

MATERIALS AND STUDIES ON
THE ARCHAEOLOGY OF
THE NORTHERN FAR EAST AND
ADJACENT TERRITORIES

Ruslan S. Vasil'evskii and Alexander I. Lebedintsev

Translated by
Richard L. Bland



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation.

The Shared Beringian Heritage Program at the National Park Service is an international program that recognizes and celebrates the natural resources and cultural heritage shared by the United States and Russia on both sides of the Bering Strait. The program seeks local, national, and international participation in the preservation and understanding of natural resources and protected lands and works to sustain and protect the cultural traditions and subsistence lifestyle of the Native peoples of the Beringia region.

Materials and Studies on the Archaeology of the Northern Far East and Adjacent Territories

Editors Ruslan S. Vasil'evskii and Alexander I. Lebedintsev

English translation by Richard L. Bland

2016

ISBN-13: 978-0-9907252-8-2

This book publication and translations was funded by the National Park Service, Shared Beringian Heritage Program. Published by the United States Department of the Interior through the Government Printing Office.



National Park Service

Shared Beringian Heritage Program



Департамент внутренних ресурсов США является ведущей природоохранной организацией, которой вверена охрана большей части национальных земель общего пользования и сохранение природных и культурных ресурсов. Частью работы Департамента является обеспечение наиболее разумного использования наших земельных и водных ресурсов, охрана рыболовных ресурсов, диких животных и растений, охрана окружающей среды и культурных ценностей и исторических достопримечательностей в наших национальных парках и предоставление возможности активного и приятного отдыха на природе.

Программа Службы национальных парков Департамента внутренних ресурсов США «Общее наследие Берингии» является международной программой, которая способствует признанию и чествованию являющихся общими для США и России природных ресурсов и культурного наследия российской и американской территории по обеим сторонам Берингова пролива. Программа стремится обеспечить сохранение и изучение природных ресурсов и охраняемых территорий на местном, региональном и международном уровне, а также поддержку и развитие культурных традиций и традиционного образа жизни коренных народов района Берингии.

Материалы и исследования по археологии Севера Дальнего Востока и сопредельных территорий

Редакторы Руслан С. Васильевский и Александр И. Лебединцев

2016

Эта книга переведена и издана на средства Программы Службы национальных парков «Общее наследие Берингии» и выпущена в печать Государственным типографским офисом Департамента внутренних ресурсов США



Служба национальных парков

Программа «Общее наследие Берингии»

TABLE OF CONTENTS

DEDICATION.	<i>vii</i>
TRANSLATOR'S INTRODUCTION.	<i>ix</i>
LEBEDINTSEV, A. I. N. N. Dikov—Investigator of the Ancient Cultures of the Northeast.	<i>1</i>
KIR'YAK, M. A. Mesolithic Sites at Lake Ekityki (Central Chukotka).	<i>5</i>
SLOBODIN, S. B. Archaeological Complexes of the Okhotsk-Kolyma Plateau.	<i>13</i>
LEBEDINTSEV, A. I. Survey Work on the Okhotsk Coast.	<i>59</i>
OREKHOV, A. A. A Site of the Old Koryak Culture on Cape Ploskii (Koni Peninsula).	<i>81</i>
PONOMARENKO, A. K. The Neolithic Site of Anadyrka in Northwestern Kamchatka.	<i>93</i>
PONOMARENKO, A. K. Ethnic Association of the Anadyrka Site and Some Features of Ethnic Processes in Northern Kamchatka in Antiquity.	<i>129</i>
PTASHINSKII, A. V. Abandoned Shrines: A New Type of Cult Sites on the Northwest Coast of Kamchatka.	<i>137</i>
PITUL'KO, V. V. The Natural Environment and Ancient Man: The Problem of Settlement of the Arctic Region in Antiquity.	<i>151</i>

SHUBINA, O. A.	
Forms of Cultural and Economic Adaptation of the Natives of Sakhalin in the Neolithic and Middle Ages.	159
GARKOVIK, A. V., AND ZHUSHCHIKOVSKAYA, I. S.	
The Earliest Ceramic Complex of Primor'e (Based on Materials of the Ustinovka-3 Site).	169
KIR'YAK, M. A.	
Anthropomorphic Visages from Western Chukotka.	177
LITERATURE.	181
ABBREVIATIONS.	201

*This book is dedicated
to the memory
of Nikolai Nikolaevich Dikov*

The life of N. N. Dikov, a great and versatile scholar who left a deep mark on science, has ended. Forty years, filled with field surveys in Chukotka and Kamchatka, were given in the Northeast. For more than 30 years, he headed the Laboratory of Archaeology, History, and Ethnography of the Northeast Interdisciplinary Science Research Institute. His students work in Moscow and on the Kuban, in Rostov and on Sakhalin, in Magadan and in Kamchatka. In memory remains the joy of communicating with this extraordinary and fascinating man who possessed encyclopedic knowledge in the realm not only of the historical sciences but also of philosophy, astronomy, and physics. Inherent in him were the best qualities of the Russian intelligentsia: true spirituality, service to the good of the Fatherland, and the ability to keep pace with the times. He was distinguished by an inexhaustible capacity for work, impulsive energy, and the greatest optimism.

Nikolai Nikolaevich Dikov continues to live in his books and our memories, but the pain of his loss does not abate.

His Colleagues

TRANSLATOR'S INTRODUCTION

This book was originally published as *Materialy i issledovaniya po arkheologii Severa Dal'nego Vostoka i sopredel'nykh territorii* (Magadan: SVKNII DVO RAN, 1997).

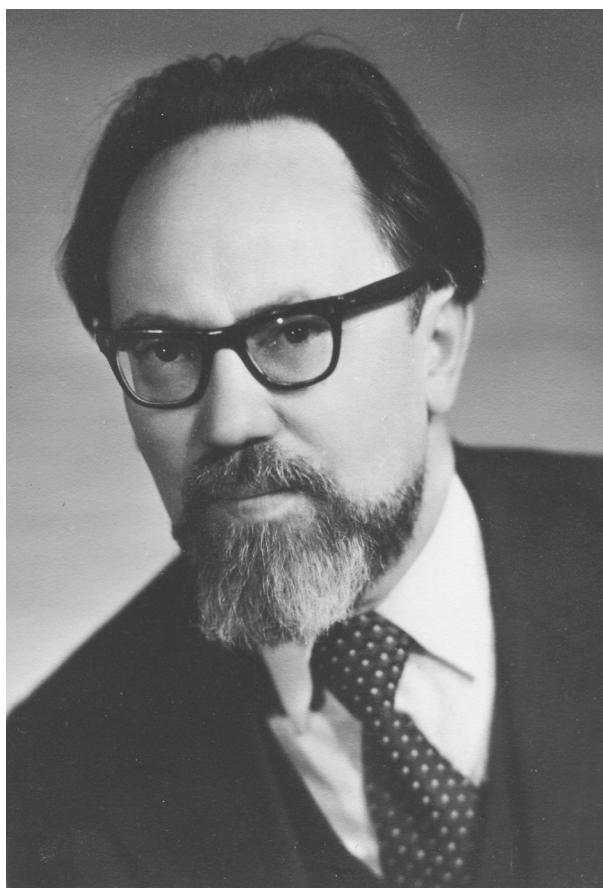
Every translation, and particularly from Russian to English, has the problem of finding a suitable form of transliteration. None of the three systems available (U.S. Board of Geographic Names [BGN], Library of Congress [LOC], or "Linguistic" system [Ling]) was felt to be entirely adequate. I have therefore created my own system. In this system, I use some of the BGN system with a slightly modified version of the LOC. For example, the "ye" of BGN is written as "e," following LOC. The Russian "ë" is also written as "e" (not "yo"), following Ling. (In the ë/e problem, an exception is made for the name of the author of this book.) The Russian "э" is written as "e," following BGN. Both the Russian "и" and "й" are transliterated as "i," unlike in any of the three systems. The Russian "ю" and "я" are written as "yu" and "ya," following the BGN. The Russian soft sign, which is often dropped in transliterations or replaced with an "i," is retained here as an apostrophe, following BGN. I have also settled on one ending for words, as the English language forces us to do, rather than providing the appropriate ending (masculine, feminine, neuter, plural/nominative, genitive, dative, accusative, instrumental, prepositional) that can occur in Russian. And having 24 possible grammatical endings is not the end of it. In the masculine nominative, for a name ending in "-sky" there are at least five possible endings that can be found in English ("-sky," "-skiy," "-skij," "-skii," "-ski"). In addition, there are aberrant spellings that have been accepted in the literature, for example, "Wrangell" instead of the Russian "Vrangel'" (here the soft sign has been replaced by a second "l"), and have already been adopted in English. Some names are "semi" formalized in English. For names that do not have an accepted English form I have tried to consistently use my system for transliterating. On the other hand, I generally give a (Russian) "i" or "y" plural for plural words that are not translated. This is with the exception of ethnic names, which are given no ending in the plural (following one accepted form found in *Webster's 3rd International Dictionary*, 1965). All this in no way exhausts the problems the translator faces, but rather provides a notion of the difficulties attendant upon any translation project. Nonetheless, I hope the explanation of my method will aid the reader, especially if he or she should want to go back from English to Cyrillic. And I apologize in advance to all whose names I have unintentionally "corrupted."

The reason for this corruption? Some of the Native names resulted from forms that can only be appreciated by dealing with the Cyrillic and the phonetic alphabets. This becomes far too cumbersome without a great deal of explanation. For those interested in name and word origins, it is recommended that the original text be used.

Some of the illustrations have items designated by the Cyrillic alphabet. There should be no problem matching the Cyrillic character in the illustration with the one in the caption. However, I give here my list of correspondences for those who wish to use it:

А	Б	В	Г	Д	Е	Ж	З	И	К	Л	М	Н	О	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш
A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	R	S	T	U	V	W	X	Y	Z

I owe a debt of gratitude to Anna Gokhman who proofread the translation, to Nicola Fucigna who edited the manuscript into more idiomatic English, to Teresa Duffy who laid the manuscript out in book form, and to Julia Knowles who proofread the manuscript in final form for typos and other errors. I am also deeply indebted to Andrew Tremayne, director of the Shared Beringian Heritage Program. Finally, I am grateful to Nan Coppock who has made all this possible. Without them this work could not have been done. Ultimately, we all owe the greatest thanks to Dr. Alexander I. Lebedintsev for permitting his valuable book to be published into English.



Nikolai Nikolaevich Dikov

N. N. DIKOV—INVESTIGATOR OF ANCIENT CULTURES OF THE NORTHEAST

Alexander I. Lebedintsev

On February 8, 1996, in St. Petersburg, in the 71st year of life Nikolai Nikolaevich Dikov passed away after a severe and prolonged illness. The well-known Russian scholar was a Member of the Presidium of the Far-Eastern Division of the Russian Academy of Sciences, Corresponding Member of the Russian Academy of Sciences, Doctor of Historical Sciences, Professor, and head of the Laboratory of Archaeology, History, and Ethnography of the Northeastern Interdisciplinary Science Research Institute of the Far-Eastern Branch of the Russian Academy of Sciences.

N. N. Dikov was born on March 17, 1925, in the city of Sumy. In 1944 he enrolled in a correspondence course with the History Department at Moscow State University. Then he transferred to the archaeological division at Leningrad University and graduated in 1949. During his studies he went on archaeological expeditions to the North Caucasus, Turkmenistan, and Siberia. Under the leadership of such outstanding scholars as B. B. Piotrovskii, A. P. Okladnikov, and M. E. Masson, Nikolai Nikolaevich acquired good practices. He participated in excavations at the Urartian fortress of Karmir-Blur in Armenia (1947), in the Buryat-Mongolian expedition of the Leningrad Division of the Institute of Archaeology, Academy of Sciences, USSR (LOIA AN SSSR) (1948–1949), and on the Angara expedition (1950–1953).¹

In 1953 N. N. Dikov defended his candidacy dissertation entitled “The Bronze Age of Zabaikal’e [Trans-Baikal],” and five years later his first book under the same name came out in Ulan-Ude. The work examined archaeological sites of the Bronze Age and Early Iron Age (tiled graves, deer stones, petroglyphs, and chance finds). A more well-founded and precise classification and date were given for these sites. For the first time archaeological sites of the Trans-Baikal Bronze Age, except its early period, were described in one book full of illustrative material. N. N. Dikov drew important conclusions about the economy, way of life, social structure, religion, cultural connections, and ethnic association of the Trans-Baikal population of the Bronze Age and Early Iron Age.

In 1955 N. N. Dikov went to Chukotka and worked as director of the Chukotka Regional Museum. From 1956–1959 he conducted a complete survey of the innercontinental regions and seacoast of Chukotka, following the largest rivers of Chukotka—the Anadyr’, Amguema, Vankarem—and the Krasnoe and Chirovov Lakes. Nikolai Nikolaevich discovered a multitude of Neolithic sites and early Eskimo settlements and cemeteries. On the basis of these investigations he suggested that Chukotka was already settled in the Paleolithic. In addition, he advanced hypotheses about an autochthonous northern origin for early Eskimo culture, as well as about the proto-Chukchi association of the innercontinental sites of Chukotka.

Due to the initiative and efforts of N. N. Dikov, publication of *Notes of the Chukotka Regional Museum* was begun in 1958. And in the first two issues preliminary accounts of archaeological surveys

¹ See page 201 for abbreviations.

were given. In 1960 the Magadan Publishing House published the popular-science book *On the Trail of Ancient Campfires: Archaeologists Going through Chukotka*, in which the author, using diary entries, relates his archaeological expeditions.

Upon the founding of the Northeast Interdisciplinary Science Research Institute in 1960 in Magadan, N. N. Dikov served as the head of its Laboratory of Archaeology, History, and Ethnography. He led this laboratory for 35 years.

In 1961 Nikolai Nikolaevich organized his first expedition to Kamchatka. The primary route passed along the Kamchatka River. As a result of this expedition, about fifty early Itel'men sites and villages were found, and on the shore of Ushki Lake there was evidence of human occupation in the Upper Paleolithic. For more than 30 years, beginning in 1962, he conducted excavations at the Ushki Paleolithic site in Kamchatka. The area of the excavated part amounts at present (1997) to more than 5,000 m². For the first time in the Northeast, a multi-component site containing Paleolithic layers with clear stratigraphy that was strictly controlled by ash layers was discovered. Subsequently, N. N. Dikov distinguished an early from a late Ushki Paleolithic culture.

The early Ushki Paleolithic culture is represented by materials from Layer 7, in which the remains of large, double, tent-type surface dwellings and traces of hearths were discovered. N. N. Dikov serendipitously discovered a Paleolithic burial, strewn with red ocher, in which were agalmatolite and amber beads, pendants, burin-like points, and punches. The most remarkable tools of this culture, dated to 13,000–14,000 cal years ago, are stemmed points, leaf-shaped knives, and polished beads and pendants. The complex of Layer 7 is unique; it has no analogies among the known Paleolithic cultures of Siberia and the Far East.

The late Ushki Paleolithic culture, revealed in the Ushki sites I–VI, is dated to 12,000–10,000 cal years ago. In Layer 6 of the Ushki I site, the remains of 40 round dwellings were found; among them were deepened dwellings with a corridor entryway, as well as surface dwellings with ringed hearths or fireplaces. The discovery of such a number of dwellings was possible due to a very precise method of archaeological excavation: careful cleaning in maximally wide areas of all carbon stains and lenses in combination with painstaking, attentive investigation of the stratigraphic profiles. N. N. Dikov succeeded in distinguishing two primary horizons and defining the features of the plan of the late Ushki Paleolithic settlement in two of its basic stages. In one of the dwellings was the burial of a domesticated Eskimo dog; two others contained round grave pits with children's burials.

The early Ushki people occupied themselves with fishing and hunting birds and animals. In the burned-out hearth fill were the bones of salmonid fish, fragments of bird bones, and tiny splinters of bones of other animals, and around the hearths and away from the dwellings were fragments of the bones of bison and horses.

In the 1960s N. N. Dikov carried out active investigations in Chukotka, as well as conducting excavations at Neolithic sites near Petropavlovsk-Kamchatski, along the Kamchatka, Anadyr', Amguema, and Penzhina rivers, and at early Eskimo cemeteries (in Chini, Enmynytyn, Uelen, Chegitun, among other places). The tireless investigator gives an account of the work in these years, as well as the primary sites of interest, in the popular-science book *Ancient Campfires of Kamchatka and Chukotka: Fifteen Thousand Years of History*, published in 1969 in Magadan. The materials from the excavations at the Chini cemetery, conducted in 1963, were published in a monograph in 1974 in Novosibirsk.

In 1967 and 1968 Nikolai Nikolaevich examined a unique archaeological site in Chukotka—the Pegtymel’ petroglyphs. An expedition of three people worked almost around the clock. They uncovered more than 100 compositions of rock art that told of hunting reindeer, whales, orcas, bearded seals, and other seals. Though less prevalent, there were also images of a polar bear, Arctic foxes, wolves, and waterfowl. Various anthropomorphic figures, which are presumed to be mushrooms, make up a special group. Nikolai Nikolaevich drew analogies between these mushroom-like figures and the cult art of small sculpture of the ancient Maya in America and in petroglyphs of South Siberia and the southern Far East. In his 1971 book *Mysteries in the Rocks of Ancient Chukotka (Petroglyphs of Pegtymel’)*, N. N. Dikov dedicates a large part of the text to this important archaeological site.

In 1972 N. N. Dikov defended his doctoral dissertation “Ancient Cultures of Kamchatka and Chukotka,” in which he summarized the results of his multi-year investigations. In the 1970s he conducted intensive surveys and excavations in the flood zone of the Kolymsk Hydroelectric Station, which brought about the discovery of several sites of the late Pleistocene and early Holocene. In 1975 N. N. Dikov identified on Wrangel Island Asia’s earliest Paleo-Eskimo culture. Materials from the Chertov Ovrage site, where a large number of stone tools and a toggling harpoon head were discovered, have much in common with the earliest Paleo-Eskimo sites in Arctic America.

The results of 20 years of investigations in the Northeast resulted in a two-volume monograph *Archaeological Sites of Kamchatka, Chukotka, and the Upper Kolyma* (Moscow, 1977) and *Early Cultures of Northeastern Asia* (Moscow, 1979). And in 1979, for his scientific attainments, N. N. Dikov was accepted as a corresponding member of the Academy of Sciences of the USSR.

In the 1980s, while continuing his study of the Ushki site in Kamchatka, Nikolai Nikolaevich examined the Chukchi Peninsula with great care, making a continuous survey route on an all-terrain vehicle along the coast of the Bering Sea from Provideniya to Lavrentiya and going deep into the interior continental regions of Chukotka. As a result of these expeditions, he came across many new Paleolithic and Mesolithic sites. The primary results of the archaeological surveys on the eastern Chukchi Peninsula in 1979–1986 were published in St. Petersburg in the monograph *Asia at the Juncture with America in Antiquity* (1993).

Though the discovery of the Paleolithic in Kamchatka, Kolyma, and Chukotka could be considered the greatest result of his archaeological investigations, Nikolai Nikolaevich obtained no less significant results in the study of later Holocene cultures of the Northeast, many of which he was the first to reveal for science (the Mesolithic and the early Neolithic of Kamchatka, Kolyma, and Chukotka, as well as the Paleo-Eskimo culture on Wrangel Island).

The Northeast Asian Interdisciplinary Archaeological Expedition (SVAKAE), headed by N. N. Dikov, carried out successful search and investigation of archaeological sites in Kamchatka, Chukotka, the Kolyma, and the Okhotsk coast, as a result of which new materials were revealed and later summarized by N. N. Dikov and his students (T. M. Dikova, M. A. Kir’yak, A. I. Lebedintsev, A. A. Orekhov, A. K. Ponomarenko, and T. S. Tein) in personal monographs. The materials of the SVAKAE were published in collections of scientific works of the Northeast Interdisciplinary Science Research Institute (SVKNII), *Archaeological Discoveries*, and in journals.

N. N. Dikov was also occupied quite successfully and fruitfully with the problems of history and historiography, as well as the methodology of the history, of the Northeast. Under his supervision in the laboratory, his team created summary monographs—*Essays on the History of Chukotka from Earliest Times to the Present* (Novosibirsk, 1974) and *The History of Chukotka* (Moscow, 1989)—and completed a work on fundamental interdisciplinary work, *History of Northeast Russia*.

N. N. Dikov diligently worked out the dialectical periodization in history (using the examples of socioeconomic and technological development of humanity). This concept was first reported in a session of the Academy of Sciences of the USSR, at the historical congress in the Federal Republic of Germany and at a science symposium in India (1985). N. N. Dikov published articles on this problem in the journals *Questions of Philosophy* (1983, No. 4), *Bulletin of the Academy of Sciences of the USSR* (1986, No. 10), and *Social Sciences* (1989, No. 2). N. N. Dikov also proposed the dialectical approach to correlating form and content for analysis of the ethnic development of humanity in the journal *Bulletin of the Far-Eastern Division of the Russian Academy of Sciences* (1994, No. 1).

N. N. Dikov was the author of nine monographs and more than 200 articles. Many of his works were published in the United States, France, Canada, Japan, Czechoslovakia, Italy, England, Chile, and South Korea. He was the science editor for various collections and monographs.

N. N. Dikov was a participant in the VII, VIII, and XI International Congress of Anthropological and Ethnographic Sciences, the XIV and XVI Pacific Congresses, the Congress of the International Union for Quaternary Research (INQUA), and others.

Nikolai Nikolaevich coordinated investigative and organizational work of historians, archaeologists, and ethnographers of the northern Far East and carried out many scientific, organizational, and social activities. He was a member of the National Committee of Historians, member of the Presidium of the Far-Eastern Branch of the Russian Academy of Sciences on Humanitarian Sciences, and member of the Pacific Science Association. Nikolai Nikolaevich headed the Presidium of the Magadan Regional Council of All-Russian Society for the Preservation of Sites of History and Culture and became a member of the Central Council of this society in Moscow.

N. N. Dikov allotted great attention to the education of the science staff. He was director of dissertation research in history and archaeology of the Northeast; he chaired student defenses of their dissertations. In 1990 he was elevated to the rank of professor.

The many years of fruitful scientific and social activities of N. N. Dikov were noted by awards, such as the Orders of the Red Banner of Labor, the “Badge of Honor,” and other state honors.

The scholar left this life having enriched global and Russian science with works of great significance and having made an important contribution to the establishment and development of the academic science of the Far East.

For all who knew Nikolai Nikolaevich, he will always remain an example of selfless service to science.

Memory of him is preserved in our hearts.

A. I. Lebedintsev

MESOLITHIC SITES AT EKITYKI LAKE (CENTRAL CHUKOTKA)

M. A. Kir'yak

In 1993 the Chukotka Archaeological Detachment of the SVKNII DVO RAN carried out survey work in the Iul'tin Region of the Chukotka Autonomous District under the leadership of the author. One of the routes passed along the shore of Lake Ekityki,² which lies in a narrow valley with high sides formed by a mountain massif (elevations of over 1,000 m). The lake stretches from southwest to northeast and, with a length of 25–28 km, has an insignificant width—no more than 2.5 km (Fig. 1).

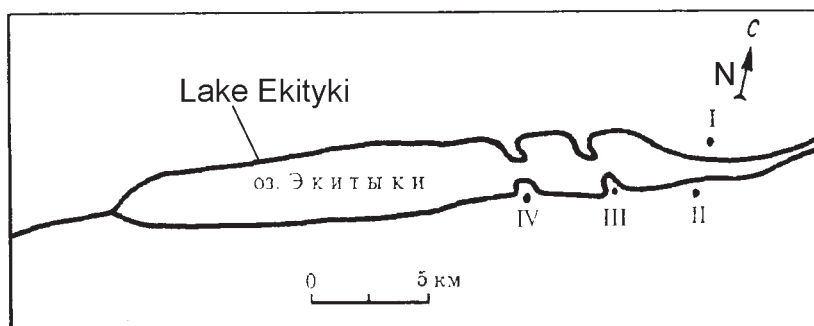


Figure 1. Map of site locations (designated in Roman numerals) on Lake Ekityki.

We found cultural remains from various periods on hills and small crests along the precipitous shore of the lake. The hills and alluvial terraces have level areas whose surfaces, with almost completely broken-up sod, are formed of gravel, gruss, and sandy loam, as well as isolated areas covered with sparse tundra vegetation; low brush is encountered only in the floodplains of the small streams rapidly carrying their waters to the lake. We succeeded in investigating only one-third of the shore zone on the north and south sides in the part of the lake where the Ekitykiveem River begins. This river, cutting a deep canyon, rushes toward the Amguema—the primary water artery of the region. Based on artifacts lying on the surface, we discovered four early site locations, two of them belonging to Late Neolithic times, two others—Ekityki III and Ekityki IV—to an earlier pre-Neolithic period.

² Archaeological investigation of Lake Ekityki was carried out for the first time. Traces of the existence of early people were discovered in this region in 1947 on the Ekitykiveem (Yakitykiveem.—M. K.) River, which flows from Lake Ekityki. The remains of an early site were discovered by N. N. Levoshin (1950) and interpreted as Late Neolithic by A. P. Okladnikov (1950a). In 1974 V. N. Smirnov found a second site while he was conducting geological investigations (Dikov and Smirnov 1977).

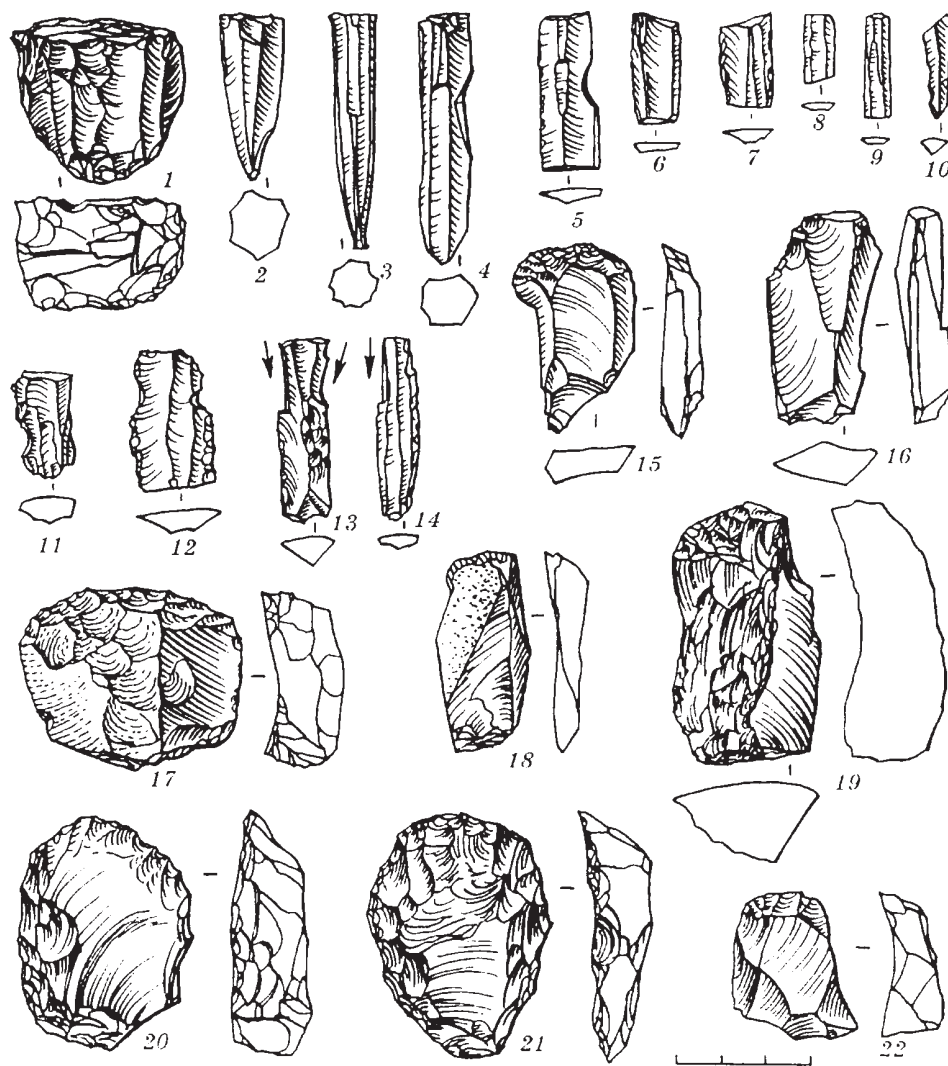


Figure 2. Stone inventory from the Ekityki IV (1–16, 18–22) and Ekityki III (17) sites: 1–4—cores; 5–12—knife-like blades; 13, 14—angle burins; 15, 17–22—end scrapers; 16—angle scraper-spokeshave (?).

The Ekityki III site is located on the southern lakeshore, which is shaped like a cape, and occupies two level areas 3–4 m and 6–7 m high, respectively. In the complex collected from the broken-sod surface were the following cultural remains: 1 prismatic core, 1 scraper, 1 large spall from platform rejuvenation of a core, 32 knife-like blades, 58 sections of knife-like blades, and 35 flakes. All the finds are of one kind of raw material: light-gray siliceous slate. The majority of the knife-like blades and fragments are without retouch. A scraper of the end type with two opposing working edges was made on a proximal section of a large and broad blade; the size of the instrument is 4.2 x 5 x 1.5 cm; the length is less than the breadth of the artifact (Fig. 2:17). The flakes are without traces of use.

The Ekityki IV site is located on a second projection, shaped like a cape, with an alluvial terrace 7–8 m high. The surface is level, formed of pebble-gravel deposits compacted by a fill of sandy loam,

covered with lichens, and slightly sod covered in some areas. In the site area was a small structure of reindeer antlers that in all probability marked the place of a reindeer herder's aboveground burial. Cultural remains were collected in an area of about 1,000 m². The complex of 298 items included 1 cobble blank with a large spall negative, 4 cores, 7 end scrapers, 60 knife-like blades and 107 blade sections, 2 burins, and 1 graver, with the rest being debitage (pieces of raw materials, flakes, and tiny scales). Light-gray felsite was used as raw material, with a limited amount of obsidian.

The cores, blades, and knife-like blades give an idea about the primary flaking.

One *core* is prismatic, of shortened proportions, mono-frontal, with flattened back, and straight subrectangular platform (Fig. 2:1). Another *core* is prismatic, of elongated proportions, and single platform; blades were flaked all around (Fig. 2:4). Similarly, two different conical cores were found. One of these *cores* is conical with a pyramidal form and a straight pressure platform, from the whole perimeter of which blades were flaked (Fig. 2:2). The other *core* is conical with a pencil-shaped form, with negatives of the removal of narrow blades (Fig. 2:3).

The knife-like *blades* are from large (4.1 x 1.2 cm) to micro (1.5 x 0.7 cm) specimens, many bearing traces of unifacial retouch on one or both lateral edges (Fig. 2:5–11). In the collection are two *burins* of the angle type (Fig. 2:13, 14); one of them is double. The *graver* is on a fragment of a blade with traces of multifaceted retouch on the lateral edges; the working edge was formed on a corner of the blade by small-faceted retouch (Fig. 2:12).

The end *scrapers* with thin working edges were made on blades (Fig. 2:15), lamellar flakes (Fig. 2:18), amorphous flakes (Fig. 2:22), and spalls from platform rejuvenation of cores (Fig. 2:20, 21). In the collection is an end *scraper* with a high working edge on a large lamellar flake with cortex (Fig. 2:19) and an angle *scraper* (*spokeshave*?) with a dentate edge (Fig. 2:16).

Meanwhile no inventory of other categories was encountered in the complexes of Ekityki III and Ekityki IV. In spite of the fact that excavations were not conducted, the cultural remains found here permit characterizing the stone industry of the site as blade and unifacial. Small specimens with regular edges predominate in the collection of blades—including sections) 56% in the complex of the Ekityki III site and more than 70% in Ekityki IV.

Judging from the rather representative collection, these knife-like blades could have been used as lateral insets. No other categories of micro-inventory (scrapers, blades with straight- or obliquely-retouched edge, or indented butt edge) were characteristic for these complexes. Burins on blades make up a very insignificant share—in the complex of the Ekityki IV site, they totaled only 0.5%. Incidentally, excavations could in all probability make certain corrections only in the numerical relation of the individual categories of the inventory.

Judging the date of the Ekityki complexes is practically impossible since there are few diagnostic elements in them and no corroborating data (based on radiocarbon, for example). Nevertheless, we will try to disclose the circle of cultures in which these complexes logically fit. The closest analogies in Western Chukotka are indisputably the Mesolithic complexes of the Tytyl' I and Tytyl' IV (Locus 3) sites. Parallels can be seen in several identical elements: end scrapers on crude blades, cortical lamellar flakes, large spalls from rejuvenation of core platforms (Figs. 3, 5), and group of cores (Kir'yak 1994: Fig. 1:1–3); analogous, based on technique of preparation and proportions, are angle burins (compare Kir'yak 1994: Fig. 2:5, 6). The variety of categories of micro-inventory on knife-like blades distinguish

the Tytyl' complex, as does the presence in the Tytyl' IV (Locus 3) complex of wedge-shaped cores and cores of transitional form (from wedge-shaped to prismatic).

The Tytyl' sites are highly significant and informative for they characterize a post-Paleolithic culture in Western Chukotka as represented by a settlement³ with a workshop (the Tytyl' I site) and a clear, from the point of view of morphologically specialized forms, collection of stone inventory (Tytyl' IV, Locus 3). Unfortunately, the complexes of artifacts here were acquired outside a stratigraphic context (with the exception of the workshop) by means of clearing the surface of the exposed cultural layer and surface collections. Because of the specifics of nature in the polar zone, neither charcoal nor faunal remains were preserved in the Tytyl' sites, which prevents making a more precise chronological time reference.

Based on the technical-typological characteristics, parallels in the Mesolithic complexes of Eastern Chukotkan should be noted. In both sites can be found the identical techniques of flaking, based on the separation of large spalls through the rejuvenation of core platforms, of crude blades and lamellar flakes, and of using the flakes as blanks for end scrapers (the Puturak site); some types of inventory are analogous as well (Dikov 1993: Plate 34–40). In the small lamellar industry of several Mesolithic complexes of Eastern Chukotka (Itkhat IB, Chel'kun IV) it is possible to note weak development of the burin technique and absence of butt retouch of knife-like blades (Dikov 1993: Plate 53–56, 59–61).

As noted earlier with the characteristics of the Western Chukotka Mesolithic (Kir'yak 1979:51; 1994:106, 107) in the inventory of the Ekityki III and Ekityki IV sites, I cannot help but see parallels in a number of features of the Ekityki complexes with the Sumnagin complexes (Yakutia). These similarities can be seen in the two-component nature of the Sumnagin inventory with its overwhelming predominance of microblades, in the types of end scrapers on large blades, and in the presence of angle burins on knife-like blades (*Mezolit. . .*, 1989:91, Pl. 115).

Based on the named technological parameters, the complexes of the Ekityki III and Ekityki IV sites are closer to the Sumnagin than others discovered in recent years in Western and Eastern Chukotka. But this apparent, in the present situation (the complex is limited to surface collections), closeness could change with excavations and more detailed study of these sites. Again a complex question emerges: are the Mesolithic sites of Chukotka original or did they all come from a center of Sumnagin super culture (Mochanov 1977; Pitul'ko 1996)?

At present a chain of Mesolithic sites can be traced in the territory of Chukotka: on the western flank—Tytyl' I and Tytyl' IV, Locus 3 (Kir'yak 1993a; 1994), in the center—Ekityki III, Ekityki IV, and on the eastern flank—Puturak, Itkhat, Chel'kun IV, Lynkvylenveem, and Ananaiveem (Dikov 1993). All

³ V. V. Pitul'ko expresses doubt in the correctness of my interpretation of the stone features in the Tytyl' I site and treats them as the result of cryogenic processes (Pitul'ko 1996). Through years of work in Chukotka, I have examined more than 30 stone features in archaeological sites of different periods: dwelling (small boulders were used for keeping the leather covering of early dwellings in place) and hearth—round, oval, subrectangular, sometimes with additional stonework for a feature next to the hearth, with coals in the hearth and without them (the absence being explained by leaching and blowing of insignificant carbonaceous and ashy accumulations). I have investigated (and recorded) stone enclosures—frameworks in burials based on the custom of recent reindeer herders (Chukchi and Koryak)—and examined numerous features on the upper reaches of the Omolon River. In every field season, we encountered fresh features made by reindeer herders during movement of the herds. The investigations in the Northeast hearth features were noted in archaeological sites not only in inner continental regions but also on the coast of the Okhotsk and Bering seas. Judging by the configuration, the hearth structures reflect, in my view, cultural variety and ethnic differences. That is why they are given, unwarranted in V. V. Pitul'ko's opinion, significant place in my monograph. Twenty years of experience in archaeological work in Chukotka permit me to distinguish man-made structures of stone with purposeful selection of uniform material from piles caused by "typical manifestation of cryogenic processes." Indeed, it does not occur to anyone, for example, to compare the stone features of Northern Europe with an "accumulation of boulders and debris."

the materials obtained from these sites have been published entirely (Dikov 1979a; 1993; Kir'yak 1979; 1988; 1989; 1993a; Dikov and Kir'yak 1982), as well as the Sumnagin sources (Mochanov 1969; 1977; *Arkheologicheskie*. . ., 1983; *Mezolit.* . ., 1989). When constructing parallels it is not difficult to note the commonality that is characteristic of post-Paleolithic technology for the huge region embracing Northeast Asia. First is the transition to a lamellar industry (flaking of blades, small blades, and microblades with both prismatic and irregular facets) and the use of products of flaking as blanks for the working inventory (without preliminary preparation or after secondary modification). Second is the unifacial modification (absence of bifacially modified knives and points). Third is the absence of ceramics and ground artifacts, which is a prerogative of the Neolithic. In truth we note the presence of 3 bifacially retouched artifacts and 1 ground one in the Sumnagin complexes (Mochanov 1977:246) and 2 bifaces in the complex of the Tkachen site in Chukotka (Dikov 1993:53)—a fact whose clarification still eludes researchers. But with such main technological unity it is impossible not to note differences, whose essence lies at the base of each specific culture. Thus, the inventory of the Sumnagin culture is based “on the technique of separation of knife-like blades” (*Mezolit.* . ., 1989:191) from cores with single or double platforms, having “most often a pencil-shaped form” (Mochanov 1977:242).

Yu. A. Mochanov gives clear and complete characteristics for the tools from blades, which amount to 85–95% (!) of the total number of stone tools, of them “about 30% have micro-dimensions—a width not exceeding 0.4 cm” (Mochanov 1977:242).

At the base of the flaking in the Puturak workshop site lie a crude lamellar technique and the use of cores of a different type (Dikov 1993: Pl. 33–36, 43, 46). Also inherent in the complex of the Tytyl' IV (Locus 3) site is a crude lamellar technique (Figs. 3–5) and the use of broad shortened cores—if one can judge by the blades and platforms of rejuvenation removed from them, on which end scrapers were made (Figs. 3:1, 8–10; 5:1, 2, 5–8), as well as the use of about 10% of flakes as tools. At the same time, in the Puturak complex there is a pencil-shaped core (Dikov 1993: Pl. 43:10). Present in the Tytyl' complexes are wedge-shaped cores, pencil-shaped cores,⁴ and others, from which knife-like blades of small dimensions were flaked, including micro-specimens (Kir'yak 1994: Fig. 2:1); however, these cores went primarily into the making of burins. The technique of butt retouch on microblades in the Chukotkan complexes was not broadly developed: in the Tytyl' complex there are isolated specimens, in the Ekityki none at all, just as there are also none of them in the Mesolithic sites of Eastern Chukotka.

Besides these differences, which are not striking, there exist more substantial ones that opponents remain silent about (Pitul'ko 1996). Present in the microlithic complexes of the Sumnagin culture are parallelograms and pointed items (*Mezolit.* . ., 1989:191), none of which are found in Chukotka. Based on Yu. A. Mochanov's suppositions, in the Sumnagin culture can also be found points “made from knife-like blades with the aid of edge retouch” (*Mezolit.* . ., 1989:191). There is not a hint of them in the relevant Chukotka complexes, but they are encountered in the Early Neolithic sites of Tytyl' IV (Locus 1) and Verkhnetytyl'skaya IV. The Chukotkan Mesolithic complexes also differ sharply from the Yakutian by the absence of axes and adzes with “ears” on them. In contrast, these axes and adzes are present in the inventory of the Sumnagin sites (Mochanov 1977:245). These differences permit me to speak of the originality of the Chukotkan Mesolithic, the sources of which remain unclear.

⁴ The very process of primary flaking supposes as the end result the presence of such cores, which can be traced especially clearly in the example of a series of pre-cores and cores of wedge-shaped specimens and in the transitional form from blank to completely depleted specimens (Fig. 4).

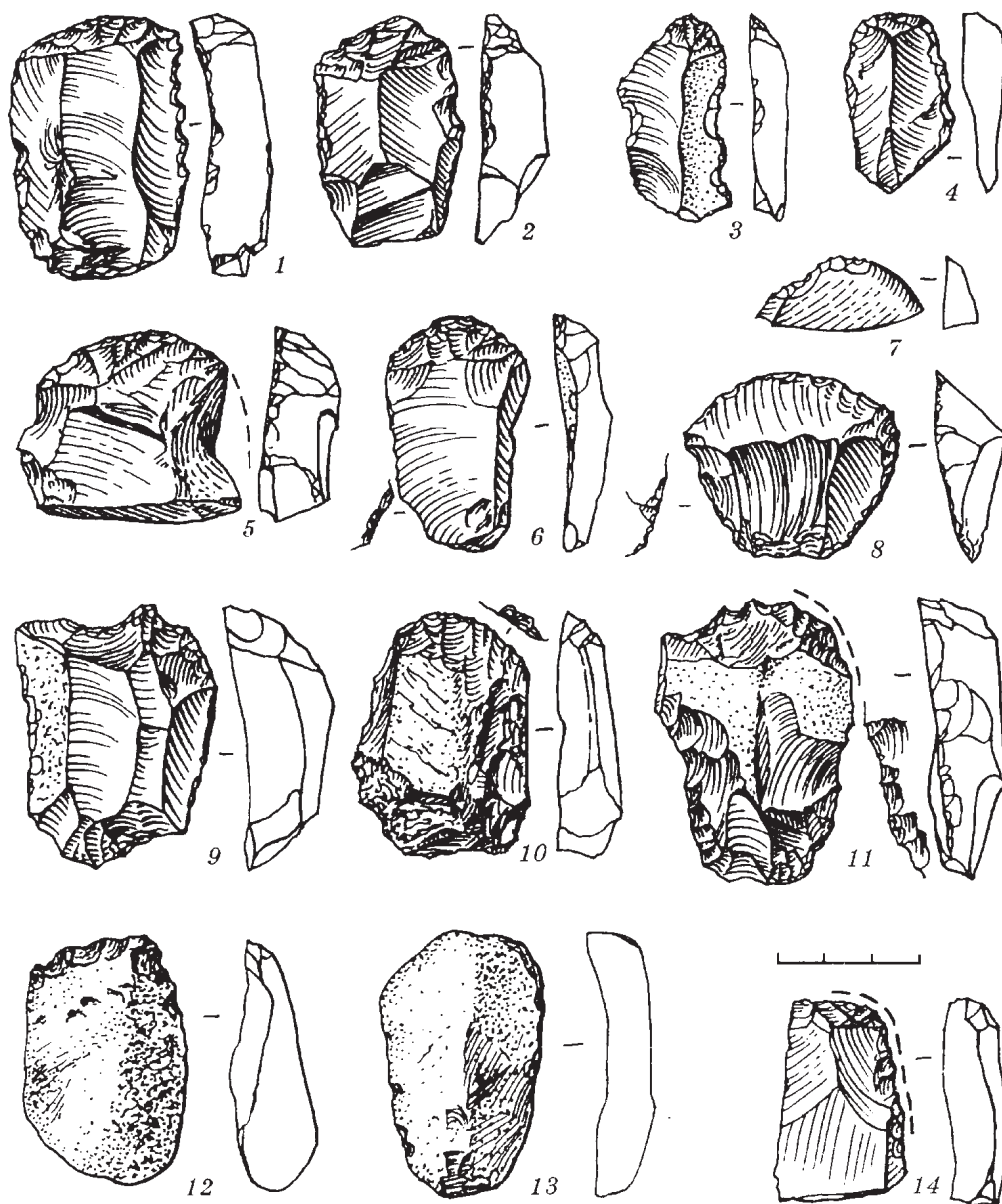


Figure 3. The stone inventory from the Tytyl' IV (Locus 3) site. End scrapers.

The debate about the sources of the Mesolithic cultures in Northeast Asia and their distribution and influence on cultures in adjacent territories, in my view, can be constructive on the condition of rather broad territorial investigations (in particular, in Chukotka, the central regions of which remain poorly studied) and valid disarticulation (with consideration of regional features) of the variants of the Sumnagin culture and its chronological stages.

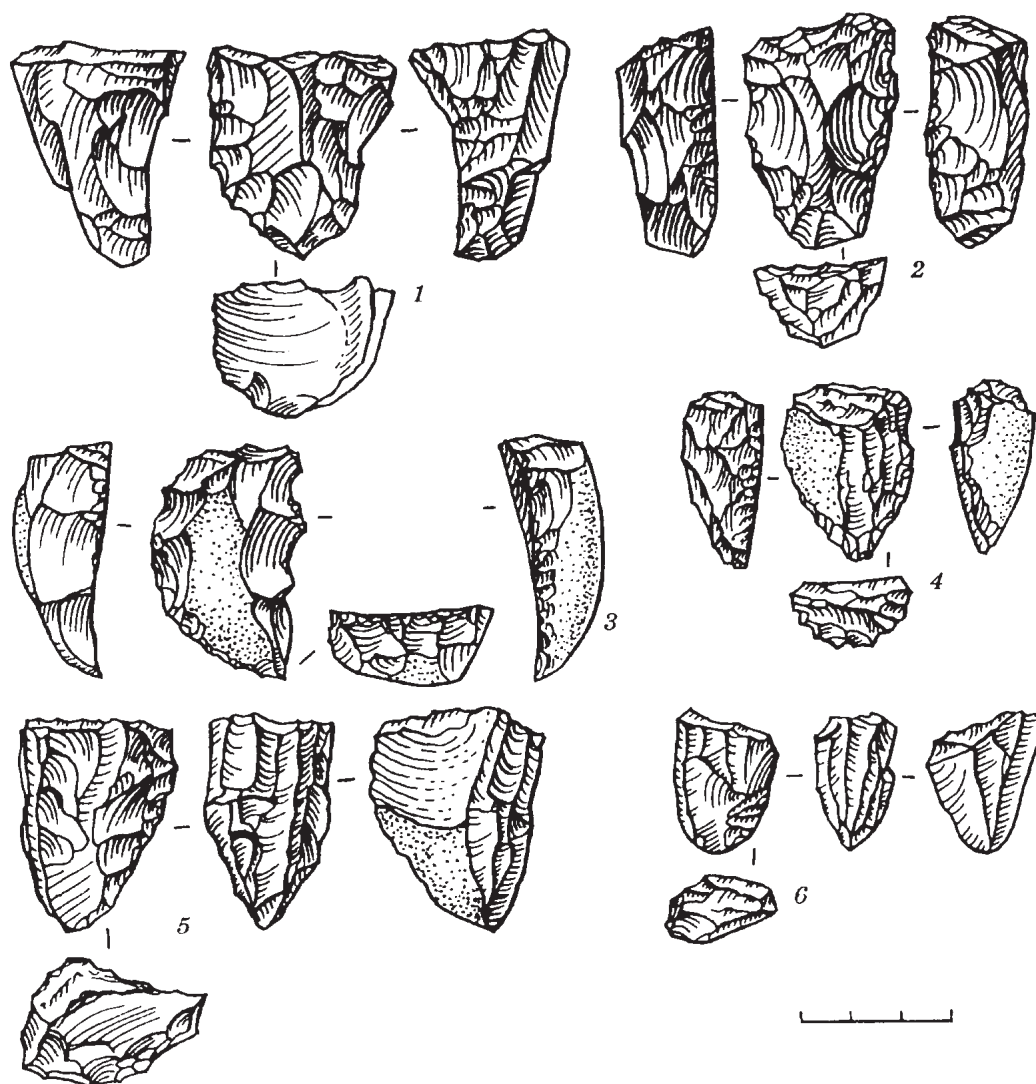


Figure 4. The stone inventory from the Tytyl' IV (Locus 3) site. Pre-cores and cores.

In the Tytyl' and Ust'-Timp-ton complexes, for example, there are elements peculiar to late Paleolithic cultures (wedge-shaped cores, cores of transitional forms), which suggest, in all probability, an earlier time of their formation. In the Sumnagin layers of the Bel'kachi I site, these elements are absent, while the standard set of the inventory makes them closer to the Early Neolithic (Syalakh) culture of Yakutia. The arrowheads on blades of the "svideroidnyi" type and willow-leaf most probably appear in the concluding stages of the transition period from the Paleolithic to the Neolithic. Returning to the complexes of artifacts of Ekityki III and IV, I would assign them, of course with a large share of caution, to an intermediate chronological framework between the Tytyl' and late Sumnagin complexes.

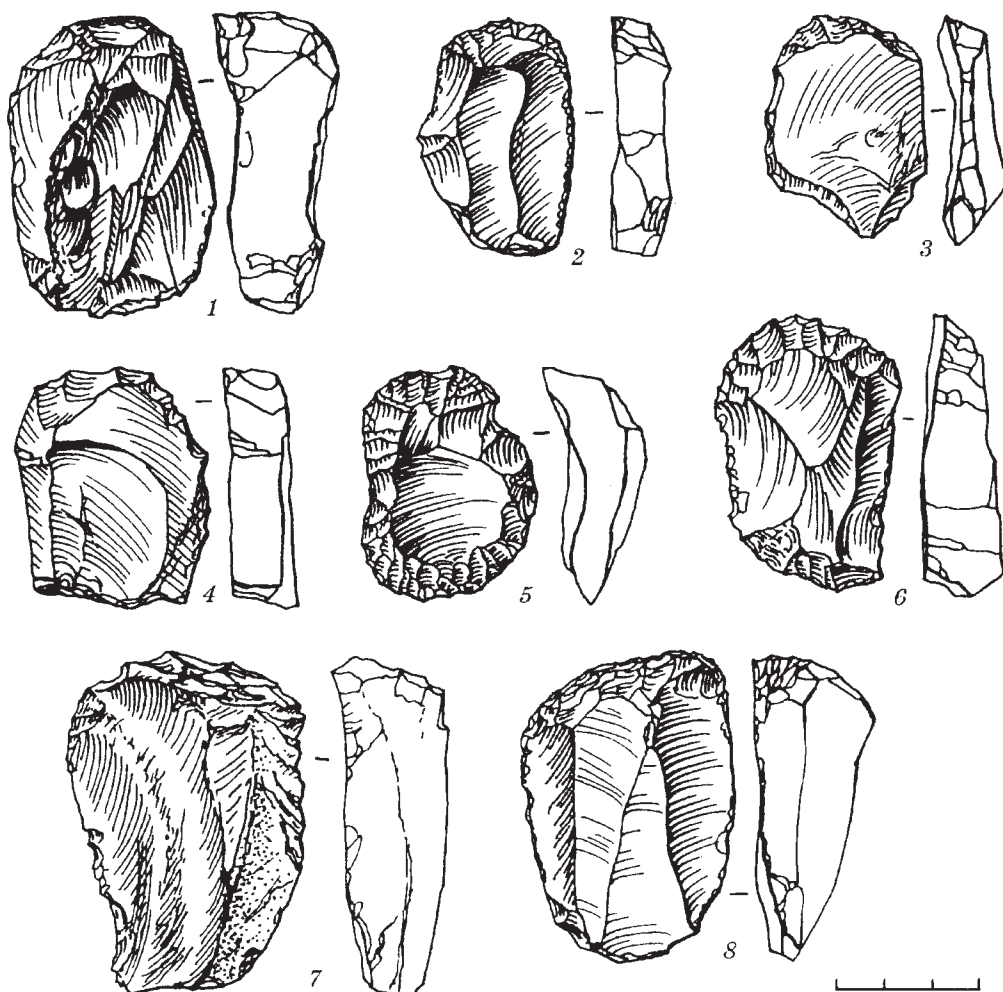


Figure 5. The stone inventory from the Tytyl' IV (Locus 3) site. Scrapers.

ARCHAEOLOGICAL COMPLEXES OF THE OKHOTSK-KOLYMA PLATEAU

S. B. Slobodin

Archaeological investigations in the territory of the Okhotsk-Kolyma plateau were first conducted by N. N. Dikov in 1974–1975. At this time the Maltan site was investigated, based on the materials from which the Maltan complex (Maltan culture) was isolated (Dikov 1977; 1979a, b). Later study of the region was carried out based on surface material collected by geologists at the Urtychuk site (Dikov and Savva 1980) and assigned by N. N. Dikov to a “late Paleolithic or Mesolithic culture still unknown in the Northeast” (Dikov and Savva 1980:66). The circle of materials at our disposal at the beginning of investigations of the Okhotsk-Kolyma watershed was limited to these sites. The intended and planned study of the watershed expanse of the Okhotsk-Kolyma basin was begun by the Upper Kolyma Archaeological Detachment in 1984. During this time a large quantity of sites was discovered, the materials from which substantially add to the results of the initial investigations in cultural-chronological regard. Part of them has already been published (Slobodin 1988; 1994; 1995; Slobodin and Glushkova 1992; King and Slobodin 1994), but most of them have not yet been introduced into scientific circulation. The present publication is designed to fill this gap.⁵

The Okhotsk-Kolyma tundra-sparse forest plateau occupies a vast expanse along the watershed between the Arctic and Pacific oceans, including the basin of the upper reaches of the Kolyma and its largest right tributaries—the Balygychan, Sugoi, and Buyunda rivers (within the boundaries of the territory being studied). Countless rivers divide the territory, which ranges from 600 to 1200 m high and has numerous ridges that exceed 2000 m (Omsukchanskii, Nayakhanskii, Maimandzhiiskii, Bol’shoi and Malyi Annychag, Bol’shikh Porogov, and others). The relief of the Okhotsk-Kolyma plateau is created by medium and low denuded tectonic mountains with smoothed outlines and separated by lava plateaus or troughs. Traces of early glacial action on a large part of the territory are reflected unclearly; only small high ridges have an alpine appearance with traces of two mountain-valley glaciations preserved in relief. Morainal deposits are encountered in the flat watersheds of several low-mountain regions in the basin of the Upper Kolyma.

The climate of the region of investigation is continental subarctic. Moreover, the climate of the valleys differs sharply from the climate of the mountains and passes, especially those located above the tree line. The average temperature for January is -31° to -35° C [-24° to -31° F], in July +9° to +13° C [48° to 55° F]. The snow cover begins in September and stays until the end of May (in the passes the snow often remains until the middle of June and falls by the end of August, which significantly complicates fieldwork).

The greatest concentration of sites today is observed in the upper reaches of the Buyunda River, the Ol’skoe Plateau (upper reaches of the Ola, Arman’, and Maltan rivers), and the Khetinskoe Plateau (Fig. 1). They reflect different cultural-chronological processes that occurred on the Okhotsk-Kolyma watershed in the Pleistocene and Holocene.

⁵ The author expresses his gratitude to the Department of Education and the Department of Administration of Culture of the city of Magadan, to the City’s Center of Youth Tourism, to the Karamenskaya Geological Survey Expedition, and to Omsukchanskaya Mining Geological Company for financial support and aid in organization and carrying out the expedition.

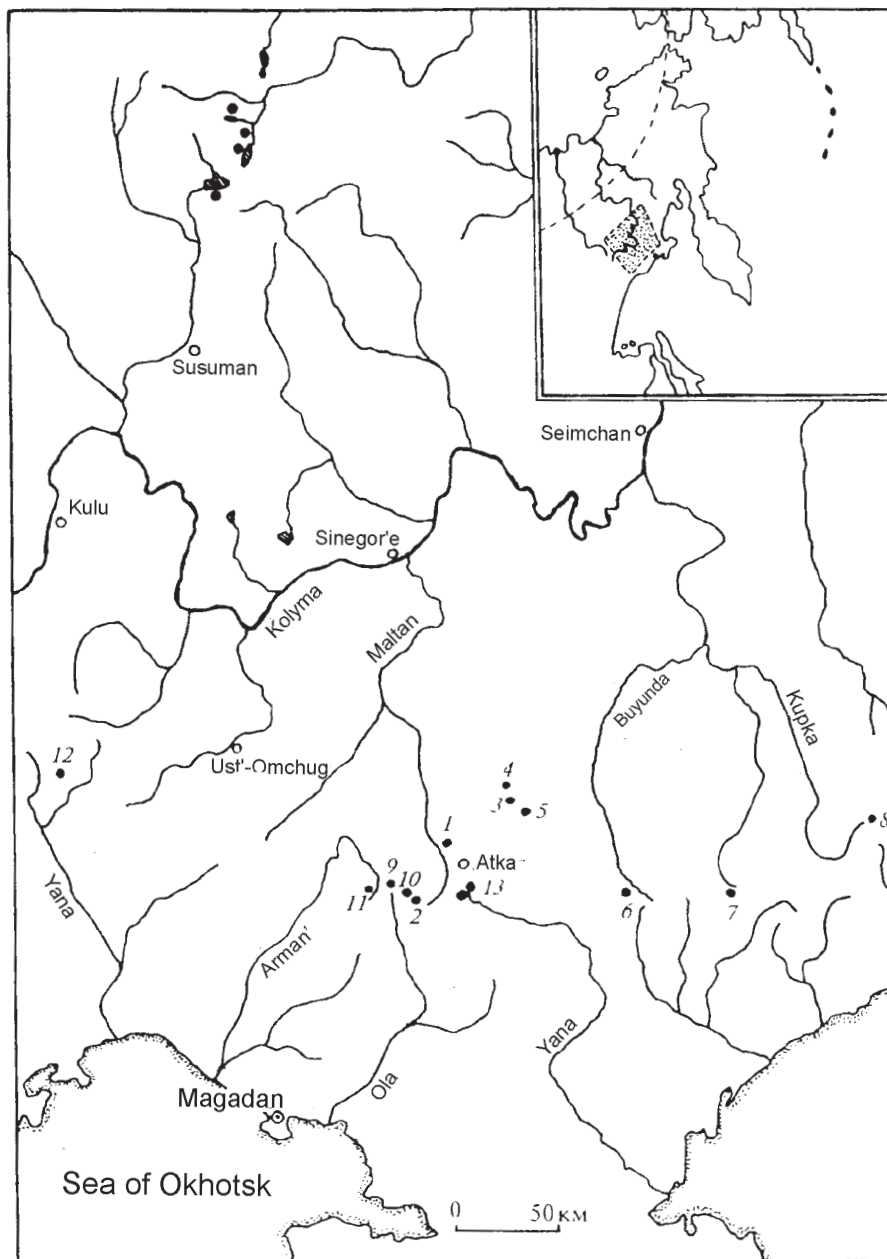


Figure 1. Location of sites on the Okhotsk-Kolyma watershed: 1—Mal'tan; 2—Urtychuk I (investigated by N. N. Dikov); 3—Kheta; 4—Gipoteticheskii; 5—Levaya Kheta II; 6—Buyunda II, III, and VII; 7—Dzhugadzhaka I-IV; 8—Kupka I; 9—Khurendzha I-XI; 10—Urtychuk II-X; 11—Nil-Ust'e and Nil II and IV; 12—Utro; 13—Ozero Elikchan.

In 1991, the **Kheta site** was discovered 180–200 km northeast of the city of Magadan ($61^{\circ} 05'$ north latitude, $151^{\circ} 45'$ east longitude). It is located on a rocky projection of the 3rd terrace above the floodplain 10–15 m high, at the confluence of the Pravaya Kheta and Levaya Kheta rivers, in the region of the Maimandzhiiskii Ridge. The absolute elevation of the site is 800 m.

The relief of the axial part of the Maimandzhiiskii Ridge, with absolute elevations of 1300 to 1700 m, is deeply segmented, sharp-peaked, and has an alpine appearance. As the distance from the axial part of the ridge increases, the depth of the slope cuts gradually decrease and the relief becomes plateau-like with absolute elevations of the peaks from 1000 to 1200 m.

The most widespread type of vegetation in the vicinity of the site is sparse-forest larch, and at elevations above 1000 m above sea level it is shrubby tundra and lichen tundra. In the geological literature of the Northeast, this region is known as the Khetinskoe Plateau or Khetinskoe Agate Deposit (*Khaltseyony*. . ., 1987:28, 29). Here various types of silicified stone, agates, and chalcedony are widely represented. There is also a deposit of agalmatolite. At the same time the quality of the agate stone is not high due to severe fracturing. Most of the stone favorable for working can be found in the form of cobbles on the spits in the valley of the Kheta River, which cuts through the southern part of the Khetinskoe Plateau.

The site was partially destroyed by a telephone cable laid through it. Investigations established that the site is multi-component and contains, besides the finds we assigned to the Neolithic, a lower cultural layer that is Paleolithic (late Pleistocene) based both on technical-typological indices and on stratigraphic position. In addition, another tool complex was distinguished, occupying an intermediate position.

The structure of the loose deposits of the site is the following:

	Thickness, m
1. Sod-plant layer	0.0–0.1
2. Light pale-yellow sandy loam (upper cultural layer)	0.1–0.2
3. Light-gray volcanic ash	0.2–0.3
4. Carbonaceous gray loam	0.3–0.35
5. Rust-colored loam (lower cultural layer)	0.35–0.45
6. Inequigranular sand, small pebbles	0.45–0.5
7. Bedrock, siliceous slate	more than 0.5

The first cultural complex, a Paleolithic tool complex, was taken from the undisturbed areas of the site and during excavations was clearly fixed based on the presence of the volcanic ash layer that covers these areas. Some artifacts of the surface collections, which were examined separately, can also probably be assigned to it.

The stone inventory of the lower cultural layer of the site includes more than 500 flakes, 2 scrapers, 1 wedge-shaped core, 20 microblades, 1 ski-shaped spall, 4 bifaces, 4 cores, 1 burin, 1 punch, 2 pendants, and other artifacts. The flakes were predominantly small and medium in size. Most of them are products of secondary modification. Distinguishing primary spalls among them is difficult since the initial material used was platy slabs of greenish-gray chert. Two such platy slabs found in the layer have approximately the same subtriangular form and size. The edge of one of these blanks, lying opposite the sharp angle, was worked by the bifacial technique (Fig. 2:2), while the edge of the other is steeply unifacial (Fig. 3:1). The edges of the blanks adjacent to the sharp corner are flat. They were obtained by means of flaking (boat-shaped) spalls off the edge. One such spall was found together with the blank, which was modified by unifacial retouch (Fig. 2:3). Judging by the pattern of the stone on the lateral surfaces of the blank and of the spall, they were parts of one whole. There is another such blank, made from black chert, in the surface material (Fig. 2:1), but, unlike the other blanks made of platy slab, it was made of a biface. On the sharp corner, formed by the

conjoining of the flat edges of the artifact, several short burin spalls had been removed. Judging by everything, all three blanks served for making tools and wedge-shaped cores, which are the most diagnostic artifacts in Paleolithic complexes of the Northeast.

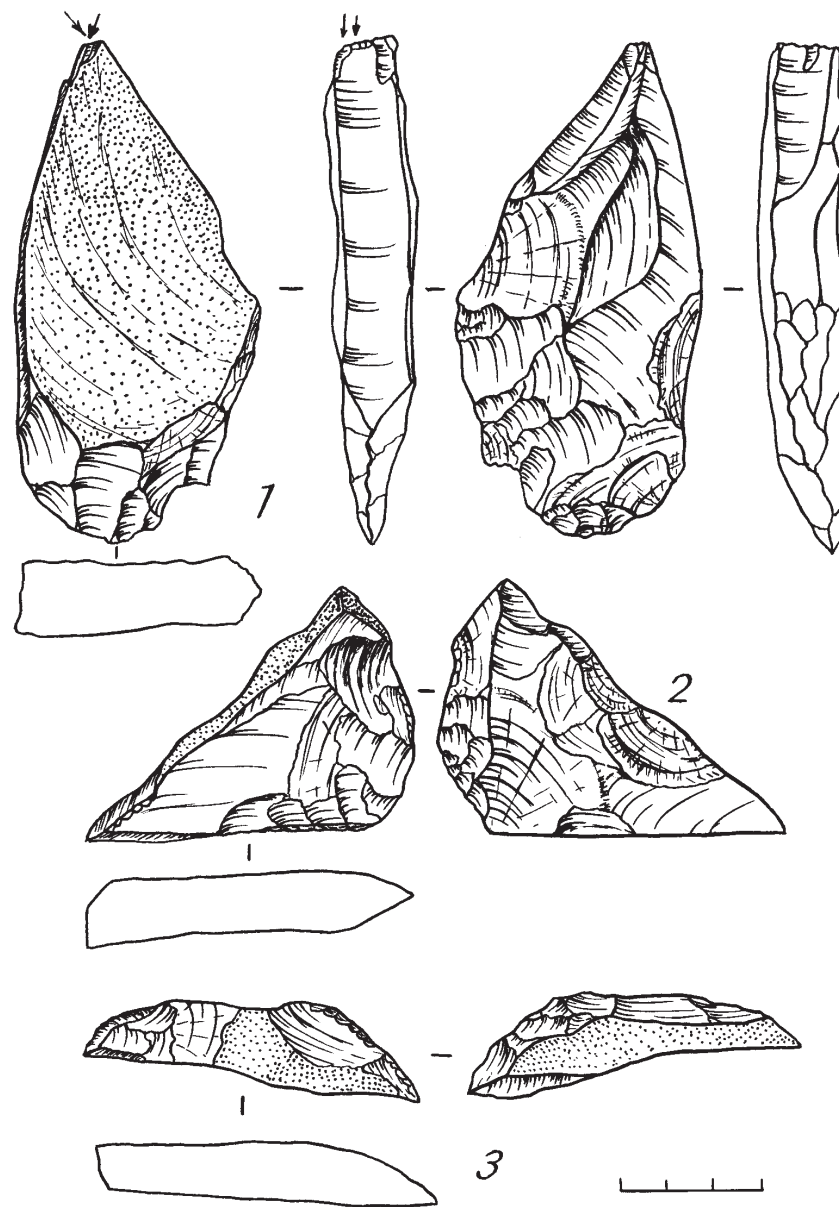


Figure 2. Stone artifacts from the Kheta site: 1, 2—blanks of tools; 3—boat-shaped spall.

The wedge-shaped core has a subtriangular transverse and longitudinal section (Fig. 4:8). The pressure platform was formed by the removal of one spall and is strongly beveled. The angle between

the plane of flaking and the pressure platform amounts to 75° . The keel of the core was formed by small edge retouch, the sides by the removal of broader and deeper spalls. Narrow (no more than 0.3 cm wide) knife-like blades were flaked from the butt of the core. On the working edge can be seen traces of several breaks that cover the whole front such that the core can be considered completely exhausted.

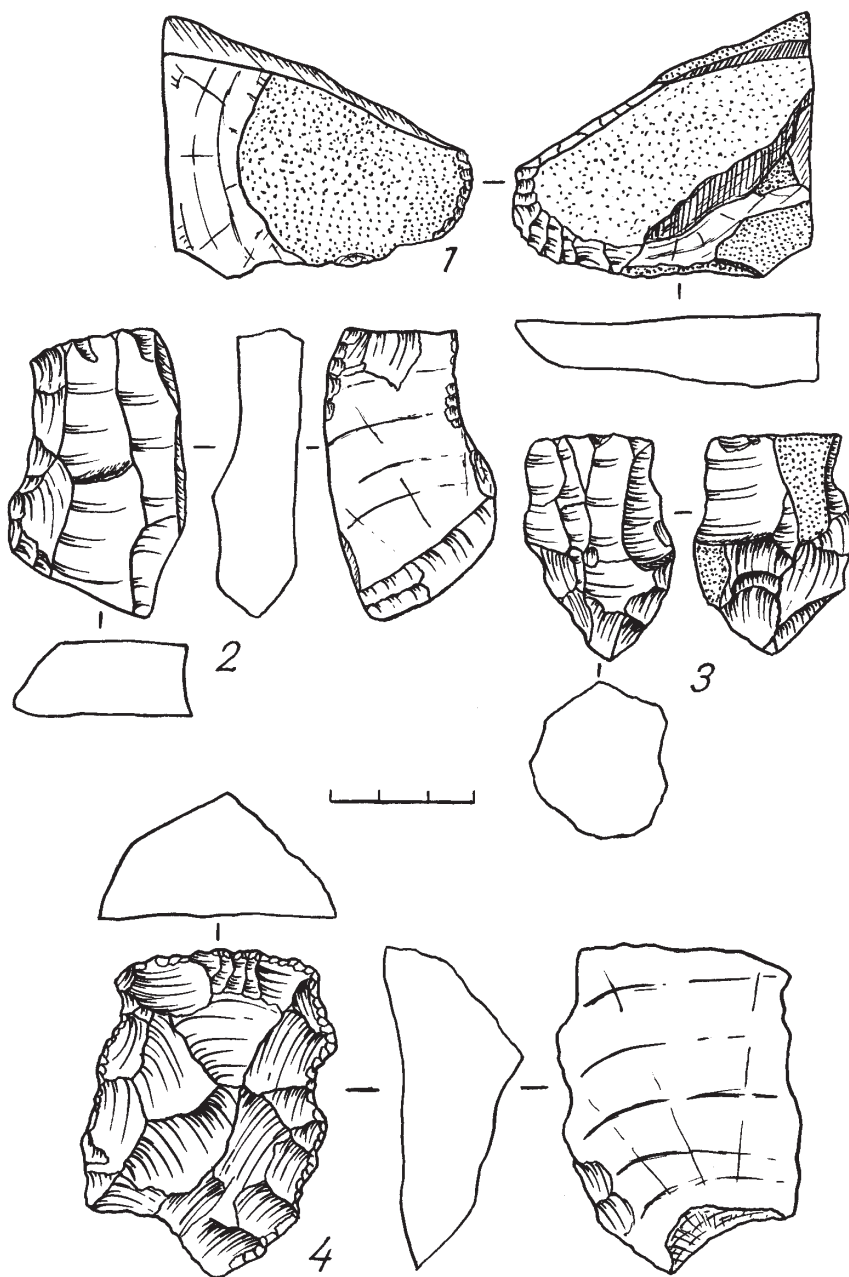


Figure 3. Stone artifacts from the sites of Kheta (1–3) and Buyunda VII (4): 1—tool blank; 2, 3—cores; 4—scraper.

The ski-shaped spall, based on material and size, is definitely associated with a core, though not fitted to it because of the absence of intermediate spalls. On its dorsal surface can be seen traces of rejuvenation of the core platform (Fig. 4:6).

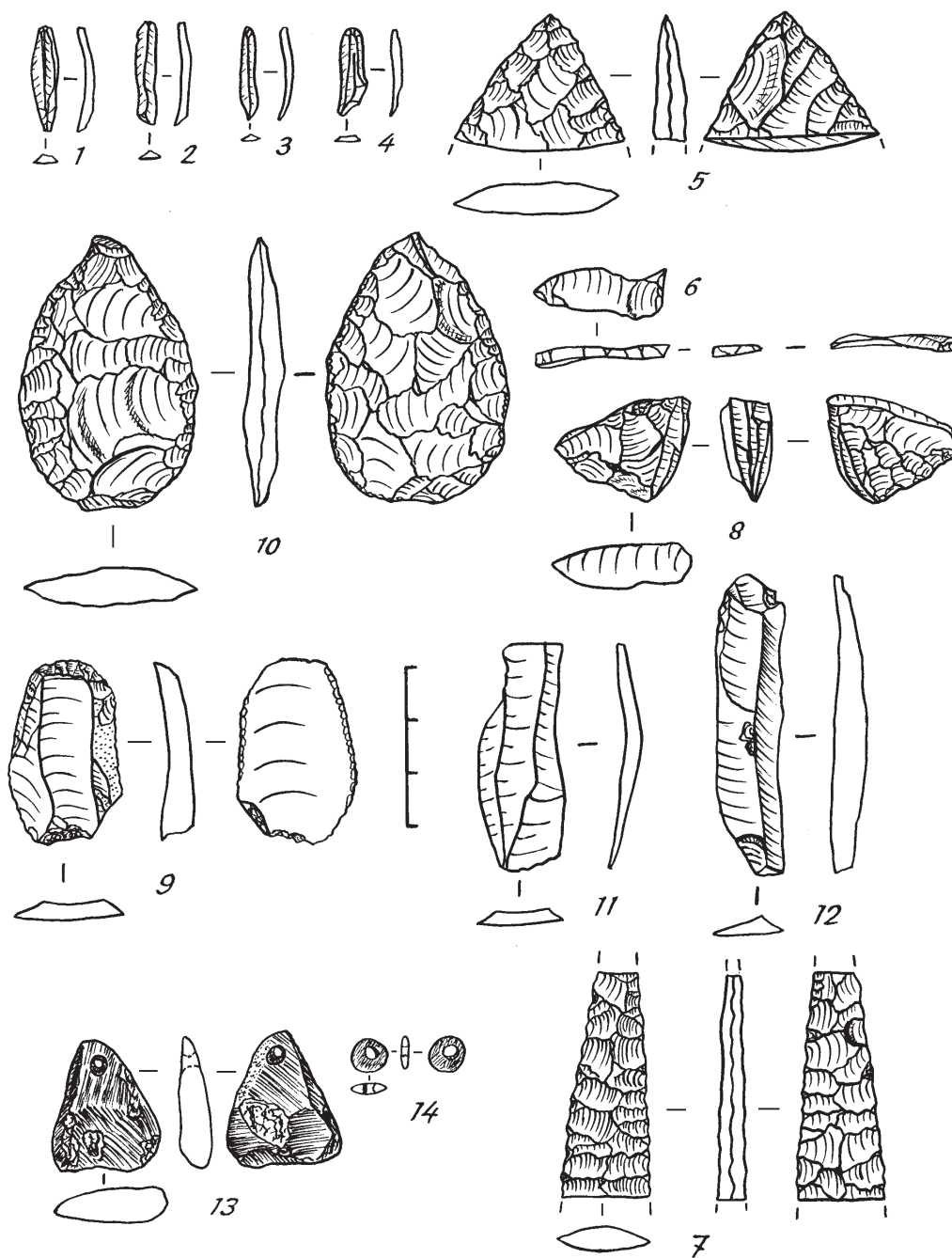


Figure 4. Stone artifacts from the Kheta site: 1-4—microblades; 5, 10—bifaces; 6—ski-shaped spall; 7—point; 8—wedge-shaped core; 9—scraper; 11, 12—blades; 13—pendant; 14—bead.

Two *scrapers of the end type* were made on lamellar flakes with subtrapezoidal section. One of them has a high back, a working edge modified by steep retouch, and was trimmed by small edge retouch, giving it a symmetrical oval-convex form. Small retouch was applied along the whole left edge of the scraper. No traces of modification were found on the ventral side of the scraper. The working edge was formed by retouch directed from ventral to dorsal. The base of the scraper was also trimmed in this direction; part of the base was split off by strong vertical blows so that the blade's bulb of percussion was removed. There are traces of polish on the scraper's working edge and the blade's longitudinal edges. The angle of sharpening of the working edge is 60–70° (Fig. 4:9). On the second scraper, as on the first, the right working edge is more rounded; the working edge was modified by steep unifacial retouch directed from ventral to dorsal. Its upper end, with the bulb of percussion, is truncated just as on the first scraper. On one of the facets of the scraper, cortex of the section of lamellar separation was preserved. The angle of sharpening of the working edge is about 60° (Fig. 5:1). The working edges of both scrapers repeat the configuration of lamellar flakes and are slightly bent. Both tools have bodies that expand from the working edge.

Of the *knife-like blades* only six are whole. Their length is 1.7 to 2.3 cm, their width 0.3 to 0.5 cm (Fig. 4:1–4). Irregular lamellar flakes were removed from amorphous subprismatic cores. Their length reaches 5.5 cm, their width from 0.7 to 2.4 cm (Figs. 4:11, 12; 5:4, 6, 7).

Points are represented by 2 fragments of bifacially worked tools. One of them, narrow and elongate, is most probably the point of an arrow or dart. Judging by everything, it was leaf-shaped (Fig. 4:7). The second fragment of a biface, considering its dimensions and form, can be assigned to spear points (Fig. 4:5). It has a flattened-lenticular section. Both broad surfaces of the fragment were worked by flat pressure retouch; the edges were trimmed by small retouch. The tip was formed by the edges of the biface converging at an angle of 70°.

Knives are represented by 2 specimens: a whole bifacially worked oval artifact (Fig. 4:10) and a fragment of a biface base (Fig. 6:1). The planes of the bifaces are completely covered with large flattening retouch, the edges by smaller regular retouch. These edges are additionally trimmed by the smallest convergent retouch. The dimensions of the bifaces exclude the possibility of their use as blanks for making wedge-shaped cores. Such possibility supposes a bifacially percussion-flaked blank (Fig. 5:5), worked by the removal of large spalls. One end of the tool at the butt was left unmodified: the natural surface of the lamellar separation can be seen in the fracture. On the other end of the artifact, a plane of flaking was formed by the removal of a transverse spall and a platform by the removal of a longitudinal spall along the edge of the tool. On the face can be seen traces of several removals. The pressure platform was trimmed by small retouch. The angle between them amounts to approximately 53–55°. A fragment of another such tool was found.

The *burin* was made on a small bifacially modified oval blank. Burin spalls were removed from the opposite ends of the artifact on opposite edges. One end of the tool from the point of removal of the burin spall was broken during preparation or use. The remaining burin spall measures 1.8 cm long by 0.4 to 0.6 cm wide. The undamaged working edge of the burin was formed by the removal of a vertical burin spall 1.8 cm long and 0.3 to 0.6 cm wide (Fig. 5:3).

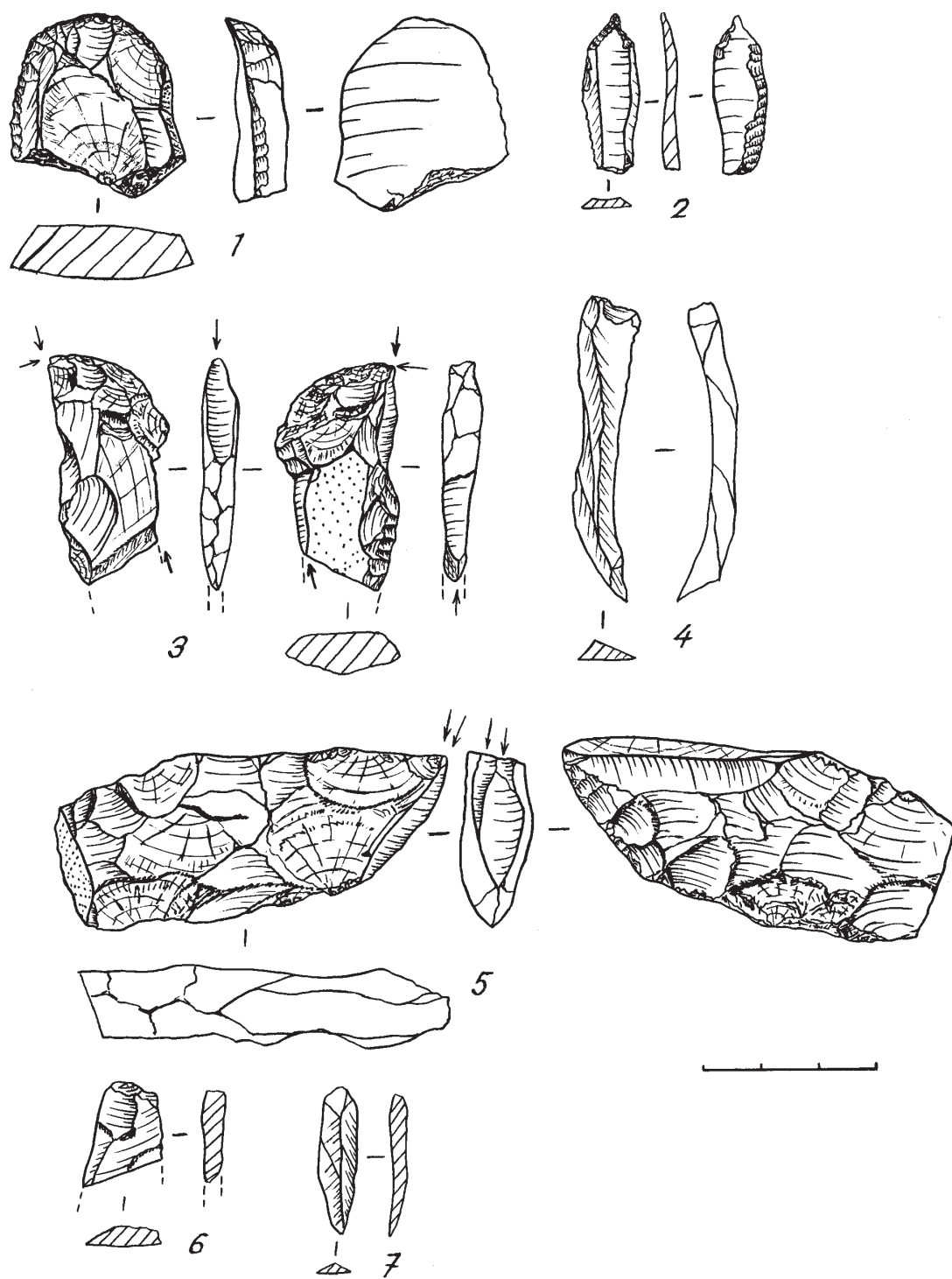


Figure 5. Stone artifacts from the Kheta site: 1—scraper; 2—punch; 3—burin; 4, 6, 7—blades; 5—blank of a wedge-shaped core.

