position and which remains have been deranged. When we do the second examination of the Motonoki Site, we should ascertain the original stratification at the site and the direction of movement of the points found in the surface earth.

We found potsherds equivalent to a whole pot. As long as we found the pottery, we should find out whether or not there are stone implements that were used simultaneously with the pottery. However, the stone implements from the surface earth are mostly points and flakes with the characteristic features that were produced during the process of making the points. As

far as technique of manufacture and form goes, even if there are some stone implements or flakes of a different age, it will not amount to an important quantity. We shall get a true answer to this problem only when we have a chance to examine other sites whose remains consist mainly of the same type of pottery.

The second problem is the inventory of the stone implements. According to the first examination of the site, the stone implements at the Motonoki Site consist of only three kinds: points, notched implements and scrapers of various shapes. We certainly have not found a definite answer as to what other kinds of stone implements are to be found along with points. However, I have never heard of a site which produced such few kinds as this site does. Do these implements of only three kinds represent the Motonoki culture? If we can establish an assumption that the spot of excavation was at that time a place of manufacture of stone implements or a residence of some special kind, then we can understand the reason why stone implements like the end-scraper or stone gimlet are missing. We would like to make this point clear by the next examination of the site.

The third problem is the manufacturing method. When I saw for the first time Mr. Ishizawa's collection of remains from the surface, I noticed at once that all of them have the prepared platform and at the same time are in the shape of a shoe or fan. Upon excavation, together with points, we were able to acquire material in process of manufacture and discovered that these are special by-products of the points. A characteristic of these flakes is that almost all the bulbs are not sticking out. Perhaps these are so-called flattened bulbs or salient bulbs. Thus, we can conclude

that the method they used at the Motonoki Site for making points is either the mallet percussion-flaking method or the cyrindrical hammer percussion-flaking method. It is very positive that these points were core implements for the following two reasons: we can find no stone cores which are the usual material for making points; we found a few specimens which appeared to be large unfinished points made of flat pebbles from the river shore. This assumption is quite possible as long as stone cores are not buried in another place by themselves. According to research done by Mr. Tsugio Matsuzawa, they found quite a few stones which can be considered core artifacts among the points found at the Odoriba Site in Nagano Prefecture. This is a very important problem to be solved in the future.

The fourth problem is the nature of the site. Up to now remains of point culture in other areas have always been found in the loam stratum. Perhaps the point culture existed when the formation of the loam stratum was in progress, and it continued to accumulate after the remains were left to be buried. At the Motonoki Site, the only place where the artifacts have remained at the original place without changing their position is the black earth beneath the loam stratum just above the terraced gravel stratum. What does the existence of this black earth stratum right above the gravel stratum mean, if we suppose the remains in the surface earth and in the upper loam stratum were moved from their original place at a later period? Since this is only the first excavation, we cannot, of course, arrive at a hasty conclusion. We can, however, tentatively assume that a place in the river shore a little higher than the rest was their residence or the place where they made stone implements. On the north

side of the trench right above the gravel layer there are alternating bands of sand and loam, and the latter contains hardly any remains. Another loam stratum is above the bands. Thus, we can suppose that the period when the people at the Motonoki Site lived was the time when the formation of the gravel stratum at the area had been completed and the accumulation of the loam just started. The site of the early Jomon period is at the Unoki Site, which is a terrace below the Motonoki Site. Therefore, the difference in time between these two sites is considerably large (Fig. 6).

The fifth problem is the place of the site in Japanese pre-ceramic culture. Among the points, type B is the largest in number, being about 50% of the total amount of the points. We found points nearest in shape to this type at the Babadaira Site in Nagano Prefecture which I examined in the past. When we excavated the Babadaira Site we could not find a layer which contains many points of this type except the deranged layer at trench III. However, among Mr. Shigeya Yui's collection of surface earth remains of the Babadaira Site, I could recognize many that are of type B. We also found the same type among surface earth remains of the Ijima Site of Kagawa Prefecture which Mr. Yoshimasa Kamaki reported on. A most characteristic type at the Motonoki Site is type A. Long, narrow points of this kind have never before been excavated. Moreover, it is surprising that 10% of the total number of points are of this type. Type D has a thin and pointed tip. Two points of the same type have been found at Locality B at Nakappara, Nagano Prefecture. This type has a broad leaf-like shape. A few of similar shape have been found at Odoriba and Furuyashiki in Nagano Prefecture, but there are not too many of the E type.

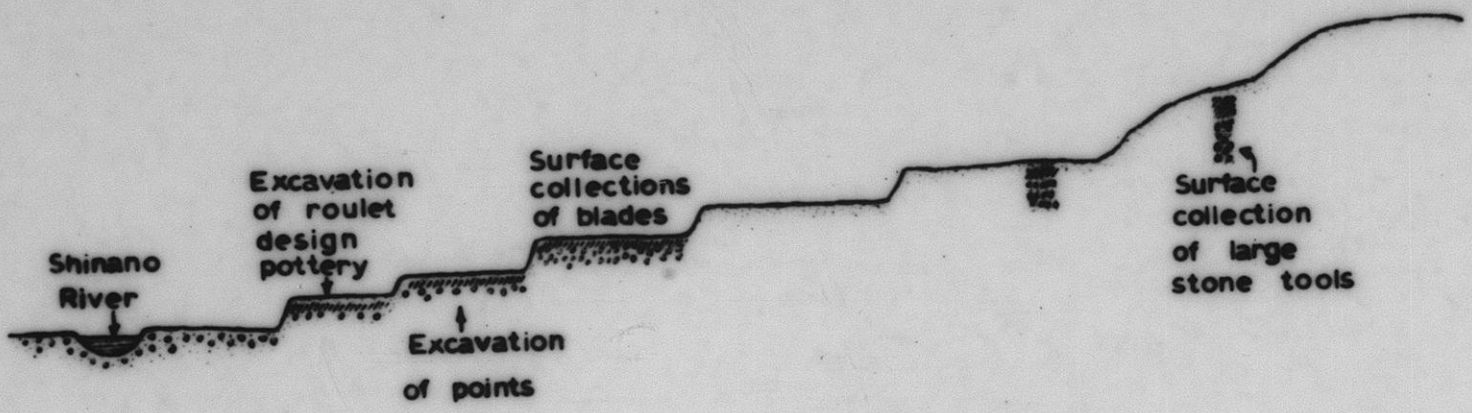
Shinano River
Excavation of roulet design pottery
Excavation of points
Surface collections of blades
Surface collection of large stone tools

Fig. 6:

Type F has a little smaller leaf-shape. This type shares the same characteristics with those excavated from trench V at Babadaira, Nagano Prefecture.

All the points from the Motonoki Site are retouched on both sides, have flat bulbs and are core artifacts. The shape of these points is obviously different from those so far excavated at other places, take for example the thin, long type A. A partial similarity in shape, however, can be found between these and the points excavated at Babadaira, Locality B at Nakappara and a few other sites. Since we do not have a detailed chronology of point industries of the Japanese pre-pottery age, we can only compare the shape or the technique. Technically, these points at the Motonoki Site are more advanced than those points with only unifacial retouch at Mitsuya, Gumma Prefecture, or those with partial bifacial retouch at Takei, Gumma Prefecture and at Yashima, Nagano Prefecture. On the other hand, they are not as advanced in the method of flaking and preparing as those well prepared small points with both sides shaped found at Odoriba and Uenodaira, Nagano Prefecture. The remains so far excavated at the Motonoki Site indicate the closest relationship to those found at Babadaira (at trench III and V) and Locality B at Nakappara.

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Appendix

This report is a part of the research supported by a grant from the Natural Science Research Fund, Ministry of Education, 1956, given to Mr. Kiyoo Yamanouchi. The authors are Mr. Yamanouchi's co-workers.

Ed. note:

The following addendum was supplied in 1961 by the junior author of the above article.

After the excavation of the Motonoki site, a morphological analysis of chipped points discovered in Japan was carried out in an attempt to re-assess the problem. As a result, it was found that the form of the points which have been unearthed from the loam strata and established as coming from a Pleistocene deposit is, in a word, laurel leaf, and does not go beyond the range of this type. On the other hand, the points excavated at Motonoki are varied in form. It has come to be thought that they, together with those from Yokokura and Kamikoshiba in Nagano Prefecture and from Tachikawa in Hokkaido--sites which were then under investigation--represent a separate period apart from the point industry which has conventionally been classified as one of the preceramic cultures of Japan. The points found at these latter sites are not of the laurel-leaf form but

include some with rounded base, some with pointed tip and some with tanged base. When their stratigraphic position was examined, moreover, they were found to come from levels which cannot necessarily be regarded as Pleistocene strata. However, the lack of association with pottery and the unearthing of numerous points in clusters suggest that they are not points belonging to the Jomon culture. More recently, points apparently belonging to this group have been uncovered at Sannenyama and Chaenwara in Taku City, Kyushu. Material of this nature may be expected to increase in the future.

A second investigation of the Motonoki Site has been conducted by K. Yamanouchi.

HOKKAIDO BEFORE THE AINU -- IN SEARCH OF THE ANCIENT CULTURE OF THE NORTHERN AREA

(Ainu Izen no Hokkaido -- Hoppo Kodai Bunka no Nazo o Saguru)

by Chosuke SERIZAWA and Masakazu YOSHIZAKI

(Kagaku Yomiuri, Vol. 11, No. 5, pp. 31-37. Tokyo, 1959)

Discovery of Mammoth

Erimo point is located where the Hidaka range, the backbone of Hokkaido, terminates in the Pacific Ocean. Near a hamlet at the base of Erimo point, strange fossils were discovered twice, once sixteen or seventeen years ago and again in 1954. Soon after the second discovery, these fossils were brought to the attention of Dr. Minato of the Department of Geology at the University of Hokkaido and were ascertained to be the molars (M_2 and M_3) of the extinct mammoth. The mammoth was a heavily-haired elephant and, in contrast to the elephants of today, lived in cold regions. This animal appeared on the earth between 100,000 and 200,000 years ago and became extinct about 10,000 years ago. It is well known that the frozen carcasses of this animal have been found in the perma-frost in Siberia.

No fossils of mammoth had ever been found in Japan until the discovery at Erimo point by which the existence of this animal in Hokkaido was proved. According to the thorough geological investigation of the layer which contained the fossils, it is assumed that these mammoths lived about 20,000 and 30,000 years ago. This was during the period of the Tottabetsu

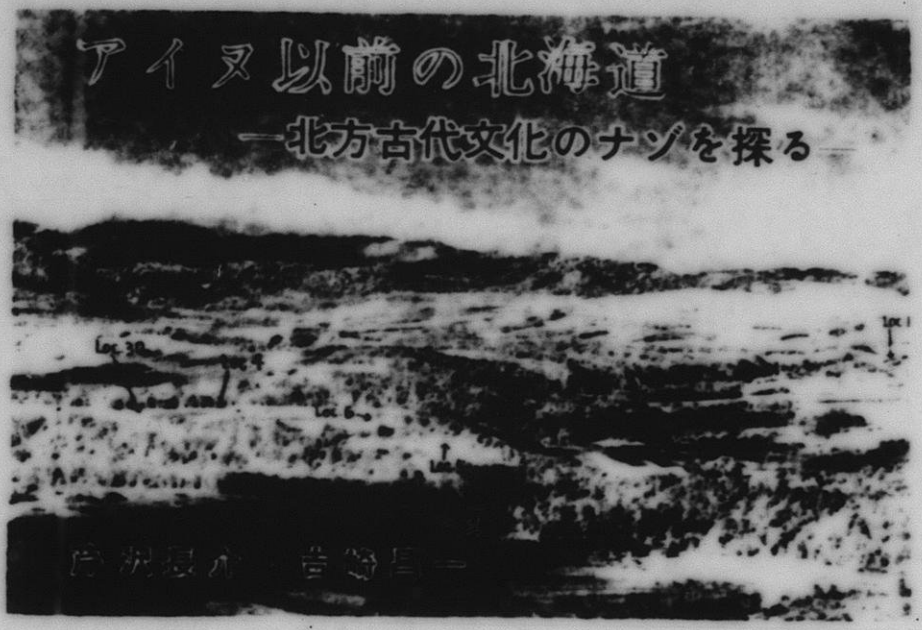


Fig. 1. A distant view of the group of sites in Shirataki village, Mombetsu county, Hokkaido.

glaciation of which traces remain in the form of cirques in some parts of the Hidaka range. At that time, the climate of Hokkaido was much colder than it is now. The annual average temperature of that time is estimated to have been the same as that of Sakhalin today.

Dr. Masao Minato, who investigated the mammoth, and other scholars who were studying the Quaternary of Hokkaido seem to have been telling each other that Palaeolithic stone implements and human skeletons would be found in Hokkaido in the near future. This was not a fantasy but was based on the following reasons. Firstly, there were land bridges across the Tatar Strait and the Soya Strait during the Ice Age, and animals could easily go back and forth. This is verified by researches in biological geography and those on the lowering of the sea level because of glaciation. Thus it can be assumed that the mammoths moved from the continent across the land bridges.

Secondly, many sites of the Upper-Palaeolithic period have been found in Siberia and most of them are considered to have been left by mammoth hunters. Therefore, it can also be assumed that a branch of these hunters migrated to Hokkaido in pursuit of the mammoths.

As a matter of fact, at almost the same time that we heard the news about the discovery of the mammoth in Hokkaido, the archaeologists independently came to the conclusion, based on the study of stone implements, that there are traces of the people of such an ancient period.

Discovery of Palaeolithic and Microlithic (Non-Pottery) Culture

Shirataki-village is on the east of the Sekihoku tunnel, the longest tunnel in Hokkaido, which is on the National Railroad Sekihoku line from

Asahikawa to Abashiri. The area around the village has long been famous for the production of obsidian. Especially in the places which the villagers call "Kokuyo no sawa (Valley of obsidian)" or "Kobo no sawa (Valley of Priest Kobo)," most of the pebbles consist of glass-like obsidian. Moreover, on the upper reaches of the valleys, there are cliffs of obsidian which cannot be seen anywhere else in eastern Japan.

Obsidian is one of the volcanic glasses. It is a beautiful black or red stone which is semi-transparent. Those who have travelled in Hokkaido must have seen obsidian accessories as well as agate earrings and pendants in the showcases of gift shops. This beautiful stone which is used now only for accessories was one of the most useful materials for stone implements to the ancient peoples. Just as we make knives of iron, the people of the Stone Age, cutting and shaping obsidian stones, made knives and arrowheads. There is no reason why they should have missed this wonderful mountain of treasure.

Along the Yubetsu River which runs across Shirataki-village, four or five levels of river terraces have developed. On the terraces, local historians Mr. Eiji Toma and Mr. Kioe Yonemúra discovered a large quantity of artificially produced bits of obsidian and (a) large stone tool (s,?, tr.) in 1931 or 1932. A little later, a part of the materials collected was donated to the museum in the botanical garden attached to Hokkaido University and was published by Doctors Hiromichi Kono and Takemitsu Natori as implements having a Palaeolithic or microlithic character. However, they have remained undated.

In 1952, one of the co-authors, Yoshizaki, wondered whether these remains found near Shirataki village are of the non-pottery period, and

undertook a field investigation. Its result made it clear that the group of stone implements in question was the remains of a non-pottery period like those from the Iwajuku site in Gumma Prefecture. Furthermore, Yoshizaki found that obsidian implements had remained without disturbance in the Pleistocene clay layer at a depth of two meters in the cliff facing toward the railroads in the Kamishirataki area of the village.

In 1954, another important discovery was made in southwestern Hokkaido. At Igarashi, Tarukishi village, Suttsu county, a child of pre-school age happened to pick up a shale blade in a field. This launched an official excavation conducted by the staff members of the Hakodate Museum. Accordingly it was confirmed that there also existed in this area a non-pottery culture characterized by large blades although these were made of stone other than obsidian.

Thus, several kinds of sites of non-pottery culture ranging between the Holocene /Pleistocene? -- tr./ and the lower Holocene have been found in various places totalling more than one hundred.

Features of the Non-pottery Culture

People were living in Hokkaido before the Jomon period (about 4,000 B.C.-100 B.C.). The inhabitants did not know how to make pottery. Their implements were mainly flaked stone tools and probably bone tools. It is assumed that they lived in a simple hut on the plateau where water was easily available and that at most several families lived cooperatively. Well, let us explain their remains--almost nothing but stone implements were left--from the older to the newer.

Among the stone tools which have been excavated so far, the group considered to be the oldest were found at the sites called Locality 27 and Locality 4 in Shirataki village of Mombetsu county. Both of the locations are on the terrace 40m. above the river bed. Remains were discovered in the weathered sand layer which covered the layer of terrace gravels. The typical stone tools are obsidian knives which have a little retouch on the back. Besides there are crude flakes of feldspar (See Fig. 2). A small crude boat-shaped tool (s) is found at Loc. 4 but not at Loc. 27. Such an industry of stone tools (Sekki-bunka, orig.) has not been found except at Shirataki village.

The industry excavated at Loc. 13 in the same Shirataki village can be regarded as younger than the industries of Loc. 27 and Loc. 4. The conditions of occurrence at this site are unusual. The stone tools were contained in the clay layer at a depth of 2m. from the surface of a poorly developed terrace 20-23m. above the river bed. Between the surface and the clay layer, there are layers of sand, clay and gravels. Thus it seems that this spot was submerged, even if temporarily, after the people had lived in the site. As shown in Fig. 3, the excavated remains are mainly composed of true blades, pointed blades, refined boat-shaped tools, single blow burins, and stone hand-axes. Few such industries of stone tools have been found. For example, a pointed blade and several blades were obtained below the volcanic ashes at the Meto site on the upper Tokachi River. Another example is the collection of a few stone tools, which look like the above, gathered near Kitami-city of Mombetsu county. A cultural unit of stone tools composed mainly of large blades has been excavated from the

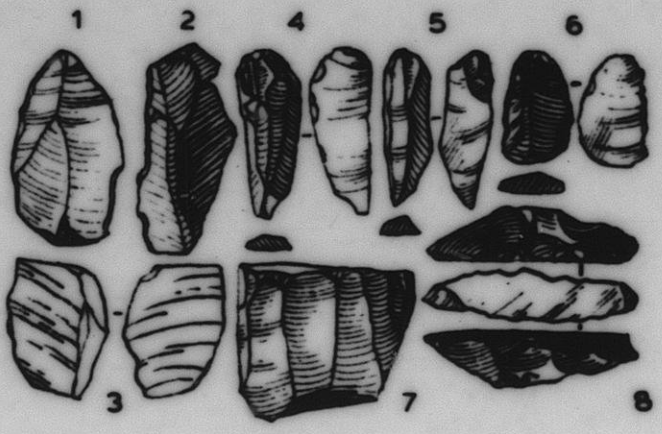


Fig. 2. A group of stone tools found at Loc. 27(1-3) and at Loc. 4 (4-8) in Shirataki village



Fig. 3. A group of stone tools found at Loc. 13 in Shirataki village

Igarashi site at Tarukishi village of Suttsu county. Upon the basis of the shape of the blades, this industry shows a similarity with that of Loc. 13 in Shirataki village. However, the boat-shaped tools are small and crude and they look rather like those of Loc. 4 in Shirataki village. Therefore this industry cannot be considered to be the same as that of Loc. 13 of Shirataki.

According to Dr. Masao Minato, there is a strong possibility of relating the layer which contained remains at Loc. 13 of Shirataki village to that in which the mammoth of Erimo point was found. If so, the people who owned the culture represented by the industry of Loc. 13 must have lived at the same time as the mammoths lived and have pursued the heroic mammoth hunt. It is regrettable that fossils which might support this assumption cannot be found because of the geological condition of Loc. 13, which has been incapable of preserving bones. If any site of this period which has preserved fossil remains is excavated in the future, the bones of several mammoths and tools made of their bones will probably be found there.

Now, a problem remains to be considered: although it is clear that the industry of stone tools at Loc. 13 belonged to the period of the Tottabetsu glaciation before the land bridges to the continent were cut off, no similar tools have been found on the continent. It is even strange that the industry of Loc. 30 in Shirataki village, which is much younger than that of Loc. 13, has a remarkable feature in common with the Palaeolithic culture of Siberia. A possible solution of this problem is to attribute the following explanation: the industry of Loc. 13 is somewhat



Fig. 4. Line of stones and stone artifacts excavated at Loc. 33 in Shirataki village. Obsidian implements are in the right corner



Fig. 5. Stone culture of the above site

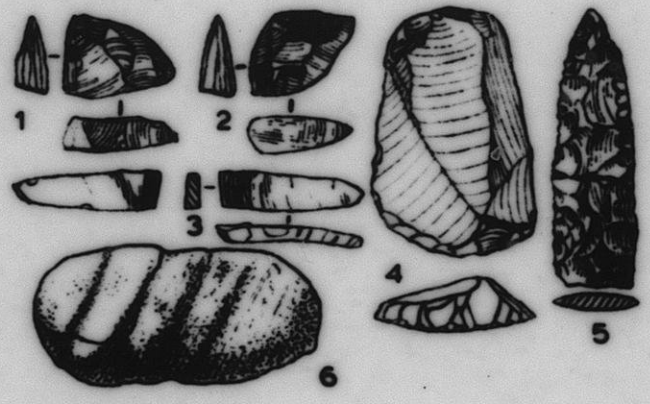


Fig. 6. Stone tools at Loc. 30 in Shirataki-village

older than the Upper Palaeolithic culture found in eastern Siberia, or it developed in isolation.

Near Loc. 13 of Shirataki village, there is a site named Loc. 33. This site was discovered on a terrace 12-15m. above the riverbed, formed by cutting the one on which Loc. 13 was found. Therefore, this site is far younger than that of Loc. 13. Here, burnt rocks and fireplace (s) were discovered in a weathered sand layer. Around the fire place in a cluster, there were stone points, various scrapers, rich varieties of burins, many boat-shaped tools, large bifaces which looked a little like hand-axes, and rather crude blades (See Fig. 5). Among these stone implements, the newest and the most significant is the appearance of points. This marvelous weapon retouched on both sides made a new epoch in Palaeolithic culture.

This kind of industry has been found at Loc. 14, 16 and 17 of Shirataki village, Loc. C. of the Tachikarushinai site in Engaru town of Mombetsu county and in the vicinity of Okedo town, Tokoro county.

Inferring from the dating of the terrace and from the appearance of points, the Palaeolithic culture of Loc. 33 provides the conditions for correlation with the "culture of points" which is considered to have flourished in the Kanto and Chubu districts during the upper Pleistocene. For instance, this assumption may be supported by the fact that among the stone implements in Loc. 33, there are small peculiar points (Fig. 5, no. 4), which are found in the early stage of "culture of points", and burins made of points.

Recently Mr. Minoru Kato of Yamagata University and the staff members of the Chido Museum have discovered sites of the non-pottery period in the

Tohoku district. It is said that some of these sites under investigation are accompanied by points and blades. If the culture which contains such a combination of stone artifacts in the Tohoku district is thoroughly investigated, the relationship between the Palaeolithic culture of Loc. 33 and that of the Tohoku district will be clarified.

Following the industry of Loc. 13 and Loc. 33 of Shirataki characterized by boat-shaped tools and blades, there appears an industry found at Loc. 29 and 30 of Shirataki and Loc. B. of the Tachikarushiina site in Engaru town, Mombetsu county, and this industry is characterized by Shirataki engravers. The shapes of Shirataki engravers are shown in Fig. 6, no. 1 and no. 2. Usually scratches running lengthwise are found on the undersurface.

Shirataki engravers are produced by a strange technique: cutting points. The bottom surface is completed by flaking off several spalls. On this occasion, ski shaped flakes (Funazoko suporu) are produced and they are often utilized as tools (Fig. 6, no. 3). Associated with Shirataki engravers are narrow points, Tategata soki (long scrapers) made of thick flakes, and irregularly shaped scrapers (Fig. 6). In Loc. 30 of Shirataki, in which typical specimens were found, grindstones for making bone or horn artifacts and an engraved (?) pebble (Fig. 6, no. 6) were found.

The Palaeolithic culture characterized by Shirataki engravers is also found in the Akaigawa site of Yoichi county and the Kuriyama site of Yubari county which have been reported by Mr. Akira Matsushita. Such a site has not yet been recognized in Honshu.

On the other hand, outside Japan sites which have similar characteristics are widely distributed in northeastern China, Mongolia and Siberia.

In China, Shirataki engravers have been found in Dchalainor (Amur River Province), Chichuehchingtsu (Sinkiang) (Fig. 7, no. 1), and in Kuhsiangt'un in the suberbs of Harbin (Fig. 7, no. 2). They were excavated at the site of Verkholenskaia Gora on the Angara river and of Zabochka on the Yenisei river (Fig. 8). The dates of these sites are considered to be between the latest period of the Pleistocene and the early Holocene. This dating coincides with the features observed at the Hokkaido sites in which Shirataki engravers have been found. From a rather broad viewpoint, detailed comparisons aside, it may be said that this type of Palaeolithic culture in northern Asia and in Hokkaido belonged to the same cultural area.

After the period characterized by Shirataki engravers, the microlithic culture which marks the beginning of the Holocene is thought to have appeared. The Sakkotsu site in Nishiokoppe village of Mombetsu county belongs to this period. The remains at this site consist mainly of obsidian Saisekijin (microlithic blades)--which rather should be called Kogata sekijin (small blades)--40-50mm. in length and 5-8mm. in width. These microlithic blades are accompanied by Arayagata chokokuto (Araya style burins) and a few scrapers (Fig. 9, nos. 4-7).

The microlithic blades are different from earlier stone tools. They are set in a row in a groove cut into a wooden or bone shaft. This can be made into a spear or a harpoon. A group of such combined microliths is called a "composite tool."

Interestingly enough, the points which accompanied the Shirataki engravers disappear in the period of microlithic blades. It can be considered that the points used before were replaced by the spears composed of microlithic blades.



Fig. 7. Shirataki engravers found in China: 1, from Chichuehchingtzu, 2. from Kuhsiangt'un

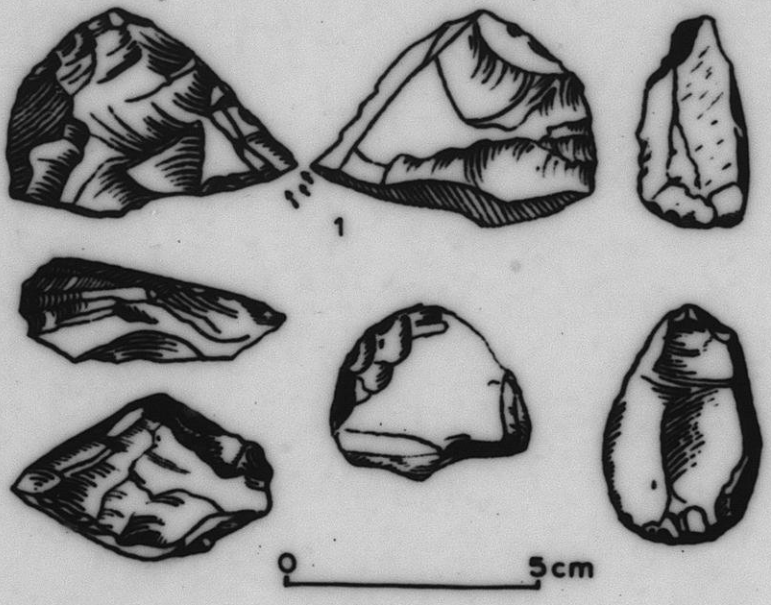


Fig. 8. Shirataki engravers found at the Zabochka site in Siberia



Fig. 9. 1-3 found near Okedo, Tokoro county, 4-7 from Sakkotsu site of Nishiokoppe village, Mombetsu county

The cores found in the site of Sakkotsu, from which microliths are made, look like the Shirataki engravers in shape although the former are rather rugged. The cores are usually larger than the Shirataki engravers, and the former do not have scratches as the result of use. However, along with the disappearance of points, the similarity of shapes between the two kinds of artifacts might have some significance for the origin of microliths. It is not impossible to assume that Shirataki engravers were transformed in a certain way to show the characteristics of cores. If this assumption is correct, we will be able to trace the developmental processes of microliths in Hokkaido. This tracing will be a great contribution since such a problem has not yet been clarified even in the area abroad where microlithic cultures are found.

Good materials on microlithic cultures similar to that of Sakkotsu have been reported by Dr. Toshio Oba on the Kamitokoro site of Tokoro county and by Messrs. Shimpei Kato and Haruo Oi on the Kunneppu site of that county. Such materials have also been collected by the staffs of the Hakodate Museum from Kaributo town of Abuta county and from the vicinity of the Tachikawa site at Kombu in Isoya county in southwestern Hokkaido. The stone culture excavated from the Araya site which is located at Kawaguchi town of Kitauonuma county in Niigata prefecture and which is the type site of the Araya gata-chokokuto (Araya engravers), can be considered to belong to the same category. Outside of Japan, similar stone cultures can be found around the Osinovka site on the coast of Siberia and at the site of Cape Denbigh in Alaska beyond the Aleutians. Therefore, the microlithic culture represented by the Araya and the Sakkotsu sites can be assumed

to have been distributed in the area including Eastern Japan, Coastal Siberia, Kamchatka Peninsula and Alaska.

The above mentioned microlithic culture seems to be followed by another complex of microlithic culture characterized by cores of cylindrical or trigonal pyramid shape. The specimens gathered near Okedo town in Tokoro county (Fig. 9, nos. 1-3) and those collected by the staffs of the Hakodate Museum at the Nishi site in Kombu, Isoya county, fall into this group. Generally speaking, the microlithic blades of this group are smaller than that of the Sakkotsu site. Most of them are 30-40mm. in length and 2-5mm. in width.

Microlithic culture similar to this group has been excavated from the Yadegawa site in Nagano Prefecture, and is also found in such areas as north-eastern China, Mongolia and Siberia. It is highly possible that the inter-relationship between these areas and Japan can be traced.

Until the end of the summer excavation season last year, the microlithic cultures as above mentioned had been considered to be the latest stage of non-pottery culture in Japan. However, the rapid accumulation of materials has proved that the microlithic cultures are followed by a non-pottery culture without microliths. The excavation of the Tachikawa site at Kombu, Isoya county, conducted by the staff members of the Hakodate Museum is one of the sites which clarified the existence of such a non-pottery culture. In this site were found Araya type engravers, Tategata soki (long scrapers -- tr.) and the points named "Tachikawa points" which have stems peculiar to this period (Fig. 10). Such a combination of stone tools has been collected by Mr. Korehiko Kimi (君 尹彦) in the vicinity



Fig. 10. Stone implements from the Tachikawa site at Kombu, Isoya county

of Okedo town, Tokoro county, and the other examples have been found in Shirataki village and at Setoushi in Nishiokoppe village of Mombetsu county. As investigations progress, similar stone cultures will be discovered in various parts of Hokkaido.

Stone implements quite like the "Tachikawa points" have been found in groups, by the staffs of the Nagaoka Municipal Museum of Science (Nagaoka Shiritsu Kagaku Hakubutsukan), in part of the Osegasawa cave of Higashi kambara county of Niigata prefecture. Although the results of this discovery have not yet been reported in the detail, this group of stone artifacts is assumed to belong to the period prior to the **roulette** design pottery culture which has so far been considered to be the oldest culture in the area.

Although it seems that there is some time lag between the date of the Tachikawa site and that of the Osegasawa cave, probably a period will be added to the chronological sequence in which the stemmed "Tachikawa points" are widely distributed and before the emergence of ceramic culture in east Japan.

In addition, another culture posterior to the microlithic culture has recently been noticed in Honshu. The Kamikoshiba site in Kami-ina county, Nagano prefecture, investigated by Mr. Shigeki Hayashi can be mentioned as representing this culture. From this site, large points, blades and partially polished axes are found in groups at several spots. No pottery has been found so far. Considering the special condition of the site, the Kamikoshiba site might have to be regarded as a cemetery.

It is reported that partially polished axes like those of the Kamikoshiba site have been found once in a while at the Konoue heights in Shirataki

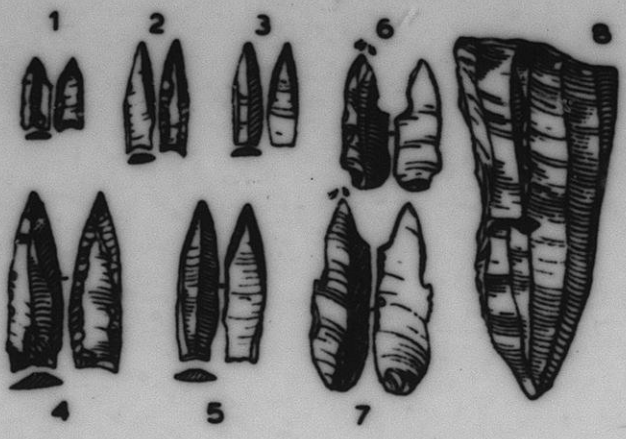


Fig. 11. Blade arrowhead culture found at the Yubetsu site of Mombetsu county

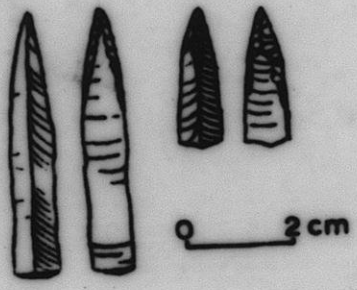


Fig. 12. Blade arrowhead found in K'unmaoch'i, China

village and Ikutahara town of Mombetsu county. If this information is valid, we can assume that a stone culture such as is represented by the Kamikoshiba site will be found also in Hokkaido, following the culture which contains the "Tachikawa points."

A very particular type of stone culture has been recognized exclusively in eastern Hokkaido. It is named the blade arrowhead culture, since the major stone tool is a blade arrowhead made by retouching the back of blades. The blade arrowheads are accompanied by well-shaped blades, engravers, and scrapers, but not by pottery (Fig. 11). Similar artifacts have been found among the stone tools of the Khina period in Siberia and from Ang-ang-hsi in northeastern China (Fig. 12).

The Khina period is dated to 5,000 B.C. [A. P. Okladnikov's guess date--Ed.]. The stratum which contains the blade arrowheads in Hokkaido is close to the level in which the early pottery culture is found (4,000 B.C.). These two facts may indicate the relationship between the two areas. It is probable that a branch of the stone culture which developed and became widely distributed in northern Asia when pottery had just begun to be in use, spread to reach eastern Hokkaido via Sakhalin and to form the blade arrowhead culture.

Some Problems in the Search for Non-Pottery Culture

So far we have reviewed the non-pottery culture in Hokkaido. It goes without saying that the non-pottery period cannot necessarily be equated with the Palaeolithic period. The definition of the Palaeolithic period is not based upon the cultural phenomena of human history, but upon the

natural phenomena----more strictly speaking, on the classification of geological chronology agreed upon among the international group of geologists. Therefore its definition is not proper. This is one of the reasons why the term "non-pottery culture" is adopted here. However, if we are forced to stick to "Palaeolithic period", the periods up to the one in which the "Shirataki engravers" flourished would be put into the Palaeolithic period, based upon the characteristics of the strata which contain stone implements and upon the chronology of the Upper Palaeolithic period in Siberia. Consequently, the period in which the microlithic culture prospered would be called the "Mesolithic".

It is generally accepted that the rising of the sea level severed the land bridges in the early Holocene (7,000 B.C.?). What effects were wrought upon the ancient culture by this change of natural environment? This is one of the intriguing problems to be asked. The microlithic culture was flourishing in the early Holocene. Did the bearers of this culture come by boat? Or were the land bridges still able to provide a route for them when they came? The keys for solving these problems will be revealed in the future as the investigation of non-pottery culture goes on and detailed comparison of the whole series of periods is undertaken in the perspective of a broad geographical area. The dating of the time when the Tsugaru Strait was formed will also become possible from the archaeological point of view.

About the Culture after the Appearance of Pottery

How pottery appeared during the Stone Age in Hokkaido is still a puzzling question. If we make an assumption within the limit of present

knowledge, the non-pottery culture seems to have ceased its existence when a culture with pottery arrived from somewhere around 4,000 B.C.

The wares which have been so far considered to be the oldest in Hokkaido are called the Tawara B style and the Tanneto E style. The characteristic of these wares is the design made by stamping cords. It is worth noticing that side blades which show the aspect of the Northern culture are found among the accompanying stone artifacts.

Setting aside such an old pottery culture, a review of the Jomon wares of Hokkaido after the period in which the clearly defined Jomon culture appeared in the Tohoku region makes us aware of the following phenomenon. That is, in spite of the presence of the Tsugaru Strait, the types of pottery found in the southwestern part of Hokkaido look more similar to those of the northern half of the Tohoku region than to those of eastern Hokkaido. For example, during the period in which the Ento style pottery was distributed in the Tohoku and southwestern Hokkaido, a group of crude wares called the Hokuto style existed in eastern Hokkaido. Secondly, while the elaborate Final Jomon pottery called Kamegaoka style was prevailing in the Tohoku and southwestern Hokkaido, Zenhoku style was distributed through eastern Hokkaido and the /southern/ Kuril Islands. Thirdly, the special design technique called "Tsukikobu-mon (bosses raised by punctation)" which is found in Siberia and in Alaska frequently appears on the pottery of eastern Hokkaido, while on the other hand, this technique is limited in time and in quantity in southwestern Hokkaido. Fourthly, the wares which it has not been possible to classify into any category--such as the Kushimemon (comb design) pottery named the "Shupunotsunai style" (Fig. 14) discovered by Mr. Saburo Abe or

Fig. 13. (Lacking in the text.--eds.)

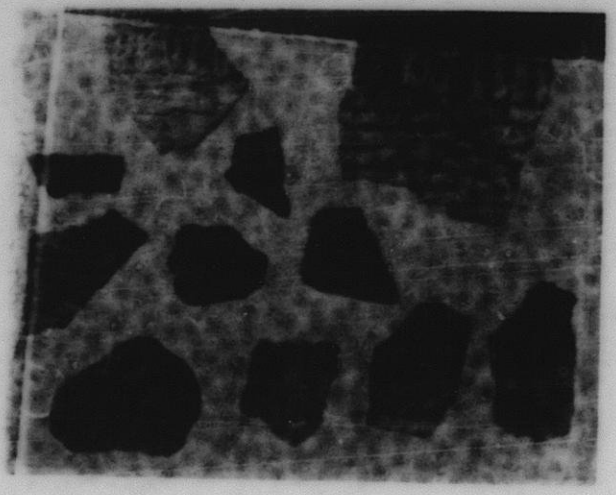


Fig. 14. Tanneto E style pottery. (From the Tanneto site in Aonuma town, Yubari county. Data preserved by the Local History Club of Sapporo-Nishi High School)

the "Koyo style" pottery named by Mr. Kioe Yonemura--have mainly been found in eastern Hokkaido. Finally, later in the Heian period (794-1192--tr.) the Okhotsk style pottery culture arrived from abroad and spread along the coast of the Okhotsk Sea in eastern Hokkaido. This peculiar fact prevailing all through the different periods might be interpreted to mean that this area (Hokkaido? tr.) was a marginal area to the Jomon culture or other ancient Japanese culture which emerged in Honshu, and that this area has been always strongly influenced by other cultural areas.

Beyond the northern tip of Hokkaido there is an isolated island called Rebun Island. A large quantity of shell artifacts accompanying the Nohoro style wares of the Late Jomon have been collected on this island (Fig. 15). They are as large as a button and there is usually a hole in the middle. Such a kind of shell artifacts has hardly been discovered in southwestern Hokkaido or in Honshu. However, a lot of them have been found in the burials of the Glazkovo period in coastal Siberia and around Lake Baikal /Glazkovo does not occur on the coast--Ed./. Moreover among those found around Lake Baikal, which is away from the ocean, there are artifacts made of sea-shells. According to the archaeologists of U.S.S.R., these shell artifacts were made in coastal Siberia and brought to this area. It may be natural to assume a relationship between two cultures which had shell artifacts, being adjacent to each other both geographically and chronologically.

The more interesting fact is that tombs of piled stones which have never been discovered in western Japan are found in Hokkaido during the Late Jomon period. Dr. Hiromichi Kono excavated a small piled-stone tomb surrounded by a low bank and found stone knives (Sekiken), pottery and fragments of Atsushi (the Ainu jacket) from the burial chamber. This type

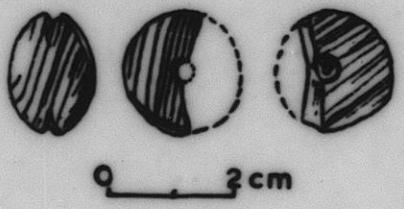
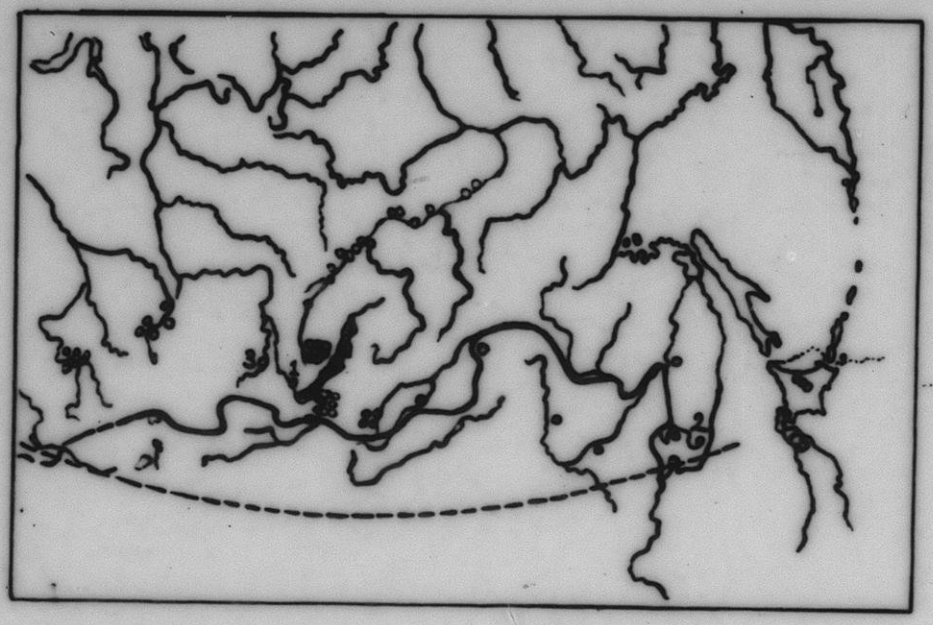


Fig. 15. Shell artifacts found on Rebun Island, Hokkaidō



Map 1: Distribution of Palaeolithic and Mesolithic sites in northern Asia. 1-Verkholenskaia Gora, 2-Osinovka site, 3-Zabochka site. (------ the southern extremity of mammoth distribution, tr.)



Map 2: Sites in Hokkaidō
1-Sakkotsu, 2-Setoushi, 3-Tachikarushinai,
4-Shirataki, 5-Memambetsu, 6-Kamitokoro
7-Kitami, 8-Kunneppu, 9-Oketo,
10-Metō, 11-Higashi-kagura,
12-Kuriyama, 13-Erimo Point,
14-Akaigawa, 15-Kaributo,
16-Tachikawa, 17-Kombu-Nishi,
18-Tarukishi

of tomb looks like the above-mentioned burials of Neolithic Siberia which were accompanied by shell artifacts.

The influence of continental culture can often be noticed on the ancient culture of Hokkaido even during the metal period. Some manufactured metal tools came not only from Honshu but also from abroad. Bronze points, which were evidently made in the continent although we cannot locate their particular origin, have been collected. It is also reported that Scythian metal belts have been found from a tomb which contains the Kohoku style pottery, which chronologically corresponds to the Yayoi culture of Honshu.

Considering this evidence, it might have to be realized that we have been placing too much emphasis on the influence from the west in regard to the development of stone age and metal tool culture, and that we have not paid enough attention to the cultural trends from the north.

If detailed investigations in the northernmost areas are continued along with the establishment of a reliable chronological sequence, this will provide a fresh point of view in solving the following problems: what elements of Jomon culture are of northern origin? How did Jomon culture emerge, develop and disappear? Were metal artifacts and textiles--so far regarded as not appearing during the Jomon period--really absent?

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STONE AGE CULTURE BEFORE THE JOMON CULTURE

(Jomon Bunka Izen no Sekki Bunka)

by Sosuke SUGIHARA

(Chapter 1 of Sosuke Sugihara, ed., Jomon Bunka /Jomon Culture/, Nihon Kokogaku Koza /Japanese Archaeology Series/, Vol. 3, pp. 1-36. Tokyo, 1956.)

1. The expansion of the primitive world

The first step which man, differing from other animals, took in starting life in the manner of "man" was not to live in houses or to wear clothes, but to begin using tools. Through this man for the first time enlarged his activities from a stage in which he relied solely on his naturally-endowed physical body to an area which was far more extensive. It is possible that the sensibility to perceive beauty exists in the animal kindgom, but the technique of expressing this is unique to man. Furthermore, even this technique had to await the discovery of tools. On the first page of the history of man, therefore, the implements which he uses become the principal theme; and his history develops with the development of his life through the changes in these implements. Such a beginning stage in the history of man is called the "primitive age", and life in it was maintained solely through a "gathering" economy. Therefore, the development of life /or livelihood/ in this primitive age can be learned by examining how the implements evolved in terms of effectiveness in the context of a society that was centered about the activities of hunting and fishing.

In the centers of ancient civilization, food production in the form of agriculture and animal husbandry began ca. 5,000 B.C. with the beginning of the so-called Neolithic Age. Accordingly, in order to learn about life in the primitive age, we must go back beyond it to the Palaeolithic or the Mesolithic Ages. And, in fact, in studying the long-past primitive age, we cannot learn of changes in the life of that age unless we thus enter into worlds which are reckoned by tens of millenia. If we attain them, however, we can certainly glean the important workings of man's life -- development.

In Japan the Jomon culture is the era preceding that in which agricultural society emerged. It is a primitive culture with a distinct individuality: it might be called a Neolithic culture without agriculture, or an extremely highly developed hunting-and-fishing life within the stage of a gathering economy that had developed in Japan. It is a culture which had endured on the Japanese Archipelago for at least a few thousand years prior to the Christian Era. Furthermore, it was equipped from the beginning as we know it with the means to serve as the basis for economic techniques capable of supporting such a culture. It must be deduced, therefore, that the Jomon Culture was at a considerably advanced stage even at its beginning, and that there were no great spurts of advance in the duration of its existence. It was a culture which represented the final result of an extremely long primitive-age life.

In order for Jomon Culture to have arrived at that stage, it is bound to have passed as a primitive-age culture, through several transitional stages. On the assumption that there must be evidence of remains of human life preceding the Jomon Culture in Japan, there have been numerous attempts

at proof through discoveries of material and human remains. All such attempts have ended in failure and have not resulted in theories. In fact, it had been the accepted view until recently that the existence of human life in Japan prior to the Jomon Culture could not be proved. And the situation was such that the stages of primitive life which must have occurred could be explained only through adducing examples that had been demonstrated in other geographical areas.

It was without doubt the hope of all archaeologists to somehow fill this gap representing a basic stage in cultural development. However, the results of the survey of the Iwajuku site in September and October of 1949, based on data presented in that year by Tadahiro Aizawa of Gumma-ken, provided a lead toward solving this problem. Through the survey an assemblage of stone implements was discovered in the Kanto loam stratum, which geologists had assessed as extending back to the diluvial epoch. There were, furthermore, no pottery or flint arrowheads in the stone artifact assemblage. Through a comparison of the stratum containing these stone implements with strata containing a group of early-Jomon-type wares this group of stone implements was proved to belong to a stone-age culture older than the Jomon Culture. It is important to note, furthermore, that as a result of this survey stone-implement assemblages are being discovered in the Kanto loam strata at various areas, and that it has become evident that there may be numerous complexes involved. And it will be demonstrated that these complexes signify chronological changes.

Thus, it has been clarified that human life began in Japan in an extremely early era, one which goes back into the geological past. And

the fact that evidence of change can be seen in these remains confirms that this era had lasted over a lengthy period in olden times, and this fact also means that vital material has been made available for studying that era as a concrete entity. Thus, it has become possible for the first time in Japan to examine the changes in implements--the central theme in the study of the primitive age--and to learn about the initial step in the history of man. In order to do this, it became necessary to recognize that there were a number of important cultural stages preceding the Jomon Culture. Consequently, this approach can be considered, perhaps, as "expanding the primitive world". It is possible that the various stages of primitive culture in Japan were not accomplished successively by one homogeneous race, but that is beside the point. It is fortunate at any rate that it has become possible in Japan to study the numerous stages of their life. The greater portion of the studies on these ages was heretofore done on the Continent. Hereafter these studies will flourish in Japan, and we may hope that phenomena observed in this island country may supplement the shortcomings of previous studies.

One thing which is bound to become a problem is what to call this culture which is thus becoming known for the first time. In a terminology based on implements, the primary meaning of "Neolithic culture" is "the culture of polished-stone implements and of beautifully-fashioned stone implements", while that of "Palaeolithic culture" is "the culture of stone implements of the era in which man lived together with now-extinct animals--the diluvial epoch". On this basis, however, a gap will occur in most parts of the world unless the era of chipped-stone implements of the

alluvial /post-glacial/ epoch is set up in between the two, and the concept of Mesolithic culture applied as the name for that era. Although there are some problems in regard to Jomon Culture--/e.g.,/ the existence or absence of agricultural cultivation--it should suffice to call it Mesolithic culture. The stone-age culture which preceded it, which is currently becoming a problem for investigation probably belongs to either the Mesolithic or the Palaeolithic culture stage since it is a culture entirely of chipped-stone implements. According to radio-carbon dating and such topographical studies as shore-line gauging, it is firmly established that the origin of Jomon Culture goes back some thousands of years prior to the Christian Era; this, it seems, would place it around six or seven thousand years ago. Since the boundary between the alluvial and diluvial epochs is said to be some 10,000 years ago, then if the stone-age culture which continued for so long prior to the Jomon Culture is to be laid out chronologically, its greater portion would probably belong to the Palaeolithic stage, and its lesser portion to the Mesolithic stage. If this is so, however, there would remain the problem of where to place the boundary between the diluvial and alluvial epochs in Japan. Also, just as we do not ordinarily refer to the Jomon Culture simply as a Neolithic culture, it is our desire to use a very distinctive appellation for this new stone-age culture. Such names as zen-Jomon bunka /pre-Jomon Culture/ or mu-doki bunka /non-pottery culture/, which we are utilizing provisionally, do not convey the nature and content of that culture; they seem, therefore, inappropriate. The Yayoi and Jomon cultures took for their names those pottery wares which typify the cultures. This being the case, a solution based on the style

of stone implements would be desirable, but this would be extremely difficult. This is because stone implements are weak in stylistic characteristics and are strong in morphological characteristics. Therefore, this shortcoming will undoubtedly be overcome hereafter by names given to the stone-implement forms, their composition, and, consequently, to the culture.

2. The problem of natural environment.

The strata which yield man-made remains, chiefly stone-implements, are those of the Kanto loam stratum or equivalent strata, as well as of later strata. Up to the present there has not been a single reliable discovery of anything to verify the existence of human life in Japan in the period prior to these strata. In the cases of areas which lack Kanto loam or equivalent strata or in cases of later strata, the stratum containing the remains may be the surface soil comprising a humus stratum; they are at times, therefore, the same strata as those containing Jomon Culture remains. Since the greater part of the remains have been discovered in the Kanto loam stratum, that stratum becomes the principal focus of study. With remains thus being discovered of an era belonging to a stratum which differs from the present, it becomes necessary to lay considerable emphasis on the natural environment of that era.

To begin with, we must deepen our understanding of the Kanto loam stratum itself--the layer of soil which is distributed widely over the plains of the Kanto District. D. Brauns calls it "loam", and Professor Jiro Makiyama has named it akatsuchi /red soil/. Loam is defined as soil

in which the clay content is equivalent in volume to 25-37.5% of the sand content. According to Wentworth's standards of granularity, sand is defined as being greater than 1/16mm. in diameter, and clay as being less than 1/16mm. in diameter. In actual fact, fine sand (1/16 - ¼mm.) is the most numerous type of sand, and silt (1/16 - 1/256mm.) is the most numerous type of clay. Furthermore, there would naturally be some variation in the horizontal distribution and vertical distribution of the Kanto loam stratum, which extends over a broad area. Minerals contained therein include quartz, felspar, hypersthene, common pyroxene, amphibole, magnetite, and clay mineral and hematite produced by erosion. Their proportion of occurrence differs somewhat in horizontal distribution and vertical distribution. The yellow-brown color of the Kanto loam stratum is said to be the result of chemical change after accumulation. In regard to the cause of formation of these strata, the theory currently is that it resulted from the accumulation of volcanic ashes from a volcanic explosion. During a volcanic explosion there is first the destruction of the covering substance; this is followed by the eruption of pumice-stone, and by the overflow of lava; the volcanic ash is then ejected in ten or more eruptions. The volcanic ash rides on the upper air-current and is transported generally from west to east at a speed which is said to be approximately 22 meters per second, or 80km. per hour. Consequently, it may fall and be deposited either on land or sea.

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Now there arises the problem of the geological-historical position of the Kanto-loam stratum from the standpoint of geology. Professor Yanosuke Otsuka represented it with the symbol du II, and Professors Nobuo Ikebe and Yoshikazu Suzuki represented it with the symbol J3. They placed it in the upper part of the diluvial epoch, and the other geologists have expressed almost identical opinions.