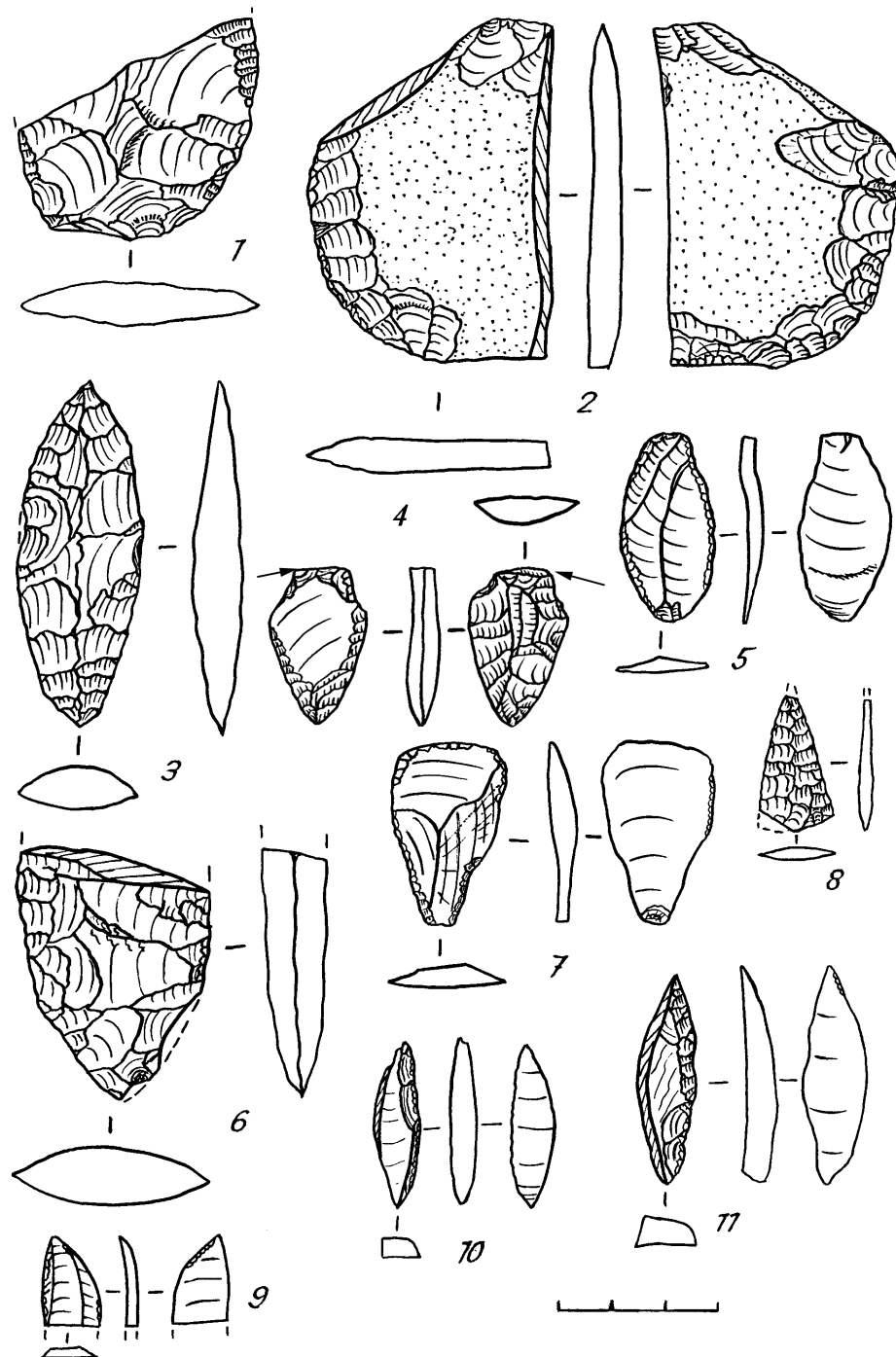


Figure 6. Stone artifacts from the Kheta site: 1, 2, 6—bifaces; 3, 4, 8—points; 5, 7—scrapers; 9—punch on a blade; 10, 11—gravers.

The *punch* was made on a blade (Fig. 5:2). The pointed working edge of the punch was formed by small edge retouch from the dorsal side. On the ventral side, along the whole right edge, flat unifacial pressure retouch was applied.

Several flakes from the lower layer were found with traces of unifacial retouch in small areas along the edges. One of them can be characterized as a scraper-like indented tool.

Ornaments are represented by two artifacts: a pendant and a bead. The pendant was made from a small pebble, which was given a subtriangular form by grinding. In the upper part of the pendant, there is an asymmetrical biconical hole 0.23 cm in diameter. The grinding of the pendant is crude and traces of abrasive material can be clearly seen (Fig. 4:13). The bead has a flat rounded form with a hole 0.2 cm in diameter. The hole is biconical and symmetrical; the edges of the bead are rounded; the quality of the grinding is high. It was made of a semi-translucent white material, probably from the same as that of the pendant—agalmatolite or a variety of it (Fig. 4:14).

Two more artifacts from the damaged areas of the excavation were tentatively assigned to the lower complex. The first was made on a slab of chert. Its rounded edge was formed by bifacial retouch; the lateral planes were not modified (Fig. 6:2). The second is a fragment of the base of a biface. One plane of the biface was worked completely by large faceted retouch, the other by small pressure edge retouch. Judging by the base, the biface had a leaf-shaped form (Fig. 7:3).

The **second (middle) cultural complex** is distinguished based on typology. It is characterized by its position below the ash layer, its contact with the rust-colored sandy loam, and the absence of traces of argillaceous matter on the finds, which were covered instead with a carbonaceous film.

In the stratified areas of the site, where excavations were carried out, only flakes of chalcedony and black chert were assigned to this complex. No tools were found. In the damaged areas, a complex of tools was distinguished and associated with finds from the layer based on the raw material and carbonaceous film. To this complex were assigned 2 *cores*—of chert and chalcedony, of the flattened-prismatic type, single front, single platform, and used for flaking lamellar flakes and amorphous blades. The striking platforms of the cores were unformed, their dimensions less than the width of the flaking front (Fig. 3:2). The other core was of the conical type, of black chert. The pressure platform is level, round, and modified by spall removal around the perimeter. Cobble cortex was preserved in some areas of the core (Fig. 3:3).

The most numerous group of tools consists of *bifaces* (4 specimens). One is represented by a whole (with a small indentation) leaf-shaped artifact of black chert. This was most likely a spear point, though the slight bend of the tip can be viewed in favor of the use of the biface as a knife. Along its whole surface, the tool was modified by large flat retouch. In addition, the working edge along the whole perimeter was trimmed by small edge bifacial retouch. The base of the tool is tapered: toward the point the biface expands, and only in the upper third of the tool do the edges of the biface begin to converge toward the tip (Fig. 8:1). The second point, made of the same material, is almost an exact copy of the first. The end of the artifact is broken (Fig. 8:2). Both tools have a flattened-lenticular cross section. Two more bifaces are fragmentary: one is made of gray chert, worked along the surface by multifaceted flat retouch, the lateral edges even, and the base rounded (Fig. 7:1); the other, of yellow silicified tuff, was worked over the whole surface by flat pressure retouch, with the edges trimmed by small convergent retouch (Fig. 6:6).

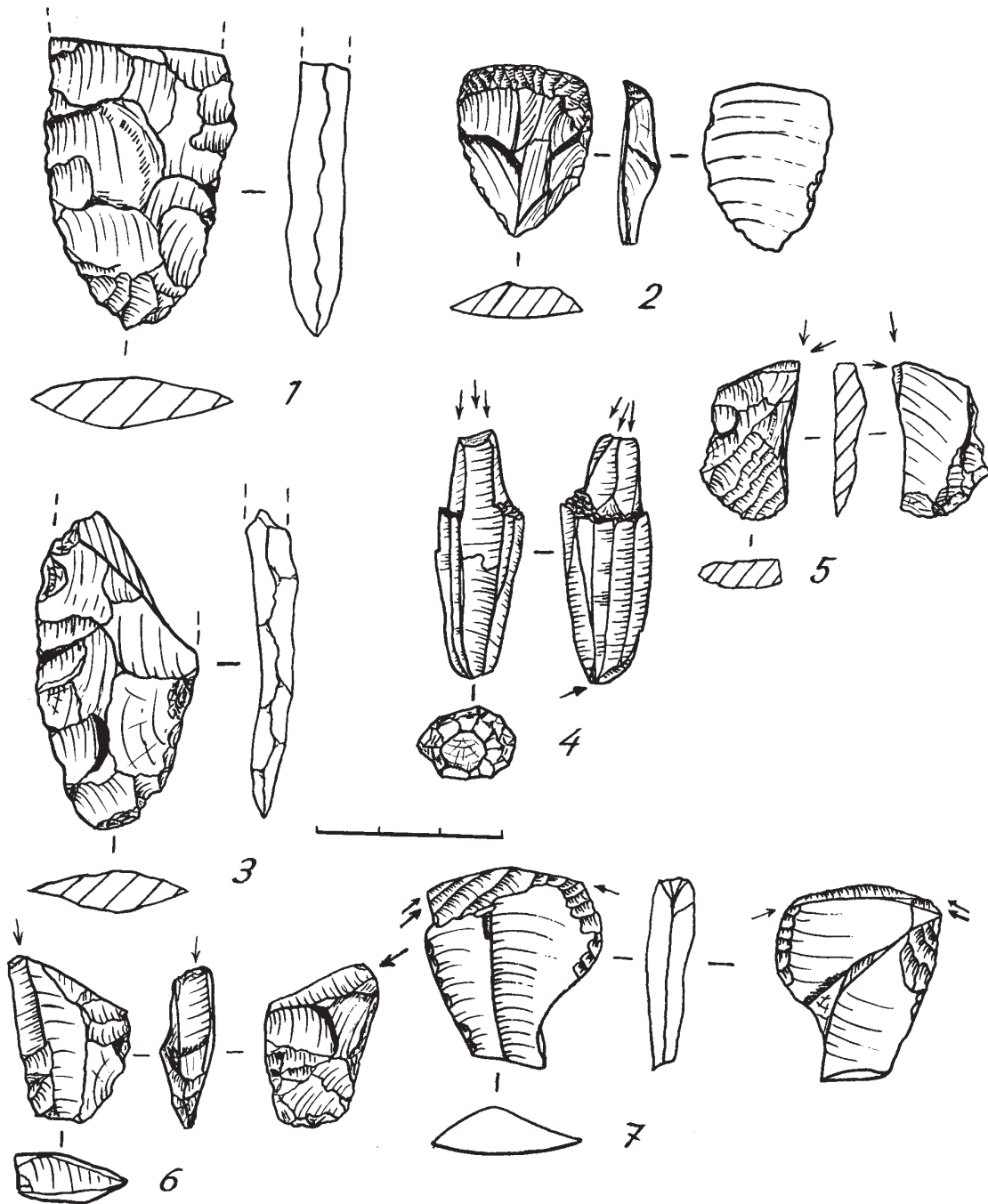


Figure 7. Stone tools from the Kheta site: 1, 3—bifaces; 2—scraper; 4—7—burins.

The *scraper* was made on a lamellar flake with subtriangular section. The oval-convex working edge was formed by steep parallel unifacial retouch directed from ventral to dorsal. Besides the formed working edge, there are no other traces of modification (Fig. 9:7). Two scrapers, precise copies of each

other, were found almost side by side. They were made on flat oval flakes of purple banded chert. The scrapers were modified by small regular unifacial edge retouch along almost the whole circumference on the dorsal surface, with the exception of the striking platform for the removal of the flake and of an area 1 cm long on the lower end of one of the scrapers (Figs. 8:7; 6:5). A *tool* on a shaped flake should evidently be assigned to scrapers. The right edge of the flake was worked by unifacial retouch on the ventral side and the left edge on the dorsal side. The remaining surface of the flake was not modified (Fig. 10:14).

A *scraper* or *knife* of original shape was made on a flake. The tool has a handle that transitions into a subrectangular working edge. Small edge unifacial retouch was applied on the dorsal side along the whole perimeter of the tool. The left side of the tool's working edge was additionally worked by small retouch on the ventral side (Fig. 6:7).

Three *burins* were found. One, transverse, was made on a subtriangular flake. The lateral edges were retouched; burin spalls were removed transverse to the flake from right to left; the pointed edge that was formed was used as a burin (Fig. 7:7). Another burin was made on a chalcedony flake. The tool was worked on the bottom and along one edge by bifacial retouch. The second edge was formed by the removal of a burin spall. Another burin spall was removed along the diagonal of the flake. The angle of the burin working edge that was formed is about 60°. On the working edge can be seen traces of trimming and indentation. The width of the burin spall is 0.4 cm (Fig. 7:5). The third burin was made on a lamellar flake. Both lateral edges were worked by retouch. The burin edge was formed by the removal of two burin spalls: a diagonal one and a longitudinal one along the left edge. The diagonal spall was inclined toward the ventral plane of the tool, the lateral spall toward the dorsal. The angle between these spalls amounts to 50–55°. Traces of trimming by small unifacial retouch can be seen on the working edge (Fig. 7:6).

Three other tools were tentatively assigned to burins until confirmation of their morphological features allows separating them into a certain type of burins. They were made on leaf-shaped flakes. One edge of each artifact was formed by the removal of an unbroken longitudinal spall; the other was worked by steep unifacial retouch. The artifacts' ventral and dorsal surfaces were almost unmodified. In two cases short burin spalls were removed at the tip end of the artifact (Figs. 6:10; 9:5). On one the working edge was trimmed by small unifacial retouch on the ventral side (Fig. 6:11).

Two *tools* are represented by artifacts on large, slightly bent lamellar spalls. One of them was made from silicified tuff and has a subtriangular cross section. The left edge of the blade was worked by small unifacial retouch, which characterizes the artifact as a side scraper (Fig. 8:5). The second lamellar flake, with subtrapezoidal section, was most probably used as a knife. Both its lateral edges were worked by small unifacial, convergent retouch and have indentations. There are no other traces of modification (Fig. 9:8).

Judging by the raw material and the patina, more than 1,500 flakes can be assigned to this complex. It is possible that the lower and middle complexes were a single whole, though there are at this time no arguments in favor of this.

The third cultural complex was recorded in layers damaged by a cable laid through the site and above the ash layer. Separating it does not seem possible either by the typology of the tools or by raw material.

This complex is characterized by a large number of flakes (more than 5,000), of which 5,118 are of chert and 75 of chalcedony. Here were found 582 chert knife-like blades, 15 cores and core blanks, and more than 20 tools.

Basically most of the flakes are debitage from secondary working of the artifacts. The width of the knife-like blades is from 0.3 to 1.9 cm. The average width of most of the blades is 0.5 to 0.7 cm. About 20 blades were worked by small unifacial retouch along one or both edges. Several blades have blunting retouch (Fig. 10:1–6).

Core blanks are represented by 4 specimens. They are subprismatic with a rounded pressure platform. Crude, short lamellar flakes were flaked from their whole surface (Fig. 10:10). The height of the blanks is 3.4 to 4.8 cm, the width 2.2 to 3.8 cm. They are made out of different shades of chert.

Among the cores with traces of removed clear subprismatic blades on the surface, 6 conical, 1 prismatic single-platform, 1 prismatic double-platform, and 1 conical-flattened core were distinguished.

The *conical cores* are almost completely exhausted. Their working areas were carefully modified by small retouch over the whole surface (Fig. 9:1–3).

The *single-platform prismatic core* has a beveled pressure platform. The front of the flaking plane was trimmed by small retouch (Fig. 9:4).

The *double-platform prismatic core* has rounded pressure platforms, one of which is damaged (Fig. 10:9). They were carefully worked around the whole perimeter by small pressure retouch. The surface of the core is slightly convex.

The *conical-flattened core* of yellow chalcedony was used for the removal of knife-like blades over its whole surface. The front of the flaking plane was trimmed by retouch that beveled the pressure platform to the side opposite the flaking front (Fig. 10:8).

Nine *points* were found. Five of them are represented by fragments of tips with lenticular cross section and bifacially modified surfaces. Whole points can be assigned to three groups. The first unites two points of leaf-shaped form; one was made of chert (Fig. 6:3), the other of soft stone (Fig. 8:4). The surfaces of the points were completely worked by flat retouch. The cross section is lenticular.

To the second group was assigned a stemmed *arrowhead*. It was made on a flake of yellow tuff. The dorsal surface was completely worked by retouch; on the ventral surface only the tip of the point, the edges, and the stem were worked. The remaining part retains the surface of the initial spall. The stem is separated from the working edge by small shoulders. Below, the stem has a subrectangular form from the removal of a transverse spall. The cross section is asymmetrical and unifacially convex (Fig. 6:4).

The third group includes a *point of subtriangular form* with a convex, slightly pointed base. The point is carefully worked along the whole surface by even parallel retouch. Very thin spalls, removed from the side of the base, flatten the point; the cross section is flattened-lenticular (Fig. 6:8).

Six artifacts were designated as *knives*. Two of them are bifacially percussion flaked blanks, while two others are represented by fragments of bifacially modified working edges. Almost a whole specimen of an oval knife was made from colorful chalcedony. It was worked on both sides by rather crude retouch and trimmed along the edges by small regular retouch. The cross section is lenticular (Fig. 8:6).

Also to knives was assigned a small leaf-shaped *biface*, close to oval in form. It was completely worked by bifacial retouch with several crude flattening spalls on the base. On the working edge are traces of strong polish (Fig. 10:12).

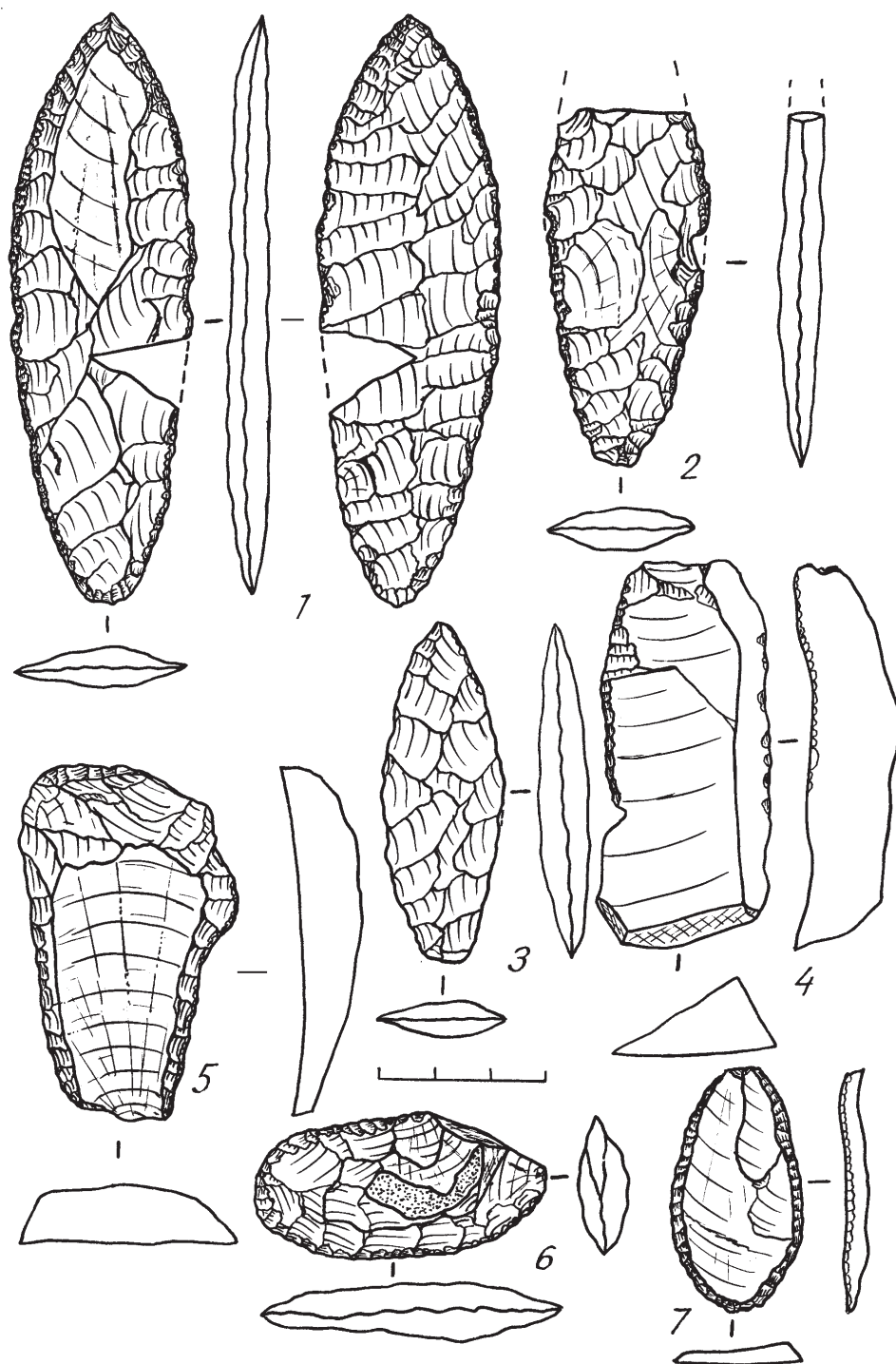


Figure 8. Stone artifacts from the Kheta site: 1, 2—bifaces; 3, 7—scrapers; 4—point; 5—tool on a blade; 6—knife.

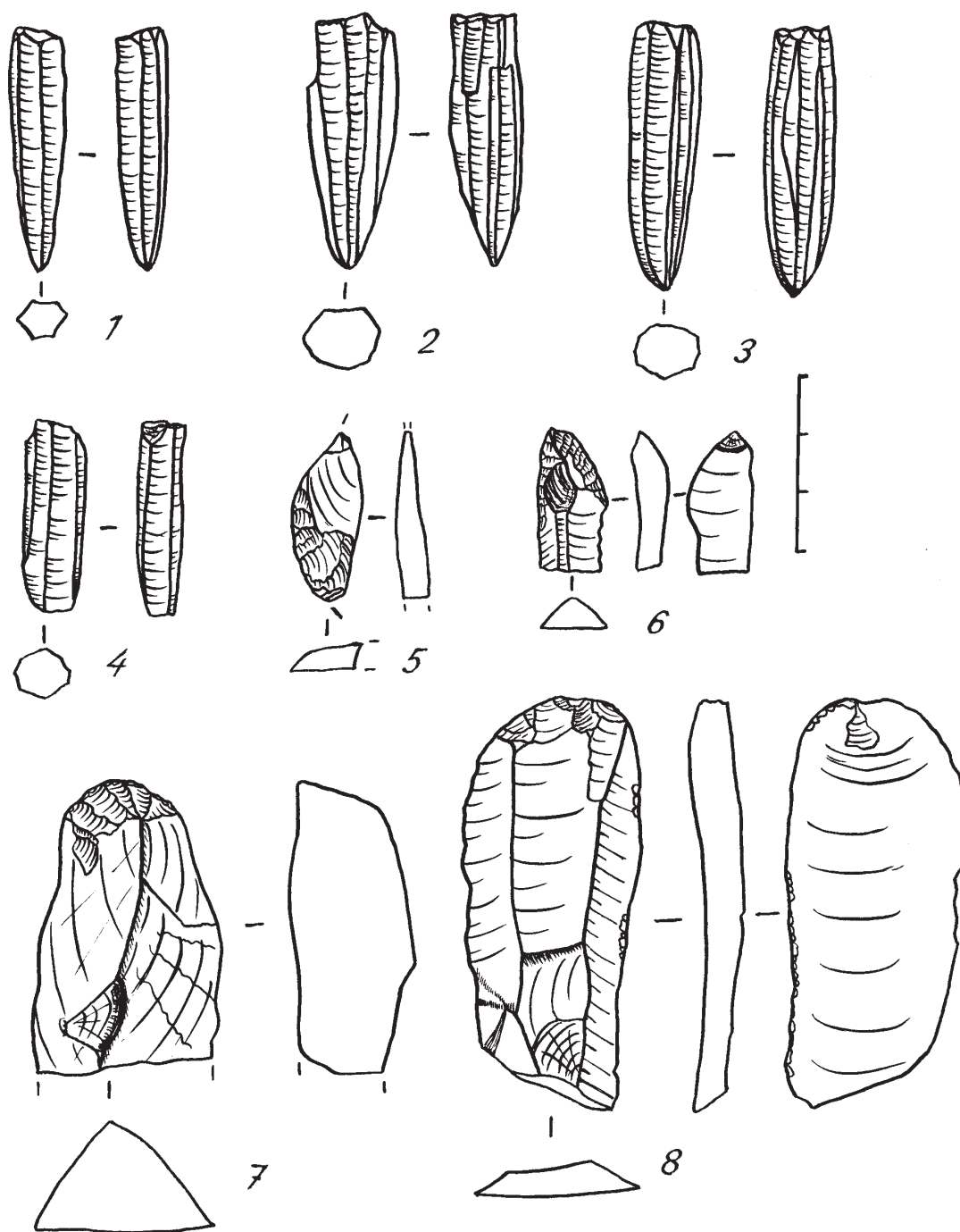


Figure 9. Stone artifacts from the Kheta site: 1–4—cores; 5—graver; 6, 7—scrapers; 8—knife on a blade.

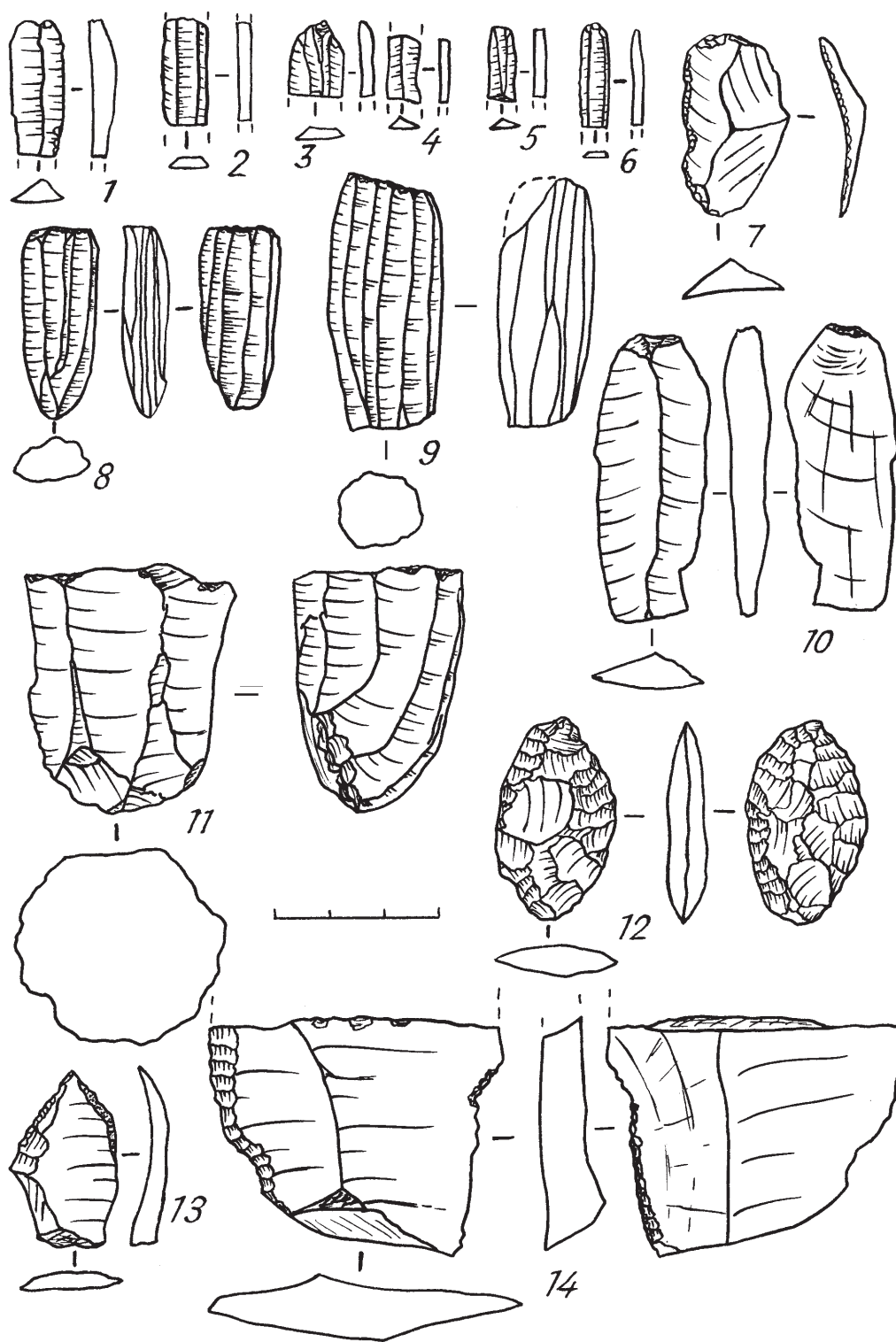


Figure 10. Stone artifacts from the Kheta site: 1–6—knife-like blades; 7, 14—scrapers; 8, 9, 10—cores; 11—blade; 12—biface; 13—graver.

The group of *scrapers* is represented by rather varied specimens. The largest of them, measuring 4.5 x 5 cm, was made on a subrectangular flake. The uneven (dentate) working edge was formed by the removal of crude spalls.

A *subtriangular scraper* with a slightly convex, almost straight working edge was made on a chert flake. The slightly bent end of the working edge occupies the whole lower edge of the flake. The angle of sharpening of the working edge is 60–65°. The edges were trimmed by small retouch (Fig. 7:2).

A *scraper with an oval-convex working edge* was made of soft stone. The working edge of the scraper, like the lateral edges, was modified by retouch directed from ventral to dorsal. Its dimensions are 3.3 x 2.8 cm, with a thickness of 0.7 cm. The angle of sharpening of the working edge is 50–60°. A *side scraper* was made on a chert flake, slightly bent in profile. One longitudinal edge of the flake was worked by small unifacial retouch. The cross section is subtriangular (Fig. 10:7). A *scraper with a beveled working edge* on the end of a knife-like blade has a subtriangular cross section (Fig. 9:6).

A unique subrectangular *tool* with a subtrapezoidal cross section was assigned to scrapers. The dorsal surface was formed by the removal of one broad spall. The edges were worked by steep, almost vertical retouch. A slightly convex form was given to the distal end of the spall. The removal of several spalls caused damage to the working edge (Fig. 8:3).

A *punch (graver?)* was made on the end of a knife-like chert blade of subtrapezoidal section. The converging edges of the blade were trimmed by unifacial edge retouch—along one edge from the ventral side, along the other from the dorsal (Fig. 6:9).

The only specimen of a *polyhedral burin* is represented by a core-like haft. A burin working edge was formed by the removal of seven spalls. Several diagonal spalls were removed from the lower end of the haft. The edge that was formed could have been used as a burin. The burin was rounded in section (Fig. 7:4).

This does not exhaust the tool kit of the third layer. About 20 flakes, worked in small areas by small edge retouch, were identified in the collection. They could have been used as scrapers, knife-gravers, and other auxiliary tools.

Noteworthy is the small number of knife-like blades, considering the substantial number of cores. The strata containing the upper complex lie above the ash layer. Analogies to artifacts from this layer can be found in the Mesolithic and Neolithic materials of Chukotka and Yakutia (conical cores, polyhedral burins, subtriangular scrapers, retouched blades, and others) and dated to the same time. However, it is important to consider that artifacts from the damaged areas of the site, which are assigned to the early and middle complex, could have gotten into the upper complex.

The **Gipoteticheskii site** is located to the west on a cape near where the Gipoteticheskii Creek enters into the Pravaya Kheta from the right 1.5 km above the Kheta site. On the surface of a 20-meter, terrace-like area, in a scattered layer, were found a leaf-shaped *point (knife?)* with round base and a large *blade* with small edge retouch, which was used as a knife (Fig. 11:1, 2). The tools were analogous to artifacts from the second cultural complex of the Kheta site.

The **Buyunda II site** was discovered on the upper reaches of the Buyunda River, 3.5 km from the watershed between the Buyunda and Nyavlenga rivers. On the left bank of the Buyunda, on a scattered-sod area of a 3-meter terrace, a chalcedony *flake* was found (Fig. 12:2).

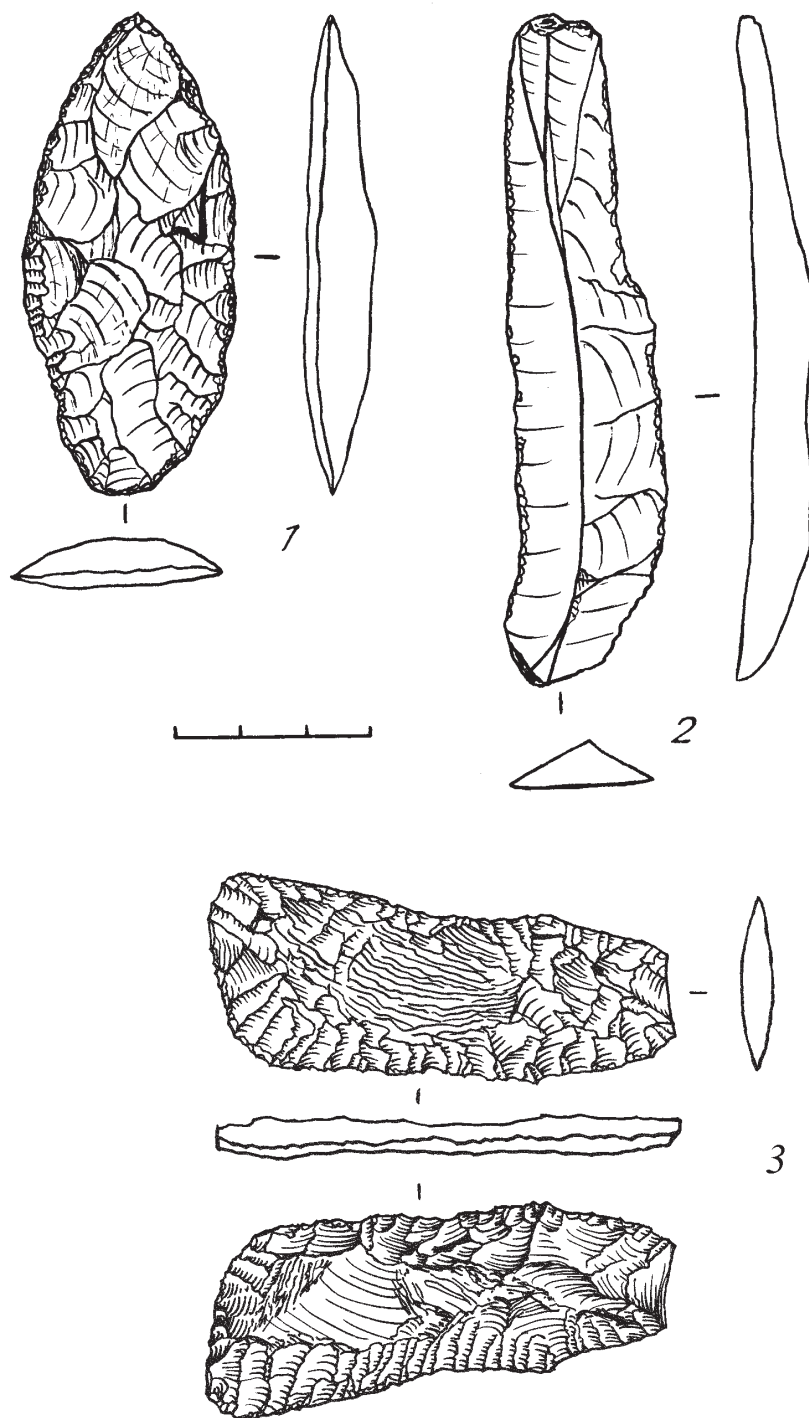


Figure 11. Stone artifacts from the Gipoteticheskii site (1, 2) and Levaya Kheta II (3): 1—leaf-shaped biface; 2—knife on a blade; 3—stemmed knife.

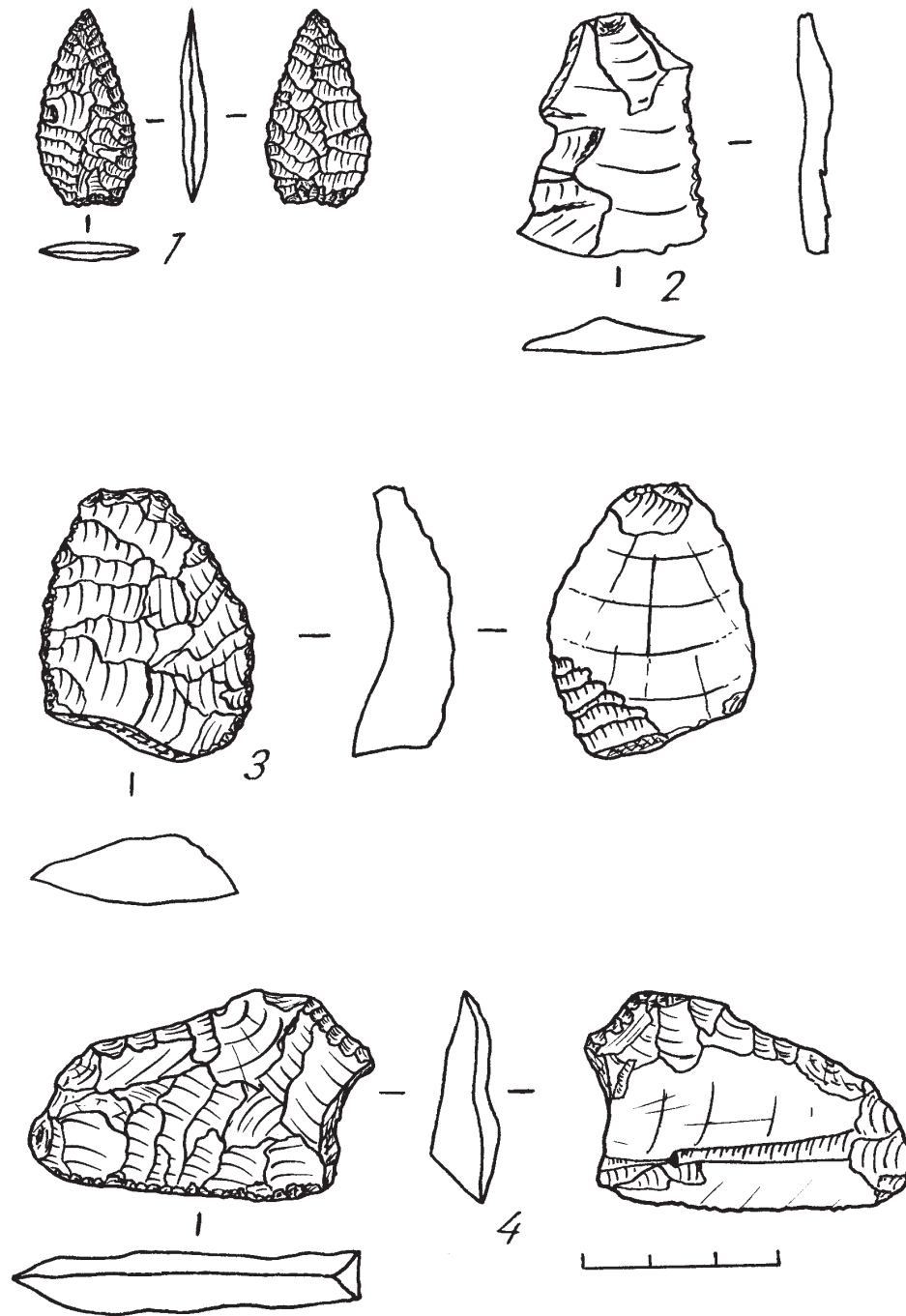


Figure 12. Stone artifacts from the Buyunda II site: 1—point; 2—retouched flake; 3—scraper; 4—knife-scraper.

Upon clearing the exposure, three more artifacts of chalcedony were found: a point, a knife, and a scraper. They lay close together in gray sandy loam under the sod at a depth of 4–6 cm. The flake was possibly used as a tool (scraper or knife) since its one edge had indentations.

The truncated leaf-shaped *arrowhead* was worked by fine pressure retouch (Fig. 12:1).

The scraper was made on a flake bent in profile. Its dorsal side is completely covered with retouch; only a few spalls were removed from the ventral side along the lower edge of the flake and in the place of the bulb of percussion. The working edges of the scraper are the longitudinal edges of the flake, trimmed additionally by small retouch (Fig. 12:3). The functional assignment of the next artifact is difficult to determine. One edge of the subtriangular flake was worked by bifacial retouch, the other by unifacial. This is probably a knife-scraper (Fig. 12:4). The site dates to the Late Neolithic.

The **Buyunda III site** is located on an island terrace that appeared as a result of the formation of a new channel of the Buyunda River. Thus, the terrace is in the middle of the valley separated from its left side by an old, dry channel and from its right side by the modern river channel. The terrace is 1.5 to 2 m high, level, and formed of small sandy loam deposits. Brush, occasional trees, moss, and lichens cover its surface.

On the surface of the terrace were found 2 chert flakes and northeast of them 2 knife-like blades. Excavations were conducted in an area 2 x 2 m in the place where these two blades were found. The cultural layer, revealed at a depth of 15 to 20 cm, went down to 60 cm. With the excavation, it became clear that the blades had been brought to the surface with soil from a chipmunk burrow; the remains of this burrow, up to 15 cm in diameter, were clearly recorded in the excavation, in the profile of the western wall.

Part of a hearth, built into the western wall, was uncovered by the excavation. The deepest cultural layer (60 cm) is recorded in the fill of the hearth (Fig. 13a, 13b). Around the hearth and especially in its fill a wealth of charcoal was noted. The charcoal is represented by rather large, high-quality specimens. In addition, in the fill of the hearth was a large quantity of flakes, blades, and a few pieces of burned birch bark. On many blades a layer of residue up to 1 mm thick was preserved. The outside diameter of the hearth (based on the profile of the eastern wall) was approximately 1 m. It was formed from several large (to 25 cm across) stones with small stones filling between them. These stones all have traces of smoke and soot. On the outside of the hearth was a multitude of flakes, blades, and two fragments of cores with traces of soot. Two other cores were found 0.5 m from the hearth with no traces of smoke on them. At the base of the cultural layer were lenticular accumulations of volcanic ash, presumably from Elikchan (Lozhkin 1987). Based on the eastern wall of the excavation, the following stratigraphy of the site was determined:

	Thickness, cm
1. Vegetation layer	6–18
2. Gray sandy loam with carbonaceous layer in the lower part (cultural layer)	to 50
3. Dense rust-colored sandy loam	10–15
4. Gray sand with pebbles	more than 50

Stone artifacts were found over the whole area of the excavation, but their greatest concentration was observed in the eastern part. A total of 2,420 stone artifacts were found in the layer: 1,275 flakes, 950 knife-like blades, 57 ribbed blades, 5 cores, 4 regeneration spalls of the working platform of the cores, 21 core fragments, 98 tools on blades, and others.

Most of the flakes are small, measuring 1 cm or less (948 specimens of them in the collection). Substantially fewer flakes measure from 1.1 to 2 cm (283 specimens), from 2.1 to 3 cm (37 specimens), and only 7 flakes measure more than 3 cm. On the dorsal surface of individual flakes are small areas covered with cobble cortex. The same cortex can be seen on fragments of cores and on core regeneration spalls. Its presence on artifacts is not connected with water or wind erosion. This is a feature of so-called slab separations that are formed in crystalline rocks, for which increased cracking, layering, and breaking are characterized, which probably led to imperfection in the making of cores. Such stones were obtained not on the river bars but in exposures of bedrock on the hill slopes. Chert of yellowish and light-gray color and poorly silicified tuff of gray and greenish color were used.

The knife-like blades were made from the same stones of chert as the flakes. Most of the blades are represented by fragments of proximal, distal, and medial parts. No more than 10 blades can be assigned to whole specimens. Among the rest, whole specimens can be assembled by means of refitting. Thus, three blades were restored from two pieces and one from three pieces. Also, two blades were refitted in the sequence of their removal from a blank (Figs. 14:11; 15:33). The width of the first spall, in order of removal, is 1 cm in the upper part, 1.6 cm in the lower; the length is 4 cm, the thickness 0.4 cm. It was used for making an end scraper with a beveled working edge. The second spall is larger. Because of preserved areas of the cortex of plate separation, both spalls were reliably and successfully refitted. The fact is that the different conditions of bedding of the spalls, even within the framework of one stratified horizon and one cultural layer, lead to different qualities and colors of the patina forming on them. The second spall is gray in color with a dark-brown patina on the ventral side. The first spall can be described as a denser yellowish silicified stone. In addition, the spall removed first is 0.16 cm higher than the second; this difference attests to the trimming of the core's pressure platform before the removal of the other blade, as well as each successive blade, from it.

The greatest length of whole blades is 6.1 cm, but, judging by some ribbed blades, it could have reached 6.5 cm. There are 154 specimens of microblades less than 0.5 cm wide in the collection. The overwhelming majority of blades (752 specimens) are 0.5 to 1 cm wide. There were 54 specimens of blades with a width of more than 1 cm. Part of them have indented edges and were evidently used as insets. On the whole, blades amount to 39.3% of all artifacts from the site, but considering that all the tools were made on blades and ribbed blades, in fact derived from the modification of cores that also attest to a blade technology, their share in the complex amounts to 46%. But even this does not reflect the real picture since most flakes are debitage from the production of cores and trimming of their pressure platforms.

Most chert fragments (12 specimens) could be refitted into a prismatic core blank. Traces of only a few amorphous spalls can be seen on its surface. The poor quality of the material led to waste. Ribbed blades were not used for making tools. Their greatest length is 6.5 cm, width from 1.6 to 2.4 cm. All the ribbed blades have a three-faceted cross section. Eleven specimens were worked by retouch of one of the dorsal facets; 17 specimens have both upper facets retouched (Fig. 14:1, 2). The remaining specimens are represented by small fragments.

Cores are of the prismatic type. Blades from them were flaked along the whole circumference. Two cores were split in cross section. Their diameters fluctuate from 2.2 to 3.5 cm (Fig. 14:15). One core is represented by a spall that embraced half the pressure platform and part of the flaking front (Fig. 14:17). Judging by the small edge retouch applied to the upper part along the longitudinal edges of the spall that were formed after the splitting of the core and to the area of removal of the smallest burin spalls

along its sharp lower edge, the tool was reformed into a burin. Also, indentations and polish of the lower edge of the spall point to this. Two more cores are represented by almost exhausted specimens. The form of the pressure platform is rounded. One possibly had the base split. Cores are single-platform, but each has one spall removed, directed from the support area. Fine and even knife-like blades of triangular and trapezoidal section were removed from the cores (Fig. 14:12, 13).

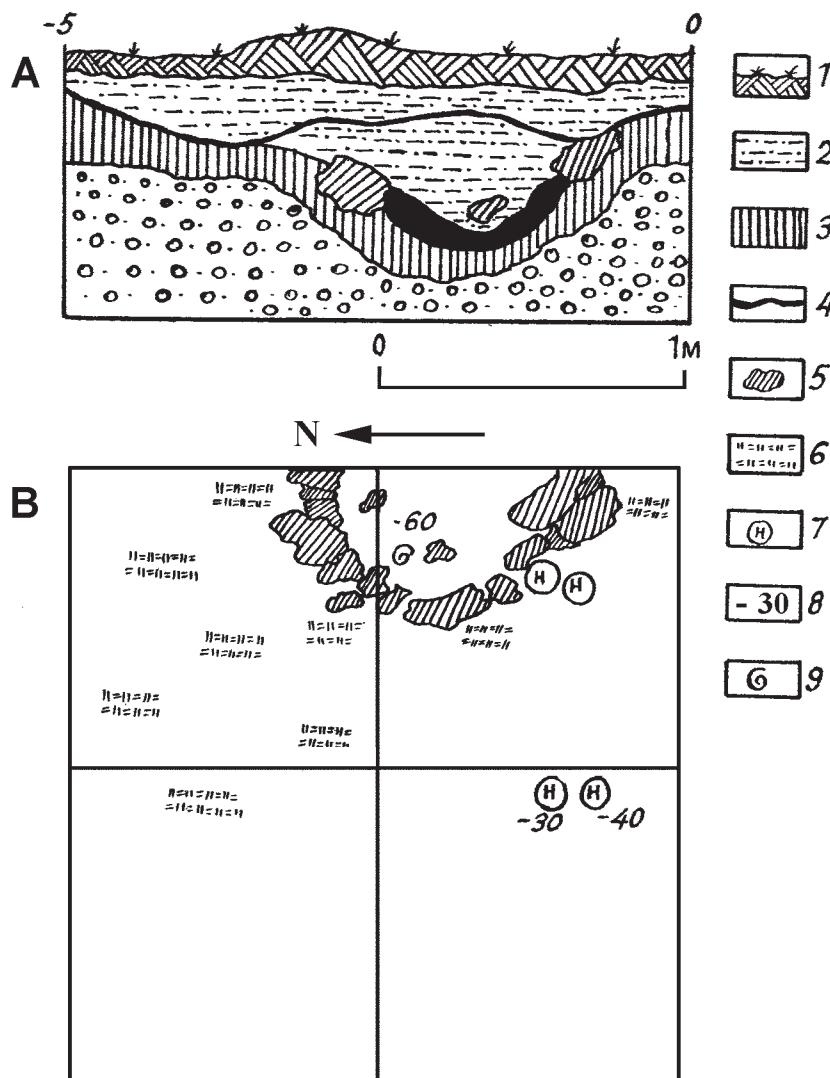


Figure 13. Stratigraphic profile of the eastern wall (a) and plan of the trench (b) in the Buyunda III site: 1—sod; 2—gray sandy loam; 3—rust-colored sandy loam; 4—carbonaceous layer; 5—stones; 6—carbonaceous stains; 7—core; 8—depth of finds; 9—charred birch bark.

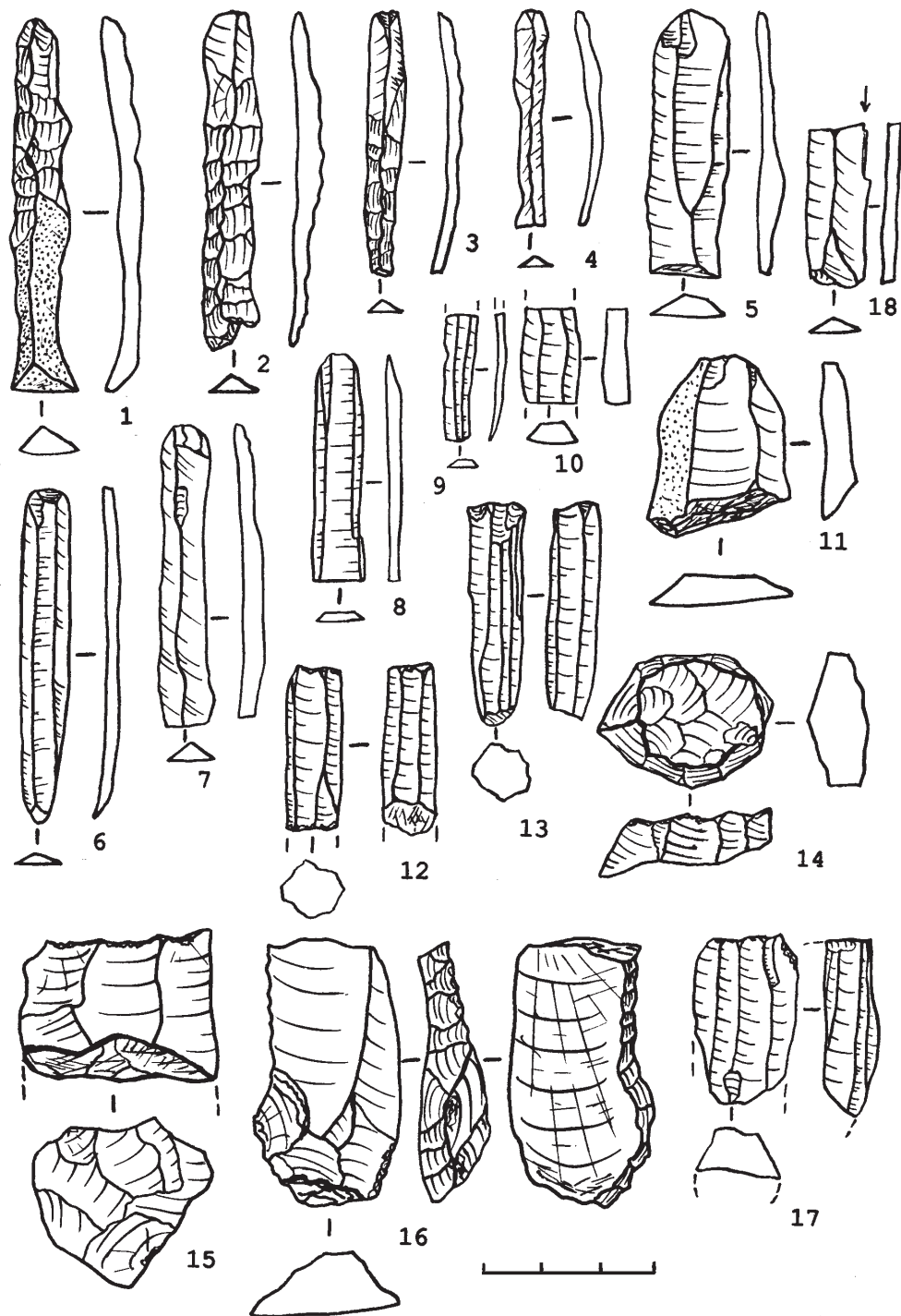


Figure 14. Stone artifacts from the Buyunda III site: 1-3—ribbed spalls; 4-10—knife-like blades; 11—blade; 12, 13, 15—cores; 14—core tablet; 16, 17—spalls from cores; 18—angle burin.

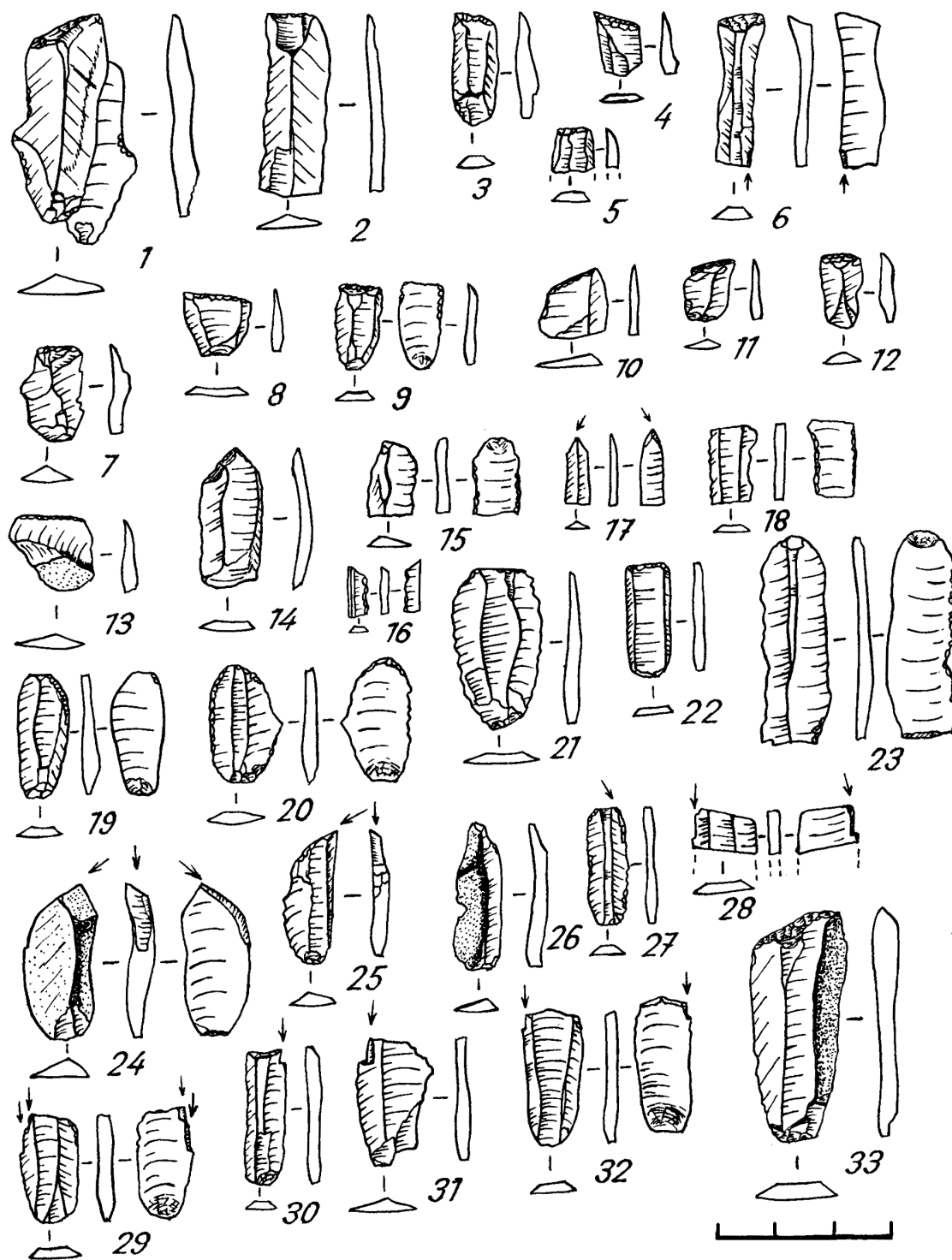


Figure 15. Stone artifacts from the Buyunda III site: 1–33—tools on knife-like blades.

Of four regeneration spalls from the pressure platform of the cores, three are large flat *flakes*, measuring 3.0 x 3.8 cm, which had embraced part of the pressure platform of the core. On their dorsal surface can be seen radial spall scars from trimming the pressure platform of the core, and on the butt are negatives of blade removal. One spall is a completely removed oval pressure platform—a core tablet. On its end can be seen the negatives of five or six removals (Fig. 14:14).

The largest flake in the collection is a lamellar one of gray chert. One edge of the large blade is flat, formed by retouch, evidently having traces of modification of the artifact from which it was split. The other edge is sharp, almost unworked, with the exception of a small area on the lower part of the blade (Fig. 14:16).

Stone tools were made predominantly on blades and sections of them. Only four flakes were found with traces of unifacial retouch along the edges. In three cases these are scrapers; in one case, the flake could have been used as a knife. The dimensions of the flakes are from 2 to 4 cm. The most interesting are tools on blades. They include insets (63 specimens), burins (8 specimens), graters (4 specimens), blades with beveled edge (8 specimens), and scrapers (15 specimens).

Insets were made predominantly from unretouched blades. Only a few of them have a working edge that is lightly trimmed by the smallest edge retouch on the dorsal (Fig. 15:18–20) or ventral side (Fig. 15:15, 17, 21, 23). But this retouch is often concealed by breaks and traces of wear and thus the retouched blades fall into the group of insets without modification (there are more than 50 of them in the collection). In most cases retouch or traces of wear are recorded along one edge of the blade. Combined use of the insets is possible: retouch along the edge coincides with the removal of a burin spall (Fig. 15:27). Bifacial or convergent retouch is almost absent. On only four insets is there such retouch, though not along the edges of the blades, but rather on the ends of the segments for forming a beveled edge (Fig. 15:19, 20, 22). The width of the insets is from 0.4 to 1.1 cm, the thickness from 0.15 to 0.35 cm.

Angle burins. A burin spall was removed at a right angle to the plane of flaking of the blades along one of the edges (Figs. 14:18; 15:28–32). Two burins were rejuvenated two or three times by removal of burin spalls. On some burins the edge opposite the burin edge was worked by small retouch, forming a beveled edge (Fig. 15:27). The length of the burins is 1.8 to 2.8 cm, the width 0.7 to 1.1 cm. The length of the burin spalls is 0.3 to 0.9 cm. *Graters* are represented by four specimens. Their working edges were formed by the removal of a beveling spall directed transverse to the blade (Fig. 15:14, 16, 24, 25). In one case the tip was additionally set off by a deep groove (Fig. 15:26). The length of the graters is 2.1 to 2.2 cm, the width 0.8 to 1.2 cm.

Scrapers are represented by 15 specimens. On all of them the working edge is located on the lower end of the blade. Distinguished are scrapers with a beveled (seven specimens), straight (seven specimens), and slightly convex (one specimen) working edge. All the working edges were modified by small edge retouch directed from ventral to dorsal. Noted among the scrapers with a beveled working edge are artifacts with the working edge slanting to the left (four specimens) and to the right (three specimens). The angle of the slant amounts to 50–70°. Scrapers can be divided into tools for working in the direction away from the body, sideways, or ambidextrously, with either the left or right hand. The length of the scrapers is 1.1 to 4 cm, the width 0.6 to 1.6 cm (Fig. 15:1, 3, 4, 10, 11). Seven artifacts were assigned to scrapers with a straight working edge. On 4 scrapers the working edge was modified by unifacial retouch, on 2 the retouch is more slanting. The length of the scrapers is 1.0 to 2.1 cm, the width 0.7 to 1.3 cm (Fig. 15:2, 5–9, 13). The one artifact with a slightly convex working edge is on the end of a blade (Fig. 15:12).

Artifacts (eight specimens) with an edge trapezoidally beveled by retouch were assigned to a separate group (Fig. 15:19, 20).

A bifacially worked *chopping tool* 7.8 cm long and 3.6 cm wide was made of silicified stone. It has an elongate triangular form and almond-shaped cross section. By varying faceted retouch, from sloping to steep, along the whole perimeter of the tool, the working edge was formed. Its broad, flat lateral surfaces were not modified: on one side, this is the natural surface of the plate separation; on the other, there are negatives of large, probably primary, spalls. Toward the working edge, the tool narrows in plan and in longitudinal section, while toward the butt it expands.

Based on charcoal taken from the hearth, radiocarbon dates were obtained determining the age of the site: 8135 ± 220 (GX-17064), 7510 ± 205 (GX-17065), 7790 ± 190 (LE-3991), 8146 ± 130 (DRI-3043), and 5610 ± 110 (LE-3898). These dates provide a basis to assert that the upper reaches of the Buyunda were settled in the early Holocene.

The **Buyunda VII site** was discovered on the upper reaches of the Buyunda River, on its right bank 2 km above its confluence with Tabornyi Creek, and on a high hill partially damaged by a pit and cut by a road. The height of the hill is 6 to 7 m. It stretches from north to south along the road 75 m and from east to west 27 m.

On the northern part of the hill, at the edge of the pit, six artifacts were found: one core, one blank, one scraper, two cobble scrapers, and one cobble flake.

The *core* was made of brown chert and was not exhausted at all. Its final form would possibly change during the process of use, but at this stage of its modification it can be assigned to the conical type. In cross section its form is closer to quadrilateral. Two of the four sides of the core were almost unworked; the pressure platform is level, covered, except a small area, with flat pressure retouch. From the core only primary spalls were taken off, which removed the cobble cortex from the well-chosen blank (Fig. 16:2).

The *blank*, of white silicified tuff, has the form of a rectangular whetstone. The ventral and dorsal surfaces were not modified. The lateral planes were partially retouched (Fig. 16:1).

The *scraper*, of bright-green chert, is quadrilateral in plan. The cross section is subtriangular. The ventral surface was not worked and is represented by the plane of a spall. The dorsal surface was modified completely. The edges were additionally trimmed by small pressure retouch (Fig. 3:4).

The two skreblos were made on primary subtriangular cobble spalls. The lateral edges were retouched for attachment of the skreblos to a haft. The lower edge of one flake is straight, while the other is slightly convex; both were used as scraper working edges without additional modification. The dimensions are 4.7 x 5.5 cm and 8.5 x 7.2 cm, respectively.

The cobble skreblos and flake were taken from the exposure at a depth of 4 to 5 cm under the sod in rust-colored sandy loam. The first three artifacts of chert were found on the surface of the exposure.

The finds from this site were assigned to different chronological periods: the core, blank, and chert scraper can be dated to the early-middle Holocene; the cobble skreblos are similar to materials from sites of the Metal period on the Upper Kolyma.

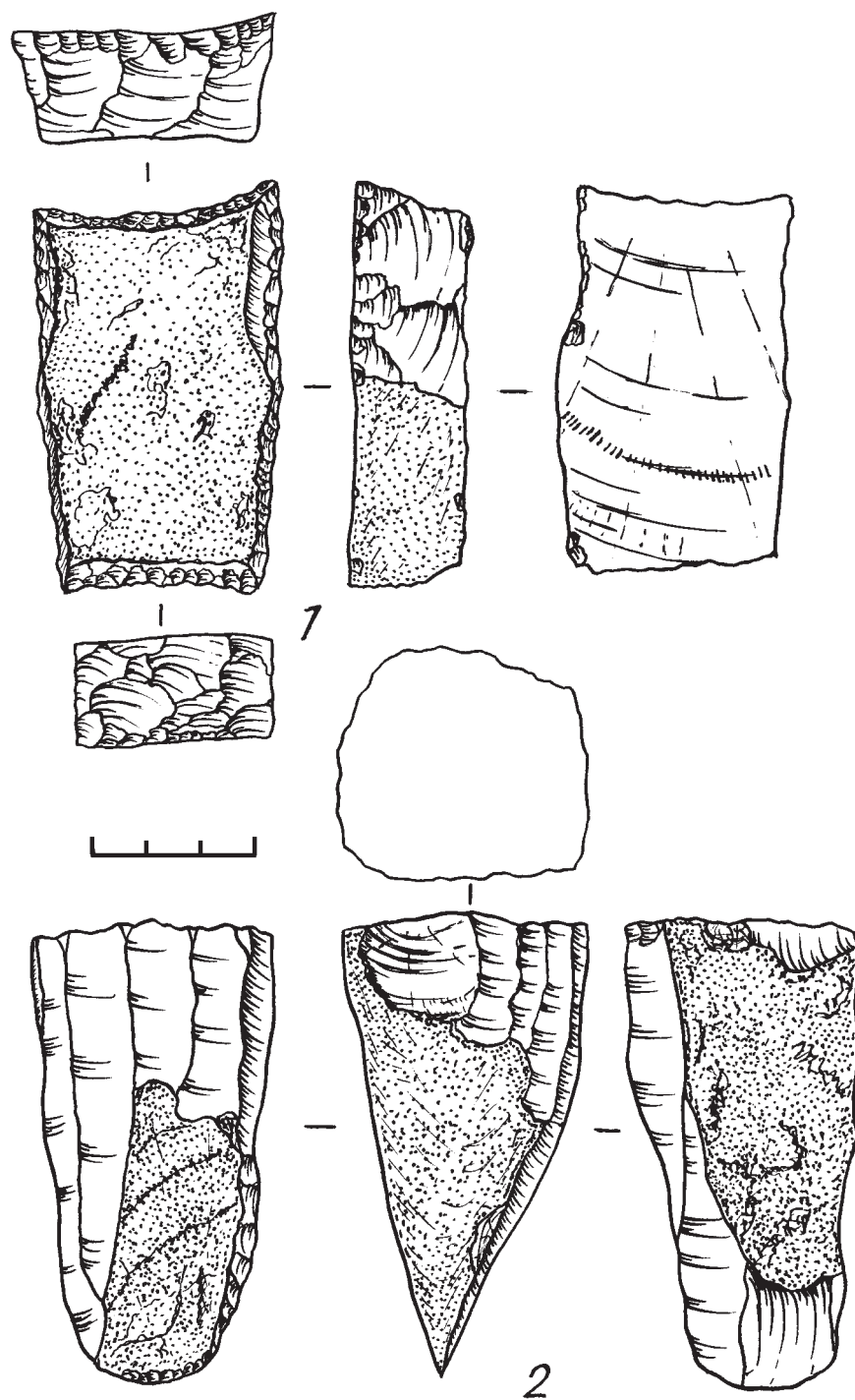


Figure 16. Stone artifacts from the Buyunda VII site: 1—blank; 2—core.

The **Kupka I site** was discovered in 1989 in the region of the Okhotsk-Kolyma watershed, in the pass between the Kananyga River, which empties into the Okhotsk Sea, and the Pravaya Kupka River (a right tributary of the Buyunda River). On the scattered-sod surface of the pass, in a plot designated **Locus I**, 12 flakes, 10 blades, and 10 tools were found in an area of about 4 m².

The flakes, of light chert, are predominantly medium and large in size (1 to 3 cm). Some have edge retouch and could have been used as tools.

The *knife-like blades* have a subtriangular and subtrapezoidal cross section. Their width is 0.6 to 1.4 cm (Fig. 17:1–4). The blades were partially retouched along the edges. Identified among the tools are an arrowhead, burin, scraper, five biface fragments, an inset, and a grooved tool.

The *arrowhead* is of the stemmed type with sloping shoulders smoothly transforming into a working edge and with an elongate subtriangular stem. It was completely worked on both sides by pressure retouch and has lenticular cross and longitudinal sections (Fig. 17:7).

The *burin* is polyhedral with a subtriangular retouched haft (Fig. 17:8).

The *scraper* was made on a flake, the lower edge of which was worked by small unifacial retouch (Fig. 17:12).

Of the five fragmentary biface *tools*, one was apparently still in the blank stage. Two others are represented by pieces of knives (Fig. 17:9, 13). Judging by the material, the quality of modification, and the sizes, it is possible that these fragments make up one tool: a bifacially worked knife with a bent haft and convex working edge that has a lenticular cross section. Two more *bifaces* are fragments of knives or points. One has a slightly convex base, the other a pointed base. The cross section is lenticular (Fig. 17:10, 11). The *inset* was made of light chert. It has straight edges and a flattened-lenticular section; it was worked on both sides by creeping retouch (Fig. 17:6).

The grooved tool was made on a chert flake. Two grooves, 0.2 to 0.3 cm deep and 0.7 to 0.8 cm wide, were formed on the opposite ends by unifacial retouch (Fig. 17:5). The site is dated to the Neolithic.

The **Dzhugadzhaka I site** was discovered on the upper reaches of the Dzhugadzhaka River on the Okhotsk-Kolyma watershed. On some maps this river bears the name Dyugadyak and Dyugudyak, which in translation from Even means “summer house” or “summer camp” (Leont’ev and Novikova 1989:135).

The site is located on the northeastern shore of Lake Kolkhoznoe. On the surface of a 3–5-meter terrace, at the spot of a nomadic reindeer herders’ camp, 30 stone artifacts were collected: gray silicified tuff (10 specimens), chalcedony (four specimens), and orange (one specimen) and gray (15 specimens) chert. Among the finds are 15 flakes, three blades (Fig. 18:2, 3, 7), three flakes with retouch (Fig. 18:4), one lamellar flake with retouched longitudinal edges, and seven tools and fragments of them.

Of the three *blades*, represented in the collection, only one can be viewed as knife-like (Fig. 18:3); two blades were worked along the edges by unifacial retouch (Fig. 18:2, 3).

The *tools* are represented by a whole almond-shaped biface (Fig. 18:1), two insets on lamellar flakes with longitudinal edges worked by unifacial opposing retouch (Fig. 18:4, 5), a fragment of a bifacial tool of chalcedony worked by creeping retouch on both surfaces and having a lenticular section (Fig. 18:6), and fragments of tools (Figs. 18:8, 9; 20:1, 3). The materials from the site were assigned to the late stage of the Neolithic.

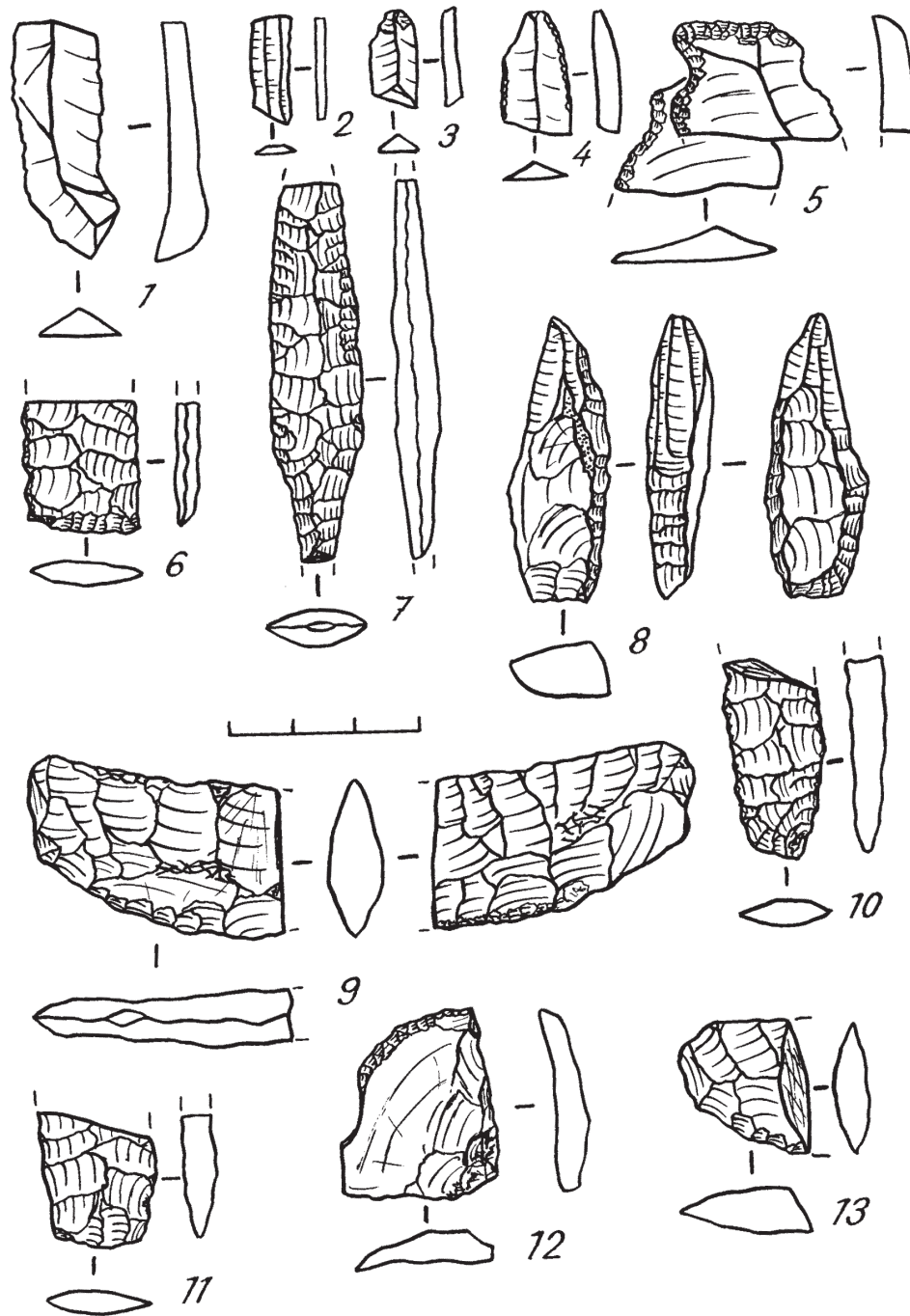


Figure 17. Stone artifacts from the Kupka I site: 1–4—knife-like blades; 5—grooved tool; 6, 9, 10, 11, 13—biface fragments; 7—stemmed point; 8—polyhedral burin; 12—scraper.

The **Dzhugadzhaka II site** was discovered on the watershed between the Dzhugadzhaka and Olyn' rivers, approximately 0.5 km south of Lake Kolkhoznoe.

Seventeen specimens were found and collected in an area 10 to 12 m² on the scattered-sod surface of a small hill. They were all made of one material: platy separations of gray laminated slate. Only two types of tools are distinguished among them: knives and points. All the artifacts were worked by bifacial retouch. The small points were worked over the whole surface. The only whole *arrowhead* has a straight base and straight parallel edges that converge at the very tip (Fig. 19:2). Noted among the finds are several fragments of straight biface bases (Fig. 19:3, 4), a tip (Fig. 19:6), and a midsection (Fig. 19:7), all of which can be assigned to points. Larger artifacts were worked only on the edges, while the middle retained the unmodified area of platy separation (Fig. 19:1).

A bifacially worked inset with an asymmetrical straight base should most likely be assigned to *knives* (Fig. 19:5). The other insets are fragmentary (Fig. 19:8–10). The rest of the artifacts are exfoliating and indeterminate fragments of tools. The site is dated to the Late Neolithic.

The **Dzhugadzhaka III site** was found on the watershed between the Dzhugadzhaka and Olyn' rivers, on an isolated hill 500 m south of the Dzhugadzhaka II site. In an area 10 to 15 m² on the scattered-sod surface of the hill were found three large (more than 3 cm) flakes, eleven lamellar flakes of chert, one chalcedony flake, and three tools.

The lamellar *flakes* are 1.2 to 4.5 cm wide and up to 6.7 cm long. The section of the blades is subtriangular and trapezoidal. All three tools—a point and two fragments of bifaces—were made on slabs of slate. The base of the point is damaged and difficult to determine. One of the surfaces of the point was ground after being modified by retouch. On the other side, only the edges were worked. The site is dated to the Neolithic.

The **Dzhugadzhaka IV site** was found in the watershed between the Dzhugadzhaka and Olyn' rivers. On the scattered-sod surface of a terrace in an area of about 20 m², 18 artifacts of white silicified tuff were collected. All the finds had a heavy patina. Among them are three flakes measuring up to 3 cm, three ribbed blades (Fig. 20:2, 7, 10), blades and lamellar flakes (11 specimens) with subtriangular (Fig. 20:8, 9) and subtrapezoidal (Fig. 20:4, 5) cross section, and one knife-like blade (Fig. 20:6) with subtriangular section. The site is dated to the early Holocene.

The **Nil-Ust'e site** was discovered on the upper reaches of the Nil River in the Ol'skoe Plateau. It is on a cape on the right of the mouth of a left tributary of the river. The gentle slopes of the cape have scattered sod as a consequence of solifluction processes. On the surface of the slopes in an area 60 m² were found more than 150 flakes of chalcedony and chert, 30 knife-like blades with traces of use, two cores (one conical flattened), one fragment of ceramics with waffle stamp, one spall from a ground tool, fragment of a rounded-in-plan pendant with a hole, one scraper of subtriangular form, one multifaceted burin with retouched unifacially convex body, two knives (one on a flake, the other on a chert slab), one point of subtriangular form with a grooved base on a chert flake, one fragment of a point with lenticular section, one blank of a biface tool, two artifacts on blades, and one bifacially worked fragment (a stem?) of a tool (Figs. 21:1–13; 22:1–13).

The **Nil II site** was found on the right bank of a tributary of the Nil River 2 km from its mouth. A 5-meter morainal hill extends 35 m along the tributary. On the edge of the hill distant from the mouth, in an area 30 m² were more than 100 chert and chalcedony flakes, 30 knife-like blades and ribbed spalls (Fig. 23:1–3), including two specimens with an edge truncated by retouch (Fig. 23:3, 4), a piece of a prismatic core (Fig. 23:5), two fragments of stemmed tools (Fig. 23:7, 8), a subtriangular point (Fig. 23:9), and an adze-like tool on a cobble (Fig. 23:6).