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(2) Otsuka, Yanosuke, "Daiyonki" /"The Quaternary Epoch"/ (Iwanami Koza, Chishitsugaku-koseibutsugaku, No. 1, 1931).

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(5) Shikama, Tokio, Daiyonki /The Quaternary Epoch/ (1952).

The Kanto loam stratum was formerly thought of simply as one stratum. The results, however, of recent researches on the Kanto loam stratum, centered about the Quaternary Epoch Sub-Committee and the Kanto Loam Society (Research Association), appear to have given a completely new aspect to previous studies. To summarize this, firstly there can be recognized within the

several black layers of the Kanto loam stratum humus-type substances, and it is surmised that the upper surfaces of /those layers/ were respective land surfaces in the past. Secondly, there are irregular stratifications within the Kanto loam stratum itself; furthermore, on the terraced banks of the Tama River there can be seen the way in which the Kanto loam has been deposited in varying ways, and this should be acknowledged as being variances arising from topographical changes. It is now stated that the Kanto loam stratum can be divided roughly from bottom /to top/ into the Tamagawa Loam, Shimosueyoshi Loam, Musashino Loam, and Tachikawa Loam. Thirdly, in observing them from the standpoint of their positions within the Diluvial system, they start in the lower portion and extend to the upper portion separated by a slight interruption, and are labeled as important depositions from the standpoint of geological-history in reflecting the process of volcanic activities and land-formation movements during the long geological age. In other words, we are arriving at a fortunate situation in which detailed Diluvial stratigraphic chronology, which obviously could not become known without these depositions, has become possible through the existence of the Kanto loam strata, and in which man-made remains (which are our concern) can be aligned chronologically against a geological-historical background--if these remains are associated with such deposits.

References: (1) Dai-Yonki sho-iinkai /The Quaternary Epoch Sub-Committee/, INQUA Nihon shibu renraku-shi (No. 1-No. 11, 1952-1955).

(2) Kanto romu kenkyukai, Kanto Loam (No. 1-4, 1954-1955).

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(5) Naruse, Yo, "The Geology of the Eastern Edge of Sagamino Plateau," (Chishitsugaku zasshi, v. 58, no. 684, 1952).

(6) Kaizuka, Sohei; Toya, Hiroshi, "The Topography and Geology of the Eastern Section of Musashino Plateau and the Tephrochronology of the Surrounding Plateaus," (Chigaku zasshi, v. 62, No. 2, 1953).

In regard to the thick layers of the Kanto loam stratum described above--and the extremely long chronology coming to be known as a result--it is chiefly in the upper portion, representing later ages, that we have often discovered man-made remains, and it is that portion which has thus become of interest. The soil of the upper 30 - 50cm. of the Kanto loam stratum is soft, becoming hard immediately below this; the question was whether this change represented a different level. Mineralogically, however, it was found that there was no difference in the composition of the two portions. And from an archaeological standpoint they do not constitute two different layers since identical remains are discovered in both portions. It is said to probably represent the breaking down of the surface into soil. Consequently it appears more appropriate to refer to them as the "soft part" and the "hard part" of the Kanto loam stratum, rather than the "soft loam" and "hard loam". In the Southern Kanto a dark-brown band-like layer of approximately 0.5m.-2m. can be seen some two meters below the surface. In Southern Kanto it is divided into two bands, the upper being thicker than the lower and separated from it by 30cm. to

60cm. There was question as to the significance of this black-band layer; its content of carbon and nitrogen was extremely large when compared with the layers above and below it, and it was thought to contain organic matter. The conclusion was that it formerly constituted a humus layer. In other words, the top of the black-band layer was an ancient earth surface. We know that stone implements occur in the portion above the upper surface of the black-band layer in Southern Kanto, and in the middle and upper portions of the black-band layer in Northern Kanto.

References: (1) Toya, Hiroshi, Soft Loam and Hard Loam (Kanto Loam, No. 3, 1955).

(2) Sugihara; Sosuke, Otsuka, Hatsushige, "Joso daichi ni okeru Kanto romu sochu no sekki bunka" /"Stone-Age Culture in the Kanto Loam Stratum at Joso Plateau"/ (Shundai shigaku, No. 5, 1955).

(3) Toya, Hiroshi; Kaizuka, Sohei, "Kanto romusochu no kaseki-dojo" /"Fossil Soil within the Kanto Loam Stratum"/ (Nihon chirigakkai koen-yoshi /Abstracts of Papers Japan Geographical Association/, 1954)

When we consider that the soil layer represented by the upper portion of the Kanto loam stratum reflects the era in which the stone-age people were active, it follows that the topography of that time must be studied. First of all, the major problem is whether the island nation which Japan is today was the original /topographical/ form. Dr. F. Osborn had said long ago that on the basis of his study of mammalian fossils, the Japanese Islands and the Continent were connected by land during the Diluvial Epoch. Also,

since the construction of boats capable of crossing oceans at the Palaeolithic stage is deemed an impossibility, the rational conclusion is that man migrated to Japan by way of a land bridge. In regard to the separation of Japan from the Continent, Dr. Nagakatsu Yabe has placed the date of the separation during the period from the Pre-Narita layer to the Tama-terrace era inclusive--in other words, roughly during the middle of the Diluvial Epoch (Pleistocene); he sought this /conclusion/ in land-formation and ocean-surface activities in his research on continental shelves. At present, the straits separating Siberia, Sakhalin and Hokkaido are less than 100 meters in depth, while those separating Hokkaido, Honshu and Korea are greater than 100 meters. It might be difficult, therefore, to explain the separation of Honshu from the Continent solely by reason of the recent rising of the ocean. According to this, Japan was already an island country during the era in question.

References: (1) Yabe, Nagakatsu, "The Latest Land Connection of the Japanese Island to the Asiatic Continent," Proceedings of the Imperial Academy, v. 4, No. 4 (1929).

(2) Yabe, Nagakatsu, "Geological Age of the Latest Continental Stage of the Japanese Islands," Proceedings of the Imperial Academy, v. 4, no. 9 (1929).

The Kanto loam stratum, at least its upper portion, is a deposition made upon the original topography, and the present valleys were not made by erosion following the deposition. The topography of that time, therefore, was probably not much different from that of today. The question is rather the water system, and, in pondering it, we must consider the phenomena of the advancement and recession of the ocean from the Diluvial to the Alluvial Epoch. Material for /studying/ the sea recession can be gained, firstly,



第1図　関東地方および諏訪湖周辺（左上）における遺跡の分布
1：岩宿遺跡　2：武井遺跡　3：茶臼山遺跡　4：茂呂遺跡　5：上ノ平遺跡

Fig. 1: Distribution of sites in the Kanto and in the vicinities of Suwa Lake (upper left).

1: Iwajuku
2: Takei
3: Chausuyama
4: Moro
5: Uenodaira

Principal tool types of the site
●: Hand axe
■: Blade
▼: Kiridashi knife
▲: Point
×: unknown

by removing the alluvial stratum which is currently at the bottom of Tokyo Bay (the Yurakucho Stratum); there will then appear a valleyed topography which might be presumed to be an extension of the present land. This topography at the bottom of Tokyo Bay is thought to be that of the previous land surface. At present, its deepest section is more than 50 meters beneath the present sea surface. Although it is said to have been the land surface of the period from the upper Diluvial Epoch to the beginning of the Alluvial Epoch, it would be most interesting to assign it, through comparison, to the peak period of a particular glacier. Secondly, material for /studying/ the rise of the ocean can be acquired by studying the distribution of the Jomon Period shell mounds and the types of shells which they comprise. It shows that there was a time when the ocean surface rose approximately ten meters above the present level; this is said to have been from the end of the Initial Jomon Period to the first half of the Early Jomon Period. It is probable that it can be compared in time with the epoch during which the Littorina Sea emerged out of Lake Ancylus in northern Europe. At any rate, in regard to the natural topography of that era which we are seeking to know, we must bear in mind the fact that there was considerable rising and falling of sea level.

References: (1) Fukkokyoku kenchikubu /Reconstruction Bureau Construction Section/, Tokyo oyobi Yokohama chishitsu chosa hokoku fuzu /Report of Research on the Geology of Tokyo and Yokohama. Attached Maps/, (1929).

(2) Otsuka, Yanosuke, Nihonto no oitachi /Early Days of the Japanese Islands/ (1948).

(3) Kono, Isamu, "Kanto chiho ni okeru jomonshiki sekki jidai bunka no hensen" [="Evolution of the Jomon-type Stone-Age Culture in Kanto"] (Shizengaku Zasshi, v. 7, no. 3, 1935).

(4) Esaka Teruya, "Kaigansen no shintai kara mita Nihon no shin sekki jidai" ["Japan's Neolithic Age as seen from the Advancement and Recession of the Coastline"], (Kagaku Asahi, v. 14, no. 3, 1954).

Climate was a part of the natural environment which had an important bearing on the lives of the people of that time. Dr. Nagakatsu Yabe had previously explained that research on shell varieties shows that a cold climate existed in Japan during the Diluvial Epoch. Of greatest interest today, however, is the problem of the Egota Layer, which was studied by Dr. Shigeru Miki. Fossilized plants such as shirabe, touhi, karamatsu, and chosengoyo [These are, respectively, Abies Veitchii Lindl, Picea jezoensis Carr, larix leptolepis Murray, and Pinus koraiensis Sieb, et Zucc.--T.N.] have been discovered in this layer; these [plants] exist today at an altitude of 1,000-3,000 meters and are considered to indicate clearly that a cold climate had existed. There is a divergence of opinion as to the relationship of this Egota Layer to the Kanto Loam Stratum: one is that it constitutes the lower layer of the Kanto Loam Stratum (Musashino Layer), and the other is that it constitutes the upper layer of the Kanto Loam Stratum (Tachikawa Layer). Another possibility is that the Egota Layer constitutes the lower layer of the Kanto Loam Stratum, but that the fossilized plants were imbedded while the Kanto Loam Stratum was accumulating. We cannot at the present decide as to which is the correct solution. Nevertheless, it is probably a fact that a cold climate was in existence at a time approaching that of

the formation of the upper section of the Kanto Loam Stratum. Also, the existence of a warm climate can be established by the presence of coral in the bog layer above the Kanto Loam Stratum, which had formed after the latter's accumulation; and by the finding of Anadara granosa in the Yurakucho Layer. However, this would bring it into the Alluvial Epoch--probably into the era of the Jomon culture. Therefore we feel that it is necessary to bear in mind the importance of the transition from the climate indicated by the Egota Layer to that indicated by the bog layer.

References: (1) Miki, Shigeru, "On the Change in the Flora of Japan Since the Upper Pliocene and the Floral Composition at the Present" (Japanese Journal of Botany, v. 9, no. 2, 1938).

(2) Yabe, Nagakatsu, "Egota shohakuka shokubutsu kasekiso no chishitsugakujo no igi /The Geological Significance of the Egota Coniferae-Fossil Layer/" (Chichitsugaku-zasshi, v. 53, no. 622-627, 1947).

(3) Yokoyama, Matajiro, "Mollusca from Coral Bed of Awa" (Journal of the College of Science, Imperial University of Tokyo, v. 45, Article 1, 1924).

(4) Yamakawa, Mochito, "Yurakucho san chusekki kaigara /Alluvial Epoch Shells Produced in Yurakucho/" (Chishitsugaku-zasshi, v. 16, no. 187, 1910).

3. Description of principal sites

In regard to the number of sites which are definitely seen to belong to a stone-age culture antedating the Jomon, those which reportedly have yielded

remains amount to several dozen at present [i.e., 1956]. In fact, the author has been involved in the excavation of no less than ten. I shall introduce here those sites on which investigations have been completed, making possible a presentation of the over-all picture: those sites, the cultural contents of which possess distinctive characteristics. At present, "clay layer" is used, with no aim of deeper significance, to indicate the Kanto Loam Stratum in a broad sense, while "yellow-brown clay layer" is used to indicate the Kanto Loam Stratum in a narrow sense. That which is designated as "dark-brown clay layer" may quite possibly possess characteristics of the black-band layer. The yellow-brown clay layer is divided by a dotted line in the chart into the "soft portion" (upper portion) and "hard portion" (lower portion) of the Kanto Loam Stratum. Furthermore, it will be obvious that, among the sites to be described below, the Iwajuku site and the Moro site are stratigraphically proved to represent cultures which antedate the Jomon Culture.

Iwajuku site: Its major portion is located within the wet-fields of Asami, Kasagake-mura, Nitta-gun, Gumma Prefecture, while the minor portion is in Iwajuku. The site is located in the southwest slope of the saddle-portion of the Iwajuku Hill, which appears like twin-hills and constitutes one of the many hillocks at the southern foothills of Akagi-zan. Its elevation is approximately 160 meters, and it is some ten meters higher in elevation than the swamp-water surface of Roku-no-gawa, which is to its front. The stratification at the site consists of a humus layer of some 50cm., a yellow-brown clay layer of some 100cm., a dark-brown clay layer of some 40cm., and a red-brown clay layer of some 100cm. I have labeled them, respectively, "Kasagake-so," "Asami-so," "Iwajuku-so," and "Kompirasan-so." I had, at one time,

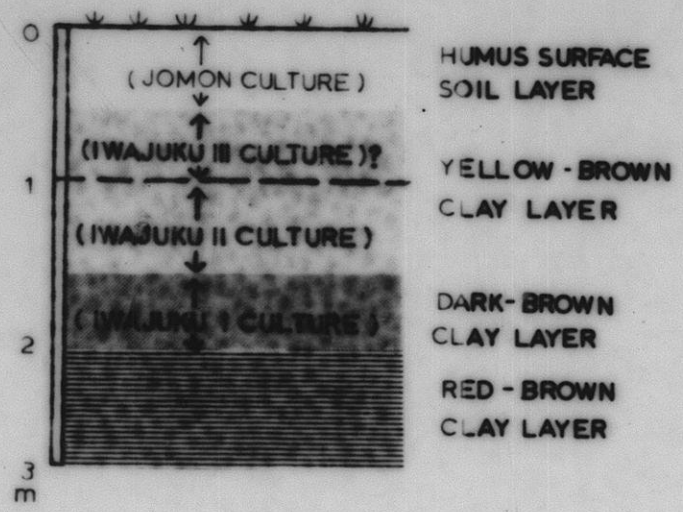

Fig. 2: Geological and cultural levels at the Iwajuku site

called the Asami-so the "fine-grained sand layer," since the soil had a coarser grain than the soil in general of the Kanto Loam Stratum. Four grades can be seen in the stratification of this site. The Iwajuku I Culture, which is characterized by the hand-axe, is found within the dark-brown clay layer (Iwajuku-so); the Iwajuku II Culture, which is characterized by the kiridashi knife /kiridashi-gata sekki/, is found in the lower part of the yellow-brown clay layer (Asami-so); the Iwajuku III Culture, which comprises a non-pottery culture differing from Iwajuku I and II, is found within the upper part of the yellow-brown clay layer (Asami-so); and the Initial-period Jomon Culture, which includes the Inaridai-type pottery and the Yamagata roulette design pottery, is found within the humus surface layer (Kasagake-so). The "Iwajuku III Culture," which exists in addition to Iwajuku I and II cultures, refers to the elegant thumb-shaped end-scraper which we discovered close to the upper part of the yellow-brown clay layer, the bifaced point which was collected by Aizawa Tadahiro, and other remains. As a result of subsequent excavations of the Uenodaira site, it became clear that the above end-scraper and point were two items of the same culture; the Iwajuku III Culture, therefore, consists mainly of the Uenodaira Culture, and we were able to deduce that it should be assigned a cultural layer in the upper part of the yellow-brown clay layer. As for other considerations, we can mention that there were groups of pebbles within the Iwajuku I cultural layer, and that fragments of charcoal of chestnut wood were obtained. The extent /the area/ of distribution of remains was, in all cases, limited. The Iwajuku I Culture and Iwajuku II Culture were not clearly separated, being partially overlapping. The Iwajuku II Culture and the

Iwajuku III Culture were found a few meters apart. The above is the result of survey by the Meiji University Archaeological Institute, conducted September 11-13, and October 1-10, 1949, and April 11 - April 20, 1950. (Reference: Sugihara, Sosuke, "Site of Iwajuku, Nitta-gun, Gumma-ken," Nihon Kokogaku Nempo /Archaeologia Japonica. Annual Report of the Japanese Archaeological Association/, 1949 and 1950).

Takei Site: This is located within Shutto, Takei-nai, Niisato-mura, Seta-gun, Gumma Prefecture. This site is also situated atop a small rising hill at the southern foothills of Mt. Akagi. Its elevation is approximately 155 meters, and it is around five meters higher than the small mountain stream which has eroded into, and flows along, the east side of the site. The stratigraphy of the site consists of a humus layer of some 40cm., a yellow-brown clay layer of some 70cm., a dark-brown clay layer of some 60cm., below which is an intervening layer of ash-brown clay which extends down to the tufa base. The site is divided into two layers within this stratification. The Takei I Culture, which is characterized by the primitive knife-blade, is found within the upper approximately 50cm. of the yellow-brown clay soil. Remains are also found frequently within the humus surface layer, but they are considered to be Takei II cultural remains which had drifted out of the yellow-brown clay layer. Also, there were five groups of pebbles discovered within the Tekei II Culture layer. The distribution of remains of Takei I and II overlap. The former, however, is extremely restricted, while distribution of the latter is unusually extensive for this type of site, being spread about some 400 square meters. The above is the result of surveys by the Meiji University Archaeological Institute, conducted January 7-10 and May 19-29, 1954. (Reference: Sugihara, Sosuke, "Stone-Age Culture at the Site of Takei,

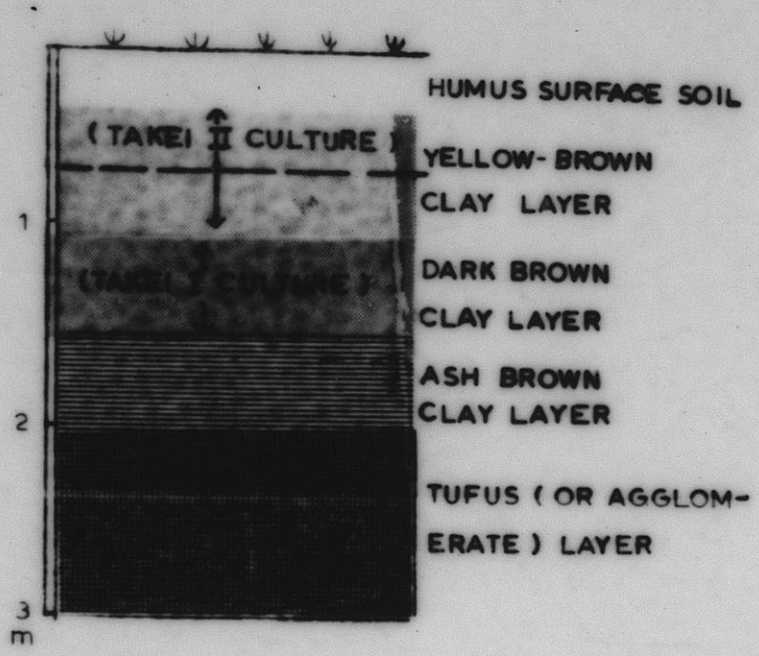

Fig. 3: Geological and cultural levels at the Takei site

Gumma-ken," Abstract of Research Announcements at the Fifteenth General Meeting of the Nihon kokogaku kyokai [Japan Archaeological Association].)

Moro Site: This site is situated at Moro-yama, Moro-machi, Itabashi-ku, Tokyo. At present it is situated atop a solitary hill which juts out into the canyon through which Shakujii River flows. The Shakujii flows on its north side. The elevation of the site is approximately 20 meters; it is some 10 meters above the elevation of the canyon [river] Surface. The stratigraphy of this site consists of a humus layer of some 30cm., a chestnut-colored soil layer of some 50cm. intervening between the surface soil layer and the loam; below it there is a yellow-brown clay layer of some four meters, and the base below it is the Itabashi clay layer. At the point shown, the site can be seen divided into two strata. The lower part begins some 40cm. below the upper surface of the yellow-brown clay layer and extends downward for some 40cm. more; it is recognized to be the Moro Culture, which is characterized by the knife-blade. The upper part comprises the chestnut-colored soil layer, from which there have been discovered remains including Igusa-style pottery, which is regarded as the oldest type of the Jomon Culture. There is, in other words, a sterile layer of approximately 40cm. in between [the two cultural strata]. Groups of pebbles can be seen clearly in the vicinity of the Moro Culture discoveries. Furthermore, there are numerous charcoal fragments, and these are known to be of varieties of chestnut and oak. The area of distribution of remains is also restricted in the case of this site.
The above are results of a survey by Musashino Museum and Meiji University Archaeological Institute, conducted July 10-19, 1951. (Reference: Sugihara,

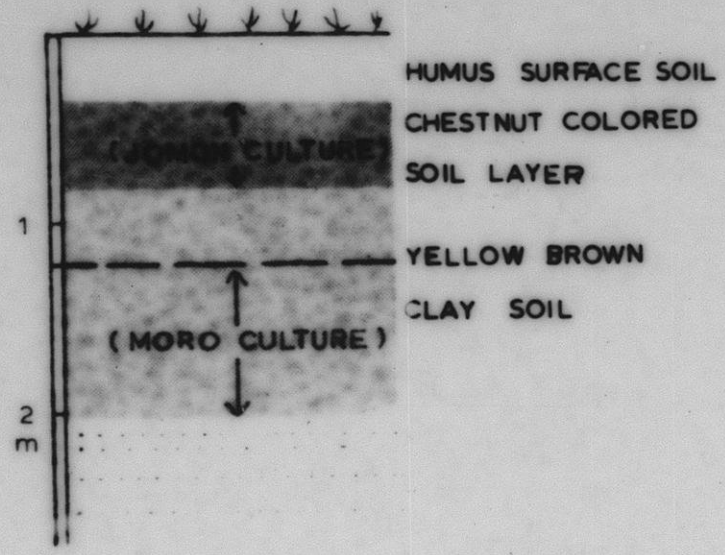

Fig. 4: Geological and cultural levels at the Moro site

Sosuke; Yoshida, Itaru; and Serizawa, Chosuke, "Concerning Stone Tools Discovered in the Kanto Loam Stratum at Moro, Itabashi-ku, Tokyo-to," Abstract of Research Announcements at the Ninth General Meeting of the Japan Archaeological Association, 1952.)

Chausuyama Site: This site is situated atop a plateau called Chausu-yama, in Suwa-shi, Nagano Prefecture. This location is a hill which constitutes the point of the Kirigamine-Volcano plateau, and it directly faces Suwa-ko /lake/. The elevation is approximately 855 meters, some 95 meters higher than the surface of Suwa-ko. This site appears as though it entirely occupied the top of the small plateau. Since construction works have been carried out here since the Medieval period (13th-16th century), great care must be taken in observing the stratification. To describe the stratification just as we found it, beginning at the top, there is at present a humus surface-soil layer of some 10cm., a black-soil layer with loam admixture of some 80cm., a black humus layer of some 40cm., and a yellow-brown clay layer which extends down to the base. This site manifests one important peculiarity in stone-age culture in that, from scrutinizing the remains, we find that the culture is generally uniform, and that the problem of the complex stratigraphy is solved at the same time. /The peculiarity/ lies in the fact that /the culture/ called Chausuyama Culture, is characterized by the developed blade. From the upper surface of the yellow-brown clay layer, remains are found to a depth of 70cm., as well as upward throughout the black humus layer and the black-soil layer with loam admixture. It is evident that the black-soil layer with loam admixture represents a re-accumulation during previous construction work. A problem is presented by the black humus layer; if it

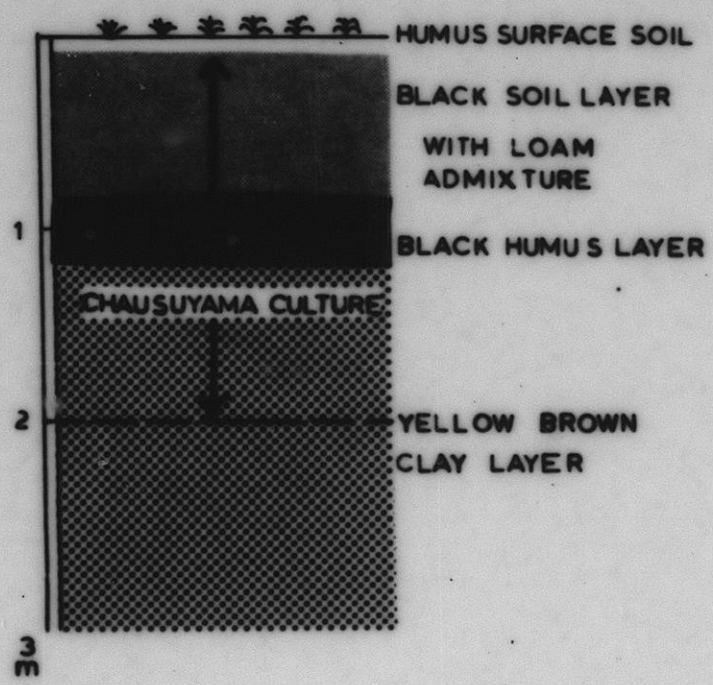

Fig. 5: Geological and cultural levels at the Chausuyama site

represents an original accumulation, then the remains /found in it/ probably drifted into it from the yellow-brown clay layer. If it represents a re-accumulation, then this means that the yellow-brown clay layer might have formerly extended farther toward the surface--which would mean that its depth would be considerable compared with heretofore known positions of remains found in yellow-brown clay layers. Although the area of distribution of remains at this site is unclear due to disturbances from construction work, we can say that it was quite extensive. The above is the result of a survey by the Suwa Archaeological Laboratory and the Meiji University Archaeological Institute, conducted October 30 - December 8, 1952. (Reference: Fujimori, Eiichi, "Site at Chausuyama, Suwa-shi," Abstract of Research Announcements at the Eleventh General Meeting of the Japan Archaeological Association, 1953.)