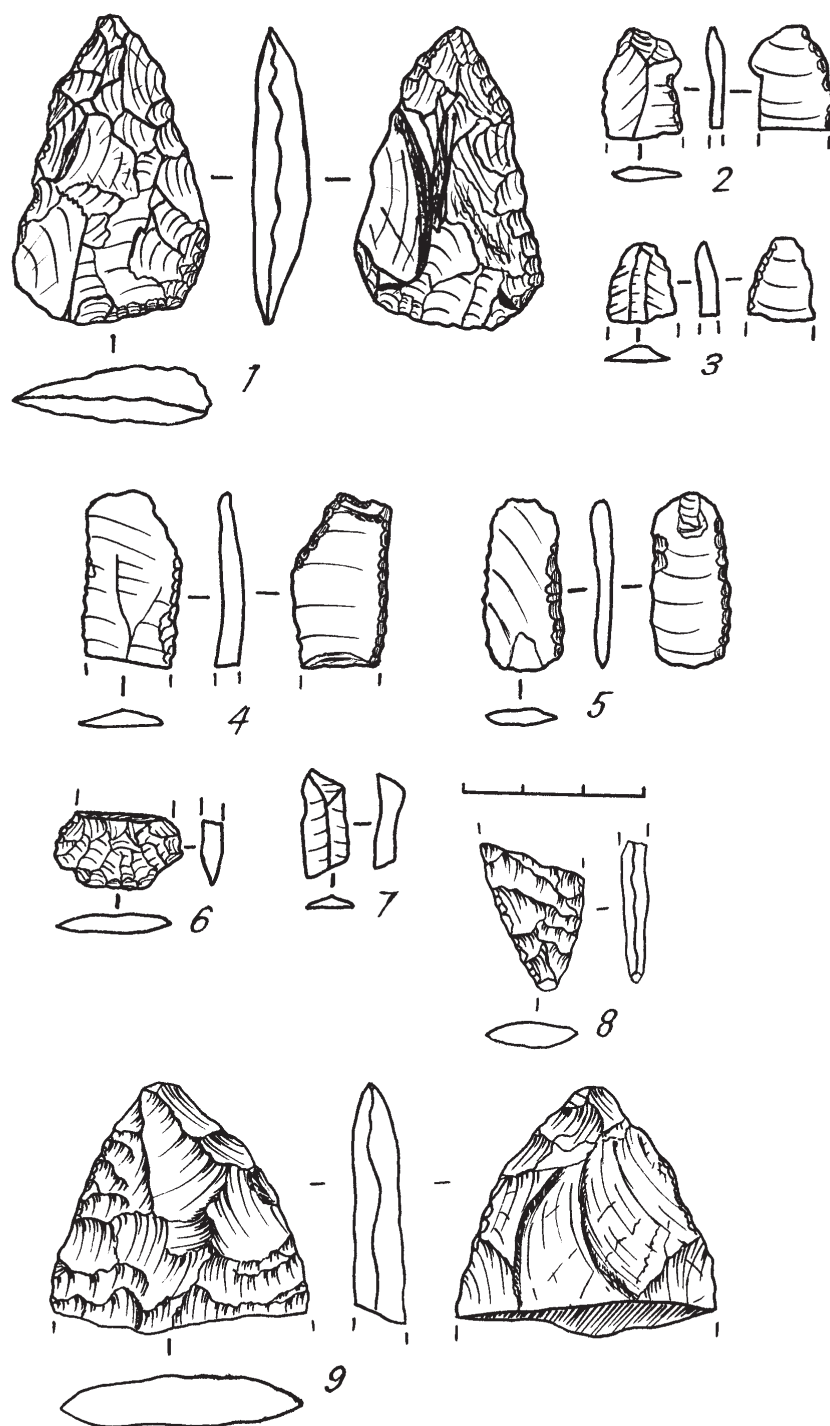


Figure 18. Stone artifacts from the Dzhugadzhaka I site: 1—biface; 2, 3, 7—blades; 4, 5—inserts; 6, 8—fragments of points; 9—biface fragment.

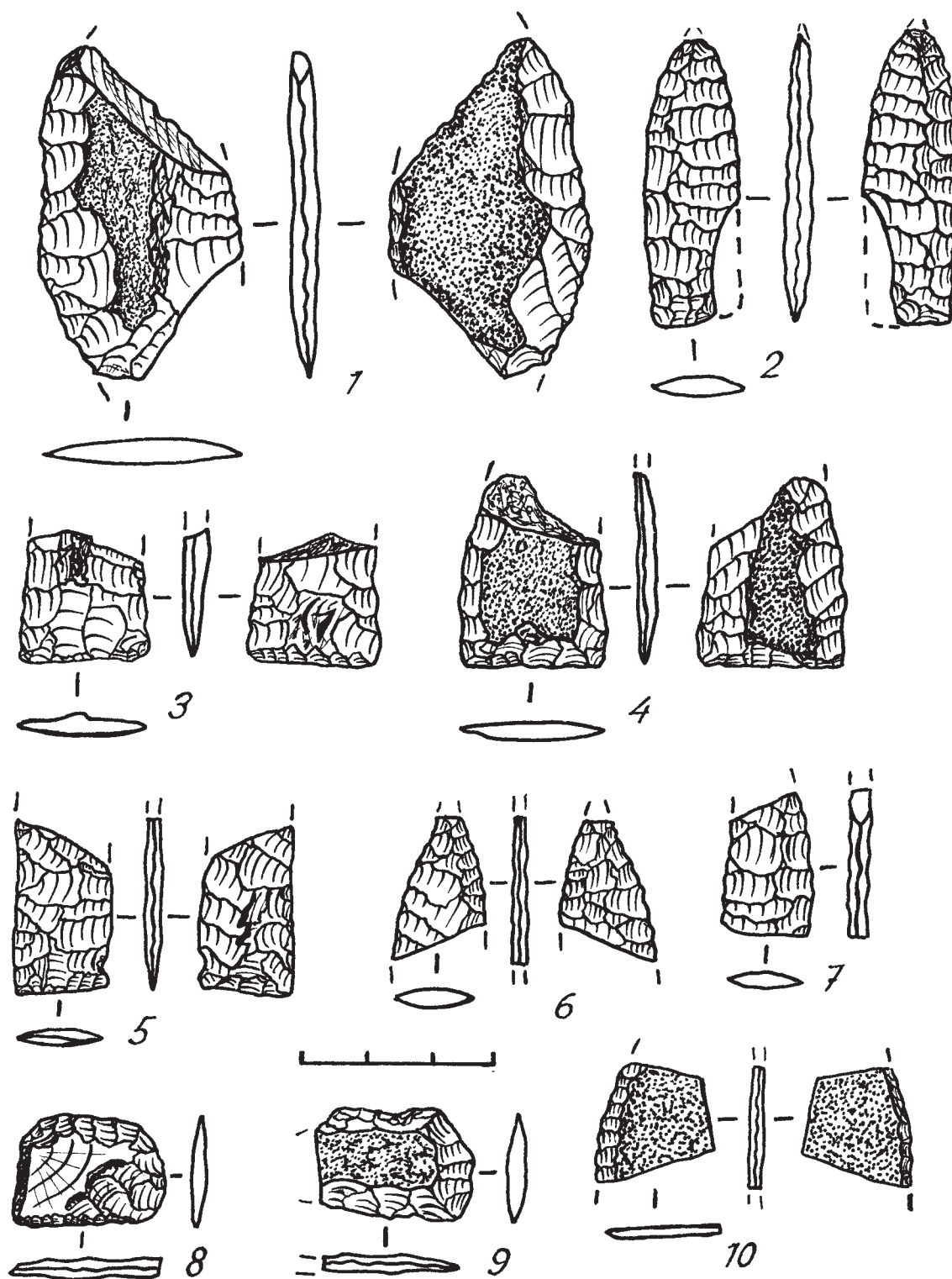


Figure 19. Stone artifacts from the Dzhugadzhaka II site: 1, 3, 4, 5, 7–10—knives, insets; 2, 6—points.

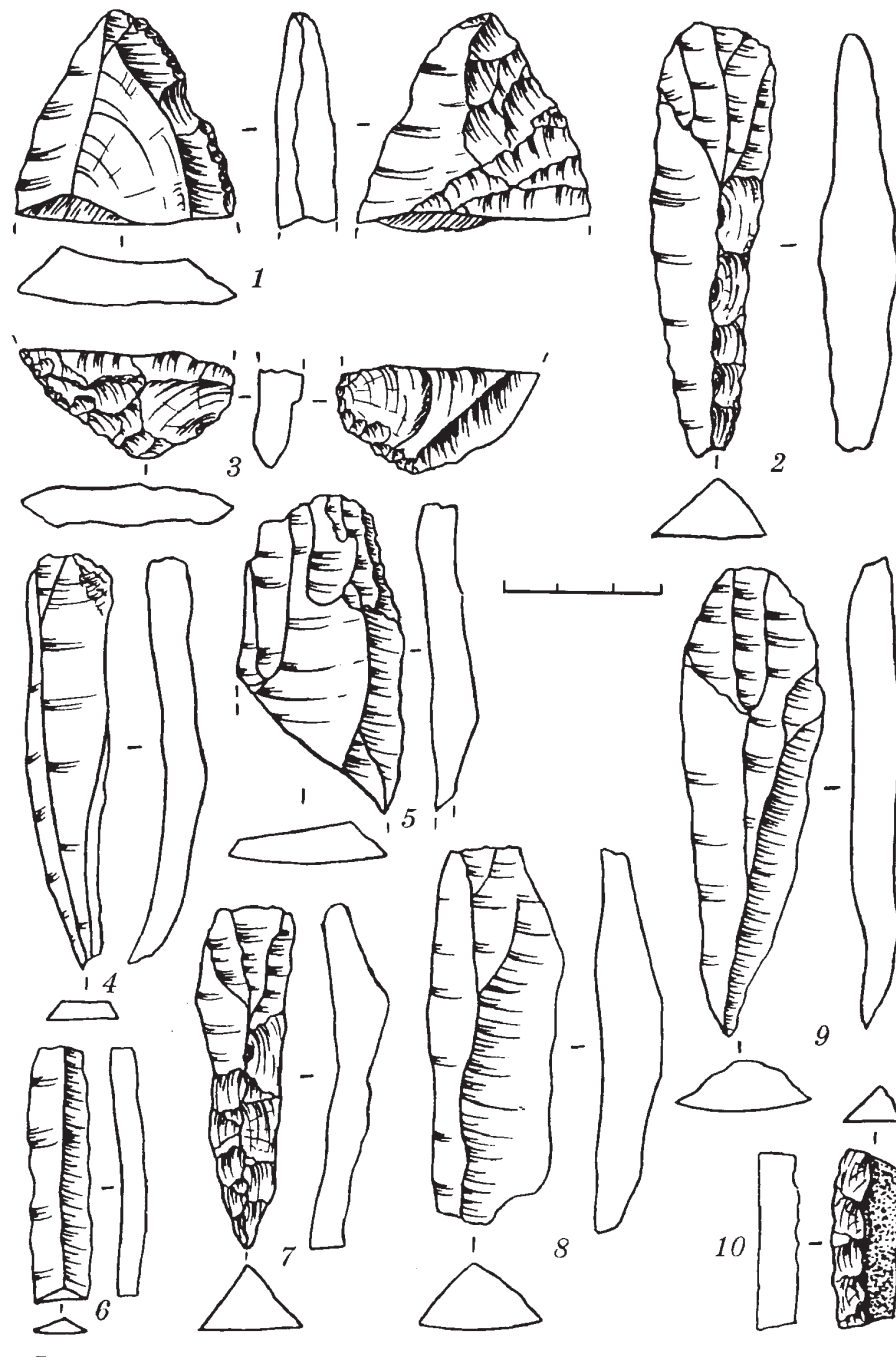


Figure 20. Stone artifacts from the sites of Dzhugadzhaka I (1, 3) and IV (2, 4–10): 1, 2—biface fragments; 2, 7, 10—ribbed blades; 4, 5, 8, 9—blades; 6—knife-like blade.

The Nil IV site was discovered on the upper reaches of the Arman' River in the region of the Ol'skoe Basalt Plateau. It is on the watershed between the Nil and Igarka rivers.

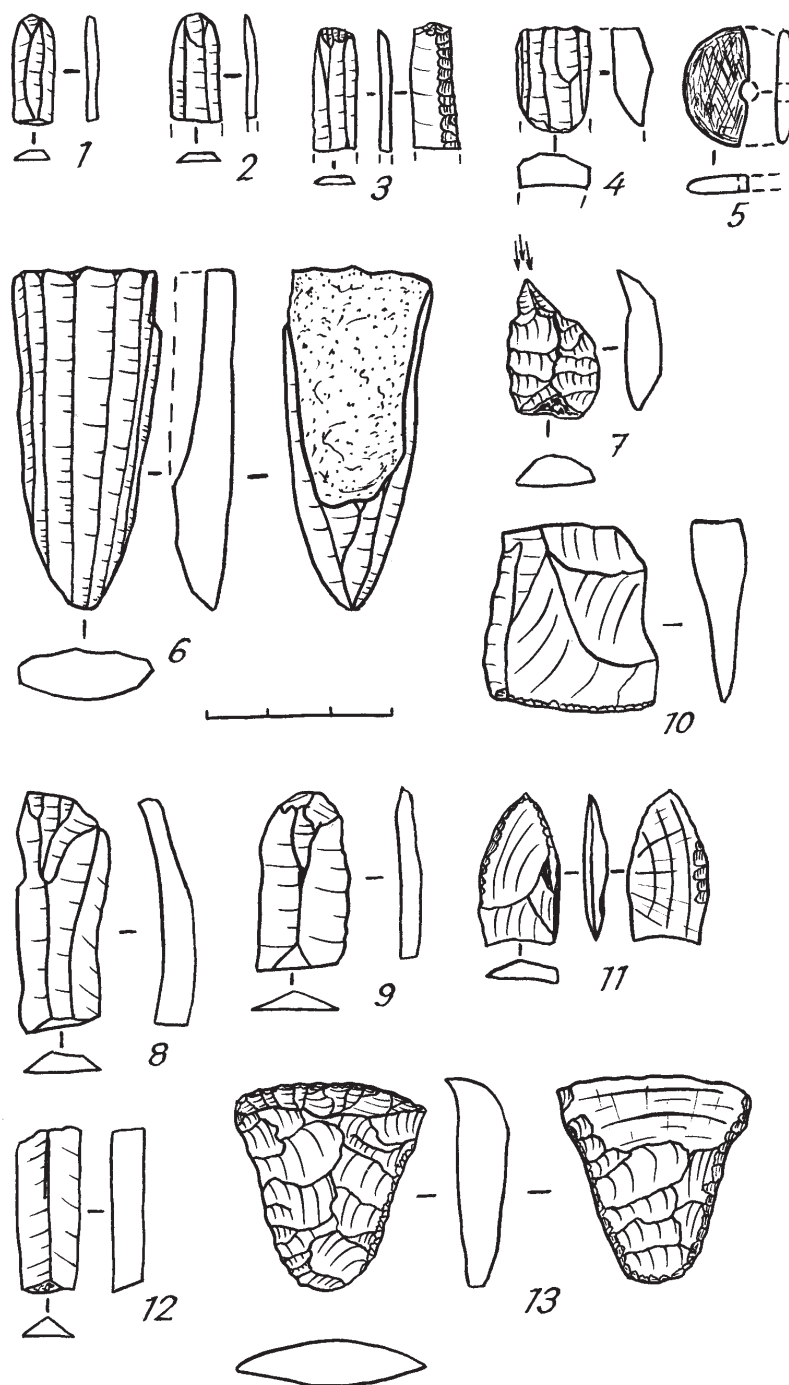


Figure 21. Stone artifacts from the Nil-Ust'e site: 1, 2, 8, 9, 12—knife-like blades; 3—inset; 4, 6—cores; 5—pendant; 7—burin; 10—knife on a flake; 11—point; 13—scraper.

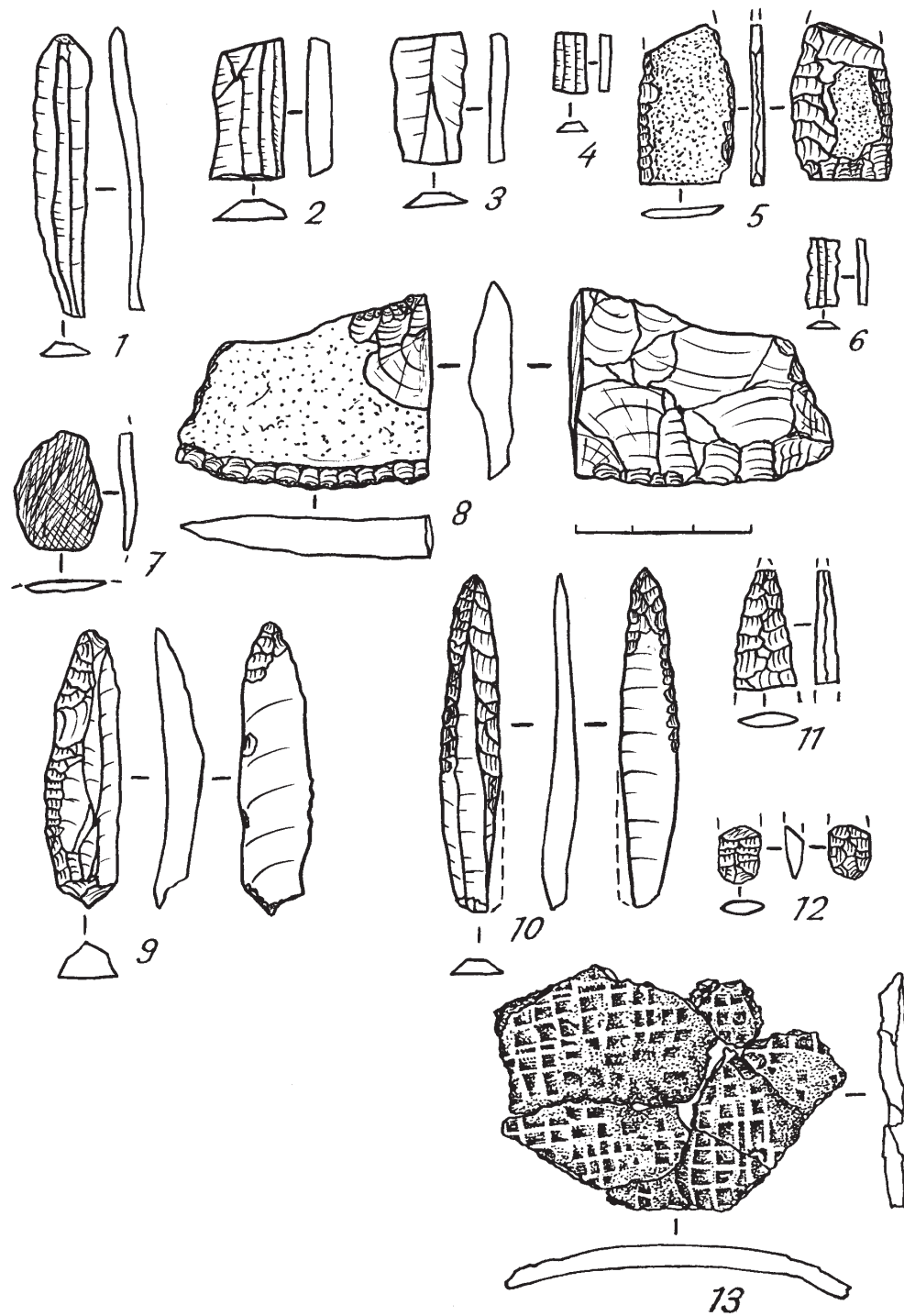


Figure 22. Stone artifacts and ceramics from the Nil-Ust'e site: 1-4, 6—knife-like blades; 5, 8—platy knives; 7—spall from a ground tool; 9, 10—tools on blades; 11, 12—point fragments; 13—ceramics.

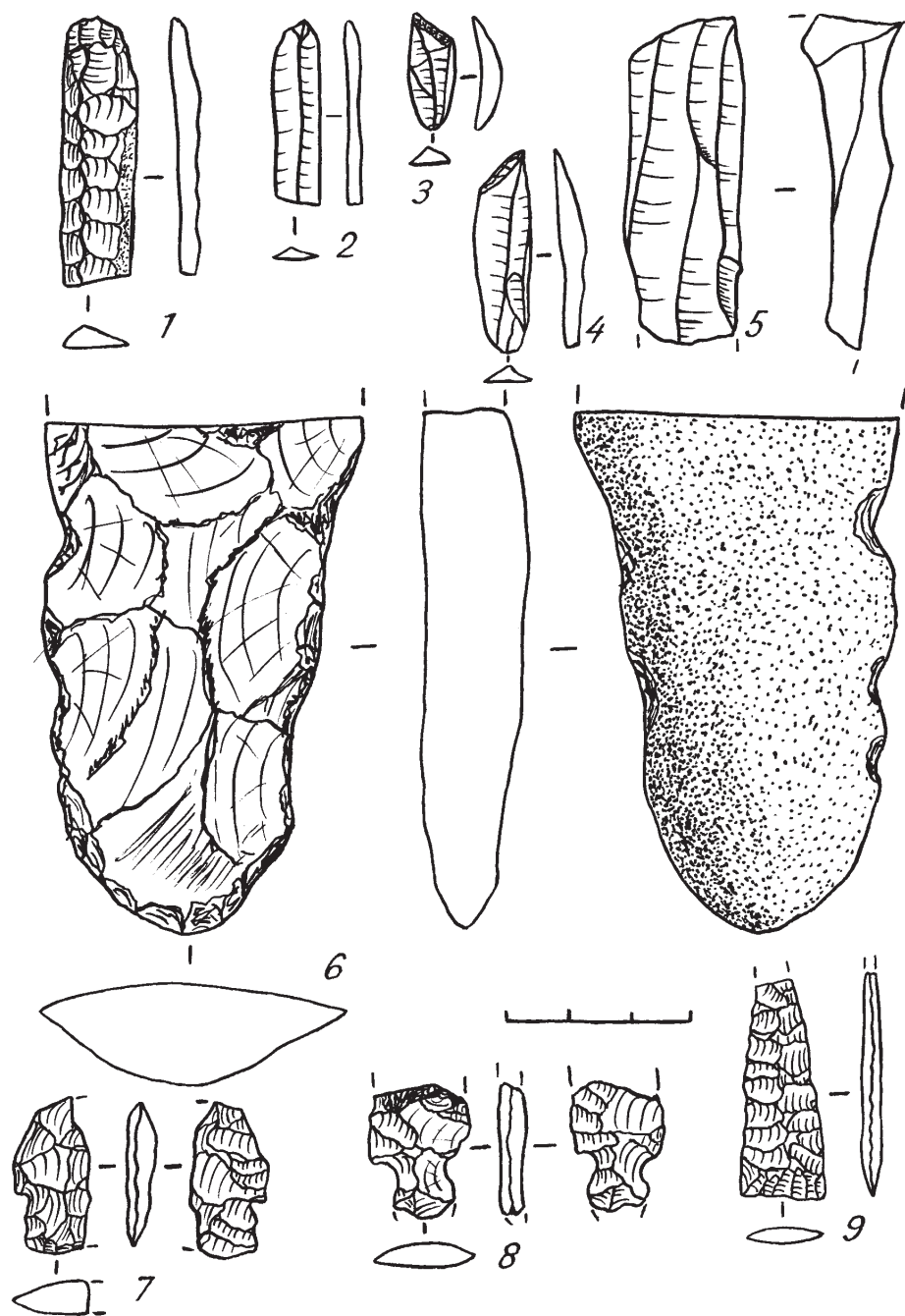


Figure 23. Stone artifacts from the Nil II site: 1—ribbed blade; 2—knife-like blade; 3, 4—retouched knife-like blades; 5—spall from a core; 6—adze-like tool; 7–9—points.

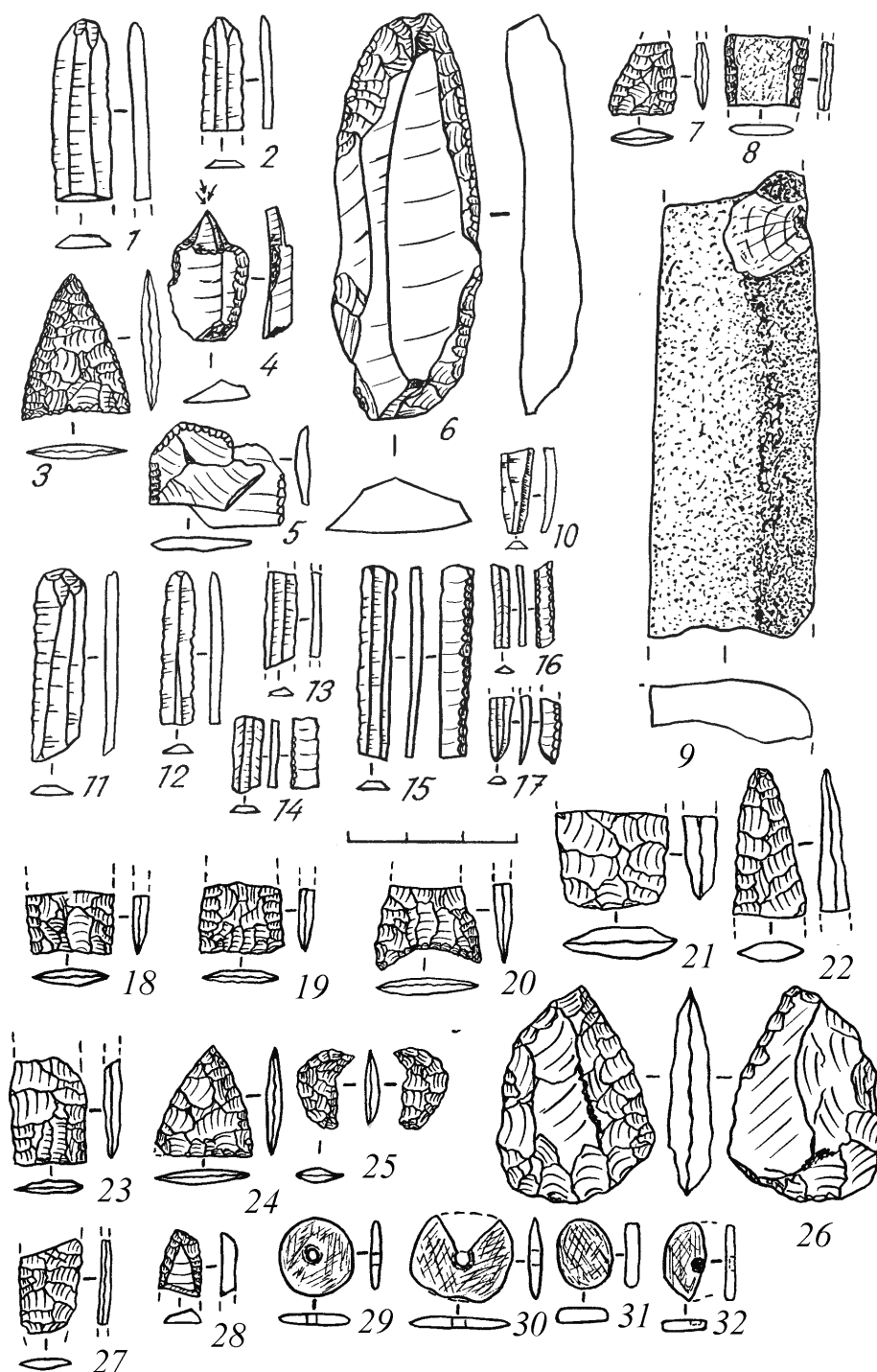


Figure 24. Stone artifacts from the Nil IV site: 1, 2, 10—knife-like blades; 3, 18–24, 27—points; 4—burin; 5, 6, 28—scrapers; 7—bifacially retouched inset; 8—tool fragment; 9—hammerstone; 11–17—insets on knife-like blades; 25—graver; 26—biface; 29–32—pendants.

In the vicinity of the pass, a tundra landscape dominates. The site is located on a dry, low knoll covered by a thin layer of moss and lichens. On the scattered-sod areas of the knoll, in a radius of a few meters, the following stone artifacts were collected: chert flakes and knife-like blades (Fig. 24:1, 2); a triangular arrowhead with a lightly grooved base, lenticular cross section, and completely worked lateral sides (Fig. 24:3); a dihedral burin on a blade with retouched longitudinal edges (Fig. 24:4); a side skreblo on a large lamellar flake (Fig. 24:6); a bifacially worked inset, asymmetrically triangular in plan and lenticular in cross section (Fig. 24:7); a fragment of the midsection of a tool with edges worked by small bifacial retouch (Fig. 24:8); a fragment of a ground, rounded, flat pendant 1 cm in diameter with a hole in the middle.

Excavations, conducted in an area of 16 m² where the surface material was collected, determined the stratigraphy of the site:

	Thickness, cm
1. Moss, sod	1–2
2. Gray, in places rust-colored, sandy loam with charcoal	8–10
3. Stones	More than 20

The finds lay in gray sandy loam directly under the sod at a depth of up to 8 cm. In the southwest corner of the excavation, a flat stone slab measuring approximately 0.5 x 1.0 m was partially revealed.

In the cultural layer of the site were various stone artifacts, including flakes, knife-like blades, points, knives, scrapers, burins, graters, a hammerstone, a ground artifact, and pendants.

More than 1,000 predominantly small flakes were found. Silicified stone of red, yellow, green, black, and white shades, as well as chalcedony, obsidian, and agalmatolite, were used for making them.

Knife-like blades (more than 300 specimens) were made from chert (Fig. 24:11), chalcedony, and obsidian (Fig. 24:12). Many of them, judging by the indented and retouched edges, were used as insets. Blades were distinguished by their retouch along one edge (Fig. 24:13–15) or both longitudinal edges (Fig. 24:16, 17).

Points differ in form and type of base, though they all were worked by bifacial pressure retouch and have a lenticular cross section. It is possible to separate them into three varieties: the first is represented by a chalcedony arrowhead of triangular form with straight base (Fig. 24:24); the second by fragments of arrowheads with a grooved base (Fig. 24:18, 20). Most numerous is the third group of points—with straight base and straight edges. Two of them are arrowheads (Fig. 24:19, 23) and one a dart point (Fig. 24:21). The remaining points are represented by five or six fragments, which makes it impossible to determine the form of the artifacts (Fig. 24:22, 27).

Scrapers were made on flakes (five specimens) and blades (one specimen). One of the scrapers on a flake was worked by large parallel retouch along the back and by small edge retouch along the working edge located on the lower end of the flake that is beveled from left to right (Fig. 25:2). A second scraper was made on a round flake, on the lower end of which a symmetrically convex working edge was formed by small edge retouch (Fig. 25:3). Several other flakes worked by small unifacial edge retouch were evidently used as scrapers (Fig. 24:5). A micro-scraper was made on a blade of chalcedony and worked along the edges and end by small regular unifacial retouch (Fig. 24:28).

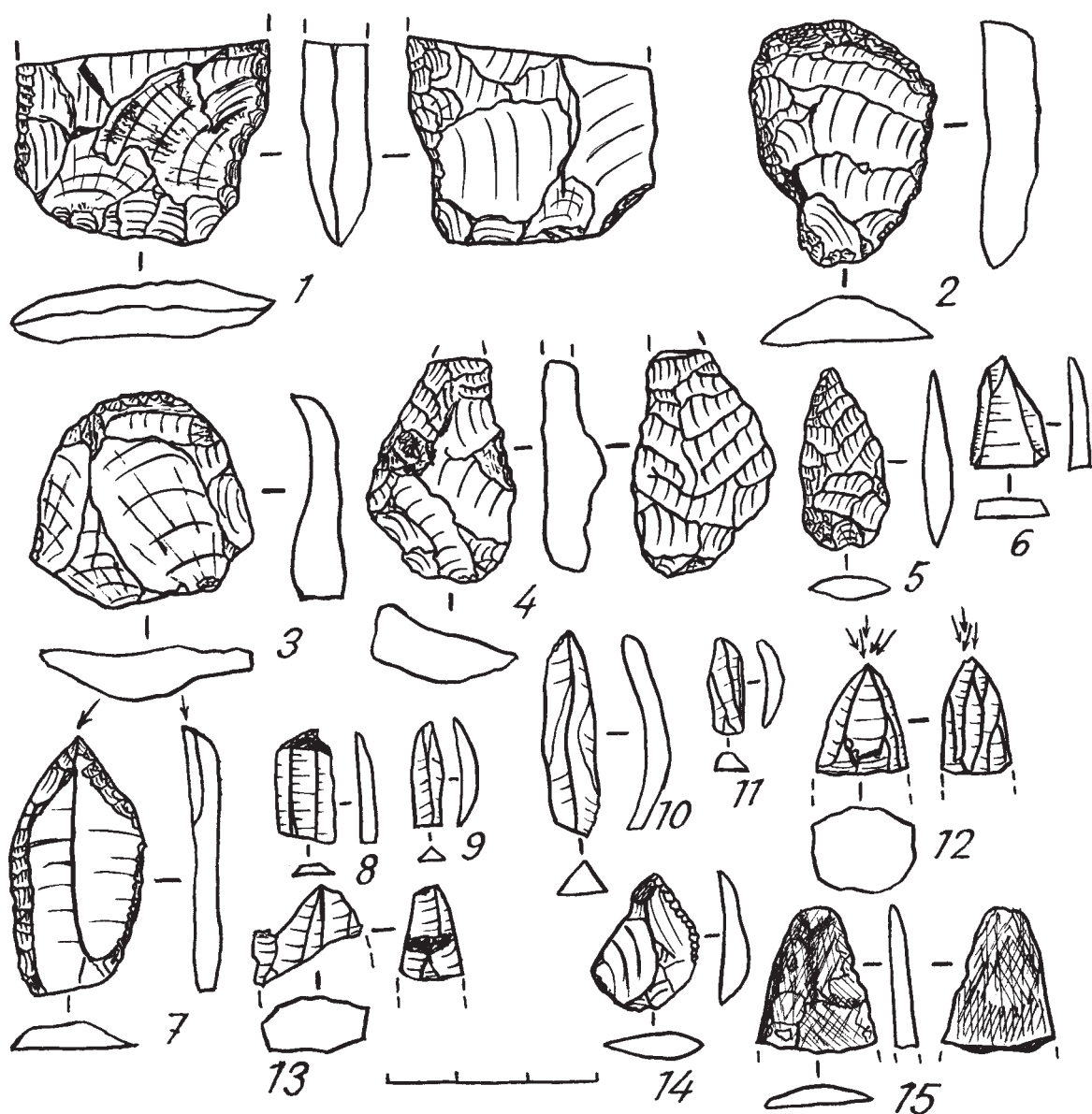


Figure 25. Stone artifacts from the Nil IV site: 1, 4, 5—knives; 2, 3—scrapers; 6, 9–11—burin spalls; 7, 12, 13—burins; 8, 14—graters; 15—fragment of a ground artifact.

Burins are separated into polyhedral (two specimens) and dihedral (one specimen). Only the working parts of the polyhedral burins were preserved, formed by the removal of a multitude of burin spalls that were taken off at a sharp angle. The working parts are broken in the place of their transition to the body (Fig. 25:12, 13). Judging by the burin blank found in the layer, they had a three-faceted re-touched haft. In addition, in the layer were about 10 burin spalls (Fig. 25:6, 9–11). The dihedral burin was made on a large three-faceted blade. Its working edge was formed by edges worked by small unifacial retouch directed from the dorsal side that converged at a sharp angle. A small area along the edges at the

base of the burin's haft was retouched on both sides. Along the left edge of the tool, on the side of the cutting edge, a 1.5-centimeter burin spall was removed, evidently to sharpen it (Fig. 25:7).

Besides burins, *gravers* were used, made on knife-like blades (Fig. 25:8) and flakes (Fig. 25:14). Tentatively assigned to gravers was a bifacially worked crescent-shaped tool with lenticular cross section (Fig. 24:25).

Knives are represented by oval (Fig. 24:26), subtriangular (Fig. 25:4), and leaf-shaped (Fig. 25:5) artifacts and a fragment with a straight base, all completely worked on both sides (Fig. 25:1). They all have a working edge lenticular in cross section.

A small piece of elongated cobble was used as a hammerstone (Fig. 24:9). A piece of a ground artifact was found (Fig. 25:15).

Pendants, made of agalmatolite, form a numerous group of finds. These are flat, rounded artifacts with a biconical hole in the middle (Fig. 24:29, 30). The surface of the pendants was ground. Several unworked fragments and about 10 ground fragments (evidently debitage from production) with traces of cutting were found. The work on one of the pendants was not completed: it lacks a hole (Fig. 24:31). Another artifact was broken while making the hole (Fig. 24:32). Thus, all stages of the technological process of making pendants—from blanks to prepared artifacts, including waste and debitage—can be observed at the site.

Based on the typology of the tool complex and the ornaments, the site can be dated to the Middle Neolithic.

The **Khaya site** was found on the upper reaches of the second, from the mouth, right tributary of the Khaya River in the pass at 1,000 m above sea level. Characteristic for the locality is a tundra landscape. Scattered-sod and small detrital material cover the surface of the pass. Several clusters of finds were identified on the surface. At **Locus a**, in an area 460 m², were found 110 chert flakes, two tool blanks with unifacial retouch along the edge, and four knife-like blades. At **Locus b**, in an area 1,200 m², were found 70 chert flakes, six of chalcedony, 12 knife-like blades, and one blank worked by unifacial retouch. At **Locus c**, in an area 50 m², were found 76 chert flakes, four knife-like blades of chert, one core, and one spall from the core.

The **Urtychuk Pass sites** are located on Urtychuk Pass within the Ol'skoe Basalt Plateau, on the upper reaches of the Ola, Arman', and Maltan rivers, at an elevation of 1,100 m above sea level. The width of the pass is somewhat more than 1 km. Its surface is covered with diluvium represented by pieces of basalt. Along the pass runs the watershed of the right tributaries of the Bol'shaya Khaya River and Urtychuk Creek. On the north, in the valley of the Bol'shaya Khaya River, the pass descends along gentle slopes covered with tundra vegetation. To the south, in the valley of Urtychuk Creek, the pass is broken by steep, almost sheer slopes in narrow valleys heavily overgrown with forest and brush.

In 1978, in the pass at the **Urtychuk I site** in a radius of 200 m, geologists found flakes, one blank, and two whole prismatic cores (Dikov and Savva 1980:64).

In 1986, we examined the whole pass. As a result, nine more previously unknown Stone Age sites were discovered. These are the sites of Urtychuk II–X. Surface material was collected at all the sites. At the Urtychuk IV site, which received the name Nukleus ["Core"], excavations were conducted.

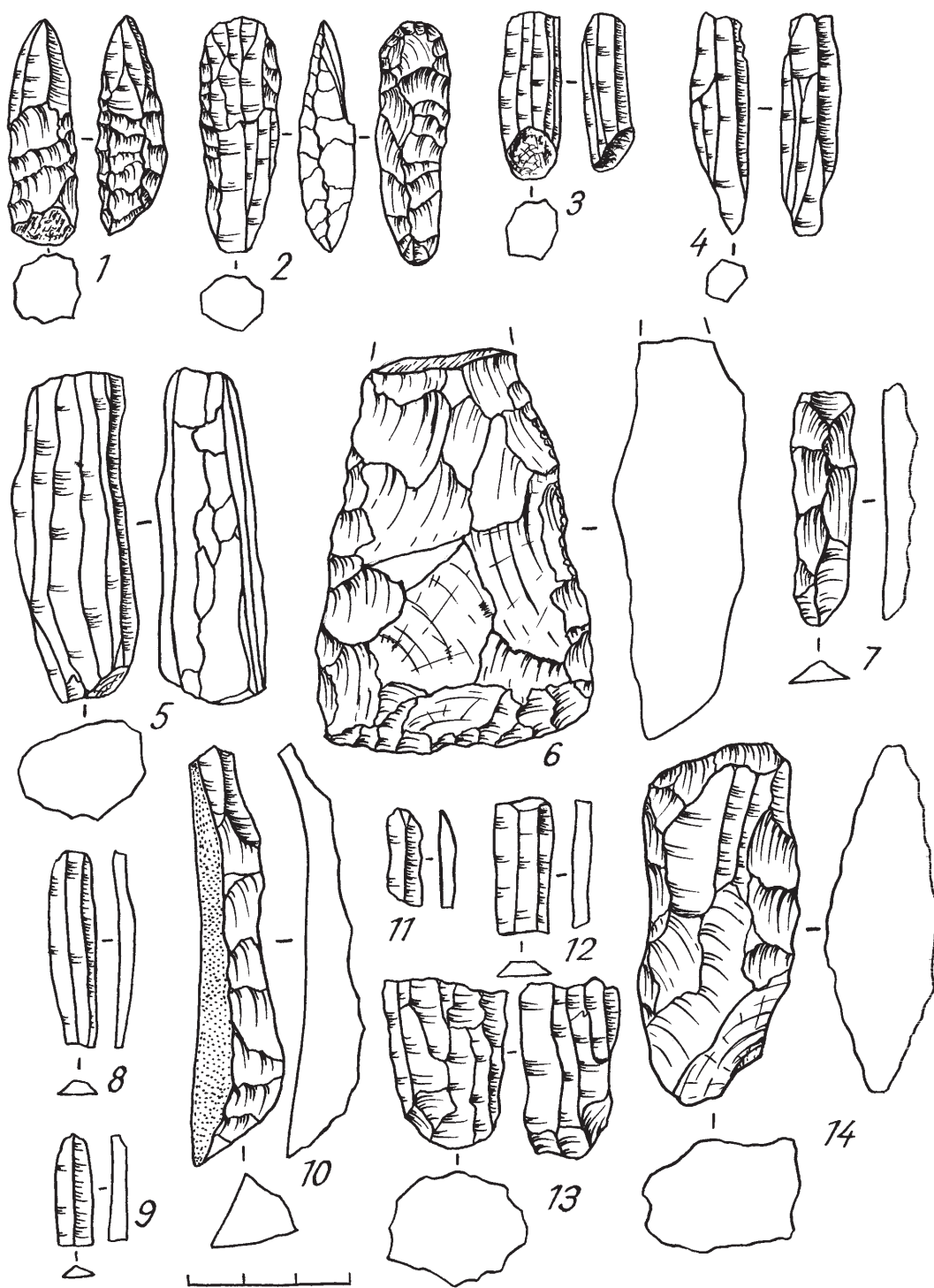


Figure 26. Stone artifacts from the sites of Urtychuk III (1), IV (7, 5, 11), V (8, 12, 14), VI (4), VIII (13), IX (2, 3, 9, 10), and X (6): 1—burin; 2—scraper (adzet?); 3–5, 13, 14—cores; 6—adze-like/skreblo-like tool; 7, 12—ribbed blades; 8–11—knife-like blades.

The age of the sites is determined to be within the Holocene.

The **Urtychuk II site** is located on a small hill located 500 m north of the pass. On the flat scattered-sod top of the hill and along its slope, surface material was collected at three loci.

Locus IIA was distinguished by a cluster of 168 chert and four chalcedony flakes, two lamellar spalls, and a knife on a lamellar flake with a working edge modified by bifacial retouch.

Locus IIB contained 125 chert and five chalcedony flakes and five knife-like blades and blank of a cores measuring 4 x 4 x 2.5 cm with chaotically flaked facets.

Locus IIC included 50 chert flakes, one knife-like blade, one subtriangular core blank, and one piece of a prismatic core.

The **Urtychuk III site** is located in the pass proper. The area of distribution of finds is about 50 m². The surface is level scattered sod. Collected were 329 flakes of chert and silicified tuff, 19 knife-like blades with traces of wear on the lateral working edges, and 1 polyhedral burin with a haft completely worked by retouch and a quadrilateral cross section (Fig. 26:1).

The **Urtychuk V site** is found on the highest area of the pass close to its western edge. The surface of the site is level. Here were collected 368 chert and five chalcedony flakes, 27 knife-like blades (Fig. 26:8), several ribbed blades from 0.8 to 2.0 cm wide (Fig. 26:12), three lamellar spalls 2.0 to 2.3 cm wide, and one core blank (Fig. 26:14).

The **Urtychuk VI site** is located 100 km [100 m?] west of the Urtychuk V site. The western edge of the pass, like the eastern, has a small drop in comparison with the central part. In a small 10 x 12 m area covered with rubble, 659 chert and 39 chalcedony flakes, 15 knife-like blades, and 1 completely exhausted core of prismatic (conical?) form were collected (Fig. 26:4).

The **Urtychuk VII site** was found 100 m west of the Urtychuk VI site on a small point at the western edge of the pass. On its scattered-sod surface were 54 chert and two chalcedony flakes, four knife-like blades, one large ribbed blade, two lamellar flakes (one of chert, the other of chalcedony) with unifacial edge retouch, and one core blank.

The **Urtychuk VIII site** was discovered 1 km north of the pass on a terrace at the left (western) side of a stream valley that enters the Bol'shaya Khaya River. The height of the terrace is from 10 to 15 m above stream level. On the terrace, in a radius of 15 m on a scattered-sod surface, were found 31 chert flakes, one knife-like blade, one prismatic core (Fig. 26:13), and one hammerstone of a flat oval river cobble impacted on both ends.

The **Urtychuk IX site** was found on a terrace at the western edge of the pass. On its scattered-sod surface, in an area 10 m², were collected 1,507 chert flakes, six lamellar flakes, nine knife-like blades (Fig. 26:9, 10), one prismatic core (Fig. 26:3), and one tool that is a scraper or adzlet with a haft. It is lenticular in section with a slightly convex working edge (Fig. 26:2).

The **Urtychuk X site** is located on a ledge in the slope of the right side of Urtychuk Creek. The cluster of artifacts stretched 30 m from north to south and 15 m from west to east. Found were 162 flakes, four knife-like blades, four lamellar spalls, three blanks (presumably) of cores, and one bifacially worked subtriangular adze-like/skreblo-like tool (Fig. 26:6) with lenticular cross section.

The **Nukleus (Urtychuk IV) site** is located in the top of the pass on the upper reaches of Urtychuk Creek (a right tributary of the Khaya River). The surface of the site is level and covered with diluvium. The finds were located in a strip (from north to south) 40 m long, 15 m wide, and included 599 chert flakes, 54 edge spalls from cores, 85 knife-like blades (Fig. 26:7, 11), and 8 prismatic cores with blanks of silicified tuff and chert (Fig. 26:5).

Excavations 7.5 m² in area were conducted at the site. At a depth of 3 to 20 cm in gray carbonaceous sandy loam were found about 1,000 knife-like blades, more than 30 edge spalls, and 6 prismatic cores in different stages of modification, from blanks to completely exhausted.

Based on charcoal from the cultural layer, dates of 8285 ± 95 (GX-17063) and 4920 ± 240 (LE-3899) were obtained, which permit assigning the site to the early Holocene.

The **Ozero Elikchan site** was found on the north shore of Lake Elikchan, on a terrace 3 to 4 m high. The finds lay at a depth of 15 to 20 cm in gray sandy loam under a sod up to 10 cm thick. The base of the terrace consisted of diluvium.

In the terrace exposure, 10 knife-like chert blades 0.5 to 1.0 cm wide, 53 chert and chalcedony flakes, and 3 tools were collected: a scraper on a flat oval chert flake with a working edge made by flat pressure retouch from the back; a multifunctional tool (knife-scraper) on a flat oval cobble flake measuring 6.5 x 5.5 cm, and a polyhedral burin with a retouched body of rhomboid cross section (Slobodin 1988:136, Fig. 4:5). The site is dated to the Neolithic.

The large group of **sites on Lake Khurendzha** (Khurendzha I–XI) was discovered and investigated on the Ol'skoe Plateau in the vicinity of Lake Khurendzha. Various stone artifacts reflecting chronological and cultural stages of the opening up of this territory in the Neolithic were found here. Materials from excavation of the sites have been published (Slobodin 1988) and are used in the concluding part of this article to reconstruct the historical processes that occurred on the Upper Kolyma in the Holocene.

* * *

Investigations have permitted distinguishing several periods in the history of the opening up by Paleoasians of the Okhotsk-Kolyma watershed. These periods are reflected in the materials both of individual sites and in groups of sites.

Some of the earliest materials in the region examined are from the lower layers of the Kheta site. The Paleolithic finds were in a layer of rust-colored sandy loam (5), covered by deposits of gray sandy loam (4) and volcanic ash (3), which is an indicator horizon for Continental Priokhot'e and the Upper Kolyma. The ash (3) is correlated with Elikchan volcanic ash from lake bottom deposits, the age of which, based on a series of dates, amounts to 8,500 to 8,600 years (MAG-976–979) (Lozhkin 1987). According to this data, the gray sandy loam (4) was formed at the boundary of the Sartan cooling period and the Holocene during the period of replacement of the "grass pollen zone" by "forest communities" (Lozhkin 1987). Alluvial cobbles (6) lying on top of the terrace base, judging by similar deposits in northern Priokhot'e (Glushkova 1983), were formed in the Karginisk interglacial. All this attests that the accumulation of the rust-colored sandy loam took place in the Sartan period of cooling (Slobodin and King 1996).

The stone inventory of the lower layer of the Kheta site includes flakes, end scrapers, a wedge-shaped core with knife-like blades produced from it, and ski-shaped and edge spalls. Bifaces are represented by an oval knife and fragments of points of a spear and an arrow with lenticular cross section. All these artifacts are joined through uniformity of the material from which they were made as well as the presence of an argillaceous film that is absent on artifacts from the levels above. In accordance with the geological data, the covering of minerals with argillaceous films occurs under conditions of periglacial processes (Anan'ev et al. 1984). We find the most complete analogy in Northeast Asia to the Kheta complex in materials of the Ushki (Layer VI, Kamchatka), Dyuktai (Yakutia), Ustinovka (Primor'e), and Ust'-Ul'ma (Amur) cultures of the Upper Paleolithic. Some technical-typological correspondence can be traced between the Kheta complex and materials from the Druchak-Vetrenyi site, located in the eastern part of the Okhotsk-Kolyma highlands (30 km from the line of the Okhotsk-Kolyma watershed). I. E. Vorobei, who discovered and investigated this site, dates it to the early Holocene (Vorobei 1992), though there is every reason to view it as late Pleistocene, possibly even earlier than the Kheta site. I. E. Vorobei compares the Druchak complex with the Pleistocene and early Holocene sites of the Far East, Yakutia, and Kamchatka. Thus, N. N. Dikov's hypothesis about the opposition of the Siberdik culture on the Kolyma to the Dyuktai tradition (Dikov 1979a:20) and, by extension, other traditions is not supported by archaeological materials.

The surface finds of black chert and chalcedony, which belong to the second cultural complex of the Kheta site, should most likely be dated to the transition from the Pleistocene to the Holocene period. The flakes of black chert and chalcedony, though found in rust-colored sandy loam, do not have traces of argillaceous coating. The complex includes large leaf-shaped bifaces with narrowed butts, lamellar flakes, subprismatic cores, transverse and combination burins, and end and side scrapers. Leaf-shaped bifaces with narrowed butts, similar to those at Kheta, are known at the Uptar site in Continental Priokhot'e. The cultural layer of the site lies under deposits of volcanic ash identified as "Elikchan," the age of which is at least 8,300 years (King and Slobodin 1996).

During the transition period from Paleolithic to Neolithic on the Upper Kolyma and in Continental Priokhot'e, several technological traditions developed. One of them, the Buyunda, was identified in the Okhotsk-Kolyma watershed. Represented by materials from the Buyunda III, Urtychuk IV, and Dzhugadzhaka IV sites, the Buyunda is characterized by the prevalence in their stone inventory of artifacts on knife-like blades. Among these blades are insets uniaxially worked along the edge from ventral or dorsal, insets with an edge beveled by retouch, angle burins, and end scrapers. The only bifacially worked tool is a small adzlet. The technique of primary flaking of stone is represented by prismatic cores. One such core in the initial stage of modification was found at the site of Buyunda VII. The radiocarbon dates obtained for these sites permit assigning the period of existence of this tradition to the 7th to 6th millennium B.C.

The location of the sites in the passes within the Okhotsk-Kolyma watershed indisputably attests to the priority of the hunting lifestyle in the economy of their inhabitants. Based on the characteristics of the stone inventory, they are clearly different from the Mal'tan complex, which is allocated to the Upper Kolyma (Dikov 1979a, 1979b). Based on the technical-typological characteristics and the time of existence, the Buyunda complex can be assigned, with the Sumnagin culture, to a single early Holocene technological tradition of Northeast Asia. These data are the basis for refining the role of the "Mal'tan Mesolithic culture," which in N. N. Dikov's opinion served as a "barrier" to the Sumnagin culture in Kolyma (Dikov 1979b).

The most numerous group is made up by sites representing the Neolithic period in the history of the opening up of the Okhotsk-Kolyma watershed and representing the period from the 5th to 2nd–1st millennium B.C. A large part of these sites is assigned to the Middle Neolithic: the Khurendzha I–XI, Utro (Slobodin 1988), Nil-Ust'e, Nil II and IV, Urtychuk II, III, and V–X, Ozero Elikchan, Khaya, and Kheta (upper layer). On the whole, characteristic for the material complex of the Middle Neolithic in the investigated region are conical, prismatic, and flattened cores and knife-like blades in the form of points retouched along one or two edges; stemmed arrowheads, subtriangular and lenticular in section; triangular arrowheads with straight and concave bases with an asymmetrical barb; biface-knives of sub-rectangular and oval form; side and end scrapers on flakes with partially or fully retouched bodies, of sub-triangular or oval form; punches on flakes and knife-like blades; multifaceted burins with three-faceted retouched or core-like hafts, among which unifacially-convex ones are encountered; dihedral burins on flakes; graters of various forms; adze-like tools; and discoid ground pendants with a hole in the middle.

Noted in the materials of the middle stage of the Neolithic of the Okhotsk-Kolyma watershed are several elements similar to those of the Middle Neolithic complexes of Pribaikal'e, the Amur, Yakutia, and Chukotka; this similarity attests to broad cultural connections of this region with neighboring regions. At the same time, the difference in these materials can be clearly seen in both individual artifacts and in the complexes as a whole.

Based on the typology of the material and the radiocarbon dates of 4530 ± 150 (MAG-1261) and 5210 ± 170 (LE-3901) for the sites of Khurendzha V and VIII, the sites of the Middle Neolithic of the Okhotsk-Kolyma watershed can be dated to the 4th to 3rd millennium B.C. Earlier these sites were dated to the Late Neolithic (Slobodin 1988). Because of the radiocarbon dates obtained and the redating of the Neolithic and Eneolithic cultures of Pribaikal'e (Mamonova and Sulerzhitskii 1989), the period of existence, for example, of the Glazkova culture, was moved from the 2nd to the 3rd millennium B.C. (Konopatskii 1982). This revision also permits placing the Neolithic sites examined on the Okhotsk-Kolyma watershed 1,000 years earlier.

In the Late Neolithic (2nd millennium B.C.), in the territory of the Okhotsk-Kolyma watershed, appear, most probably from Yakutia, waffle-stamp ceramics, rectangular and segment-like bifacially retouched insets, and flat stemmed points (found in the Kupka I and Nil-Ust'e sites).

The Neolithic period ends at the boundary of the 2nd–1st millennium B.C. The fading out of the microblade technology, disappearance of cores and polyhedral burins, and the making of tools on flakes, which is recorded at the Dzhugadzhaka I–III and Buyunda II sites, characterize this period.

Attesting to connections of the Kolyma region with the Okhotsk coast and Kamchatka at this time is the find at the Levaya Kheta site of a stemmed knife (Fig. 11:3) similar to ones found at the Bol'shoi Kamen' site in southern Kamchatka (Ponomarenko 1989a:129, Fig. 19:23) and at the Spafar'eva and Ol'skaya sites in Tauiskaya Bay (Lebedintsev 1990: Figs. 72, 92), dated to the 1st millennium B.C. Knives of such form evidently continue to exist up until the end of the 1st millennium A.D. (Ponomarenko 1985: Pl. 30).

At the end of the 1st millennium B.C., iron penetrates into Kolyma, which leads to the fading out of stone technology. But such material-demanding instruments as cobble chopping tools and large cobble scrapers worked by crude percussion retouch, similar to those found at the Buyunda VII site, were preserved. By analogy to such tools from the Agrobaza III site in Kolyma, these finds can be dated to the 14th to 16th centuries.

However, it is clear that these materials do not exhaust all the variation in the stone industry of the Okhotsk-Kolyma watershed, where recently sites were found on the Khetinskoe Plateau, on the upper reaches of the Sugoi and Omolon rivers, containing materials that must be taken into account in the reconstruction of the cultural-historical processes that occurred in Northeast Asia in the past.

SURVEY WORK ON THE OKHOTSK COAST

A. I. Lebedintsev

In 1990 the North Okhotsk field team of NEISRI conducted survey work in the Ol'skii District of the Magadan Region. An area of the Okhotsk coast was investigated from Shel'tinga Bay to the Onatsevicha Peninsula. The route passed along the coast on the sailing-motor yacht *Lamut*.⁶ During the 1990 field season, new sites were found: Shel'tinga II, Mys Dal'nii,⁷ Shestakova I and II, and Onatsevicha I and II, and a site on Talan Island (Fig. 1). The physical-geographical description of the territory being examined was acquired from the following works: *Lotsiya*. . ., (1986) and Zarudnyi (1992).

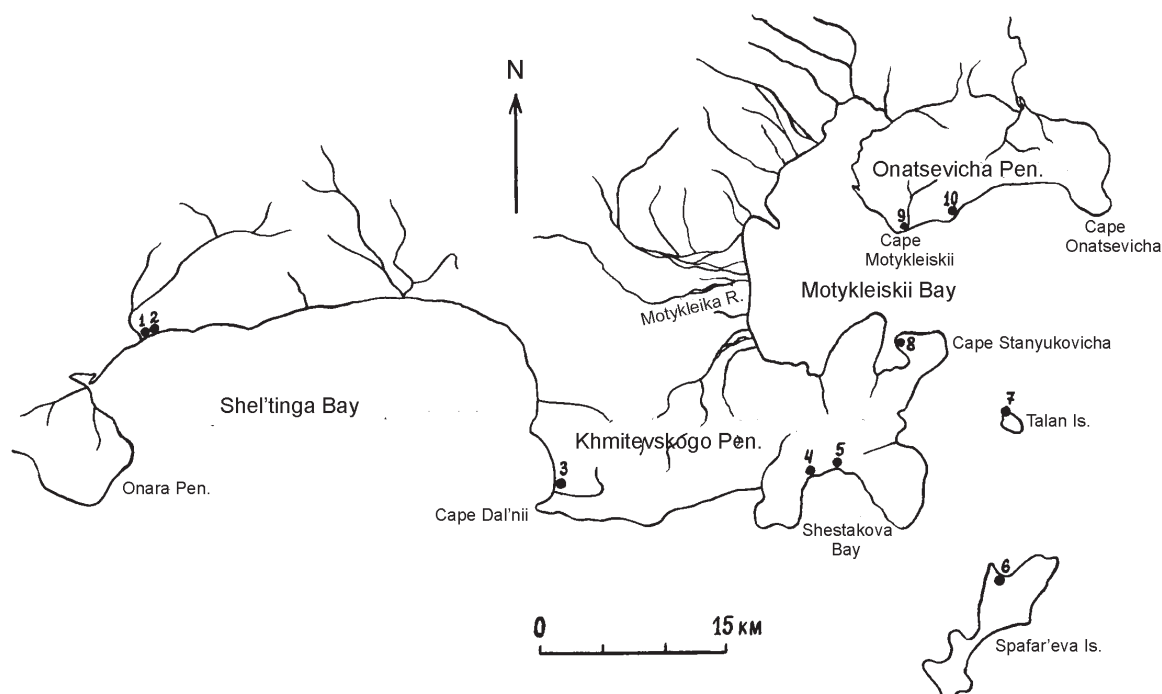


Figure 1. Plan of the site locations: 1—Shel'tinga I; 2—Shel'tinga II; 3—Mys Dal'nii; 4—Shestakova II; 5—Shestakova I; 6—Spafar'eva; 7—Talan; 8—Tokareva; 9—Onatsevicha I; 10—Onatsevicha II.

Two new sites were found in Shel'tinga Bay—Shel'tinga II and Mys Dal'nii. Shel'tinga Bay⁸ juts into the north shore from the Sea of Okhotsk between Capes Moskvitina and Dal'nii. The shore of the bay is mostly high and rocky. High mountains with steep slopes closely approach the shoreline. Forests

⁶ The author expresses gratitude for aid in conducting the survey to G. O. Fedotov, captain of the yacht *Avrora* of the Magadan Youth Professional Society of the "Magadanrybprom" Production Association.

⁷ The body of land known as Mys Dal'nii [literally "Cape Distant"] is here referred to as Cape Dal'nii. The archaeological site on the cape is identified here as the Mys Dal'nii site.—*Trans.*

⁸ Shel'tinga Bay was named after Midshipman Aleksei Elizarovich Shel'ting (Shkhelting), member of the Second Kamchatka Expedition of 1733–1743 (Leont'ev and Novikova 1989).

grow on the slopes of the mountains below bare peaks. Along the precipitous parts of the shore of the bay stretch stone or pebble beaches, in places broken up by deposits of large rocks and rocky points. In the western part of Shel'tinga Bay, 4 km from the former village of Shel'tinga, a site was discovered in 1979 where stone material of Neolithic appearance was collected (Lebedintsev 1990:20, 21). This site is located on a 7-meter coastal terrace, runs 50 m along its edge, and continues along the right bank of an old stream for 30 m. In areas where surface material was collected, profiling and cleanings were carried out; two test pits and a trench were dug. Since another, new locus of stone artifacts was discovered in this region, we named this site Shel'tinga I.

In 1990, on the other side of the old stream, the site we named Shel'tinga II was found. Surface material from a 14 x 19 m area was collected from a scattered-sod surface.

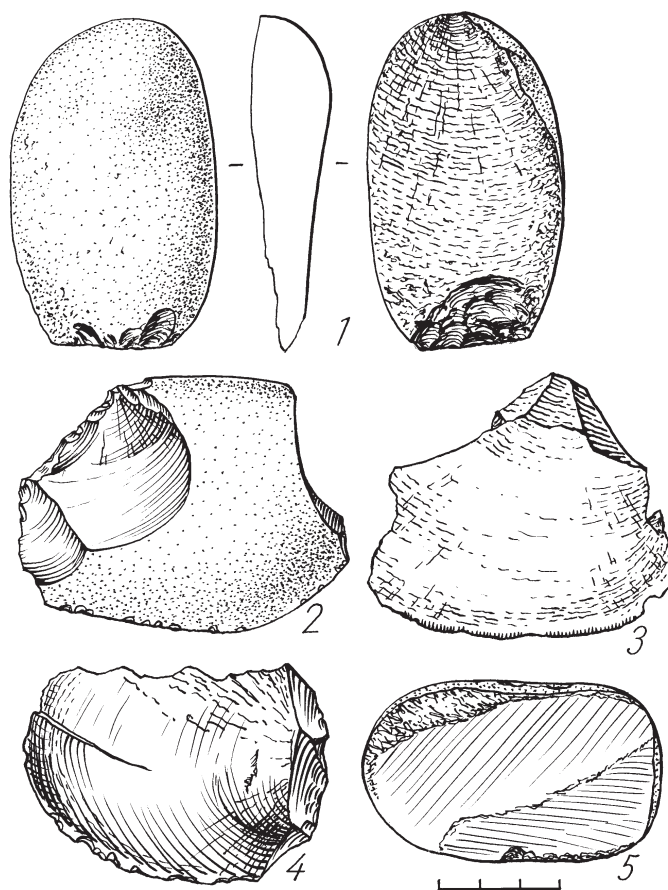


Figure 2. Scrapers of andesitic-basalt (1), diorite-porphyrityte (2), silicified tuff (3), tuff of basic composition (4), and cinereous silicified tuff (5) from the Shel'tinga II site.

At the **Shel'tinga II site** were eight scrapers on large andesite cobble spalls (two specimens), andesite-basalt (one specimen), diorite-porphyrityte (one specimen), and various tuffs (four specimens). Among them are scrapers with special modification of the scraper working edge (Fig. 2:1, 4, 5) as well as cobble spalls with traces of smoothing from being used as a scraper (Fig. 2:2, 3).

In the surface material, there are also flakes and spalls (a total of 42 specimens). On some of them are areas of cobble cortex. Judging by the form and presence of cobble cortex, these flakes and spalls were obtained as a result of modifying tools from the cobble: cinereous tuff (2 specimens), andesite (4 specimens), tuff-sandstone (12 specimens), and tuff-siltstone (24 specimens).

Scrapers on flat cobbles and on large cobble spalls continued to be used for a long time in the daily life of ancient hunters and reindeer herders on the Okhotsk coast and the Upper Kolyma (Vasil'evskii 1971:136, 137; Slobodin 1993:31). The absence of any other tools attests to the fact that the Shel'tinga II site belongs to a rather late time and has an age of no more than 400 to 500 years. Ancient reindeer hunters, who had come to the coast from the interior of the continent, most likely left this site.

Cape Dal'nii is at the eastern entrance into Shel'tinga Bay. On the north side, it is sloping, while on the south it is rocky and precipitous. The water is deep under Cape Dal'nii. North-northeast of the cape stretches a rocky drainage that forms a natural bowl with the shore that could have served in antiquity as a shelter from waves brought on by eastern winds.

In 1990, an Old Koryak site was discovered on a 3-5 m coastal terrace 2.5 to 3.0 km from Cape Dal'nii. A 1 x 1 m test pit was placed 6 m from the edge of the terrace.

The following stratigraphy was revealed in the site:

	Thickness, cm
Sod	12–20
Brown sandy loam	28–45
Gray sand; the upper part of the sand is humusy	

The cultural layer is represented by brown sandy loam. In it were layers of shells (periwinkle) 2 to 5 cm thick and a small lens of yellow sand 5 cm thick in the northeast corner of the test pit. Large cobbles and stones were also found in the layer.

In the **Mys Dal'nii** site were four stone tools; one piece of a slate slab; two cobble spalls—one of hornfels, the other of diorite-porphyrity; four flakes of different kinds of stone: silicified cinereous tuff, argillite, siltstone, and diorite-prophyrite; one small slate slab; six small quartz spalls; and two small chalcedony flakes.

The stone tools are as follows: a scraper on a grayish-greenish cobble spall of silicified volcanic tuff with traces of smoothing on the working edge (Fig. 3:1); a scraper on a gray cobble spall of tuffite with the cobble cortex completely preserved on one side, a subtriangular cross section of the scraper, and the working edge polished from work (Fig. 3:2); a scraper-burin on a black cobble spall of argillite with the small (2 cm) scraper working edge trimmed by retouch and the burin working edge formed by the removal of spalls and small retouch of the sides (Fig. 3:4); and a scraper on a lamellar chalcedony flake that has fine retouch along one edge (Fig. 3:5).

The scrapers do not have a developed form; they were made on cobble spalls (three specimens) and a small chalcedony flake (one specimen). They are typical for the late stages of the Old Koryak culture. In addition, in the layer was a fragment of a slab of black slate with traces of cuts and grinding (Fig. 3:3). On the right edge of both sides of the piece, cut lines, along which the break was made, can be seen.

In the test pit, there were various bone artifacts. A subrectangular *adze* has a rectangular cross section (Fig. 4:1). Its upper part is broken. Similar adzes were found at the sites of Atargan (Vasil'evskii 1971: Pl. XXII:2, 4), Bukhta Rassvet (right bank terrace) (Vasil'evskii 1971: Pl. XXVII:1, 9), and Stanyukovicha. A *fragment of protective plate*—for the thumb when shooting a curved bow—has two rounded holes, one at each edge (Fig. 4:2). Two decorated protective plates for the thumb were found in the Atargan site (Vasil'evskii 1971: Pls. XVII:7; XVIII:1).

A *point* or *polisher* has a blunted, worn, asymmetrical front end and flattened stem with a hole (Fig. 4:6). Such points are typical for the Old Koryak culture of the Atargan stage. They were found in the sites of Stanyukovicha (Lebedintsev 1990: Fig. 153:4), Svetlaya and Atargan (Vasil'evskii 1971: Pl. XIX:8, 9, 13), Mys Ploskii and Alevina (Vasil'evskii 1971: Pl. XXXIII:8), Tri Brata (Vasil'evskii 1971: Pl. XLV:9), Bukhta Rassvet (right bank terrace) (Vasil'evskii 1971: Pl. XXVII:7), Mayachnaya (Zav'yalova Island) and Orochan (Vasil'evskii 1971: Pl. XXXV:8), Srednyaya (Vasil'evskii 1971: Pl. LI:7), Kip-Kich (Vasil'evskii 1971: Pl. LIX:3), and Varganchik (Vasil'evskii 1971: Pl. LXII:2, 3). At the same time, a bone tool from the Mys Dal'nii site was worn on only one side and, most significantly, its working end became asymmetrical as a result of some subsequent production operation. Therefore we believe that this tool is a polisher. Similar tools from the Ryabukhina site in southern Kamchatka attest to this designation (Ponomarenko 1993: Fig. 58:2, 7). They have a polished asymmetrical working end and longer haft; some have spurs for attachment (Ponomarenko 1993: Fig. 58:5–7). A. K. Ponomarenko supposes that these sharp points are instruments for making tools or working soft materials (Ponomarenko 1993:40).

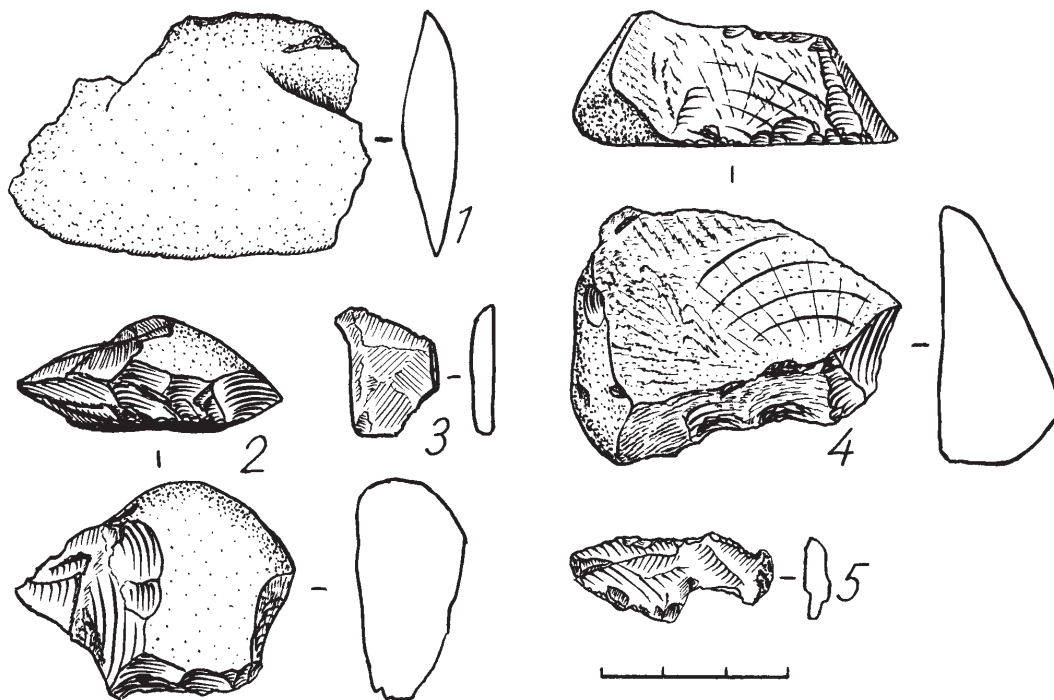


Figure 3. Tools and artifacts of stone from the Mys Dal'nii site: scrapers of silicified volcanic tuff (1), tuffite (2), and chalcedony (5); scraper-burin of argillite (4), fragment of a slate slab (3).

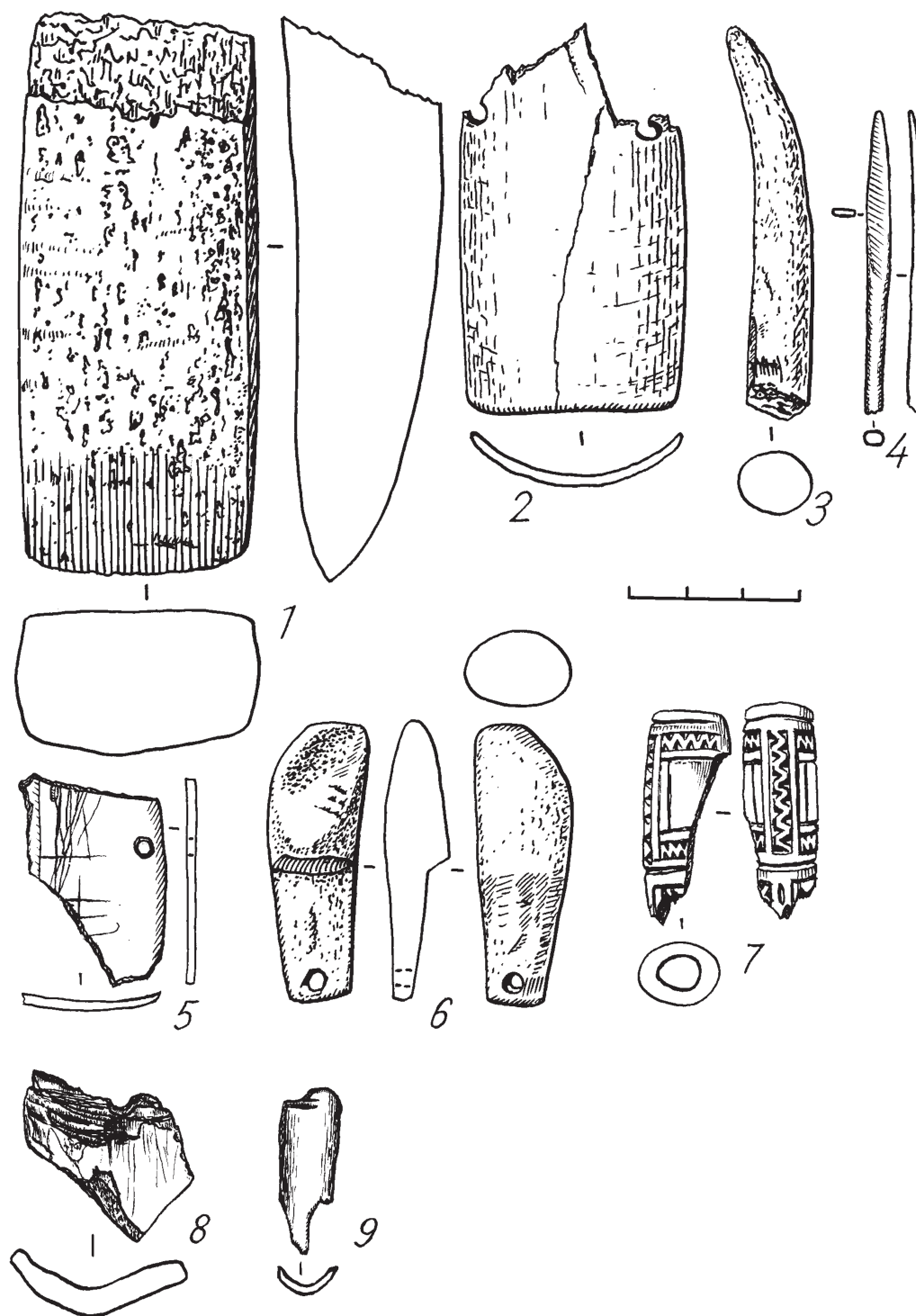


Figure 4. Bone artifacts and fragments with traces of work from the Mys Dal'nii site: 1—adze; 2—fragment of a protective plate; 3—piece of reindeer antler; 4—needle; 5—piece of an artifact; 6—point or polisher; 7—needle case; 8, 9—pieces of long-bone.

A piece of a needle case made of long-bone is decorated with linear engraving and small, grooved triangles (Fig. 4:7). Such technical methods of carving on bone are characteristic for the Koryak (Ivanov 1963:171). The following decorative motifs can be distinguished: parallel and dotted lines and zigzags.

A needle with a broken-off lower part was also found in the cultural layer (Fig. 4:4). Its upper part was sharpened and flattened by shearing. A piece of an artifact in the form of a thin plate has a hole at the edge and carved lines (Fig. 4:5). A piece of reindeer antler has traces of cutting (Fig. 4:3). Pieces of long-bones have traces of carving, probably with a metal tool (Fig. 4:8, 9).

On the whole, the bone material from the Mys Dal'nii site is comparable with material from the Atargan stage.

Eight small fragments of ceramics, including three rims, were found in the layer. The ceramics are thin-walled and 0.3 to 0.5 cm thick. Only the upper edges of two rims were thickened (Fig. 5:1, 2). The ceramics are composed of a dense paste, which appears to be a mixture of sand, gravel, and small pebbles. Some fragments on the inner and outer side are covered with soot.

The following finds were the most characteristic:

A fragment of undecorated rim with thickened edge beveled outward has a light- and dark-brown paste. The fragment is covered on the inner and outer sides with soot. The paste contains a mixture of sand and grus. The thickness is 0.4 to 1.1 cm (Fig. 5:1).

A fragment of a rim with thickened edge beveled inward has a dark-brown paste and no decoration. The fragment is completely covered with soot. In the paste is a mixture of sand and grus. The thickness is 0.5 to 1.0 cm. (Fig. 5:2).

A fragment of rim has a lightly thickened edge and straight upper surface. The outer surface of the rim is light-brown and covered with soot. The color of the paste is black in the break; the paste is a mixture of sand and grus. The thickness of the fragment is 0.3 to 0.5 cm. (Fig. 5:3).

A fragment of ceramics has two longitudinal parallel depressions: one on the upper part and the second on a small corner of the first. The external surface of the fragment is light brown with a groove from grass pressed into it when the vessel was being formed. The interior surface has two colors: one half is light brown, the other is black. On the inside of the fragment were preserved depressions from fingers. The paste is black in the break and contains a substantial mixture of small gravel. The thickness of the fragment is 0.3 to 0.5 cm (Fig. 5:4).

The described rims are rather often encountered in Old Koryak sites. Vessels with such rims are primarily smooth walled. Such rims are found in the sites of Atargan (Vasil'evskii 1971: Pl. XII:3) and Stanyukovicha (Lebedintsev 1990: Fig. 152:5). There are analogies to the parallel depressions on the fragment of ceramics from the Mys Dal'nii site in the ceramic material from the Stanyukovicha site. A fragment of a rim was found there with imprints of several of the same paired, parallel depressions; possibly a comb made these depressions.

Faunal remains were collected in the test pit: 429 bones of small pinnipeds, 41 specimens of split long-bone (deer), 1 fragment from the lower and 2 from the upper jaw of a deer, 15 bird bones, and 1 fish bone. Layers of shell were made up of periwinkle and mussel. Charcoal was taken from a depth of 15 to 45 cm in the cultural layer for radiocarbon analysis. The Old Koryak site at Cape Dal'nii can

be preliminarily dated to the Atargan stage. The find of an Old Koryak site in Shel'tinga Bay supports our assumption that this bay was also in the distribution zone of the Old Koryak culture (Lebedintsev 1990:233). At the moment Mys Dal'nii is the westernmost Old Koryak site.

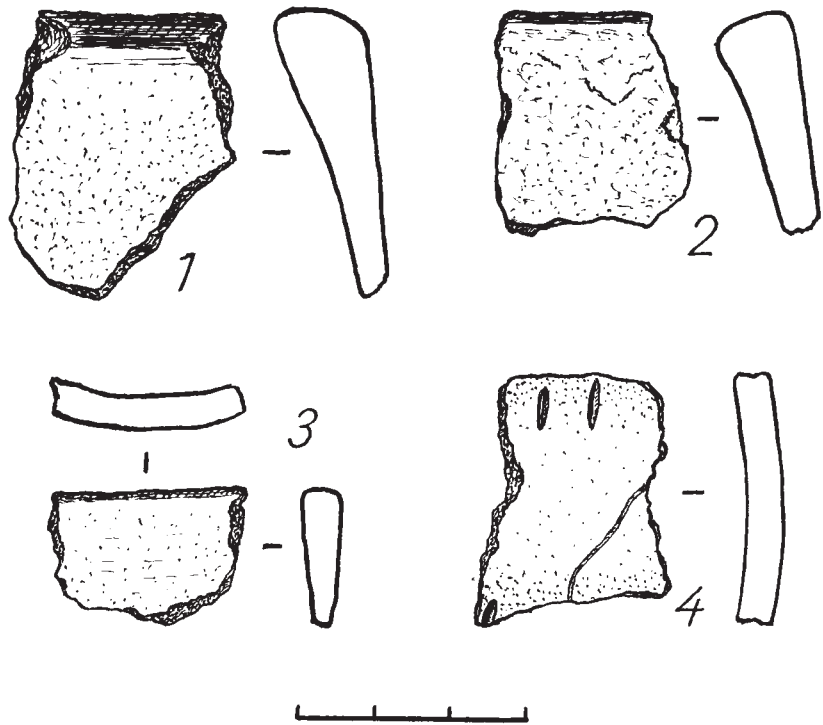


Figure 5. Fragments of ceramics from the Mys Dal'nii site.

As a result of investigation of Shestakova Bay, two, probably seasonal, Old Koryak sites were found.

Shestakova Bay is 21 km east of Cape Dal'nii.⁹ It is bounded on the east by the Antamlan Peninsula. The shore of the bay is high and rocky.

The slopes of the mountain tops that surround the bay are overgrown with forest. A stream enters into Shestakova Bay. To the west, for a distance of approximately 2 km, the shore is bordered by a sandy-rocky drainage. Beside this stream an Old Koryak site was found in 1990 that we named **Shestakova I**.

The site is located on an outlier of a 3- to 5-meter terrace at the mouth of the stream. The terrace of somewhat extended form is gradually being eroded on one side by the action of the stream and on the other by the sea. The outlier is a small area connected to the slope of the hill. A 2 m² test pit was placed on the end of the outlier, 4 m from its edge.

⁹ Shestakova Bay was named after the Yakutsk Cossack leader Afanasii Fedotovitch Shestakov, a famous explorer of the Okhotsk Sea, who in 1729 sailed from Okhotsk to Penzhinska Bay (Leont'ev and Novikova 1989).

The stratigraphy of the site is:

	Thickness, cm
Sod	8–15
Dark-brown humic sandy loam	8–26
Light-brown sandy loam with cobbles of various sizes	more than 3 m

The cultural layer, in which a large number of stones and cobbles were found, is a dark-brown sandy loam.

Five stone tools were found in the test pit:

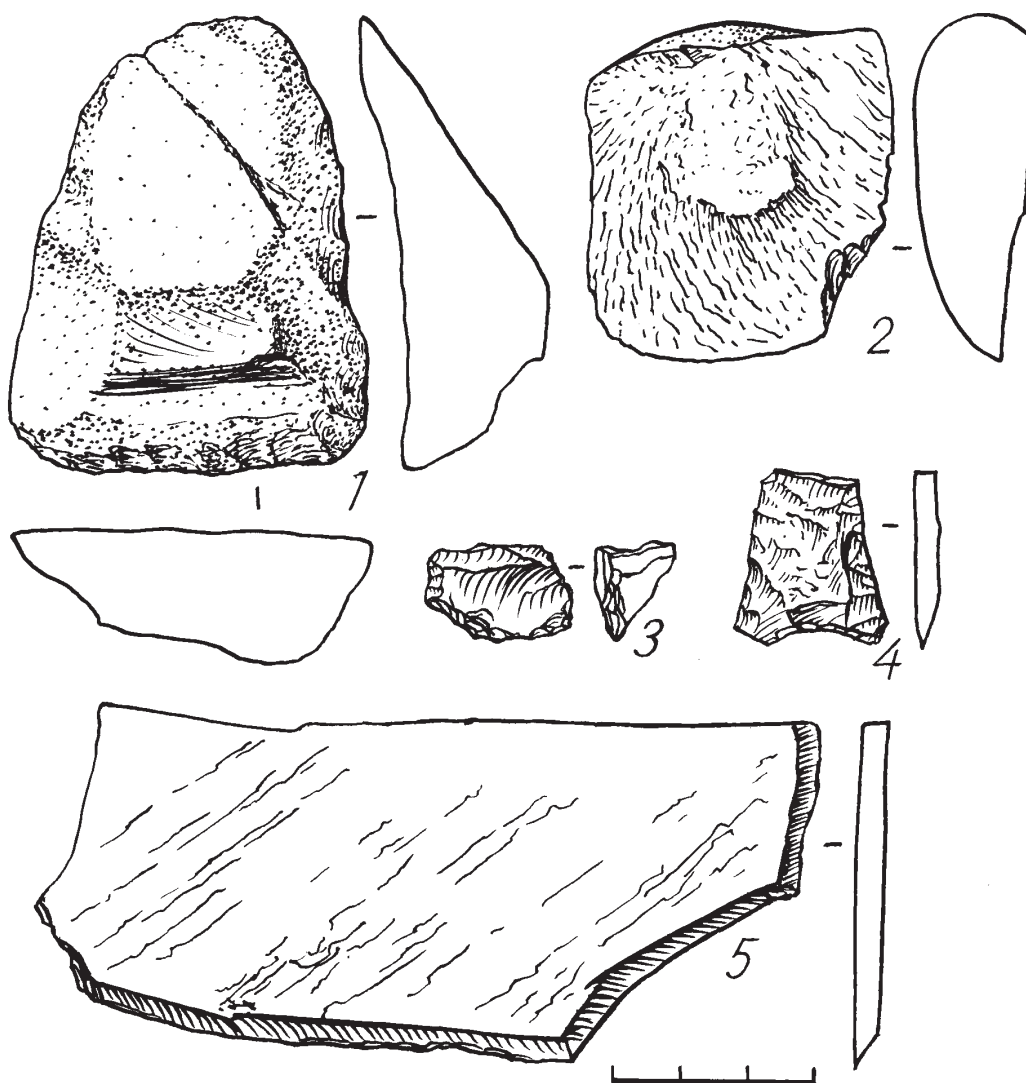


Figure 6. Stone tools from the Shestakova I site: scrapers on sandstone (1), andesite-basalt (2) and chalcedony (3); hornfels point (4); slate knife (5).

A trapezoidal scraper on a large light-gray sandstone flake (Fig. 6:1) has a working edge, modified by steep retouch from ventral to dorsal, that is straight.

A scraper on a cobble spall of black andesite-basalt (Fig. 6:2) has a reverse side that completely preserves the cobble cortex. The working edges on the lower and the right side have traces of polish from use. The working edges of the scraper do not have special modification by retouch.

A scraper on a flake of chalcedony (Fig. 6:3) has a convex back, a subtriangular cross section, and the working edge modified by retouch.

A triangular hornfels arrowhead with concave base (Fig. 6:4) has a point that is completely worked on both sides by retouch. The cross section is lenticular. The tip and barbs at the base are broken.

A knife on a lamellar slab of phyllitic slate (Fig. 6:5) has grinding and scratches on its edges and flat sides. The working edge is located on the lower part and was trimmed by retouch.

A cluster of ceramics was in the cultural layer as well as isolated fragments (a total of 82 fragments, including 14 rims). There are fragments that are severely exfoliating, and some that are more compact. The paste of the ceramics contains a mixture of large-grained sand and small gravels. The thickness of the fragments is from 0.3 to 1.1 cm. Most fragments belong to one vessel. The vessel had a truncated egg-shaped form, smooth walls, and rounded body and base. The rim of the vessel is decorated by applied dissected ridges, rounded beads, and oval vertical appliques.

The most interesting cemented part of this vessel is its rim, which had a wide (2.2 cm), flat surface, probably beveled outward, decorated along the edges by narrow (0.3 cm) applied dissected rolls and oval beads 0.4 to 0.5 cm in diameter in the middle (Fig. 7:1). The rim is substantially thickened by an applique triangular in cross section, overhanging in the form of a cornice. Along the outer edge of the rim, cuts were applied, and just below it, under the cornice, the vessel is decorated with oval, vertically situated, parallel appliques. The fragment in the illustration is the exfoliated applique of the thickened upper part of the rim. Its outer part is covered with soot. The paste of the rim is exfoliating and a light-brown color; in it can be seen a mixture of sand and grus.

Another striking aspect of this vessel is its applied elements. Part of the vessel's wall has six horizontal applied dissected rolls placed in pairs 0.3 to 0.4 cm wide and applied beads 0.4 to 0.6 cm in diameter (Fig. 7:2). Each row of beads is under one of the pairs of horizontal rolls. The color of the surface of the wall ranges from light brown to black. The paste is dark brown and, only in the thickened part of the rim, light brown. Fragments of this vessel were exfoliated into two parts, which is probably connected with the fact that its walls were thickened with an additional layer. On the upper part of the rim, the lamination is increased; thus the flattened broad applique rendered was very fragile. In the paste, there is a mixture of sand, grus, and gravel. The glued area of the wall is partially covered with soot on the outside and completely covered on the inside. The thickness of the wall is 0.4 to 0.6 cm, but approximately 1 cm in the place of the attachment of the applique.

The ceramics from the Shestakova I site are common for the Old Koryak culture. Dissected rolls appear for the first time in the period of the Zav'yalova stage (5th–8th centuries). Ceramics with applied beads have been found in the Old Koryak sites of Bogurchan (Vasil'evskii 1971: Pl. XXIV:15), Alevina (Ponkratova 1996:163), Oksa I (Lebedintsev 1990: Fig. 147:3), Stanyukovicha (Lebedintsev 1990: Fig. 152:2, 3), and Talan (Lebedintsev 1992: Fig. 4:2).

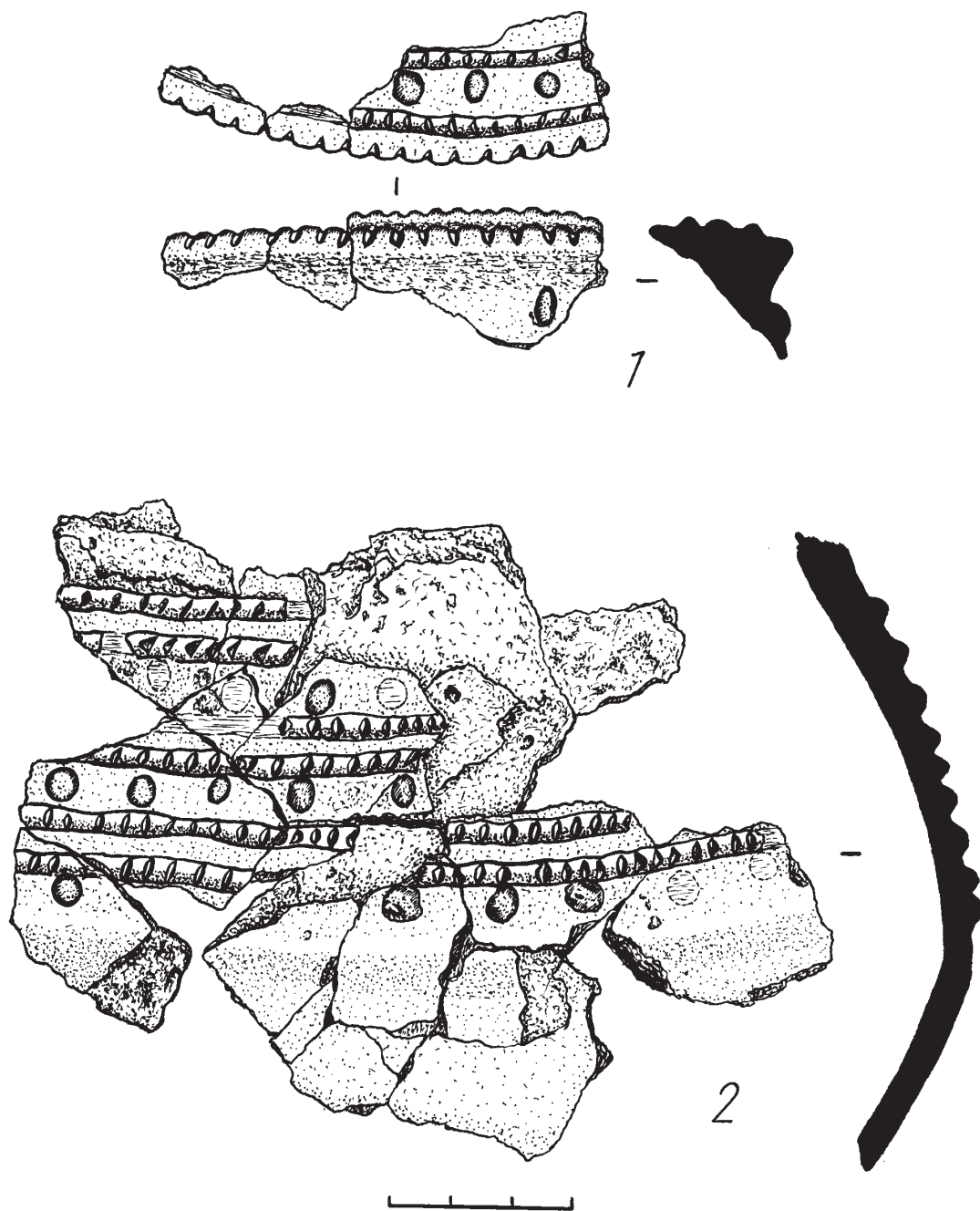


Figure 7. Fragments of a ceramic vessel from the Shestakova II site.

From the cultural layer were extracted 12 bones of small pinnipeds, and charcoal was taken from a depth of 10 to 25 cm for radiocarbon analysis.

The Shestakova I site can be tentatively dated to the 10th century. This is confirmed by finds of stone tools (a triangular point with a concave base and a scraper on a chalcedony flake) characteristic of

earlier stages of the Old Koryak culture (Zav'yalova and Bogurchan), as well as ceramics with applied beads, which appear in the Bogurchan stage.

In the western part of Shestakova Bay, another site was discovered: **Shestakova II**. It was located on a low 3-meter coastal terrace 15 m from the stream.

A 2 m² test pit was placed 3 to 4 m from the edge of the terrace.

The following stratigraphy was revealed:

	Thickness, cm
Sod	10–16
Brown sandy loam	10–15
Sand with grus	

The cultural layer is brown sandy loam. Immediately under the sod in a large part of the test pit was a cluster of mollusk shells (periwinkles and mussels) 1 cm thick. In the lower part of the sod and under the sod to a depth of 10 to 15 cm were encountered everywhere the bones of sea mammals, reindeer, and birds. Collected in the test pit was a total of 188 whole and broken pinniped bones, 53 bird bones, and 67 reindeer bones, including 22 split long-bones and 10 teeth.

In this layer were also 2 large stone spalls. One spall was from a pebble with rounded edge. It was used as a scraper without additional modification of the scraper working edge (Fig. 8:1). Weak polish can be seen along the working edge. The pebble cortex was completely preserved on one side. The other spall, also large and massive in the upper part, has a triangular form, but without any traces of use (Fig. 8:2). Both were made from the same kind of stone—diorite-porphyrte. Charcoal was taken from the layer at a depth of 15–20 cm.

Judging by the stone finds, the site is late, its age no more than 400 to 500 years. The site was probably seasonal and belonged to hunters who were occupied in this region with hunting sea mammals and reindeer and catching birds.

During the field season of 1990, we investigated for the first time the small Talan Island near the Khmitevskii Peninsula.

Talan Island is located in Tauiskaya Bay in the Sea of Okhotsk, 8 km from the mainland shore of the Khmitevskii Peninsula. It is a stone pedestal 2.5 km² in area that rises 221 m above sea level. The extent of the island from northwest to southeast amounts to about 2.5 km with a maximal width of a little more than 1 km. The slopes of the shore, except at the western one, drop steeply and sheerly into the sea. The height of the coastal precipices is from 30 to 150 m. The island is formed basically of biotite-hornblende granodiorites, as well as crystalline and argillaceous slates. Quaternary deposits are represented by sand, boulder-cobble, and silty-clay material of alluvial-diluvial origin. The coastal slopes of the island are in large part sod-covered. Vegetation is sparse on the slopes. From the northwest shore of the island, a dry sandbank stretches 900 m. The western and eastern shores of the island are bordered by dry stones.

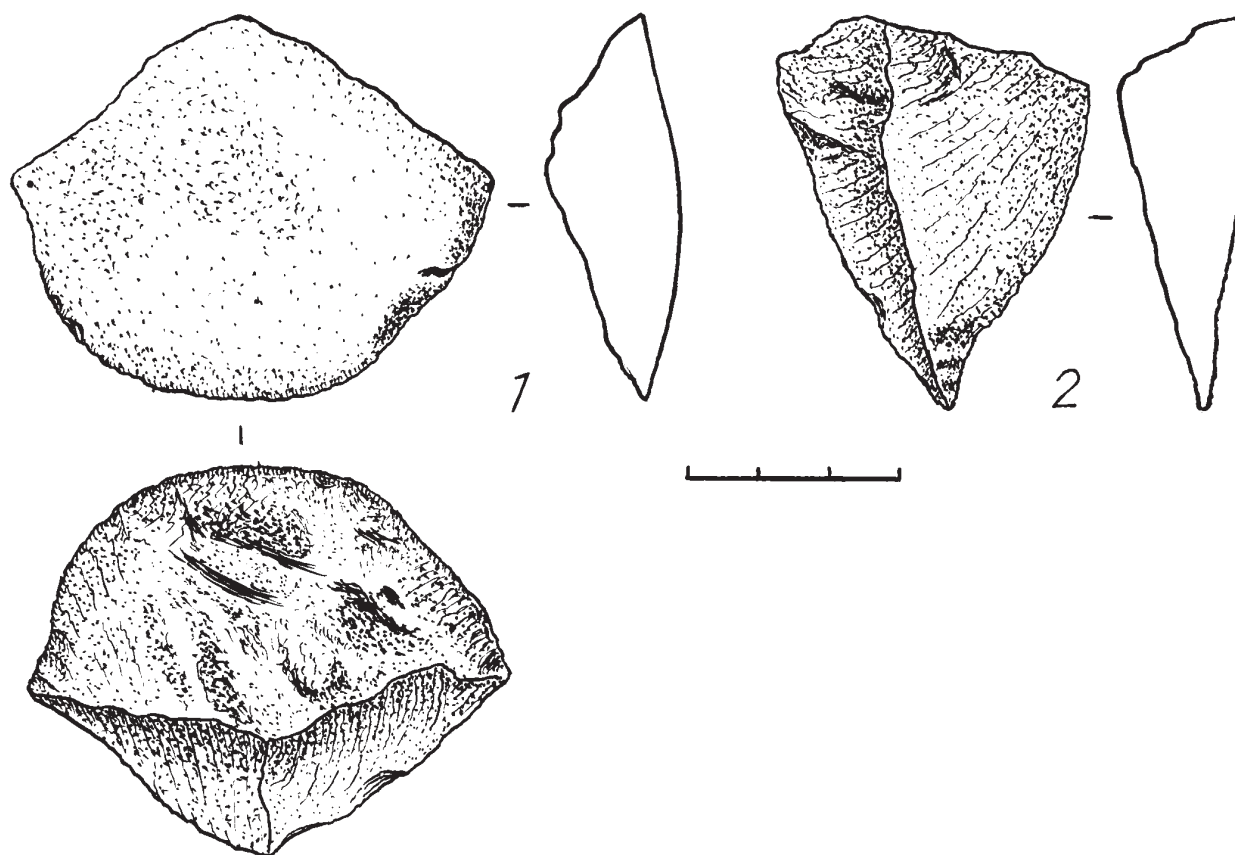


Figure 8. Stone artifacts from the Shestakova II site: 1—scraper; 2—spall.

The north slope of the island is the gentlest, with a slope of about 35 to 45°. It transitions to an ancient sea terrace 3 to 6 m above sea level. The width of the terrace is 100 to 120 m, the length 650 m. The sod-covered terrace is formed of cobbles and, on the side by the sea, bounded by pebble beach ridges. It was in this most favorable place, this terrace in the northern part of the island, that traces of ancient hunters were found. The landscape of the island has existed in modern form for at least 2,000 years. During this time a thick sod layer was formed on the terrace and several thermokarst processes occurred. Here there are two low mounds swollen with cores of icy soil; in the eastern part of the terrace is a small freshwater lake. The area of the lake surface covers only about 400 m², though it does not dry up in the summer since it is fed by snowmelt runoff and rainwater.

The **Talan site** was found on an island in 1987 by ornithologists from the Institute of Biological Problems of the North (IBPS) who were establishing a scientific field base here and delivered the archaeological finds to the SVKNII for identification. In 1990 the author was able to visit the site and carried out there a detailed description of it. During the field season of 1991, the ornithologists also made a small collection of artifacts that, in spite of their fragmentary nature, we felt were necessary to include in the present article.

Upon digging a utility pit, the ornithologists discovered a completely ground, rectangular, brownish slate adze that widens toward the working edge (Fig. 9:1). The cross section of the adze is rectangular.

The upper part is broken and has a projection on one side. On the working edge can be seen traces of wear. The edges of the upper part of the tool have polish. This type of stone adze is encountered in Northern Priokhot'e for the first time.

Upon examining the pit described above, we discovered one flake and a scraper (Fig. 10:6). The scraper was made from a flake of gray color. Small retouch had been applied along the lower edge of the tool.

A 1 m² test pit was placed 2 to 3 m from this pit and approximately 28 m from the edge of the terrace.

The sod revealed no finds and reached a thickness of 8 to 15 cm. The thickness of the cultural layer (brown sandy loam) located under the sod was 4 to 6 cm. In the sod and cultural layer were pebbles and cobbles. A multitude of bones of sea mammals and birds were also found in the cultural layer. There were a total of 709 specimens of bones, including 566 of birds and 143 of seals. Most of the bird bones belong to puffins, though some belong to Kamchatka ducks, auklets, and murrelets (based on the identification by members of the IBPS L. F. Kondrat'eva and E. Yu. Golubova). A small fragment of thin-walled ceramics without decoration was also discovered in the test pit.

Another locality with artifacts was found farther from the shore, approximately 140 m from the edge of the tide line. At a place where they removed peat, the ornithologists found a crushed ceramic vessel, tools, and flakes of stone. Later we examined this place and made a profile. As a result the following stratigraphy was revealed:

	Thickness, cm
Sod	20–30
Brown humic sandy loam with charcoal	10–15
Brown sandy loam	Permafrost did not permit determining the thickness

The artifacts from this location, delivered to the Laboratory of History, Archaeology, and Ethnography of the SVKNII, consist of whole and broken tools and flakes and spalls, debitage from working stone. In the collections are pieces of *points*: the lower part of a triangular arrowhead worked along the edges by retouch and with an indented base on a flake (Fig. 9:3) and the lower part of a leaf-shaped point with a broad and thickened butt (Fig. 9:5). The point was completely worked by retouch. Traces of exfoliated areas can be seen on two sides. *Knives* were made on lamellar flakes and worked by small edge retouch (Fig. 9:7, 8). *Scrapers* were also made on flakes and retouched along the edges (Fig. 10:1–3). There are small scrapers of chalcedony flakes (Fig. 10:4, 5). There is a total of 20 *flakes* and *spalls*, 8 of chalcedony and 12 of siliceous stone.

The broken ceramics dug up by the ornithologists represented the lower part of a pot-like vessel. The thickness of the bulk of the ceramic fragments is 1.0–1.5 cm, but there are also 0.6–1.0 cm thick ones. The color of the fragments is from light to dark brown. There is a substantial mixture of grus and small pebbles in the paste. A layer of residue 0.1–0.2 cm thick on the interior attracts attention. The bottom of the vessel is flat with a diameter of 7–8 cm. The greatest diameter in the upper part is 19.5 cm (Fig. 11).

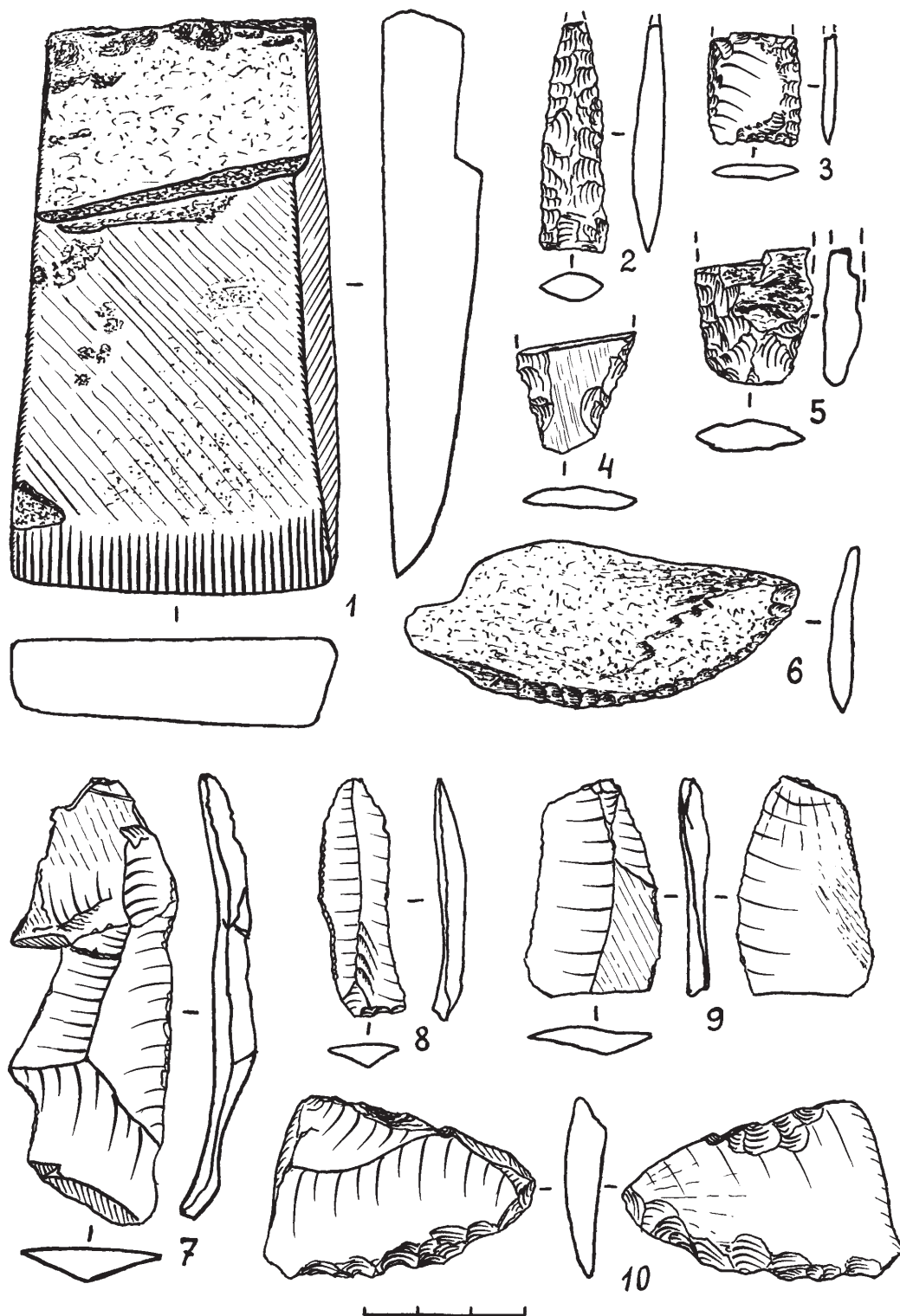


Figure 9. Stone tools from the Talan site: adze (1), points (2–5), knives (6–10).

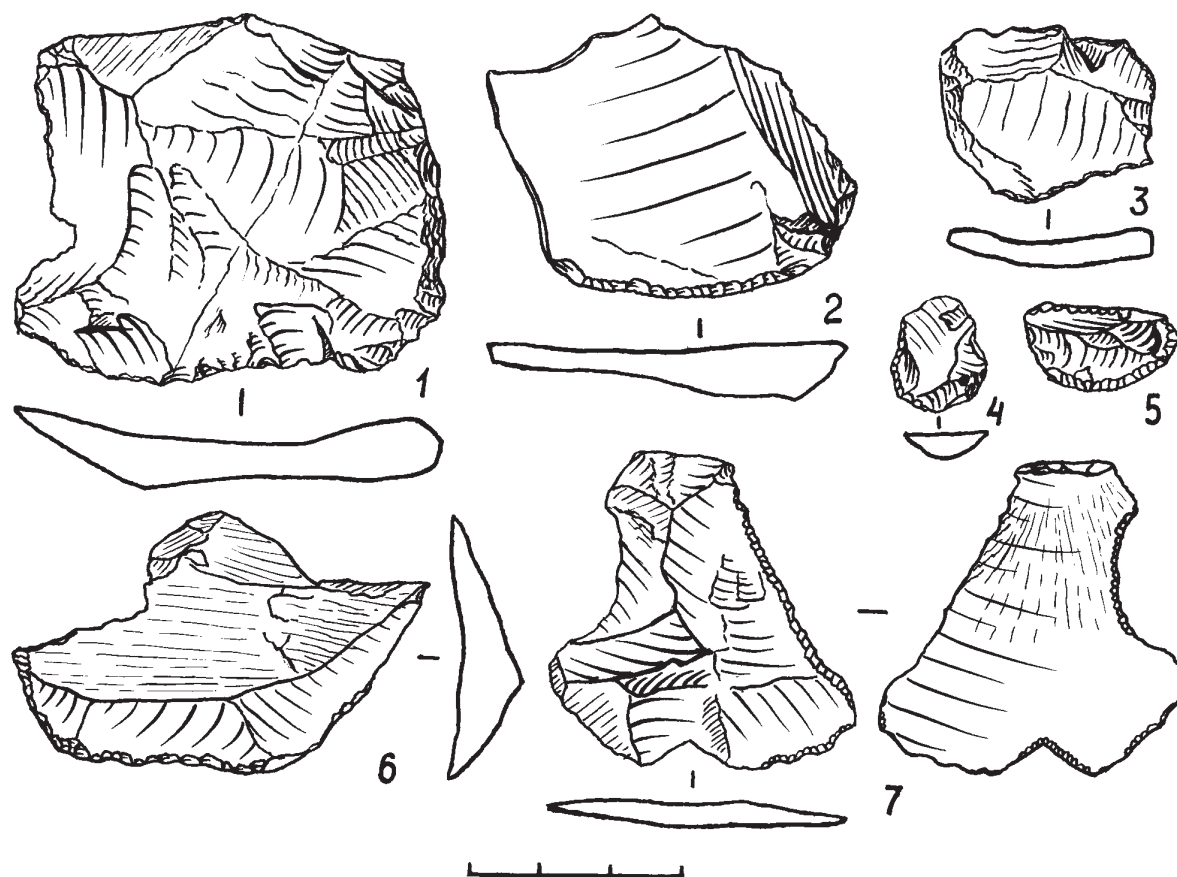


Figure 10. Scrapers of siliceous stone (1–3, 6, 7) and chalcedony (4, 5) from the Talan site.

With the stripping we found 2 points, 3 knives, and 118 flakes and spalls (95 of chalcedony, 3 of tuff, and 20 of siliceous stone). The arrowheads are represented by one nearly intact triangular artifact with a thickened straight base and broken tip (Fig. 9:2). The other is a piece of a leaf-shaped point with a pointed butt (Fig. 9:4). The knives were made on lamellar flakes retouched by small retouch along the edge (Fig. 9:9), as well as on large flakes with bifacial modification of the working edge by the removal of large spalls (Fig. 9:10). One scraper with retouch along the edge was made on a small chalcedony flake. Another was modified along the edge by small alternating retouch on both sides (Fig. 10:7), where there is a pointed indentation.

Chalcedony pebbles, siliceous slate, and tuff slabs were used for making tools: irregular flakes and blades were first obtained, from which various artifacts were then made. Two of the Talan points were completely worked on both sides by retouch (Fig. 9:2, 5). Most of the other tools, bifacial and unifacial, have only edge retouch. An adze was worked by complete grinding, which increased its effectiveness. We note that only partial grinding of the working edges is characteristic for Tokareva axes and adzes.

On the whole, the stone inventory of the site is similar to materials from Tokareva sites of the Okhotsk coast. Only a ground adze with a rectangular cross section is unusual and distinctive. Based on the determination of N. A. Kononenko, a member of the Institute of History, Archaeology, and Ethnog-

raphy of Peoples of the Far East DVO RAN, this adze cannot be assigned to stepped adzes of Yakutia and Chukotka since it has a projection on the other side. At the same time rectangular ground adzes are widespread in the Bronze and early Iron Ages of Primor'ye and Priamur'ye (*Istoriya. . .*, 1989).

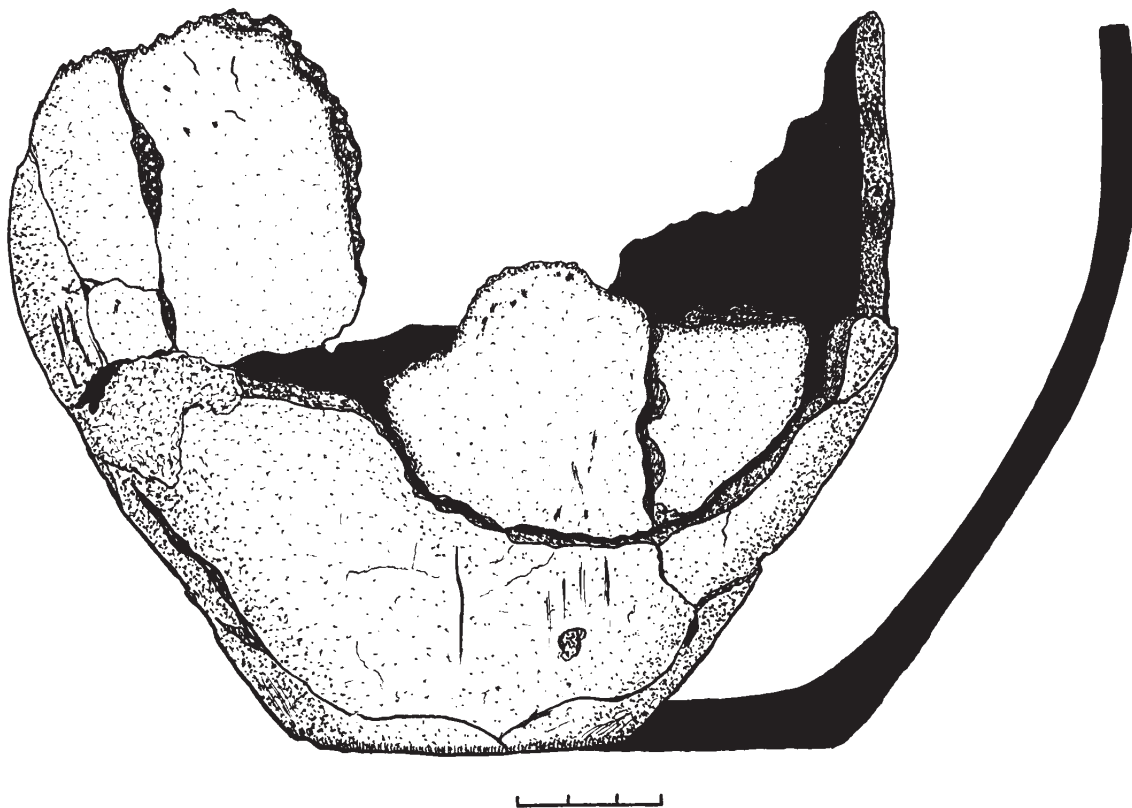


Figure 11. The bottom of a ceramic vessel from the Talan site.

The ceramic vessel from Talan Island may be compared with such vessels from the site on Spafar'eva Island (Lebedintsev 1990). Flat-bottomed ceramics appear on the Okhotsk coast during the second half of the 1st millennium B.C. Their occurrence was most probably connected with the influence of cultures of the Lower Amur. In all likelihood, the appearance of ground tools, including adzes with rectangular cross section, was also the result of southern influence.

We will compare the described stone and ceramic materials with those of Tokareva. The site on Talan Island can be dated to the second half of the 1st millennium B.C. through the beginning of the 1st millennium A.D. This is the period of Paleometal on the Okhotsk coast. The closest large site of the Tokareva culture is approximately 16 km away on Spafar'eva Island. There are sites of the Tokareva culture in Tokareva (Melkovodnaya) Bay on the Khmitevskii Peninsula and at Cape Motykleiskii on the Onatsevicha Peninsula.

The site on Talan Island is most likely seasonal, though it is possible that traces of dwellings might be found in it. Presumably, the ancient hunters were attracted to this island because of its bird

rookery, where it would have been possible to catch birds and gather eggs.¹⁰ In addition, Talan Island is on the way from Spafar'eva Island to Motykleika Bay and other bays where the Tokareva people could hunt sea mammals that crawled out onto the shore.

In 1991 ornithologists discovered fragments of Koryak ceramics under the sod beside one of the cabins of a field research station. Among the 53 fragments (0.3–1 cm thick) delivered to the author was a dark-brown rim with five applied rolls 0.4–0.6 cm wide (Fig. 12:1). On its surface are preserved traces of rolls and a small fragment of a roll triangular in cross section and segmented by notches sloping obliquely to the right. The rim is slightly turned out; the inside is covered with residue. Also among the fragments was a black rim with two rows of applied oval and round beads 0.4–0.6 cm in diameter (Fig. 12:2). Residue is noted on the inside and outside of the rim.

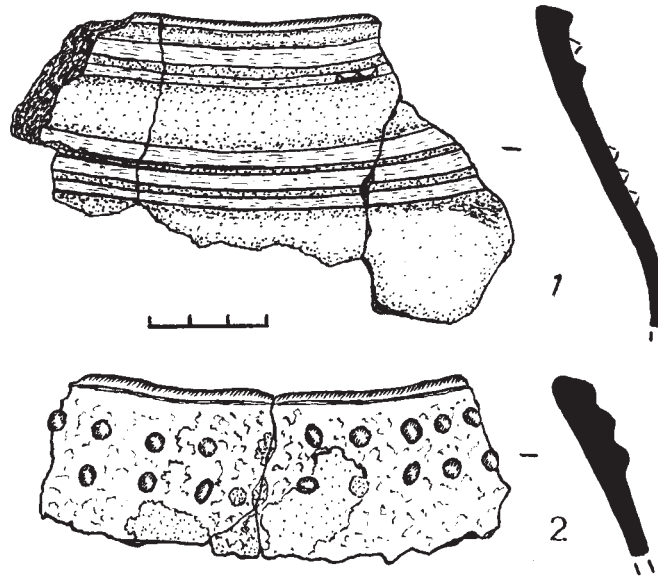


Figure 12. Fragments of ceramics from the Talan site.

The vessels had a narrow neck and convex body. Decoration with applied rolls and beads is characteristic for the Old Koryak culture. The arrangement of two rows of beads is observed on ceramics from the Bogurchan site (Vasil'evskii 1971: Pl. XXIV:15). The Koryak ceramics from Talan Island can be tentatively dated to the 10th–13th centuries. The presence of Koryak ceramics attests that the Koryak visited Talan Island as early as 700–900 years ago.

The **Tokareva site** was discovered during the course of survey work along the Okhotsk coast. It was excavated in 1980–1982. This most interesting site, which gave the name to a whole culture of the Late Neolithic–early Metal period, is gradually being destroyed by the sea.

The shore of Motykleika Bay was surveyed once again. The first surveys were carried out in 1979 and 1980. It was especially exciting to discover traces of the Russian explorers who had constructed a

¹⁰ The Talan bird rookery is one of the largest in the North Pacific (*Pribrezhnye*. . . , 1992). The name is presumably derived from the Koryak “tala-k” and means “beat/bash/thrash” (Leont’ev and Novikova 1989). This name is possibly connected with the noise of a bird rookery.

winter hut at the mouth of the Motykleika River in 1648 (Lebedintsev 1993, 1995). Presently here at the mouth of the Motykleika are the abandoned structures of a former village of fish processors and a fish factory. Attempts to find anything in this place meanwhile were not successful. In all likelihood longer special survey work is needed in this significant and fascinating place. Indeed, the Motykleika winter hut was the second settlement of Russians on the Okhotsk coast, following the Okhotsk outpost, and the first in the territory of the modern Magadan Region.

Surveys along Motykleika Bay were conducted in a rubber boat since Motykleika Bay is very shallow, and even shallower on the ebb tide, especially in the northern part, which is dubbed the *Gniloi ugol* [Rotten Corner].

On the southern part of the Onatsevicha Peninsula, sites named Onatsevicha I and II were discovered.¹¹ The southwestern extremity of the mountainous Onatsevicha Peninsula is Cape Motykleika. Cape Motykleika itself, formed by a mountain slope, is rocky and precipitous. Near this cape (approximately 0.5 km east of it) is a small bay fed by a stream. The Onatsevicha II site was discovered in this small bay, where two loci of artifacts were found. The other site, Onatsevicha I, is located 4 km east of the Onatsevicha II site.

The **Onatsevicha I site** is on a small, low 3-meter terrace. A 2 m² test pit was placed in the site.

The cultural layer (brown sandy loam) is located under the sod at a depth of 8–10 cm from the surface. Between the sod and brown sandy loam passes a carbonaceous layer (1–2 cm). The thickness of the cultural layer is 8–12 cm. An accumulation of shells was revealed in the southeast corner of the test pit.

In the cultural layer were 20 bones of pinniped, 44 of birds, and 12 mollusk shells.

In the test pit were one small flake of chalcedony, a small flattened and heavily corroded iron rod 3 cm long (Fig. 13:1), and a large piece of deer antler with traces of cuts and a slot on one edge (Fig. 13:2). The last find is probably a blank for some kind of inset tool.

Charcoal for radiocarbon dating was taken from the cultural layer. The Onatsevicha I site is probably seasonal and rather late. It can be tentatively dated to the Lengel'val stage (13th–15th centuries).

The **Onatsevicha II site** is located on a small 3-meter terrace connected to the slope of the hill in the western part of the small bay. A 1.0 x 1.3 m test pit was placed on the terrace.

The stratigraphy of the site is the following:

	Thickness, cm
Sod	8–16
Reddish brown sandy loam	20–25
Brown sandy loam with pebbles and cobbles	

¹¹ Name based on the family name of the investigator of the Far Eastern seas Lieutenant-Hydrographer Mikhail Lyutsianovich Onatsevich (Leont'ev and Novikova 1989).

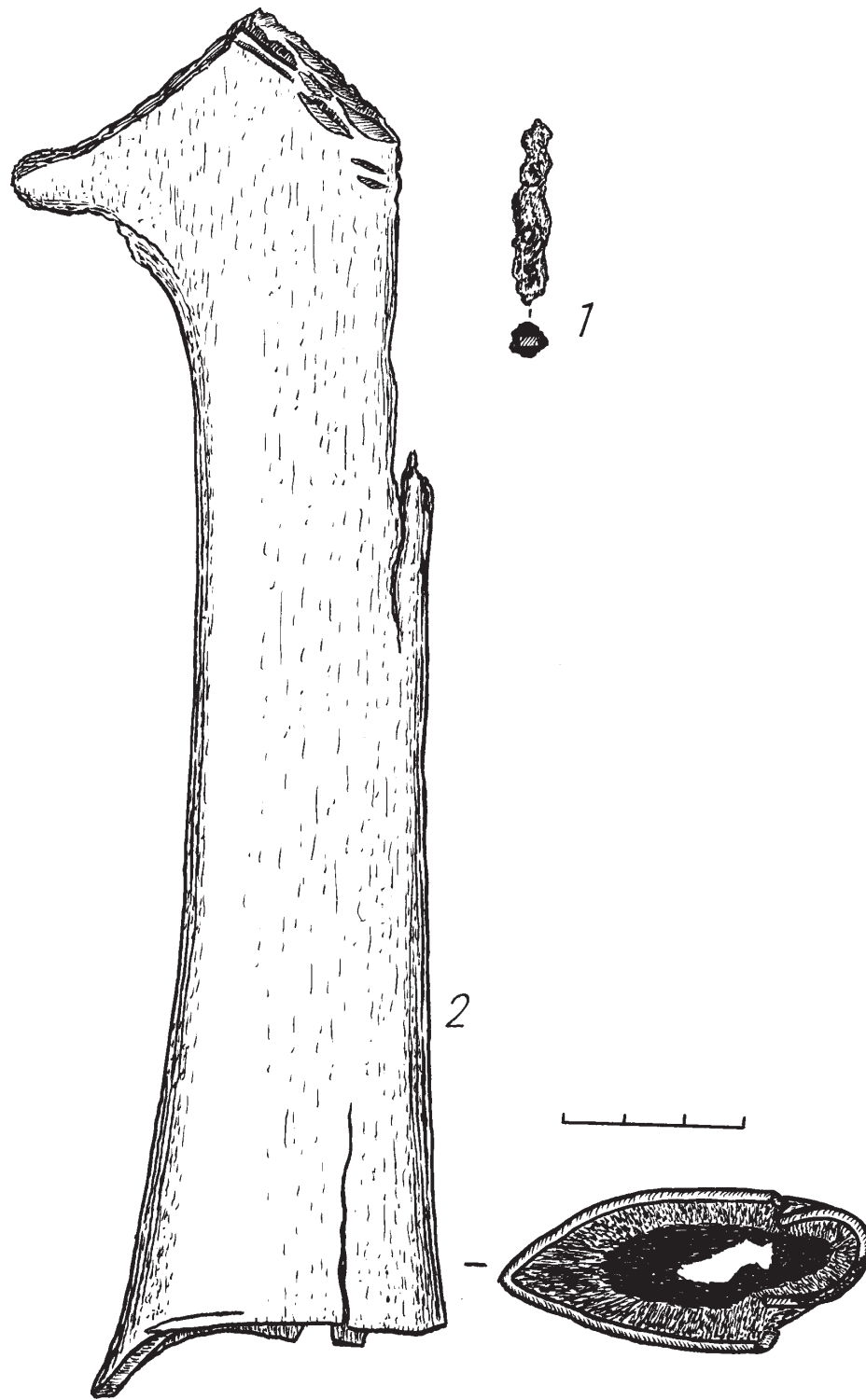


Figure 13. Iron rod (1) and blank of an inset tool of deer antler (2) from the Onatsevicha I site.

The cultural layer of reddish-brown sandy loam contains large cobbles.

The finds of stone are represented by two scrapers. One was executed on a flake of cinereous tuff (Fig. 14:1). The working edge of the scraper was modified by retouch and is 5 cm wide. The remaining parts of the scraper remain unworked. The other scraper was made on a flake of andesitic tuff (Fig. 14:2). The working edge and lateral sides were retouched. On the working edge are preserved areas of cortex from the lamellar separation. There was also found a blank of a tool from a slab of cinereous tuff.

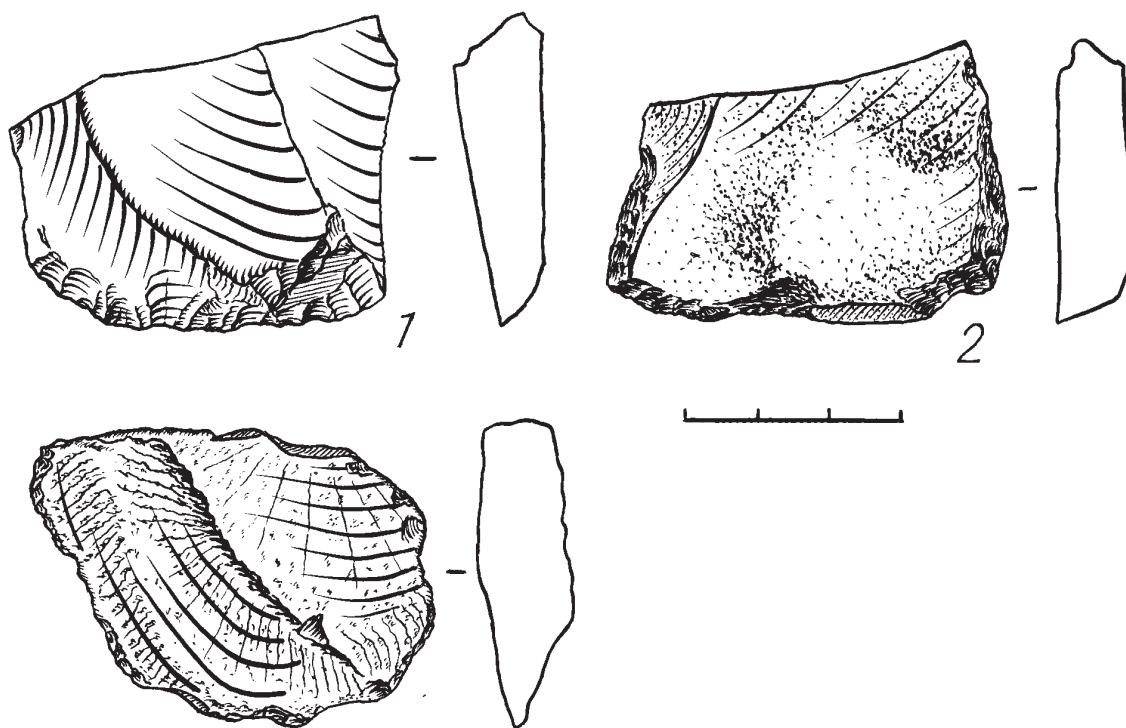


Figure 14. Scrapers of tuff of acidic composition (1) and andesitic tuff (2, 3) from the Onatsevicha II site.

In the test pit were a slab of cinereous tuff, six large spalls (one of andesite, one of arenaceous tuff, and four of cinereous tuff), 37 small and medium flakes and spalls (32 of cinereous tuff, two of andesitic tuff, two of arenaceous tuff, and one of chalcedony), and three small chalcedony pebbles. As seen from the quantitative data, most flakes and spalls are of cinereous tuff of acidic composition. This material has a heavy patina and a light-gray tint.

In the test pit were 5 isolated fragments of ceramics and, by the eastern wall at a depth of 18–20 cm, a cluster of ceramics. A total of 36 fragments were found. They were put together to form the bottom part of a pointed-bottom, thin-wall vessel (Fig. 15). The thickness of its wall is 0.2–0.4 cm; toward the bottom the thickness increases, reaching 1 cm. The color of the ceramics is from reddish brown to light brown and gray on the outside and a more uniform brown color on the inside at the bottom. In the break

the paste is black; it is rather dense, with a mixture of sand and grus. On both the outside and inside of the bottom are areas with residue. A similar bottom of a pointed-bottom vessel was found at the Tokareva site (Lebedintsev 1990: Fig. 34).

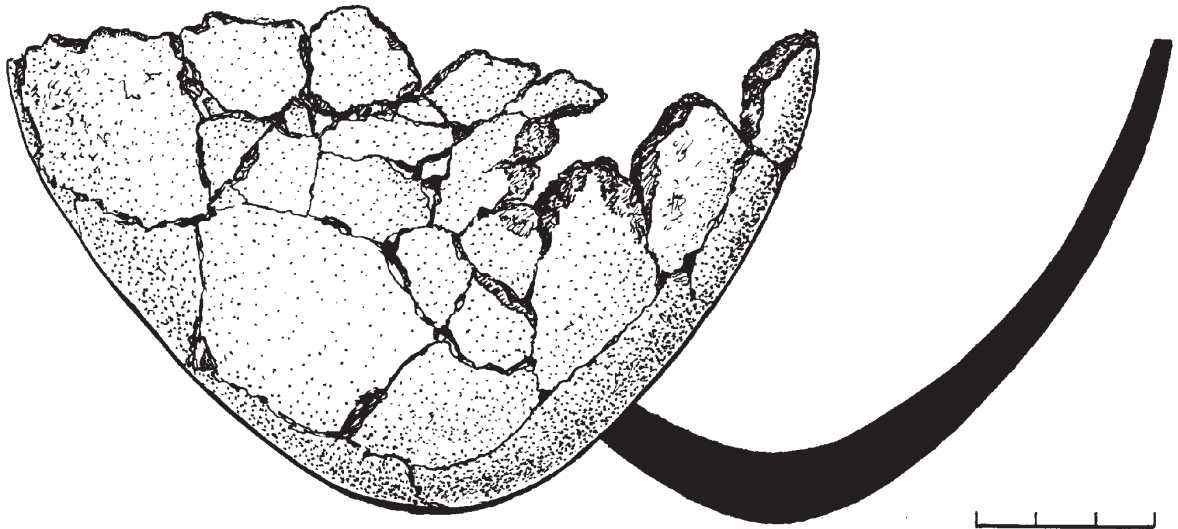


Figure 15. The lower part of the pointed-bottom vessel from the Onatsevicha II site.

Charcoal was taken from the cultural layer at a depth of 15–20 cm for radiocarbon analysis.

One more location with artifacts was found in this small bay 150 m east of the terrace. A test pit was placed there on the left bank at the mouth of the stream. From the denuded areas of a small area of sod-covered surface, the following material was collected: a scraper on a flake of andesitic tuff with polished surface and a working edge with isolated parts broken off (Fig. 14:3), three flakes (one of andesite, two of cinereous tuff), three small chalcedony spalls, one large spall of cinereous tuff, and one small oval quartz pebble.

The Onatsevicha II site apparently belongs to the late stage of the Tokareva culture. Scrapers on flakes from the Onatsevicha II site are similar to those from the Tokareva site and rather often are encountered in materials of other sites of this culture. The presence of a pointed-bottom vessel also confirms this designation. The appearance of pointed-bottom vessels in the Tokareva culture most likely indicates connections of the Tokareva people with the migrant tribes of the taiga zone.

We recall that pointed-bottom vessels appeared in Pribaikal'e by the Early Neolithic (Okladnikov 1950b:166–168). On Sakhalin they appear in the early stages of the Okhotsk culture (*Istoriya*. . ., 1989:150). Traditions of making pointed-bottom ceramics could probably have spread through the Lower Amur to regions of North Priokhot'e and Sakhalin. Even more significantly, in the early stages of the Old Koryak culture—in the Zav'yaloova stage (5th–8th centuries)—broad distribution of thin-walled, pointed-bottom vessels is noted (Vasil'evskii 1971:133).

Thus, as a result of the survey in the area of the Okhotsk coast from Shel'tinga Bay to the Onatsevicha Peninsula seven new sites were found. Earlier, sites of the Neolithic period—Shel'tinga I, of the Tokareva culture, Tokareva and Spafar'eva, of Old Koryak culture, Uzkaya and Stanyukovicha (Lebedintsev 1990), and Cape Lakhtachii (Vasil'evskii 1971:48)—were discovered in this region. Of the newly discovered sites, the oldest are Talan and Onatsevicha II, which probably belong to the Tokareva culture. The Old Koryak sites of Mys Dal'nii and Shestakova I are dated no earlier than the 10th century. The most recent—Shel'tinga II, Shestakova II, and Onatsevicha I, whose ages are no more than 400–500 years—are seasonal hunting sites. New materials attest to the fact that Shel'tinga Bay and the bays of the Khmitevskii and Onatsevicha Peninsulas and islands, located close together, were in antiquity places of active sea mammal and deer hunting. Of the newly revealed sites, the most promising for research are the sites on Talan Island and near Cape Dal'nii.

Study of archaeological sites of the Late Neolithic–early Metal period, as well as Old Koryak sites, is also important because the ethnogenesis of the ancient population of the Okhotsk coast was rather complex (Vasil'evskii 1971; Lebedintsev 1990). Special investigations of the stone, bone, and especially ceramic material can contribute to resolving this complexity. Such a study of the ceramics from the Okhotsk coast was recently begun and preliminary publications have appeared (Ponkratova 1996; Ponkratova and Savva 1996). Though only the ceramics from the Old Koryak site on Cape Alevina (Koni Peninsula on the Okhotsk coast) and the rather late, ethnically undetermined (Orekhov 1988:146) site of Russkaya Koshka (Eastern Chukotka) were studied, quite bold conclusions were drawn. But these conclusions are not yet supported by weighty arguments. The study asserts that “deep connections (of the ceramic complex of Alevina.—A. L.) with ceramics of the continental regions of Siberia and particularly with Yakutia” exist (Ponkratova 1996:163). The study also proclaims the distinctiveness of the technique and technology of pottery making in Priokhot'e and Priamur'e, as revealed by analysis of Koryak ceramics from the Alevina site (Atargan stage, 10th–13th centuries—according to R. S. Vasil'evskii 1971) and ceramics from the Russkaya Koshka site (with an ethnically mixed population, 13th century—according to A. A. Orekhov 1989). But ultimately for such conclusions, we need substantially more coverage of the ceramics from the entire Okhotsk coast over a broad time span. On the whole, the study of ceramic production and the use of research results for determining the possibilities of ethnocultural interpretation of archaeological complexes can have great prospects. At the same time, morphological and decorative traditions are the most ethnoculturally significant, and the production operations connected with them depend less on the technical-technological expediency (Zhushchikhovskaya 1996). The use of sandy clays, as well as additives of large-grain sand, grus, and gravel, in the composition of the formed mixture is probably a continuation of pottery-making technological traditions of Priamur'e, which were predominantly widespread in the southern Far East as early as the 2nd millennium B.C. (Grebenshchikov 1993:62).

A SITE OF THE OLD KORYAK CULTURE ON CAPE PLOSKII (KONI PENINSULA)

A. A. Orekhov

The first archaeological materials from the Koni Peninsula were received by V. I. Levin in 1931. Later archaeological investigations were conducted by A. P. Okladnikov in 1946 and R. S. Vasil'evskii (1971) in 1958–1961 and 1964. As a result of these investigations, dwellings of at least eight ancient sites, dating to the Atargan stage of the Old Koryak culture, were studied. N. N. Dikov (1979a:242) distinguished the complex of the inventory characteristic for this stage. A. I. Lebedintsev (1990) investigated western Koryak sites. However, in spite of numerous publications, it is premature to believe that investigation of the northern Okhotsk coast in general and the Old Koryak culture in particular is complete. The search for and study of new sites permit obtaining additional materials not only in quantitative but also, mainly, in qualitative regard.

In 1990 the Magadan Pedagogical University (MPU) heard about a find of fragments of ceramics, bone and stone tools, and other artifacts in the vicinity of the military post at Cape Ploskii¹² in an area of the Magadan Preserve (Fig. 1).

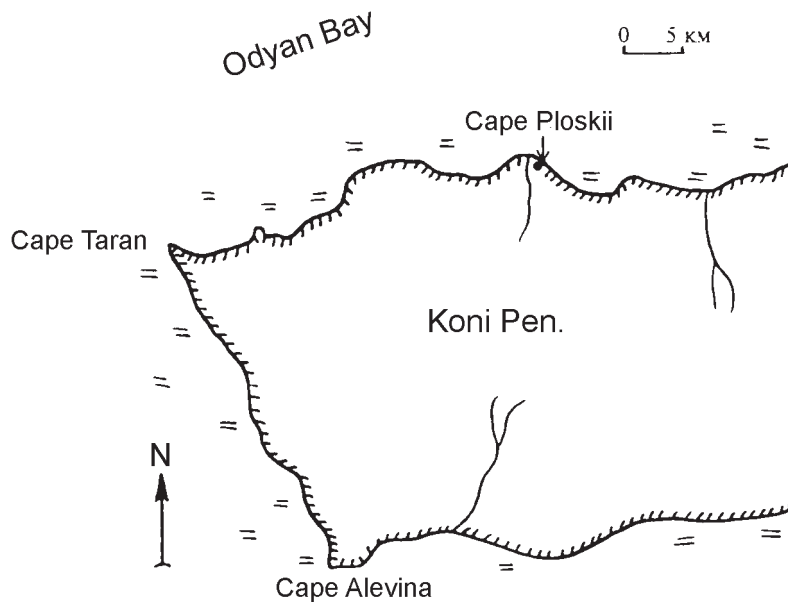


Figure 1. Map of the location of the site on the Koni Peninsula (indicated by the arrow).

¹² Mys Ploskii, which identifies a location, is translated as Cape Ploskii. The proper name of the archaeological site on that cape is transliterated as Mys Ploskii.—*Trans.*

In 1992 an archaeological expedition from MPU conducted a survey and, upon finding archaeological sites, began investigating them. They discovered the remains of approximately 20 ancient dwellings of the semisubterranean type. The remains of several dwellings were noted on the top of the 2nd terrace on the left bank at the mouth of the Khindzha (Khindya) River where it empties into Odyan Inlet of Tauisk Bay. A carbonaceous cultural layer 0.03 to 0.25 m thick, with the remains of mollusk shells, could be traced in a cutbank at a depth of 0.7 m. It was here that various ancient tools and artifacts were discovered while digging pits. On the terrace were dwellings and other buildings of the environmental post, making it impossible to investigate the archaeological objects.

The primary group of archaeological sites was discovered on the right bank at the mouth of the Khindzha (Khindya) River, on top of the first and second stream terraces. The remains of 16 dwellings were located unsystematically along the shore of the sea: seven dwellings were of the semisubterranean type; on the top of the 2-meter-high 1st terrace, six dwellings were on top of the 4–6-meter-high 2nd terrace, and three dwellings on the top of the 8–10-meter-high 3rd terrace (Fig. 2).

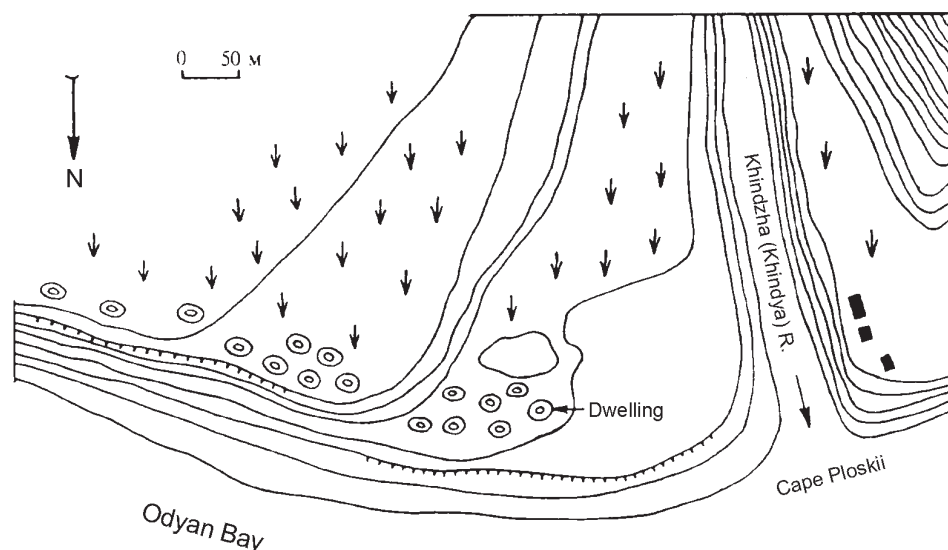


Figure 2. Plan of the site (the arrow indicates an investigated dwelling).

Near the first group of dwellings, on the shore of the sea 100 m from the mouth of the river, were the remains of a semisubterranean hut (hunting lodge?), rectangular in plan (4 x 2 m). Fragments of roofing, fortified with intertwined branches, were preserved. Judging by the state of the wooden fragments, the time of construction of the structure can tentatively be determined as the end of the 19th–beginning of the 20th century. The entryway into the semisubterranean hut is directed toward the seashore. When constructed it cut into an ancient cultural layer to a depth of 0.4 m. In the cultural layer in the wall of the semisubterranean hut was a stone adze of subtriangular form. Near the entrance, in the talus from the cultural layer in the coastal cutbank, at a depth of 0.6 m, were fragments of thin-walled ceramics without decoration, well fired, with a round rim. These are probably fragments of a round-bottomed vessel with rounded body. Here also was a piece of a leister point with three barbs.

The presence of a layer of sand with mollusk shells separating the first and second levels of the cultural layer, which contains artifacts, can be explained by a break in the functioning of the dwelling or widespread traditions of renewal of the floor with a layer of clean sand.

In the center of the dwelling were two hearths of different sizes and construction. The primary, larger subrectangular hearth (1.3 x 1.7 m) was formed of vertically set stone slabs and was associated with both the first and second levels of the cultural layer (Fig. 4).

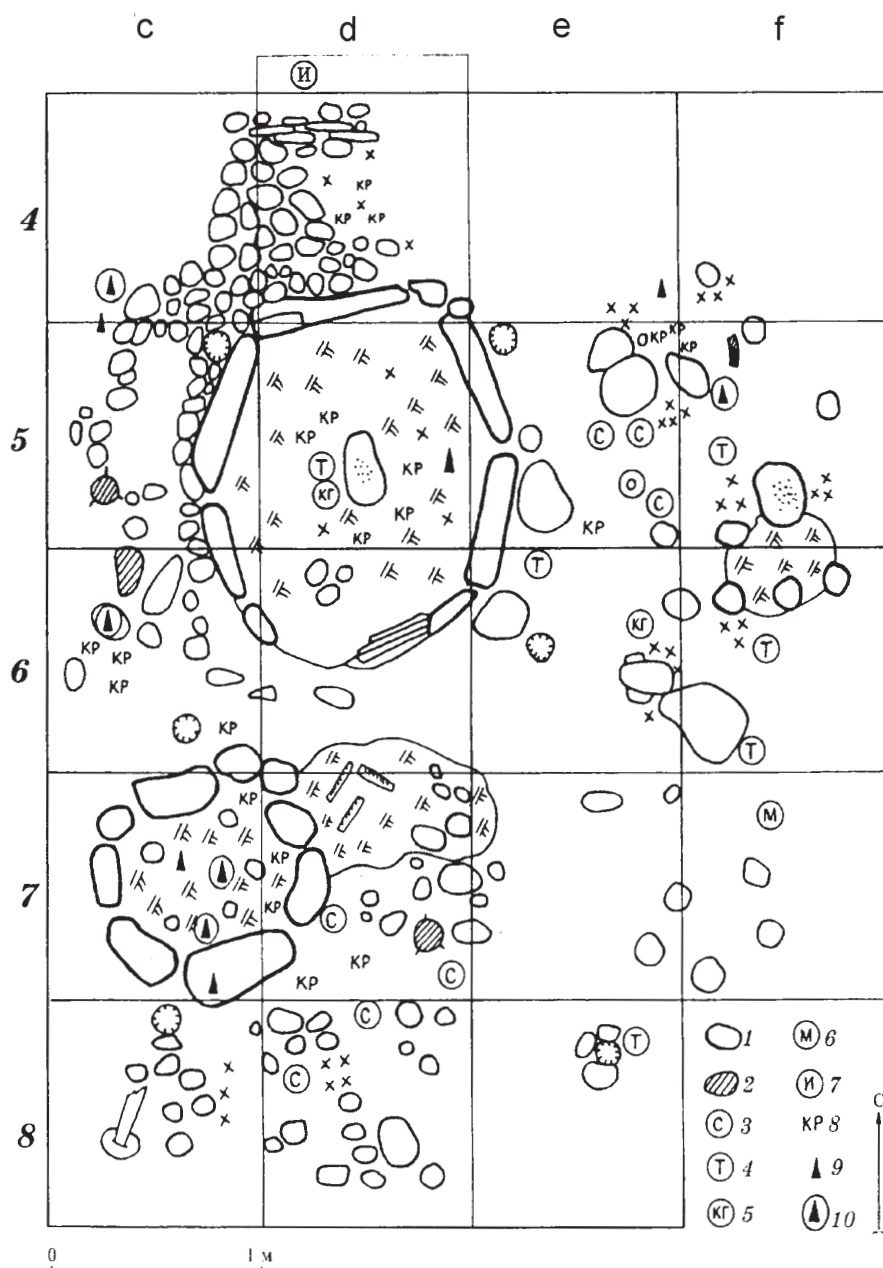


Figure 4. Plan of the excavation of Dwelling 1: 1—stone; 2—bone; 3—scrapers; 4—adzes; 5—bone combs; 6—mattok; 7—artifact of bone; 8—ceramics; 9—arrowheads; 10—harpoon heads.

The depth of the hearth was 0.4 m. In its center was a large stone anvil with traces of blows on the surface. In the hearth fill were charcoal, bones of animals (predominantly marine animals) and birds, fragments of ceramics, a subtriangular adze, and flakes.

The second, circular hearth was in the western part of the dwelling 0.7 m from the first hearth and composed of large rolled stones. The diameter of the hearth was 1 m, its depth 0.25 m. It was associated only with the first, upper level of the cultural layer. In the charcoal of the hearth fill were fragments of ceramics and flakes (see Fig. 4).

The primary part of the finds was concentrated near the hearths, where stone structures were discovered. The two hearths define domestic areas of different assignment.

The area north and west of the primary hearth was covered with flat stones. The concentration here of knives, flakes, and animal bones, including a fragment of a whale vertebra, permits supposing that food was prepared here, including meat and fish (salmon vertebrae were also found).

The floor in the corridor tunnel, in the part adjoining the dwelling, was also covered with flat stones and separated from the living quarters by stone slabs set vertically and half buried in the floor (see Fig. 4). This structure was probably a form of cold trap that impeded the penetration of cold air into the dwelling.

Such areas, laid with flat stones by the hearth, are widely represented in maritime sites of the North Pacific, and the cold trap is traditionally considered a characteristic feature of Old Eskimo dwellings.

In the eastern part of the dwelling were large stone anvils with traces of blows on the upper surface. In combination with the abundance of flakes (over 200), these anvils attest to the preparation here of tools and artifacts of stone as well as possibly of other materials (wood, bone). The adzes, scrapers, and knives found here also support this assignment of working areas. In this part of the dwelling, fragments of ceramics were also encountered, including, near the primary hearth by the north wall, fragments of the upper part of a ceramic vessel: thin walled, with rounded body, and flattened rim. The upper part of this vessel is decorated with zonal decoration from the imprint of a rectangular-toothed (comb) stamp.

In the southern part of the dwelling, by the small round hearth, was an accumulation of charcoal and burned fragments of wood and stones (see Fig. 4). The cobbles were of the kinds of stone a large part of the stone tools and artifacts were made. Small circular stoneworks were most likely used for putting round-bottomed ceramic vessels on, which is corroborated by the abundance of vessel fragments (see Fig. 4).

Approximately in the center of the dwelling were the remains of six roof support posts. The distance between the posts at the primary hearth was 1.4 m, between the first and second pairs of posts was 1.5 and 1.7 m, between the second and third pairs 1.4 and 1.84 m, and between the third pair 1.84 m (see Fig. 4). On the whole, the type of dwellings, hearths, and roof support corresponds to the Atargan stage of development of the Old Koryak culture. But the presence of a lateral tunnel-like corridor entryway 4 m long is distinct.

The bone inventory, found primarily in the second cultural horizon, is varied and interesting. These are tools used for hunting and gathering, domestic occupations, daily life, and decorations. Investigators always exhibit special interest in the hunting-gathering inventory and especially the harpoon heads and the harpoon complex on the whole. In the investigated part of the dwelling were six harpoon heads

of the toggling type (five whole and one fragment), two fragments of barbed harpoon heads, eight bone arrowheads (three whole and five fragments), one pointed object, and two fragments of a leister.

Four toggling harpoon heads were of the same type; they are characterized by a closed shallow socket for the foreshaft, two simple spurs at the base, two line holes perpendicular to the plane of the point, and elongated outlines with a rounded, pointed front end that is without a slit for insets. Their height-to-width proportions vary, and the length of the heads also changes from 5 to 10 cm (Fig. 5:1–3). One of the heads has the side of the socket broken (probably from a blow). This last finding prompted Professor K. Yamaura, upon acquaintance with the collection, to propose that the harpoon heads with a half-open or open socket for the foreshaft are a derived type from an earlier head with a closed socket (Fig. 5:1). Such type of toggling harpoons is represented in the complexes of the Atargan site (Orekhov 1984) and on the whole is characteristic for the Zav'yalova and Atargan stages (based on R. S. Vasil'evskii—Type 1, 1971).

Another type of toggling harpoon head is represented by a whole specimen (Fig. 5:4) and a fragment (Fig. 5:5). The heads have a subtriangular cross section of the point, a beveled base with open socket for the foreshaft, one or two barbs at the base, and two holes for a line (based on the typology of R. S. Vasil'evskii—Type 5, 1971).

Two fragments of barbed leister-like harpoon heads (Fig. 5:6, 7) do not provide a complete idea about the tools. Such heads were used in maritime hunting (for, evidently, small pinnipeds). They were made from the frontal part of the skull of pinnipeds.

Assigned to the rare finds is a perfectly preserved elegant leister (point) made of whalebone with four barbed tines, beautiful proportions, two holes, and a stem for fastening to a wooden haft (Fig. 5:8). A fragment of a similar leister was also found, but with three tines. In addition to the single-bone, multi-tined leister point, parts of its compound point were also found; these parts fasten to a wooden haft in the form of a diverging cluster (Fig. 5:9). Such tools for fishing are characteristic for the Old Koryak culture.

Arrowheads were found with lenticular (two specimens), subtriangular (three specimens), and rhomboid (one specimen) cross section of the point. Four arrowheads had the base, the most diagnostic part, preserved: on three the base is wedge-shaped, characteristic for the Old Koryak culture (Fig. 5:10, 11); on one the base is awl-shaped, also widespread on the Okhotsk and Beringian coasts.

Several bone artifacts (five specimens and four fragments) found in the dwelling (Fig. 5:12, 13) are very enigmatic. Similar objects were found by R. S. Vasil'evskii (1971) at the Atargan site (Pls. XX:11; XXIII:8), Cape Alevina (Pl. XXXIII:8), Cape Tri Brata (Pl. XV:9), and the Varganchik site (Pl. XII:2). They were interpreted as arrowheads for hunting birds and fur-bearing animals.

A detailed study of the artifacts, including under a binocular microscope, summoned doubt about such determination of their function. The artifacts do not have the symmetry and proportions characteristic for arrowheads, and the thickness of the “bases” and one hole through them do not agree with any known method of attachment of arrowheads to a shaft. On the three artifacts, a groove is cut from the hole to the edge of the base, but the assignment of the groove is in no way associated with firm attachment to a shaft. And, finally, traces of soft polish can be seen on both surfaces and at the holes on the artifacts, which permitted the archaeologist-trace analyst N. A. Kononenko to express the supposition that there was long contact (friction) with a soft material (hide, fur?) and attachment with a leather thong. All of the findings stated above suggest the idea that we deal with bone pendants, which, evidently in the form

of a necklace, were on a leather thong worn around the neck. What determines the stable form of these artifacts, a form that misled researchers? It can be supposed that such an intentional form has a sacred significance and is connected with ideas about the source of fertility and thus could belong to a fertility cult or, even more specifically, a phallic cult). One of the artifacts is decorated with concentric circles and parallel lines. Elements of such decoration are widespread, but interpretation of this composition is difficult.

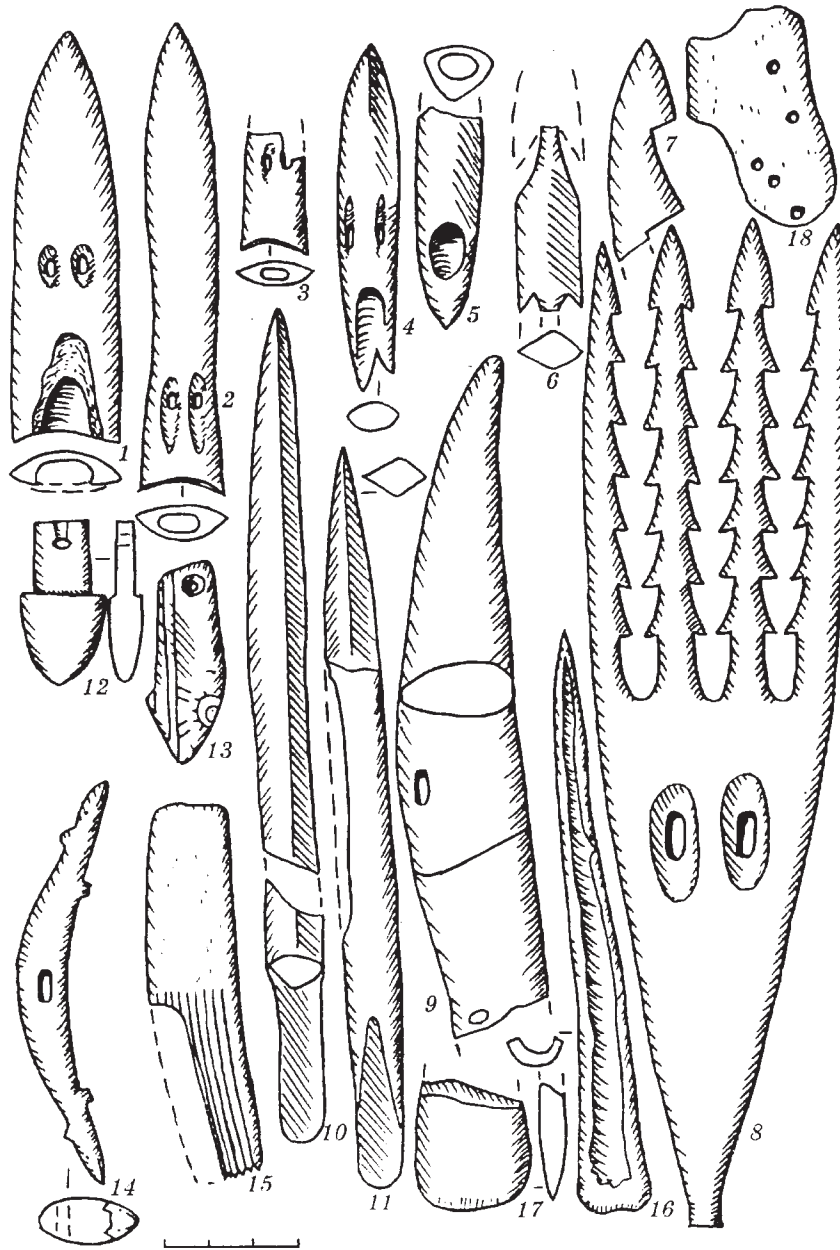


Figure 5. Bone tools and other artifacts: 1-6—harpoon heads; 7, 9—leister parts; 8—leister; 10, 11—arrowheads; 12, 13—pendants; 14—"button"; 15—comb; 16—punch; 17—adze; 18—part of an artifact.

To high-art artifacts found in the dwelling should be assigned the “button”—a utilitarian artifact intended for suspension when carrying (through a loop) different objects. On the artifact are traces of the characteristic polish; it was made in the form of an elegant pendant with a hole through the center; along the edges it was decorated with the heads of small animals (sable?) with outlined front paws (Fig. 5:14). The elegance of the proportions, expressiveness, and craftsmanship of execution of this truly genuine work of art are striking. The artifact was found in the tunnel-like exit of the dwelling where it had evidently been lost.

Everyday objects that were found include two bone combs with 12 and nine teeth (Fig. 5:15), three punches (Fig. 5:16), and an adze (Fig. 5:17). A fragment of one comb is made from the frontal part of a seal (?) skull. A fragment of a fastener is made from a baidara (Fig. 5:18).

In the eastern part of the dwelling were also the remains of a mat (bag?) woven from grass and black from charcoal.

The stone inventory consists of 56 tools and other artifacts and 13 fragments, as well as an abundance of flakes (201 specimens) and spalls (products of primary flaking). The distinctiveness of the stone inventory arises from the fact that all the tools and other artifacts were made from tuffite, a hard stone that submits well to being worked by flaking and percussion retouch, but can only be worked with difficulty by pressure retouch. Because of this feature of the raw material, tools and other artifacts outwardly appear rather archaic.

The most numerous categories of tools are adzes (17 whole and 5 fragments), adze-axes (5 specimens), and scrapers (16 whole and 3 fragments). It is interesting that morphologically adzes and scrapers are quite similar but are distinct in the profile of the working edge and traces of work (some have the polished working edge inherent in scrapers). This permits supposing the possibility of secondary use of several adzes with a change of function, that is, an adze with a working edge blunted from work was used as a scraper. We have already noted such traditions in complexes of the Lakhtina culture on the coast of the Bering Sea (Orekhov 1987).

These tools are predominantly subtriangular (with narrowed stem) and have width-to-height proportions ranging from 1:1.3 to the elongated 1:4.0. These are adzes of lenticular (10 specimens) (Fig. 6:5) and triangular (seven specimens) (Fig. 6:2) cross section. Polish characteristic for adzes is noted on one side of five of them. Their dimensions differ from 7 to 15 cm. The axes-adzes have an oval-convex, slightly ground working edge, a flattened-lenticular cross section, and a narrowed butt (Fig. 6:3). They measure 7 cm. The form of the adze-like tools (five specimens) is suboval (Fig. 6:2). All the scrapers have a lenticular or truncated-lenticular cross section and narrowed butt; their dimensions fluctuate from 5.5 to 9.0 cm (Fig. 6:4, 8). Four scrapers are pear-shaped, that is, with a narrowed, rounded butt (Fig. 6:6). The single specimen of a rectangular inset of the working edge of a knife that was found (Fig. 6:9) indicates that the inhabitants of the dwelling used flakes with sharp edges as knives without additional modification, as well as mollusk shells. Among the stone tools were a large mattock and a fragment of a mattock of elongate-triangular form and triangular cross section (Fig. 6:1). We have noted that such tools were formerly classified exclusively as adzes. However, considering the size (23 cm) and characteristic traces of work, we are inclined to define them as mattocks, which does not exclude the possibility of their primary use as axes-adzes.

Among the stone tools that attract attention are a weight with a hole in the center (Fig. 6:7) and four whetstones (Fig. 6:10).

On the whole, the stone inventory is not very informative and corresponds in general to the available characteristics.

Also found in the cultural layer were over 400 fragments of ceramics, based on which it is possible to give a preliminary idea of the vessels: they were all round bottomed, with rounded body, thin walled (0.5–1 cm), and modeled. Judging by rim fragments, there were six vessels.