Uenodaira Site: This site is at Uenodaira, Suwa-shi, Nagano Prefecture. It is also located atop the small plateau which is the hill constituting the point of the Kirigamine-Volcano plateau, and it faces Suwa-ko. It is situated parallel to, but several hundred meters northwest of, the Chausuyama Site, compared with which it is some 15 meters lower in elevation. The elevation is approximately 840 meters, some 80 meters higher than the water surface of Suwa-ko. Since the site is on a rounded hill, there is variation in the stratigraphy. A sampling at one spot shows that there is a humus surface layer of some 50cm., beneath which is a yellow-brown clay layer extending more than one meter down to the base rock. By scrutinizing the remains, we know that the culture of this site is a unitary one characterized by the developed point, and we call it the Uenodaira. The fact, particularly, that

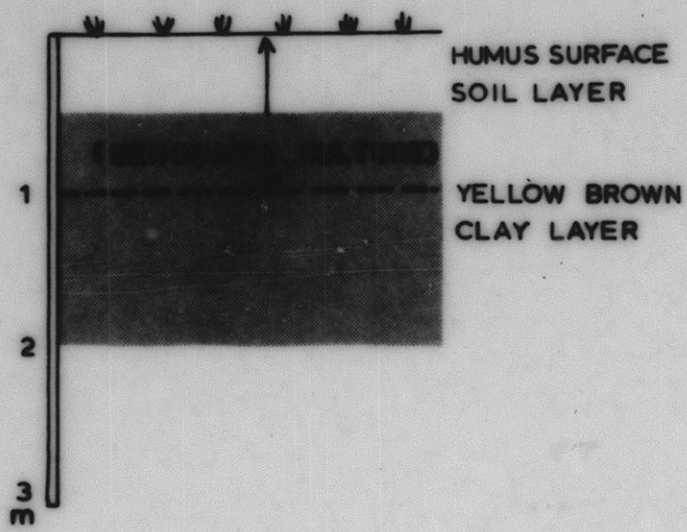

Fig. 6: Geological and cultural levels at the Uenodaira site

this site is situated on top of a small isolated hill serves to restrict remains to those of its own type. Remains are found only to a depth of 50cm. below the upper limits of the yellow-brown clay layer, and there are many found within the humus surface-soil layer. Groups of pebbles are found at the upper limits of the yellow-brown clay layer, as well as at levels just below that; they generally indicate the original position of the cultural layer, and the remains found within the humus surface-soil layer had probably shifted away from that original position. One of the characteristics of this site is, perhaps, that there are numerous fine, thin chips which had resulted from the technique of pressure-flaking. The distribution of remains of this site is rather extensive, covering approximately 200 square meters. The above is the result of surveys by the Suwa Archaeological Laboratory and the Meiji University Archaeological Institute, conducted May 31 - June 2, July 21-27, and December 23-25, 1953. (Reference: Sugihara, Sosuke, "Pointed Stone-Tool Culture Discovered at the Uenodaira Site, Nagano Prefecture," Abstract of Research Announcements at the Thirteenth General Meeting of the Japan Archaeological Association, 1954.)

It is evident from the above description of principal sites that there is yet to be discovered a single site of the types which are numerous on the Continent--i.e., those situated in caves or rock shelters; all have been open sites. Their location has hardly any relationship to elevation, being mostly at the point where mountains meet the plain, except for Southern Kanto. Another fact which attracts our attention is that most sites are located on top of solitary hills or similar elevations. In consequence, there can be discovered in approximately the same location various cultural remains which

belong to different levels and to different eras. Stratigraphically, they are found mostly in the upper portion of yellow-brown clay layers; in Southern Kanto there is yet to be discovered a cultural horizon which extends to the black-band layer. In Northern Kanto, the Iwajuku I Culture and the Takei II Culture exist within a somewhat different layer--the dark-brown clay layer, which lies beneath the yellow-brown clay layer. These two layers, however, are systematically adjusted to one another, and it cannot be concluded that the former is geologically a remarkably old layer. On the whole, we can say that the pre-Jomon stone-age culture, which has so far been discovered, is related to the upper part of the multi-level Kanto Loam Stratum.

4. An outline of the cultures

The problem of greatest importance is that of how to reconstruct the human life of the past out of the study of sites and collected remains, once we have organized them.

For this, it is probably necessary to consider restricting material temporally and spatially so that it can be related to one /particular historical/ life. The restricting /of material/ spatially can be quite readily accomplished by designating one /particular/ site. The problem then is that of temporal restriction. A culture which possesses pottery can be subdivided into fairly fine time-period units by means of the "statement of taste" - or style - which is freely expressed in pottery; /this is so/ since these modes represent fads of relatively short time duration. There is greater difficulty, in fact, in fitting into the time periods established through pottery the various other remains which comprise implements of livelihood,

since they offer a greater degree of complexity. In the case of a culture represented primarily by stone tools, on the other hand, it is difficult to detect styles and, subsequently, to establish fine time periods; /this is so/ since the material for tools was stone, /a medium/ through which the free expression of "style" is difficult, and since, being tools, the shape was determined to a greater extent by function. This applies even more so to pre-Jomon cultures, in which stone tools were made by chipping (percussion). There is, however, one possible saving grace. During such an era, it required an extremely long time for stone tools, as well as modes of living, to change, and such changes probably could not have occurred within one site or one cultural layer. Also, during an era in which subsistance was equated with environment, there was, perhaps, little degree of permanence in regard to fixed dwelling sites. It seems, therefore, that material found within one site or one cultural layer would manifest a certain temporal aspect of life during that era.

Stone tools, which constitute the principal material for the study of the period under discussion, are directly related to production and are important from the standpoint of speculating on life during that era--even though there will be the above-mentioned difficulty in the study of styles. It is possible to make progress in the study of their significant aspect--shape--and it is my belief that this should be done. For this purpose complete excavations can be made, because sites representing that era are relatively small in scale. All material found in one site or one cultural layer should be collected and organized. It is important, of course, to note positions in regard to time, but, rather than concentrating on fine time differences

at this juncture, we should emphasize contemporaneity. The solution of this problem /regarding time/ should be facilitated to a great extent by the fact which I mentioned previously regarding the unitary nature of remains found in one site or one cultural layer. The next item in order of importance is to study the question, "The remains constitute an assemblage of stone tools of what shape?". The assemblage, in other words, constituted the basis of human life, and any change in the assemblage signifies change in the /manner of/ life. Furthermore, we should scrutinize the role of the individual remains within the assemblage. Through this, we should be able to gain a deeper understanding of life in those times.

Let us proceed to organize the material in the above-stated manner. As a concept of method somewhat similar to this we see the frequent use of the term, "industry," or "l'industrie." H. Breuil applies this /term/ to a group of stone tools used by prehistoric people of a certain given period. M. Burkitt applies this term to the assemblage of stone tools when all the stone tools from one site belong to the same era; to this he adds other industries manifesting common characteristics and other remains and customs, as well as the condition that they represent the products of one racial group, and calls this a "culture." At any rate, all agree that the /remains considered/ constitute the assemblage of stone tools within a given sphere which is temporally and spatially restricted, and, as such, all are acceptable. I feel, however, that we must emphasize the significance of the fact that these restrictions are necessary in order to reconstruct actual life. I believe that the assemblage of certain stone-tool shapes ultimately represents the sum total of a way of life revealed to the archaeologist; and that, if

it possesses a certain uniqueness, it should be termed a "culture" rather than an "industry." The latter's /Burkitt's/ differentiation of terminology merely represents a difference in view on the scope of "culture," and it seems that his use of race as a qualification for the term "culture" is not in accordance with the general usage of the term. Both the above persons apparently use the term within the bounds of Palaeolithic studies, but it seems, on the other hand, to be an inconvenient term when attempting to grasp human life in the Neolithic and metal ages from the standpoint of a unified world history. Here, I wish to introduce the representative pre-Jomon Stone-Age cultures, which I have delineated on the basis of the concept that "culture" is the assemblage of stone tools and other material which have been scrutinized for coincidence and have been studied from the standpoint of shape. Since I am still at the stage of writing up reports on these materials, I shall merely present a summary here, using approximate numerical figures. For the flaking angle /i. e., "angle between striking platform and main flake surface"/, that angle which occurs most frequently is given; this is because in taking the overall average, the results can be thrown off completely by the occurrence of a single extreme case.

Iwajuku I Culture: (Fig. 7)

This culture is known through Level 1 of the Iwajuku Site. /There were found/: hand-axes - 2; side-scraper-like stone tool - 1; end-scraper-like stone tool - 1; flake blade - 6; flake - 2; chip - 33; core - 1. Most of these were of shale; but patination has been intense. Flaking angle is 110-120 degrees. The hand-axes are unique in that the striking platform remains, and this indicates classification as flake tools; both surfaces are

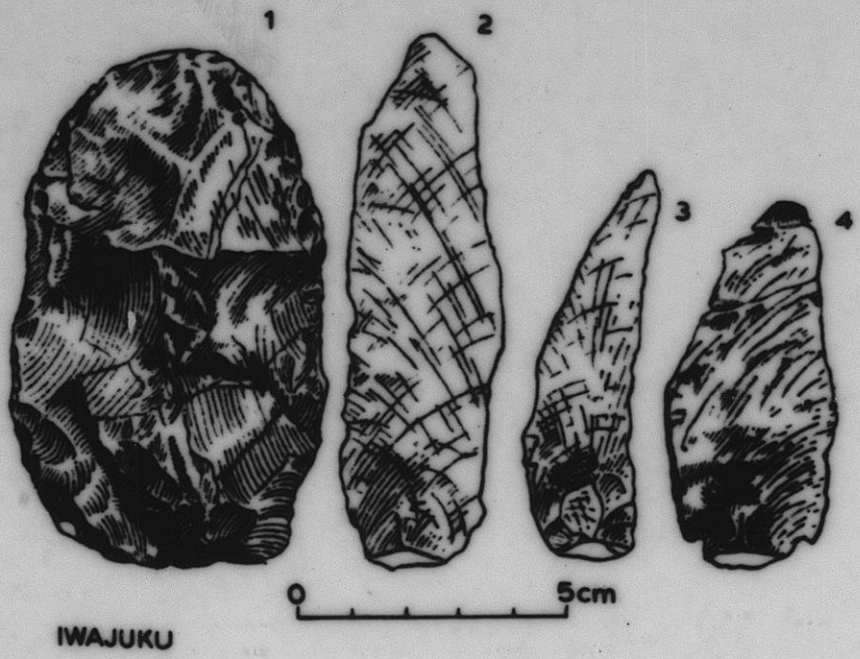

Fig. 7: Iwajuku I Culture. 1: Hand-axe; 2-4: flake blades (All of shale)



Fig. 8: Takei I Culture. 1, 2: Knife blades; 3, 4: flakes (All of obsidian)

trimmed by step flaking, and the form is ovate rather than pear-shaped. The flake blades retain an unfacetted striking platform and are convex. At the high point of the front side of the flaking surface there is retouching through small blows of step flaking, and I feel that they can be labelled knife blades. The hand-axe and the flake blade seem to be stone tools which differ from each other in basic characteristics, but they are of one variety from the standpoint of being flake tools. In Europe the hand-axe existed during the initial stage of the knife-blade culture, and today they are regarded as belonging to one and the same culture.

Takei I Culture: (Fig. 8)

This culture is known through Level 1 of the Takei Site. /There were found/: knife blades - 2; side-scraper-like stone tool - 1; notch-like stone tool - 1; flakes - 3; chips - 11; cores - 3. Mostly obsidian. Flaking angle 100-110 degrees. The knife blade, as is evident from the unfacetted core which remains, has an unfacetted striking platform, and the convexity is great. There is retouching at the base and at the outer edge of the curved surface. In other words, the sharp edge has been blunted for preservation, and here we can already see suggestions of the backed blade. The other stone tools do not yet manifest clear characteristics.

Iwajuku II Culture: (Fig. 9)

This culture is known through Level 2 of the Iwajuku Site. /There were found/: kiridashi knives - 2; artifacts of side-scraper type - 3; point-like stone tools - 4; flake blade - 1; flakes - 32; chips - 128; cores - 7. /Made of/ agate, obsidian, and shale. Flaking angle 100-110 degrees. In regard



Fig. 9: Iwajuku II Culture. 1,2: Kiridashi knives; 3, 4: forms resembling points; 5, 6: artifacts of side-scraper type. (1-4 of agate, 5, 6 of obsidian)

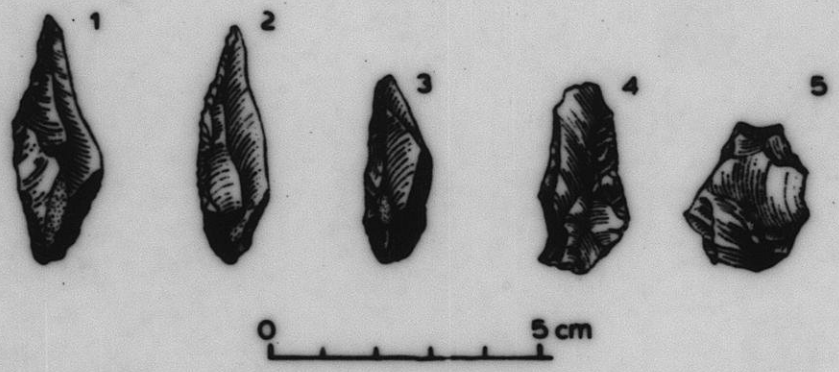

Fig. 10: Moro Culture. 1-3: knife blades; 4: artifact of side-scraper type; 5: concave scraper. (All obsidian)

to the kiridashi knife, there is the question of whether to consider the retouched portions at the top and bottom as the cutting edge or the natural edge in between them. Opinion tends toward the latter, the retouching being regarded as blunting. It is, in other words, considered a type of knife. At any rate, it is a unique stone tool. Neither the artifacts of side-scraper type nor the point-like stone tool manifest clear characteristics, and they might be regarded as variations of the kiridashi knife, depending on the point of view. From the standpoint of the core, they are, after all, unfaceted; and there are flake blades, as well, so they undoubtedly are all of the flake tool culture.

Moro Culture: (Fig. 10)

This culture is known from the Moro Site. /There were found/: knife blades - 5; artifacts of side-scraper type - 2; concave scrapers - 2; flakes - 31; chips - 76. Almost all were made of obsidian. Flaking angle was 100-120 degrees, and there was no consistency. The knife blade is a small backed blade. Since it is made from a portion of a flake, the bulb and striking platform are missing in some instances. The striking platform of the flake is generally small. The tools of side-scraper type may be regarded as a variation of the backed blade. The concave scraper, however, is clearly recognizable as such. A knife blade, identical to that found in this culture, exists in the Chausuyama Culture, but there are only two occurrences of it out of a vast amount of material. The fact that there were five examples found within the extremely limited material for this /Moro/ culture gives it an independent quality; this culture was, therefore, set up as an independent one. But it is probably a fact that these two cultures are intimately related.

Chausuyama Culture: (Fig. 11)

This culture is known from the Chausuyama Site. [Found there were]: knife blades - 36; side-scrapers - 11; end-scrapers, including end-scrapers on blades - 11; concave scrapers - 5; hand-drills - 2; flake blades - 95; flakes - 49; chips - several hundred; cores - 16. The material is somewhat scattered, but the general description is not believed to be affected by this factor. Almost all are made of obsidian. Flaking angle 110-120 degrees. The manufacture of flake blades was flourishing, and, as a result, hinge fractures can be seen; if the knife blade and the flake blade are included, the total number is overwhelmingly large, and it can be said to be the high period. A careful observation reveals, however, that there are no blade cores, and that all are unprepared irregular cores. Flake blades made from them retain large unfacettedstriking platforms; the flakes, or their tips, have slightly convex edges. They cannot, therefore, be regarded as true plain blades, both edges of which are parallel, but must be considered to be of a culture in which the knife blade was highly developed. In this culture, furthermore, the side-scraper, the end-scraper, the concave scraper and the hand-drill appear to provide a general complement of tools. The hand-drill is of the large size and is of the type with the letter "D" cross-section at the tip, not the letter "O". The complete lack of points attests that this culture has characteristics of being transitional.

Takei II Culture: (Fig. 12)

This culture is known from Level 2 of the Takei Site. [There were found]: points - approximately 80; point-like stone tools - 15; knife blades - approximately 15; side-scrapers - approximately 40; end-scrapers - approximately



Fig. 11: Chausuyama Culture. 1, 2: knife blades; 3, 4: flake blades; 5: end-scraper on blade; 6: concave scraper; 7: hand drill. (All of obsidian)



Fig. 12: Takei II Culture. 1-6: uniface points; 7: end-scraper; 8, 9: side-scrapers; 10, 11: point-like stone tools; 12: blades; 17, 18: flake blades. (1-5, 8-10, 12, 17 and 18 are made of chert; 6, 7, 11, 13-16 of obsidian)

30; concave scrapers - 4; hand-drills - 4; flake blades - approximately 15; flakes - several hundred; chips - several hundred; cores - 20. They were made of chert, obsidian, crystal, and numerous other varieties. Flaking angle 100-110 degrees. A great number of points were found, but the unifacial ones were numerous, the bifacial being few in number; there was almost no case in which the trimming was done through pressure flaking, being instead the result of step flaking or fringe chipping. None are double shouldered or single shouldered. Furthermore, there is something in between the knife blade and the point in shape, the use of which cannot be determined. This is of major significance, however, in demonstrating that there is a substantial basis for the development of the point from the knife blade, which is a flake tool. I should like to record the existence of the so-called willow leaf point. They are both knife blades and flake blades, but the existence of those with parallel edges is noteworthy. Among the side-scrapers, there are those in which a single point curves beak-like. The end-scrapers are of small shape and take the shape of the thumb end-scrapers. The concave scraper and the hand-drill, also, are of small shape, but the hand-drill is of the letter "D" type. The cores are unprepared and irregular. It seems as if the complete complement of stone-tool shapes had now appeared.

Uenodaira Culture: (Fig. 13)

This culture is known from the Uenodaira Site. [There were found]: points - approximately 40; knife blades - approximately 20; side-scrapers - approximately 20; flakes - several hundred; chips - a countless number; cores - 3. They were almost all of obsidian, with a few made of chert and ferrous quartz. Flaking angle 100-110 degrees. The number of points was

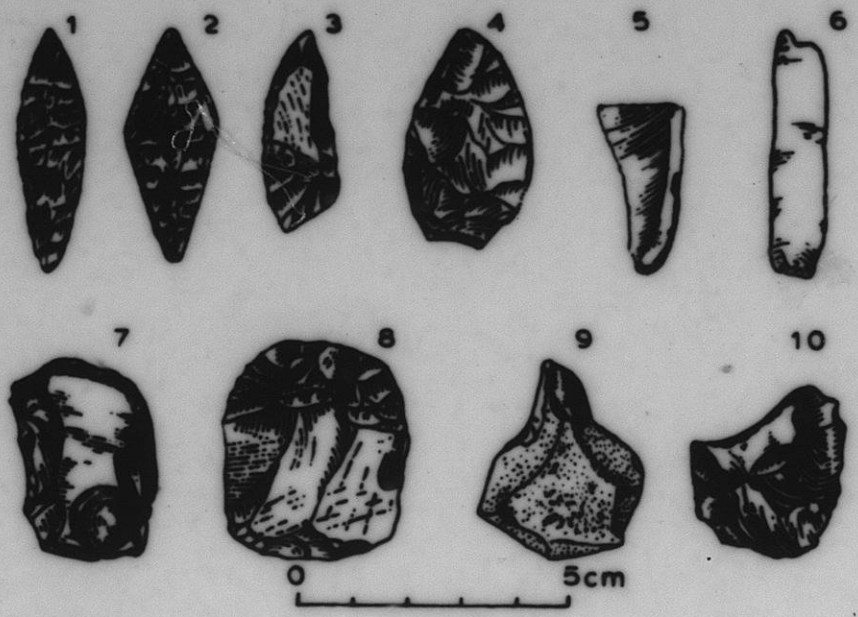

Fig. 13: Uenodaira Culture. 1, 2: bifacial points; 3: point-like stone implements; 4: side-scraper; 5: knife blade; 6: flake blade; 7, 8: end-scrapers; 9: hand drill; 10: concave scraper. (1-5, 7-10 of obsidian; 6 is made of ferrous quartz)

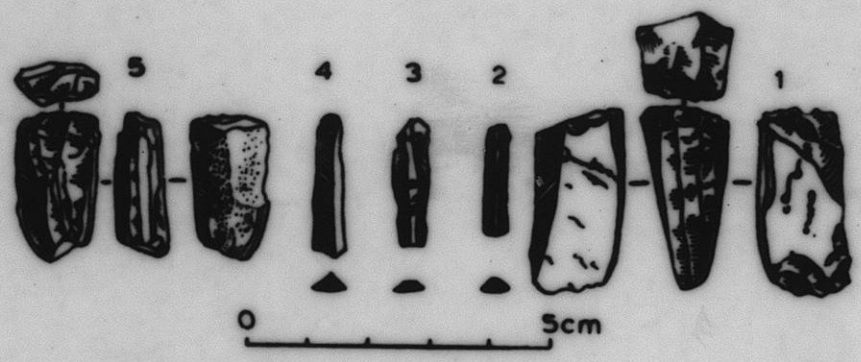

Fig. 14: Microlithic culture. 1-4: Yadegawa site, Nagano Prefecture; 5: Nenogami site, Tokyo; 1, 5 are microcores, 2-4 are microblades. (All of obsidian)

large; they were mostly bifacial, with a very few unifacial, and the technique used in most cases was pressure flaking. In the pressure flaking, there is no evidence of regular ripple flaking. None were double shouldered, but there were some which resembled the single shouldered point. In all probability, they belong to the laurel leaf point; they are small and thin, with some which are thick, and are not of typical shape. Among them, there is a considerable number which are damaged; they tell of the fact, perhaps, that they were expendable articles. Among the other stone tools, those which are of small size are the most numerous. Knife blades and flake blades are of small size, and it is worthy of note that the two edges tend to become parallel. A unique feature among side-scrapers is that there are those which form a point at /only/ one end. The end-scrapers are of the end-scraper of thumb-nail type, and among them there are those which have been chipped at both ends. There is a relatively large number of small concave scrapers and hand-drills, and the hand-drills are all of the type with the letter "D" cross section. In this culture, there are innumerable small thin chips left remaining as a result of pressure flaking applied to points and other stone tools. The cores are unprepared and irregular in shape. This culture is probably one in which the point had developed to the highest degree found within Japan Proper. As a result of the clarification of the Uenodaira Culture, we are now able to vaguely presume that the Iwajuku III Culture, of which neither the characteristics nor the associated soil layer was known, mainly embodies this culture, and that its soil layer lies above the Iwajuku II Cultural Layer in the Kanto Loam Stratum.

Other cultures.

In addition to the stone-age cultures described in the above, there are also a number of important ones which are thought to be pre-Jomon. The culture of the Yadegawa Site (Fig. 14), Nagano Prefecture, investigated by Chosuke Serizawa, is noteworthy in that its stratigraphic position is below the surface humus layer and immediately above the lava layer; that it contains principally small blades which, through perpendicular percussion, are struck off from small prepared cores of obsidian and chert possessing horizontal facetted striking platforms; and that there are left remaining conical or semi-conical cores. (Reference: Serizawa, Chosuke, "Survey of Yadegawa Site, Shinano," Abstract of Research Announcements at the Fourth General Meeting of the Japan Archaeological Association, 1954). Also, the small obsidian cores collected by Takeshi Otomo from the Nenogami Site, Tokyo, hint at the existence of a stone-age culture which left cylindrical cores. (Reference: Serizawa, Chosuke, "Preliminary Observations Concerning the Termination of Pre-ceramic Culture and the Origin of Jomon Culture in the Kanto and Chubu Districts," Shundai-shigaku, No. 4, 1954). These stone tools belong to a microlithic culture, defined in the broad sense, but it is of considerable interest that those seen in Japan do not take a geometric shape but are, instead, of the small blade culture.

The Kurashiki Archaeological Institute is carrying on a survey of non-pottery cultures of the Inland Sea coast and furthering studies of unique pre-Jomon Stone-Age cultures. (Reference: Kamaki, Yoshimasa, "Concerning Pros and Cons on the Existence of Pre-ceramic Cultures on the Inland Sea Coast," Abstract of Research Announcements at the Fourteenth General Meeting of the Japan Archaeological Association, 1954). Furthermore, the Hakodate

Museum of Hokkaido has excavated and surveyed the pre-Jomon stone-age culture at the Tarukishi Site in that area and has clarified the existence in Japan of a true blade culture in which there were plain blades made from blade cores, as well as thick scraper varieties (keeled-scraper-like stone tools). (Reference: Hakodate Municipal Museum, Preliminary Report of Excavation and Survey of the Tarukishi Site, Hokkaido, 1955).

I have introduced a number of stone-age cultures centering in eastern Japan, working upward from the deepest level which contains remains - the dark-brown clay layer, which lies at a depth of approximately 1.4 meters from the upper surface of the Kanto Loam Strata. There are common characteristics seen among these cultures. Firstly, they are cultures consisting solely of stone tools made by percussion, with no presence of those made by grinding or of pottery. Furthermore, these stone-age cultures are at a stage far more advanced than the so-called primitive cultures of pebble tools or chopper-chopping tools, but they are all clearly in the lineage of flake tool cultures, rather than of core tools. Consequently, there are stone tools similar to the blade in all these cultures, which possess knife blades or stone tools similar to them without bearing the characteristics of the true blade. I believe that we should, first of all, understand that the ancient Japanese stone-age culture was basically of such a nature and, then, proceed on to subsequent research.

5. The evolution of technique

I had stated that the history of human life, such as in the pre-Jomon Culture Stone Age, should be traced through the change in tools. Then, how

can we learn about it from the several cultures which we have now come to know? A chronology must, first of all, be assigned to the individual stone-age cultures, and this should be based as far as possible on objective facts.

In doing this, the best method is to rely upon the sequence of cultural layers in one site. Among the sites previously mentioned, this can be done in the case of the Iwajuku Site and the Takei Site. From the Iwajuku Site we can obtain for certain the chronological sequence leading from Iwajuku I Culture → Iwajuku II Culture → Uenodaira Culture (Iwajuku III Culture), and from the Takei Site we can obtain that leading from Takei I Culture → Takei II Culture. This suggests that the depth /as measured/ from the upper surface of the Kanto Loam Stratum will serve as a valuable reference. Next, if we take into consideration the assemblage of stone tools and their technique of manufacture, as well as the depth within the Kanto Loam Stratum, then we can think of a relationship of Iwajuku I Culture → Takei I Culture and Takei II Culture → Uenodaira Culture. Through this we can conjecture the relative chronology of Iwajuku I Culture → Takei I Culture → Iwajuku II Culture → Takei II Culture → Uenodaira Culture. Now the problem is how to relate this /chronology/ to the Moro Culture and the Chausuyama Culture. It is probably correct to say that these two, judging from the assemblage of stone tools and the depth of layers, are situated within Takei I Culture → Takei II Culture. These two cultures, moreover, can be regarded as being mutually intimately related and mutually adjacent. The problem is that there are four possible chronological sequences: Iwajuku II Culture → Moro and/or Chausuyama Cultures or Moro and/or Chausuyama Cultures → Iwajuku II Culture, and the decision is yet to be made. Another possibility is to establish a parallel

theory, placing the Iwajuku II Culture in a different classification. Although a chronology which includes all the cultures would merely constitute a speculation at present, I have constructed the following chronology by considering only the depths of the layers: Iwajuku I Culture → Takei I Culture → Iwajuku II Culture → Moro Culture → Chausuyama Culture → Takei II Culture → Uenodaira Culture. The microlithic culture, such as can be seen at the Yadegawa Site or the Nenogami Site, is of later date than the Uenodaira Culture and will undoubtedly become one of the important major items to fill the gap between it [i.e., Uenodaira Culture] and Jomon Culture.

Let us now endeavor to avoid that which is speculatory in regard to the succession [sequence] of cultures, the chronologies of which have been decided, and pursue the development of tools in these cultures. Various rocks were selected as material, but, among them, obsidian, which occurs in abundance in our country, was the best suited for the technique of making flake tools; it was utilized largely for knife blades since the edges of its chips were sharp blades. Following the appearance of the point, it became indispensable [for use with] the technique of pressure flaking and eventually came to constitute the major portion of the stone materials. Although raw material could be acquired in the form of nodules in the case of obsidian, the various rocks used for the manufacture of flake tools were, in all probability, generally available in the form of lumps. Such rocks were ideal for making flakes; work could be begun immediately without prior preparation. Here we can see a single lineage in the technique of [working] unprepared cores, from the manufacturing of the knife blade to that of the point. When it comes to the microlithic culture, however, the prepared core appears, although

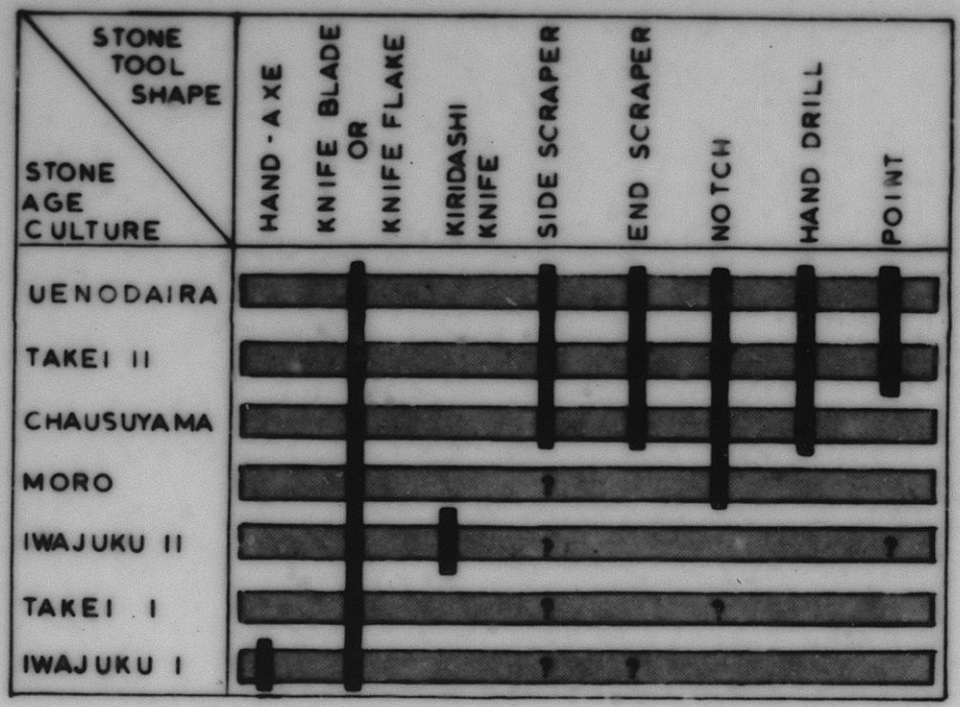

Fig. 15: Groupings of tool types and development of tools

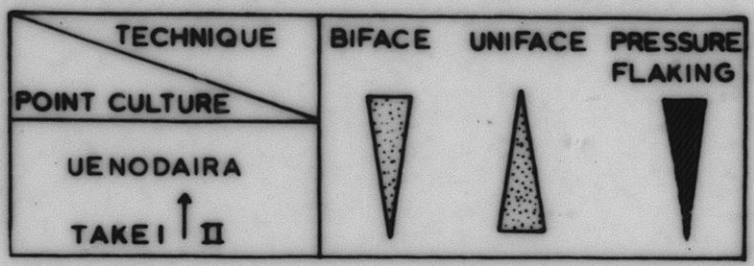

Fig. 16: Development of the techniques in the manufacture of points

of small size, and the study of this situation will probably become an important item of research hereafter. In regard to the technique of percussion, it is considered that the larger the flaking angle, the more primitive; it is largest, for sure, in the Iwajuku I Culture, but large figures appear again in the Chausuyama Culture. The margin between 100 and 120 degrees is a normal range of variation in flaking angles, and there is doubt as to how useful this will be in measuring the progress of technique in Japan. When it comes to the microlithic culture, however, it is an outstanding fact that perpendicular percussion was practiced. The manufactured stone tools, as in the case of blades of the Iwajuku I and Takei I cultures, bear signs of chipping at the base portion, and it seems better to assume that handles were attached, although crude. In other words, the idea of making composite tools had existed from the very start, and, in conjunction with the point, hand spears and throwing spears came to be made. The utilization of microliths should, perhaps, be understood as the development of this technique.

Insofar as the individual manufactured tools are concerned, the hand-axe, which is called the all-purpose primitive stone tool, existed in the Iwajuku I Culture in its final shape. It disappears completely, however, from the next stage on. The original form of the blade, as a tool, is called the knife blade, and something close to it in appearance existed in the Iwajuku I Culture; in the Takei I Culture, it has considerable convexity, already taking the shape of the backed blade, and this form flourished in the Chausuyama Culture. The flake with both edges parallel is seen in the Takei II Culture, in which the point appears, but the shape seems to be undefined. The kiridashi knife, which is regarded as a special variety of the blade tool, existed only

in the Iwajuku II Culture and, at present, is thought to be an extremely unique stone tool. Irregularly-shaped side-scrapers, which are cutting tools, had already appeared in the Iwajuku I Culture, but it is only after the Chausuyama Culture that it acquires a distinct shape; after the Takei II Culture, in which the point developed, it presented a rather unique shape. The end-scraper, which is said to have been a scraping tool, presented a distinct shape after the Chausuyama Culture, but it took the shape of the end-scraper on a blade, as /it did/ during the high period of the blade or during the true blade culture. When the major form of stone tools shifted from the blade to the point, it was unified into the thumb-shape scraper, a small independent tool-shape. The concave scraper, a type of scraper which requires roundness in its basic material, appeared in the Moro Culture, and it took a variety of shapes. The handdrill, which already existed in the Chausuyama Culture as a boring tool, was large in shape; it became small in shape from the Takei II Culture on. All appear to be flake tools, and the cross-section of the tip presents a letter "D" shape. The point, which functions as an especially sharp cutting tip for a spear point--an important hunting tool--appeared for the first time in the Takei II Culture. During the initial period it had a thick hemispherical cross-section, having depended only on traditional techniques; after the pressure-flaking technique was adopted, it became thin, most of both surfaces were prepared, and it became highly efficient as a spear point.

The above are, as mentioned previously, /tools/ which are produced from unprepared cores and, as such, form one stone-tool group. However, a culture possessing the true blade and keeled-scraper, which are made from prepared cores, as well as such specialized techniques of manufacture as fluting

and such tools as the graver, which served as a chisel, clearly existed in Hokkaido. Such materials are beginning to be found even within Japan Proper. Do these two characteristically different cultures constitute different stages of development within one cultural lineage, or are they separate parallel cultures? In the event of the latter case, were they totally unrelated, or, if not, how were they related? Thus, there are many aspects which must be clarified hereafter. Then, it is probably an indisputable fact that the present assemblages of stone tools will be broken up, and out of them will emerge new stone-age cultures.

6. The stages of living.

During the primitive era, the gathering-economy stage, a way of life in which the only tools possessed were those made through percussion continued for an extremely long time, and this /situation/ constitutes a vitally important segment of that era. Such a stage in human living, it is becoming clear, had existed even in this island country of Japan.

China's Chouk'outien Culture is recognized as the oldest trace of human life in Eastern Asia. The stone-age culture of Chouk'outien is supposed to be in the lineage of the chopper-chopping tool culture, but the stone tools of a portion of Locality 1 (Yuanjentung) and of Locality 15 there show evidence of the beginnings of flake tools. If one knows the T'ingts'un Culture, also of China, and the Ordos Culture, then it becomes clear that the flake tool culture was in the process of developing extensively in Eastern Asia. There is nothing unusual, then, in the present attempt to ascertain the existence of the flake tool culture in Japan. (Reference: Kuo Mo-jo, Yang

Chung-chien, P'ei Wen-chung, Chou Ming-chen, Wu Ju-k'ang, Ku Lan-p'o, Discovery and Study of Chinese Human Fossils, 1955.)

How did the culture of such a distant past begin in Japan? Of course, a culture even older than the Iwajuku I Culture probably existed in Japan, and search for it must be continued. Even if it did not originate in Japan, the Japanese Islands at around the middle of the Diluvial Epoch were connected to the Continent by a land bridge, and there is the possibility that man had crossed over from the continent, where /existence/ of the culture of that era has been recognized; this means that there is sufficient basis for such a culture to have flourished in our country as well.

The earliest culture known at present to have existed in Japan is the Iwajuku I Culture, which contains the hand-axe. The hand-axe is the product of the core tool culture and is said to be the sole item of which that culture is composed; it was, therefore, said to be the all-purpose primitive stone tool. The existence of the hand-axe, which is limited to the Iwajuku I Culture, may more correctly suggest an even older, preceding cultural stage. This being so, if we continue to apply the above-mentioned traditional concept of the hand-axe, then Japan's earliest stone-age culture would be left standing alone as an East Asian culture /i.e., independent of other East Asian cultures/. If the hand-axe were then in existence, even though it may have some significance as an all-purpose tool, should we not be prepared to apply the concept of the hand-axe as a pounding-tool within the flake tool group? Then, the situation in which several pear-shaped hand-axes were recognized amidst the numerous flake tools in the above-mentioned T'ingts'un Culture of China will appear hereafter as a related problem. (Reference:

P'ei Wen-chung, "Palaeolithic Cultures of China"; Ku Lan-p'o, "Report on the Excavation of Human Fossils and Palaeoliths at T'ingts'un, Hsiang-en-hsien, Shanshi," K'o-hsueh t'ung-pao, 1, 1955.)

In the Iwajuku I Culture, the differentiation among tools was already taking place, although not too clearly; there were knife-blade-like tools, although primitive, which had come to be utilized even in craft work, in addition to cutting up hunting quarry. When it came to the Takei I Culture, the knife blade manifested clearly the shape of the backed blade, highly efficient as a blade tool when used by applying heavy pressure. A unique blade tool was used in the Iwajuku II Culture. Utilization of the knife blade flourished even more in the Moro and Chausuyama cultures, and such craft tools as the concave scraper were added. In the Chausuyama Culture, in particular, the side-scraper and the end-scraper assumed shapes according to their respective functions; with the addition of the hand-drill (a boring tool) a complete set of tools was provided to expand the scope of craft work. When it came to the Takei II Culture, there was a major change in the content of culture, and a change was made in the hunting tools, the most important item for living at that time. A sharp cutting tip made of stone was attached to the spear head. From this we can definitely conjecture the use of such medium-range weapons as the hand spear and the throwing spear, but there is doubt as to whether or not such long-range weapons as the bow and arrow were then made. There is no doubt, however, that the certainty of results of hunting /efforts/ increased with the appearance of the point, and that living was improved by it. And the other items which made up the tool complement were standardized in shape according to their respective specialized

uses. When it came to the Uenodaira Culture, the point was further improved, fine hand spears and throwing spears were made, and the manufacture of hunting tools reached a point of culmination. However, the lineage of technical development seen up to this point disappeared simultaneously with the end of the Uenodaira Culture, and a new hunting life was to begin, with the use of microliths in tools which were to be different /from those above/ in the method of manufacture.

Thus, considerable change can be seen there in the tools of the pre-Jomon stone-age culture which had developed in Japan, and this probably represents a development covering a long period of time. However, there were aspects of life which did not undergo any great changes. They always lived in such places as solitary hills which afforded good observation and defense. Their dwellings present a problem. If stone hatchets made by grinding would appear, then we could say dwelling-construction techniques based on lumbering had existed; but what was the state of affairs during that era? I believe it an extreme view to say that they all lived in open terrain, and to ascribe the almost total lack of dwelling facilities to the warm climate of that time. There was in existence at that time some sort of technique for constructing shelter, and they should have been able to make considerable adjustments to changes in environment. At the Iwajuku and other sites, charcoal has been discovered, showing very probably that fire was used. There have been no adequate explanations made, however, concerning the groups of pebbles which are frequently discovered at the sites. Also, their dwellings were, simultaneously, workshops for stone tools, and crude stones and stone scraps are always found there. There were no persons specializing in the manufacture

of stone tools. Consequently, we must recognize the fact that raw material was traded to places far removed from its point of origin. A study of dwelling sites shows that, in spite of differences in size, they all represented, perhaps, the allowable minimum of social life, which probably constituted merely an extension of family life.

The above-described life, when compared with what we know of man's history, probably coincides in general with the stage which begins at the end of the Middle Palaeolithic Age, proceeds through the Upper Palaeolithic Age and ends at the Mesolithic Age. As for dating, current researches in geology and topography have yielded similar findings. This conclusion is abetted by the thought that the cultures of the world in eras before enlightenment and civilization probably progressed in unison since no specialized environments were needed, nor was development effected through cultural centers. Also, from the standpoint of the evolutionary development of the human species, there is no doubt that those who left these cultures were a variety of humans--that is, they had arrived at the stage of primitive humanity.

/The facts/ which I have related above concerning the stone-age cultures of Japan will probably contribute greatly to the study of East Asian Palaeolithic culture, the upper period of which remains relatively obscure. Also, this small area called Japan, an island country, may be of use in furnishing a certain sequence of factual material.

Once we conclude the long era of the culture of percussion-made stone tools, we can at last get into the Jomon Culture, which is a culture of ground stone tools. There is an even greater gap between these two cultures, and the study of the circumstances of their inter-relationship constitutes an enormous task facing us.

KNIFE-BLADE IMPLEMENTS FROM THE KANTO LOAM BED AT MORO, TOKYO

(Tokyo-to Moro ni Okeru Kanto-romu Sochu no Sekki Bunka)

by Sosuke SUGIHARA, Itaru YOSHIDA and Chosuke SERIZAWA

(Sundai Shigaku, No. 9, pp. 84-104. Tokyo, 1959)

I

We were able to undertake research on the stone implements of the Kanto Loam Bed at Moro-yama, Tokyo, in the summer of 1951. We feel that this research has made a significant contribution to the development of the study of preceramic culture.

We had previously been alerted to the presence of a lithic culture without pottery in the Kanto Loam Bed by the results of the excavations at the Iwajuku site in Gumma Prefecture in 1949-50. At that time, however, we did not have other data based on scientific excavations to prove the existence of such a lithic culture. Even if the lithic industry of Iwajuku proved to be prior to Jomon, we would still hesitate to say definitely that this represented a universal culture stage in Japan or whether it was a fortuitous discovery of a very special culture of limited significance. There was also hesitation with regard to the geological layer of the Kanto Loam involved here. The data were insufficient to determine whether the layer containing the Iwajuku site could be correlated with that of the Kanto Loam represented on the Musashino Plateau, which is familiar to us, or whether the Kanto Loam Bed at the Iwajuku-site was geologically unique.

It was a great pleasure for us to have been able to discover the presence of a lithic culture in the Kanto Loam Bed at Moro-yama, a part of the Musashino-Plateau with a long history of human occupation. With this excavation as the impetus, many sites of the preceramic period have been discovered on the Musashino Plateau.

On the basis of these data, it has become clear that the Kanto Loam Bed in northern Kanto and that of southern Kanto belong to the same geological period at least in the sense that both reflect the period of human occupation. It has also been recognized that the lithic culture of the Iwajuku-site and its pattern is not peculiar to the site, but has been shown to be one aspect of a culture which existed in Japan in the distant past.

At the Iwajuku-site, two stone cultures with characteristics of relatively different periods and a newer stone culture which had not been identified were found. After the excavation of the Moro site, it was found that the characteristics of its culture differ from any of the cultures at the Iwajuku-site, except that both of these sites contain lithic cultures without pottery. This fact shows that there were variations among the lithic cultures of the preceramic period in Japan, and suggests that there existed several cultural stages within the lithic culture ranging over a fairly long time span.

Besides, at the Iwajuku-site, these lithic cultures are found entirely below the layers which contain early Jomon pottery, here represented by Inaridai-type pottery. Thus, it has been concluded that these lithic cultures preceded the Jomon culture. This conclusion is one of the major findings from the research on the Iwajuku site. In the meantime, the study of

Jomon pottery has progressed and it has been established that the earliest Jomon pottery presently known in southern Kanto is the Igusa and Daimaru (大丸) types. Moreover, at the Moro site, good specimens of Igusa-type pottery were found in the humus layer at the surface and in the chestnut colored bed underneath, while the group of stone implements which we are going to discuss is found in the Kanto Loam Bed below the chestnut colored bed, with a layer interposed between them. The findings from this site have also proved that this lithic culture is far earlier than the Jomon culture. The fact that the temporal precedence of lithic culture of the preceramic period over that of the Jomon period was demonstrated by the excavation of the Moro site, following on the heels of the discovery at Iwajuku, was responsible for the satisfactory progress of subsequent research on preceramic culture even at this early stage of the investigations.

II

There is a valley to the north of Moro. An isolated hill, called Moro-yama, stands in this valley, and the Shakujii River runs around the north side of this hill. A new road was made cutting across the hill from south to north and exposing a cross-section. On the twenty-ninth of March, 1951, Mr. Hiroshi Takizawa passed along this road and found an obsidian implement at the north end of the eastern face of the cut. A little to the south, he also noticed a concentration of pebbles exposed. He reported this fact to the Musashino Historical Museum and from the Museum notification was given to the Institute of Archaeology, Meiji University. In June, the Museum and the Institute of Archaeology, Meiji University undertook a

preliminary survey of the area near the spot where the stone implement was found and recognized another group of pebbles. Consequently it was decided to carry out an intensive investigation with the cooperation of these two institutions.

The excavation was started on the tenth of July. We dug a trench 2m wide north-south running parallel with the roadcut on its east side three meters away, in the vicinity of the spot where the stone implements were found. The length of the trench was 10m. It was divided at 1m intervals into ten sections which were labelled a to j from north to south. This original trench was extended 6m northward and each 1m section was called from south to north k,....p. respectively. On the west side of the extended trench, for a distance of 7m between sections c and n it was made 1.5m wider and this expanded part was named section A. On the east side of the trench, for a distance of 3m covering section a, b and c, it was made 1m wider and this area was designated as section B.

The humus soil layer of the surface which is 20-30cm deep contained fragments of such types of Jomon pottery as Igusa, Tado I, Kurohama and Jusanbodai, among which the specimens of Igusa type provided good evidence. From section B, a nearly complete Kurohama-type vessel was found. Below the humus layer, there is a chestnut-colored layer about 50cm thick in which a very small amount of fragments of Jomon pottery was discovered. Underneath the chestnut-colored layer lies the Kanto Loam Bed, the upper part of which is soft in this area as is commonly the case elsewhere. The thickness of this Kanto Loam Bed is about 40cm. In the northernmost sections o and p, 50 or 60 fragments of poor quality obsidian and andesite were found in the

layer 10-15cm below the top of the Kanto Loam bed, but no stone implements. From the lower (hard) part of the corresponding layer in sections k, a, b, c and A, stone tools were recovered. However, no artifacts were contained in the upper part of the latter sections.

Thus we find remains in the very top of the hard layer of the Kanto Loam Bed, although at fairly restricted spots. Within the trench at sections a, b and c, assemblages of pebbles and charcoal fragments were excavated. Around these remains, stone implements (e.g. knife-blades and concave scrapers), flakes and chips of good quality obsidian were found. Although these sections were extended by the excavation of section B, few flakes were found in the latter.

From section A, a group of pebbles was found at a spot a little higher than that where the assemblage of pebbles discussed before was found. The one from section A is referred to as pebble group A and the other one as pebble group B. Around pebble group A at a little higher level there were found tools (knife-blades and concave-scrapers), flakes or chips made from obsidian of good quality. Thus, the distribution of the remains at the Moro site seems typically to consist of groups clustered around assemblages of pebbles. Therefore, it will be convenient to treat the remains found in section A as group A and those from sections a, b, and c as group B. Hence it would be proper to regard the stone implement which Mr. Takizawa found as belonging to group A on the basis of the position in which it was found, and the stone tools found between sections A and c as belonging also to group A because of their stratigraphic position. Below the layer which contains both groups of remains, no artifacts are found and after another 80cm the soil changes to a black zone layer.

Such a condition of the remains at this site suggests the sporadic distribution of artifacts in groups in the Kanto Loam layer of the Moro-yama. However, since certain results had been obtained, this excavation was terminated for the moment on the nineteenth of July after ten days in the field. In carrying out this research project, we are deeply grateful to Mr. Hiroshi Takizawa for his initial report, to Mr. Isamu Okamoto and other students for their assistance in excavation, and to Dr. Shunji Watari for his cooperation in identifying carbonized plant seeds. The drawings of the specimens in this paper were done by Mr. Tsugio Matsuzawa, to whom we express our thanks here.

Aware of the necessity of reporting our general findings from this research as soon as possible, a report was read by the same co-authors on the 26th of April, 1952, at the Ninth General Meeting of the Nihon Kokogaku Kyokai (Japanese Archaeological Association) held at Kokugakuin University.[1]

III

The Moro site is located at Moro-yama a part of the Moro district, Itabashi-ku, Tokyo-to. It is a little more than one kilometer south of the Kami-itabashi station of the Tojo line, of the Tobu Electric Railway. Moro-yama is a small hill, having the appearance of an isolated one, which projects northward from the south side of the narrow valley of the present

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1. Sugihara, Shosuke, Itaru Yoshida and Chosuke Serizawa, "Tokyo-to Itabashi-ku Moro ni okeru Kanto Loam So chu hakken no Sekki ni tsuite (On Stone Implements found in the Kanto Loam Bed at Moro, Itabashi-ku, Tokyo)," Nihon Kokogaku Kyokai Dai 9 kai Sokai Kenkyu Happyo Yoshi, 1952.

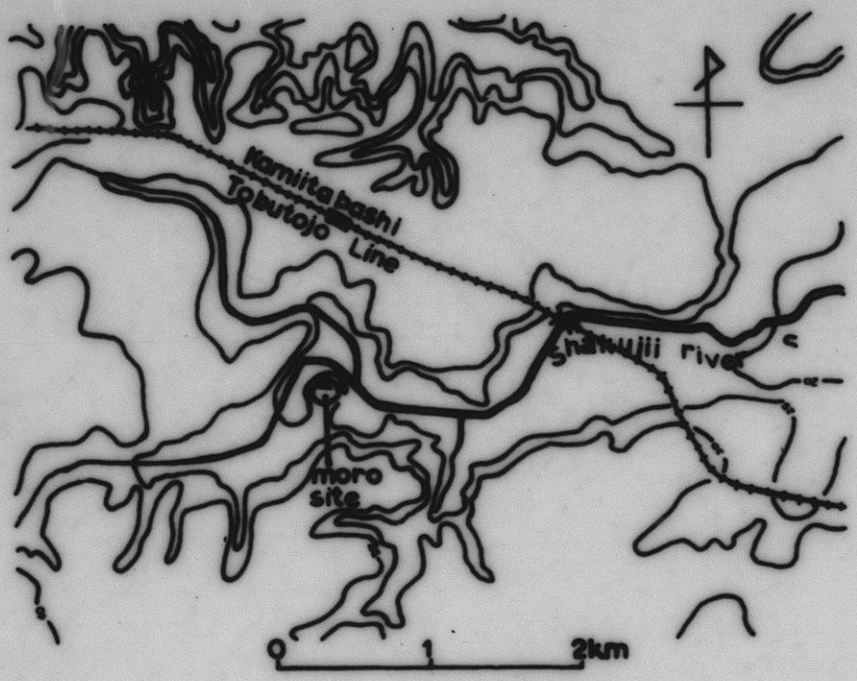

Fig. 1: Topographic map of the area in the vicinity of the Moro site

Shakujii River. The Shakujii River runs around the north side of Moro-yama from west to east. The Moro site which we investigated is located at the northern tip of Moro-yama and now faces the river. The altitude at the western part of the Musashino Plateau reaches more than 100m. above sea level. It decreases as it goes eastwards, being 40m. around Nerima station of the Seibu Electric Railway's Ikebukuro Line. It is 35m. above sea level at the plateau where Moro is located and at Moro-yama. At Itabashi, a plateau extending eastward on the northern opposite side of Moro-yama, it decreases to 30m. and this plateau ends at Akabane and Asuka-yama with an altitude of 25m. The Arakawa River runs northeast of this plateau and the Shakujii River joins the Arakawa.

The Kurihara site, which is supposed to represent a culture of the preceramic period, is located near the Moro site on the opposite western side of the river.[2] One kilometer southeastwards from the Moro site, there is the Nenoue (or Ne-no-gami) site which is famous for the discoveries of micro-cores and pottery with stamp designs.[3] Ascending the southern shore of the valley of the Shakujii River towards the west, we reach the Igusa site, and descending the valley eastwards, we see the Inaridai site on the left hand side.

Regarding the geology of the Musashino plateau, pertinent data have

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2. Okamoto, Isamu, "Tokyo-to Itabashi-ku Kurihara Iseki (Kurihara Site, Itabashi-ku, Tokyo)," Nihon-Kokogaku Nempo 4, 1955.

3. Serizawa, Chosuke, "Kanto oyobi Chubu-chiho ni okeru Mudoki-Bunka no shumatsu to Jomon-Bunka no Hassei toni kansuru yosatsu (Preliminary perspective on the close of non-ceramic culture and onset of Jomon culture in Kanto and Chubu District)," Sundai Shigaku, 4, 1954.

been obtained at Tamagawa in Setagaya Ward, Tokyo.[4]

The loam begins below the surface humus /and chestnut-colored layer/, and lasts for two meters until it reaches the black soil zone which is 50cm. thick. Usually this black soil zone contains two layers, the upper layer being inconspicuous and the lower one more conspicuous. These two layers gradually merge into one another without any clear-cut division. Below this zone lies a loam layer 50cm. thick. The above layers constitute the Tachikawa Loam Bed /of the Kanto Loam/. Underneath lies a layer separated by a disconformity which has crack belts, the upper portion of which is assumed to have once been exposed to wind erosion. Below this layer we again find a four meter deep loam bed and then we reach a pumice bed. This pumice bed, which is 10-20 cm. thick, is called the Tokyo-Pumice Bed. Further below there is one meter of Loam layer, and these layers /up to the Tachikawa Loam Bed/ are collectively called the Musashino-Loam Bed. Still deeper, this Bed merges into the Itabashi-Clay Bed or the Musashino-gravel Bed.