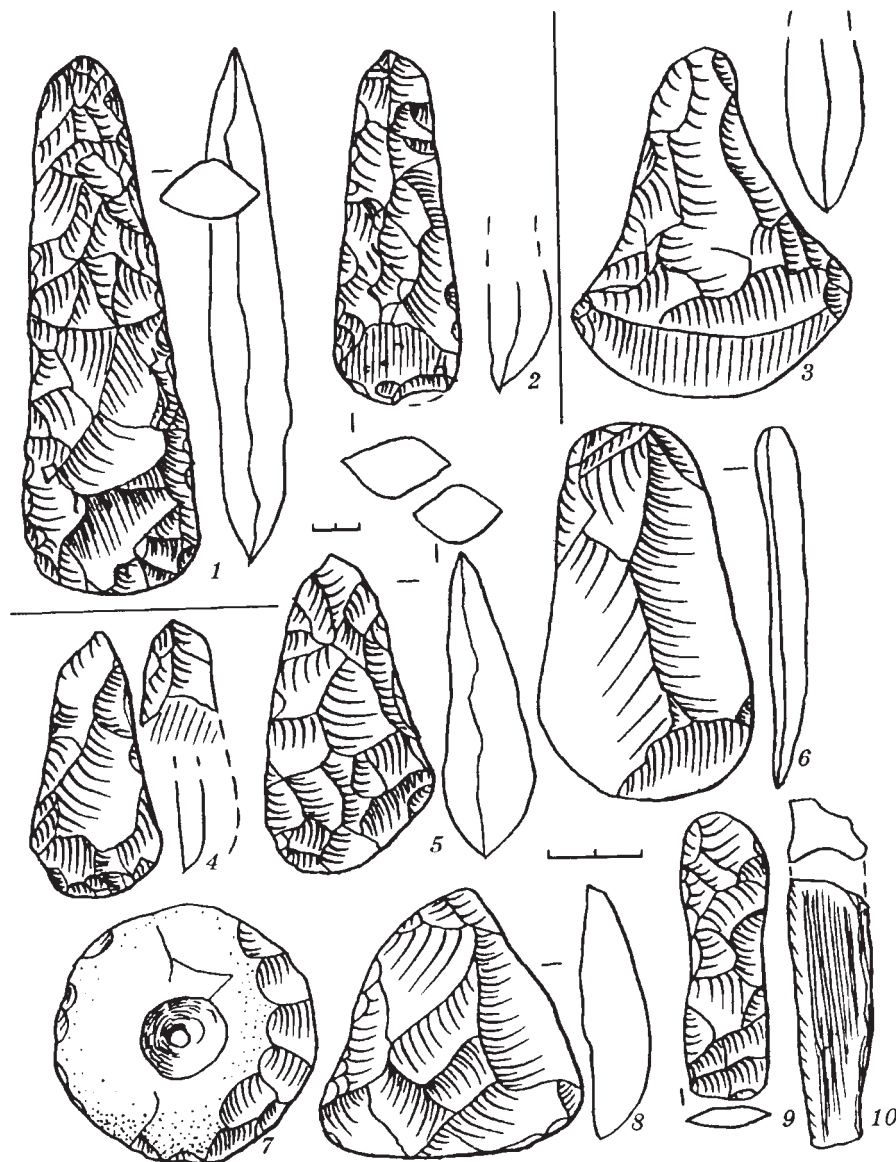


Figure 6. Stone tools: 1–3—adzes; 4–6, 8—scrapers; 7—weight; 9—knife; 10—whetstone.

The first vessel has a flattened (applied) rim; its external surface is covered to the bottom with pseudo-textile (waffle) stamp (Fig. 7:1). On some areas the imprint is very weak or generally does not

exist, that is, execution of this technological-decorative stamp was rather careless. The imprint of the stamp has a right inclination, 60° from the rim, thus revealing that the stamp was applied with the right hand while rotating the vessel. The vessel was partially restored; its dimensions at the rim are 21 x 23 cm, with an oval cross section. This distinctive feature connects these vessels to analogous ones in complexes of the Lakhtina culture (Orekhov 1987). On the fragments are noted traces of light residue. Two other vessels (Fig. 7:2, 3) are characterized by flattened rims with an internal pinching, no decoration, and various wall thicknesses. The fourth vessel (Fig. 7:4) is interesting; two fragments show a rare type of doubled (with a groove) rim. The fifth vessel (Fig. 7:5) has a rim with checks and applied rolls. The sixth vessel (Fig. 7:6) has a rim with checks and applied rolls.

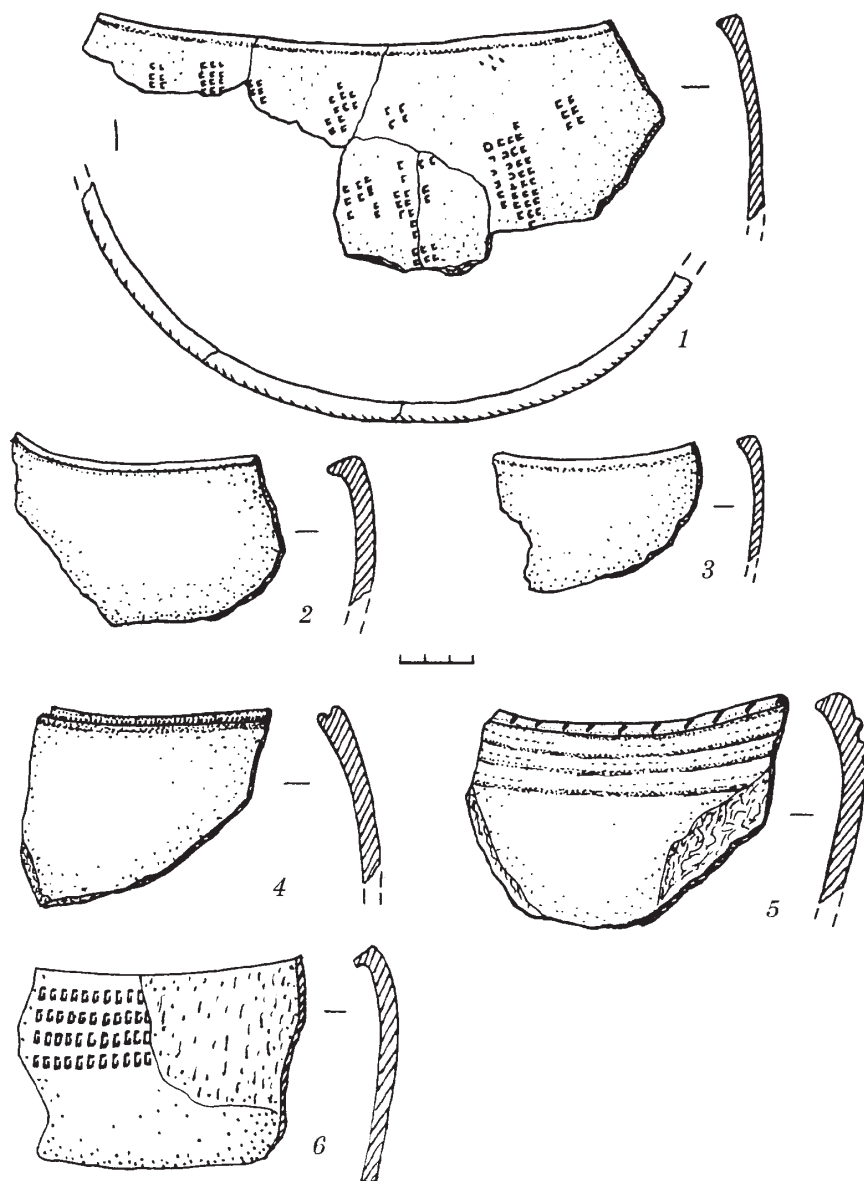


Figure 7. Fragments of ceramics from Dwelling 1 of the Mys Ploskii 1 site.

Ceramics of a similar type on the Okhotsk coast are traditionally connected with Priamur'e traditions (Vasil'evskii 1971; Dikov 1979a; Lebedintsev 1990). Also found were two fragments with pectinate stamp that formed the rim of the sixth vessel (Fig. 7:6). Such type of decoration is not traditionally considered characteristic for the Old Koryak culture.

Archaeologist-ceramics specialist I. Yu. Ponkratova cited the first preliminary data on the technology of ceramic production of the complex from the house being studied and noted that the initial raw materials for the modeling mass were clays of kaolinite-hydromica composition without artificial additives. Fracturing oriented parallel to the walls of the vessel and the absence of characteristic signs of a band-ring applique suggest that all the vessels were formed based on a pattern and their surfaces were worked by smoothing. The vessels were fired at an ordinary camp firing temperature of up to 400°. Based on data from petrographic analysis, the ceramics from Dwelling 1 of the Mys Ploskii 1 site are close to ceramics from Dwelling 1 of the Mys Alevina 1 site, which is also assigned to the Old Koryak culture and located on the south shore of the Koni Peninsula.

On the whole, the form and decoration of these ceramics correspond to those of the Atargan stage.

Newly obtained materials contribute to characterizing the development of the Old Koryak culture. Such findings merit further investigation.

THE NEOLITHIC SITE OF ANADYRKA IN NORTHWESTERN KAMCHATKA

A. K. Ponomarenko

The site is located at the east mouth of the Anadyrka River 17 km north of Palana village on the northwest coast of Kamchatka (Fig. 1).¹³

From 1959–1960, A. V. Semenov, director of the regional museum, conducted archaeological surveys in the region north of the mouth of the Palana River. Semenov and his team collected surface material and examined the cutbank at Anadyrka, one of the sites they discovered (Semenov 1964).

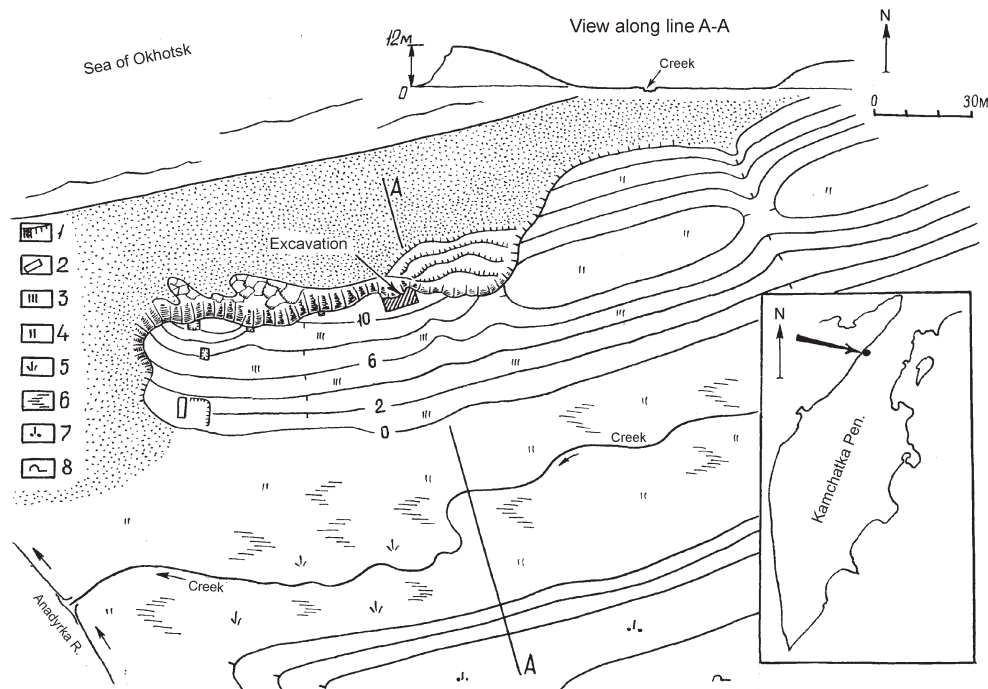


Figure 1. Plan of the Anadyrka site: 1—precipice; 2—modern building; 3—high grass; 4—low grassy vegetation; 5—overgrown with grass; 6—swamp; 7—moss and lichens; 8—creeping cedar.

¹³ Illustrations, plan of the site, and profile of excavations of the site were made by the author.

In 1993 an archaeological team from the district regional museum excavated the Anadyrka site. The cultural layer was studied in one of its damaged areas covering about 40 m² and a slump of the cultural layer was studied in an area of about 80 m².

A collection was made of 547 stone, bone, and wooden artifacts *in situ*, as well as in the redeposited cultural layer. In the slide, 110 bones of sea mammals were found, including whole and fragmented skulls and jaws.

For the preparation of this article, materials were used from the Kamchatka Territorial Geological Archive: Dvali, M. F. *Geologicheskoe stroenie zapadnogo poberezh'ya Kamchatki (Palanskii r-n)* [The Geological Structure of the West Coast of Kamchatka (Palanskii Region)]. Leningrad, 1939; Vdovenko, V. P., N. T. Demidov, I. S. Guziev, I. V. Babenko, and A. A. Nemirovchenko. *Otchet o geologicheskoi s'emke, provedennoi v basseine r. Kinkil' letom 1963 g.* [Report on the Geological Survey Conducted in the Kinkil' River Basin in Summer 1963]. Petropavlovsk-Kamchatski, 1964.

In morphological regard, the relief of the studied region is basically of erosional-tectonic origin. Its formation is connected with tectonic movements that brought about the total uplift of the land and was accompanied by intensive erosional dismemberment of the low-mountain steep-sloped relief.

Deposits in the coastal cutbanks of the Sea of Okhotsk at the mouth of the Anadyrka River consist of aleurolites and sandstones. The stones are not compact and are easily susceptible to weathering. The transgressive character of the Sea of Okhotsk in the modern stage causes an intensive process of shore destruction. During high tide the level of the water in the sea rises as much as 8 m, helping accelerate the erosive processes. The stream valley, deeply cut into the 2nd floodplain terrace parallel to the shore of the Sea of Okhotsk at the mouth of the right bank of the Anadyrka River, formed an outlier terrace that on the southeast is bounded by the stream valley and on the northwest by the shore of the sea. The outlier extends southwest to northeast; its width is 35–40 m. The southeastern part of the outlier is the relatively gentle slope of the stream valley; the northeastern part is a sheer precipice 7–12 m high that continues to be severely damaged by the sea. The base of the terrace becomes damaged more quickly than its overlying soil cover, which is about 3 m thick and affected by permafrost. When the lip that forms, overhanging the precipice, reaches critical mass, it falls and then is washed away by the surf. As a result of the intensive sea abrasion, slumps occasionally occur.

The Anadyrka site is located on the described outlier of the 2nd floodplain terrace on the right of the mouth of the stream (Fig. 1). A cultural layer of 145 m extent can be traced in the cutbank of the terrace along the seaside from west to east, as well as in areas of the cultural layer damaged by trails at the foot of the slope on the right side of the stream valley. Judging by its denudation, the cultural layer occupies the whole area of the terrace outlier for an extent of 150 m from its western to its eastern extremity. The width of the area is 35–40 m. Thus, the cultural layer is spread over an area of about 6,000 m². East of the excavation, a slump was formed as a result of erosion of the bedrock. Up to 70% of the thickness of the slump consists of cultural layer. The area of the slump is about 80 m². The thickness of the cultural layer in the western part of the cutbank is 50–80 cm, in the middle part 200–220 cm. To the northeast the cultural layer tapers out, and 25–30 m to the east-northeast of the excavation it amounts to 20–30 cm. In the wall of the excavation, the following layers were noted from top to bottom (Fig. 2):

1. Sod—10–32 cm.
2. Black, blackish-brown, or brown sandy loam with traces of man's intensive economic activity,

as well as a large content of vegetable debris: thin branches; needles and cones of creeping cedar [*Pinus pumila*]; wood chips and shavings, pieces of poles and the remains of rotted posts; birch bark; layers of grass stems; lenses from a fire and carbonaceous layers in various levels; layers of mollusk shells; bones of animals, fish, and birds; pebbles and numerous fragments of them; flakes and tools of stone, bone and wood; fur from hides of animals; and fragments of dressed hide—185–200 cm.

3. Brown sterile sandy loam with an intermittently broken traceable layer of black sandy loam 1.5–2 cm thick in the middle horizon—20–35 cm.

4. Light-yellow sterile sandy loam with small lumps, including unrolled cobbles. 279 cm below datum-level and lower.

Samples of charcoal and shells were taken from the three horizons of the cultural layer for radio-carbon dating. The obtained dates are noted in an illustration of part of the excavation's south wall (Fig. 2). A sample of charcoal from the first stratum of the cultural layer in Quad 4A, under the sod, is dated to an age of 1180 ± 40 (GIN-8035). A specimen of charcoal, taken at 167 cm below datum-level, from a hearth 3–4 cm thick has a date of 1350 ± 59 (GIN-8036). A specimen of shells, taken at 216 cm below datum-level, indicates an age of 1780 ± 70 (GIN-8037).

Judging by the dates obtained, the period of formation of the cultural layer amounts to 700–800 years and embraces almost all of the 1st millennium A.D. (1st–9th centuries A.D.).

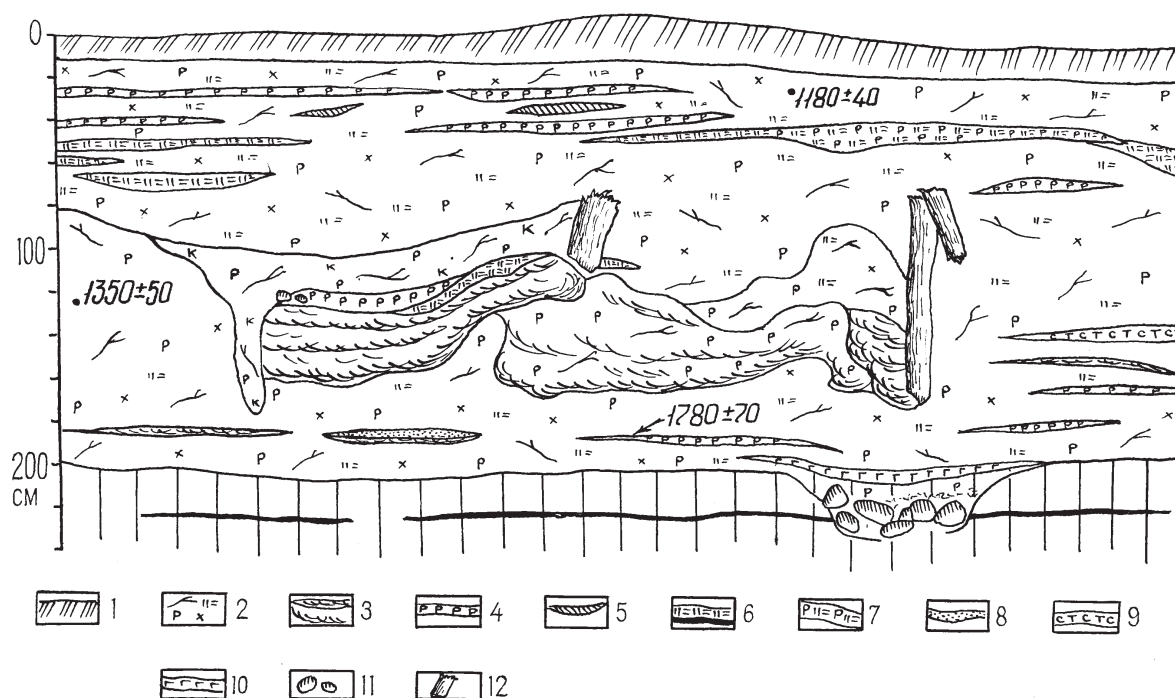


Figure 2. Profile of the wall from the excavation of the Anadyrka site: 1—sod; 2—reddish-brown, in places brown or light-brown sandy loam containing a large quantity of plant debris, carbonaceous stains, and scattered charcoal, stone, bone, and wood artifacts; 3—an accumulation of cedar needles and tundra vegetation; 4—layers of shells; 5—lenses of yellow sandy loam; 6—layers of charcoal; 7—layers of shell mixed with charcoal; 8—sand; 9—layers of stems of grass and tundra vegetation; 10—brown mass of decaying wood; 11—stones; 12—posts.

In Quad 5B, in the first stratum, an incomplete human skeleton was found. There was no skull, but the cervical vertebrae were preserved. The lower jaw lay on the cervical vertebrae, which were covered by black sandy loam 1–1.5 cm thick. The right clavical was shifted onto the spine and almost touched the left clavical. Absent from the lower jaw were all incisors, canines, and one premolar. Near the lower jaw were two incisors from the upper jaw. The bones of the left arm were located parallel to the spine, slightly bent in the elbow joint. The bones of the right arm were bent in the elbow joint so that the phalanges lay by the upper epiphysis of the humerus. Half the pelvis was missing and several ribs were broken. By the lower epiphysis of the left femur was a shovel-shaped incisor of the upper jaw. The bones of the legs are absent below the knees. In the place of the missing right side of the pelvis were five cracked stones. Under the lower jaw and cervical vertebrae lay a large flat fragment of the jaw of a whale (?). The skeleton was buried in black sandy loam, which contained charcoal and numerous, whole and cracked, small stones. Near the skeleton in the sandy loam was a cluster of small sharp bones and vertebrae of fish (?). Under the skeleton was a layer of light-brown sandy loam about 1 cm thick. To the northwest, near the skeleton, the stonework of a hearth was cleared: three large stones were located in a semicircle with two large rolled stones laid at the base of the hearth. The fill of the hearth was a carbonaceous ash mass up to 6 cm thick containing numerous, small, cracked stones. A carbonaceous stain and a carbonaceous ash stain spread to the west from the hearth.

Among the **finds in the first layer** of the cultural stratum, we note those that were well preserved: a *fragment of a rib* of an animal with the end pointed and polished in the process of use (Fig. 24:1); a *comb-like blade* from a scapula (?) of an animal (Fig. 21:1); a *polisher* of reindeer antler with a rounded working edge polished on two sides (Fig. 15:2); another such *polisher* of reindeer antler with a broken handle (Fig. 14:10); a partially broken *needle case* of long-bone with a polished surface and a crack or slit (?) on one side along the axis (Fig. 15:7); a meniscus of a sea mammal vertebra with a hole in the middle 5.7 mm in diameter and the edges of the hole smoothed and polished; on the smooth side can be seen randomly arranged scratches (Fig. 20:11); a fragment of a *bone point* (Fig. 16:14); punches of thin long-bone (Fig. 16:15, 18); a *comb* for working grass (Fig. 13:3); a *polisher* (?) with the pointed flattened end polished, poorly polished surface, and, on the lateral edges, traces of work with a burin preserved (Fig. 26:7); a *retoucher* or *polisher* (?) from a fragment of bone of sub-square cross section (Fig. 21:9); a *point* with straight flattened base and a spur on one side of the base (Fig. 10:2); a *bone point* with a micro-barb and a slot for a stone end blade and a forked base (Fig. 12:6); a *point* of reindeer antler with a slot for a stone end blade and flattened base that narrows downward (Fig. 10:23); a *point* of reindeer antler with a simple tip and a flattened base with a spur on one side (Fig. 10:12); a *point* of reindeer antler with a simple tip, oval in cross section, and flattened base narrowing downward (Fig. 10:10); a *bone point* with simple tip and flattened base (Fig. 10:14); a *point* of reindeer antler curved in plan, with simple tip and flattened base (Fig. 10:8); a *point* of reindeer antler with a simple tip and straight base (Fig. 10:16); a *point* of reindeer antler with a broken tip that is oval in cross section and with a flattened base, at the bottom of which are poorly defined symmetrical projections (Fig. 10:9); a blank of a *point-bunt* of reindeer antler with a flattened base that has negatives of trimming on the surface of the body and an unformed upper end that has traces of a fracture preserved (Fig. 11:11); a *foreshaft* of a toggling harpoon with straight heel, an oval cross section, and an asymmetrically placed hole measuring 9 x 2 mm for attaching a thong (Fig. 11:6); a flattened *foreshaft* of a toggling harpoon of reindeer antler and an off-centered hole measuring 6 x 3 mm for attachment of a line (Fig. 11:9); a *blank* of a toggling harpoon point with one basal spur and the wedge-shaped upper part hewn flat (Fig. 8:17); obsidian leaf-shaped *knives* with broken base (Fig. 4:3, 4); an obsidian leaf-shaped stemmed *knife* with partially broken base (Fig. 3:8); an obsidian leaf-shaped

stemmed *knife* with broken base and tip (Fig. 4:11); an obsidian asymmetrically leaf-shaped *knife* (Fig. 3:1); a leaf-shaped obsidian *knife* with one end broken (Fig. 3:11); a piece of a chalcedony leaf-shaped *biface* (Fig. 4:7); a leaf-shaped *knife* on an obsidian flake (Fig. 3:2); a *knife* on an amorphous obsidian flake (Fig. 3:28); a cylindrical chalcedony *retoucher* with the edges of the round perpendicularly split off (?) ends smoothed and having a star-shaped surface (Fig. 17:12); a chalcedony *punch* with a retouched haft (Fig. 17:10); an *adze butt* of slate (?) with a unifacially sharpened working edge on the end that was formed by grinding and a completely ground surface of the fragment (Fig. 5:10); *weights* of volcanic stone (?) with two symmetrically pecked notches for attachment (Fig. 8:14, 16); a leaf-shaped obsidian *point* with a broken tip and convex base (Fig. 9:16); an amorphous obsidian *flake* with a gauging notch on one side formed by sharpening retouch on the dorsal side (Fig. 8:12); a retouched amorphous obsidian *flake* (Fig. 7:9); and amorphous cores of chalcedony (Fig. 6:4) and obsidian (Figs. 6:3; 7:5).

Among the **finds of the second layer** should be noted a fragment of fabric of grass fibers (Fig. 27); a wooden *knife handle* (Fig. 15:9); a leaf-shaped obsidian *knife* (Fig. 4:18); the same kind of *knife* of chert (Fig. 3:5); a *fragment* of an obsidian leaf-shaped *knife* with one side formed by the removal of two long end spalls (Fig. 4:12); a subtriangular chert *knife* on an exhausted core (Fig. 3:29); a slate *knife* with ground working edge and broken butt (Fig. 3:26); an asymmetrical leaf-shaped obsidian *knife* (Fig. 3:4); a wooden *handle* with flattened ends with symmetrically placed projections (Fig. 16:3); a *polisher* of reindeer antler (Fig. 14:6); a reindeer *antler fragment* with traces of modification, including, on one end, a trace of the break of the antler and, along the lateral edges, traces of work with a burin (Fig. 21:15); a *fragment* of an *arrow shaft* (Fig. 10:26); a *fragment* of a wooden *hoop* with holes for attaching a cord (Fig. 17:15); a bone *punch* (Fig. 16:19); a bone *point* with micro-barb, with a slot for fastening a stone end blade and a forked base (Fig. 12:5); a *punch* of reindeer antler (Fig. 16:17); a *point* of reindeer antler with a flattened, narrowing base and broken tip (Fig. 10:11); a *point blank* of reindeer antler with flattened base and one [of two (?)] spurs at the base and unformed tip (Fig. 10:6); a reindeer *antler fragment* with traces of modification that is partitioned by a burin and split (Fig. 26:3); a barbed harpoon *point* with a tip sharpened to be flat, three rows each of four symmetrically placed barbs, one hole 5 mm in diameter for attachment of a line, and a heel, narrowing downward that is oval in cross section (Fig. 11:1); an obsidian *point* (Fig. 9:13); a stemmed obsidian *point* (Fig. 9:8); an obsidian *point* with convex base (Fig. 9:21).

Collection of items from the third layer. *Fragments* of a birch bark vessel (Fig. 22:3); a fragment of a leather shoe (?); a *handle fragment* of thin twigs for a birch bark vessel (Fig. 31); a *cord fragment* woven of grass fibers, similar to that found in the slump (Fig. 28); a narrow-bladed obsidian *knife* with poorly defined stem (Fig. 3:7); a leaf-shaped chert *point* with poorly defined stem (Fig. 9:12); a chert scraper with a cutting corner (Fig. 8:2); a *comb* of reindeer antler with one tooth broken, the upper part cut to tapering, and, under a hole measuring 2.7 x 4 mm, a geometrical decoration of two lines, from which short strokes were applied to the opposite sides (Fig. 13:9); a reindeer *antler fragment* with traces of modification (Fig. 25:2); a *punch* of reindeer antler with a polished surface (Fig. 16:8); an *arrow shaft fragment* 8.6 mm in diameter (Fig. 10:25); a *fragment* of a wooden *artifact* with two 5 mm diameter holes in the middle part (Fig. 16:5); *fragments* of wooden artifacts (Figs. 16:6; 20:15), the latter with a slot carved on one end; a *fragment* of a wooden *model* of a *bow* (?) (Fig. 20:14); a *piece* of a wooden *artifact* (Fig. 26:6); a wooden *spoon* (Fig. 22:5); a *fragment* of a wooden *vessel* (Fig. 22:4).

In the fourth layer, were fragments of a fabric of grass; an *eye* from the runner of a sled (Fig. 20:1); a stemmed obsidian spear (?) *point* with the stem broken (Fig. 9:5); a flattened, rolled *pebble* with a 4 mm diameter hole in the center (Fig. 8:13); a leaf-shaped obsidian *point* with straight base (Fig. 8:15);

a *polisher* with ends polished (Fig. 14:9); a point of reindeer antler with a flattened base, at the base of which are two symmetrical spurs (Fig. 10:5); a wooden handle (Fig. 15:10); and a *fragment of an arrow shaft* 8 mm in diameter (Fig. 10:30).

Of the finds from the fifth layer, we note *fragments of arrow shafts*, one of which has a slot for a string carved in the thickening of the lower end (Fig. 10:27) and a peg, about 50 cm long, rough hewn on one end, while the other end is broken; an obsidian *point* (Fig. 9:14); a chalcedony *scraper-burin* (Fig. 8:11); a chalcedony *scraper* with a cutting corner (Fig. 8:10); a bone *peg* (Fig. 21:3); a *comb* of reindeer antler with four long teeth and a 4 x 2 mm hole in the upper part (Fig. 13:4); a *fragment* of a wooden *artifact* with a cut-through L-shaped hole on one side and a carved on the end oval point (Fig. 26:8); a wooden *handle* (?) (Fig. 16:7); *fragments of arrow shafts* with a diameter on the ends of 7 mm, 6 mm (Fig. 10:28) and 6.8 mm (Fig. 10:29); a *blade* with a recess on one end and a unifacially convex cross section (Fig. 12:9); a bone *point* with a broken base (Fig. 10:15); *pieces* of wooden artifacts, including a *handle* (Fig. 16:4) and a *spoon* (Fig. 19:3).

Among the finds of the sixth layer, we note a leaf-shaped chert biface (Fig. 5:12); *pieces* of an obsidian leaf-shaped *biface* (Fig. 5:13) and knife (?) (Fig. 5:14); a wedge-shaped *object* with neck-waist (Fig. 20:8); a wedge-shaped *object* with symmetrical “ears” and polished ends (Fig. 20:7); a *fragment* of a wooden *object* with one pointed end and a 3.5 mm diameter hole (Fig. 19:2); a *peg* with a neck-waist (Fig. 21:4); a *fragment* of a wooden *handle* with two shoulders for attachment and one side flattened (Fig. 18:6); a *polisher* with a rounded and polished working end (Fig. 14:3); a *fragment* of a reindeer *antler* (the basal part) with a distinct handle on one end and a unifacially rough-hewn, poorly ground other end (Fig. 21:5); a knife *handle* with a slot for an attachment and a triangular hole on the end (Fig. 15:11); a *fragment of an arrow shaft* (lower part) with grooves for a string and the attachment of fletching (?) (Fig. 10:24); a *half-finished handle* of thin twigs for a birch bark vessel (Fig. 30); and a *cord* of baleen (Fig. 29).

At various times things found in the cutbank of the Anadyrka site appeared in the repository of the Koryak District Regional Museum donated by the residents of Palana village. These miscellaneous items include two antler *plates* of the ends of a bow (Fig. 12:12, 13); a narrow-bladed chalcedony *knife* with a stem (Fig. 3:12); a “backed” *knife* of chalcedony (Fig. 3:18); a broad-bladed agate (?) *knife* with a stem (Fig. 3:23); a narrow-bladed chalcedony knife with a stem (Fig. 3:15); a chalcedony *punch* with a broken tip (Fig. 17:11); a narrow-bladed chalcedony *knife* with a broken end (Fig. 3:20); a leaf-shaped asymmetrical *knife* of chalcedony (Fig. 4:17); a *knife* of chalcedony with symmetrical ears in the stem part and a broken working end (Fig. 3:19); a “backed” chalcedony *knife* with a broken base (Fig. 3:14); a stemmed chert *knife* with asymmetrical leaf-shaped working edge and broken stem (Fig. 3:10); a sub-triangular chalcedony *knife* (Fig. 4:9); a leaf-shaped chalcedony *knife* with broken end (Fig. 4:15); a subrectangular chalcedony *knife* (Fig. 3:25); a chalcedony *knife stem* with symmetrical spurs on the base (Fig. 3:17); an obsidian spear *point* with a stem, weakly curved in profile (Fig. 9:1); an obsidian leaf-shaped spear *point* with straight base and two poorly defined symmetrical shoulders on the upper part (Fig. 9:20); a leaf-shaped chalcedony *point* (Fig. 9:19); and a jasper *scraper* with a stem (Fig. 8:6).

Other items found at the Koryak District Regional Museum were a *point* of reindeer antler with simple tip, oval cross section, and a flattened and narrowing, partially broken stem (Fig. 10:7); a *point* of reindeer antler with one poorly defined barb, simple tip, and forked base (Fig. 12:3); a *point* of reindeer antler with one poorly defined barb, unformed tip, and flattened straight base (Fig. 10:20); a *point* of reindeer antler with a simple, partially broken tip, rhomboid cross section, and flattened base (Fig. 10:17); a

bunt-point of reindeer antler with a round striking part, round cross section, and flattened, partially broken base (Fig. 11:12); a *bunt-point* of reindeer antler with a forked base, with part lost (Fig. 11:10); a *cleat* of reindeer antler from a snowshoe (Fig. 20:2); a toggling harpoon *point* of reindeer antler with one basal spur, a closed, conical hole, with a diameter of 4.5 mm at the mouth, for the foreshaft that reaches the upper hole, also with a diameter of 4.5 mm, for a line: the cross section of the point is subtriangular; the side with the basal spur is convex, the other side flat; on the convex side above the line hole is a geometric design of three transverse parallel lines and short strokes; the tip is simple (Fig. 8:19); a *foreshaft* for a toggling harpoon point of reindeer antler with a 2.6 x 1.6 mm hole for attachment of a thong (Fig. 11:4); a toggling harpoon *point* of reindeer antler with the upper part partially broken, a slot for a stone end blade, one basal spur, a closed hole 5 mm in diameter and 7.5 mm deep for a foreshaft and another hole, measuring 6.2 x 4 mm, for line attachment, bored parallel to the axis of the point (Fig. 8:18); a *foreshaft* for a toggling harpoon of reindeer antler with a 6.5 x 1.8 mm hole for attachment of a thong (Fig. 11:5).

A *piece of a retoucher* (?) of cylindrical sandstone, one end broken, the other (working end) with the negatives of small spalls along the edge (Fig. 17:13); a *butt of a hammer* of sandstone with its surface ground from use as an abrader (?), oval cross section (Fig. 17:9); a *hammerstone-retoucher* of sandstone with a worn end, narrowing toward the butt, and ground surface (Fig. 17:5); a *piece of a harpoon* of reindeer antler with one barb, a hole for a line measures 4 x 6.6 mm, the base broken (Fig. 11:3); a *point* of reindeer antler with simple tip, flattened base, and poorly defined spur on one side; an oval cross section of 8 x 6 mm (Fig. 10:1); a fragment of a wooden *bunt-arrow*—spindle-shaped upper blunted end (Fig. 12:8); a spindle-shaped wooden *object* with one end pointed and partially broken and the point carved round on the other end (Fig. 20:12).

The *point* of a stick for digging up sarana (?) tubers, of reindeer antler; the hole, measuring 15 x 12.4 mm, for the shaft weakly narrows a little toward the working end that is cut at an angle of about 45° (Fig. 24:4); a bone *handle* with a spindle-shaped body and flattened, narrowing straight ends-bases; in the middle part of each of the bases are spurs symmetrically located on opposite sides for attachment; in the middle of the body are diagonal incisions of two, three, and four short lines (Fig. 16:2); a *bracket* for a composite tool of reindeer antler (polisher?) with carved slot for attachment on one end and polished pointed other end (Fig. 14:1); a *polisher* of reindeer antler, the working oval part on one end convex, flat on the other (Fig. 21:16); a *fragment of a spoon* of reindeer antler (Fig. 19:5); an oval *spoon* of reindeer antler, weakly concave with four pairs of symmetrically placed spurs on the end of the handle (Fig. 19:4); a *rod* from a swivel of reindeer antler with the hole for attachment of a thong 9 x 3 mm and the head 9 x 12 mm (Fig. 24:7); a *swivel* with two holes measuring 33 x 6 mm and 10 x 8 mm (Fig. 24:8); a *comb* of reindeer antler with five teeth from 62 to 65 mm long and a 5.5 x 4 mm hole in the upper part (Fig. 13:8); a *comb* of reindeer antler with four teeth 24 to 25 mm long and a 6 x 3 mm hole in the upper part with a decoration of two lines on one side (Fig. 13:5); a bone *comb* with four teeth 170 mm long (Fig. 13:1); a *handle* of reindeer antler that is convex on one side and flat on the other (Fig. 18:2); a curved *handle* of reindeer antler, decorated with six pairs of parallel lines with short strokes between them, with a flat stepped surface for attachment of a shaft and a narrow (15 x 2 mm) hole for attachment of a thong (Fig. 18:5); a bone *shovel* with a handle and two holes (34 x 6 and 31 x 6.7 mm) for attachment (Fig. 19:1); a *piece of a bone retoucher* (Fig. 17:7); a bone *polisher* (?) with a pointed and polished working end (Fig. 21:7).

The following are the **collection of artifacts acquired upon taking apart the slumped cultural layer northeast of the excavation**: an amorphous obsidian *core* (Fig. 6:1); a *plate* of reindeer antler with a protuberance on one end for attachment (Fig. 12:14); a *point* of reindeer antler with bisected, partially

broken tip and forked base (Fig. 11:14); a *point* of reindeer antler with bisected, partially broken tip and forked base with half of the base broken off and a groove carved for attachment on this broken off part, in which a strap (?) was placed to tighten the two halves (Fig. 11:15); a *point* of reindeer antler with a slot for a stone end blade and a forked, broken base (Fig. 11:16); a partially broken wooden knife *handle* (Fig. 15:6); a bone *shovel* with two holes for fastening and a broken working part (Fig. 20:10); a *fastener* of reindeer antler (Fig. 20:13); a *fragment of a handle* of reindeer antler, broken at the hole for fastening (Fig. 18:3).

Adzes (Fig. 5:1, 2, 4–8); an exhausted *adze-working edge* with the butt pointed by grinding (Fig. 5:9); an *axe* worked by percussion flaking with the butt flattened (Fig. 5:3); a *piece of an adze* (Fig. 5:11); a wooden *float* (Fig. 18:1); a comb-like *plate* from the scapula of an animal (?) (Fig. 21:2); a *hook* of reindeer antler (Fig. 24:2); a *gaff hook* of reindeer antler (Fig. 24:5); a *digging stick* (?) of reindeer antler (Fig. 24:3); a *needle case* of long-bone (Fig. 15:8); a broken *cleat* of reindeer antler from a snowshoe (Fig. 20:5); *cleats* from snowshoes (Fig. 20:3, 4); a *hook* of reindeer antler (Fig. 18:4); a *polisher* of reindeer antler (Fig. 21:10); *fragments* of reindeer antler with traces of modification (Figs. 21:13; 26:5); a *fragment of a tool* of reindeer antler [a polisher (?)] (Fig. 21:14); the basal *part* of a reindeer antler with traces of modification (Fig. 25:1); a retouched obsidian lamellar *flake* (Fig. 7:8).

A stemmed chert dart (?) *point* (Fig. 9:3); a chalcedony *point* with poorly defined stem (Fig. 9:10); a broken stemmed *point* of obsidian (Fig. 9:4); stemmed obsidian *points* with broken stems (Fig. 9:6, 7); an obsidian spear *point* (Fig. 9:2); a leaf-shaped obsidian *knife* (Fig. 3:6); a leaf-shaped obsidian *point* (Fig. 9:22); an obsidian *point* with poorly defined, partially broken stem (Fig. 9:11); a leaf-shaped obsidian *point* with straight base (Fig. 9:18); leaf-shaped obsidian *points* (Fig. 9:15, 17); a chert *point* with poorly defined stem and broken tip (Fig. 9:23); a *piece of an abrader* of sandstone, subtrapezoidal in cross section (Fig. 7:6); a leaf-shaped obsidian *knife* with asymmetrically concave longitudinal sides (Fig. 3:3); a narrow-bladed obsidian *knife* with haft (Fig. 3:13); a leaf-shaped *knife* of obsidian (Fig. 4:16); a narrow-bladed obsidian *knife* with an asymmetrical working edge and partially broken stem (Fig. 3:16); a *piece* of a leaf-shaped *biface* of obsidian (Fig. 4:2); a leaf-shaped *biface* of obsidian (Fig. 4:6); a large leaf-shaped *biface* of jasper (Fig. 4:1); a subtriangular chert *knife* (?) (Fig. 3:22); a *piece* of a triangular *knife* of chert (Fig. 3:21); a *piece* of a leaf-shaped *knife* of obsidian (Fig. 4:5); a *piece* of a leaf-shaped *biface* of chalcedony (Fig. 4:8); *pieces* of leaf-shaped *knives* of chert (?) (Fig. 4:10) and chalcedony (Fig. 4:13); a leaf-shaped *knife* of chert (Fig. 3:9); a decorated *comb handle* of reindeer antler with a small barb in the middle of the back and broken teeth (Fig. 13:11); a *burin* on an amorphous chalcedony flake (Fig. 7:7); a bone *retoucher* on the base of a broken tool (Fig. 17:4); a *buckle* of reindeer antler (Fig. 24:6); a *needle* for weaving, of reindeer antler (Fig. 17:2).

A *scraper* of chalcedony with an oval working edge (Fig. 8:4); an oval chalcedony *scraper* with a calibration recess with retouch on the dorsal side of one end (Fig. 8:1); a chalcedony side *scraper* with a cutting angle and retouched haft (Fig. 8:3); a leaf-shaped chalcedony *knife* (?) (Fig. 4:14); a trapezoidal *scraper* of jasper (Fig. 8:7); a chalcedony *scraper* with beveled working edge, a cutting corner and retouched base (Fig. 8:9); an obsidian planing *knife* (?) with retouched haft (Fig. 3:24); a subtriangular obsidian *scraper* (Fig. 8:8); a bell-shaped obsidian *scraper* (Fig. 8:5); an amorphous chalcedony *core* (Fig. 7:3); amorphous chert (Figs. 7:1; 6:2) and obsidian (Fig. 7:2, 4) *cores*; a conical obsidian *core* with negatives of removed lamellar flakes (Fig. 6:5).

Foreshafts for toggling harpoons of reindeer antler (Fig. 11:7, 8); a *point* of reindeer antler with a micro-barb, simple tip, and pointed base (Fig. 10:18); a *point* of reindeer antler with micro-barb, simple

tip, and pointed, poorly flattened base (Fig. 10:19); a *point* of reindeer antler with a slot for a stone end blade and flattened base (Fig. 10:22); a *point* of reindeer antler with flattened base and a decoration of two L-shaped drawn lines on one side in the middle part (Fig. 10:13); a *point* of reindeer antler with a micro-barb and flattened base, curved profile, and a slot for attachment of a stone end blade with one side broken and the other side sharpened and used as an awl (Fig. 10:21); a *point* of reindeer antler with a simple tip, flattened base, and oval cross section (Fig. 10:4); a *point* of reindeer antler with flattened base, broken tip, and rounded oval cross section (Fig. 10:3); a *needle* of reindeer antler with a perforated eye hole in the upper pointed part that had been broken during work (Fig. 17:1); a *point* of reindeer antler with two micro-barbs on one side, a simple tip, and a forked base (Fig. 11:24).

A barbed harpoon *point* of reindeer antler with four barbs: the two upper barbs placed asymmetrically, the two lower ones symmetrically; a slot for a stone end blade was partially preserved; in the lower expanded part a hole for a line 3.5–2.5 mm in diameter, the base narrowing and flattened (Fig. 11:2); a spindle-shaped *point* with forked base of reindeer antler (Fig. 11:13); *punches* of reindeer antler (Fig. 16:12, 20); *pieces of polishers* of reindeer antler (Figs. 14:2, 4, 5, 8; 15:1–4; 21:8, 11, 12); a *punch* of reindeer antler with a four-sided point (Fig. 16:11); a bone *punch* with patina on the surface (Fig. 16:16); a bone *punch* (Fig. 16:13); a *punch* of reindeer antler (Fig. 16:21); *punches* of reindeer antler (Fig. 16:10) and long-bone (Fig. 16:9); *polishers* of reindeer antler (Fig. 14:7, 11).

A *point* of reindeer antler with a micro-barb, simple tip, and forked base (Fig. 12:1); a *point* of reindeer antler with a micro-barb, simple tip, and forked base (Fig. 12:2); a *point* of reindeer antler with a micro-barb and with a partially preserved slot for a stone end blade and forked base (Fig. 12:4); *points* of reindeer antler with micro-barb, slot for stone end blade, and forked base (Figs. 11:21; 12:7); a *point* of reindeer antler with broken micro-barb, forked base, and a slot for stone end blade; the remaining part of the slot for the end blade was used as an awl (Fig. 11:22); a *point* of reindeer antler with micro-barb, forked base, and broken tip; on the lower part is a decoration, a line—an incomplete turn of a spiral with short strokes radiating upward from it (Fig. 11:17).

A *comb* of reindeer antler with five teeth broken almost at the base, two symmetrical projections on the upper part of the handle, and one projection on the lower part of the handle (Fig. 13:2); a *comb* of reindeer antler with three teeth and a hole in the pointed upper part of the handle (Fig. 13:7); a *comb* of reindeer antler with six teeth and a protuberance with a hole in the upper part of the handle (Fig. 13:10); a *comb* of reindeer antler with five broken teeth and a long handle with a hole and a broken butt (Fig. 13:6); a *point* of reindeer antler with forked base, round cross section, and broken tip; the forked base is split in half (Fig. 11:23); a *point* of reindeer antler with a forked, partially broken base and simple tip (Fig. 11:20); a *point* of reindeer antler with forked base and simple tip (Fig. 11:19); *retouchers* (Fig. 17:3, 6, 8, 14); *plates* from the limbs of a bow (Fig. 12:10, 11); *fragments* of reindeer antler with traces of modification (Figs. 15:5; 16:1; 25:5–7; 26:1, 2, 4); a wooden *scoop* with flat bottom; a hole was punched in the bottom and the handle partially broken; the depth is 52 mm, length of the handle 60 mm (Fig. 23:1); a wooden, ritual (?) *model of a boat* or baidara with figures (?) carved in the middle part of the bottom—the height of the side 15 mm (Fig. 22:1); a wooden *vessel* of stretched oval form with a round bottom and walls with a thickness up to 11 mm and a depth of 34 mm (Fig. 23:2); a wooden *scoop* with flattened handle; the front part is broken; in the base of the scoop is a 19 x 15 mm subrectangular hole, depth 31 mm, and thickness of the walls 6 mm (Fig. 22:2).

The archaeological complex of materials from the Anadyrka site adds substantially to an understanding of the 1st millennium A.D., northern Kamchatka, Neolithic culture.

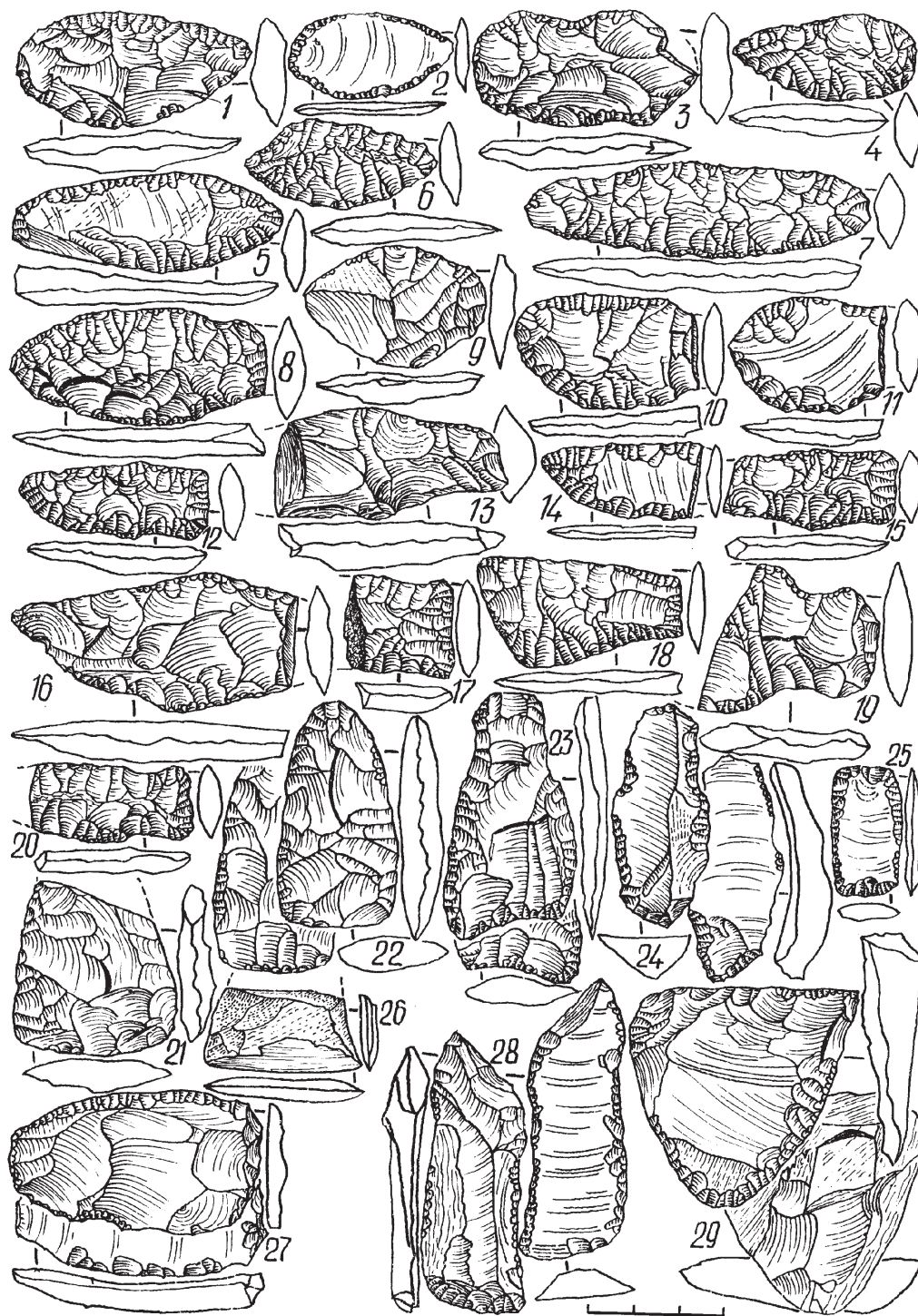


Figure 3. Knives.

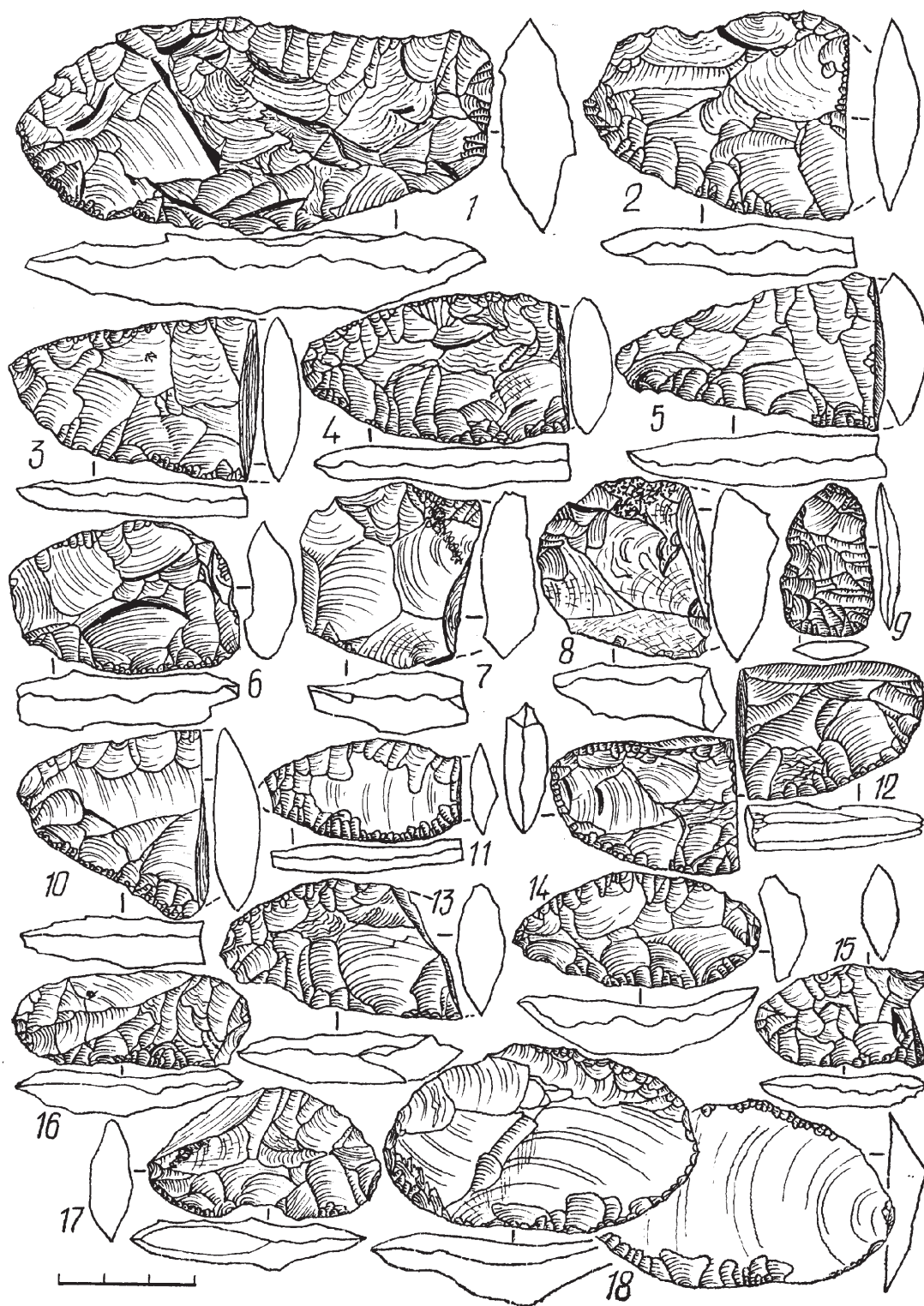


Figure 4. Knives.

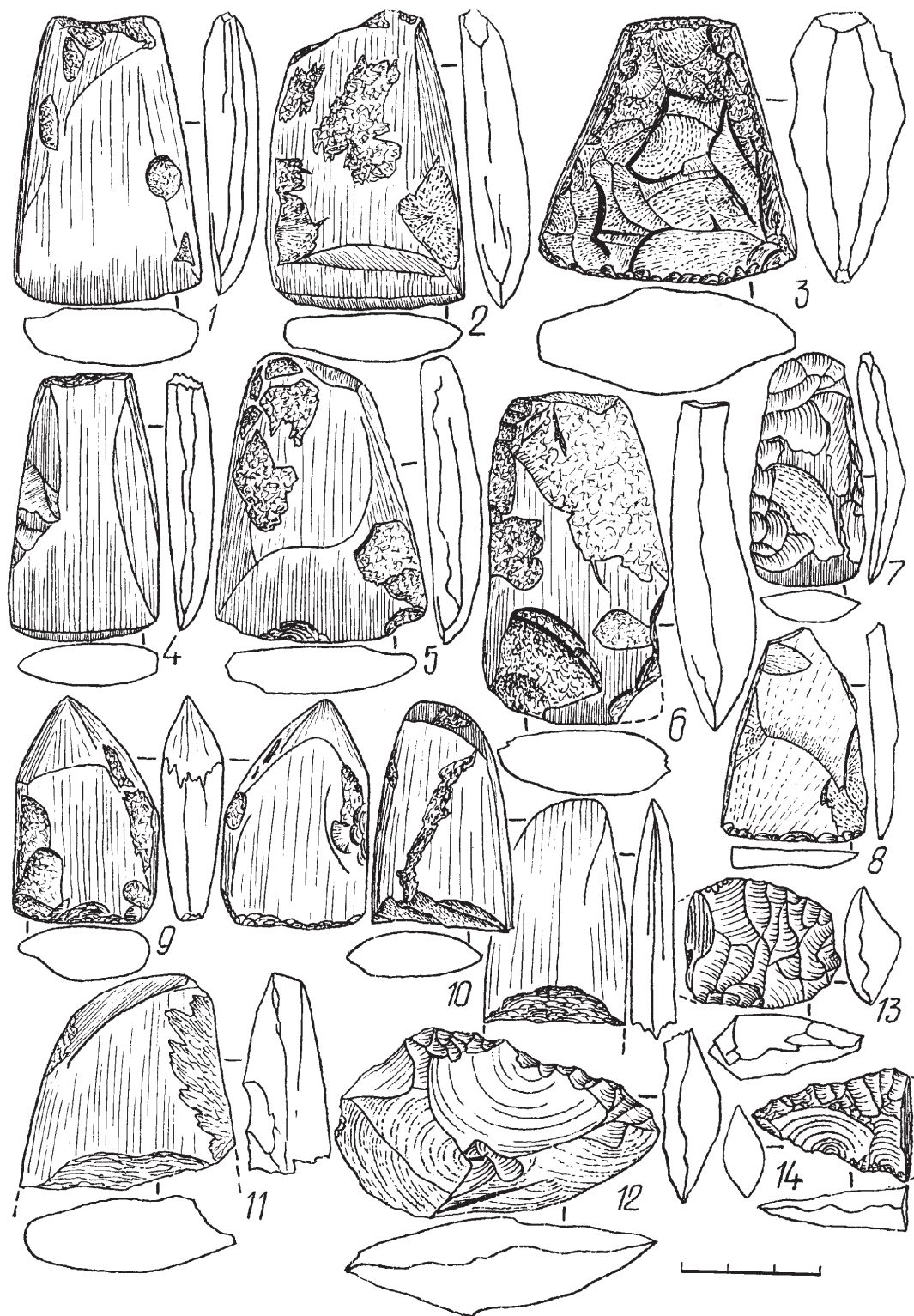


Figure 5. Adzes (1, 2, 4–11), axe (3), and knives (12–14).

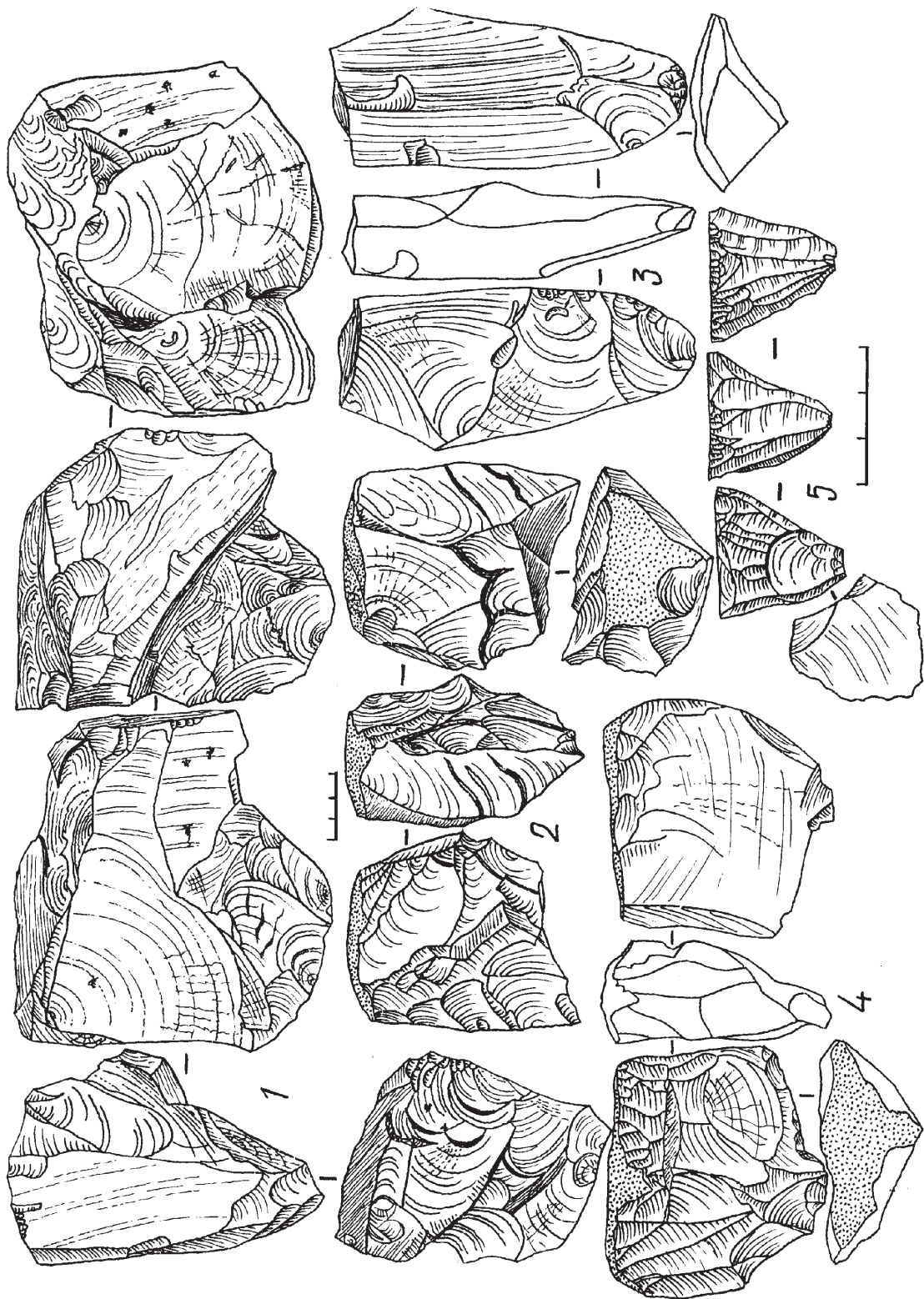


Figure 6. Cores.

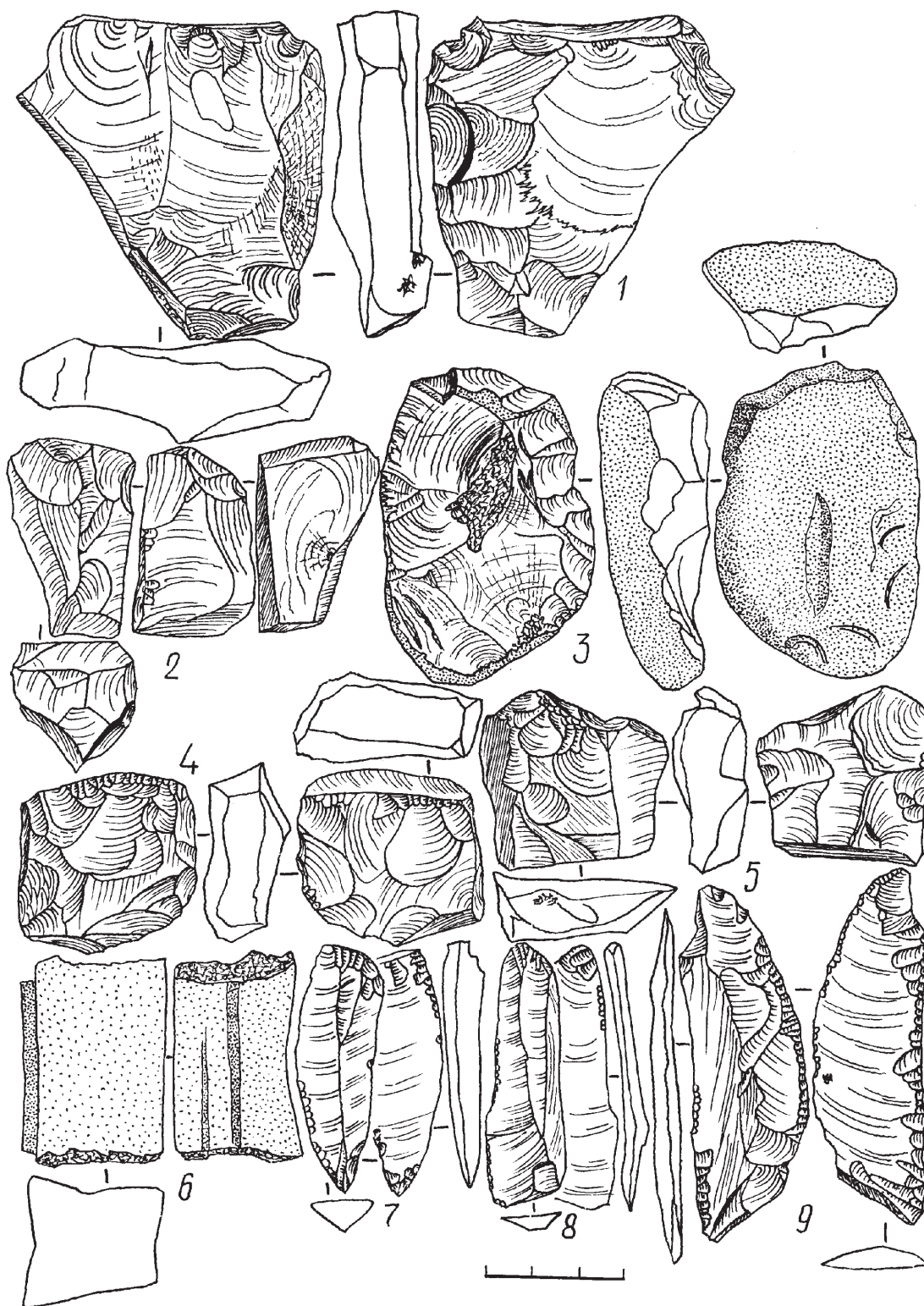


Figure 7. Cores (1–5), abrader (6), burin (7), retouched lamellar flakes (8, 9).

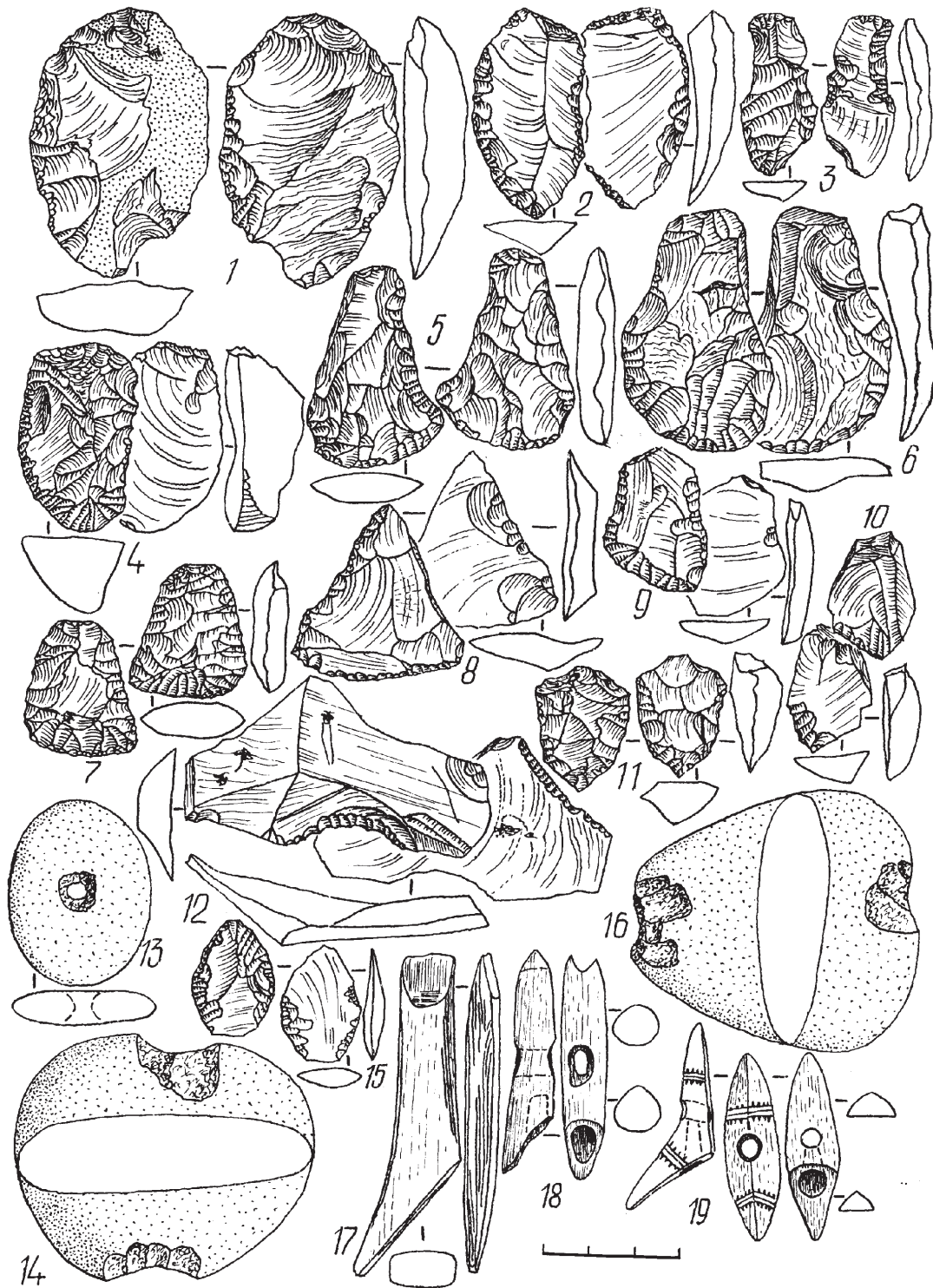


Figure 8. Scrapers (1–11), planing knife (?) (12), weight (?) (13), weights (14, 16), point (15), points of toggling harpoons (17–19).

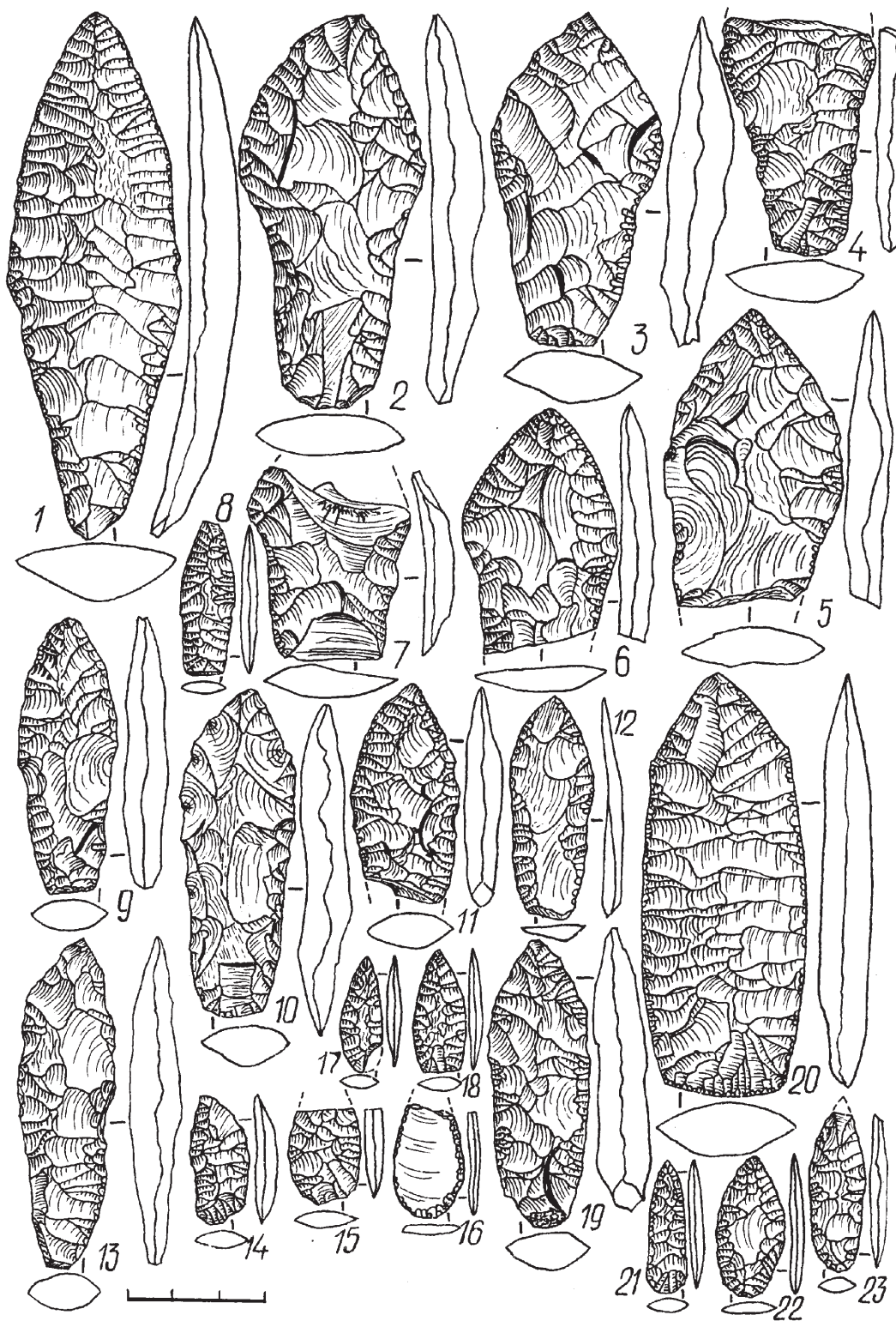


Figure 9. Points.

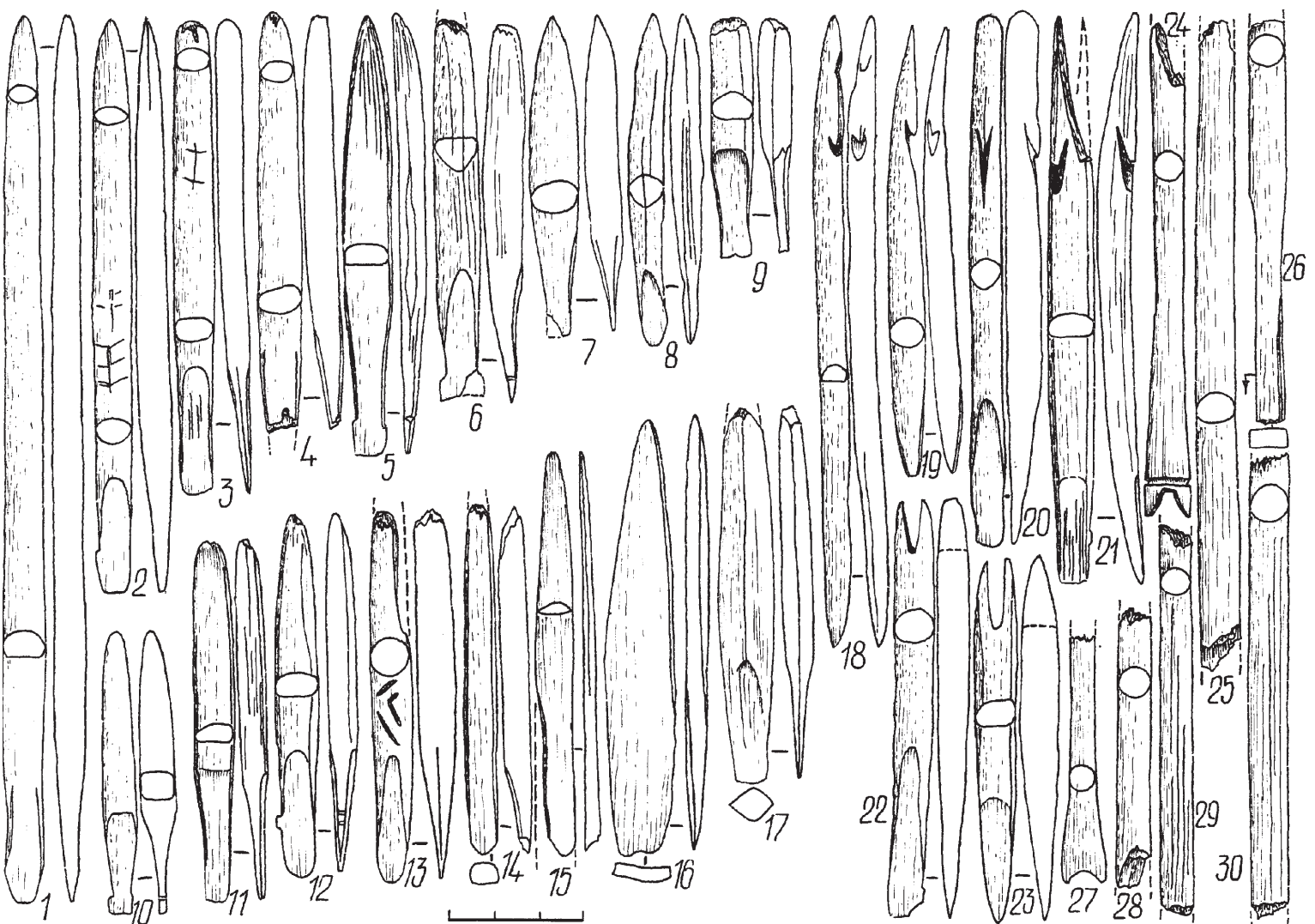


Figure 10. Bone points (1–23), fragments of arrows (24–30).



Figure 11. Barbed harpoon points (1-3), foreshafts for toggling harpoons (4-9), bone points (10-24).

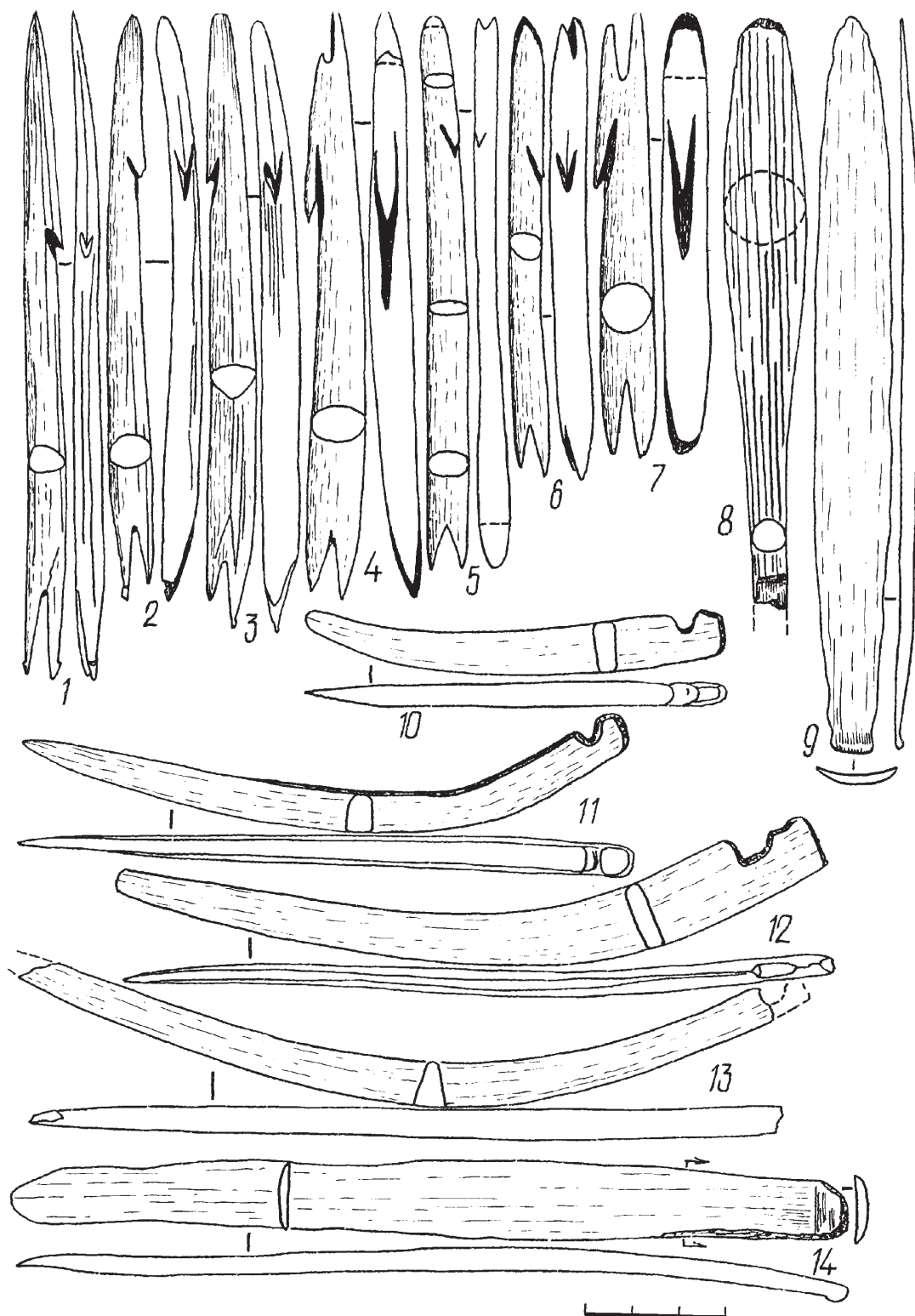


Figure 12. Bone points (1–7), wooden point (8), antler plates (9, 14), antler plates from the limbs of a bow (10–13).

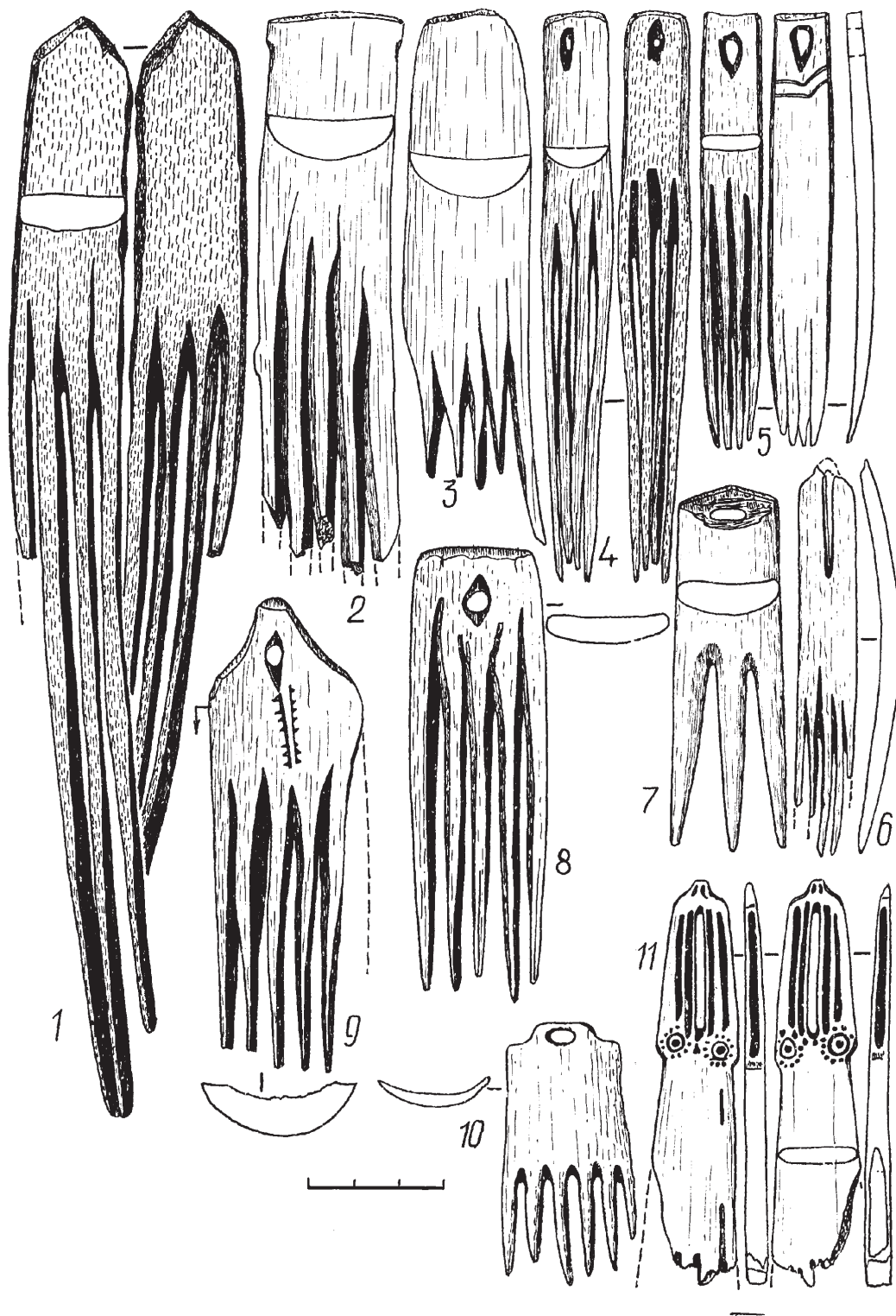


Figure 13. Combs.

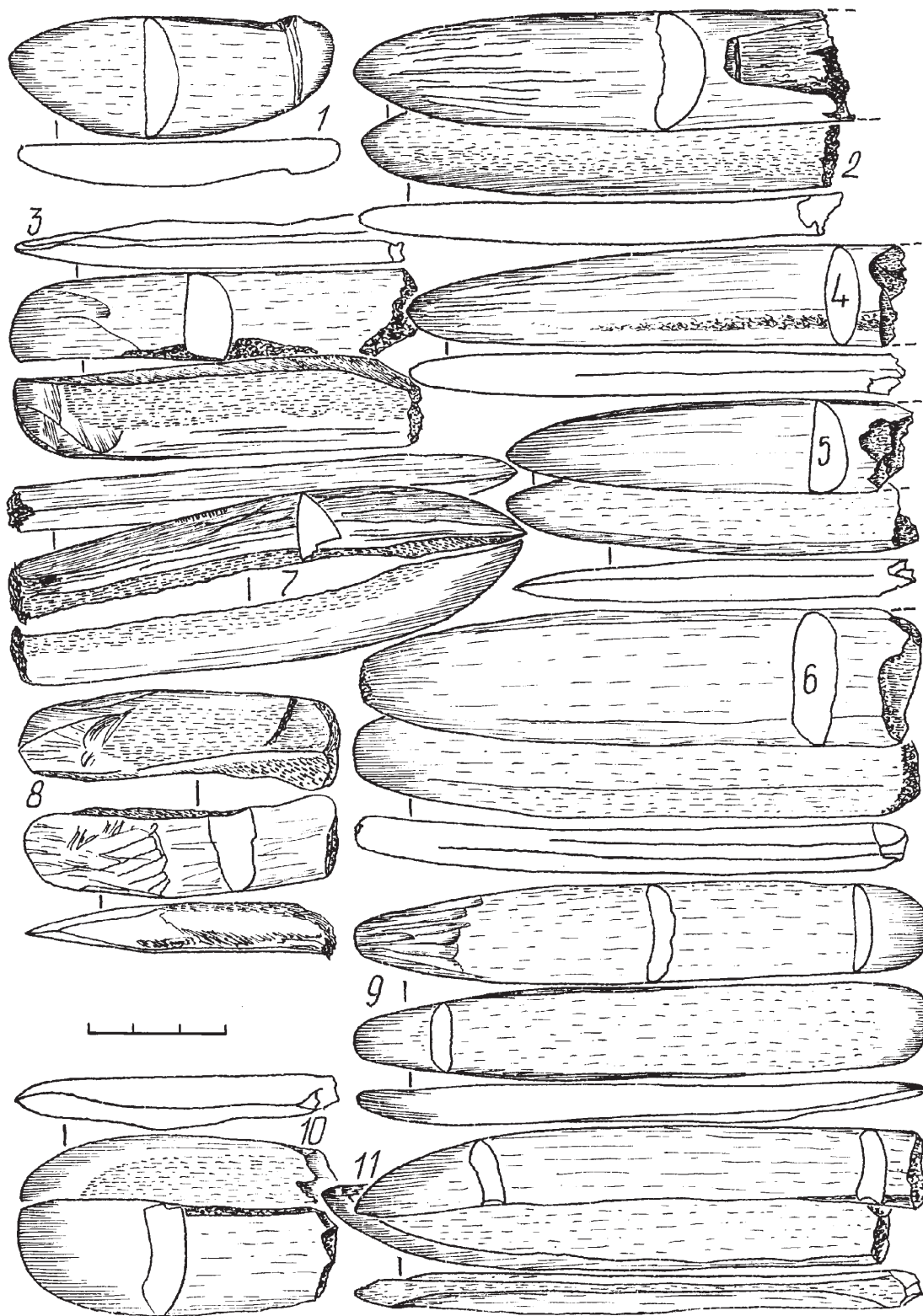


Figure 14. Polishers.

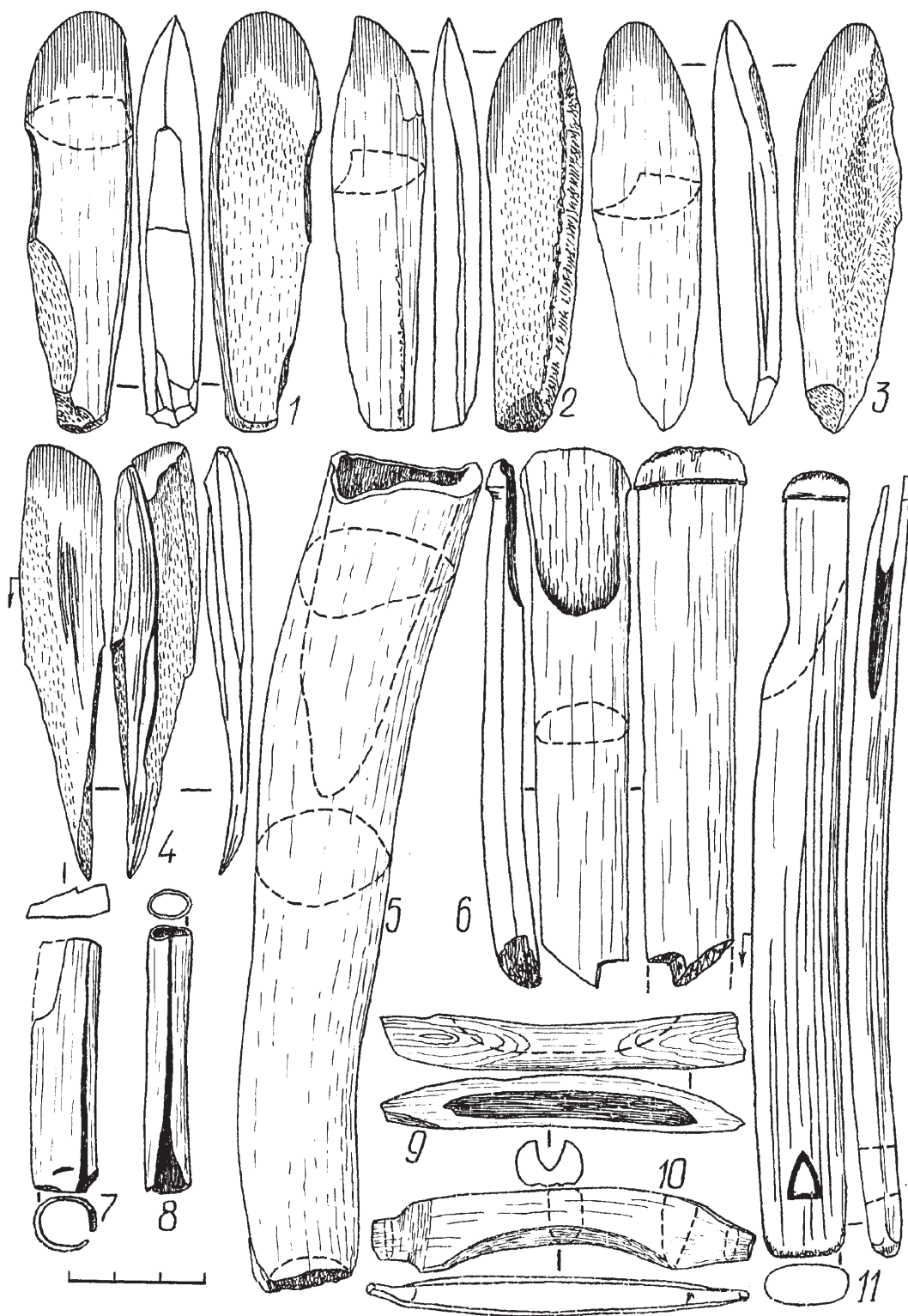


Figure 15. Polishers (1–4), handles of antler (5) and wood (6, 9–11), needle cases (7, 8).

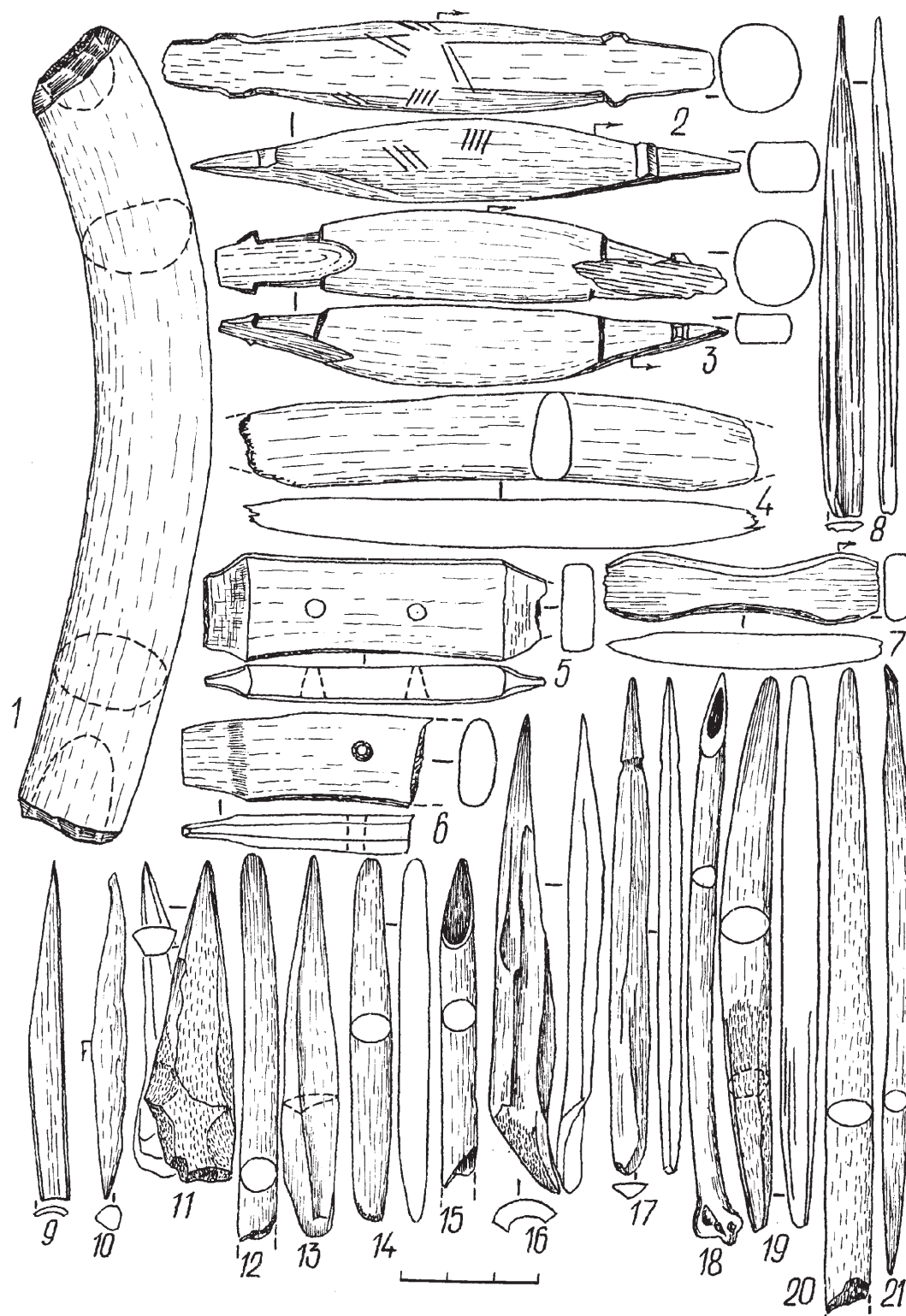


Figure 16. Handles (?) (1–7), bone punches (8–21).

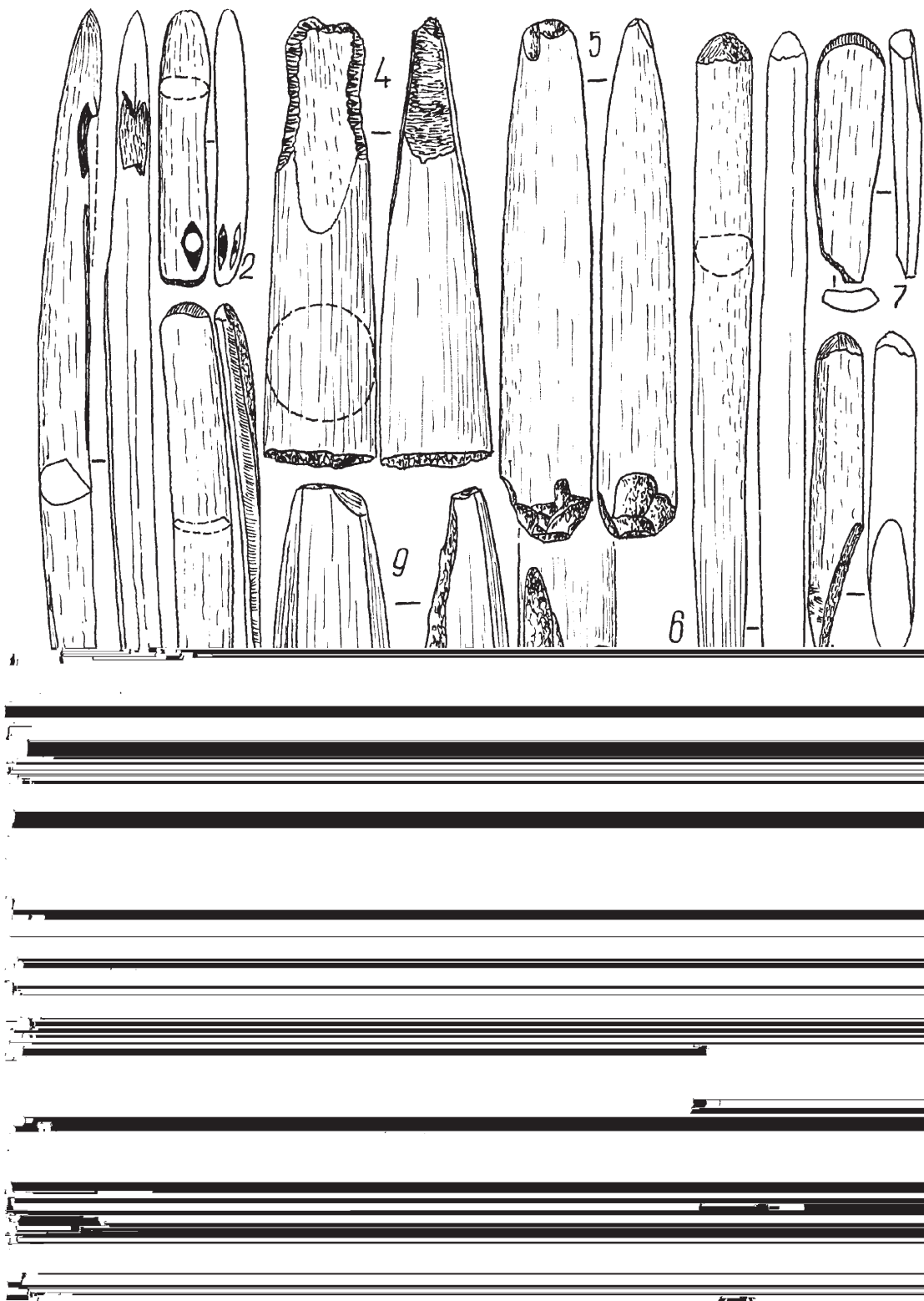


Figure 17. Needles (1, 2), retouchers (3, 4, 6–8, 12, 14), billets and hammerstone (5, 9, 13, 16), punches (10, 11), fragment of a wooden hoop (15).

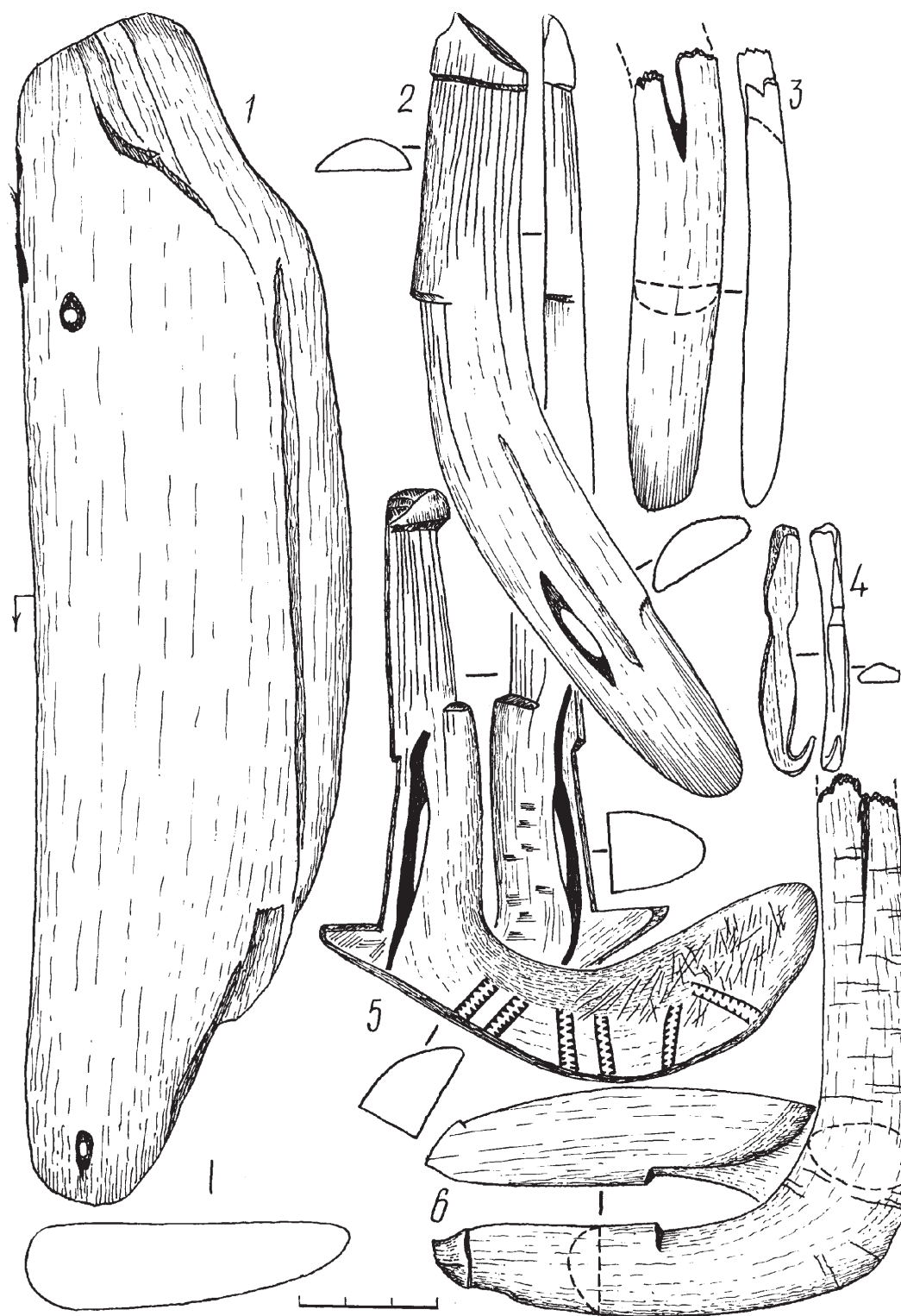


Figure 18. Float (1), handles of antler (2, 3, 5) and of wood (6), bone hook (4).

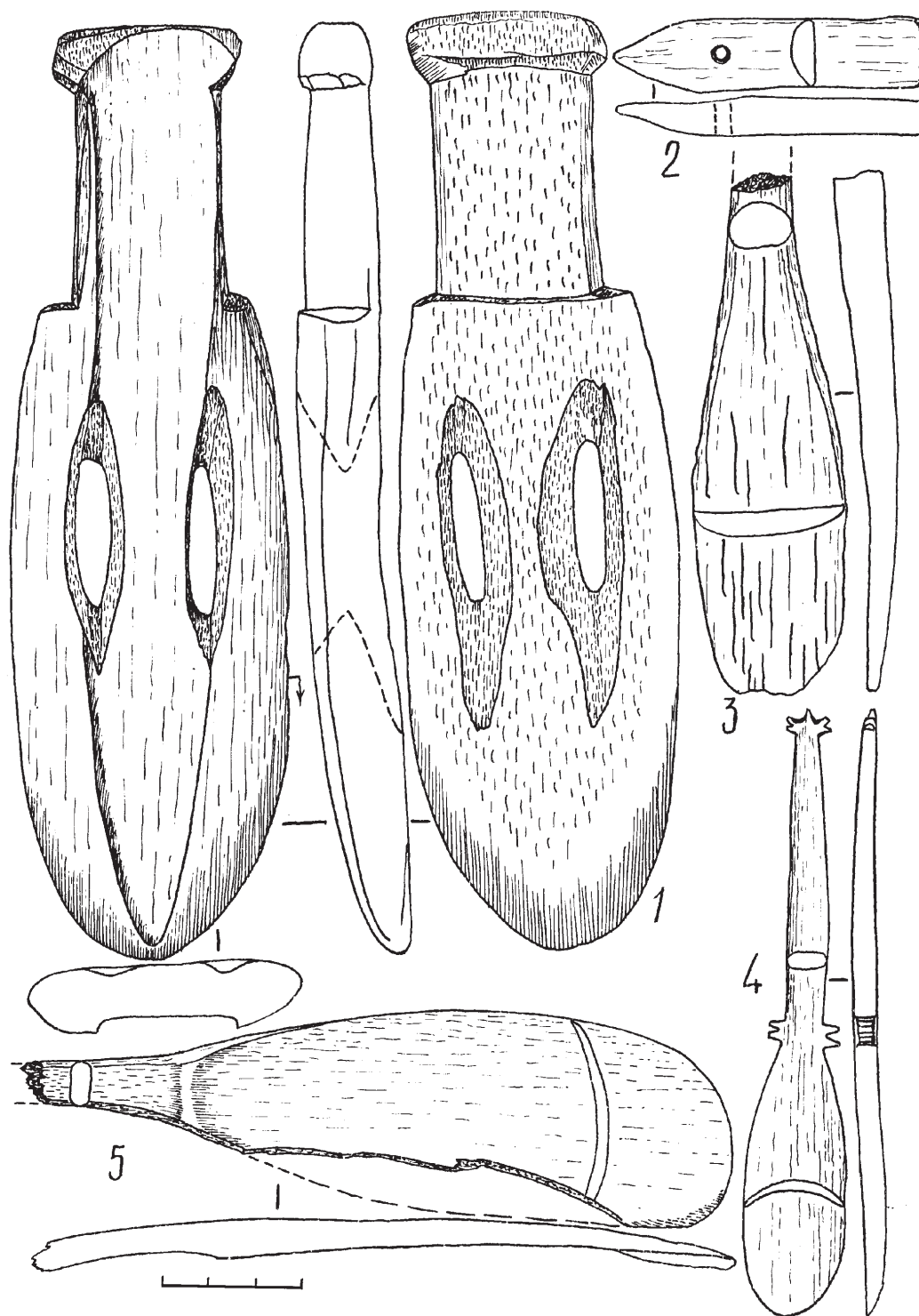


Figure 19. Bone shovel (1), fragment of a wooden artifact (2), spoons of wood (3) and bone (4, 5).

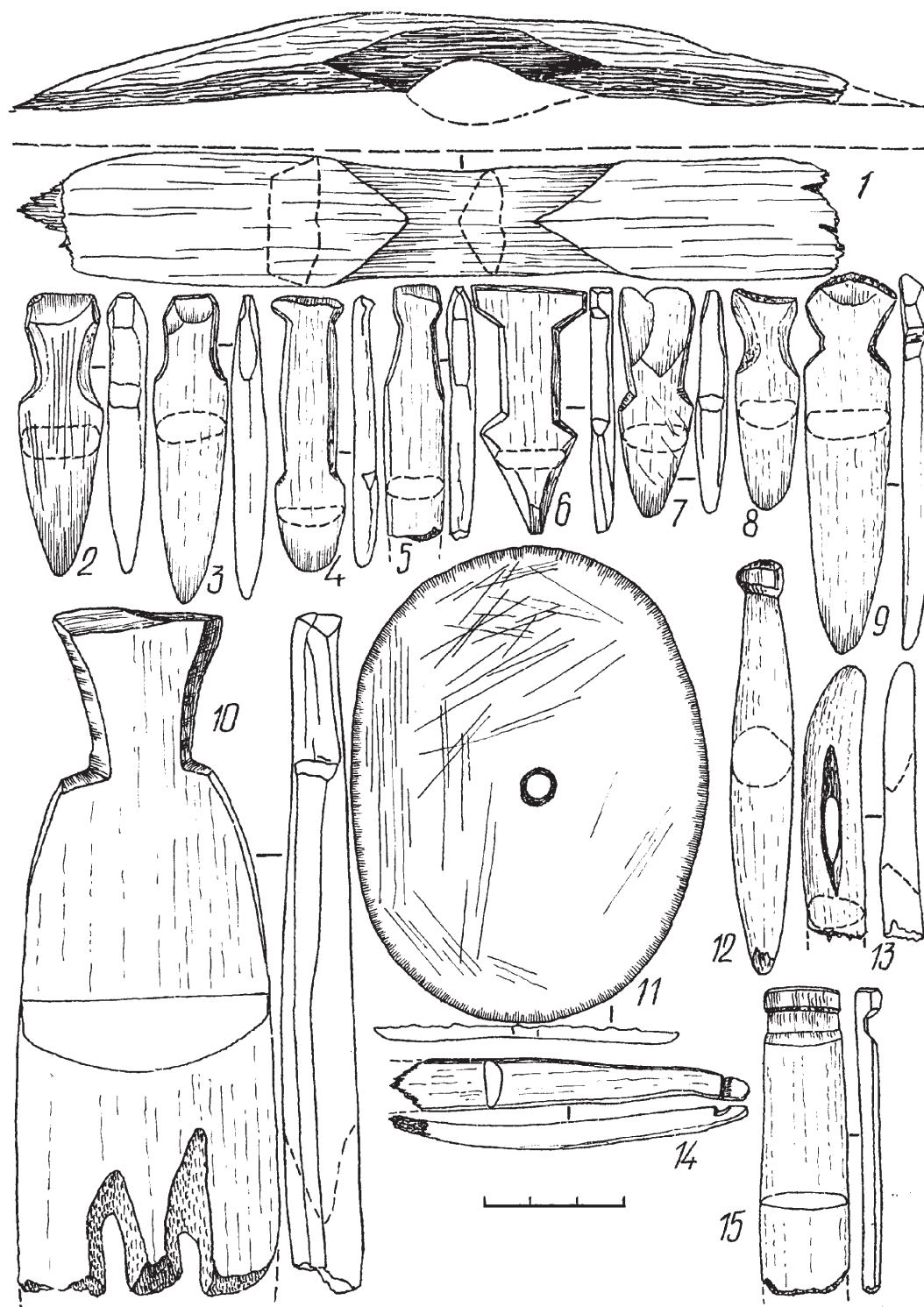


Figure 20. Lug from a sled runner (1), bone cleats (2–9), bone shovel (10), meniscus of a sea mammal vertebra (11), wooden artifacts (12, 15), bone toggle (13), fragment of a wooden model of a bow (14).

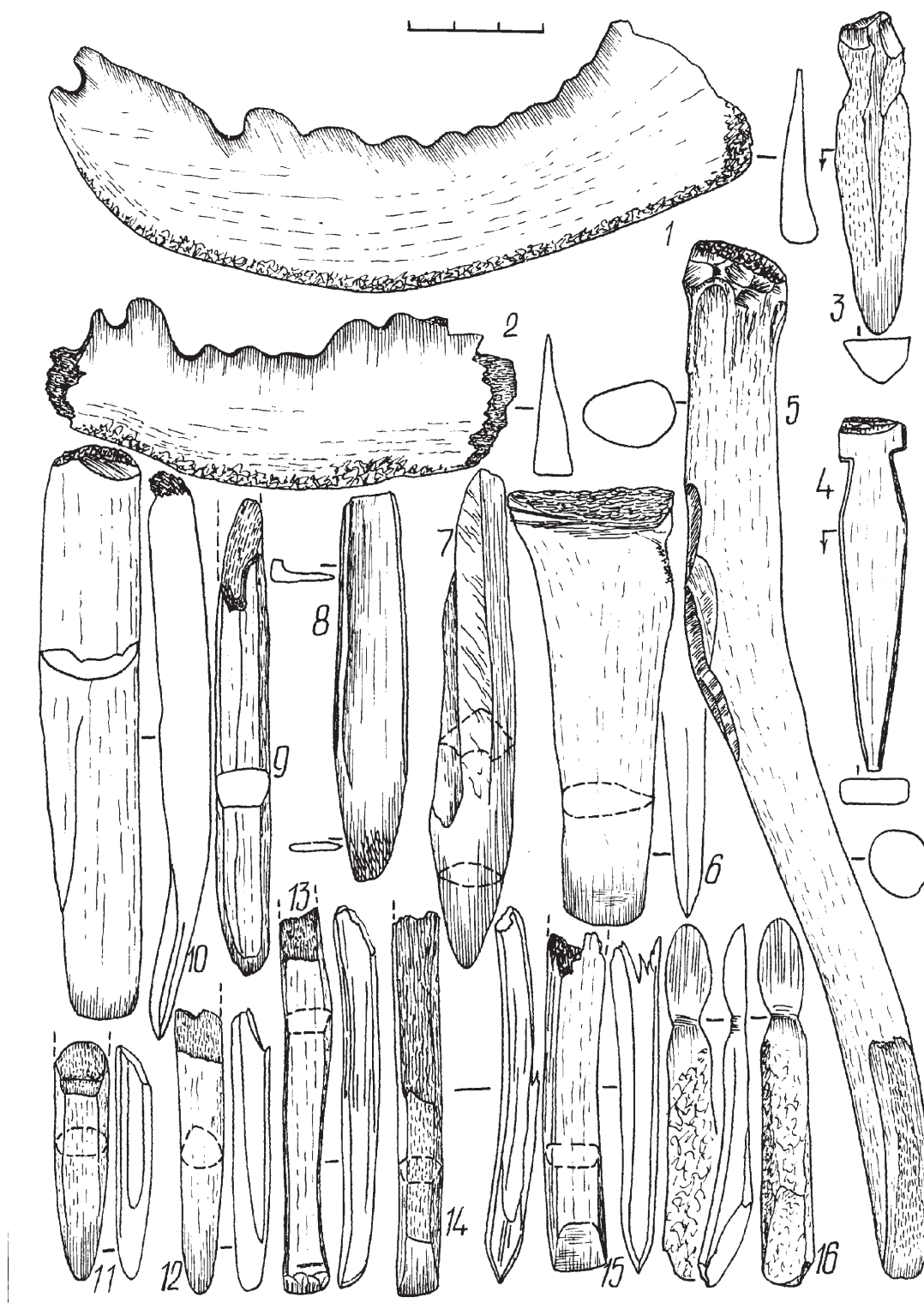


Figure 21. Comb-like plates from the scapula of an animal (1, 2), pegs of bone (3) and wood (4), fragment of reindeer antler and bones with polished ends (5–16).

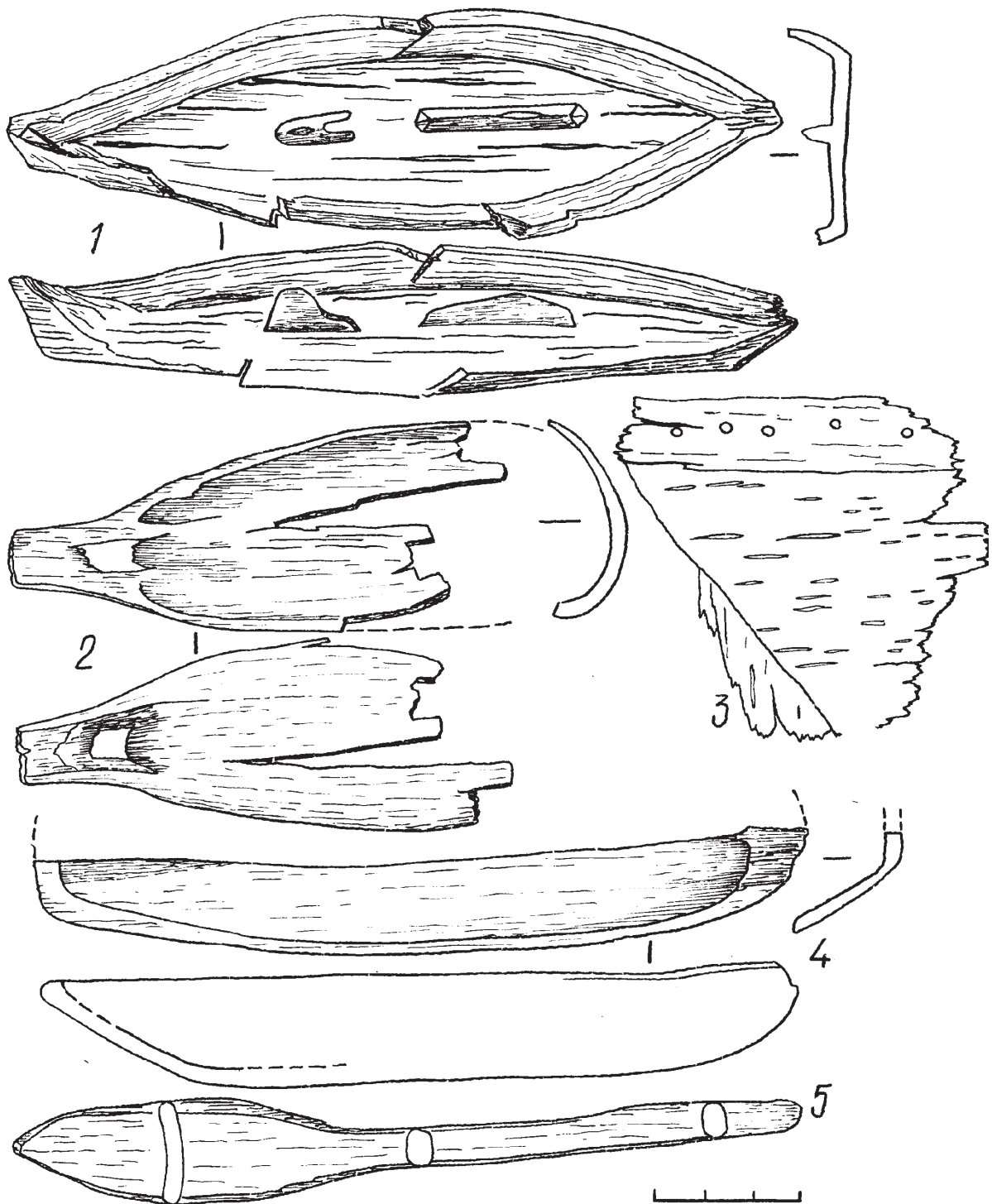


Figure 22. Ritual object (?) (1), fragments of wooden (2, 4) and birch bark (3) vessels, wooden spoon (5).

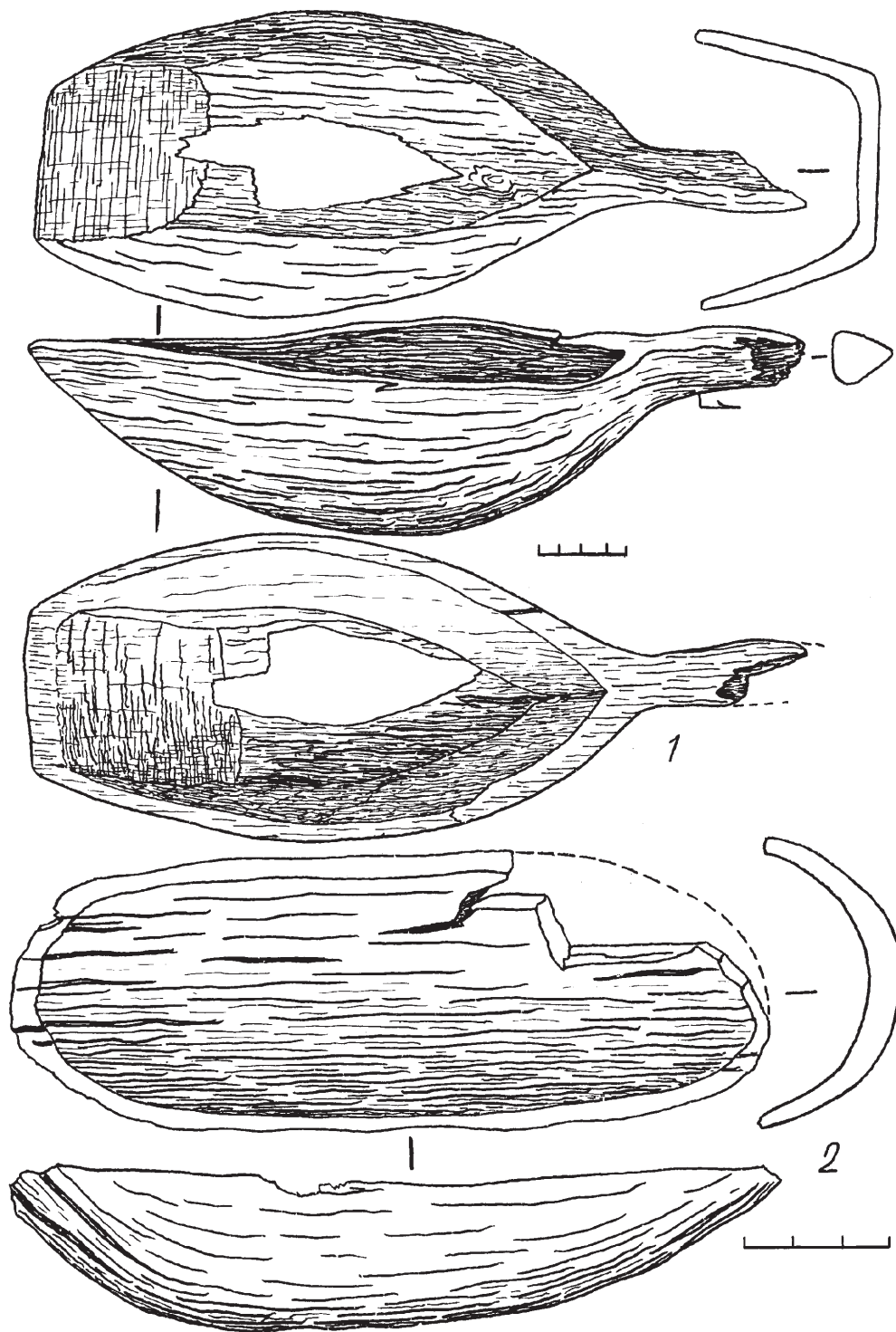


Figure 23. Wooden vessels.

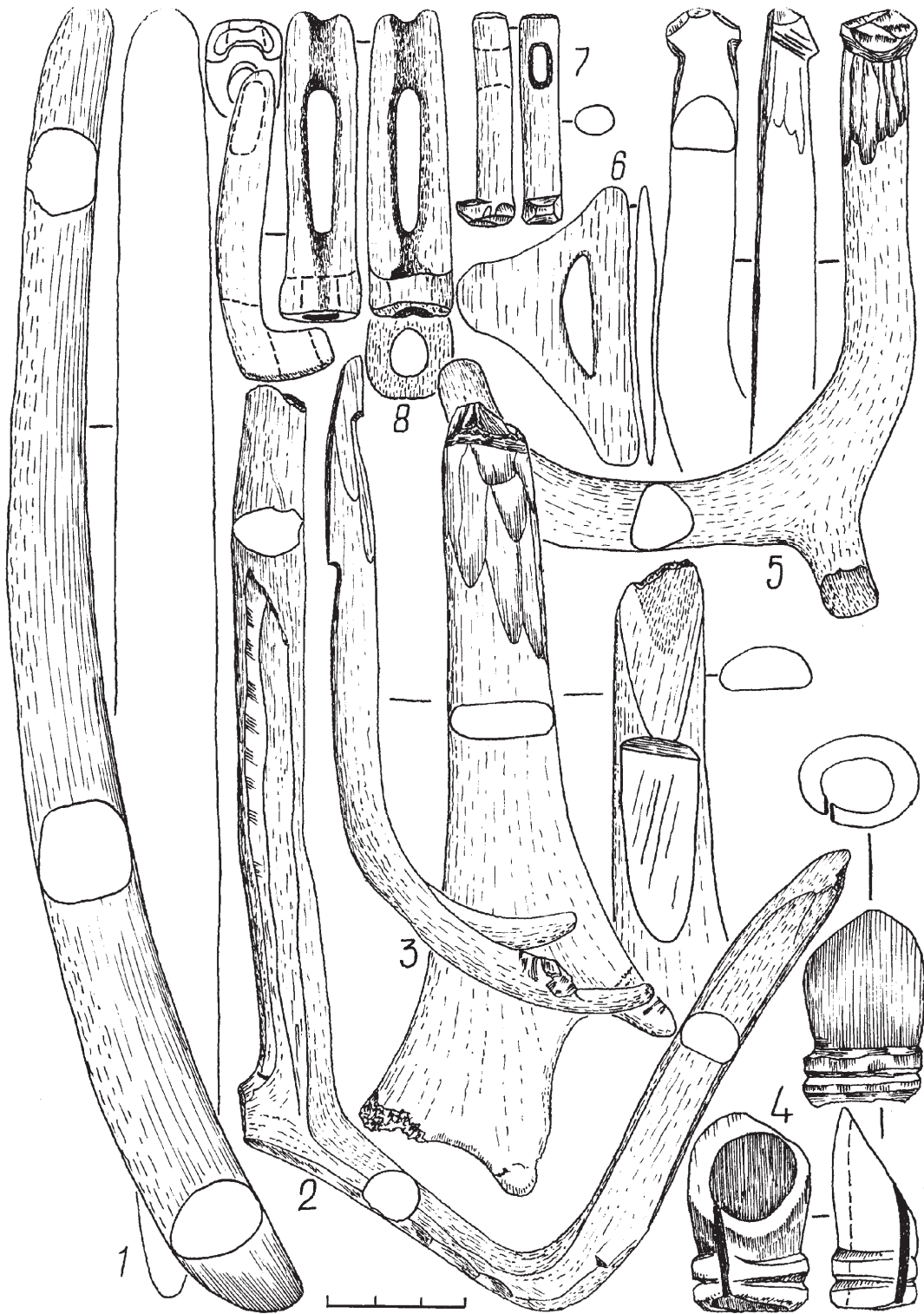


Figure 24. Fragment of a sea mammal rib with polished end (1), hook of reindeer antler (2), digger (?) of reindeer scapula (3), swivels (7, 8), clasp (6), gaff hook (5), "digger" (4).

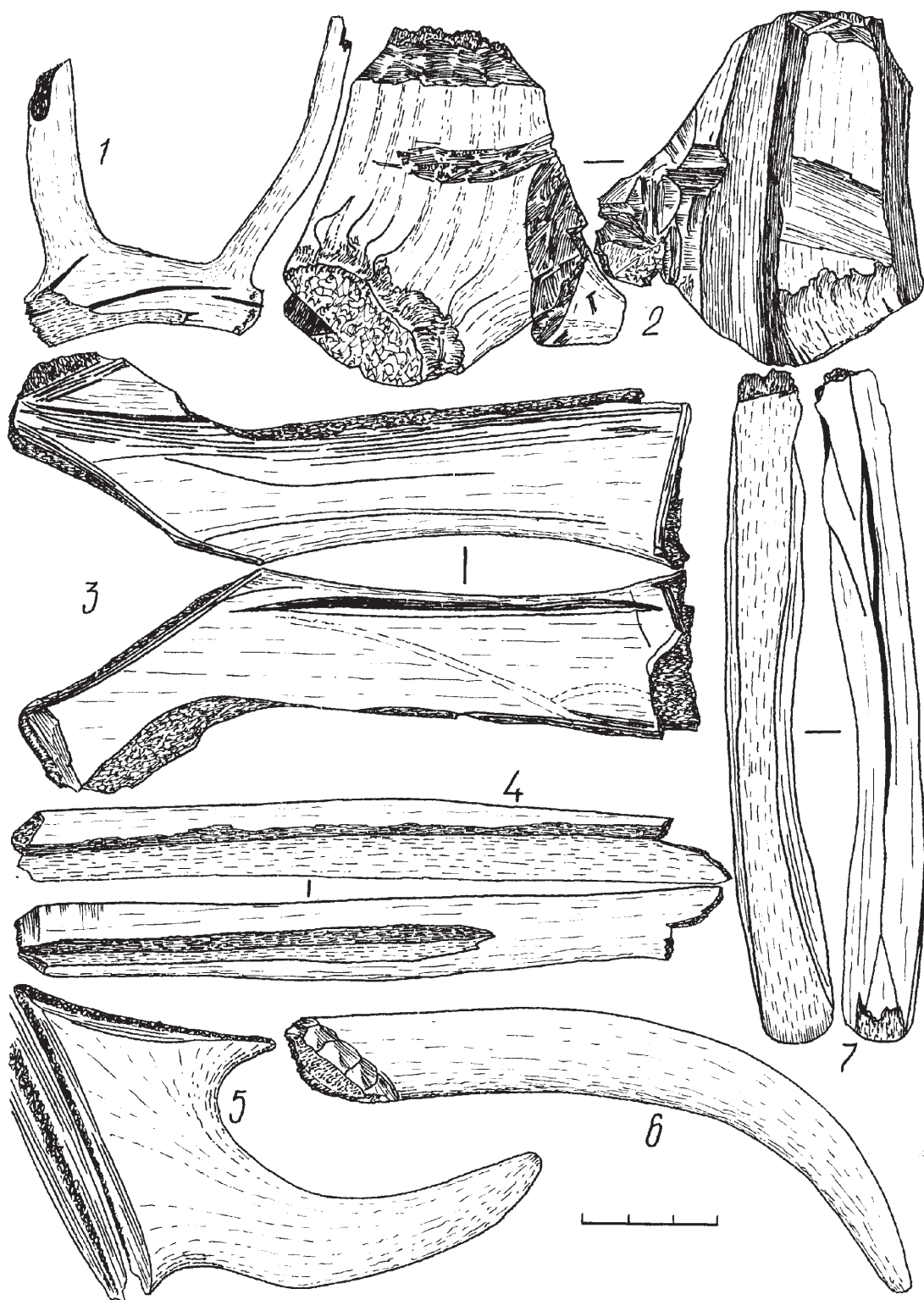


Figure 25. Blanks of tools of reindeer antler and bones of sea mammals with traces of modification.

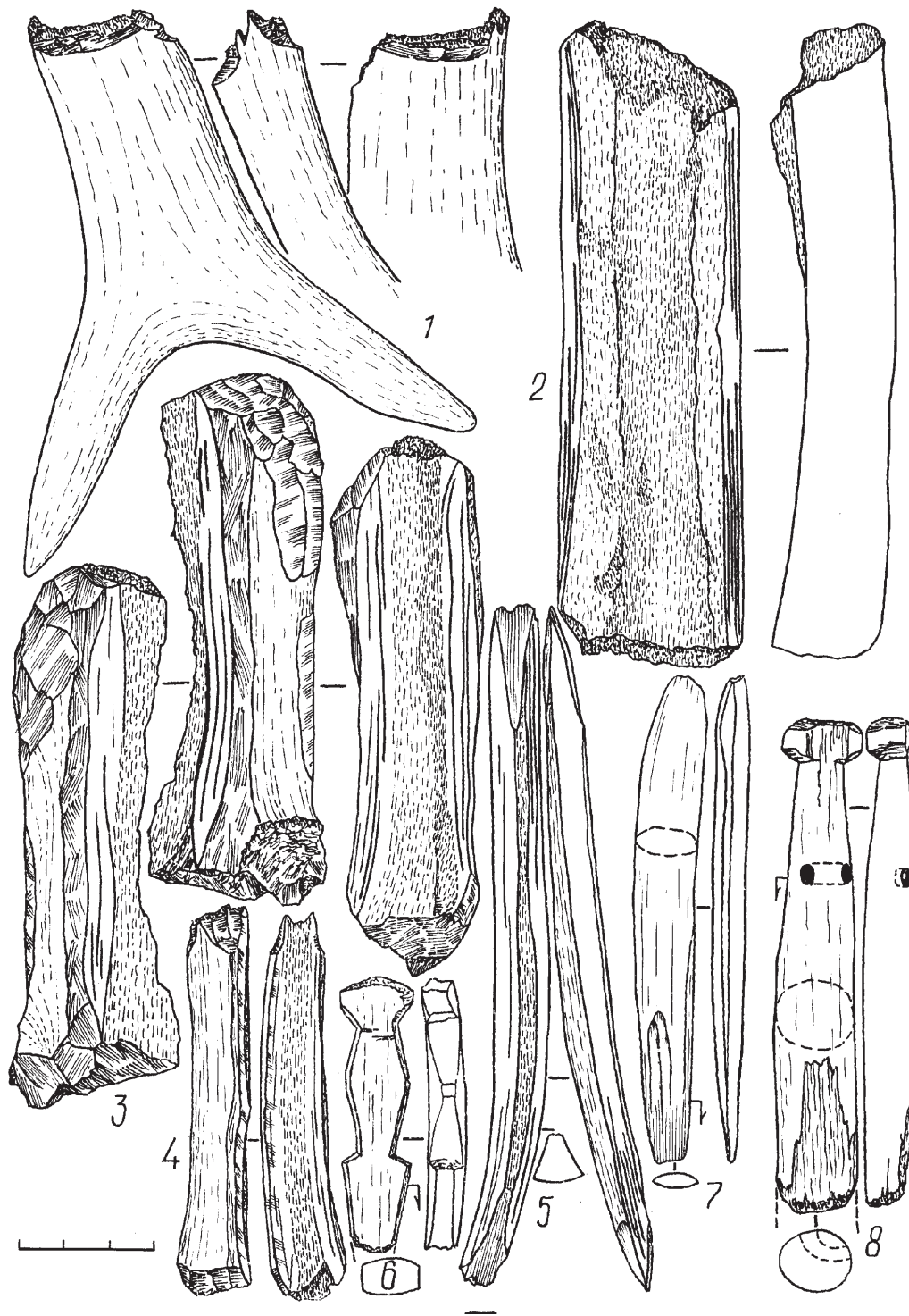


Figure 26. Fragments of reindeer antler with traces of modification (1–4), blanks of reindeer antler with pointed ends (5, 7), wooden artifacts (6, 8).

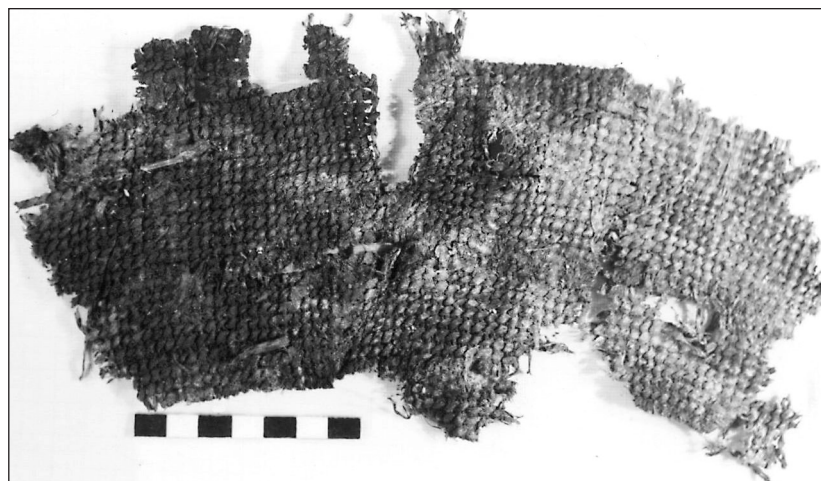


Figure 27. Fabric of grass fibers.



Figure 28. Fragment of a cord of grass fibers.



Figure 29. Cord of baleen.



Figure 30. Blank of the handle of a birch bark vessel.



Figure 31. Fragment of the handle of a birch bark vessel.

ETHNIC ASSOCIATION OF THE ANADYRKA SITE AND SOME FEATURES OF ETHNIC PROCESSES IN NORTHERN KAMCHATKA IN ANTIQUITY

A. K. Ponomarenko

The material complex, stratigraphy, and radiocarbon dates obtained from the Anadyrka site have great significance for the study of the early cultures of northern Kamchatka and the understanding of the ethnic processes of antiquity.

The stratigraphy of the site provides a basis for believing that the investigated cultural layer was formed practically without interruption by bearers of a single culture during the 1st millennium B.C. This circumstance is corroborated by the complete absence in the profiles of the excavation walls and in the cutbank at the site of sterile layers of even minimal thickness with unbroken formation, which would separate the cultural layer into parts. The lithological composition of the cultural layer in the different levels remained unchanged; the vertical alternation of carbonaceous lenses, accumulations of shells, and the plant debris of different origin were also rather uniform. All this provides a basis for asserting that the assembled collection of items belongs to one ethnos and can clearly be characterized as a culture with identifiable features.

Above all, this culture has no ceramics. Instead, a variety of wooden and birch bark vessels were used (Figs. 22, 23).¹⁴ To make these vessels, adzes of various types with broad, ground working edge and an additional working edge on the butt, as well as axes, were used (Fig. 5:3).

Winter semisubterranean dwellings, the rectangular depressions of which are clearly visible on the ground surface, were located in the middle course of the stream that begins on the southwest slope of Anadyrka Mountain and falls on the right into the Anadyrka River 700–800 m from the site and consequently from the shore of the sea. Such semisubterranean dwellings were described in detail in the middle of the 18th century by S. P. Krasheninnikov (1949:374–376). He also described the semi-nomadic way of life of the inhabitants of the peninsula's coastal regions.

With the approach of the hunting season, people left their winter huts and moved to places where they could catch fish and hunt sea mammals, among other prey (Geineman 1912:5).

The Anadyrka site was a temporary site of primitive people during the period of the summer-fall hunt. In addition, for the inhabitants of the Anadyrka River valley, this was the most favorable place to occupy themselves with traditional kinds of economy appropriate to a primitive society. Judging by materials from the excavations, one of their primary occupations was fishing. Numerous (more than 30) weights were found in the cultural layer of the site, as well as wooden floats (Fig. 18:1), a fragment of a wooden rim of a net of the scoop-net type or the “morda” [snout] of bag-like form with wooden rims (Fig. 17:15), handles of fishing tackle of reindeer antler and wood (Fig. 18:2, 3, 5, 6), hooks (Fig. 18:4), and needles for weaving nets (Fig. 17:1, 2).

¹⁴ The illustrations indicated here refer to those in the article “The Neolithic Site of Anadyrka in Northwestern Kamchatka” by A. K. Ponomarenko in the present work.

In the cultural layer were a substantial number of bones of small marine pinnipeds, in particular their jaws. The methods of taking sea mammals varied. The most widespread evidently was the drive, when the animal, cut off from the sea, was killed with clubs or darts. But there is also a harpoon complex in the collection from the Anadyrka site: foreshafts (Fig. 11:4–9) and toggling harpoon points (Fig. 8:17–19) and barbed harpoon points (Fig. 11:1–3). This more modern hunting equipment created the opportunity of hunting sea mammals not just on shore but also on the water. The methods of such hunts have been described in detail in the ethnographic literature (Krasheninnikov 1949:271, 275, 282–284).

Equipment for the individual hunt—bows and arrows, spears, darts, and undoubtedly various traps—permitted hunting various land animals and numerous feathered ones, especially waterfowl.

A characteristic feature of the culture is the presence of a substantial number of bone arrowheads with forked or straight flattened bases and a slot for a stone end-blade or simple tip and micro-barb or without it (Figs. 10:1–23; 11:14–24; 12:1–7). Points for hunting birds—bunts—were found at the site (Figs. 11:10–13; 12:8). Stone points were not numerous (Figs. 8:15; 9). In the complex, hunters used small points, as a rule leaf-shaped and truncated, with the aforementioned bone points being set in a slot. The stable form of points remains the stemmed ones. In the earlier Neolithic sites of Kamchatka, preceding the culture being examined, stemmed points were the dominant type of projectile points (Ponomarenko 1985, 1989a, 1993).

The length of arrows is difficult to establish based on the available fragments. It is also hard to make a judgement about construction of the bow. But it is definitely possible to say that bows were equipped with frontal end plates with one notch for attachment of a string (Fig. 12:10–13) and thin uniaxially convex plates of reindeer antler, evidently for attachment of the shoulder parts of a bow (Fig. 12:9, 14).

Collecting was a widespread kind of economy of a primitive population of maritime regions, and the inhabitants of the Anadyrka site were no exception. This collecting can be seen in the substantial number of shells from the littoral zone, clusters of which are often encountered in different levels of the cultural layer.

For extraction of shells from the sand in the littoral zone, as well as roots and tubers in the tundra and forest, various “diggers” with pointed ends, which were ground down during use, were used (Figs. 21:5; 24:1, 4). It is possible that the shovel of a reindeer antler was adapted for this purpose (Fig. 24:3), to which a haft was attached with the aid of notches. Of the plant remains, clusters of bracts from cones of creeping cedar [*Pinus pumila*] are often encountered. Accumulations of grass stems make up in average 50–60% of the cultural layer. Grassy vegetation was widely used in the economy, which is corroborated by numerous finds of fragments of fabric of grass fibers (Fig. 27), cords (Fig. 28), a fragment of a handle from a birch bark vessel (Fig. 31), a half-finished handle of stems of tundra vegetation (Fig. 30), and fragments of birch bark vessels (Fig. 22:3). The high level of development in the technology of working grass (nettle, reed, and, perhaps, sedge) is also corroborated by a whole complex of bone and antler instruments (Figs. 21:1, 2; 13), as well as combs for working the grass.

In addition to the above-mentioned winter dwellings, in which several families lived, making up a “large family,” each family had in the “letniki,” or places of summer-fall hunting, a structure not only for living but also for preserving the food products prepared for winter. These pile-construction structures (*balagany*) were described in detail by S. P. Krasheninnikov. He also described another kind of surface

dwelling: the *barabora* (Krasheninnikov 1949:377). Judging by the materials from the excavations (the remains of posts 20 cm and more in diameter, a multitude of pole fragments, and layers of thatching), exactly such structures stood on the terrace at the mouth of the Anadyrka River. With time these structures were destroyed and the people erected new ones. The posts, poles, and cover of thatching or thatched mats were partially used again for their original purpose or as kindling for fires. Ultimately, these materials were trampled on the ground and come down to us, due to permafrost, in the form of layers of thatching and other organic material; they fill the cultural layer in abundance. On the northeast coast of Kamchatka near Karaga village, *balagany* (*yukol'niki*) of traditional Itel'men construction have been preserved up to the present as a relic of the early culture, which once spread along the whole peninsula (Ponomarenko 1985:169). Evidently, the Itel'men came to this village, using sleds and snowshoes, for fish and meat prepared for winter in *yukol'niki* and pits.

An important characteristic feature of the culture was the presence of dog traction. Judging by a fragment of a runner (Fig. 20:1), these were sleds similar to those of the Itel'men (Krasheninnikov 1949:396). This type of sled was evidently one of the most ancient in the Northeast. The fragment of the runner was found in the middle horizon of the cultural layer, the age of which is approximately 1300 years. If it is taken into account that the domesticated dog was known in Kamchatka from the Upper Paleolithic (Dikov 1979c), it proceeds that the use of the animal was perfected and dog traction was ultimately invented. The find extends the age of the appearance of dog traction in Kamchatka, which was previously dated to the middle of the 2nd millennium A.D. (Ponomarenko 1985:188, 189).

The discovery of an incomplete human skeleton in the upper horizon of the layer, the age of which is about 1100 years, has important significance for determination of the ethnic association of the inhabitants of the Anadyrka site. This site was undoubtedly a burial. Its singularity can be explained by several characteristic features. The structure of the cultural layer and its lithological composition near the skeleton and in other places in the excavation are analogous. There is nothing that points to the fact that the person was buried in a specially excavated grave. Consequently, the skeleton remained lying on the ground surface, which explains the absence of the skull and parts of the legs and the pelvis. S. P. Krasheninnikov (1949:135–137) describes the distinctive ceremony of burial among the ethnographic Itel'men and their ideas of the afterlife. There is no doubt that, in accordance with the custom, the corpse was thrown out to be eaten by the dogs, as a result of which the skeleton is incomplete.

At various times the residents of Palana found a human skull and several lower jaws in the cutbank at the site (one jaw is preserved in the repository of the regional museum). Judging by the tooth system of the jaws found, the deceased were of mature age. The state of the teeth, according to A. A. Zubov, corresponds to the 4th stage—full defacement of all the enamel and the whole chewing surface consists of exposed dentin (Zubov 1968:173).

Based on the scale elaborated by M. M. Gerasimov for determination of age based on wear of molars, the noted state of the teeth is characteristic for an age of approximately 40 years (Ibid. p. 174). Intensive abrasion of the teeth depended on the state of the food. As the technology in the preparation of food became perfected the severity of tooth abrasion diminished.

The find of a shovel-shaped upper incisor is quite significant for interpreting the racial association of the skeleton. Teeth of such type are often encountered among Arctic Mongoloids and American Indians (Zubov 1973:105). In the opinion of American researchers A. Hrdlička and A. Dalberg, this form of incisor is archaic and in antiquity was inherent to all humanity. Because they had to withstand coarse

food and ensure maximal durability, these teeth were preserved under the severe conditions of the life of Arctic Mongoloids. In the opinion of A. A. Zubov (Ibid. p. 106), principles of a genetic character lay at the base of the spread of shovel-shaped incisors.

The inhabitants of the Anadyrka site had a highly developed technology in working various traditional materials—stone, bone, reindeer antler, wood, hides, grass, and birch bark.

Obsidian, chalcedony, chert, jasper, basalt, sandstone, and slate were used to make stone tools. Blanks for making tools of stone were obtained by flaking amorphous cores (Figs. 6; 7:1, 5). Flakes, as a rule, were of random form or, in rare cases, in the form of blades (Fig. 7:8). The negatives of lamellar flakes are sometimes encountered on cores (Fig. 6:5). The technology of flaking knife-like blades in the “classic” form was not known to the inhabitants of the site. For secondary working, billets or hammer-stones (Fig. 17:5, 9, 13, 16) and retouchers (Fig. 17:3, 4, 6, 7, 8, 12, 14) were used. Through secondary modification of the blanks, tools were produced as well as accumulations of tiny amorphous flakes, numbering from several dozen to several thousand, which were found in various levels of the cultural layer.

The working of antler and bone was also widespread. Most likely antlers taken during hunts, rather than dropped antlers, were used; the jaws of these animals in the cultural layer confirms this. Reindeer antlers were chopped into pieces (Figs. 25; 26:1–4), then split parallel to the axis of the antler into pieces necessary for making tools. Stone burins were primarily used for longitudinal splitting (Fig. 7:7). Traces of work with burins are clearly evident on the pieces of reindeer antler (Figs. 25:1, 3, 5, 7; 26:3–5). In some cases, chopping tools were used for longitudinal splitting, traces of which also are well preserved on antler blanks. Traces of work with a burin were left on many bone and antler tools still in the stage of the blank being cut. Of course, in the process of preparation, and then use of the tool, these traces were ground or polished away. In addition to the noted technological methods of working antler and bone, the inhabitants of the Anadyrka site were quite capable of drilling.

The methods that were used with working bone and antler were also used in working wood.

Notable is the complex of tools connected with the working of animal hides and sewing of clothing. In the cultural layer at various levels, accumulations of fur from hides as well as several fragments of worked hide without fur, evidently from summer footwear, were repeatedly noted. This fully corresponds to the season of summer-fall hunting. Various stone knives were apparently used for butchering the carcass of an animal and working the hide: leaf-shaped with various forms (Figs. 3:1–7; 4:1–8, 13–18; 5:12–14), subtriangular (Figs. 3:21, 22; 4:9), leaf-shaped stemmed (Fig. 3:8, 10, 11, 19), narrow-bladed with stem (Fig. 3:12–16, 20), subtriangular with stem (Fig. 3:23), rectangular (Fig. 3:25), knives on flakes (Figs. 3:24, 27–29; 7:8, 9), “backed” knives (Figs. 3:18; 4:10), and a knife with a ground working edge (Fig. 3:26). The collection includes a *complex of knife handles* of reindeer antler (Figs. 15:5; 16:1) and wood (Fig. 15:6, 9, 11).

There were also a variety of *scrapers*: stemmed (Fig. 8:3, 5, 6), with a cutting corner (Fig. 8:2, 9–11), of various geometric forms (Fig. 8:1, 4, 7, 8); pegs for stretching hides (Fig. 21:3, 4); numerous *polishers* of bone and reindeer antler (Figs. 14; 15:1–4; 21:6–16), bone (Fig. 16:8–21) and stone *punches* (Fig. 17:10, 11); and *needle cases* of long-bone (Fig. 15:7, 8). *Sandstone slabs* were used for sharpening bone awls and needles (Fig. 7:6).

The circle of analogies to tools from the collection of the Anadyrka site is rather broad. To the south along the west coast of Kamchatka, tools are noted at the mouth of the Palana River (bone points

with a slot for an end blade and forked base); on the lower course of the Tigil' River in the sites of Tigil'-11 (Ponomarenko 1991: Fig. 6), Tigil'-13 (Ibid.: Fig. 9:2–4), Tigil'-14 (Ibid.: 9:7, 10), Tigil'-15 (Ibid.: Figs. 10:1–21, 25, 27, 28; 11; 12:1–3, 5, 7), Mys Andreevskii (Ibid.: Fig. 14:3–5, 9, 13–16), and Kul'ki-7 (Ibid.: Figs. 17:7, 8, 18; 18:3–7); in the valley of the Utkholok River—in materials of the sites of Utkholok-2 and Utkholok-7 (Ponomarenko 1988a); at the mouth Kovran River—in the Kovran-18 site (Ponomarenko 1987a); in the Tikhaya River valley—in the second layer of the Tikhaya-10 site and in the Khairyuzova River valley—at the Khairyuzova-18 site (Ponomarenko 1987b); at the mouth of the Belogolovaya River—in the Belogolovaya-II site (Ponomarenko 1988b); in the Moroshechnaya River valley—at the sites of Moroshechnaya-9, Moroshechnaya-12, and Moroshechnaya-14; in the Ambon-II site; and at the mouth of the Sopochchnaya River—in the Sopochchnaya-6 site (Ponomarenko 1989b).

In sites south of the Tigil' River basin the permafrost was less widespread, which explains the absence in the collections from this territory of bone and wood artifacts, in contrast to items from the Anadyrka site that were preserved by permafrost. Meanwhile, analogies to the collections of stone tools clearly emphasize the ethnic unity of the noted sites. Based on available data, they also correspond chronologically (the date of the second layer of the Tikhaya-10 site is 1620 ± 60 IVAN-872). The other enumerated sites also most probably belong to the 1st millennium A.D., and, if they are somewhat earlier, then the similarity of stone tool types emphasizes the genetic connection of the diachronic but ethnically close sites.

Sites with analogous complexes of tools, corresponding chronologically and related ethnically, also exist north of the Anadyrka site. In 1994 a site on the right of the mouth of the Galgan River, south of Cape Tevi, was investigated. The stratigraphy of the two sites, the complexes of materials, and the dates are very similar. The following radiocarbon dates were obtained for the site at the mouth of the Galgan River based on charcoal and shells: for Stratum I (145 cm below datum-level)— 1200 ± 50 (GIN-8140); for the last, Stratum XV of the cultural layer— 1900 ± 100 (GIN-8146).

In 1994 photographs of wood and bone artifacts, found on the northeastern shore of the peninsula north of Tilichiki village, were obtained from a branch of the regional museum in the village of Ossora. The items turned out to be identical to those found in the Anadyrka site and on the right of the mouth of the Galgan River.

Thus, the available materials permit stating that in Western and Northern Kamchatka there was a vast territorial distribution of archaeological sites of the 1st millennium A.D. belonging to a single ethnic entity, represented by a rather complete complex of tools that did not have direct analogies in synchronic cultures of Northeast Asia. In Kamchatka, an identical complex was obtained with the investigation of the second layer of the Zhupanovo site on the east coast (Ponomarenko 1985:57–66). Here we find complete correspondence of most of the types of bone and stone points, knives, and scrapers.

Stemmed points (Ponomarenko 1985: Pl. 10:6–8, 10–15) are leaf-shaped (Ibid.: Pl. 10:9) and truncated leaf-shaped (Ibid.: Pl. 10:16–18). The complex of points from the Anadyrka site is small, with a notable predominance of stemmed points of spears and darts (Fig. 9:1–5). In the second layer of the Zhupanovo site there were no large stone points. The bone points from Anadyrka (Figs. 10–12) and from Zhupanovo (Ponomarenko 1985: Pl. 11) are very similar. Stone end blades of leaf-shaped and truncated leaf-shaped form for bone points from Anadyrka (Fig. 9:17, 18, 21) and from Zhupanovo (Ponomarenko 1985: Pl. 10:9, 16–18) are analogous. They differ only numerically—at the Zhupanovo site there are many more of them.

The parts of the bow are identical: end plates with a notch for a string from Anadyrka (Fig. 12:10–13) and from Zhupanovo (Ponomarenko 1985: Pl. 13:7).

The harpoon complexes are also similar. The barbed points are the same type in Anadyrka (Fig. 11:2) and in Zhupanovo (Ponomarenko 1985: Pl. 11:15; Fig. 30). A large bone foreshaft of a harpoon shaft was intended for this type of barbed point (Ponomarenko 1985: Pl. 11:14). Though no toggling harpoon points were found in the second layer at Zhupanovo, they were evidently used. Pointing to this are the foreshafts of toggling harpoons (Ponomarenko 1985: Pl. 11:17, 18), which are the same type as ones found at Anadyrka (Fig. 11:4–9). The types of knives from the Anadyrka site and the second layer of the Zhupanovo site correspond rather fully—leaf-shaped (Figs. 3:1–6; 4:1–8) (Ponomarenko 1985: Pl. 15:1), narrow-bladed (Fig. 3:7, 12, 15) (Ibid.: Pl. 15:5, 6), subtriangular (Figs. 3:21, 22; 4:9) (Ibid.: Pl. 15:7), subtriangular with stem (Fig. 3:23) (Ibid.: Pl. 15:3, 10), with ground working edge (Fig. 3:26) (Ibid.: Pl. 15:2), and with “ears” in the stem part (Fig. 3:17, 19, 20) (Ibid.: Pl. 15:8, 9). In both complexes there are numerous knives on amorphous flakes.

Handles of reindeer antler from Anadyrka (Figs. 15:5; 16:1) and Zhupanovo (Ponomarenko 1985: Pl. 13: 2, 5, 10) are analogous, as are scrapers from Anadyrka and from Zhupanovo: (Fig. 8:2) (Ibid.: Pl. 10:19), (Fig. 8:4) (Ibid.: Pl. 10:21), (Fig. 8:5, 6) (Ibid.: Pl. 10:23), (Fig. 8:3, 9–11) (Ibid.: Pl. 10:20, 22, 27), and (Fig. 8:1) (Ibid.: Pl. 10:24, 26).

Retouchers from Anadyrka and from Zhupanovo are similar (Fig. 17:3, 4, 6–8, 14) (Ponomarenko 1985: Pl. 12:1–5, 11).

Bone needles for weaving nets from Anadyrka (Fig. 17:2) are the same type as from Zhupanovo (Ponomarenko 1985: Pl. 12:13), as are stone punches with separated hafts (Fig. 17:10, 11) (Ibid.: Pl. 14:9, 13).

The technology of working bone and stone corresponds. The amorphous cores from Anadyrka (Fig. 6:7) and from Zhupanovo (Ponomarenko 1985: Pl. 14:11) are numerous. In the cultural layers of both sites, clusters of amorphous flakes were noted in various levels, as well as a substantial number of weights and the bones of fish and sea mammals, primarily small pinnipeds.

A rather numerous complex of parts of transportation means (sleds and snowshoes) in the collection from the Anadyrka site (Fig. 20:1–9) makes clear also the assignment of such artifacts from the second layer of the Zhupanovo site (Ponomarenko 1985: Pl. 13:6, 8, 9), the interpretation of which was earlier doubted. Of course, in the second layer at Zhupanovo, no sled parts were found, but this does not mean that they were not used at that time. Snowshoes and sleds of the Kamchatka type (?) existed until the second half of the 19th century, when the more spacious sled of the East Siberian type began to be used (Antropova 1949:89, 90). In Southern Kamchatka from Zhupanovo to Cape Lopatka, cleats from snowshoes are encountered fairly frequently in the cultural layers of sites from the second half of the 2nd millennium A.D. (Dikova 1983:89, 90; Ponomarenko 1993:70; Fig. 15:4, 5).

We will also note some features of the complex from the Anadyrka site. One of them is the large collection of combs made from bone and reindeer antler (Fig. 13) that were used for working grass. We also found such a comb very far south, at the mouth of the Belogolovaya River in Belogolovaya-II. There were no combs in the collection from the second layer of the Zhupanovo site, but there is no doubt that grass was widely used for weaving. When working grass the inhabitants of the Zhupanovo site used a bone instrument similar to a spoon with a pointed tip for separating the stems (Ponomarenko 1985: Pl.

13:4). The use of these tools derives from earlier horizons of the culture: the 2nd millennium B.C. In a cultural layer, dating to the end of the 2nd millennium B.C., of a site at the mouth of the Ryabukhina Creek on the Lopatka Peninsula several such instruments for working grass were found (Ponomarenko 1993:114; Fig. 58:10–12).

Combs from the Anadyrka site appeared in northwestern Kamchatka (or in northern Kamchatka) through the influence of neighbors who lived on the coast of the Sea of Okhotsk. A. I. Lebedintsev found a similar comb in the Spafar'eva site near Magadan. The site is dated to the end of the 1st millennium B.C. (Lebedintsev 1990:115).

Another feature of the complex being examined is the presence of axes and adzes primarily of trapezoidal form. Some had the butt modified into a working edge by grinding (Fig. 5). Adze-like tools of small size (Fig. 5:7, 8) are analogous to finds in the second layer of the Zhupanovo site (Ponomarenko 1985: Pl. 16:3, 4). Those remaining have no direct analogies either in Kamchatka or in the cultures of neighboring territories. There is some similarity between adzes and axes from Anadyrka and adzes from the lower layer of a site at the mouth of the Ozernaya River on the east coast of Kamchatka (Ponomarenko 1985:143) and in materials of the Tokareva culture of the 2nd–1st millennia B.C. in the sites of Oksa-I (second half of the 1st millennium B.C.), Tokareva (middle of the 2nd–1st B.C.), Batareinaya (middle of the 1st millennium B.C.), and Spafar'eva (end of the 1st millennium B.C.) (Lebedintsev 1990:33–109), as well as in materials of the Old Bering Sea culture of Chukotka (first half of the 1st millennium A.D.) (Dikov 1979a:200). The tradition of forming the butt into an additional ground working edge similar to a chisel derives from an earlier stage of the Neolithic of Kamchatka (Ponomarenko 1989a:103, 145; Figs. 5:9; 17:3). Thus, the form of adzes from the Anadyrka site emerged under the influence of two Neolithic traditions—a southern Kamchatkan and a northern.

The cited characteristics of the culture being studied and the substantial degree of identity of the overwhelming part of the collection of the Anadyrka site and second layer of the Zhupanovo site provide a basis for believing that these sites belong to an Old Itel'men culture, specifically the Kronotskii stage, of the 1st millennium A.D. (Ponomarenko 1985:165). On the northwest coast the sites of this time, as it follows from the published materials, were far north of the mouth of the Khairyuzova River, where the southernmost site containing Old Koryak ceramics is found (Ponomarenko 1987b). These facts are not contradictory. In the 1st millennium A.D. up to its end, Old Itel'men sites were located far to the north of the mouth of the Tigil' River. Judging by some notable features of the collections from these sites, they were a local variant of the Old Itel'men culture of the 1st millennium A.D., which absorbed elements of neighboring cultures: cultures of the northwest coast of the Sea of Okhotsk—Tokareva, and Old Bering Sea of the 1st millennium A.D. in Chukotka.

On the north coast of the Sea of Okhotsk the Old Koryak culture developed in the middle of the 1st millennium A.D. (Lebedintsev 1990:179) and spread toward Kamchatka. Based on A. I. Lebedintsev's supposition, the bearers of the Old Koryak culture appear in the north of Kamchatka no earlier than the middle of the 1st millennium A.D. (Ibid.:224).

Consequently, somewhere in northwestern Kamchatka the Tokareva culture and one of the local variants of the Tar'in stage of the Old Itel'men culture came into contact, and then in the 1st millennium A.D. also a northwestern local variant of the Kronotskii stage of the Old Itel'men culture and the emerging Old Koryak. The Old Koryak gradually moved to the south along the northwest coast of Kamchatka, and possibly by the 10th century A.D., as A. I. Lebedintsev supposes (Ibid.), they reached maximal dis-

tribution in northern Kamchatka. Based on our data, the southernmost sites of the Old Koryak culture are the sites in the basin of the Tikhaya and Khairyuzova Rivers—Tikhaya-10 and Khairyuzova-24.

The sites of the Old Koryak culture in Kamchatka have not been investigated adequately, and inasmuch as they are sometimes superimposed upon earlier (as seen from the cited analysis, Old Itel'men) their study will obviously be connected with some complications.

In the article by A. V. Semenov published in 1964, a description was given of a collection of surface material from the Anadyrka site, material he collected in 1959 and 1960.