Let us compare the geological conditions at the Moro site with the usual conditions as described above. At Moro, the depth of the surface humus is between 20 and 30cm., and Jomon type pottery is mostly found in this layer. Below this layer lies a chestnut-colored layer with a thickness of 40-60cm. This layer is characteristic of this area. However, since it is said that the surface humus layer of the Musashino Plateau is composed of volcanic ashes,[5] the chestnut-colored layer can only be a layer of volcanic ashes. As mentioned before, the thickness of the loam layer

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4. Kanto Loam Kenkyu Group, "Kanto Loam no Shomondai (On the problems of the Kanto Loam)," Chishitsugaku Zasshi, 62-729, 1956.

5. Kaizuka, Sohei, "Kanto Loam-so no Kyokai Mondai (Problems on the limits of the Kanto Loam Bed)," Kanto Loam 9, 1957.

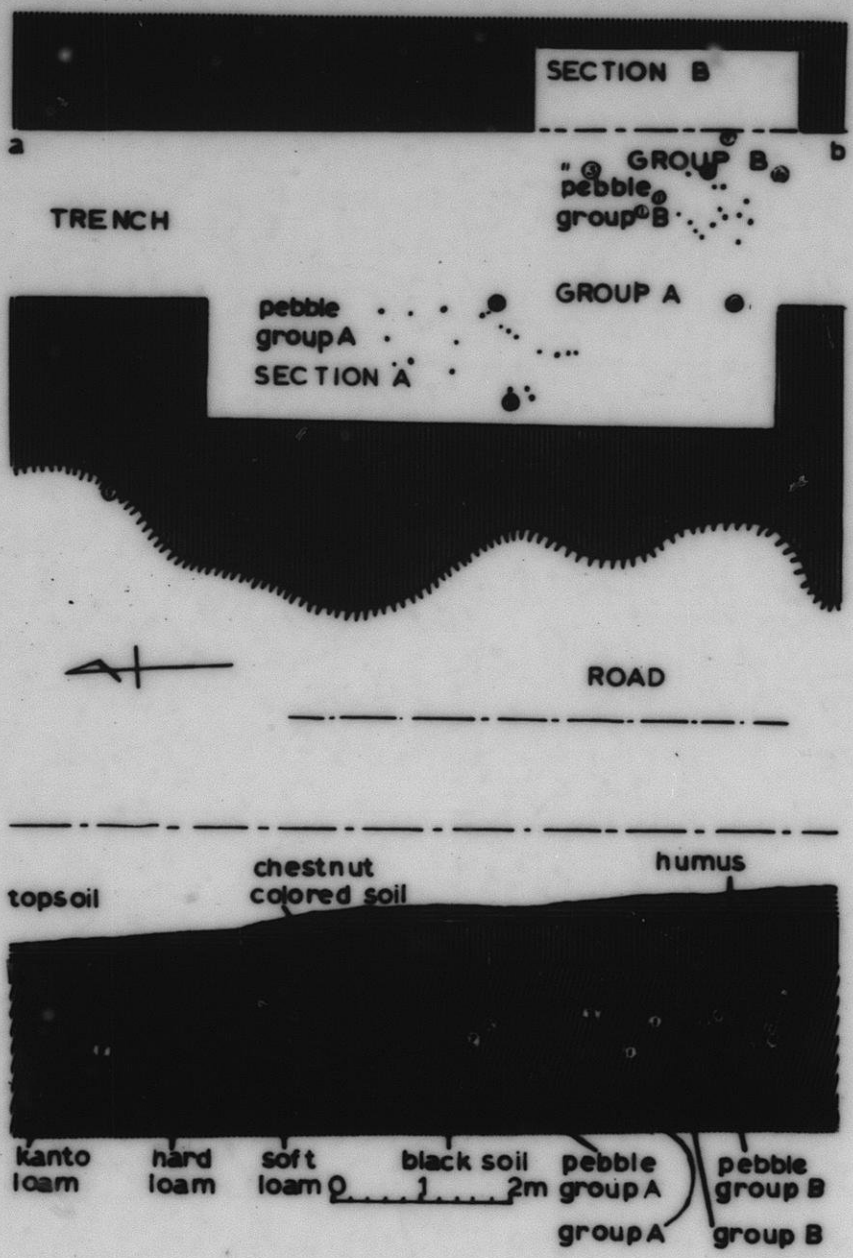

Fig. 2: Distribution of artifacts at the Moro site

to the top of the black soil layer is generally 2m. At the Moro site this is about 1.4m. thick, and if we add the chestnut-colored layer to it, the total thickness becomes about 2m. The soil of the chestnut-colored layer seems to be the secondary transformation of loam, and a few fragments of Jomon pottery are found in the upper part of this layer. The Loam bed starts below this layer.

The upper part of the loam bed, ranging from 40-50cm. in thickness, is the soft part of the loam. Underneath there lies the hard part which is 90-100 cm. thick from the top to the beginning of the black soil zone. According to the geological interpretation of the data from the vicinity of the Moro site, it is demonstrated that these two parts comprise a single layer because their mineral components are the same, and that the soil of the soft part which contains more carbon and nitrogen than the hard part has been influenced by more recent contact with the earth's surface.[6] This interpretation is supported by archaeological materials from the Maruyama site of Chiba prefecture, in which cores and flakes excavated from the soft and hard parts of the Loam bed have resembled each other.[7] Therefore, it may not be plausible to regard the stone implements found in the two parts as reflecting chronological differences to the extent that they would have had if they belonged to different geological layers. However, at the Moro

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6. Toya, Hiroshi, "Sofuto Loam to Haado Loam (Soft Loam and Hard Loam)," Kanto Loam, 3, 1955.

7. Sugihara, Shosuke, and Hatsue Otsuka, "Joso-daichi ni okeru Kanto Loam So chu no Sekki Bunka (Stone culture found in the Kanto Loam Bed of Joso Plateau)," Sundai Shigaku 5, 1955.

site, a group of chips has been excavated from the soft part of the Loam bed in sections o and p, while in sections a, b, c, and A, no artifacts are found in the soft part, and remains appear in the top of the hard part and as much as 40cm. further down. The group A remains were found in the upper part of this 40cm. while group B came from the lower part. Thus it seems that there are stratigraphic differences in the remains within a loam bed which has a uniform geological constitution. In the vicinity of this site, the soil of the black zone, which lies under the above mentioned Loam layer, is so faintly colored that we cannot recognize it easily. It is impossible to distinguish the two layers of this zone, and we can only say that it is about 50cm. thick. It has been proved that this black zone used to be the surface soil in the past, and that the humus is responsible for its black color. That is, the black soil zone contains a large amount of carbon and nitrogen, and the relative proportion between the former and the latter is approximately ten to one which is the same as that of the presently existing surface humus. This black soil zone was formerly called "fossil soil", but it is now thought better to call it "buried soil".[8]

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8. Toya, Hiroshi and Sohei Kaizuka, "Kanto Loam so chu no Kaseki Dojo (On fossilized soil in the Kanto Loam Bed)," Nihon Chiri Gakkai 1954 nendo Sokai Koen Yoshi, 1954.

Toya, Hiroshi, and Sohei Kaizuka, "Iwayuru Kuro-bando ni tsuite (On the so-called Black Band)," Kanto Loam 1, 1954.

Toya, Hiroshi and Sohei Kaizuka, "Kanto Loam so chu no Kaseki Dojo (On the fossilized soil in the Kanto Loam Bed)," Chirigaku Hyoron, 29-6, 1956.

Toya, Hiroshi,"Maibotsu dojo (Buried soil)," Kanto Loam 19, 1958.

No remains have been found in this layer and those below. Under the black zone, there lies another loam layer 50cm. thick which meets the crack belt. To ascertain the geological conditions further below, we examined the face of the cliff at the southwestern tip of Moro yama. Here, beneath the crack layer, the Musashino Loam Bed begins. The thickness of its top loam layer is about 3m., which is relatively thin. The reason for this thinness might be the fact that the measurement was done on the face of the cliff. The Tokyo Pumice Bed underneath is also as thin as 3-5cm. Further down lies another loam layer 1m. thick extending to the Itabashi Clay Bed which is well developed at this spot. We could not identify the Musashino Gravel Bed here.

On the basis of the preceding description, we conclude that the geological conditions in the vicinity of the Moro site conform to that of the Musashino Plateau in general. Besides, since the disconformity above the crack belt is identifiable, the Kanto Loam Bed in this area can be divided in two: the Tachikawa Loam Bed on the top and the Musashino Loam Bed on the bottom. As far as this site is concerned, the Tachikawa Loam Bed has archaeological importance. The Tachikawa Loam Bed reveals a different condition on the river terraces along the Tama river from that of the Musashino Plateau. The Loam Bed along the Tama River on the Musashino Terrace resembles that of the Musashino Plateau, having the same arrangement. Whereas on the Tachikawa Terrace, which is one step below the Musashino Terrace, the Musashino Loam Bed does not occur and we only find there the layers of the Tachikawa Loam Bed above the black belt which are lying directly on

the Tachikawa-gravel Bed.[9] In other words, the accumulation of loam on the Tachikawa Terrace became possible after the formation of the black zone on the Musashino Terrace. This point will be clarified in the following discussion. There is an opinion that the top portion of the black zone should be regarded as dividing the Tachikawa Loam Bed of the Musashino Plateau into lower and upper parts. The characteristic components of the Tachikawa-loam Bed are peridodite, hypersthenite, and proxene. The soil right above the black belt contains a fair amount of volcanic glass which helps us in dividing the loam layer in two. It is reported that this soil is red-orange in southwestern Kanto.[10] The black zone under this soil, as mentioned before, used to be surface soil. If we agree that the Tachikawa Loam Bed should be divided into upper and the lower parts at the top portion of the black zone, it can be said that the stone implements and other remains of the Moro site are found in the middle part of the upper Tachikawa Loam Bed.

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9. Fukuda, Makoto and Kenzo Hatori, "Musashino Daichi no Chikei to Chishitsu (On topographical and geological features of the Musashino Plateau)," Shizen-kagaku to Hakubutsukan, 19-9 & 10, 1952.

Kanto Loam Kenkyu Group,"Kanto Loam no Shomondai (Concerning problems of the Kanto Loam)," Chishitsu-gaku Zasshi, 62-729, 1956.

10. Kaizuka, Sohei, "Tachikawa Loam so o Futatsu ni Kubun suru koto ni tsuite (On the two divisions of the Tachikawa Loam Bed)," Kanto Loam 7, 1957.

Kaizuka, Sohei, "Kanto Heiya no Chikei Hattatsu-shi (History of the Topography of the Kanto Plain)," Chirigaku Hyoron, 31-2, 1958.

As we have already stated, the black zone used to be the surface soil in the past, and its top portion was the earth surface. According to the archaeological data recovered from the Kanto Loam Bed, it is assumed that evidence of the life and activities of man would be recorded in the top portion of the black zone. The valuable findings at the Toro site suggest that the remains of human life are usually left buried in the layer below the surface on which the people lived. If we follow this assumption, it is most plausible that the black zone should contain remains. However, no cases have been reported, either at the Moro site or some dozen other sites excavated in the Kanto Loam Bed in south Kanto, where stone implements have definitely been found in the black soil layer or those below. We are hopeful that stone implements will be discovered in these layers. No one will deny that the disconformity is an important criterion for a geological classification of the earth layers. The geological division between the Musashino Loam Bed and the Tachikawa Loam Bed must be established on this basis. However, archaeologically speaking, the upper part of the Kanto Loam Bed above the black zone--the level in which stone implements and other artifacts have been found--is the significant one. Therefore, the detailed division into the upper and the lower Tachikawa Bed is a convenient classification for archaeologists. Archaeologically, we should pay careful attention to the upper Tachikawa Loam Bed of the Moro site as well as of other sites.

IV

At sections o and p of the Moro site, 50-60 artificial chips of poor quality obsidian and andesite were excavated from the upper soft portion

in the upper Tachikawa Loam Bed. But finely retouched stone implements were not found among them at all. Therefore it is difficult to say more about the characteristics of this stone culture.

Around section A, from the lower hard portion of the upper Tachikawa Bed, stone implements (Fig. 3: 2, 7), flakes and chips were found around pebble group A. The stone tools 4 and 5 which were discovered by Mr. Takizawa have also been assigned, on the basis of their stratigraphic location, to group A together with those mentioned above. (The tool numbers correspond with those in figures 2 and 3). The average stratigraphic location of this group is 50cm. below the top of the Loam Bed and is 1m. below the top of the chestnut-colored layer if we recognize this layer as a part of the Loam Bed. Most of the pebble groups are located almost in the same stratum. Measuring from the top of the Loam layer, tool 2 was found at a depth of 65cm., 7 at 75cm., 4 at 45cm., and 5 at 80cm.; from the top of the chestnut colored layer, 2 lay at 1.15m., 7 at 1.25m., 4 at 1.05m., 5 at 1.05m., respectively. Tool 4 is located in almost the same stratum as the pebble group, and tools 2, 5, 7 are located lower. Pebble group A is distributed within a rectangle 2.30m. by 1.20m. Tools 2 and 7 are found near its margin, tool 4 is found 1.80m. to the southeast and tool 5 is 3.50m. northwest of the rectangle. Tool 5 is located too far away to be classified with group A. Pebble group A is located about 15cm. higher than group B and is wider and more scattered in distribution, and the size of each pebble is larger. These pebbles are mainly of tuff.

At sections a, b, c, and B of the trench, stone tools (1, 3, 6, 8, 9), flakes, and chips were collected from the lower hard part of the upper

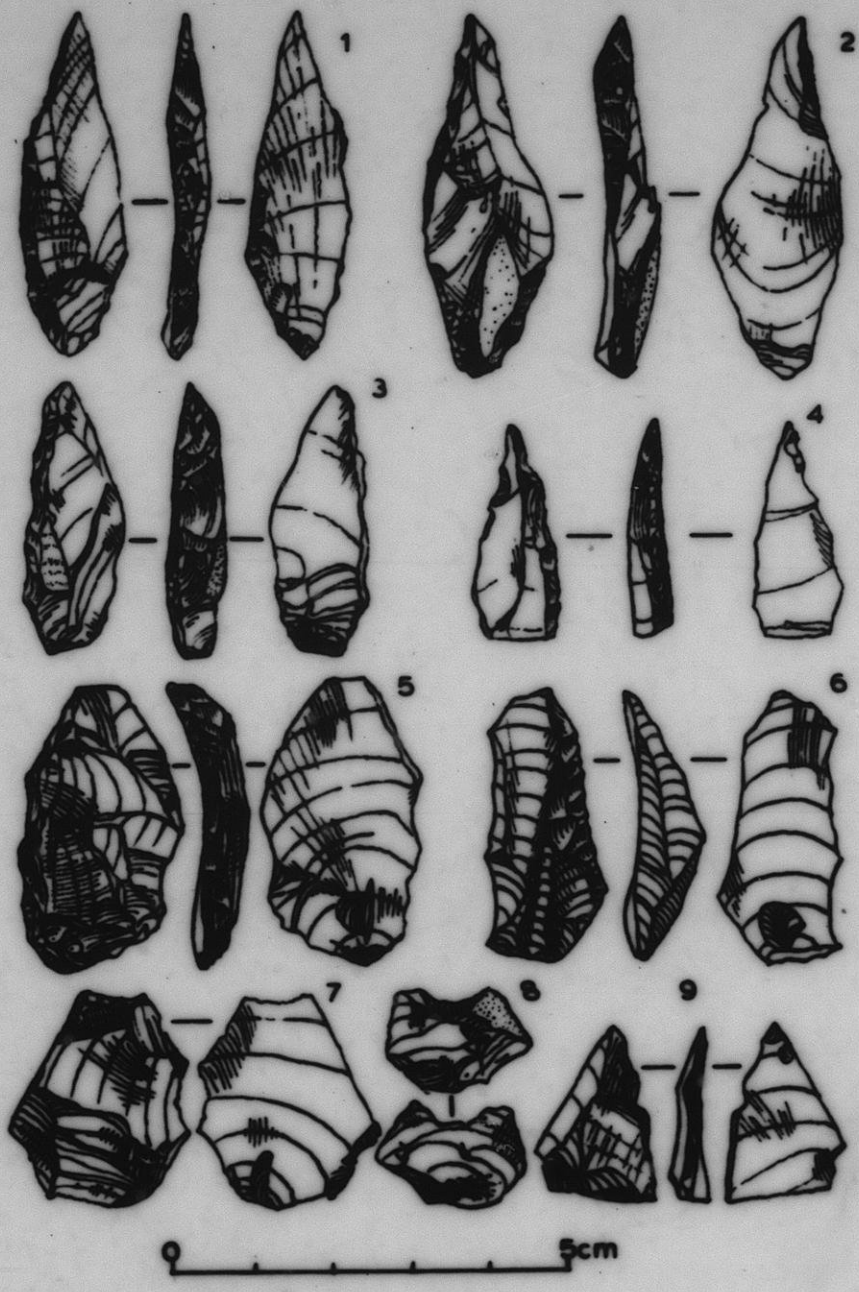

Fig. 3: Stone tools from the Moro site (Obsidian)(Group A, Nos. 2, 4, 5, 7; Group B, Nos. 1, 3, 6, 8, 9)

Tachikawa Loam Bed, around pebble group B. They are collectively named group B. The average stratigraphic location of the pebbles is 65cm. from the top of the Loam Bed, and 1.25m. from the top of the chestnut-colored layer. The pebbles are located at almost the same level. In the case of tool 1, the tip part was found 80cm. below the top of the Loam Bed and the main part of the tool at 60cm., the two parts thus being found 20cm. apart and subsequently reconstructed. Tool 3 was found 55cm. below the top of the Loam Bed, tool 6-75cm., tool 8-60cm., and 9-60cm., respectively. From the top of the chestnut-colored layer, the tip part of tool 1 was located at a depth of 1.40m., its main part at 1.20m., 3 at 1.10m., 6 at 1.35m., 8 at 1.20m., and 9 at 1.20m., respectively. The tip part of tool 1 was located lower than pebble group B and the main part was higher. Tool 3 was located higher than the pebble group, tools 8 and 9 were found right above, and tool 6 under the pebbles. The distribution of pebble group B is confined to a rectangle 1.20m. by 1m. and stone implements are found concentrated around the rectangle. Pebble group B is located about 15cm. lower than group A, its distribution is more circumscribed, but denser, and each sub-group is smaller. The stones are also mainly tuff.

Mixed with the two pebble groups were found small pieces of carbonized wood in large amounts. This indicates that these pebble clusters are probably the remains of hearths.

Selecting relatively large pieces of the carbonized wood, we asked Dr. Shunji Watari to identify them. According to the result of his examination, those woods are: 1. Castanea crenata Sieb et Zucc and 2. Cyclobalanopsis sp.

A considerable number of small fragments of carbonized wood were found among the stone fragments in the Iwajuku I layer at the Iwajuku site in Gumma Prefecture (this layer is assumed to correlate with the black soil zone which is the uppermost part of the Kanto Loam Bed of northern Kanto). One of these specimens proved to be chestnut upon examination by Dr. Watari.[11] Chestnuts have become a familiar plant to us archaeologists in the Kanto Loam Bed, although they belong to different layers. Chestnuts and oaks are not uncommon today on the Musashino Plateau. But it had long been claimed that no fossils occurred in the Kanto Loam Bed. Now fossilized plants have been discovered in the Iwajuku site and later from the Moro site, and they have been identified as broad-leaved trees. At Moro, in particular, they were found in the upper Tachikawa Loam Bed which was not mixed with humus. When we observe only the thick accumulation of brown-yellow volcanic ashes, we are puzzled about the floral environment of the time when the volcanic ashes were accumulating--flora which is indispensable to a hunting and gathering economy. It is gratifying that these environmental conditions have now become known, little by little, through empirical data.

V

As mentioned before, the remains in this site clustered around the pebble groups. Therefore we have decided to classify those surrounding

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11. Sugihara, Sosuke, "Gumma ken Iwajuku Hakken no Sekki Bunka (On the Stone Culture excavated at Iwajuku, Gumma Prefecture)," Meiji Daigaku Bungaku-bu Kenkyu Hokoku, Kokogaku 1, 1956.

pebble group A as group A and those around pebble group B as group B. As described before, both groups were excavated from the hard part of the upper Tachikawa Loam Bed. Pebble group A is located about 15cm. higher than group B. The total number of specimens found at this site is 78, including 9 stone implements, 38 flakes and 31 chips.

Group A (4 stone tools, 7 flakes, and 12 chips)

Stone Tools:

No. 2 (Figs. 2 and 3): a knife blade[12] made of good quality obsidian. Lacks a bulb, because it is made by retouching a flake. The main flake surface is not worked by fine chipping. The tip of the flake is retouched to make the base of the knife blade and the round part of the flake is retouched to make its pointed end. Fine chipping is done on both sides of the base. When we put the knife blade with its base down, we see only the left side edge is finely retouched while the sharp edge of the right hand side is left unworked. These two edges form the pointed end of the tool. Retouch is very fine and is characteristically at a sharp angle. Total length is 4.6cm., which is the longest among all specimens.

No. 4 (Figs. 2 and 3): a knife blade made of good quality obsidian. The major portion of the tool is lacking. The bulb has disappeared because of the considerable retouch. From the conchoidal fracture on the main flake surface, we can infer that the bulbed part of the flake was made into the point. No retouch has been done on the main flake surface. Looking at the knife blade with its base down, we see retouch on the right side edge, while the sharp left side remains natural, in contrast to No. 2.

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12. Burkitt, M., The Old Stone Age, 1955.

The retouch is minute and strongly slanted on the flake surface. The end of the tool is sharply pointed. Its length is 2.7cm.

No. 5 (Figs. 2 and 3): the knife blade found by Mr. Hiroshi Takizawa, which led to the excavation of this site. Though it was located at some distance from pebble group A, it is tentatively classified as group A, because of the similarity of the tool with others of the group. It is made of good quality obsidian. Its pointed end is lacking. Since it is rather wide, one could regard it as a side-scraper, but, it has been finally classified as a knife blade because the natural edge opposite the retouched one can be used as a cutting edge and a part of this seems even broken from use. A flake was utilized, leaving a bulb and bulbar scars on the main flake surface. The striking platform can hardly be recognized. The bulb is on the base of the tool. The main flake surface is not retouched. Looking at the tool with the base down, retouch appears only on the left side edge to make a blade. Retouch is minute and so extremely slanted that retouched faces meet at right angles with the main flake surface. Its length is 3.7cm.

No. 7 (Figs. 2 and 3): a concave scraper made of a thin flake of good quality obsidian. A bulb and small bulbar scars are left. We can recognize a very small striking platform. Concave retouch appears on the side opposite the main flake surface toward the end of the flake. Retouch is minute and sharply slanted. Viewing the specimen with the base down, there seems to be a missing portion on the top part of the left side. Therefore we may assume that the edge on which the concave retouch appears used to be longer. Length is 2.7cm.

Flakes:

The seven flakes are all of good quality obsidian as in the case of the stone implements. Most of them are round in shape and there are no blade flakes. It is possible that the knife-blades found in this site were made of these flakes with retouch on two sides. Since these knife-blades are small, it is unlikely that they were made of blade flakes. The fact that no cores are found in this site may suggest that the core from which knife blades were made was not necessarily a blade core. As in the case of the tools mentioned before, the striking platforms on the flakes are also small. This technique seems to be one of the characteristics of the Moro culture. In the case of the knife blades which comprise the main part of the tools from this site, sharp natural edges are used as cutting edges. From this fact, it might be permissable to infer that some of these seven flakes were used as tools without blunting on the back.

Chips:

The twelve chips are also obsidian. There is nothing one can say about them except that they are the debris from retouching cores and flakes.

Group B (5 stone tools, 31 flakes, and 19 chips)

Stone Tools:

No. 1 (Fig. 4): a knife blade made of good quality obsidian. Its major part and tip were found separately 20cm. apart, the former above pebble group B and the latter below. These two pieces were later found to be parts of a single tool. The bulb is partly left on the major flake surface. A considerable amount of trimming has been done to finish up this piece, both on the edges of the base and on the opposite side from the

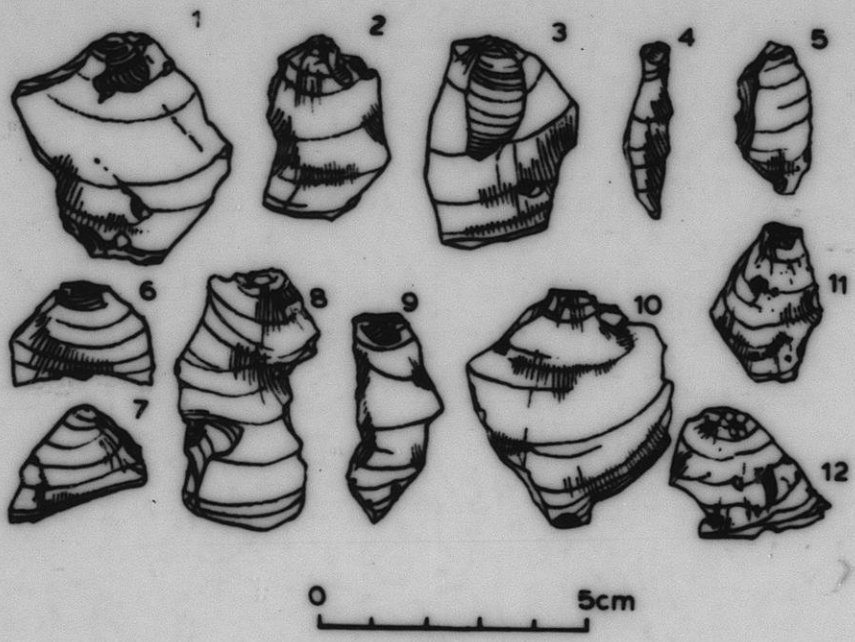

Fig. 4: Flakes from the Moro site (Obsidian) (Group A, No. 1; Group B, Nos. 2-12)

main flake surface. A slight retouch also appears on the main flake surface at the left hand side, as one looks at the piece with the base down. On the opposite side from the main flake surface, setting the piece with base down, the left side edge is totally covered with minute retouch, the surface of which meets the main flake surface at a right angle. On its right side, the sharp natural edge is left. The tip of the tool is pointed. It is a typical knife blade, with a total length of 4.4cm.