The material is mixed and non-stratified; as a result, the complex is difficult to interpret. R. S. Vasil'evskii, attempting to draw the material of A. V. Semenov into the known periodization of the Old Koryak culture, was forced to be limited to general remarks about the chronological and typological unity of the published material, about the synchronicity of the sites from which it was collected, and about the kinship of the people who lived in the sites (Vasil'evskii 1971:130). Of three published ceramic fragments (Semenov 1964:38; Fig. 7:78, 80, 83) R. S. Vasil'evskii cites only one (1971:247). It is evident this is not by chance since such ceramics are often encountered in complexes of Old Koryak sites in Kamchatka. Meanwhile, another fragment with a pit decoration is little known (Semenov 1964:38; Fig. 7:80). We found such ceramics at a site in the valley of the Ivashka River together with a well stratified collection of carefully worked stone tools. Analysis of materials from investigations of the Ivashka site and its date have already been published (Ponomarenko 1985:151–156, 166, 167).

Polyhedral core-like burins from the Ivashka site are analogous to Middle Kamchatkan ones of Tar'in times from the mouth of the Tigil' River, from Layer II of the Ushki-I site, and to burins of the Ust'-Bel'skaya culture. These analogies permit dating the Ivashka site to the 1st millennium B.C. If this date is reliable, then the ceramics with the "pit decoration" (more precisely, with imprints of the end of a tubular bone) and with other variants of ceramic decoration from the Ivashka site are the earliest in Kamchatka, corresponding to the period of the Tokareva culture. At the same time there are no such ceramics in materials of the latter.

To clarify what this poorly studied culture of northern Kamchatka is—one of the sites of which is evidently the Ivashka site—is a task for future research. But the culture's distribution in this region is evident; it is confirmed by A. V. Semenov's find of a fragment of such ceramics on the northwest coast. Of course, it is unclear just where it was found. Judging by the description of the clearing of the cultural layer, the discovery was made on the right of the mouth of the Anadyrka River. But the rather large area of cultural layer that we disassembled leaves no doubt that the culture being studied is without ceramics. It is possible that there was a complex of material different in appearance, containing ceramics, in the cultural layer.

ABANDONED SHRINES: A NEW TYPE OF CULT SITE ON THE NORTHWEST COAST OF KAMCHATKA

A. V. Ptashinskii

“Another formidable beast whose life
the savage hunter takes with joy, yet
with fear and trembling, is the whale.”

J. Frazer, *The Golden Bough*, Ch. 52

At present in Northeast Asia a variety of cult sites, left by the native residents—bearers of continental and maritime cultures are known. Their planographic and structural features, the variety in placement, functions, composition, time of creation, and ethnic association are noted in the literature, on the basis of which they are systematized. These ritual sites or sanctuaries (Amal’rik and Mongait 1966:160–162; *Religioznye. . .*, 1993:184) make up another category, adding to the general classification of archaeological sites proposed by N. N. Dikov (1977:226, 227).

As a result of the archaeological work conducted on the coast of the Penzhina Bay, ritual sites were discovered that were represented by stoneworks, piles of reindeer antlers (*tynmai*), vertically implanted jaws of whales or with whale jaws in their composition (in several cases faunal complexes and artifacts were added)—*appapil’*. No excavations or detailed study of them were conducted; therefore, we cite the primary information and on the basis of comparative analysis draw preliminary conclusions.

Known cult sites are located along the western shore of Penzhina Bay to the north from the border of the Magadan and Kamchatka Districts on the east coast of the Taigonos Peninsula to the Paren’ River, then to the mouth of the Penzhina River and farther to the south along the western shore of Kamchatka to the Palana River. Their names are given based on the names of the rivers or on the closest geographic objects (Fig. 1).

Osgincho. At 35 m southwest of a battlement built on the top of a coastal hill 91.7 m high, on a gentle slope facing Tretii Island, are 10 bases of implanted whale skulls. They are all the same in external appearance and sizes. The bases project 30–35 cm above the ground and are light-gray in color, compact, and porous in structure. Their top parts are broken.

Most of the six bases are laid out in a row at a distance of 1.6 to 2.3 m from each other from northwest to southeast, which corresponds to the direction of the coastline. The remaining bones are laid out to the sides and down the slope of the coastline (Fig. 2). No tools, charcoal, or flakes were found nearby. No traces of ancient sites were found in the vicinity. But near the foot of the hill are depressions from one of the Koryak sites—Srednyaya Itkana.

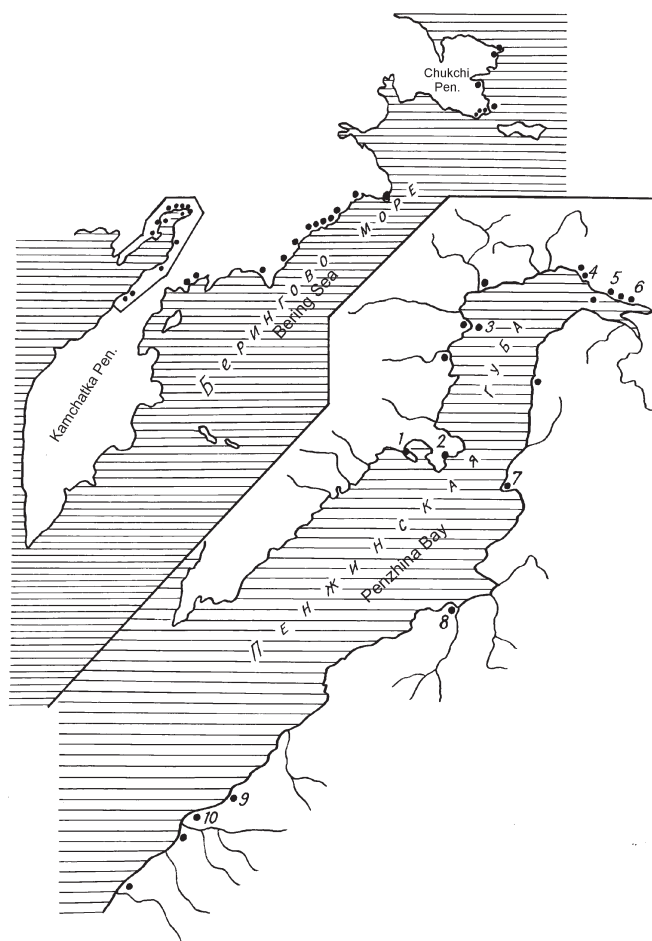


Figure 1. Map of the location of “Mandibula Sacra” sites on the coast of Northeast Asia and the northwestern shore of Kamchatka. Cult sites, found and described by the author (numbered) and plotted on the map based on the different literary sources (indicated by dots): 1—Osgincho; 2—Itkana IV; 3—Ostrov Dobrzhanskogo; 4—Lovaty III; 5—Kamennaya II; 6—Cape Kontrol’nyi; 7—Cape Vodopadnyi; 8—Ivriin; 9—Tevi II; 10—Galgan I.

Itkana IV. On the edge of a precipitous seacoast about 20 m high, near an Old Koryak site consisting of three house depressions, was an altar—*appapil’*—overgrown with thick reed grass. Its area is about 6 m². Two whale jaws implanted among the stones project 25–30 cm above the ground. Scattered around lay whale ribs, skulls of belugas and bears, jaws of dogs, and reindeer antlers. Bear crania had been perforated on the left sides for extraction of the brains, and not on the right, in distinction from skulls at an altar near Vetvei village (Vdovin 1971:282).

Ostrov Dobrzhanskogo.¹⁵ On a high southwestern cape of the island were noted 10 house depressions, about 30 cache pits, three groups of whale bones, and a pile of poorly preserved reindeer antlers, overgrown with grass. Groups of whale bones include implanted jaws leaning at various angles

¹⁵ “Ostrov” is Russian for “island.” “Ostrov” is retained here since it is a proper name and not a geographic location, though the site is on Dobrzhanskogo Island. It is the same for the following site: “Reka” is “river” in Russian. However, Reka Tylkhai is the name of a site located on the Tylkhai River. “Mys” is Russian for “cape.” Thus, Mys Kontrol’nyi is the site, Cape Kontrol’nyi the geographic location.—*Trans.*

and ribs 1–1.5 m high and other parts of skeletons scattered around; one skull was implanted. Among the rocks was a structure of whale bones and skulls of dogs, bears, belugas; reindeer antlers were also scattered about (Pika 1992:187, 188; Rudenko 1986).

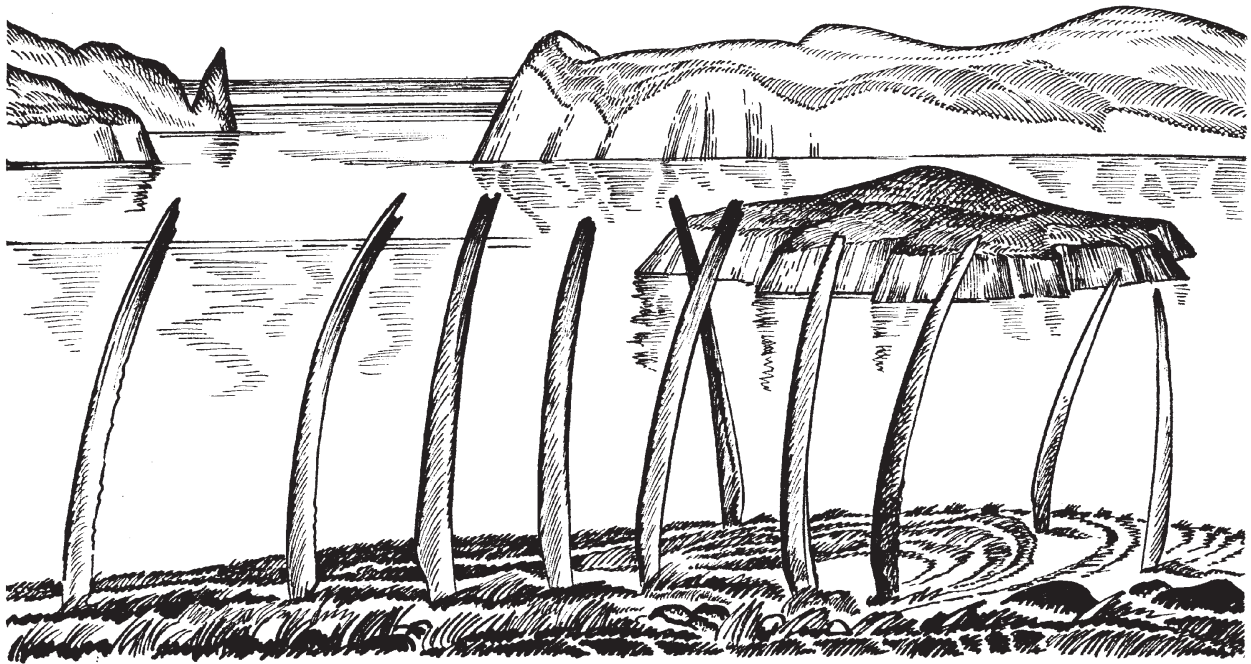


Figure 2. The Osgincho cult site. A reconstruction. Artist V. I. Zorin.

This *appapil'* is evidently one of the most long-term cult complexes still being honored by the Koryak—residents of Paren' village, descendants of bearers of the ancient ceremony.

The special, possibly intercommunal, ritual character of the site is emphasized by the fact that in the literature of the 1920s–1930s it is not mentioned. For example, K. Bauerman (1934:74) cites the names and indicates the location of 15 clan *appapili* in the territory of occupation by the Paren' people, but reports nothing about an island altar. Also, I. S. Vdovin, in special research, does not cite information about it (1971:187, 188).

Reka Tylkhoi. Based on the literary sources the existence is known of an *appapil'* on the left bank at the mouth of the river. It is represented by whale jaws, skulls of dogs and sea mammals, and reindeer antlers (Beretti 1929:39).

Reka Ornochek. In the sketchbooks appended to the report of the Penzhina Interdisciplinary Expedition of 1930, kept in the Palana Regional Museum, there are photographs with views of the Ornochek

appapil', a large faunal complex with reindeer antlers, large whales bones, and small mammals bones. In the vicinity of the Koryak site of Ornochek, we did not succeed in finding traces of an altar. Judging by one of the photographs, the Ornochek *appapil'* might be located on Ornochek Island.

Lovaty III. On the edge of a precipice about 15 m high, near the former Koryak settlement of Lovaty, was the base of an implanted light-gray whale jaw 12 cm high, which was substantially damaged. Nearby, in blowouts, were a basalt scraper and four fragments of ceramics. In the depths of the terrace, 80 m to the west, is a second base of a large gray whale bone, about 40 cm high, which was better preserved.

Kamennaya II. On a rocky seacoast about 20 m high, among 10 depressions of Old Koryak houses and 10 cache pits, were the bases of eight implanted whale jaws. One of them is near a long entry-way into the largest, subrectangular depression, measuring 9 x 4 m; four others form a central group, and three whale jaws are located at the very precipice. The preserved “stumps” project from the ground 20–40 cm, have a gray color, are covered with cracks, and their upper parts are damaged in various degree.

Ostrov Appapil'. The name of this islet speaks for itself. The cult site was represented by a faunal complex. At present, based on our information, it has been destroyed. “On this island there was a haulout for seals and sea lions, to which, however, the non-Koryak were not permitted access” (Vdovin 1971:279).

Evidently in antiquity altars of maritime hunters existed on most islands in Penzhina Bay.

Mys Kontrol'nyi. On the edge of a 26 meter-high precipitous cape was a group of two bases of whale jaws and a pit from a third, fallen one, about 40 cm deep. The preserved bones project from the ground 15–20 cm; their external surface is gray in color and cracked. East of them 30 m were noted traces of an Old Koryak site (Ptashinskii 1989, 1990).

Mys Kamennyi. “On the edge of sixteen-meter precipice . . . are two amazing structures; implanted deeply in the ground, elliptically, were the bones of a large sea mammal. The bones had been turned to a spongy mass from snow and rain, from sun and wind. With difficulty it was determined that these were the ribs and jaws of whales.

“The remains of one of the structures were preserved relatively well—the bones rose 30–50 cm above the ground. Only seven projecting bumps remained from the other structures” (Malyukovich 1972).

Unfortunately, these shrines have now been destroyed.

Reka Berezovaya. On the surface of a sea terrace at the river's mouth was a “cluster of bones (primarily skulls) of bears, sheep, reindeer, belugas, and whales” (Pokhialainen 1979:152).

Mys Vodopadnyi. On a narrow precipitous cape about 40 m high on the southern part of the Mametchinskii Peninsula is an altar. The faunal complex is represented by the tops of skulls of snow sheep with bony outgrowths, skulls and jaws of seals and dogs, and part of a whale jaw about 60 cm long. But here two lay under the sod in a horizontal position. In a cutbank were two socketed and 14 stemmed bone arrowheads without shafts (Fig. 3), an iron knife with a decayed wooden handle, and 2 rifle cartridges.

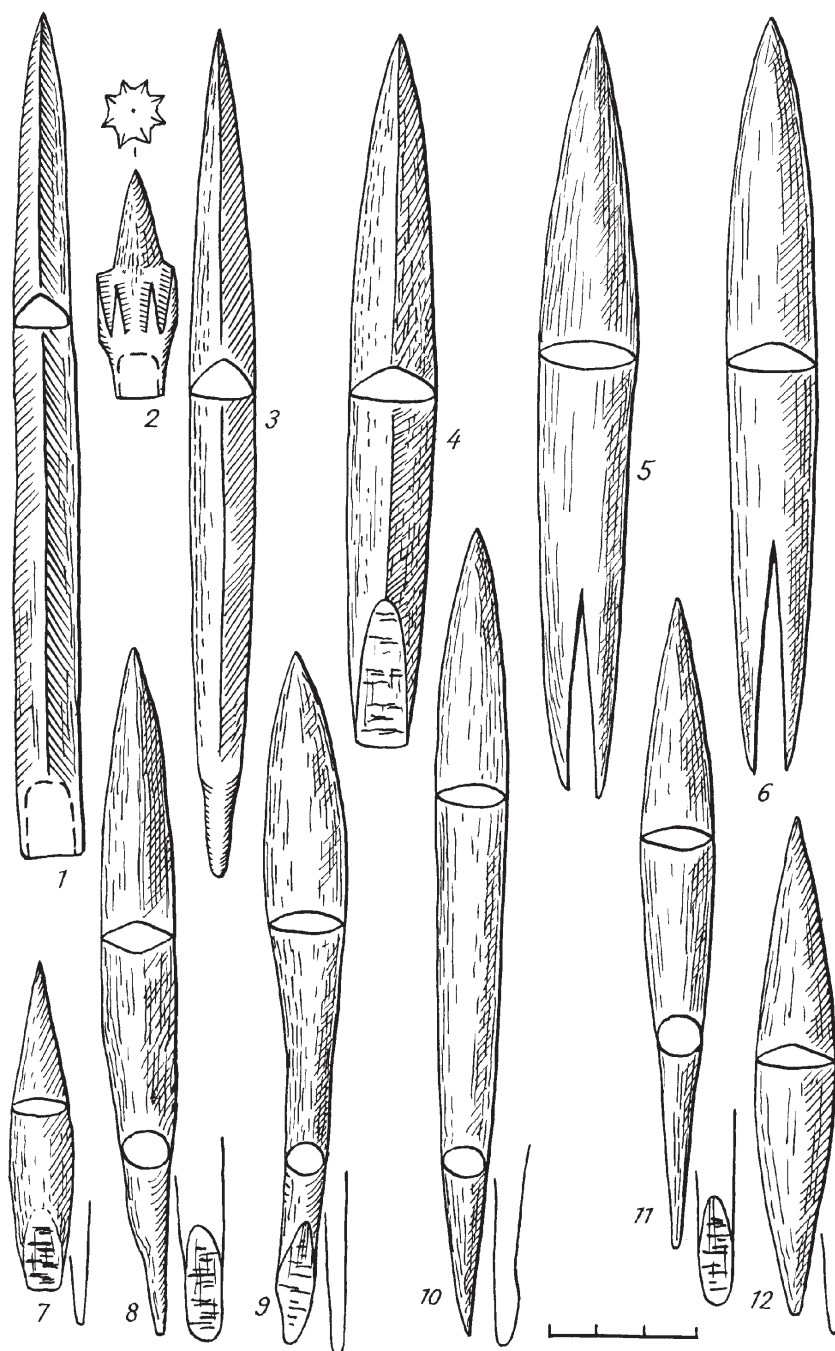


Figure 3. Bone arrowheads from the Vodopadnyi altar.

This shrine can serve as a good illustration for information from the second half of the 18th century: "... on one very high rock a multitude of reindeer antlers and wild sheep horns had been placed, and in the middle the frontal parts of bear and sable heads, and under and around the multitude of these were bone, stone, and iron arrows" (*Zapadnyi*. . . , 140).

Ivrivin. On the left of the mouth of the Pustaya River, on a cape about 80 m high, was an altar that had been almost destroyed in the 1960s during the period of the Rekinniki settlement. Its remains are represented by a large implanted whale skull rising 60–70 cm above the ground, fragments of whale bones, reindeer antlers, the jaws of belugas, dogs, and seals. No artifacts, flakes, or charcoal were found upon superficial examination, but several Old Koryak sites were noted on this coast in the mouth area of the Pustaya River.

Tevi II. On the left of the mouth of the Tevi River, on a slope in the rear part of the terrace were the remains of an implanted whale jaw of light-gray color, cracked, projecting 50 cm above the ground at an angle. A cultural layer could be traced in the terrace cutbank, possibly left by bearers of the Old Koryak culture.

Galgan I. On a mouth-area terrace about 15 m high, 20 m from the precipice, was the base of the largest whale jaw—measuring in the upper part 56 x 18 cm. It projected 50 cm from the ground at a slight angle, the surface of a light-gray color, cracked, and in places exposing the macro-porous structure. A site was located on the terrace; its cultural layer evidently belongs to the Old Itel'men culture, which does not match with the presence of the whale jaw.

Kinkil'. At 70 m from the shore, on the brow of the 2 m high 2nd floodplain terrace on the left of the mouth were three groups of large bones (skulls) of sea mammals and whales. They were located in a row almost along the line of the shore at a distance of about four meters from each other. One bone of light-gray color projected a little above the ground; others, of dark-brown tint, were covered with a thin layer of sod. No tools or charcoal were found, but on the first terrace two Old Koryak house depressions were noted.

Ust'-Palana. In 1987, upon plowing virgin soil for a vegetable garden 1 km from the seashore, jaws, ribs, vertebrae, and parts of a whale skull were found (Balandov 1987). The composition and location permit supposing that this faunal complex was a cult site, the southernmost of those known at present on the west coast of Kamchatka.

In spite of the individual differences, the primary part of each of these sanctuaries is united by a common formal feature—the presence of whale jaws.

Their external appearances are approximately identical: the upper part was destroyed to various degrees; the remaining “stump” preserves the vertical position or is inclined; they are implanted to a depth of 40–50 cm; in most cases, permafrost holds them in place; and no traces of mechanical activity (holes, chop marks, grooves) were noted. The height and size of the preserved parts of the jaws were the result of time, the place they were installed, and the age or species of the whale itself. Meanwhile, it is impossible to make these statements specific without special investigation.

All the jaws (more precisely, their “stumps”) found at the capes and sites were undoubtedly left by maritime hunters—bearers of the Old Koryak culture.

The hunting of sea mammals, including whales, was characteristic of this culture, especially during the Lengel'val' stage (13th–15th centuries A.D.) (Vasil'evskii 1971:131). Supporting this conclusion is the small harpoon complex from the denudation of the Old Koryak house at the Pustaya I site, located not far from the Ivrivin altar.

Three typologically identical *toggling points* 6.5–7 cm long with basally beveled spurs, cylindrical line holes, and slots for an end blade situated in the plane of the line hole were found together

with three 8–8.5 cm-long foreshafts and additional carefully retouched end blades-insets of basalt and obsidian, one of which is shown in Figure 4:1.

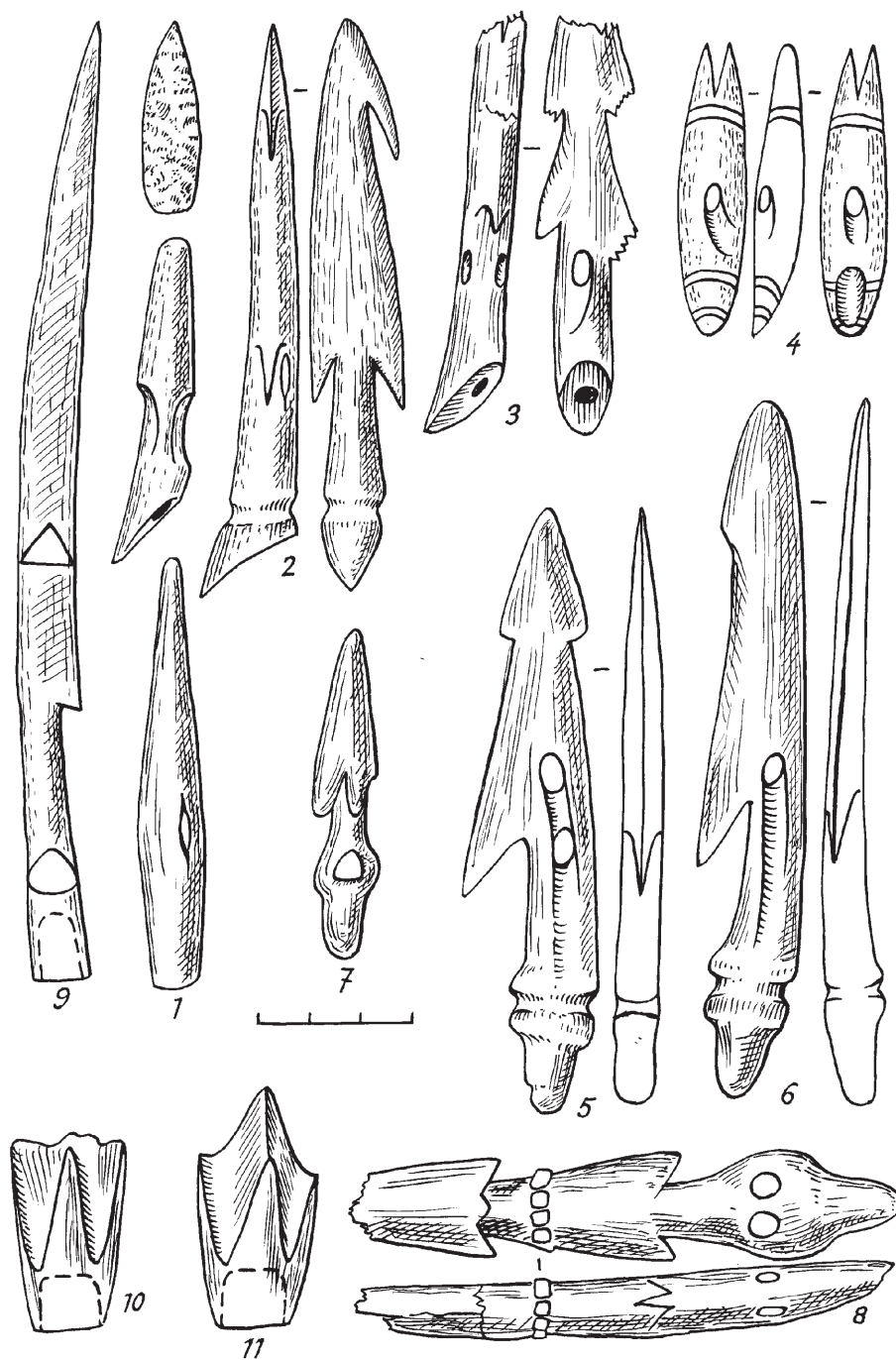


Figure 4. Points of arrows and harpoons from the Pustaya I site.

A point 11.5 cm long, with a basally beveled spur, a narrow slit for a line, a symmetrical pair of barbs in the middle part, and one barb in the upper part, was made from walrus tusk. The base is encircled by a narrow groove (Fig. 4:2).

Another point 8.7 cm long has a slit for an end blade, a perpendicularly oval line hole, a basally beveled spur, and two pairs of barbs—the upper pair symmetrical and the middle pair asymmetrical. The upper part of a foreshaft was preserved in the closed socket (Fig. 4:3).

Another point is 6 cm long, oval in cross section, with one spur, and a closed, partially broken socket. An oval line hole with grooves running downward and to the side is located parallel to the slot for an end blade. This point is decorated by three rows of double, poorly preserved, carved lines (Fig. 4:4).

Non-toggling points are represented by two typologically close tools with one barb and a groove in the line stop. They differ in that one has a length of 12.1 cm, two oval line holes, and a clearly expressed end point, while the other is 14 cm long, has one hole, and a blunted point (Fig. 4:5, 6).

Another point is relatively small, 6.5 cm long with three barbs around the waist, and a slot for an end blade situated perpendicular to the subtriangular line hole in the line stop (Fig. 4:7).

Another non-toggling harpoon point is 10.9 cm long, has two pairs of symmetrical barbs with longitudinal slits on the ends, a girdle in relief with transverse notches between the barbs, and a slot for an end blade perpendicular to two cylindrical holes for attachment of a line in the line stop (Fig. 4:8).

Serving as evidence of the altars being connected with the Old Koryak sites are the bone arrowheads found at this site, in particular the socketed bunts and long points, three-sided in cross section (Fig. 4:9–11).

Based on our data, the Old Koryak culture was spread along the northwest coast of Kamchatka in developed form around the beginning of the 2nd millennium A.D. The possibility of precise dating of the cult sites is lacking, but relying on the results of investigations of similar shrines on the northwestern Bering Sea and the date of the Pustaya I site— 310 ± 40 (GIN-6378) and 470 ± 40 (GIN-6379)—they possibly emerged in the middle of the 2nd millennium A.D.—in the 14th–16th centuries.

Possibly the differences in arrangement of vertically set ritual whale jaws attest to the existence of a hunting cult and cult of the ancestors among the bearers of the Old Koryak culture.

Jaws set up on prominent capes and eminences in regions of the hunt and of the butchering of whales most probably attest to the existence of a hunting cult. Magic ceremonies connected with these cult sites are not described in the ethnographic literature, but there is a direct indication to the fact that the Paren' Koryak “believe in the sea whale, and bring to the sacrifice bone and iron arrows” (Vdovin 1973:166). It is also well known that “they also show signs of respect to the cape or that stretch of land on which they hunt” (Lindenau 1983:126). Easily seen vertically implanted jaws, bleached by the weather and sun, could be signs guaranteeing the return of whales and other sea mammals to the coastal hunting grounds.

Altars that are located near sites apparently reflect the existence of the cult of the ancestors. Implanted whale jaws were most likely associated with the wooden posts that still stood in the sacred places in the first half of the 20th century (Vdovin 1971:275). To these patrons of settlements—wooden posts 1.5–1.75 m high with pointed upper part and an image of a human face on it called “ok-kamak” or

“nymel-gen” (Bauerman 1934:74)—and to *appapili* the best bones of the whale and skulls of killed bears were brought to the sacrifice for various reasons (Beretti 1929:39, 41, 42).

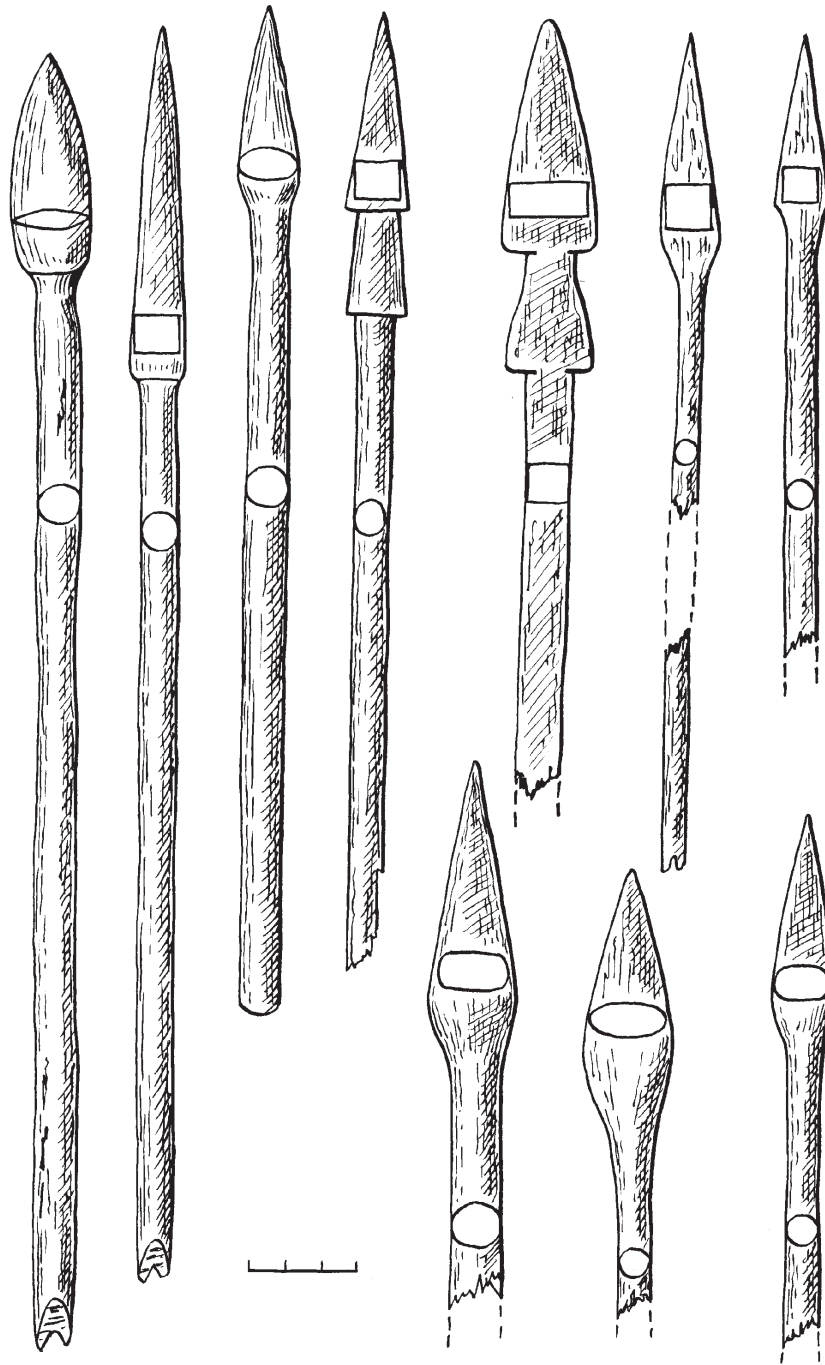


Figure 5. Wooden ritual arrows and end blades from the altar on Verkhoturova Island.

S. P. Krasheninnikov's (1949:133) information provides evidence of the existence of similar cult sites on the northeast coast of Kamchatka: "The Kut, whom they [the Koryak.—A. P.] honor as God and the first resident of this country, live at this river, set up before their yurts a whale jaw . . . observing that, the Koryak still set up in this place a tree instead of a jaw." The river mentioned is the Dranka (Valkylveem, in the Koryak language, which means "jaw-river"). "In the past, among the Koryak and Chukchi there was the custom of setting up before a settlement a post-guardian *okkamak* of whale jaw, and if there was none, they used wood. . . . They made offerings to this post-guardian, asking for prosperity. Such posts of whale jaws were preserved at many old sites along the coast from Kamchatka to the Arctic Ocean" (Leont'ev and Novikova 1989:134).

Cult structures are noted on Verkhoturova Island, on the left bank at the mouth of the Kultushnaya River, on the right bank of the Apuka River (Vdovin 1965:24), near Vyvenka village on the Anapka River (Vdovin 1971:277, 294), at Opukha Lagoon, on Cape Rifovyi, and Cape Lagunnyi (Leont'ev 1983:44).

Based on our data, the altar on the northern cape of Verkhoturova Island is a cluster of skulls of walruses, sea lions, seals, bears, snow sheep, and sea birds, and of reindeer antlers projecting from under a thin sod layer. In the middle of this cluster were the remains of a wooden post, a small stump about 10 cm high. The altar had evidently been destroyed. All the walrus skulls had their tusks knocked out; in several cases, greenish pebbles, canines of bears and sea lions, and skulls of birds had been put in their place.

Among the osteological remains were iron knives and bracelets, Winchester and other rifle cartridges, lead buckshot, fragments of burnt bottle glass, large and small beads, bone arrowheads and one basalt arrowhead, and wooden ritual end blades and arrows. Objects of wood were poorly preserved, partially rotted, and grown through with roots. Characteristic of these wood objects are crudely worked shafts and more carefully worked upper parts (Fig. 5).

Bone points are represented by two that are subtriangular in cross section with flattened wedge-shaped bases (Fig. 6:1, 2), three that are socketed—a bunt with one primary point and one small additional one (Fig. 6:3), and two that are decorated (Fig. 6:4, 5).

A *stemmed point* of basalt was made by the removal of large spalls and crude retouch along the edge (Fig. 6:6).

The wooden end blades and bunt are analogous to finds by I. S. Vdovin at an *appapil'* near Vetvei village (Vdovin 1971:277) and are similar to bone points of the Lakhtina culture in form and decoration (Orekhov 1987: Figs. 66:21; 67:7).

In addition to the altar, two late house depressions were noted on the brow of a coastal terrace about 15 m high: one typically Koryak, the second probably from an earlier time. The Koryak *appapil'* known as *Samaenpynavpil'* ("Old Woman of the Island") located on small Verkhoturova Island (Vdovin 1971:277) evidently functioned in the 18th–19th centuries. The island's position and the probable seasonal honoring of the altar attest to connections of the site with a cult of animals and possibly ancestors, to which the proper name points.

Substantial information was provided by the interdisciplinary archaeological-ethnographic investigation of the Kerek altars (*kamaki*) and early sites. According to this source, almost everywhere in early cult locations standing jaws of whales are encountered, often surrounded by walrus skulls, which possibly were protectors of Kerek villages and had a purely ritual significance. It is proposed that in those

places *kamaki* were carried out—thanksgiving and protective rites with an offering and the feeding of the “guardian of the village” and skulls from a ritual dish (Leont’ev 1983:47). On many ritual platforms around the whale jaws were the primary part of wooden ritual arrows and bone points, hunting equipment, fragments of ceramics, and large and small beads (Orekhov 1987:149, 150).

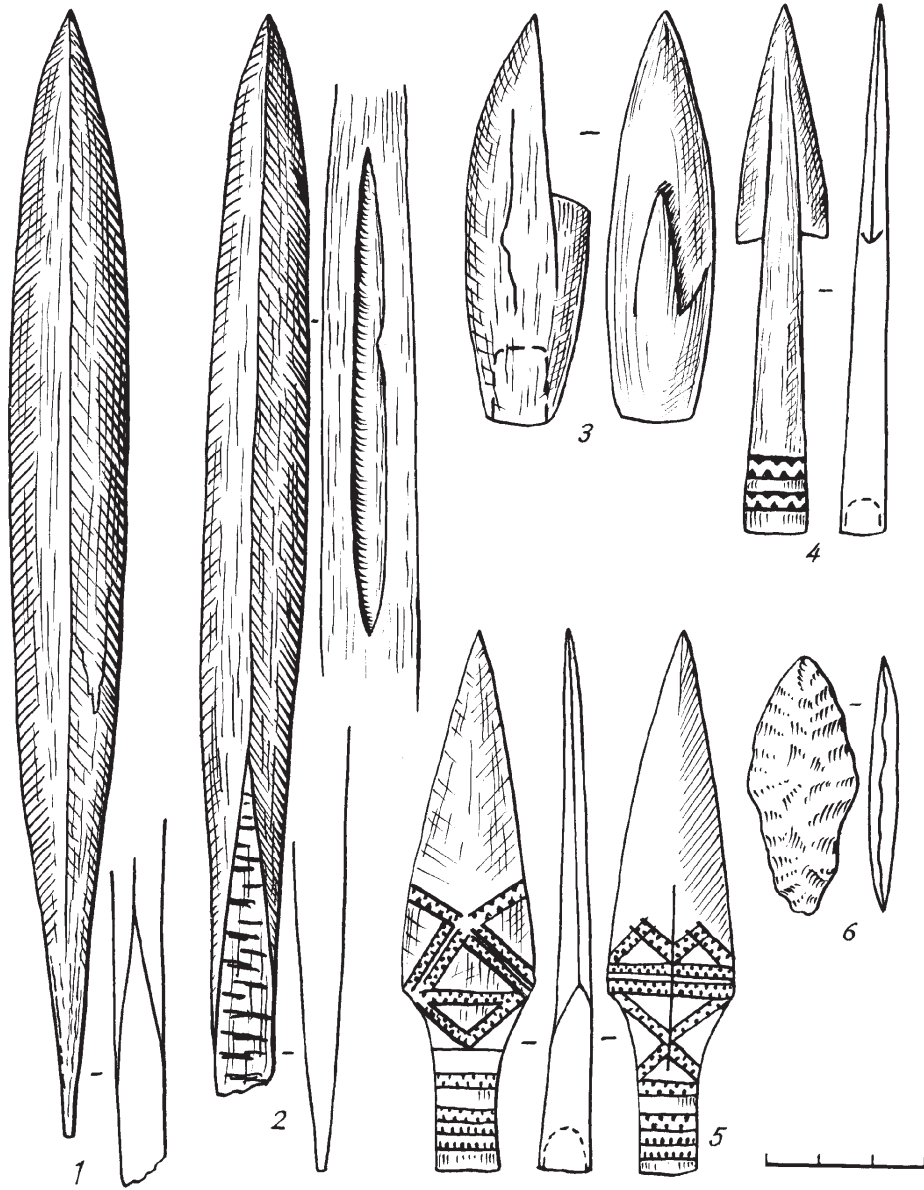


Figure 6. Arrowheads from the altar on Verkhoturova Island.

These altars may reflect two ideas: the cult of the ancestors and the cult of the animals (Leont’ev 1983:52). It is believed that they coexisted with the settlements (Orekhov 1987:150) during the period of the Lakhtina culture (2nd millennium B.C.–17th century A.D.). The Kerek *kamaki* most probably belong to its late stage (Dikov 1979a:256), the middle of the 2nd millennium A.D.

It is difficult to explain the fact that in materials of the dwellings and altars no harpoon points were found, that is, “the Kerek were not true maritime hunters” (Leont’ev 1976:205), though the wealth of bones of whales and other sea mammals “attest to the intensity of maritime hunting among the early Kerek” (Dikov 1979a:259).

The ancient Eskimo cult center on Yttygran Island—the Whale Alley sanctuary, represented by rows of about 60 implanted skulls and 34 whale jaws variously grouped—undoubtedly has a ritual character. Whale Alley was created by bearers of a highly developed culture of maritime hunters during the period of the late Punuk (14th–16th centuries A.D.) (Arutyunov et al., 1982:142).

Not to enlarge on the complexity of the functional reconstruction and ceremonial interpretation of the site, we note that some researchers hypothetically connect the site with hunting cults (Ibid.:144). Based on another opinion, Whale Alley more certainly reflects the idea of hunting cults connected with whaling (Boriskovskii 1985:304, 305).

In addition, the possibility is allowed that “single posts near a group of skulls in Whale Alley were symbols of ancestors, as has been recorded among the Asiatic Eskimos and coastal Chukchi in historic times” (Arutyunov et al., 1982:152).

During its early existence, Whale Alley was not necessarily unique; though it is hard to say, it probably fit into a series of ritual sites that were structurally similar (Ibid.:122). In fact, on the coast of Chukotka, in particular Mechigmen Bay, are known implanted single jaws, groups of them, and whale skulls having a ritual character (Ibid.:144, 162–164).

Physically analogous are the altars of the northwestern Bering Sea (Orekhov 1987:151), to which, in light of the represented materials, the ritual sites of the Old Koryak culture reveal greater similarity. It is possible that this commonality runs substantially deeper than has been believed until now. In the territory of the Old Kerek and Old Koryak cultures, implanted jaws (about 170) numerically predominate over skulls (about 70).

The origin of these sites is possibly connected with favorable climatic conditions and the efflorescence of whale hunting in the northern sector of the Pacific Ocean during the early Middle Age warming (Dikov 1979a:219) or in the 9th–14th centuries A.D. (Arutyunov et al., 1982:140). Under these conditions, the whale was evidently seen as to the most significant object of the hunt, a symbol of the guarantee of vital well-being.

Probably as a consequence of subsequent ecological changes and ethnic shifts, these sanctuaries underwent several changes. The skulls of walruses, seals, and other sea and land mammals began to be placed by the jaws of whales; the jaws themselves were turned into esteemed ancient objects; later they were replaced by wooden posts.

Researchers established the following bases for the classification of sanctuaries (Arutyunov et al., 1982:114–122; Vdovin 1971:275, 276; Leont’ev 1983:44–53; Orekhov 1987:148–152): 1) functions (ritual or utilitarian), 2) location of placement (near a settlement or far from it, mainland or island), 3) structural elements (ring or row), 4) combinations in a complex (paired or unsystematic), 5) “structural” material (bones of sea mammals of one genus or species or their combination with others or with stones), 6) objects brought as an offering and their relationship (blood or bloodless), 7) location in ethnically defined territories, 8) ideas that they reflected (cult of the ancestors or animals, worship of the ancestor of

the settlement or master of the place), and 9) ethnically known names (common or proper). It is possible to present many more changeable criteria to extend and clarify the proposed systematization.

Based on the above classification, the most indicative structural feature of external formation of the site is the vertically set whale jaw. This type of site can be called “Mandibula Sacra” (sacred jaw). In our opinion, it attests to the commonality of the spiritual culture of the ancient sea mammal hunters who lived on both coasts of northern Kamchatka and northwestern Bering Sea in the middle of the 2nd millennium A.D.

THE NATURAL ENVIRONMENT AND ANCIENT MAN: THE PROBLEM OF SETTLEMENT OF THE ARCTIC REGION IN ANTIQUITY

V. V. Pitul'ko

The Pleistocene was characterized by cycles of glacial and interglacial epochs, which were accompanied by periodic increases in glacial cover on the continents and in the Polar Regions during the glacial periods and sharp reductions in glaciers (to modern size and smaller) in the interglacials. With changes in glacial cover, large eustatic fluctuations of the level of the global oceans occurred.

It is generally accepted that continental glaciations are interesting both as a natural phenomenon, which determined much of the change in climate over huge territories of both hemispheres and which brought on global ecological changes, and as a factor that influenced not only the evolution of the flora and fauna, but also the culture of early humans, their migration and settlement. The possibility of initial settlement of many territories, including those of the Eurasian Arctic and the North American continent, appeared in the last phase of the late Pleistocene Valdai-Sartan-late Wisconsin glaciation, which according to available data was the coldest stage in the Pleistocene.

Characterizing its specifics, A. A. Velichko (1973) called it “the third cryogenic stage of the Pleistocene,” in contrast to the preceding “glaciogenic,” having in mind the fact that in the late phase of the last glaciation the mainland and sea ice were not maximally widespread, unlike the permafrost.

Several points of late Quaternary history of the Arctic, in particular problems of the dynamics and volumes of glaciation (both for the region as a whole and for its individual areas), are sharply debatable. A substantial group of authors, beginning with I. P. Gerasimov and K. K. Markov (Gerasimov and Markov 1939; Markov and Velichko 1967; Velichko 1973, 1979), relying on facts accumulated in the course of multifaceted study of the Subarctic continental margins and the Arctic shelf, believe as evident the existence of local late Pleistocene glacial sheets, the dynamics of which did not always coincide in time and character. N. V. Kind calls this phenomenon “chronological hetero-dynamics of glacial processes” (1974:233). At the same time, an alternative hypothesis of total glaciation of the Barents Sea and other shelf zones and even the whole Arctic basin has been proposed—the so-called concept of a Pan-Arctic ice sheet, vigorously advocated in Russian literature by M. G. Grosval'd (Shyutt et al., 1974; Grosval'd et al., 1974; Grosval'd 1977, 1982, 1983; Astakhov 1978, 1982).

Thus, it is presumed that on land and on the continental shelf the glacier must have covered an expanse from Greenland to the northeastern extremity of the Taimyr and occupied the adjacent vast shelf zone, including the shelves of the Barents and Kara seas, as well as the White Sea basin, and in the deep waters of the Arctic Ocean where the water changed into floating sea ice 1 to 1.5 km thick. Besides traditional land centers, independent centers of glaciation were formed on the Barents, Kara, and possibly East Siberian shelves. The maximum of the late Pleistocene glaciation occurred 20,000–18,000 or 16,000–14,000 years ago, and the time of its existence on the shelf and adjacent lowlands stretched for another 10,000 years. In the opinion of adherents of the maximal hypothesis, glacial conditions persisted in a large part of the continental and maritime Arctic up to the middle Holocene (Grosval'd 1983; Arsla-

nov et al., 1977), and the glaciers made up “a single dynamic system of an Arctic super-shield” up to its stormy, almost catastrophic breakup in the early and middle Holocene.

Supporting this hypothesis are various glaciological and geological-geomorphological facts, which allow at least two interpretations that numerous opponents of M. G. Grosval'd—A. A. Velichko, I. D. Danilov, V. M. Makeev, G. G. Matishov, and others—have pointed out. In addition, in recent times both for the continental Arctic territories—the Pechorskaya Basin (Danilov 1978), Northwest Siberia (Danilov 1978, 1988; Evseev et al., 1982; Ukraintseva et al., 1982), and the Taimyr-Severnaya Zemlya region (Kind et al., 1978, 1981; Danilov and Parunin 1982; Makeev et al., 1979)—and for the high-latitude Arctic islands (the presumed “centers of glaciation” in the Pan-Arctic sheet system)—the islands of Novaya Zemlya and Vaigach (Chizhov et al., 1968; Krasnozhen et al., 1982), the Franz Joseph and Spitzbergen lands (Troitsky et al., 1979; Velichko et al., 1988) and especially in the Severnaya Zemlya archipelago (Makeev et al., 1979), the New Siberian Islands (Makeev et al., 1989; Verkulich et al., 1989; Makeev and Pitul'ko 1991) and Wrangel' Island (Vartanyan et al., 1993) numerous and multifaceted data were obtained that completely exclude for several territories the possibility of glaciation in the late Pleistocene and even more in the first half of the Holocene, and for others—attest to its minimal scale for the period examined.

Data, including archaeological, permit viewing the last glaciation in the Arctic as quite limited in size, with centers within the high parts of the mainland and the islands, that is, representing a “multi-domed glacial system,” as a rule, with disconnected elements, with the periods of maximal development of the latter most often being diachronic (Velichko et al., 1988).

Thus, problems of the paleogeography of the Arctic region turn out to be directly connected with the problem of antiquity of the initial settlement of these territories, and the archaeological data, in its turn, become an argument in paleogeographic reconstructions.

As a consequence of irregular and quite poor archaeological study of the Arctic region in several territories, this problem, as a question about the scope of settlement of the Arctic by early people, is quite relevant. For Scandinavia and the Kola Peninsula, the territories with the best paleogeographic and archaeological data, this question has been practically resolved and only requires clarification: the stage of their initial settlement can be reliably assigned to 11,000 years ago (Shumkin 1988). But for a large part of the Eurasian Arctic, such clarity is lacking.

Thus, for example, data on the earliest stages of settlement of the northeastern European Polar region are in significant degree fragmentary. Most relevant is the problem of antiquity, a problem closely connected with ideas of the late Quaternary history of the region, the dynamics and scale of the last glacial events, and the times and rates of deglaciation. As already mentioned, the last of these could have developed in the form of a “minimal” or “maximal” model. Correspondingly, on the one hand, if the point of view of M. G. Grosval'd and his supporters is taken, the beginning stage of settlement of the northeastern European Polar zone cannot be dated earlier than 5,000 years or, in the extreme case, 7,000–8,000 years ago. But on the other hand, A. A. Velichko's well-known hypothesis, which frames ideas about the loss of synchronization and the different extents of the late Valdai glacial events, suggests the possibility of late Valdai habitation in the region. We note that no archaeological materials that could document this stage of settlement of the northeastern European Polar zone have been presently revealed, and researchers ordinarily date the earliest sites of the region to 9,000–8,000 years ago (Vereshchagina 1990; Volokitin 1986). At the same time, in the non-Polar territory of the extreme northeast of Europe, from

the investigations of V. I. Kanivets (1976), B. I. Guslitser and P. Yu. Pavlov (1987, 1988), several sites are known that are unambiguously assigned to the Paleolithic period (including Medvezh'ya Cave—one of the northernmost Paleolithic sites, the age of which B. I. Guslitser and P. Yu. Pavlov define as Middle Valdai. The results of isotope dating are considered unreliable.

The most recent paleogeographic investigations in the region show that in the territory of the northeastern European Polar zone natural conditions existed in the late Valdai times that made human habitation plausible. It is from this position, with reference to the arguments of A. A. Velichko, A. I. Golikov, I. D. Danilov, and O. A. Skarlato, that G. V. Ivanov examines finds on Vaigach Island, near Cape Lito-Salya, and in some other places where a small number and not very diagnostic surface materials were collected, consisting predominantly of regular knife-like blades and blade sections (sometimes with trimming), flakes with retouch, a core, and isolated tools—skreblo and a chisel-like instrument (Ivanov 1991:117, 118; Fig. 1; 1993:48; Pl. 1). In G. V. Ivanov's opinion, some of the artifacts, primarily the above-mentioned skreblo and chisel-like tool, can be typologically compared with the inventory from Medvezh'ya Cave.

Not to doubt the correctness of the analogies cited by G. V. Ivanov, we note that dating the material on a typological basis is always debatable, and, even in combination with paleogeographic data enlisted as a general background, assigning the age of the Vaigach finds to an ancient time is problematic. G. V. Ivanov believes that the primary argument in favor of the antiquity of the finds is accessibility to the island, and he thus connects the earliest stage of its settlement with some point in the regression phase of the Polar basin. However, since it is a matter of a territory that is located a minimal distance from the mainland (the narrows of Yugorskii Shar strait is only 5 km wide), mutual coordination of these events (appearance on the island of hunting groups and its dry-land union with the mainland) does not seem relevant since there were also other ways to reach the island (for example, in winter over the ice).

At the same time, it is quite evident that these materials (especially that part of them in which knife-like blades with regular facets are represented) mark the earliest stage of settlement of Arctic island territories of the western sector, since blade industries do not exist in the extreme European northeast of about 5,000 years ago, and consequently finds containing a blade complex must be earlier. Before G. V. Ivanov's finds, the earliest traces of humans on Vaigach Island were thought to be sites on the northeast extremity of the island, which dated to the Late Neolithic-early Metal period, about 3,500 years ago (Pitul'ko 1988:46–51).

There were also isolated finds that permitted expecting the discovery of earlier sites (Khlobystin 1988). Other materials obtained in subsequent years on islands of the western Arctic (Ivanov 1993:47–54; Fig. 1; Pl. 2–4) are either difficult to assign chronologically (the finds on Franz Joseph Land) or have an obviously late age (the Novo Zemlya materials). At the same time it is impossible not to mention the most interesting finds, made in 1993 by P. Yu. Pavlov on the mainland shore of Yugorskii Shar strait. Here, for the first time for the northeastern European Polar zone, archaeological materials that represented a clearly marked blade industry accompanied by fauna of sea mammals were discovered lying *in situ*. The finds are preliminarily dated to the Mesolithic-Early Neolithic, that is, not younger than 5,000–6,000 years ago (P. Yu. Pavlov, personal communication).

Thus, the few early archaeological materials known in the territory do not agree well with views of an exceptionally broad and long (up to the middle Holocene) existence of large glaciers; these materials show that the time of initial settlement can now be assigned to at least 6,000 years ago. In fact, the territories were evidently inhabited by the Holocene boundary.

The archaeological investigation north of western Siberia has been exceptionally poor. The only evidence of people being there, allegedly at the latitude of the Arctic Circle, in relatively early times is the Korchagi I-B site, discovered by L. P. Khlobystin near the city of Salekhard (Khlobystin 1977:108–111) and dated to 7260 ± 80 years ago (LE-1376). However, paleo-natural data obtained in the western Siberian north in recent decades permit assuming the presence there also of earlier sites. Thus, I. D. Danilov (1978, 1988), characterizing late Quaternary deposits of the region, points to peat-silt-sand layers penetrated by vertical ice veins. The age of the peat from these deposits is 24,000–25,000 years. However, with this no traces were revealed of deformation of the ice veins (at least in their upper part) that could be connected with the activities of glaciation of the Kara sheet, as constructed by the adherents of the maximal model. Farther, on the western shore of the Yamal Peninsula, peat beds were discovered containing macro-remains of a birch tree, dated by C^{14} to about 16,500 years ago (Zubakov 1972). Peats beds with an age of 15,000–16,000 years are rather numerous, and consequently the peninsula, at present practically completely a tundra zone, was covered in the period being examined not with a glacier but with forest-tundra vegetation (Danilov 1988:78).

It is characteristic that the peat bed on the shore of Baidaratskaya Bay, dated to approximately 15,500 years ago, contains normal forest-tundra spore-pollen complexes (Badinova et al., 1976:154–167). On the Tazov and Gydansk peninsulas, data were obtained that also point to the existence there during the last glaciation of periglacial tundra (Avdalovich and Bidzhiev 1984). What is more, any possibility of glacial events at the Pleistocene/Holocene boundary is excluded—the well-known Yuribey mammoth is dated to 9,600–10,000 years ago (Evseev et al., 1982:19; Arslanov et al., 1982:35, 36). Contemporary to it, in the opinion of researchers, were tundra landscapes with areas of larch sparse-forest, presently encountered 200–300 km to the south (Ukrainitseva 1982:29–36). Thus, northwestern Siberia by 15,000–16,000 years ago was a normal environment for occupation by late Paleolithic man; with the periglacial tundra, populated by mammoth fauna, at the boundary of the Holocene, the natural conditions were more favorable than in modern times.

The archaeology of the Russian Arctic, the Taimyr Peninsula, has been better studied. However, the investigations of Khlobystin (1982) conducted there in 1966–1981 included predominantly its southern regions. The overwhelming majority of sites were discovered in the basins of the Pyasina, Dudypa, Kheta, and Khatanga rivers. Most of their number belongs to comparatively late stages of settlement of the territory. Speaking of a reliably documented early stage of the settlement of the peninsula, Khlobystin had particularly in mind materials from the Pyasina sites of the Mesolithic period (Pyasina I, III, IV, and V; Lantoshka II; Malaya Korennaya II and III; and Kapkannaya II) and the Tagenar VI site—“the only precisely dated site,” having an age of 6020 ± 100 years ago (LE-884); he determines the age of the Taimyr Mesolithic to be about 7,000 years ago (Khlobystin 1982:8). At the same time it is quite probable that the territory of the peninsula was occupied by early people long before this. A find on the surface of the 2nd terrace of the Pyasina River, near the mouth of the Polovinka River, of a chopper-like artifact made from a piece of greenstone serves as the basis for this supposition. Such artifacts, Khlobystin noted, are characteristic of the Afontova and Kokoreva cultures of the Yenisei Paleolithic. Assuming that the Tagenar and other Mesolithic materials are in no way the oldest on the peninsula, Khlobystin deduced the possibility of settlement, at least part of the peninsula, to be about 12,000 years ago (Ibid.:3, 4). Data on the late Quaternary history of the Taimyr-Severozemel'skaya region, accumulated in recent years, refute ideas of the extensive character of the last local glaciation and support the validity of such assumptions (Badinova et al., 1976; Danilov and Parunin 1982; Makeev et al., 1979; Makeev 1983).

In this connection, finds made in 1993 during the fieldwork of the program of the Russian-German project in the central Taimyr must be mentioned. The most interesting results were obtained during investigation of the southeastern shore of Lake Engel'gardta, where in Cutbank I of the terrace, on a narrow area (3–4 m), a substantial number of fragmentary late Pleistocene (?) faunal remains were collected. A basis for reliable species identification of the last was lacking. However, it was clear that here were represented various species of mammals clearly differing in size, including the undisputed presence of mammoth, which have two spinous processes of cervical vertebrae (identified by A. K. Kasparov, IIMK RAN). The species diversity, the specific character of the fragmentation of the bone remains, and the exclusive presence of fragmented bones permit supposing an anthropogenic origin for the complex.

Also, identification of the layer from which the material originated was successful: four more fragments of various bones were found, with three of them lying close together. The radiocarbon dates obtained— $10,020 \pm 80$ (LU-3152) and 9680 ± 130 (LU-3153)—only increase the probability of an anthropogenic origin for the complex; thereby dating its appearance to the early Holocene climatic optimum, which in the Asian Arctic belongs to the interval 9,000–10,000 years ago, and which is repeatedly confirmed by investigations both in the high-latitude islands (Severnaya Zemlya and New Siberian) and in continental Arctic territories (Makeev et al., 1979, 1989; Tomskaya 1989; Boyarskaya et al., 1989; Kaplina and Lozhkin 1982).

However, if in the European Polar zone and, in substantial degree, in northwestern Siberia and the Taimyr Peninsula, processes of the initial opening up and settlement by early people were regulated for the most part by the dynamics of glaciation, then in the territory of the eastern Siberian and in part the American sector of the Arctic a fundamentally different situation occurred. It is generally known that, as a consequence of accretion of the northern European and Laurentide glacial sheets, a drying of a substantial part of the modern shelf zone occurred, within the scope of which a vast coastal plain existed, which included the modern New Siberian Islands and Wrangel' Island. This plain was subsequently obliterated by the Holocene transgression of the Polar basin. There are various estimates of its size, but at a minimum there was at least 90–100 m.

Thus, a gigantic ecological niche was formed with quite severe natural conditions, though entirely favorable to habitation and with practically inexhaustible food resources. This territory was undoubtedly settled or at least regularly visited in its eastern part where it adjoins the Bering Isthmus. However, intensive archaeological investigations (both in Alaska and in Chukotka) have not brought to light reliable material dated earlier than 11,000 years ago (Powers et al., 1990; Pitul'ko 1992; Dikov 1993). Perhaps any stream of migration, as Alexander Easton (1992:28–36) for example suggests, was confined to the southern edge of the Bering Land Bridge.

Nevertheless, the Siberian Arctic was indisputably already settled in the late Pleistocene. Data documenting this earliest known stage in the opening up of the Arctic territories by people are meanwhile quite fragmented and confined to a few locations investigated in the Primorskaya lowland by Yu. A. Mochanov and his associates (Mochanov 1977; Argunov 1990; Shcherbakova 1980). However, in most cases these materials are not highly diagnostic or are mixed with younger finds; sometimes they are represented by only faunal remains of late Pleistocene age, the appearance of which, similarly to Engel'gardta, could indicate an anthropogenic origin. Such locations include Adycha (Mochanov 1972; Shcherbakova 1980:65), Bochanut (Mochanov 1977:93), Kigilyakh (Mochanov and Fedoseeva 1980, and Mochanov, personal communication). In fact, the only truly informative site of this time is the well-known Berelekh

site, which has frequently been radiocarbon dated to about 12,000–13,000 years ago (Vereshchagin and Mochanov 1972; Mochanov 1977). Researchers assign the site to the concluding stage of the Dyuktai culture and record settlement during the period at least to 71° north latitude. In connection with the above, extremely interesting are finds brought up from a depth of 32–33 m in the core of Borehole 19, placed by Kymyneikei Mountain in the southeastern Vankaremskaya coastal lowland. Three successively deposited Sartan moraines, separated by inter-morainal deposits, were revealed, with the artifacts encountered in a redeposited state among the cobble-pebble sandy loam of the third from the top, that is, the oldest of the moraines (Laukhin et al., 1989). The unexpected conditions of deposition and typological similarity of one of the artifacts (a wedge-shaped core) with items from the Ikhine II and Ust'-Mil' sites permitted the authors to suggest a very early age for the materials—about 30,000 years ago, based on ideas about the chronology of the Aldan Paleolithic, according to Yu. A. Mochanov (1977). At the same time, Z. A. Abramova's (1979) well-known point of view is that these materials are much younger. The Sartan age of the aforementioned moraines can hardly be challenged. However, from my point of view this still does not serve as a basis for a maximally broad chronological understanding of the Kymyneikei complex; the archaeological materials acquired from it can be put into the category of strange occurrences.

It is evident that in the early Holocene, the territory of ancient man in the Arctic, and not just in Asia, substantially expanded. Data characterizing this period is also in substantial degree fragmentary. However, judging by data from recent investigations, sites in the region from the Taimyr to Chukotka that have a Mesolithic appearance and date to the first half of the Holocene now number 30–40. Evidently, the mobility of humans naturally grows during this period (Krupnik 1989) as hunting groups were forced to become reoriented to procuring new species; favorable conditions of early Holocene climatic optimum and displacement to the north of the boundaries of the landscape zones also contributed to the movement of man to the north and settlement of new, including high-latitude, territories (Makeev and Pitul'ko 1991). It is to this period that the Mesolithic site on Zhokhov Island (De Long Archipelago) is assigned; this site, located at 76° north latitude, was investigated in 1989–1990 (Pitul'ko and Makeyev 1991; Pitul'ko 1993). The site, repeatedly dated by radiocarbon, has an age of about 8,000 years and is indisputably the earliest of the presently known traces of migration into the high-latitude Arctic.

At the same time, judging from fragmentary data reported by Matvei Gedenshtrom [Mattias Mattiasson Hedenström/von Hedenström] and Yakov Sannikov (Gedenshtrom 1822), sites similar to the Zhokhov site must have been common on the New Siberian Islands, which were relicts of the late Pleistocene Arctic plain during the first half of the Holocene. Though the detailed characteristics of the finds do not enter into the task of the present article, it must be noted that early Holocene materials of the eastern Siberian Polar region are quite uniform, and thus it is no accident that researchers view them as a single superculture embracing the territory from the Taimyr to Chukotka (Mochanov 1977; Argunov 1990; and others). It immediately became clear that the Zhokhov complex was different from the circle of mentioned Sumnagin antiquities based on several characteristics. The greatest differences appeared in the technique of micro-prismatic flaking. No analogies to it within all the Asian Arctic have been successfully revealed.

It is curious that, judging from the most recent materials discovered by N. N. Dikov at several sites of eastern Chukotka—the sites of Puturak, Itkhat IB, Chel'kun IV, and Ul'khum (lower)—there are cores similar to Zhokhov (Dikov 1993: Pls. 46, 52, 60, 107). The age of the finds corresponds to the age of the Zhokhov site—based on a specimen of wood charcoal from the Chel'kun IV site, as N. N. Dikov (*Ibid.*:149) reports, which has a date of 8150 ± 150 (MAG-719). However, what precisely lies behind the

noted analogies—the spread of migrations of an early Holocene population of the eastern Siberian Arctic, its cultural unity, convergent events in the field of development of the technique of micro-prismatic flaking, or of all these events together—is not entirely clear.

The settlement of the Arctic territories by ancient man evidently occurred at an exceptionally quick tempo, though population density remained low. In each stage, the maximum available territory was most likely settled, as can be seen in the example of the eastern Arctic where Mesolithic hunters advanced to 76° north latitude 8,000 years ago. Other clear examples, from my point of view, are the Paleoeskimo sites of the Canadian Arctic and Greenland—pre-Dorset, Independence, and Sarkak—appearing there immediately after deglaciation of the coastal and island territories approximately 4,000–4,500 years ago. Finds by E. Knuth (1962) in Peary Land, at 82° north latitude, show that the settlement of the accessible territories in this period was also extensive.

FORMS OF CULTURAL AND ECONOMIC ADAPTATION OF THE NATIVES OF SAKHALIN IN THE NEOLITHIC AND MIDDLE AGES

O. A. Shubina

From the beginning of human society, humans have had to define and redefine their relationship to the geographic environment. In antiquity, when the dependence of man on nature bore a more inflexible character, people selected an economic activity that would secure for them the most optimal conditions for survival and development. The type of economy corresponded to the ecological conditions and was closely connected with features of the climate, landscape, and animal and plant environment in the region of occupation of the human community. The number of the population depended on biological balance, which was different for various socioeconomic levels and natural conditions.

As a part of the natural ecological system, people had to maintain this balance using various methods of adaptation or by improving their productive forces, which sometimes meant changing their primary type of economic activity. In the regions of Siberia and the Far East during the Neolithic-Bronze Age, several specific cultural-economic areas arose that were associated with different landscape-climatic zones. The natural circumstances of Sakhalin were a region of traditionally appropriating forms of economy over the extent of a long period of the Stone Age.

The results of archaeological and ethnographic investigations have revealed different forms of cultural and economic adaptation by the inhabitants of Sakhalin depending on the ecological niche they occupied, the level of development of productive forces, and of mutual contacts with peoples of adjoining territories. A concrete reflection of adaptation processes can be seen in the topography and number of settlements; structural specifics of dwellings; technology of the stone industry; pottery production, which shows the material and spiritual culture of the peoples; and the orientation of their economic-cultural connections.

At present, on Sakhalin more than 1,000 archaeological sites have been revealed in broad chronological range—from the Upper Paleolithic to the ethnographic present, including long-term settlements with a thick cultural layer and traces of dwellings, temporary sites, and locations of isolated finds. The Paleolithic period of the history of Sakhalin has meanwhile been inadequately studied; most materials are represented by finds in surface collections and in sites with a damaged or mixed cultural layer. The modern level of archaeological study of Sakhalin permits rather reliably judging the adaptation processes of the early population of the island only beginning with the Neolithic period.

Due to extended broad-scale investigations at Neolithic sites, Sakhalin archaeology has gained a firm, multi-component, and quite representative, in numerical regard, source base that permits reaching a level of apportionment and identification of specific archaeological cultures. In northern Sakhalin on the southern part of the island, the Imchinskaya [Imchin] and Severosakhalinskaya [Northern Sakhalin] sites were found. The Neolithic Yuzhnosakhalinskaya [Southern Sakhalin] and Anivskaya [Aniva] cultures of these sites possess a set of specific stable features appearing in the topography of the settlements, form and construction of dwellings, and in the technology and typology of the stone inventory and ceramics.

On Sakhalin the Neolithic period extended up to 0 A.D., and even to the 1st–middle of the 2nd millennium A.D. (the time of existence on southern Sakhalin of the so-called Okhotsk culture), which many researchers assign to the “remnant” Neolithic, though chronologically this period corresponds to the Iron Age and correlates with the period of the Middle Ages. By comparing archaeological data with materials of ethnography, one can identify types of early societies and their connections among themselves and with nature. Topography and the character of the settlements, construction technique, form, arrangement, and sizes of dwellings were basically dictated by ecological factors, the economic base of society, and ethnic traditions.

A consistent pattern is noted in the distribution of Stone Age archaeological sites in the territory of Sakhalin depending on their cultural-chronological association. In the northern part of the island, the majority of Neolithic sites are associated with the river system. Settlements were located on low and medium-high, dry river terraces, chiefly on the lower and middle course of the rivers, as well as on the shores of sea lagoons and, rarely, on the open seacoast. In contrast, sites of the Okhotsk culture of southern Sakhalin were concentrated on the seacoast near sources of potable water.

An analogous pattern in the geographic distribution of settlements was noted by ethnographers of the 19th century in relation to the native peoples of Sakhalin. The inhabitants of the northern part of the island—the Nivkhi—built seasonal camps: in summer they lived on the lower parts of rivers or on the banks of sea bays and lagoons where they occupied themselves with catching fish, while in winter they lived in permanent warm dwellings several kilometers up river where they hunted taiga animals. The Ainu of southern Sakhalin, who were traditionally occupied with sea mammal hunting, fishing, and gathering in the littoral zone, as well as hunting on land as an auxiliary occupation, tended toward seacoasts where their permanent, long-term settlements were located.

Both these peoples led a settled form of life determined by their type of economic activities. In contrast, the nomadic Orochi (Ul'ta) tribes, who settled the middle and northern Sakhalin, migrated over the tundra plains of the interior regions of the island after reindeer herds and went out to the seacoast in summer. Their economic cycle dictated the existence of temporary seasonal sites with light portable dwellings. Similarly, the selection of topographical features for settlement and the construction of dwellings by the Neolithic occupants of the island were most likely connected with their way of life and economic orientation.

The type of dwelling that had to reliably protect people from the cold, wind, and snow depended largely on the climate of Sakhalin. The island, located by the eastern shore of the Asian mainland, is affected by the monsoon of temperate latitudes, which typically produces cold snowy winters and cool rainy summers. In the course of the year, an average of about 100 cyclones and typhoons, bringing an increase in wind and cloudy weather with precipitation, passes over the island. In the north of Sakhalin, the temperature on some days in winter can be -40° to -50° C. Soils freeze to a relatively shallow depth: 140–160 cm in the north and the middle part of the island. Winter is characterized by a stable snow cover with an average thickness of 50 to 70 cm. The severity of winter is increased by frequent blizzards that can continue for several days.

Under these conditions, the most natural and favorable dwelling was a semisubterranean type with the floor of a pit excavated into the ground and the walls and roof formed of earth, logs, and sod. Even in the most severe and snowy winter, such a dwelling, heated from within by one or several hearths, was better able to protect the people than a surface structure.

The economic potential of the society in combination with the natural environment, which determines the location of the dwelling and the availability of the basic structural material, dictates the construction technique.

The landscape of Sakhalin over the extent of the last 4,000 to 6,000 years practically did not change, in spite of fluctuations of the climate connected with the Holocene Climatic Optimum and the cooling at the transition from the Subboreal to Subatlantic period. The vegetation of northern Sakhalin is characterized by a predominance of Dahurian larch, the south of the island—fir and deciduous species; in the floodplain forests grow alder, willow, white birch, and other trees, many of them being good structural material. In constructing dwellings excavated into the ground, features of the soil were also important: predominantly the podzol, of soft and friable consistency, formed of sand and sandy loam.

This is clearly illustrated by materials of the Imchin XII site, completely investigated in the course of four years of archaeological excavations, where a single excavation of a 662 m² area contained eight pithouses. The site occupies the surface and partially the slopes of a small knoll measuring at the foot 55 x 35 m and reaching up to 5 m high. The irregular, oval knoll rises in the middle of a swampy marsh and is covered with cedar brush, larch, and dwarf birch. Nearby flow the fish-rich Tym' and Imchin rivers and a small freshwater stream. On the modern surface, traces of ancient dwellings are easily noted in the form of round depressions measuring from 6.5 to 10 m in diameter and an average depth of 0.5 to 1.2 m. They are located in a compact group, almost touching shoulder to shoulder. The site is single component; the thickness of the cultural layer is from 0.1 to 0.3 m in the space between the dwellings, to 0.5 to 0.8 m in the center of the dwelling depressions, and to 1.3 to 1.7 m under the steep slopes of the shoulders.

The general and characteristic features of the dwellings of the Imchin XII site, as well as the Neolithic dwellings in several other archaeological sites of Sakhalin, are the following:

1. The presence of a basin excavated on average 0.5–0.7 m into the ground.
2. The form of the basin is round or oval (in sites of the Imchin culture) and subrectangular or square with smoothed corners (in sites of the Severosakhalinskaya and Yuzhnosakhalinskaya cultures).
3. The sizes of the dwellings vary from 5 to 10 m in diameter, the floor area from 20 to 50 m² and in rare cases up to 70–75 m².
4. In dwellings of the Neolithic Imchin culture, the system of holes from posts and interior features suggests the presence of a round frame holding together the inner roof bindings. A certain regularity is observed in the position of the pits: they were dug along the perimeter of the basin and form as it were two circles for the inner bindings of the dwellings. One binding passes directly along the lower edge of the shoulders, sometimes even penetrating into them, while another binding is separated from the walls by 0.8 to 1.5 m. In subsquare dwellings of the Severosakhalinskaya and Yuzhnosakhalinskaya cultures, two rows of inner bindings that supported the roof of the dwelling were also recorded: the pits from the corner posts and along the walls of the basin, and in the central part around the hearth. The roof of the dwelling was probably conical and consisted of thin logs and poles that were supported at the upper ends on posts of the inner circle of binding, while the lower ends rested directly on the shoulders of the basin beyond the edge of the house depression. The dwelling was covered on top with earth and sod.
5. The dwellings contain postholes of complex form. They are double and “superimposed” on

one another, which suggest repeated reconstruction, or, more precisely, renewal of the support posts of the roof. This attests to the long-term character of the sites and the settled life of their inhabitants.

6. Most Neolithic dwellings have no signs of an entrance on the ground; they do not have an opening in the wall of the basin or any kind of corridor. The entrance into the pithouse was probably the light/smoke opening in the roof. On the floor of all dwellings of the Imchin XII site, in the vicinity of the hearth, were noted small round areas of strongly compacted sandy loam elevated 10 to 20 cm above the level of the floor. It can be supposed that they served as a foundation, a kind of “starting point,” from which the ascent to the exit along a “stairs” was begun; perhaps, they jumped down onto an inclined post with notches. After many years of use, this area of the floor was compacted to a stony hardness.

Thus, the habitable structures of the Neolithic occupants of Sakhalin reflected their successful adaptation to the natural-climatic conditions at the existing level of production forces and technical and economic possibilities of the society. Like the spawning salmon runs, the rich animal and plant world of the Sakhalin taiga, a distinctive biome characteristic of regions of the Far East, determined the economic base of the ancient population of Sakhalin.

The topography of sites, located as a rule on dry forested terraces along the banks of rivers, frequently at some distance from the sea but predominantly in the vicinity of lagoons where at certain times the seasonal fish run began, attest to the occupations of hunting and fishing. Throughout human history, fishing was one of the most important economic pursuits of the Far East.

Those ancient residents of northern Sakhalin who lived in the same natural-geographic conditions as its natives—the Nivkhi—most likely had a similar economic way of life. The basis of their occupations were hunting, fishing, and in some degree, gathering, which contributed ultimately to their sedentary nature and the existence of large long-term settlements, geographically connected to traditional places of hunting and fishing.

The sedentism of the population and long-term settlements can be seen in the thick (on average 0.2–0.5 m or more) and uniform (without evidence of seasons) cultural layer, which is saturated with artifacts. Similarly, the remains of dwellings in the form of shallow basins, the number of which fluctuates from 3 to 100–150 in individual settlements demonstrates sedentism.

The layout of a Neolithic settlement, in which dwellings closely adjoin one another without a definite system, is evidence of close social connections and unity of the clan community caused both by origin and by material and economic factors in the life of the group during the period of primitive social structure.

Pithouses were widespread among most peoples of the Far East, Northeast Asia, and North America, who were placed by nature in similar severe conditions of life and located in the same level of socioeconomic development. This type of dwelling was not only territorially widespread but also preserved over the extent of millennia (though with certain historically induced modifications) and was recorded by ethnographers even in the 19th century among several peoples of Northeast Asia and the Far East (Jochelson 1908; Shrenk 1899, 1903; Shternberg 1933; Kreinovich 1973; Lebedintsev 1980; Brodyanskii 1975; Taksami 1961; Shubina 1986).

In the 1980s in northern Sakhalin, the remains of living structures of an entirely different appearance were discovered (Kolosovskii and Gorbunov 1980; Shubina and Kolosovskii 1988). These

structures were of the surface type; they were traced on the modern surface in the form of mound-shaped and ringed eminences and were accompanied, as a rule, by small hole depressions along the perimeter. Such dwellings had only been discovered in the inner regions of the northern Sakhalin plains and on the terraces of rivers falling into Lake Nevskoe (Poronaiskii Region, Terpeniya Bay).

Archaeological excavations of three of these dwellings at the Bol'shaya Rechka 7 site (Shubina 1991) revealed that these were light seasonal structures of the *chum* [skin or bark tent], *shalash* [shelter of branches], or canopy type, occupied only during the warm summer period. There were no traces of insulated and fortified dwellings, a relatively thin cultural layer, a sparse archaeological inventory, represented chiefly by fragments of stone tools and ceramics, and blurred hearths. It can be supposed that having arrived at the place of a future camp its ancient inhabitants fixed up the elevated area through excavating earth along the perimeter of the chosen place. As a result, pits formed and protected the settlers from the accumulation of rainwater during strong downpours. On the acquired eminence, they set one or two, tentatively speaking, "*chumy*" or simply settled around campfires. The pits on the periphery of the living areas could have been used as hearths for heating, which is corroborated by the presence of fired earth with charcoal in the bottom of the pits.

In such sites probably lived fishermen and hunters, who stayed for a short term of seasonal fishing and hunting without their families. Upon returning to their "winter quarters," they gathered with them all the things they had brought from "home," except what was broken and used. The abandoned dwelling areas and hearths became blurred with time by rain and drifting sand. Eventually, the eminences surrounded by pits emerged.

This explanation is definitely hypothetical. The topography and geographic distribution of the sites with such type of dwellings suggest their possible association with nomadic tribes (for example, the ancestors of the Orochi-Ul'ta), who in the 17th–18th centuries moved after the herds of semi-wild and domesticated reindeer across the tundra of northern Sakhalin in the region of Lake Nevskoe and Terpeniya Bay. In any case, a clear example of a distinctive form of the Neolithic population's adaptation to the seasonal conditions of life is present.

The natural-climatic conditions of northern Sakhalin in the 3rd–2nd millennia B.C.—during the period of development of the Imchin culture—determined the type of economy and way of life of the culture. Judging by the results of typological and traceological analyses of the stone inventory collected at the Imchin XII site, the ecological circumstance was favorable for the formation of the appropriate type of economy based on a complex utilization of natural resources. As a result of the functional-traceological study of the tools and debitage from production, two basic directions of work activity were revealed: the procurement of food and the preparation of products of the hunt; and the processes of production and domestic work (Kononenko and Shubina 1991).

It is characteristic that the bearers of the Neolithic Imchin culture used the standard supply of local raw material for making stone tools: high-quality chert, predominantly of a brownish-red color and, more rarely, gray; chalcedony; siliceous slate; and silicified sandstone. In sites of the Neolithic Severo-sakhalinskaya culture light-gray or white siliceous slate was largely widespread, but the functional kit of the stone inventory on the whole was identical. Modification of the raw material and preparation of tools were carried out in the territory of the site, frequently directly within the dwellings. In addition, more than 8% of the flakes and spalls were used later as tools without special or additional modification of the surface.

More than 26% of all tools in the collection are connected with hunting, including points of projectile tools (arrows, darts, spears) and knives. A comparatively small portion of the projectile tools of stone was supplemented with artifacts of bone not preserved in the layer. In addition to the bow and arrow, dart, and spear, other tools could have been used for hunting. As recorded by ethnographic sources among the peoples of Northeast Asia and Sakhalin, there were distinctive adaptations of wood and plant fibers, including nooses, traps, snares, loops, crossbows, lassos, clubs, and the like. The objects of the hunt could have been reindeer, musk deer, fox, hare, sable, and small fur-bearing animals. Traditionally, the main object of the hunt of Far Eastern peoples was the brown bear. In one of the dwellings of the Imchin XII site was a small (2.5 x 3 cm) figurine on a flake of brownish-red chert that is vividly reminiscent of the skin of a bear stretched for drying. It was most likely connected with a hunting or other cult ritual of the ancient peoples. Reverence of the bear as one of the chief “masters” of nature was noted by researchers studying the peoples of Siberia and the Far East, including the Nivkhi of Sakhalin Island (Shrenk 1899; Shternberg 1936:60). Perhaps, this custom originates in the Neolithic period.