No. 3 (Fig. 4): a knife blade made of good quality obsidian, thick and small. The flake has been trimmed to a great extent. Scarcely any trace of the striking platform remains. The bulbar part forms the major portion of the tool, though the bulb has not been left because the part is fairly well retouched. On the reverse side of the major flake surface, only the left hand side (base down) is retouched. Some of the chips removed are large and some are small; the retouch slants sharply to meet the main flake surface at a right angle. Since the piece is thick, the retouched surfaces give the appearance of forming a third side. On the right hand side, the natural sharp edge is left as a blade. The tip is sharply pointed. Total length is 3.5cm.

No. 6 (Fig. 4): a knife blade made of good quality obsidian. The original shape is distorted, because it suffered damage during excavation. The striking platform remains and bulbar scars can be recognized on the main flake surface. On the reverse side of the main flake surface, with the base down, there is sharply slanted retouch on the right side; nothing can be said regarding the left hand side since its edge is lacking. This specimen is wider than ordinary knife blades, but it is classified as one

here, following the precedent of No. 5. The length of the surviving portion of the tool is 3.4cm.

No. 9 (Fig. 4): a knife blade made of good quality obsidian. This specimen must be the tip of a knife blade, since minute retouch is visible on the right side of the end, and there is a sharp natural edge on the left hand side. We may assume that the original unbroken artifact was a fairly large one. This tool is relatively thin. Judging from the conchoidal fracture on the main flake surface, it is assumed that the bulb was located on the major part of the tool. The length of the remaining part is 2.2cm.

No. 8 (Fig. 4): a concave scraper made of a thin flake of obsidian. The striking platform scarcely remains and the bulb is visible on the main flake surface. On the tip portion of the main flake surface and the reverse side, a concavity has been formed by fine retouch. It is a small tool 1.3cm. in total length.

Flakes:

Of the 31 flakes, four are shale and the rest are obsidian. Two pieces out of twenty-seven obsidian flakes have air bubbles, but otherwise they are of good quality. These materials coincide with those of the stone tools. One flake has an elongated shape, but perhaps this was not intentionally done. Other features on the flakes of this group are same as those of group A. Judging from these flakes, it is assumed that the cores of this stone culture are irregularly shaped unprepared ones.

Chips:

The 19 chips are also obsidian. The small number found might suggest a characteristic of the stone-working techniques in this culture.

Besides the above-mentioned artifacts, there is a pebble tool which might possibly have been used as a hammer stone, and this completes the inventory of the remains. The stone tools of group A consist of three knife blades and a concave scraper, and those of group B consist of four knife blades and a concave scraper. There are larger numbers of stone tools, flakes or chips in group B than in group A. Nevertheless, the number of stone implements found in either group is small, and it is too early to claim that we know the complete composition of this lithic culture. However, we have been urged to discuss this matter on the basis of the presently available data. We notice that groups A and B have quite a similar inventory of stone tools. As an exception, however, in two cases among the knife blades of group A, the bulbs of the flakes are located on the tip portion of the tools, which is not common in the ordinary production of stone implements. This fact might be interpreted as a natural consequence of the tool producing techniques in this particular culture, because judging from the fact that every knife blade is made by reshaping flakes to a great extent, it seems to be a characteristic of this lithic industry that stone tools are made in disregard of the shapes of the original flakes. Whatever the explanation may be, the presence of these knife blades characterizes the Moro stone industry.

As mentioned a while ago, group A and group B are located with 15cm. of vertical separation. If two groups are located on vertically different levels in close proximity, as in these cases, it is generally interpreted to indicate that group B is older than group A. We do not know how long it took to accumulate loam 15cm. thick. The similarity of the composition

of stone implements of these two groups might suggest that this loam was accumulated in a short time, or that, if the loam had taken a long time to accumulate, the lithic culture of that time was a long-lasting tradition. Anyhow the similarity between the two groups might indicate that the composition of the excavated stone implements is a good indication of characteristics of the Moro culture.

Therefore we are inclined to recognize tentatively the composition of the tools--consisting mainly of knife blades accompanied by concave scrapers--as being diagnostic of the Moro culture. As mentioned before we do not have a sufficient body of material to describe the total composition of the Moro lithic industry. However, within the limit of available data, it should be emphasized that steep scrapers or keeled scrapers are not found at all. Since we found a knife blade on the cliff at the northeastern side of Moro-yama, we can assume that groups of remains surrounding pebble concentrations like groups A or B are scattered over the hill. If we investigate these groups in the future, the features of the Moro lithic industry will be better clarified.

The knife blade in the Moro industry is sharply pointed with one of the edges of the flake retouched at a sharp angle and the other edge retaining the sharp natural edge. This kind of artifact used to be called "point" or "pointed blade"; now it is termed "lame a dos rabattu"[13] or "backed blade".[14] This tool is retouched in order to blunt it so that the

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13. Breuil, H., Les subdivisions du paleolithique superieur et leur signification, 1937.

14. Leakey, L.S.B., Adam's ancestors, 1953.

blade could be grasped--not to sharpen the blade. The sharp natural edge was used as the cutting edge. As shown in the examples, the base of the tool is also retouched fairly finely, which is probably for the purpose of hafting. The concave scraper is used to shave down round slender sticks. With regard to tool No. 7 of group A, it was once considered to be a possible graver since the left end of the tool is cut away, but it was finally classified as a scraper since the blade is not sharp enough for a graver and since we have a comparable situation with tool No. 8 in group B.

VI

Since the discovery of the Moro site in south Kanto, some dozen sites of lithic cultures of preceramic age have been found on the Musashino Plateau and Joso Plateau. However, in terms of the size of the site and amount of remains, they are meager compared with those in northern Kanto and the Chubu Plateau. Now this poverty has even come to be considered as one of the characteristics of the area. One of the reasons for it must have been that the material for stone implements had to be carried for a long distance. Moreover, we have to consider the natural environment and the possibility of hunting and gathering in southern Kanto at the time in question.

The Moro site provided data, as explained before, which clarify the features of the unknown stone culture to a fair extent. Even now this site is one of the important ones in south Kanto. In this area there is no other site at which knife-blades form the major part of the remains,



Fig. 5: Igusa style potsherds from the decomposed organic soil layer and the chestnut colored soil layer at Moro

although knife blades have been sporadically excavated from other sites as well as the Moro site. The stone tools which have been reported as blades are mostly flakes or blade flakes and few of them are recognizable as true blades. Among the few known knife blades, there are ones of shale and of chert from Locality A of the Nishinodai site in Tokyo[15], one of obsidian from the Nezuyama site in Tokyo[16], and one of chert from the Nakamachi site in Tokyo.[17] These specimens were found in various levels of the upper Tackikawa Loam bed. As to the accompanying stone implements, they are either complicated or unknown. Therefore it seems to be difficult to draw any general conclusion as to common features of the Moro site in comparison with other sites in Kanto.

In regard to the distribution of knife blades in larger geological perspective, there are such examples as Ohata in Fukushima prefecture,[18]

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15. Yoshida, Itaru, "Tokyo-to Kitatama-gun Koganei-machi Nishinodai Iseki Hakkutsu Hokuku (Report on the Excavation at Nishinodai Site, Koganei-machi, Kitatama-gun, Tokyo)," Musashino, 231-232, 1957.

16. Naora, Nobuo, "Nihon Kyusekki Jidai no Kenkyu (Study on the Palaeolithic Period in Japan)," Waseda-daigaku Kokogaku Kenkyushitsu Hokoku 2, 1954.

17. Yoshida, Itaru, "Musashino-daichi no Jomonshiki Bunka izen no Iseki (Sites of Pre-Jomon Culture in Musashino Plateau)," Musashino 33-3, 4, 1954.

18. Serizawa's collection from Ohata, Iwashiro-shi, Fukushima-ken.

Uwamine (上峰) in Saitama prefecture,[19] Yonekura-yama in Yamanashi prefecture,[20] Hie-yama (冷山),[21] Tenagaoka,[22] and Omekura[23] in Nagano prefecture. In these instances, the stratigraphy and accompanying tools should be examined in due time. So far, we can say that these knife blades are morphologically similar to those from the Moro site.

In the region adjacent to the one mentioned above, in the northern part of Nagano and Niigata prefectures, another kind of knife blade is found which has a narrow shape with pointed ends like a willow leaf. These knife blades can be exemplified by those from the Sugikubo site in Nagano prefecture,[24] and from the Kamiyama site in Niigata prefecture.[25] The relationship between these two types of knife blades will possibly develop into the

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19. Kooya (古屋谷)'s collection from Ohata, Iwashiro-shi Fukushima-ken.

20. Yamamoto, Suzuo, "Yamanashi-ken ka ni okeru Mudoki-bunka no Chosa (Researches on Non-ceramic culture in Yamanashi Prefecture)," Sekki-jidai, 1, 1955.

21. Miyasaka's collection from Shibukawa, Tsumetayama, at the foot of Mount Yatsugatake, Nagano-ken.

22. Hayashi's collection from Tenagaoka, Suwa-shi, Nagano-ken.

23. Suzuki, Makoto and others, "Omekura Iseki chosa hokoku (Report on the excavation of the Omekura site)," Shinshu Loam 3, 1957.

24. Serizawa, Chosuke and Masaru Aso, "Hokushin Nojiri Kotei Hakken no Mudoki bunka (On non-ceramic culture discovered from the bottom of the Lake Nojiri in northern Shinshu)," Kokogaku Zassi, 39-2, 1953.

25. Serizawa, Chosuke, Kazuaki Nakamura and Masaru Aso, Kamiyama Iseki (Kamiyama site), 1959.

crucial problem whether cultural areas existed on Honshu in the pre-ceramic period.

Among so called blade implements, there are tools called true blade or plain blade, besides the knife blades which have been discussed. Regarding the relationship between the two, there has been an interesting discussion throughout the history of palaeolithic studies abroad on the question of whether these two blade types are of entirely different nature with different composition of tools and with different producing techniques. In this country, the culture with true blades has been found at the Tarukishi site in Hokkaido[26] and other sites,[27] and its roster of stone implements has also gradually been clarified. From a consideration of these data, the problem as discussed abroad is likely to be raised in this country, too. Preceding this discussion, it is urgent to clarify the characteristics of any site which has genuine knife blades such as the Moro site.

As to the chronological position of the Moro site, we have not found proper sites for comparison to establish the stratigraphical relationships of the Moro site. However, we have made several assumptions which are discussed elsewhere, and readers are recommended to refer to them.[28]

(Sugihara is responsible for the actual writing of this paper.)

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26. Hakodate Museum, Tarukishi (Tarukishi Site), 1956.

27. Yoshizaki, Masakazu, "Hokkaido Kitaminokuni Ainonai-mura Toyoda Iseki Ryakuho (Preliminary Report on the Toyoda site, in Ainonai-mura, Kitaminokuni, Hokkaido)," Sekki jidai 1, 1955.

28. Sugihara, S., "Stage of stone age culture in Japan," Actes du IV Congres International du Quaternaire Rome-Pise, Aout-Septembre 1953, (1956)

(footnote continued)

Sugihara, Sosuke, "Jomon bunka izen no Sekki Bunka (Stone age culture before Jomon culture)," Nihonkokogaku Koza 3, 1956.

Serizawa, Chosuke, "Kanto oyobi Chubu-chiho ni okeru Mudiki-bunka no Shumatsu to Jomon bonka no Hassei toni kansuru Yosatsu (Preliminary perspective on the close of nonceramic culture and onset of Jomon culture in Kanto and Chubu District)," Sundai Shigaku 4, 1954.

Serizawa, Chosuke, "Nihon ni okeru Mudoki Bunka (Non-ceramic culture in Japan)," Jinruigaku Zasshi 64-3, 1956.

PROBLEMS REVOLVING AROUND THE KIRIDASHI KNIFE

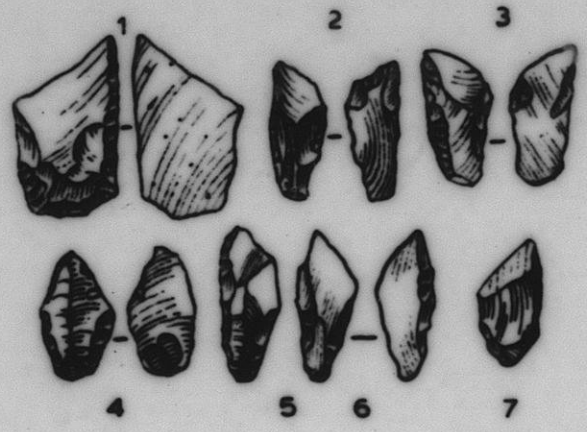
(Kiridashi-gata Sekki o Meguru Mondai)

by Mitsunori TOZAWA

(Kaizuka, No. 68, pp. 1-2. Tokyo, 1957)

There are several problems revolving around kiridashi knives. Recently, Prof. Sosuke Sugihara and Mr. Chosuke Serizawa have published, independently of each other, discussions on the chronological sequences of the tools in terms of two periods, one represented by Iwajuku II and the other represented by Moro (茂呂)-Chausuyama. While Prof. Sugihara proposes the sequence from Iwajuku II to Moro-Chausuyama, Mr. Serizawa insists on the reverse order. Since kiridashi knives in question belong, as is well known, to the group of Iwajuku II, it seems that these tools are critical in causing the disagreement on chronological settings. Besides the question of chronology, problems go further. Now, let us review each site.

It was incidentally in the Iwajuku site that the kiridashi knives were first discovered. They were found from the Asami-layer which lay over the level of Iwajuku I culture, that is the Iwajuku layer. The layer from which the tools were found showed a clear difference from the Iwajuku I layer and was named the Iwajuku II layer. Among the several stone tools contained in this layer, there are two kiridashi knives, knife-shaped point-like stone tools, and irregularly shaped scrapers. It is significant that the group of stone tools of the Iwajuku II layer which are accompanied by the kiridashi knives are definitely newer than the group of the Iwajuku I composed of



Tozawa: 1957, Kauzuka

Fig. 1: No. 1: Omagura; No. 2: Iwajuku II; No. 3: Tonogayato; No. 4: Yonekurayama; No. 5: Tamaribuchi; No. 6: Ijima I; No. 7: Yadegawa.

hand-axes and longitudinal flakes. However, the relationship of these two groups to the one of the Iwajuku III which contains completed points has not yet been conclusive.

Following the Iwajuku site, typical kiridashi knives were found at Tonogayado of Tokyo. Here, it is reported, are found endscrapers and a piece which is considered as a base part of a point retouched only on one surface.

At Maruyama in Chiba prefecture, except for only one typical kiridashi knife, no stone tools were identifiable. In regard to this circumstance, Prof. Sugihara suggests "What criteria should be applied to this stone tool--kiridashi knife? There is room for further discussion as to the treatment of this tool as a type tool. We have to notice that the sites accompanied by the kiridashi knives cannot necessarily be identified to be of the blade-culture or of the point-culture." (Sundai-Shigaku, no. 5, p. 11).

The remains from Yonekura-yama of Yamanashi Prefecture, together with those of Tamaribuchi which will be described later, have added another type to the varieties of kiridashi knives. So-called "kiridashi knives" had been defined by Mr. Serizawa as follows: they were made of oblong* shell-shaped flakes, the position of their bulb was not on the base part or on the end like knifeblades, and they were retouched, except the sharp edge, produced on the first flaking-off, so that the circumferences became trapeziform. (Sundai-Shigaku, no. 4, p. 72). However, the specimens from Yonekurayama and Tamaribuchi are "made of flakes which are long lengthwise and are consequently characterized by having the bulbs at the base part." (Kokogaku

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* originally "yokonaga no", tr.

Noto, Vol. 1, p. 62). At Yonekurayama, the kiridashi knives of this kind are accompanied by stone tools, yet close to points, on which the technique for backed-blades are used, and by the artifacts which can almost be called points.

Mr. Serizawa interpreted this fact "to be placed between knife-blades and points." (op. cit.).

Although the writer has not seen the formal report on the data of Tamaribuchi, Mr. Serizawa has reported "we investigated a group of kiridashi knives contained in the loam layer above the black soil level and also we found two bifaced points from the still higher level" (Jinruigaku-Zasshi, Vol. 64, no. 3, p. 37). If this description is correct, this site is significant as the first material to have clarified the chronological sequence from the kiridashi knives to the points.

The kiridashi knives had been confined only to the Kanto region until they were discovered at Omekura, Nagano prefecture. The remains from the Omekura site consist mainly of points, retouched on both surfaces, the cross-section being D-shaped. Accompanied by other stone implements and flakes, three kiridashi knives were found in the top-soil, and three from the loam layer. Another kiridashi knife was found at 45cm. below the loam layer, without being accompanied by points or other tools. Upon the basis of this condition, the cultural stratum of the kiridashi knives has been assumed to be under that of points. Although this assumption is meaningful as it is, it is very uncertain. It rather seems to be more urgent to examine the position of the kiridashi knives in the total complex of all the stone implements found at the Omekura site. (Shinshu romu, no. 3).

So far we have reviewed the kiridashi knives and their related materials of Eastern Japan. Here we have not yet attained the definite information as to the chronological stratigraphy of the kiridashi knives, especially in relation to knifeblades or points. The method by which Professor Sugihara determined the chronology of the culture of Iwajuku II upon the basis of the depth of layers in which stone implements were contained should be reexamined. Another straightforward question should also be answered in regard to the complete composition of the 'industry' set up as a combination of stone implements accompanied by the kiridashi knife tools.

Furthermore, the relationship between the kiridashi knives and the group of stone implements found at the Ijima I site in the Inland Sea region is problematical. The stone tools from the Ijima I site are "principally made of asymmetrically rectangular and long-sided flakes. The sharpest side formed by the original flaking-off is left without secondary treatment and other sides are retouched fairly well. At Washiuzan, Okayama prefecture, this kind of stone tools should be located above the points, that is, be in a more recent period than the points." Mr. Kamaki says, "if the stone implements of the first group (the Ijima I and the Iwajuku II) are the products of the same culture, there must be an error in the chronological stratification. If we undertake a close examination of the tools of both sites, we may arrive at the conclusion that they are basically different from each other in spite of their similar appearances. It is a problem for future investigation. At present the writer is inclined to treat the two sites separately." (Sekki-jidai, no. 4, p. 10). In addition, although Mr. Serizawa classifies a group of stone tools found at Yadegawa

as being Ijima I of Eastern Japan (the site in question is a little distant from the one at which a lot of small blades are found) (Kokogaku Noto Vol. 1, p. 116), its relationship with the kiridashi knife is still unknown.

In discussing only a few points, the problems around the kiridashi knives are complex. The writer has neither the competence nor the materials to solve these problems. Even after the accumulation of research work on non-pottery culture during the last ten years, it is still our task to clarify the composition of the stone implements and their chronological sequences. The writer feels that there is room to develop further the problems revolving around the kiridashi knives upon the basis of excellent contributions which have been made so far. This is the reason why the writer presents this paper although he realizes it is not well organized.

PRECERAMIC CULTURES OF HOKKAIDO -- STONE TOOLS OF THE PALAEOLITHIC AND MESOLITHIC PERIODS

(Hokkaido no Mudoki Bunka ni Tsuite -- Kyusekki to Chusekki Jidai no Sekki)

by Masakazu YOSHIZAKI

(Kyodo no Kagaku, No. 19, pp. 3-7. Sapporo, 1958)

1. Introduction

Since about three years ago various views concerning non-ceramic cultures of Hokkaido have been rapidly changing. Researches on the Pleistocene by the members of the Hokkaido Quaternary Study Group, with Dr. Masao Minato as the central figure, and investigations of sites belonging to the preceramic culture conducted by Drs. Hiromichi Kono and Toshio Oba, and by ourself in various areas, have brought about several entirely new results. We need not mention the accomplishments of such enthusiastic local historians as Messrs. Hideo Fujimoto, Yonetaro Saito, Tadashi Kondo, Zenichi Tanase, Eizaburo Kawano, Kenzo Tagawa, Eiji Toma and Shichiro Ishibashi, and of such museums as those in Abashiri, Asahigawa, Hakodate and Kushiro which are continuing active research. However, the truth of the matter is that research has just begun and that details are still not well known.

It has become possible to formulate several new ideas concerning industries [“combinations of artifacts”] and chronology on the basis of recent investigations and particularly this year's excavation. [This probably refers to 1957 since this article was published in January of 1958.]



Artifacts of the preceramic cultures discovered in Shirataki Village, Mombetsu County, Hokkaido.

(1) Blade core
(2) Shirataki engraver (property of Yoshito Matsudaira)
(3) graver
(4) (5) Spalls removed from the bottom of a Shirataki engraver (property of Yoshito Matsudaira)
(6) End scraper
(7) A point implement made on a blade
(8) Boat-shaped tool
The material is all obsidian

On the basis of the various results[1] obtained so far and of these new ideas let us look very broadly at the preceramic cultures of Hokkaido.

2. Classification of industries

Using primarily the results of investigations of a group of sites in Shirataki Village, Kitami Province, which we have been continuing from many years back, we can classify preceramic cultures of Hokkaido roughly in the following manner.

Group A

Mainly consisting of crude flake blades (blade-like flakes of the long variety) which are not made by the blade technique (a special technique used in making blades), this group seems to include backed blades (Fig. 1). (These backed blades are broad and have a form similar to the so-called Audi points of Europe.) This group has not been known other than from Loc. 27 of Shirataki Village. (Unless otherwise specified, all the locality numbers to follow refer to site numbers in Shirataki Village.) Since no excavation has been conducted even at Locality 27,[2] details are unknown.

Group B

This group is represented by: a core without prepared platform whose upper surface is made by a single flaking, the core being a remnant from which pieces have been flaked off in order to make tools (Fig. 2); blades flaked off from this core (Fig. 3); and small, crude boat-shaped tools (Fig. 4). So far, this group is known only from Locality 4.[3]

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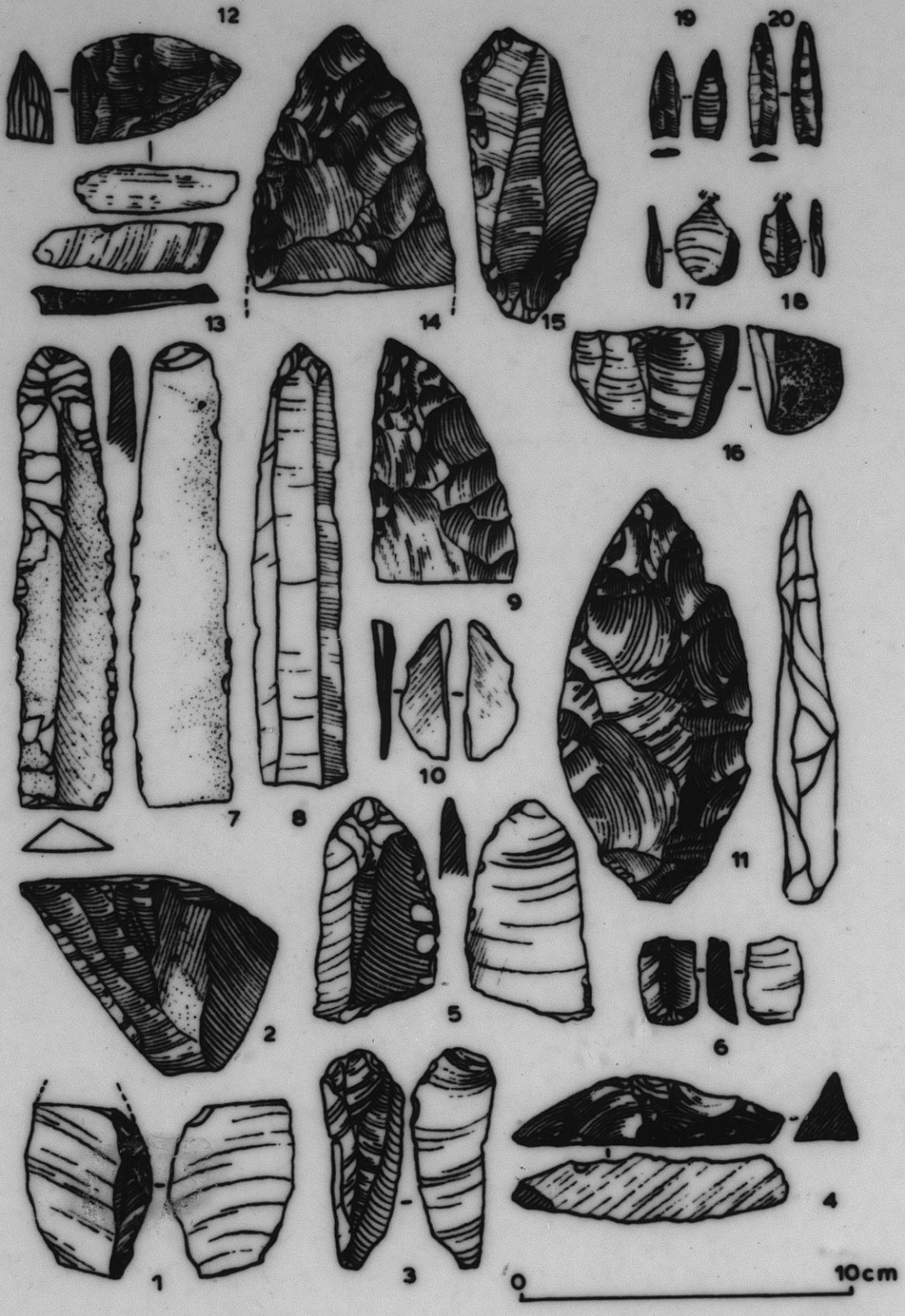
1. Yoshizaki, Masakazu: "Hokkaido no blade industry ni tsuite," Hokkaido Dai-yonki Kenkyu Renrakushi, no. 7, 1957. Oba, Toshio and others: "Engarucho Shimoshanabuchi iseki no hakkutsu ni tsuite," Hoppo Bunka Kenkyu Hokoku, no. 12, 1957 and other sources.

2. 3. Not yet reported. The author is investigating.

Implements of Hokkaido preceramic cultures.

1. Locality 27, Group A
2, 3, 4. Locality 4, Group B
5, 6, 7. Locality 13, Group C
8. Tarukishi site in Shiribeshi, Group C. Property of Hakodate Municipal Museum
9, 10, 11, Locality 33, Group D
12, 13, 14, 15. Locality 30, Group E
16. Excavated at Katei Gakko, Engaru Town, Kitami Prov., Group F. Property of Dr. Toshio Oba
17, 18, 19, 20. Excavated on the share of Notoro Lake in Kitami, Group H
17, 18 are gravers and 19 and 20, blade-arrowheads


12
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9
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11
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10cm

Group C

This group is characterized by: a blade core (a remnant from which blades have been flaked off, showing long, vertical flutings) with a platform prepared by several blows (Plate 1, no. 1); true blades flaked off from this core (Figs. 7 and 8); boat-shaped tool (Plate 1, no. 8); several varieties of end scrapers (tools used in scraping) (Plate 1, no. 6 and Fig. 6); and Shirataki type pointed blades which have a sharp cutting edge at one end (Figs. 5, 7, 8). This industry is defined by the artifacts from Locality 13.[4] The famous Tarukishi site[5] in Shiribeshi also has similar tool types and therefore is considered to be roughly contemporaneous with Locality 13.

Group D

This group is represented by: true blades; blade cores; bifacial points (a kind of spearhead) (Fig. 11); similarly bifacial, semilunate points (Fig. 9); hand-axe-like tool (large bifacial tool); boat-shaped tool; and graver (a kind of chisel) (Fig. 10). Locality 33[6] is the type site. In Shirataki Village, five localities have been discovered which produce similar tools. Other than these, the site investigated by Dr. Toshio Oba in Oketo Town, Kitami Province, is also said to belong to this group.

Group E

This group is defined by: bifacial points (Fig. 14); a variety of boat-shaped tool called Shirataki engraver (Fig. 12) and others. On the bottom surface of these engravers very often there are scratches, providing

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4. Not yet reported. The author is investigating with others.

5. Tarukishi Hakkutsu Hokokusho, Hakodate, Hakodate Municipal Museum, 1956.

6. The author is investigating.

clues to infer the use. Ordinarily this bottom surface is made with a single blow. But when the surface was not made as desired or became old, it was thinly flaked off to make a new one. The spalls (waste material) removed at this time are pieces which clearly reveal the shape of the bottom of the engraver and therefore can be used as one of the criteria to identify this group. Moreover, the microspalls which have been removed in order to make the beautiful flutings at the tip of this tool (see, for example, the left drawing of Fig. 12) have a shape just like the small blade (a kind of microlith). But since traces of use or retouch cannot be recognized at all on the edges of these spalls, we cannot consider this type of engraver as a microcore (core from which microliths are produced).[7] Aside from the remarks above, it is to be noted that true blades are absent or, if present, rare.[9] Thus implements are all made on flakes or flake blades, except that gravers (Fig. 15) alone are made on pieces very much like blades. Other than at Locality 30,[8] this group has been found near Oketo Town in Kitami by Mr. Toshio Oba. A site of the same kind has also been found in Kaributo Town in Shiribeshi.[10]

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7. I make this comment because there is a view which claims that this type of engraver is a microcore.

8. Now under investigation by the author.

9. Since there are sites around this one which belong to different periods and produce blades, the excavation of one or two blades is suspected of being an intrusion.

10. Kaributo Iseki. Abuta County, Kaributo Town, Board of Education, 1957.

Group F

Near the town of Engaru in Kitami Mr. Eiji Toma and others have been discovering from quite a while back several sites which produce stone tools and waste flakes alone. When Mr. Toshio Oba investigated the site on the campus of Katei Gakko of the same town,[11] it was found that a small core (Fig. 16) which partially leaves the natural surface of a pebble, points and blades can be collected from quite a wide area. Since artifacts of this sort are not found ordinarily from Jomon sites, and since no pottery was found from these sites, it seems justifiable to include them in pre-ceramic culture. However, we hardly known anything about the geologic deposit containing these implements or what types of tools are associated to constitute an industry. A site which seems to produce artifacts similar to these was once investigated near Shihoro Town in Tokachi by members of the Local History Club of Kashiwaba High School of Obihiro and Mr. Zenichi Tanase. A considerable quantity of tools have been unearthed here and I plan to investigate this area next year [probably meaning 1958--tr.] with students of this high school, so that we will know the details soon.

Group G

This group comprises a microlithic culture. But we are still not sure if this group exists in Hokkaido. Only the microcore which is said to have been unearthed at Katsurazawa, Kombu, in Shiribeshi, seems to belong to it.[12] Also, what seem to be microblades, which were collected in Tokachi, are reported by Mr. Hitoshi Watanabe. In most cases what have been reported as

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11. See note 1.

12. An example is Y46, Fig. 34 on p. 56 in the report cited in note 10.

small blades or microcores belong to Group E. However, other than the small blade industry, groups of small tools unassociated with the blade technique have begun to be noted at Iwanai[18] and Shimakotan in Shiribeshi.[13] Although there is no report on sites of this sort. since Dr. Toshio Oba is said to have excavated at Iwanai, it may be expected that details will soon be made clear.

Group H (Blade arrowhead industry)

In eastern areas of Hokkaido there is a group of implements with a fine blade technique which existed about the time when pottery began to be used. The notable characteristic of tools of this industry is the technique of refined secondary retouch on the main flake surface of the blade (under flaking), a technique which is used in making the tools representative of this industry, known as blade arrowheads (Figs. 19 and 20). There is an old report on the Shin-yoshino site in Tokachi by Mr. Yonetaro Saito.[14] After the war Dr. Takemitsu Natori and Mr. Yonetaro Saito reinvestigated this site on a large scale. Also, this year, /probably 1957/ with Mr. Toshio Oba as the leader people of Memambetsu Town excavated a site belonging to this industry located in this town.

3. Other industries

I have briefly presented the industries from A to H which have been found in Hokkaido up until now. Other than these, implements which are

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18. Oral communication from Dr. Toshio Oba.

13. An instance is known from Shimakotan, Isoya County. Uninvestigated.

14. Saito, Yonetaro: "Kushimemon doki nizuihan suru saisekki iseki," Kokogaku Zasshi, vol. 33, no. 7, 1943.

suspected possibly to belong to the preceramic culture have been found from various places. Since data concerning them are few and since I have not seen most of them, I did not touch on them. For example, the group of implements which Mr. Hideo Fujimoto has collected near Hyakuninhama in Hidaka[15] and the group of relatively small tools which Mr. Tadashi Kondo has discovered in Ikutahara Town in Kitami probably belong to the preceramic culture. I shall discuss these groups after detailed reports have been provided by the people who are conducting research on them.

4. Chronology of industries.

In what sequence can we arrange the industries which we classified in section (2)? Since research has been insufficient, we cannot be definite. But roughly speaking we could say the following.

Setting aside groups A and B, which seem to be the oldest, in Shirataki Village sites of groups D and E are located on a terrace which is lower than the terrace containing group C.[16] C, therefore, seems to be older than D and E. As for the relationship between D and E, D seems to be older for the following reasons. (1) The same type of boat-shaped tools associated with group C is found in D. (2) Blades are found in groups C and D but not in E. (3) Both groups D and E have bifacial points; but not group C. (4) Engravers which characterize group E are not found in groups C and D. A

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15. Fujimoto, Hideo: "Kotoshi no Hidaka kokogaku," Senshi Jidai, no. 1, 1955.

16. At the locality containing Group C there was water deposition amounting to 2 meters in thickness. It was ascertained that the site of groups D and E is in the weathered formation on a terrace which was created by removing this deposition.

diagramatic representation will make these relationships still clearer.

	C	D	E
Engraver			o
Point		o	o
Boat-shaped tool	o	o	
Blade technique	o	o	

Of course we cannot believe that groups C to E continuously succeeded one another; but it is impossible to insert between them groups F, G or H either on the basis of the manufacturing techniques of their stone tools or stratigraphy. It is probably certain that groups F, G and H are more recent than E, but except for H, there have not been sufficient data to argue this. Group H can be dated to about the time of the first use of pottery and therefore must belong to the terminal period of the preceramic culture.[17] Finally, I have stated at the beginning that groups A and B are probably the oldest; I would like to add that this is based entirely on typological inferences.

In the preceding I have briefly described preceramic cultures. Unfortunately I have gone far beyond the allotted number of pages. I therefore did not touch on several remaining problems, such as the relationship with geological findings and comparison with preceramic cultures of Honshu. For example, particularly problematic archaeologically are the bifacial points associated with blades. The point industry of Honshu is not associated with blades and therefore cannot be equated with that of Hokkaido. Whether this phenomenon is to be resolved as a regional difference or as

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17. According to Drs. Toshio Oba and Hiromichi Kono at the November, 1957 meeting of the Quaternary Research Discussion Group.

a temporal difference does not go beyond mere guess at the present stage. Problems concerning projectile points will probably be one of the important keys in establishing the chronology of preceramic cultures of Japan.

Summary

* In Hokkaido, too, as in Honshu, there were non-pottery cultures before the Stone Age which is associated with pottery.

* So far, only stone implements and stone flakes have been found from sites belonging to these preceramic cultures. These stone tools can be roughly divided into the eight groups of A to H. The difference between these groups represents temporal difference.

* Groups A to E probably belong to the Upper Pleistocene and G and H to early Holocene. The status of the Group F is completely unknown.

* Although somewhat problematic, from the above discussion, groups A to E may be thought to belong to the late Palaeolithic period and G and H to a Palaeolithic-like period in the Mesolithic Holocene. Therefore, the preceramic culture does not directly correspond to Palaeolithic culture.

* Comparisons with Honshu are as yet too difficult.

DEVELOPMENTS IN MICROLITHIC PROBLEMS, II -- HOKKAIDO

(Saisekki Mondai no Shinten)

by Masakazu YOSHIZAKI

(Kaizuka, No. 83, p. 1. Tokyo, 1958)

Since Mr. Chosuke Serizawa undertook an investigation of the Tachikarushunai site in the summer of 1958, the problems concerning microliths in Hokkaido have entered on a new phase. As Mr. Serizawa pointed out before, the presence of the Araya type burins in Hokkaido made us assume that the "Araya industry" was distributed as far as Hokkaido. However, the investigations on several sites, in which the Araya style burins are found, have revealed the complexity of the industry of the implements.

At the Tachikarushunai site in Engaru town of Mombetsu county, the Araya type burins are accompanied by the Shirataki engravers, keel-shaped spalls[1] and a small quantity of points. But retouched micro-blades have not been found among the materials from surface collections in spite of our firm expectation. Of course there are blade-like flakes among the excavated materials which could be used as micro-blades or small blades. However, they are not retouched except for one or two examples. Therefore, as the result of investigation at the Tachikarushunai site it has become clear that the Araya type burins can exist among a different combination of implements from the industry of the Araya site. Another fact to be mentioned here is

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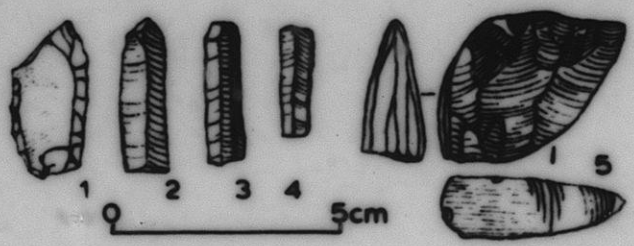
1. This spall itself was used as implement. There often are scratches running across the longitudinal axis.


1
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3
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that the Shirataki engraver is important at Tachikarushunai. This stone artifact (Fig. 5) was first excavated at Loc. 30 in Shirataki village of Mombetsu county.[2] There it was accompanied by points, gravers and end-scrapers which offered a group of materials of uniformly high quality. At Loc. 30 micro-blades or small blades were not found at all and the gravers were typologically different from those of the Araya type. This fact offers sufficient information to assume that some Shirataki engravers are accompanied by Araya type burins and that some are not.

Following the investigation at the Tachikarushunai site, another significant discovery was made at the Sakkotsu site in Kami-okoppe of Nishiokoppe village, Mombetsu county. At this site, more than 160 specimens of micro-blades (Fig. 2-4) were found from a small potato cellar. On at least 30 of them, secondary treatment and scratches because of using were recognized. Besides microliths, there are found scrapers which seem to have been made of part of a large biface and sharply pointed scrapers made by retouching thin flakes. A single Araya type burin was also collected (Fig. 1). This implement was found on the surface at a corner of the section where stone fragments were scattered. Because of the circumstances of the discovery, this specimen cannot be considered as associated with microliths, although the site was an unmixed one. A further problem is presented by the fact that the burin is made of agate, while all of the microliths are

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2. Yoshizaki, Masakazu, "Hokkaido no Mudoki-bunka (Non-pottery culture in Hokkaido)," in Kyodo no Kagaku, No. 19, 1958.

of obsidian. Anyhow, the Sakkotsu site, unlike the Tachikarushunai site, certainly shows an industry composed mainly of micro-blades.[3]

Finally, the Tachikawa site at Kombu in Rankoshi town, Isoya county, is problematic. This site was excavated by the Hakodate Museum in the middle of November, 1958. The excavation was conducted at two of the three spots at which the real Araya-type burins were found. The remains were discovered in groups from the loam layer at a depth of about 35cm. The loam layer covers the 15m. river terrace and another loam layer is found between the gravels of the 5m. terrace. According to Mr. Yoshiyuki Hasegawa of Hokkaido University, these loam layers were formed in the early Holocene. This excavation has brought unexpected results. On both spots, in spite of the presence of the Araya style burins, micro-blades or Shirataki engravers were not found. Instead, a fairly large amount of stemmed obsidian points to which no attention had been paid because of their "recency," were found. Subsequent investigations of points and arrowheads which accompany pottery in southern Hokkaido have resulted in confirming that such points (hereafter we call them the Tachikawa style points) belong to non-pottery culture. Thus a new group accompanied by the Araya style burins--that is, the Tachikawa industry--has become to be recognized.[4] Up to now, the Tachikawa industry has been found at one of the locations of the Shirataki

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3. It is named "Sakkotsu industry." Yoshizaki, Masakazu, "Sakkotsu Iseki-Hokkaido ni okeru Saisekki-bunka no Hakken--(The Sakkotsu site--A Discovery of Microlithic Culture in Hokkaido)," in Sapporo Gakugei Daigaku Kokogaku Kenkyushitsu Renrakushi, Jan. 1st, 1959.

4. The Hakodate Museum kindly offered the material for this paper.

group of sites, at Setoushi of Nishiokoppe village of Mombetsu county, and in the vicinity of Okedo town of Tokoro county as reported by Mr. Korehiko Kimi of Sapporo Gakugei University.

Summarizing the above, in Hokkaido the Araya style burins are accompanied (1) by Shirataki engravers and points--Tachikarushunai industry, (2) by stemmed points--Tachikawa industry and, although not certain, (3) by micro-blades or small blades--Sakkotsu industry. Strictly speaking, among them Tachikarushunai and Tachikawa industries cannot be considered as microlithic culture. Therefore at the moment only Sakkotsu industry can be treated as microlithic culture or as a micro-blade industry in the usual sense of the term. However, even if the presence of the Araya type burins is confirmed at the Sakkotsu site, this will hardly be identified with Araya industry. Generally the microblades at the Sakkotsu site are larger than those at the Araya site, some of the former being so large they could be called small blades. The secondary treatment on the edge of micro-blades occurs less frequently on the former than the latter group. Moreover the burin spalls, a large amount of which are excavated at the Araya site, are not found at the Sakkotsu site. This suggests that the relative quantity of the Araya style burins, even if they are found together with the Sakkotsu industry, will be far fewer at the Sakkotsu site than at the Araya site.

The investigations on microliths and the Araya style burins in Hokkaido during the year 1958 developed the field of research on non-pottery culture of the early Holocene. We have come to recognize that the period characterized by the Shirataki engravers is followed by the period accompanied by the Araya style burins and that these two periods can be further classified.

After the proposed detailed investigation on the sites of Sakkotsu and Tachikarushunai of the coming year, new materials will be added in regard to the chronological relationship among the above mentioned industries.[5]

Editor's note.

This paper succeeds the one by Mr. Serizawa in No. 82. Present discussion will be followed by Mr. Serizawa or other writers.

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5. Although not certain, the writer assumes, on the basis of the materials so far collected, the sequence: Loc. 30 of Shirataki--Tachikarushunai--Sakkotsu--Tachikawa.

THE LOCALITY 30 ASSEMBLAGE AT SHIRATAKI VILLAGE, HOKKAIDO

(Hokkaido Shirataki-mura Loc. 30 no Sekki Gun)

by Masakazu YOSHIZAKI

(Kokogaku Techo, No. 6, pp. 2-3. Tokyo, 1959)

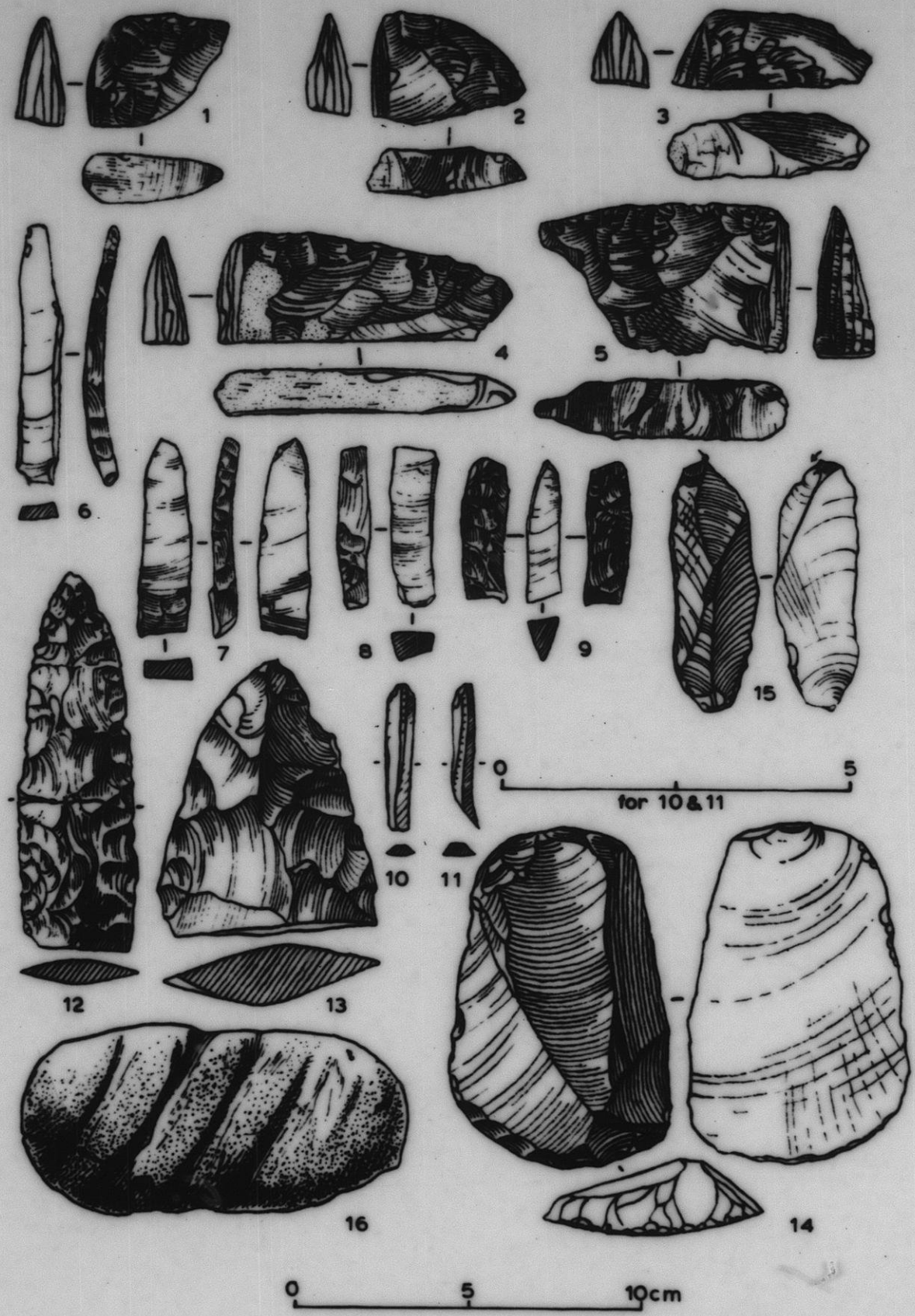
1. Shirataki Village is already well known for the presence of rich preceramic sites. For the past several years the writer has been investigating the sites located in the village and to date has recorded 35 sites belonging to the preceramic culture. I have assigned locality numbers to them and have been excavating one to two localities every year. What is presented below is one of these. It is the material obtained during the investigation of 1957. A formal report is to appear in 1959. As I was requested by the editors of Kokogaku Techo to present a quick report on the assemblage of this locality, I have decided to prepare a brief description on the basis of the illustrations which had already been made up. It is for this reason that the numerical dimensions of specimens and the frequencies of tool types appearing in the assemblage are not indicated in the text.

In the investigation of the present locality I received various assistance from the Shirataki Village Board of Education. Also, Messrs. Yoshio Horie, Koshiro Uehara, Tatsuo Wakaoi, Kiyoshi Hasegawa and Jiro Ishii participated in the excavation. Other than these, as always Dr. Hiromichi Kono and Mr. Chosuke Serizawa have provided their guidance. I would like to express my gratitude.

2. Shirataki Locality 30 is situated on a river terrace, 40 meters above the present river bed, which has developed at the junction of the Yubetsu River and the Shiyubetsu River in Shirataki Village, Mombetsu County, Hokkaido. This terrace has been named Kogami Terrace, after Mr. Nobuharu Kogami who cultivates the land where this locality is situated. Artifacts are contained in a weathered stratum in the upper portion of a sand layer, which is very much like a loam layer, overlying a gravel layer. Aside from these, they are secondarily mixed in the plow zone and also distributed on the surface in an area 10 meters by 40 meters. We were able to observe on the trench wall that the thickness of the artifact layer and that of the weathered layer coincide extremely well. This means that the date of this site is after the deposition of the sand layer. On the average the plow zone was 15cm. and the weathered layer 10-60cm. Also, the sand layer down to the gravel layer was about 2 meters and the gravel layer 1.5-2 meters.

3. Artifacts. Artifacts discovered were all flakes and implements. There were no fossils or hearths. The material was almost all obsidian, with shale, quartz and andesite being very occasionally noticed.

The principal finds among the excavated implements are the Shirataki engravers /burins/ (Nos. 1-5). Flutings are commonly applied to one or both ends though there are a few without them. Also, on almost the entire bottom surface of this tool there are scratches running longitudinally starting from the end where the flutings are. There are rare pieces without scratches; these are probably unused or had the bottom surface remade. These scratches, therefore, must be noted as an important characteristic



Shirataki Locality 30, Shirataki Village, Mombetsu County, Hokkaido

to show the nature of the Shirataki boat-shaped tool. Other than this, the Shirataki boat-shaped tool has in its process of manufacturing the following peculiarity not observed in other tool types.

Preparing a point about 2cm. thick, thin, long pieces are flaked off from its edge parallel to the length of the point. The bottom surface is completed by repeating this process several times, after which fluting is applied. As a result, in making the bottom of the implement there will be produced one spall, triangular in cross section and having the edge of the point as its ridge, of ski shape at first glance, having a shape roughly like the bottom surface. (Nos. 6-9). These spalls are very often themselves used as tools, having scratches at right angles to the long axis or showing extreme wear along the edges (tips of Nos. 7-9). These spalls have morphological similarities to the burin spall artifacts to which Dr. Gidding has called attention; but the relationship between them is not clear. Whether these pieces with a special form and made by a special technique were simply utilized as tools or whether they were intentionally made, I would like to decide only after a careful analysis.

End scrapers are large and broad, compared with others (No. 14). Almost all of the excavated specimens have the form illustrated. But a few irregular pieces one end of which seems to have been used as an end scraper have also been unearthed.

Points are of two varieties: thick and broad ones which are found only with one half missing (No. 13) and thin, narrow and long ones (No. 12). The former were probably fashioned as the material for the Shirataki boat-shaped tool.

Gravers are made in most cases by flaking once the tip of a flake blade from upper left to lower right (No. 15). The Araya type gravers are not found. Other than these, as a special type, six grinding stones made of hard sandstone have been discovered (No. 16). Among these, four are clearly grinding stones; but whether the other two may be classified as grinding stones is somewhat doubtful. They might be a kind of sculpture.

I have given above a rough description of the excavated artifacts. It is a noteworthy fact that no true blade was ever discovered either among the implements or among the flakes.

4. Summary. Above discussion may be summarized as follows.

(1) The Locality 30 assemblage is situated on a terrace which is about 40 meters above the Yubetsu River bed in Shirataki Village. The artifact stratum is found in the weathered layer in a sand stratum overlying a gravel layer in the terrace.

(2) Artifacts chiefly consist of Shirataki boat-shaped tools, accompanied by gravers, points, end scrapers and grinding stones.

(3) Microliths are not associated; nor is the blade technique recognized.

5. A few problems. An assemblage similar to Shirataki Locality 30 is examplified at Locality 29 discovered in the Kami-Shirataki area of the same village. Here the site was found in a weathered layer on a terrace which is about 10 meters above the present river bed of the Yubetsu. About 200 meters downstream from this locality there is a site designated as Locality 13. This site has its artifact stratum in a terrace deposition on a terrace which is about 23-25 meters above the present river bed, one

terrace higher than that on which Locality 29 is found. Artifacts unearthed at Locality 13 constitute an assemblage which may be characterized by blades, boat-shaped tools, hand-axe-like tools, and gravers. The terrace on which Locality 29 is situated was clearly formed after the removal of the terrace on which Locality 13 is found. Thus it is clear from the terrace relationship that Locality 13 assemblage can be dated to be older than those of Locality 29 or 30. Also, at Sakkotsu, Nishiokoppe Village of the same Mombetsu County, a terrace which can be correlated with the above-mentioned 10 meter terrace on which Locality 29 is located, is covered by a loam deposition in which a group of implements mainly consisting of small blades unassociated with Shirataki boat-shaped tools was found. On the basis of these facts there is no doubt that the Locality 30 assemblage is more recent than an industry chiefly consisting of blades and boat-shaped tools but antedates the small blade industry. Also, though detailed analysis will be reserved for the formal report, there will be no problem in dating the geological age of this assemblage to the end of the Pleistocene or the beginning of the post-Pleistocene.

Examining the distribution of the Shirataki boat-shaped tool outside Japan, there are good examples at the Verkholenskaia Gora site and the Zabochka site in Siberia. Examples are known from Ang-ang-hsi and Dchalainor in the northeastern section of China /Manchuria/ and it appears to be widely distributed on the Mongolian Plateau. Recent investigations in the northeastern areas of Hokkaido suggest that there are two or three types of the Shirataki boat-shaped tool and that the examples from Locality 30 belong to the thicker variety among them which is thought to be older.

A thinner variety was found by Mr. Chosuke Serizawa at Locality B of the Tachikarushunai site, Engaru Town, Yubetsu County. Here thin Shirataki boat-shaped tools have been associated with Araya burins. Just from the forms of Shirataki boat-shaped tools, the examples found at Locality 30 resemble those of the Verkholenskaia Gora site and the Zabochka site and the thinner instances reported from Tachikarushunai are similar to those of Ang-ang-hsi and the Dchalainor site. Since precise comparison of associated tools of all the sites has not been done, exact correlation is still difficult. But very roughly speaking, the date of the Shirataki boat-shaped tool is probably not very different from that of the continental finds.

(Though I did not mention this in the text, Nos. 10-11 are microspalls resulting from the flutings of the boat-shaped tool. They are not micro-blades.)

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