The numerous categories of knives for skinning and butchering the carcasses of animals demonstrates the great significance of the hunt in the life of the inhabitants of northern Sakhalin. In the collection of the Imchin XII site, knives amount to almost 22%. Through experimental traceological research of the collection, it has been determined that ripping, skinning, and cutting up the meat was carried out with the aid not only of typologically stable, bifacially worked artifacts, but also of flakes and spalls with a sharp cutting edge. It is probable that these were tools of one-time use. In addition, there are cutting instruments of the compound type with a wooden or bone mount and an inset stone cutting blade. Such insets were collected at several sites in northern Sakhalin.

The topography of North Sakhalin sites, including rivers with rich fish resources, presuppose the occupation of fishing. And though direct evidence of this activity (in the form of hooks, harpoons, and sinkers) have not been found, there is a series of knives, the morphological features of which provide a basis to connect them with butchering and eviscerating fish. The ends of the knives are sharp and bent up. A similar form of working edge is characteristic for artifacts of the Sakhalin Nivkhi (Orlova 1964).

The ethnographic data attest that the residents of rich fish regions (Sakhalin, Priamur’e, and Primor’e) widely used tools of wood and plant fibers for catching fish, such as traps, wicker diversion dams, nets, and so on; unfortunately, these artifacts could not be preserved in the layer (Taksami 1975:16–24). But during this period special tools were not needed for such a natural occurrence specific to the Far Eastern regions as a massive spawning run of salmon (chum, humpback); fish were killed with a club, speared, and caught with a dip net, a spread net, or simply with the hands.

The great significance of fishing in the life of the Neolithic inhabitants of the Imchin XII site is supported by the find of a sculpture of a fish (probably a species of salmon) made of red chert. The varied kit of tools speaks of the large role in economic-production activities of such kinds of raw material as wood, bone, and antler. Seventy-four percent of all stone artifacts in the Imchin XII site were connected with domestic pursuits and were used for modifying antler, bone, and wood; working hides of animals and clothing; production of tools for work; and everyday life. A stable kit of tools clearly reflects the natural-economic connections of the early population of the island. It also, with the prevalence of the occupations of taiga hunting and fishing, attests to the complex use of natural resources.

Similarly, the ceramic production of any society, both that being reconstructed based on archaeological materials and that being studied by ethnography, is very closely connected with the surrounding

environment and some of its components (Zhushchikhovskaya 1990:8, 9). The Neolithic cultures of Sakhalin also clearly reveal this dependence. The raw material, one of the most important ecological factors that influence pottery production, is reflected in the composition of the modeling mass of the ceramics. It has been established through studies of the raw material base of ceramic production in the Far East (Zhushchikhovskaya 1988a; Zhushchikhovskaya and Zalizchak 1990) that local resources were used in pottery production of Sakhalin. Deposits of clays were available in different regions, including river valleys and the seacoast. For some settlements the local raw material sources were successfully determined. No cases of non-local raw material for production of ceramics were noted (Zhushchikhovskaya 1990:11).

The thinning admixture [temper], the second compositional component of the modeling mass, is an important indicator not only of the territorial but also of the cultural-chronological association of the ceramics. In the Neolithic period, this admixture was directly dependent on the natural surroundings and was dictated by regional geological specifics. The geological-raw material factor influenced the forming of traditions and technology of pottery making, which can be viewed as an ethnocultural indicator. It has been established that primitive potters used sources of mineral tempers that were in the immediate vicinity of the settlement. For residents of Primor'e, river sand, stream pebbles, and grus from deteriorating bedrock served as these sources, and the composition of the thinning inclusions in Primor'e ceramics corresponds, as a rule, to intrusive kinds of stone. On Sakhalin gravel-sand stream deposits were used; the thinning additives in Sakhalin ceramics are from sedimentary rocks (Zhushchikhovskaya 1990:12).

The mineral type of the thinner was not universal for all cultures of Sakhalin; what is more, the technology of its use appears in southern Sakhalin comparatively late—in materials of Neolithic sites of the 2nd millennium B.C., becoming developed in Okhotsk times. In most cultures of the Sakhalin Neolithic of the 5th–2nd millennia B.C., the composition of the modeling mass is fundamentally different for it is not of mineral but of organic composition. The bearers of the Imchin culture of northern Sakhalin actively used freshwater and brackish-water mollusk shells as thinner. Characteristic for ceramics of the Neolithic Yuzhnosakhalinskaya culture is plant thinner in the form of finely chopped grass. Ceramics are also noted without any artificial additives (the Neolithic Severosakhalinskaya culture).

These facts, in I. S. Zhushchikhovskaya's opinion, can be explained by the low technical-ty-pological level of production: the use of organic thinner is more reasonable and easy in the process of forming and firing ceramics if there is insufficient experience and technical possibilities (a biogenic recipe is considered an archaic method of composing the modeling mass). The use of mineral thinner from gravel-sand deposits of Sakhalin requires great practical experience in treatment of the clays during the process of modeling, drying, and firing vessels (Zhushchikhovskaya 1990:17). However, the ecological factor also should not be ignored: people used those natural materials that were most accessible and familiar.

Analyzing the zone of distribution of ceramics containing an admixture of mollusk shells in the territory of the Far East, researchers have established that, in northern Sakhalin, the lower Amur, and in northern Primor'e, sites with ceramics of this type are found on the banks of rivers with an abundance of various kinds of freshwater mollusks. The inhabitants of settlements of the Neolithic Yuzhnosakhalinskaya culture added to the modeling mass such plants as sedge and horsetail, which, based on binocular research, are most widespread in the south of the island (Zhushchikhovskaya 1991).

Thus, the technological features of early pottery production were closely connected with the ecology of the habitation places of the bearers of the cultural traditions. The absence of high-quality

mineral thinning raw material motivated the inhabitants to experiment with various organic materials, and a developed recipe of the modeling mass in some period became not only a chronologically but also a culturally significant feature.

In the middle of the 1st millennium B.C. in southern Sakhalin, a new ethnocultural community emerged that was given the name Okhotsk culture. It developed, changing over the course of two millennia, and went through several stages that at present are divided into independent cultures and local variants of the Okhotsk culture. It spread over a vast territory of southern Sakhalin (to the south of Terpeniya Bay) and is noted in the southern Kuril Islands and northern Hokkaido. Questions of its origin, ethnic association, connections with other cultures of the Pacific Ocean region, and so on remain much debated. In the archaeological materials of the early—Susui—stage of the Okhotsk culture (Kozyreva 1967; Shubin 1977; Vasil'evskii and Golubev 1976) or the Susui culture (Vasilevskii 1990), indisputable influences of the Neolithic cultures both of northern and southern Sakhalin can be traced that probably served as the basic components in its formation. In A. A. Vasilevskii's opinion, climatic changes in the early Subboreal about 4,600–4,300 years ago (in the 3rd millennium B.C.) brought on migrations of the population from Priamur'e and northern Sakhalin to the south of the island, where in the end of the 3rd–1st millennia B.C. contact occurs between two regions of cultural exchange—Amur-Sakhalin and Sakhalin-Hokkaido—and a new contact region is formed in the zone of transfer from the mainland to the island. From this conglomerate of cultural traditions, a new cultural community—the Susui (or Early Okhotsk)—is formed (Vasilevskii 1993).

In the works of several researchers (Kosarev 1986; Erlikh 1986; Dolukhanov 1979; Chernetsov and Moshinskaya 1974; Simchenko 1976; Kosarev 1973, 1976), questions arise regarding the influence of the ecological factor on the migration events. M. F. Kosarev noted that a worsening of natural conditions and a reduction in additional product brought on ecological crises, which led to a more primitive lifestyle with a new form of economy or migration (Kosarev 1984:178, 179). This trajectory possibly occurred also on Sakhalin after the climatic optimum of the Holocene, with its cooling and impoverishment of natural resources, resulted in a partial outflow of the population from the northern regions. With this background of worsening natural conditions of the Subboreal-Subatlantic, the Susui culture is formed. In A. A. Vasilevskii's opinion, this culture was characterized by highly eclectic and centripetal tendencies and a highly adaptive potential that allowed it to spread in the south to northeastern Hokkaido by the first centuries A.D. (Vasilevskii (1993:64, 65).

The early residents of Sakhalin always gravitated toward the coastal zones where there were more possibilities for a stable existence and complex use of natural resources. Study of the topography and archaeological complexes of the Susui and Okhotsk sites attests to their orientation in significant degree toward a coastal economy and close interconnection with a maritime ecosystem. Intensive development of fishing and sea hunting led, on the one hand, to the creation of large villages and a stable settled form of life and, on the other, to working out specialized forms of hunting and fishing and tool complexes.

On the coasts of southern Sakhalin, chiefly in the lake regions of the Aniva Bay type of lagoon, numerous large settlements with semisubterranean dwellings are observed, totaling several dozens and sometimes even hundreds of depressions with a thick cultural layer saturated with an archaeological inventory and faunal remains. In the kitchen middens of settlements, the following bones of sea mammals predominate: seals, fur seals, sea lions, and whales. The bones of fish, birds, mollusk shells, carapaces

of crabs and sea urchins are also encountered. Characteristic signs for the Okhotsk sites are shell heaps (Kozyreva 1967:69–87; Alekseeva and Gorbunov 1993; Vasil'evskii 1986:18). All these facts attest to the predominance in the inhabitants' diet of items of maritime hunting, fishing, and gathering in the littoral zone and to the corresponding direction of the economy.

Reorientation of the economy entailed a change in the tools of work and of hunting-fishing. The primary indicator here is the development of a specialized bone industry with distinctive bone tools used for catching fish (simple and compound hooks, points, and sinkers) and sea mammals (harpoon heads and leisters) (Kozyreva 1967:76–79). The diversity of tools is due to the variety of objects for craft (Prokof'ev 1986). Individual changes are also noted in the stone inventory. This is corroborated by the appearance of large stemmed stone points with serrating retouch interpreted as harpoon heads, sinkers, and “anchors.” Group fishing with the use of boats and nets brought about these changes.

Finding himself in close union with nature, man strove at all times to reflect in illustration or sculpture the objects closest to him or those being mythologized by him. In collections from several hunting sites of Sakhalin, the Kuril Islands, and Hokkaido, there are productions of representative art that show the special relationship of people to such animals as whales, orcas, and seals: these are scenes of hunting whales (Golubev and Prokof'ev 1976:117; Gorbunov 1985:29, 34) and bone, stone, and ceramic figurines of seals (Gorbunov 1985:31, 35; Shubina 1992:88, 160) with sometimes realistic, more often stylized, but nevertheless recognizable images of pinnipeds, as well as waterfowl—in the form of stamped imprints on ceramics (Shubin 1979). Among the variety of stamps encountered in the decoration of ceramic vessels are zoomorphic images, including a fox and tracks of a bear.

The tool kit of Okhotsk sites includes not only an inventory of sea mammal hunting, but also numerous instruments and tools connected with hunting on land, the modification of products of the hunt, and domestic occupations. In spite of the huge significance of maritime hunting in the life of the Natives of southern Sakhalin in the 1st–2nd millennia A.D., their economy bore a complex character that harmoniously combined sea mammal hunting, fishing, hunting on land, and coastal and taiga gathering. In the late stages of development, in the middle of the 2nd millennium A.D., signs of domestication of animals appear: at several settlements were found the bones of Manchurian pigs and dogs (Alekseeva and Gorbunov 1993; Alekseeva 1990), which were probably bred for meat.

A unique collection of zoomorphic art was assembled during the excavations of the Ivanovka settlement: found here were well-preserved images of pigs sculpted from wood (more than 15 specimens) and bone (1 specimen), which points to the significance of these animals in the economy of the Okhotsk population. Also found were images of dolphin, orca, seals, birds, and a wooden scoop with a handle in the form of the bear's head (Gorbunov 1989).

Materials from archaeological sites from the end of the 1st to the beginning of the 2nd millennia A.D. in Sakhalin indirectly attest to an acquaintance with metal and its use in the production of varied artifacts, tools, and hunting-fishing equipment, though finds of metal tools themselves are extremely rare. Island isolation and the absence of natural conditions for the development of their own metallurgy on Sakhalin was the reason for the technological lag of the ancient population in Sakhalin behind continental peoples. This situation stimulated the import of several necessary wares from the mainland, contributing to the liveliness of trade and cultural connections. The natural features of the island left their mark on the character of the trade, which, based on materials from the investigation of the so-called Santan trade, can be traced between the peoples of Sakhalin, the lower Amur, Manchuria, and Hokkaido in the 18th–19th

centuries. But the beginning of these trade connections reaches back to the 8th century (about which early Japanese chronicles provide evidence) and possibly to even earlier times. The residents of Sakhalin obtained metal artifacts, fabric clothing, ornaments, and other wares, which they were not able to produce themselves, in exchange for the products of their hunting-fishing: hides of fur-bearing animals (furs of sable, otter, fox, marten, reindeer) and the tail feathers of eagles (Sasaki 1992:124; Harrison 1954:289).

The form of life and economy of the population of Sakhalin Island from the beginning stages of settlement of the island up to the 18th–19th centuries were determined by natural-climatic features, resources from the animal and plant world of the island's ecosystem, the level of development of the production force, and interconnections with the cultures of adjoining territories. The processes of adaptation to natural and social factors are reflected in the material and spiritual culture of the peoples and the direction of their economic and cultural connections.

THE EARLIEST CERAMIC COMPLEX OF PRIMOR'YE (BASED ON MATERIALS FROM THE USTINOVKA-3 SITE)

A. V. Garkovik and I. S. Zhushchikhovskaya

Well known in Far Eastern archaeology are complexes of the late Paleolithic period and the developed culture of the Neolithic, but poorly studied is the transition from the Paleolithic to the Neolithic period—a time of great change in the ecology, material culture, and economy of ancient society, which in many ways determined its subsequent development. The discovery and investigation of archaeological sites that belong to this period of human history are of special scientific value.

One of the sites preserving materials of the earliest culture in eastern Primor'ye in the transition from the Paleolithic to Neolithic stage is Ustinovka-3. The site is located on the middle course of the Zerkal'naya River, in the southern part of a floodplain terrace of its left-bank tributary. The elevation of the terrace is 10 m above the level of the riverbed. The closest population point, the village of Ustinovka, is 4 km west of the site. Ustinovka-3 is one of a series of sites, associated with an extrusion of silicified tuff, which was widely used in antiquity as raw material for making stone tools (Garkovik 1994:23).

The cultural layer of the site contains diachronic complexes. The latest of them, represented primarily by small, heavily rolled fragments of modeled ceramics, is assigned to the Bronze Age. The primary complex defining the cultural appearance of the site is dated to the early Holocene. This complex is characterised by a combination of features peculiar to the late Paleolithic Ustinovka tradition of stone working with blade and microblade elements, as well as features of more developed Neolithic cultures.

The cultural deposits of the site consist of a fine loam, with a soft lumpy structure, 30–35 cm thick. The sod horizon is poor and thin with a 6–8 cm thickness. The upper part of the deposits—a grayish-brown loam—is humic, containing a large quantity of plant roots. The lower part is a sandy (light) yellow-brown loam with inclusions of gravel. The cultural deposits lie directly on pebbles, the stream facies of the terrace.

During investigation of the Ustinovka-3 site, an area of more than 150 m² was excavated. The dismantling of the cultural layer was conducted by thin stripping (2–4 cm) with the recording of all artifacts. The cultural-chronological position of Ustinovka-3 site is determined primarily by features of its stone industry. The bulk of artifacts—flakes, spalls, and other categories—are tools and debitage. A noticeable series is made up of lamellar flakes. Also included in the complex are cores, core fragments, and blanks. A large part of the cores are amorphous, though there are specimens close to subprismatic and end cores. A clear feature of the stone inventory is the presence of a group of large biface tools that have been worked by percussion retouch with trimming of the edges by pressure retouch. Clusters of artifacts connected both with flaking and with preparation of bifaces were found in the lower part of the cultural layer. All the named features of the stone inventory connect the primary complex of Ustinovka-3 with the Ustinovka late Paleolithic culture. Researchers have determined the time of its existence rather broadly from 22,000 to 8,000 years ago (Vasil'evskii 1985; Vasil'evskii and Gladyshev 1989:105).

New, progressive elements in the technique of stone working are represented by elongated-triangular arrowheads, formed by thin pressure retouch, and adzes and chisels with a ground working edge (Kononenko et al., 1993). These artifacts connect the stone inventory of the primary complex of Ustinovka-3 with traditions of Neolithic Rudninskaya culture, dated by radiocarbon to 6,000–7,000 years ago and close in area to the Ustinovka culture (*Neolit* . . ., 1991).

According to spore-pollen analysis of the cultural deposits of Ustinovka-3, the primary complex of the site dates to 9,000–8,000 years ago, which permits determining its cultural-chronological position as intermediate between the Ustinovskaya and Rudninskaya cultures (Verkhovskaya 1993).

An unprecedented finding in the study of the Ustinovka-3 site and early Holocene cultures was uncovered in the 1994 field season. A ceramic complex was discovered that had no analogies in Primor'e. It consisted of fragments of ceramics that were found in the western part of the site, in the lower part of the cultural layer, in the sandy yellow-brown loam, at the juncture with the underlying pebble-gravel horizon. A combined deposit of ceramics and artifacts of stone, typical for the primary Ustinovka-3 complex, was noted.

The ceramic collection consists of about 150 fragments, probably belonging to two or three vessels. One of the vessels was partially reconstructed. A peculiarity of the collection is the absence of bottoms or bottom fragments, as well as parts around the bottom. Only pieces of upper parts with preserved rims and walls are represented.

The technological characteristics of the ceramics include the composition of the modeling mass, the modeling, working the surface, and firing.

The modeling mass, based on data from petrographic analysis,¹⁶ includes hydromicaceous clay and an admixture of non-clay particles of a silty and sandy fraction comprising 30–40% of the modeling mass by volume. The composition of the non-clay admixture is plagioclase, quartz, and biotite. The characteristic features of the non-clay are varied grain size (the sizes of the particles vary from a hundredth part of a millimeter to 2.0–2.5 mm without the presence of the prevailing fraction) and irregularity of distribution in the modeling mass. On the whole these features correspond to a modeling mass made from thinners or natural clay without special additives. The modeling masses with artificial mineral thinner are characterized in most cases by its textural uniformity, even distribution, and presence of textural breaks between the natural silty admixture in the clay and the thinning additives (Saiko and Zhushchikhovskaya 1990; Magetti 1982).

A survey for identification of deposits of ceramic raw material (clays and loams) conducted in the area of the Ustinovka-3 site revealed their presence at several points. However, based on analyses of the collected samples (petrographic microscopy and physical-mechanical testing), identification of the probable source of the raw material from which the ceramics of Ustinovka-3 could have been made has presently not been successful. Clays similar but not identical were found at a distance of 0.8 km from the site. These were quaternary clay-loam deposits, somewhat sandy, and of a yellow and brown-yellow color in the fresh unfired state. However, in distinction from the modeling mass of the ceramics of Ustinovka-3, this raw material contained practically no biotite. In addition, the color of the discovered clay, in

¹⁶ Petrographic determinations were carried out by Candidate of Geological-Mineralogical Sciences B. L. Zalizchak.

a state of complete oxidation (after firing at a temperature of 900° C), differs from the color of repeatedly fired (also at a temperature of 900° C) specimens of the ceramics being studied.¹⁷

Reconstruction of the method of forming the ceramic vessels provided interesting results. The extremely fragmentary nature of the material and lack of sufficiently large pieces permit making only general suppositions concerning this technological operation. Several fragments attract attention: two layers of modeling mass can be distinctly seen in the break, as if one lay on the other. Petrographic analysis indicated features of compression of the clay fraction on the surface layer of the samples. Flattening and leveling of the outer surface of the ceramics, the thickness of which in most cases is 0.5–0.6 cm, can be visually noted. These features, in combination with the absence in the collection of evidence of the band or coiling method of forming, suggest that preparation of vessels could have been produced on a solid support by the overlay of successive layers of modeling mass and its compaction. It cannot be excluded that the modeling mass was laid in the form of ordered pieces or “patches.” According to ethnoarchaeological evidence and materials from the study of the earliest pottery making, a combination of “patch” applique, or “slab construction,” with the use of solid or soft supports, or blanks, is one of the features of the archaic nature of ceramic traditions (Bobrinskii 1978; Vandiver 1987).

Work on the surface of the ceramics differed in a specific way. On the outside of fragments, there are no signs of smearing on an additional layer of clay or subsequent smoothing or polishing. The outer surface is rough, with emerging grains of mineral inclusions. On the inner surface of all the fragments discovered are noted shallow, 0.2–0.3 mm wide subparallel grooves or troughs (Fig. 1b) that are straight, horizontal, or slightly wavy. These grooves could have been left in slightly dry clay by a tool with a rather rigid uneven working edge. Comparison of the ceramics being studied with collections of standards for working the surface¹⁸ has shown that such a tool was most likely a wood chip, a bundle of tightly packed stiff grass (stems), or the shell of some sea mollusk.

It is possible to outline the connection between the character of the work of the inner surface and the proposed method of modeling on a base. Preparation of a vessel on a solid support always requires a so-called intermediary liner, which, after finishing the modeling and some light drying, was easily removed from the support and separated from the vessel just made. As such, some kind of woven structure could have served as a liner, for example, of plant raw material. Most likely, after the removal of the liner, it was necessary to smooth and eliminate, using a special tool, its traces on the inner surface of the vessel. However, the working of the surface that left the characteristic grooves may not be functionally connected with the operation of modeling.

The primary characteristics of firing ceramics are the temperature and atmospheric regimes (Zhushchikovskaya 1988b; Shepard 1965). Color and petrographic analysis, repeated firing, and the hardness index of the Mohs Scale were used to identify the materials of the Ustinovka-3 ceramics. It was established that the firing temperature did not exceed 600° C, corresponding to a primitive level for the firing structure. The atmosphere of firing was oxidizing, with partial smudging, which was most probably not intended, but a chance effect common for open fire firing. In the break of the ceramics dirty, faded tones of poorly oxidized clay are often noted, which points to a low temperature inadequate for a more complete oxidation length of firing.

¹⁷ Color identification of clay raw material is a rather well-known method of analysis of early ceramics (Shepard 1965) that is also used in studies of archaeological ceramics of the southern Far East (Zhushchikovskaya and Zalizchak 1990).

¹⁸ A standard collection of samples of surface work is used in studies of the early pottery making of the southern Far East.

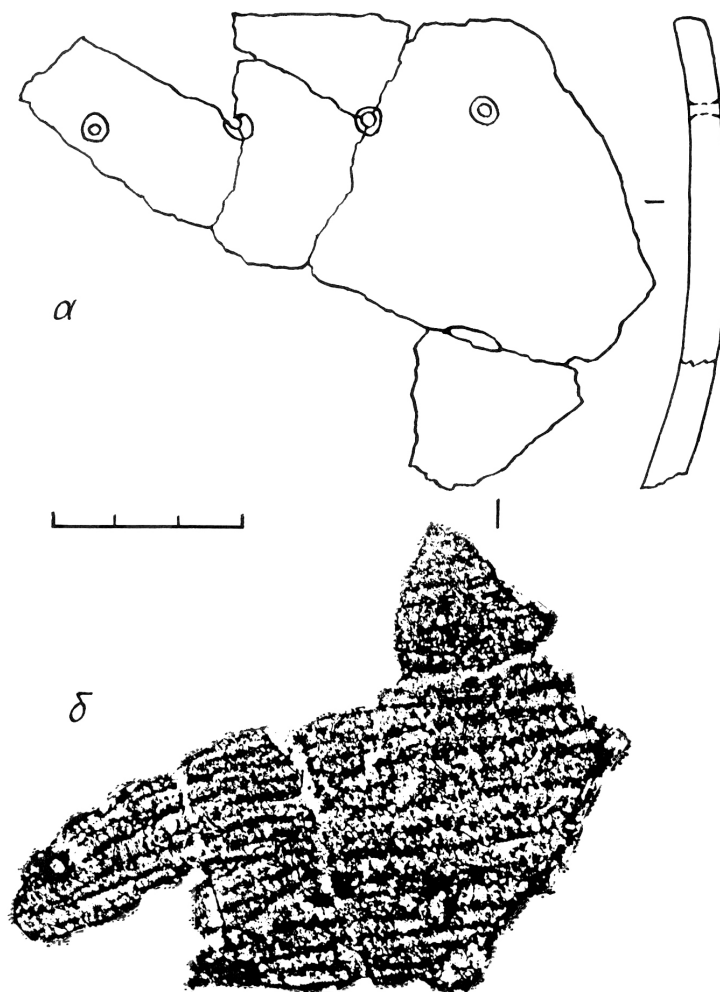


Figure 1. Fragment of the reconstructed upper part of a vessel. View from outside (a) and from inside (b).

The form of the ceramic containers has been only partially reconstructed. Judging by the preserved fragments of the upper parts, the vessels had a whole structure without an emphasized body and neck (see Fig. 1a). The walls in the upper part of the container and the rim are straight, without accentuation of the outer or inner sides. An interesting feature is the clearly expressed flatness of the upper edge of the rim. This can be viewed as additional, though one can deduce that the technology of modeling was on a solid support: to make a vessel by such method it would be in the position of “bottom up,” during which the pressure of the modeling mass on the rim brings on the flattening of its upper edge.

These vessels could have had both a flat and a round or sharp bottom; examples of such variants can be found in the early ceramic complexes of different regions (Golubev and Zhushchikhovskaya 1987). On the whole, the material from Ustinovka-3 reflects the lowest stage of development in the morphological structure of ceramic containers.

None of the ceramic fragments found are decorated. But an interesting detail that can be noted is the chain of perforating holes along the rim of the reconstructed upper part of one of the vessels (see Fig. 1).

The technical-technological and morphological characteristics of the ceramic complex from Ustinovka-3 place it among the presently well-known earliest ceramic complexes of Primor'e. These are represented by materials from sites of the Rudninskaya culture in Chertovy Vorota Cave, dated by radiocarbon to 6,000–6,500 years ago (*Neolit* . . ., 1991) and by materials from sites in southern Primor'e of the Khansi-I, Zarech'e-I (Andreev 1960), and Boismana-I (early cultural horizon) type.¹⁹ The last are tentatively dated to 6,000–6,500 years ago based on analogies with complexes related in cultural appearance (Popov 1992).

Based on the level of technical-technological development and morphology, the ceramics from Ustinovka-3 are close to the material of Khansi-I, Zarech'e-I, and Boismana-I. Common attributes for these ceramics include the technology of preparing the modeling mass from poorly cleaned clay without special thinning additives; archaic methods of modeling;²⁰ absence of methods of working the walls (smearing, smoothing, polishing) to ensure a smooth surface (without projecting grains of mineral inclusions) and low permeability; low-temperature firing in primitive thermal structures; and a low level of development of morphological structure of the ceramic containers. At the same time, the ceramics of the Khansi-I, Zarech'e-I, and Boismana-I sites are more developed. The small series of samples attest to the technological striving of the early potters, including the use of crushed shells of sea mollusks as a special thinning additive to the modeling mass. A variety is observed in the formation of the rims. A feature of the ceramic tradition of Khansi-I, Zarech'e-I, and Boismana-I is broad use of ornamentation that is simple in technical means and compositional principles.

Comparison of materials from Ustinovka-3 with the Rudninskaya culture site of Chertovy Vorota reveal noticeable differences in the level of development of the technique, technology, and morphology of ceramics. Ceramic artifacts from Chertovy Vorota demonstrate such progressive features as the use of a specially made modeling mass with mineral thinner; established technological standards for modeling by the band-ring applique method: working the surface by slipping, coating, and smoothing; and mastery of a morphological model of a structurally segmented vessel with a neck. The decorative tradition of ceramics from Chertovy Vorota indicates sufficient variation in technical methods of decor and its connection with the form of the pottery artifacts.

Correlation of ceramic complexes based on the level of development of basic pottery-making skills permits making the following assumptions:

1. The ceramic complex of Ustinovka-3 looks most archaic in light of the presented materials.
2. The substantial difference in the level of development of pottery-making traditions in the practically synchronic sites of eastern (Chertovy Vorota) and southern (sites of the Boismana-I type) Primor'e affects the character of the correlation of the ceramic complex of Ustinovka-3 with the named complexes. Based on the level of development of the technique, technology, and morphology, the ceramics from

¹⁹ The authors are grateful to Candidate in Historical Sciences Yu. E. Vostretsov for the possibility of working with ceramics from the Boismana-I site and including some of the results of the research in this article.

²⁰ The ceramics from sites of the Boismana-I (early horizon) type were made by rope applique, a technology that differed by extreme imperfection in this pottery-making tradition.

Ustinovka-3 are closer to material from sites of the Boismana-I type than to ceramics from Chertovy Vorota, which are characterized by a whole series of progressive features.

3. Discovery of the early Holocene ceramic complex at Ustinovka-3 allows a new perspective of the rather well developed, in comparison with other synchronic sites of Primor'e, character of the ceramics of the Chertovy Vorota settlement. Analysis of this material in due time left no doubt that what was before the researchers was far from the initial stage of development of ceramic production. The pottery-making tradition of the Rudninskaya culture must have had some hypothetical cause (*Neolit* . . . , 1991:122–147). Today we can raise the question in consideration of the cause of this archaic pottery-making tradition, which is represented by the material from Ustinovka-3. In favor of interpreting the Neolithic Rudninskaya culture as the successor of the Ustinovka-3 tradition is, first, their geographic closeness and, second, some common methods in the technique of stone working.

From the position of seeking features in the ceramic collections of Ustinovka-3 and Chertovy Vorota that could have been treated as a reflection of genetic interconnection of pottery-making traditions, interesting is the method of working the surface by a tool with hard uneven working edge. If this method is expressively demonstrated by a large series of examples in the ceramics of Ustinovka-3, in the collection from Chertovy Vorota ceramics with traces of such modification are not so widely represented. In several cases the internal surface underwent modification by a tool with a hard, uneven working edge; sometimes the outer surface also underwent such modification (Fig. 2). In other ceramic complexes of the Primor'e Neolithic, no features of working the walls that left distinctive, unsmoothed grooves on the surface are recorded.



Figure 2. Fragment of ceramics with traces of work by a tool with a hard, uneven edge, from the Chertovy Vorota site of the Rudnina culture.

Thus, today the ceramic complex of Ustinovka-3, connected with the primary early Holocene cultural horizon, is interpreted as the earliest in Primor'ye. For this region this is the first case of archaic ceramics in combination with a stone industry with a late Paleolithic appearance to be discovered. Considering the now well-known sites containing the earliest clay vessels of the Japanese Islands (Miyata 1995; Suda 1995), Priamur'ye (Derevyanko and Medvedev 1992), and southern China (Chang Kwan-chin 1986:71–106), the early age of the ceramics from Ustinovka-3 being proposed looks more regular than exceptional. In antiquity the basin of the Sea of Japan was evidently one of the regions where pottery making emerged and ceramics spread. The ecological and socioeconomic conditions and reasons for the appearance of ceramics and ceramic production need to be viewed as a theme of special research.

ANTHROPOMORPHIC VISAGES FROM WESTERN CHUKOTKA

M. A. Kir'yak

The western Chukotka collection of small stone sculptures contains 23 items that were found by the author during field surveys and excavations in the Bilibin Region of the Chukotka Autonomous District. After more intensive recording, studying, and researching, the early artistic artifacts will be entered into the vaults of the Magadan District Regional Museum and will be presented to a broad circle of visitors. While a preceding essay (Kir'yak 1993b) was dedicated to zoomorphic sculpture, in the present article two anthropomorphic images are examined in depth.

A skull-shaped visage (see Figure 1:a) was found during the profiling of a terrace 2–3 m high on the western bank of a narrow neck of Lake Tytyl'. The visage was made on the distal segment of a blade of brown hornfels. For a representation of the facial details of the skull, the ancient master used the ventral surface of the blade with the rounding on the end reminiscent in form of the oval of the lower part of the face. Eye sockets in the form of subsquare hollows are situated at an angle to each other, as if delineating a nose bridge expanding toward the forehead. Below are two round depressions: one is in the place of a nose, while the second, larger one imitates a mouth. In the lower part, the contour of the chin is bisected by a pressed-off micro-flake. The upper roundness of the skull can be guessed in the conchoidal bend of the blade; above it, on the right are two recessed dots.

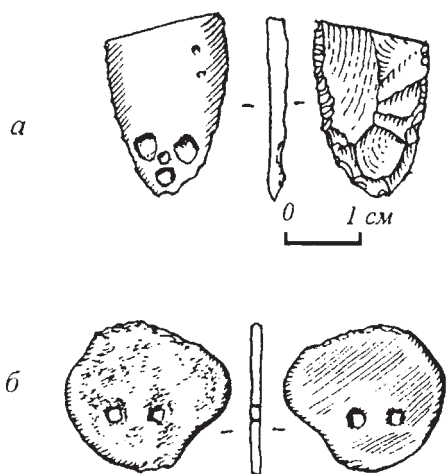


*Figure 1. Anthropomorphic images from Western Chukotka: a—skull-like visage from Lake Tytyl';
b—visage from the Rauchuvagytgyn I site.*

Without trace analysis it is difficult to determine what technical methods were used for working individual details; it can only be stated that the image was executed in shallow relief. On the back of

the blade, there is the negative of the removal of a flake with two narrow and short traces of scraping on the surface that are combined with the eye sockets of the visage. Both lateral sides of the blade, with the exception of a small area on the narrowing end, are covered on the dorsal side by small steep regular retouch. The complex of artifacts obtained while profiling the slope of the terrace is of Neolithic appearance. Further investigation of the site is necessary for determining its cultural association and dating.

The second visage (see Figure 1:b) was found during excavations of the Rauchuvagytgyn I site. It was made on a fragment of slate slab and has a curvilinear contour, asymmetrically elongated toward one side. The image belongs to the category of partial ones, since it is incomplete; such features as mouth and nose are absent. Two small subsquare holes, probably imitating eyes, were made by counter (?) sawing. In the depths of one of them, there remains a small ledge break. Both surfaces and edges along the whole perimeter were polished as if in prolonged contact with a soft object. No scratches or traces of work on the features can be seen. The composition looks finished and seems to correspond to the sacred idea that the ancient master placed in it.

The Rauchuvagytgyn I site is dated by C¹⁴ to 2500 ± 100 years ago (MAG-902). It occupies a special place among the Late Neolithic sites of Western Chukotka due to a representative collection of graffiti that depicts the spiritual life of the early population of Chukotka.

As far as the published sources permit judging, among archaeological items of mobile art there are no analogs to Western Chukotkan rarities either in the territory of Siberia and the Far East or in the European part of Russia. Recently a whole series of visages was discovered in a Neolithic culture in southern Primor'e (the Boismana II site). They were executed on grinders and pieces of sandstone in the form of two or three bored conical pits, sometimes with other features formed in relief, such as a nose or oval face (Brodyanskii 1993:134–144, Fig. 4:1–4). Images similar to those of Primor'e are also encountered in Priamur'e (Brodyanskii 1993:134–144, Fig. 4:6–10). But the Far Eastern artifacts differ from the Chukotkan in technique, style, and probably by a different semantic load. In the art of small forms of Japan and Korea, there are visages made from mollusk shells (Brodyanskii 1987:62, Figs. 2, 3) and treated by investigators as masks. They have three holes: two subsquare (eyes) and one that is round and broad (mouth).

The closest parallels to Chukotkan anthropomorphic artifacts can be found in the ethnographic material. A skull-like image with two eye sockets was applied to the handle of a wooden clapper for shamans' tambourines (private collection of F. F. Il'in in Yakutia). A visage, similar to that from Tytyl' but carved on a tree trunk is cited by S. V. Ivanov in a description of a sculpture of religious significance among the Baikal Evenk (Ivanov 1970: Fig. 156). These visages can be connected through the similar depiction of the eye sockets (their form and proportion in relation to the remaining facial features), as well as the similar execution of the whole composition in shallow relief. According to M. G. Levin, among the northern Baikal Evenk, images on trees reflected deceased shamans and were made for the purpose of obtaining success in the hunt; a small table was set before these images with a food offering (Ivanov 1970:172).

Anthropomorphic partial visages, analogous to that found in the Rauchuvagytgyn I site, are encountered on items of a cult among peoples of the Altai-Sayan highlands, in particular among the Kumandin and Teleut. They were executed on scraps of cloth (Ivanov 1955: Figs. 24, 30). Just like the Chukotkan find, the Kumandin images were treated simplistically: irregular (deformed) contour of the

skull without ears or hair and only round or square eyes on the “face.” But present on these figures is a whole image with arms, legs, and trunk without sexual characteristics, executed in a linear manner, though the head is disproportionately large. According to the ideas of the Kumandin people, these images embodied the spirits of the ancestors in the female line and were intended to protect pregnant women and secure a successful birth (Ivanov 1955:229). Among the Teleut, along with whole anthropomorphic figures, there are also abbreviated ones and sometimes only heads are rendered. The figures were rendered by women and represented spirits of the ancestors, inherited along the maternal line (Ivanov 1955:235).

Visages similar to the one from Rauchuvagytgyn are also encountered on “Mountain” Buryat *ongony* (Ivanov 1957: Fig. 9),²¹ created by shamans as receptacles for spirits of ancestral shamans, as well as on *ongony* of blacksmiths—in this case the figure with a two-eyed visage was perceived as the older sister of the divine smiths, patron of their craft (Ivanov 1957:113, 114, 125, 126).

As a result of analysis of the cited parallels, it can be concluded that the idea of spirits-guardians is reflected in the visage from the Rauchuvagytgyn I site. An image of a spirit did not require detailed work since the spirit itself was not a material substance and did not have a corporeal form: it existed only in the imagination of man. It can be assumed that working out or ignoring individual features depended on the practical sense that the ancient artist invested in his production, that is, on the function of the spirit he reproduced. But despite the partialness of images, in most cases eyes are recorded, since among the peoples of Siberia only in this case was an object endowed with life and capability (Ivanov 1954:748).

The cult of a dead person (a kinsman, a shaman) appears in the skull-like visage from the Tytyl' site: the object of reverence is the skull. In representations of several peoples of Siberia and the Far East, the receptacle of the spirits-assistants was the head of the shaman. Embodying this head, the ancestor thinks for the shaman, directing him (Okladnikov 1955:304).

The Yukaghir assigned paramount importance to the head of a shaman. This was reflected in the custom of dismembering the body of the shaman after death. His dried bones and corporeal tissue were turned into amulets: personal guardians of members of the family, while the head remained as a family deity that was addressed with the request for success in hunting and fishing (Jochelson 1926).

The custom of removing the head of a deceased shaman and to burn or boil it with subsequent burial was also noted among the Sel'kup. People who died a violent death were dealt with in the same way: the head was cut off and buried separately. In Sel'kup legends about the Kveli, a vanished people, there are whole cemeteries of such heads (Pelikh 1972:115–119).

Ritual burial of human skulls in Chukotka (Dikov 1961:34) possibly reflects similar ideas and cults. The custom of removing and preserving the skull of a revered ancestor is known from the Middle Paleolithic. Until recently this custom existed in Oceania, Indonesia, and South America. In N. R. Kabo's opinion, the cult of the skull displays an appeal to a mysterious substance: human thought (Kabo 1984:96).

And still the meaning of the Chukotkan finds remains an enigma to us.

²¹ *Ongony*—images of spirits drawn in ink on fabric, sewn up from rags, carved out of felt, wood, or sheet metal, or molded from clay (Ivanov 1957).

LITERATURE

Abramova, Z. A.

- 1979 "K voprosu o vozraste Aldanskogo paleolita" [On the Question of the Age of the Aldan Paleolithic]. *SA* [Soviet Archaeology] 4:5–14.

Alekseeva, E. V.

- 1990 "Arkheozoologicheskie issledovaniya na Sakhaline" [Archaeozoological Investigations in Sakhalin]. *Kraeved. byul. Yuzhno-Sakhalinsk* [Yuzhno-Sakhalinsk Regional Studies Bulletin] 1:48, 49.

Alekseeva, E. V., and S. V. Gorbunov

- 1993 "Fauna stoyanki okhotskoi kul'tury Ivanovka, Yuzhnyi Sakhalin" [The Fauna of the Okhotsk Culture from the Ivanovka Site, Southern Sakhalin]. *Novye materialy po arkheologii Dal'nego Vostoka Rossii i smezhnykh territorii* [New Archaeological Materials on the Russian Far East and Adjoining Territories], pp. 80, 81. Vladivostok.

Amal'rik, A. S., and A. L. Mongait

- 1966 V poiskakh ischeznuvshikh tsivilizatsii [In Search of Vanished Civilizations]. Moscow: Nauka.

Anan'ev, G. S., E. G. Anan'eva, and A. Yu. Pakhomov

- 1984 "Chetvertichnye oledeneniya Severo-Zapadnogo Priokhot'ya" [Quaternary Glaciations of Northwestern Priokhot'e]. *Pleistotsenovyie oledeneniya Vostoka Azii* [Pleistocene Glaciations of Eastern Asia], pp. 43–56. Magadan: SVKNII DVNTs AN SSSR.

Andreev, G. I.

- 1960 "Nekotorye voprosy kul'tur Yuzhnogo Primor'ya III–I tysyacheletii do n.e." [Some Questions of Cultures of Southern Primor'e of the 3rd–1st Millennia B.C.]. *MIA* 86:136–161.

Antropova, V. V.

- 1949 "Starinnye kamchatskie sani" [Old Kamchatkan Sleds]. *Sbornik MAE* [Journal of the MAE] 10:47–92. Moscow-Leningrad.

Argunov, V. G.

- 1990 *Kamennyi vek Severo-Zapadnoi Yakutii* [The Stone Age of Northwestern Yakutia]. Novosibirsk: Nauka.

Arkheologicheskie. . .

- 1983 *Arkheologicheskie pamyatniki Yakutii* [Archaeological Sites of Yakutia]. Novosibirsk: Nauka.

Arslanov, Kh. A., et al.

- 1977 "O paleogeografii i geokhronologii pozdnelednikov'ya na Severe Pechorskoi nizmennosti" [On the Paleogeography and Geochronology of Late Glaciation in the North of the Pechorskaya Lowland]. *Vestnik LGU* [Bulletin of Leningrad State University] 2:113–119.

- 1982 "Ob absolyutnom vozraste Yuribeiskogo mamonta" [On the Absolute Age of the Yuribey Mammoth]. *Yuribeiskii mamont* [The Yuribey Mammoth], pp. 35–37. Moscow: Nauka.

Arutyunov, S. A., I. I. Krupnik, and M. A. Chlenov

- 1982 “*Kitovaya alleya*”: *Drevnosti ostrovov proliva Senyavina* [“Whale Alley”: The Antiquity of the Islands of Senyavin Strait]. Moscow: Nauka.

Astakhov, V. I.

- 1978 “O Karskom tsentre oledeneniya Zapadnoi Sibiri” [On a Kara Center of the Glaciation of Western Siberia]. *Sovremennoe i drevnee oledenenie ravninnykh i gornyykh raionov SSSR* [Modern and Ancient Glaciation of the Plain and Mountain Regions of the USSR], pp. 33–45. Leningrad.

- 1982 “Struktura severnogo pleistotsena po dannym kosmicheskikh i vysotnykh s`emok” [The Structure of the Northern Pleistocene Based on Data of Space and High-Altitude Filming]. *Issledovaniya Zemli iz Kosmosa* [Investigations of the Earth from Space] 5:22–25.

Avdalovich, S. A., and R. A. Bidzhiev

- 1984 “Karginskies morskies terrasy na severe Zapadnoi Sibiri i problema sartanskogo oledeneniya” [Karginsk Sea Terraces in the North of Western Siberia and the Problem of the Sartan Glaciation]. *Izv. AN SSSR. Ser. geogr.* [Bulletin of the Academy of Sciences of the USSR: Geographic Series] 1:89–100.

Badinova, V. P., et al.

- 1976 “Radiouglerodnye datirovki laboratorii VSEGEI (LG). Spisok III” [Radiocarbon Dating of the Laboratory of the All-Union Science Research Geological Institute (Leningrad). List III]. *BKIchP* [Bulletin of the Committee for the Study of the Quaternary Period] 45:154–157.

Balandov, A.

- 1987 “Taina raspadka Bezymyannyi” [The Secret of Bezymyannyi Gully]. *Koryakskii kommunist* [The Koryak Communist], 4 June.

Bauerman, K.

- 1934 “Sledy totemisticheskogo rodovogo ustroystva u parenskikh koryakov” [Traces of Totemic Clan Structure among the Paren’ Koryak]. *Sovetskii Sever* [The Soviet North] 2:70–79.

Beretti, N. M.

- 1929 *Na krainem Severo-Vostoke* [In the Extreme Northeast]. Vladivostok.

Bobrinskii, A. A.

- 1978 *Goncharstvo Vostochnoi Evropy* [Pottery Making of Eastern Europe]. Moscow: Nauka.

Boriskovskii, P. I.

- 1985 Review of “*Kitovaya alleya*”: *Drevnosti ostrovov proliva Senyavina* [“Whale Alley”: The Antiquity of the Islands of Senyavin Strait], by S. A. Arutyunov, I. I. Krupnik, and M. A. Chlenov. *Sovetskaya antropologiya* [Soviet Anthropology] 3:304–305.

Boyarskaya, T. D., et al.

- 1989 “Osobennosti klimata Zapadnoi Chukotki v pozdnem pleistotsene i golotsene” [Specifics of the Climate of Western Chukotka in the Late Pleistocene and Holocene]. *Paleoklimaty pozdnelednikov`ya i golotsena* [The Paleo-Climate of the Late Glacial and Holocene], pp. 151–154. Moscow: Nauka.

Brodyanskii, D. L.

- 1975 “Arkheologicheskie istochniki po istorii zhilishch narodov Priamur`ya i Primor`ya” [Archaeological Sources on the History of Dwellings of the Peoples of Priamur’e and Primor’e]. *Voprosy*

- istochnikovedeniya i istoriografii* [Questions of Source Studies and Historiography]. Issue 4, pp. 65–80. Vladivostok.
- 1987 “Antropomorfnye mifologicheskie obrazy v sisteme artefaktov neolita i paleometalla Dal’nego Vostoka” [Anthropomorphic Mythological Images in the System of Artifacts of the Neolithic and Paleometal of the Far East]. *Antropomorfnye izobrazheniya* [Anthropomorphic Images], pp. 58–72. Novosibirsk: Nauka.
- 1993 “Figurki, lichiny i znaki drevnikh tikhookeantsev” [Figurines, Masks, and Signs of Early Pacific Peoples]. *Vestnik DVO RAN* [Bulletin of the DVO RAN] 4/5:140–147.
- Chang, Kwan-chin
1986 *The Archaeology of Ancient China*. 4th ed. New Haven: Yale University Press.
- Chernetsov, V. N., and V. I. Moshinskaya
1974 “O nekotorykh obshchikh chertakh v drevnikh kul’turakh narodov Zapadnoi Sibiri i Severnoi Ameriki” [On Some Common Features in the Early Cultures of Peoples of Western Siberia and North America]. *Drevnyaya Sibir’* [Ancient Siberia]. Novosibirsk.
- Chizhov, O. P., et al.
1968 *Oledenenie Novoi Zemli* [Glaciation of Novaya Zemlya]. Moscow: Nauka.
- Danilov, I. D.
1978 *Pleistotsen morskikh subarkticheskikh ravnin* [The Pleistocene of the Maritime Subarctic Plains]. Moscow: Nauka.
- 1988 “Problemy pozdnechetvertichnoi istorii Barentseva i Karskogo morei” [Problems of Late Quaternary History of the Barents and Kara Seas]. *Chetvertichnaya paleoekologiya i paleogeografiya Severnykh morei* [Quaternary Paleoecology and Paleogeography of the Northern Seas], pp. 73–82. Moscow: Nauka.
- Danilov, I. D., and O. B. Parunin
1982 “Sravnitel’nye rezul’taty radiouglerodnogo datirovaniya karbonatnykh konkretnykh i rastitel’nykh ostatkov iz verkhnepleistotsenovykh otlozhenii karginskoi terrasy nizov’ev Eniseya” [Comparative Results of Radiocarbon Dating of Calcareous Concretions and Plant Remains from the Upper Pleistocene Deposits of the Karginsk Terrace of the Lower Reaches of the Yenisei]. *DAN SSSR* [Reports of the Academy of Sciences, USSR] 262(2):402–404.
- Derevyanko, A. P., and V. E. Medvedev
1992 *Issledovanie poseleniya Gasya (obshchie svedeniya, predvaritel’nye rezul’taty 1975 g.)* [Investigation of the Gasya Site (General Information, Preliminary Results of 1975)]. Novosibirsk: SO AN SSSR.
- Dikov, N. N.
1961 “Predvaritel’nye dannye ob arkheologicheskikh rabotakh na Chukotke v 1959 g.” [Preliminary Data on Archaeological Work in Chukotka in 1959]. *Zap. ChOKM* [Notes of the Chukotka Regional Museum] 2:21–36.
- 1977 *Arkheologicheskie pamyatniki Kamchatki, Chukotki, Verkhnei Kolymy*. Moscow: Nauka. (Published in English as *Archaeological Sites of Kamchatka, Chukotka, and the Upper Kolyma*. Anchorage, Alaska: Beringian Shared Heritage Program, National Park Service, 2003.)

- 1979a *Drevnie kul'tury Severo-Vostochnoi Azii: Aziya na styke s Amerikoi v drevnosti*. Moscow: Nauka. (Published in English as *Early Cultures of Northeast Asia*. Anchorage, Alaska: Beringian Shared Heritage Program, National Park Service, 2004.)
- 1979b "Kul'turnye svyazi mezhdru Severo-Vostochnoi Aziei i Amerikoi po dannym pozднеpleistotsenovym i rannegolotsenovym stoyanok Kamchatki, Chukotki i Verkhnei Kolymy" [Cultural Connections between Northeast Asia and America Based on Data from the Late Pleistocene and Early Holocene Sites of Kamchatka, Chukotka, and the Upper Kolyma]. *XIV Tikhookeanskii nauchnyi kongress. Komitet L: Tez. dokl.* [XIV Pacific Science Congress. Committee L: Abstracts of Reports] 2:190–192.
- 1979c "Zakhoroneniye domashnei sobaki v zhilishche pozднеpaleoliticheskoi stoyanki Ushki-I na Kamchatke" [The Burial of a Domestic Dog in a Dwelling at the Late Paleolithic Site of Ushki-I in Kamchatka]. *Novye arkheologicheskie pamyatniki Severa Dal'nego Vostoka* [New Archaeological Sites of the Northern Far East], pp. 12–17. Magadan: SVKNII DVNTs AN SSSR.
- 1993 *Aziya na styke s Amerikoi v drevnosti* [Asia at the Juncture with America in Antiquity]. St. Petersburg: Nauka. (Published in English as *Asia at the Juncture with America*. Anchorage, Alaska: Beringian Shared Heritage Program, National Park Service, 1997.)
- Dikov, N. N., and M. A. Kir'yak
 1982 "Otkrytie pervykh mezoliticheskikh i neoliticheskikh pamyatnikov na zapade Chukotki (na ozere Tytyl' v verkhov'yakh r. Malyi Anyui)" [Discovery of the First Mesolithic and Neolithic Sites in Western Chukotka (On Lake Tytyl' on the Upper Reaches of the Malyi Anyui River)]. *Kraeved.zap.* [Regional Notes] 12:115–124.
- Dikov, N. N., and N. E. Savva
 1980 "Novaya vnutrikontinental'naya stoyanka kamennogo veka v Severnom Priokhot'e (u istokov ruch.Urtychuk)" [A New Intercontinental Stone Age Site in Northern Priokhot'e (At the Sources of Urtychuk Creek)]. *Noveishie dannye po arkheologii Severa Dal'nego Vostoka* [The Most Recent Data on the Archaeology of the Northern Far East], pp. 64–68. Magadan: SVKNII DVNTs AN SSSR.
- Dikov, N. N., and V. N. Smirnov
 1977 "Novaya ranneneoliticheskaya stoyanka v basseine r. Amguemy" [A New Early Neolithic Site in the Amguema River Basin]. *Kraeved.zap.* [Regional Notes] 11:121–126.
- Dikova, T. M.
 1983 *Arkheologiya yuzhnoi Kamchatki v svyazi s problemoi rasseleniya ainov* [The Archaeology of Southern Kamchatka in Connection with the Problem of the Settlement of the Ainu]. Moscow: Nauka.
- Dolukhanov, P. M.
 1979 *Geografiya kamennogo veka* [Geography of the Stone Age]. Moscow: Nauka.
- Easton, A. N.
 1992 "Mal de Mer above Terra Incognita, or, 'What Ails the Coastal Migration Theory?'" *Arctic Anthropology* 29(2):28–41.
- Erikh, V. A.
 1986 "Vzaimootnosheniye cheloveka i prirody v bronzovom veke na territorii Zapadnoi Sibiri (obzor literatury)" [The Interaction of Man and Nature in the Bronze Age in the Territory of Western

- Siberia (Overview of the Literature)]. *Paleoekonomika Sibiri* [Paleoeconomy of Siberia], pp. 125–133. Novosibirsk: Nauka.
- Evseev, V. P., et al.
1982 “Mestonakhozhdenie Yuribeiskogo mamonta: geologiya, tafonomiya, paleogeografiya” [The Site of the Yuribey Mammoth: Geology, Taphonomy, Paleogeography]. *Yuribeiskii mamont* [The Yuribey Mammoth], pp. 5–19. Moscow: Nauka.
- Garkovik, A. V.
1994 “Formirovanie istochnikovoi bazy (na primere izucheniya arkheologicheskikh pamyatnikov Primor'ya)” [Formation of the Source Base (On the Example of the Study of Archaeological Sites of Primor'e)]. *Ocherki pervobytnoi arkheologii Dal'nego Vostoka* [Essays on Prehistoric Archaeology of the Far East], pp. 16–54. Moscow: Nauka.
- Gedenshtrom, M.
1822 “Puteshestvie Gedenshtroma vdol' poberezh'ya Ledovitogo okeana” [Gedenshtrom's Voyage along the Coast of the Arctic Ocean]. *Sibirskii vestnik* [Siberian Bulletin] 17–19:171–378.
- Geineman, B. A.
1912 *Ocherk rybolovstva na Kamchatke* [An Essay on Fishing in Kamchatka]. St. Petersburg.
- Gerasimov, I. P., and K. K. Markov
1939 “Lednikovyi period na territorii SSSR” [The Glacial Period in the Territory of the USSR]. *Tr. IGAN* [Works of the Institute of Geography, Academy of Sciences], Vol. 33.
- Glushkova, O. Yu.
1983 “Istoriya razvitiya rel'efa Severnogo Priokhot'ya v pozdnem pleistotsene i golotsene” [The History of the Development of Relief in Northern Priokhot'e in the Late Pleistocene and Holocene]. *Stratigrafiya i paleogeografiya pozdnego kainozoya Vostoka SSSR* [The Stratigraphy and Paleogeography of the Late Cenozoic of the Eastern USSR], pp. 114–124. Magadan: SVKNII DVNTs AN SSSR.
- Golubev, V. A., and M. M. Prokof'ev
1976 “Izobrazhenie zhivotnykh i ryb v iskusstve okhotskoi kul'tury” [The Image of Animals and Fish in the Art of the Okhotsk Culture]. *Pervobytnoe iskusstvo* [Primitive Art], pp. 116–120. Novosibirsk: Nauka.
- Golubev, V. A., and I. S. Zhushchikhovskaya
1987 “Neoliticheskaya kul'tura yuzhnogo Sakhalina v svete analiza keramicheskikh kompleksov” [Neolithic Culture of Southern Sakhalin in Light of Analysis of Ceramic Complexes]. *Voprosy arkheologii Dal'nego Vostoka SSSR* [Questions of Archaeology of the Far Eastern USSR]. Vladivostok: DVO AN SSSR.
- Gorbunov, S. V.
1985 “O morskome zveroboinom promysle aborigenov Sakhalina” [On Sea Mammal Hunting of the Natives of Sakhalin]. *Etnograficheskie issledovaniya Sakhalinskogo oblastnogo kraevedcheskogo muzeya* [Ethnographic Investigations of the Sakhalin Regional Studies Museum], pp. 27–39. Yuzhno-Sakhalinsk.
1989 “Zoomorfnye figurki stoyanki Ivanovka” [Zoomorphic Figurines of the Ivanovka Site]. *Issledovaniya po arkheologii Sakhalina i Kuril'skikh ostrovov* [Archaeological Investigations of Sakhalin and the Kuril Islands], pp. 14, 15. Yuzhno-Sakhalinsk.

Grebenshchikov, A. V.

- 1993 "Paleogoncharstvo i problemy kul'turogeneza (na materialakh Priamur'ya)" [Paleo-Pottery Making and Problems of Cultural Genesis (On Materials of Priamur'e)]. *Arkheologicheskie issledovaniya na Dal'nem Vostoke Rossii* [Archaeological Investigations in the Far East of Russia], pp. 57–63. Vladivostok: DVO RAN.

Grosval'd, M. G.

- 1977 "Poslednii Evraziatskii lednikovyi pokrov" [The Last Eurasian Glacial Cover]. *MGI* [Materials of Glaciological Investigations] 30:45–60.
- 1982 "O proiskhozhdenii 'zatonuvshikh beregovykh linii' glyatsial'nykh shel'fov Severnoi Atlantiki" [On the Origin of "Sunken Coast Line" of the Glacial Shelves of the North Atlantic]. *Kolebaniya urovnya morei i okeanov za 15 000 let* [Fluctuations of the Levels of the Seas and Oceans during 15,000 Years], pp. 125–133. Moscow: Nauka.
- 1983 "Oledenenie kontinental'nykh shel'fov" [Glaciation of the Continental Shelves]. *Paleogeografiya* [Paleogeography], Vol. 1. Moscow: VINITI.

Grosval'd, M. G., et al.

- 1974 "Lednikovaya stadiya markhidavel't: dvoynoi serdzh Barentsevomorskogo lednikovogo shchita?" [The Markhidavelt Glacial Stage: A Double Surge of the Barents Sea Glacial Sheet?]. *MGI* [Materials of Glaciological Investigations] 24:173–188.

Guslitser, B. I., and P. Yu. Pavlov

- 1987 *O pervonachal'nom zaselenii severo-vostoka Evropy (novye dannye)* [On the Initial Settlement of Northeastern Europe (New Data)]. Syktyvkar. Issue 132.
- 1988 "Verkhnepaleoliticheskaya stoyanka Medvezh'ya peshchera (novye dannye)" [The Upper Paleolithic Site of Medvezh'ya Cave (New Data)]. *MAESV, II* [Materials on the Archaeology of the European Northeast, 11] 5–18. Syktyvkar.

Harrison, J. A.

- 1954 "The Saghalien Trade: A Contribution to Ainu Studies." *Southwestern Journal of Anthropology* 10:278–293.

Istoriya Dal'nego Vostoka. . .

- 1989 *Istoriya Dal'nego Vostoka SSSR s drevneishikh vremen do XVII veka* [The History of the Far East of the USSR from Earliest Times to the 17th Century]. Moscow: Nauka.

Ivanov, G. V.

- 1991 "Stoyanka kamennogo veka na o. Vaigach" [A Stone Age Site on Vaigach Island]. *Problemy izucheniya istoriko-kul'turnoi sredy Arktiki* [Problems of the Study of the Historical-Cultural Environment of the Arctic], pp. 113–119. Moscow.
- 1993 "Nakhodki kamennykh orudii na ostrovakh Evropeiskoi Arktiki (1989–1992)" [Finds of Stone Tools on the Islands of the European Arctic (1989–1992)]. *AD POLUS*, pp. 47–50. St. Petersburg: Izd-vo FARN.

Ivanov, S. V.

- 1954 *Materialy po izobrazitel'nomu iskusstvu narodov Sibiri XIX–nachala XX vv.* [Materials on Representational Art of the Peoples of Siberia in the 19th–Beginning of the 20th Centuries]. Moscow-Leningrad: Izd-vo AN SSSR.

- 1955 “K voprosu o znachenii izobrazhenii na starinnykh predmetakh kul'ta u narodov Sayano-Altai-kogo nagor'ya” [On the Question of the Meaning of Images on Old Cult Objects among Peoples of the Sayano-Altai Highlands]. *Sb. muzeya antropologii i etnografii* [Collections of the Museum of Anthropology and Ethnography]. Moscow-Leningrad: Izd-vo AN SSSR. 16:165–264.
- 1957 “K semantike izobrazhenii na starinnykh buryatskikh ongonakh” [On the Semantic of Old Buryat Spirit Images]. *Sb. muzeya antropologii i etnografii* [Collections of the Museum of Anthropology and Ethnography]. Moscow-Leningrad: Izd-vo AN SSSR. 17:95–150.
- 1963 *Ornament narodov Sibiri kak istoricheskii istochnik* [Decoration of Peoples of Siberia as a Historical Source]. Moscow, Leningrad: Izd-vo AN SSSR.
- 1970 *Skul'ptura narodov severa Sibiri XIX–pervoi poloviny XX v.* [The Sculpture of Peoples of Northern Siberia in the 19th–First Half of the 20th Century]. Leningrad: Nauka.
- Jochelson, W. I.
- 1908 “Drevnie i sovremennye podzemnye zhilishcha plemen Severo-Vostochnoi Azii i Severnoi Ameriki” [Ancient and Modern Semisubterranean Dwellings of Tribes of Northeast Asia and North America]. *Ezhegodnik RAO* [Annual of RAO], Vol. 2. St. Petersburg.
- 1926 “The Yukaghir and the Yukaghirized Tungus. The Jesup North Pacific Expedition 9.” *Memoirs of the American Museum of Natural History*. New York: Leiden.
- Kabo, V. D.
- 1984 “U istokov religii” [At the Sources of Religion]. *Priroda* [Nature] 3:96–102.
- Kanivets, V. I.
- 1976 *Paleolit Krainego Severo-Vostoka Evropy* [The Paleolithic of the Extreme Northeast Europe]. Moscow: Nauka.
- Kaplina, T. V., and V. A. Lozhkin
- 1982 “Istoriya razvitiya Primorskikh nizmennostei Yakutii v golotsene” [The History of the Development of the Maritime Lowlands of Yakutia in the Holocene]. *Razvitie prirody territorii SSSR v pozdnem pleistotsene i golotsene* [Development of Nature in the Territory of the USSR in the Late Pleistocene and Holocene], pp. 207–220. Moscow: Nauka.
- Khaltsedony. . .*
- 1987 *Khaltsedony Severo-Vostoka SSSR* [Chalcedony of the Northeastern USSR]. V. I. Goncharov, M. E. Gorodinskii, G. F. Pavlov, and others. Moscow: Nauka.
- Khlobystin, L. P.
- 1977 “Nakhodki bliz g. Salekhard” [Finds near the City of Salekhard]. *KSIA* [Brief Reports of the Institute of Archaeology, Academy of Sciences of the USSR] 189:108–111.
- 1982 *Drevnyaya istoriya Taimyrskogo Zapolyar'ya i voprosy formirovaniya kul'tur Krainego Severa Evrazii* [The Early History of the Taimyr Polar Region and Questions of the Formation of Cultures of the Extreme North of Eurasia]. Avtoref.dis. ... dokt.ist. nauk [Abstract of Thesis for Doctorate in Historical Sciences]. Moscow.
- 1988 Otchet o polevykh issledovaniyakh Zapolyarnoi ekspeditsii v 1987 g. [Report on the Fieldwork of the Polar Expedition of 1987]. Leningrad (Arkhiv IIMK RAN [Archive of the Institute of the History of Material Culture, Russian Academy of Sciences]).

Kind, N. V.

- 1974 "Geokhronologiya pozdnego antropogena po izotopnym dannym" [The Geochronology of the Late Anthropogene Based on Isotope Data]. Tr. GIN AN SSSR [Works of the Geological Institute of the Academy of Sciences, USSR]. Issue 257.

Kind, N. V., et al.

- 1978 "Radiouglerodnye daty GIN SSSR. Soobshchenie IX. Aziatskaya chast' SSSR: Zapadnyi Taimyr" [Radiocarbon Dates of the Geological Institute of the USSR. Report IX. The Asian Part of the USSR: The Western Taimyr]. *BKICHP* [Bulletin of the Committee for the Study of the Quaternary Period] 48:191–199.
- 1981 "Radiouglerodnye daty GIN SSSR. Soobshchenie X" [Radiocarbon Dates of the Geological Institute of the USSR. Report X]. *BKICHP* [Bulletin of the Committee for the Study of the Quaternary Period] 51:184–189.

King, M. L., and S. B. Slobodin

- 1994 "Terminal Pleistocene Occupation of the Kheta Site, Upper Kolyma Region, Northeastern Russia." *Current Research in the Pleistocene* 2:138–140.
- 1996 "A Fluted Point from the Uptar Site, Northeastern Siberia." *Science* 273:634–636.

Kir'yak, M. A.

- 1979 "Pervye mezoliticheskie i neoliticheskie stoyanki Zapadnoi Chukotki (oz. Tytyl' v verk-hov'yakh Malogo Anyuya)" [The First Mesolithic and Neolithic Sites of Western Chukotka (Lake Tytyl' on the Upper Reaches of the Malyi Anyui)]. *Novye arkheologicheskie pamyatniki Severa Dal'nego Vostoka* [New Archaeological Sites of the Northern Far East], pp. 39–52. Magadan.
- 1988 "Mezoliticheskaya stoyanka na ozere Tytyl'" [A Mesolithic Site on Lake Tytyl']. *Kraeved.zap.* [Regional Notes] 15:138–150.
- 1989 *Arkheologiya Zapadnoi Chukotki, Srednego i Nizhnego Prikolym'ya i nekotorye voprosy etnogeneza yukagirov* [Archaeology of Western Chukotka and the Middle and Lower Kolyma Area, and Some Questions of the Ethnogenesis of the Yukagir]. Avtoref.dis. . . . kand. ist. nauk. [Abstract of Dissertation for Candidate in Historical Sciences]. Leningrad.
- 1993a *Arkheologiya Zapadnoi Chukotki v svyazi s yukagirskoi problemoi* [Archaeology of Western Chukotka in Connection with the Yukagir Problem]. Moscow: Nauka.
- 1993b "Miniatyurnaya kamennaya skul'ptura Zapadnoi Chukotki" [Miniature Stone Sculptures of Western Chukotka]. *Kraeved.zap.* [Regional Notes], Issue 19, pp. 29–49. Magadan: Kn. izd-vo.
- 1994 "Tytyl'—novyi mezoliticheskii pamyatnik Chukotki" [Tytyl'—A New Mesolithic Site of Chukotka]. *Vestnik DVO RAN* [Bulletin of the DVO RAN] 4:103–107.

Knuth, E.

- 1962 "A Report on the 1st Peary Land Expedition." *Polar Record* 6(44):209–214.

Kolosovskii, A. S., and S. V. Gorbunov

- 1980 *Arkheologicheskie pamyatniki Okhinskogo raiona* [Archaeological Sites of the Okha Region]. Okha.

Kononenko, N. A., A. V. Garkovik, and Kh. Kadzivara

- 1993 *Issledovanie dokeramicheskoi stoyanki Ustinovka-3 v Primor'e* [Investigation of the Pre-Ceramic Ustinovka-3 Site in Primor'e]. Vladivostok: Dal'nauka.

Kononenko, N. A., and O. A. Shubina

- 1991 "Khozyaistvo neoliticheskogo naseleniya Severnogo Sakhalina (po materialam raskopok poseleniya Imchin XII)" [The Economy of the Neolithic Population of Northern Sakhalin (Based on Materials from Excavations of the Imchin XII Site)]. *Kraeved.byul. Yuzhno-Sakhalinsk* [Yuzhno-Sakhalinsk Regional Studies Bulletin] 2:134–145.

Konopatskii, A. K.

- 1982 *Drevnie kul'tury Baikala (o. Ol'khon)* [Ancient Cultures of Baikal (Ol'khon Island)]. Novosibirsk: Nauka.

Kosarev, M. F.

- 1973 "Kolebanie klimata i chelovek v Zapadnoi Sibiri (II–I tys.do n.e.)" [The Fluctuation of Climate and Man in Western Siberia (2nd–1st Millennia B.C.)]. *Priroda* [Nature] 12:63–69.
- 1976 "Geograficheskaya sreda i neravnomernost' sotsial'no-ekonomicheskogo razvitiya raznykh raionov Zapadnoi Sibiri v pervobytnuyu epokhu" [The Geographic Environment and Irregularity of Socioeconomic Development of Different Regions of Western Siberia in the Primitive Era]. *Voprosy arkheologii Priob'ya* [Questions of Archaeology of Priob'e]. Tyumen'. Issue 1.
- 1984 *Zapadnaya Sibir' v drevnosti* [Western Siberia in Antiquity]. Moscow: Nauka.
- 1986 "Ekologicheskie aspekty arkheologicheskogo issledovaniya" [The Ecological Aspects of Archaeological Investigation]. *Paleoekonomika Sibiri* [The Paleoeconomics of Siberia], pp. 3–11. Novosibirsk: Nauka.

Kozyreva, R. V.

- 1967 *Drevnii Sakhalin* [Ancient Sakhalin]. Leningrad: Nauka.

Krashennnikov, S. P.

- 1949 *Opisanie zemli Kamchatki* [A Description of the Land of Kamchatka]. Moscow-Leningrad: GeografGIZ.

Krasnozhen, A. S., et al.

- 1982 "Verkhnechetvertichnye otlozheniya Yuzhnogo ostrova Novoi Zemli" [Upper Quaternary Deposits of South Island of Novaya Zemlya]. *Stratigrafiya i paleogeografiya pozdnego kainozoya Arktiki* [Stratigraphy and Paleogeography of the Late Cenozoic of the Arctic], pp. 40–52. Leningrad: Nauka.

Kreinovich, E. A.

- 1973 *Nivkhgu*. Moscow: Nauka.

Krupnik, I. I.

- 1989 *Arkticheskaya etnoekologiya* [Arctic Ethnoecology]. Moscow: Nauka.

Laukhin, S. A., et al.

- 1989 "Vozrast poslednego oledeneniya na severe Vostochnoi Chukotki" [The Age of the Last Glaciation in the North of Eastern Chukotka]. *Izv.AN SSSR.Ser. geol.* [Bulletin of the Academy of Sciences, USSR. Geological Series] 3:136–140.

Lebedintsev, A. I.

- 1980 "O proiskhozhdenii uglublennykh zhilishch Severa Dal'nego Vostoka" [On the Origin of Semisubterranean Dwellings of the Northern Far East]. *Noveishie dannye po arkheologii Severa Dal'nego Vostoka: (materialy SVAKAE)* [The Most Recent Data on the Archaeology of the Northern Far East: (Materials of the SVAKAE)], pp. 69–78. Magadan.
- 1990 *Drevnie primorskie kul'tury Severo-Zapadnogo Priokhot'ya*. Leningrad: Nauka. (Published in English as *Early Maritime Cultures of Northwestern Priokhot'e*. Anchorage, Alaska: Beringian Shared Heritage Program, National Park Service, 2000).
- 1992 "Drevnyaya stoyanka na ostrove Talan" [An Ancient Site on Talan Island]. *Pribrezhnye ekosistemy Severnogo Okhotomor'ya. Ostrov Talan* [Coastal Ecosystems of the Northern Sea of Okhotsk. Talan Island], pp. 215–222. Magadan: IBPS DVO RAN.
- 1993 "Pervyi morskoi pokhod russkikh zemleprokhodtsev vdol' severnogo poberezh'ya Okhotskogo morya" [The First Maritime Campaign of Russian Explorers along the North Coast of the Sea of Okhotsk]. *Kolyma* 12:25–28.
- 1995 "Motykleiskoe zimov'e" [The Motykleiskoe Winter Hut]. *Pamyatniki, pamyatnye mesta istorii i kul'tury Severo-Vostoka Rossii (Magadan. Obl. i Chukotka)* [Sites and Memorable Places in the History and Culture of Northeastern Russia (The Magadan Region and Chukotka)], pp. 89–91. Magadan: Kn. Izd-vo.

Leont'ev, V. V.

- 1976 *Po zemle drevnikh kerekov* [In the Land of the Ancient Kerek]. Magadan: Kn. izd-vo.
- 1983 *Etnografiya i fol'klor kerekov* [The Ethnography and Folklore of the Kerek]. Moscow: Nauka.

Leont'ev, V. V., and K. A. Novikova

- 1989 *Toponimicheskii slovar' Severo-Vostoka SSSR* [Toponymic Dictionary of the Northeastern USSR]. Magadan: Kn. izd-vo.

Levoshin, N. N.

- 1950 "Drevnyaya stoyanka v verkhov'yakh reki Yakitikiveem [An Ancient Site on the Upper Reaches of the Yakitikiveem River]. *KSIIMK* 30:196–198.

Lindenau, Ya. I.

- 1983 *Opisanie narodov Sibiri (pervaya polovina XVIII veka): Istoriko-etnograficheskie materialy o narodakh Sibiri i Severo-Vostoka* [A Description of the Peoples of Siberia (First Half of the 18th Century): Historical-Ethnographic Materials on the Peoples of Siberia and the Northeast]. Magadan: Kn. izd-vo.

Lotsiya. . .

- 1986 *Lotsiya Okhotskogo Morya* [Sailing Directions of the Sea of Okhotsk]. Moscow: Glavnoe upravlenie navigatsii i okeanografii Ministerstva oborony SSSR. Issue 2. Severnaya chast' morya.

Lozhkin, A. V.

- 1987 "Radiouglerodnoe datirovanie v geokhronologicheskikh i paleogeograficheskikh issledovaniyakh na Severo-Vostoke SSSR" [Radiocarbon Dating in Geochronological and Paleogeographic Investigations of the Northeastern USSR]. *Regional'naya geokhronologiya Sibiri i Dal'nego Vostoka* [Regional Geochronology of Siberia and the Far East], pp. 150–154. Novosibirsk: Nauka.

Magetti, M.

- 1982 "Phase Analysis and Its Significance for Technology and Origin." *Archaeological Ceramics*, pp. 121–133. Washington, D.C.: Smithsonian Institution Press.

Makeev, V. M.

- 1983 "Istoriya prilednikovykh ozer Severnoi Zemli" [The History of Periglacial Lakes of Severnaya Zemlya]. *Istoriya ozer v SSSR* [The History of Lakes in the USSR] 1:122, 123. Tallinn.

Makeev, V. M., et al.

- 1979 "Vozrast mamontov Severnoi Zemli i nekotorye voprosy paleogeografii pozdnego pleistotsena" [The Age of the Mammoths of Severnaya Zemlya and Some Questions of Paleogeography of the Late Pleistocene]. *DAN SSSR* [Reports of the Academy of Sciences of the USSR] 245(2):421–424.

- 1989 "Stratigrafiya, geokhronologiya i paleogeografiya pozdnego pleistotsena i golotsena o. Kotel'nyi" [Stratigraphy, Geochronology, and Paleogeography of the Late Pleistocene and Holocene of Kotel'nyi Island]. *BKICHP* [Bulletin of the Committee for the Study of the Quaternary Period] 58:58–69.

Makeev, V. M., and V. V. Pitul'ko

- 1991 "Novye dannye o prirodnykh usloviyakh v kontse pozdnego pleistotsena—nachale golotsena v vysokoshirotnoi aziatskoi Arktike i vremeni ee zaseleniya drevnim chelovekom" [New Data on the Natural Conditions at the End of the Late Pleistocene—Beginning of the Holocene in the High-Latitude Asian Arctic and the Time of Its Settlement by Early Man]. *DAN SSSR* [Reports of the Academy of Sciences, USSR] 319(2):435–437.

Malyukovich, V.

- 1972 "V khrame kita rastet golubika" [In the Temple of the Whale Grow Blueberries]. *Kamchatskii komsomolets* [The Kamchatka Young Communist League]. 19 September.

Mamonova, N. N., and L. D. Sulerzhitskii

- 1989 "Opyt datirovaniya po ^{14}C pogrebenii Pribaikal'ya epokhi golotsena" [An Experience in Dating Burials of the Pribaikal'e of the Holocene Period by ^{14}C]. *SA* 1:19–32.

Markov, K. K., and A. A. Velichko

- 1967 *Chetvertichnyi period* [The Quaternary Period]. Moscow: Nauka.

Mezolit. . .

- 1989 *Mezolit SSSR* [Mesolithic of the USSR]. Moscow: Nauka.

Miyata, E.

- 1995 "The Incipient Period of Pottery in Southern Kyushu." *Toadzia Kekutonodoku no kiyaen* [The Origin of Ceramics in Eastern Asia], pp. 129–133. Sendai: Tohoku Fukushi Press.

Mochanov, Yu. A.

- 1969 *Mnogosloinaya stoyanka Bel'kachi I i periodizatsiya kamennogo veka Yakutii* [The Multicomponent Bel'kachi I site and Periodization of the Stone Age of Yakutia]. Moscow: Nauka.

- 1972 "Issledovaniya paleolita na Indigirke, Kolyme i zapadnom poberezh'e Okhotskogo Morya" [Investigations of the Paleolithic on the Indigirka, Kolyma, and the Western Coast of the Sea of Okhotsk]. *AO 1971* [Archaeological Discoveries 1971]. Moscow: Nauka.

- 1977 *Drevneishie etapy zaseleniya chelovekom Severo-Vostochnoi Azii* [The Most Ancient Stages of Settlement by Man of Northeast Asia]. Novosibirsk: Nauka.

Mochanov, Yu. A., and S. A. Fedoseeva

- 1980 "Osnovnye itogi arkheologicheskogo izucheniya Yakutii" [The Primary Sources of Archaeological Study of Yakutia]. *Novoe v arkheologii Yakutii* [News in the Archaeology of Yakutia], pp. 3–13. Yakutsk: YaF SO AN SSSR.

Neolit . . .

- 1991 *Neolit yuga Dal'nego Vostoka: drevnee poselenie v peshchere Chertovy Vorota* [The Neolithic of the Southern Far East: An Early Site in Chertovy Vorota Cave]. Moscow: Nauka.

Okladnikov, A. P.

- 1950a "Pervyi neoliticheskii pamyatnik Chukotskogo poluostrova" [The First Neolithic Site of the Chukchi Peninsula]. *KSIIMK* 30:193–195.

- 1950b *Neolit i bronzovyi vek Pribaikal'ya: (istoriko-arkheologicheskoe issledovanie)* [The Neolithic and Bronze Age of Pribaikal'e (Historical-Archaeological Investigations)]. Moscow, Leningrad: Izd-vo AN SSSR. Pt. 1 & 2 (MIA.1950.N 18).

- 1955 *Neolit i bronzovyi vek Pribaikal'ya* [The Neolithic and Bronze Age of Pribaikal'e]. Moscow-Leningrad: Izd-vo AN SSSR. Pt. III (Glazkovskoe vremya [Glazkov Times]).

Orekhov, A. A.

- 1984 "Zhilishche drevnekoryakskogo poseleniya Atargan" [An Old Koryak Dwelling of the Atartan Site]. *Kraeved.zap.MOKM* [Regional Notes of the MOKM] 13:64–72.

- 1987 *Drevnyaya kul'tura Severo-Zapadnogo Beringomor'ya* [An Ancient Culture of the Northwestern Bering Sea]. Moscow: Nauka. (Published in English as *Early Culture of the Northwestern Bering Sea*. Anchorage, Alaska: Beringian Shared Heritage Program, National Park Service, 1999).

- 1988 "Problema etnokul'turnoi prinadlezhnosti kompleksov poseleniya Russkaya Koshka (Anadyrskii raion)" [The Problem of Ethnocultural Association of Complexes of the site of Russkaya Koshka (Anadyr Region)]. *Problemy arkheologii Severnoi Azii* [Problems of Archaeology of Northern Asia], pp. 144–146. Chita.

- 1989 "Drevnee poselenie Russkaya Koshka I na poberezh'e Anadyrskogo limana" [The Ancient Site of Russkaya Koshka I on the Coast of the Anadyr Estuary]. *Drevnie kul'tury Dal'nego Vostoka SSSR (Arkheologicheskii poisk)* [Ancient Cultures of the Far East of the USSR (Archaeological Investigations)], pp. 25–29. Vladivostok: DVO AN SSSR.

Orlova, E. P.

- 1964 "Nozhi gilyakov" [Knives of the Gilyak]. *Arkheologiya i etnografiya Dal'nego Vostoka* [Archaeology and Ethnography of the Far East], pp. 223–239. Novosibirsk: Red.-izd. otdel SO AN SSSR.

Pelikh, G. I.

- 1972 *Proiskhozhdenie sel'kupov* [The Origin of the Selkup]. Tomsk: Izd-vo Tomskogo un-ta.

Pika, A. I.

- 1992 “Zhivushchie u reki Poitovayam” [Those Living along the Poitovayam River]. *Sto narodov, sto yazykov* [One Hundred Peoples, One Hundred Languages], pp. 181–189. Moscow: Prosveshchenie.

Pitul'ko, V. V.

- 1988 “Novye stoyanki s kamennym inventarem na Krainem Severo-Vostoke Evropeiskoi chasti SSSR” [New Sites with a Stone Inventory in the Extreme Northeast of the European Part of the USSR]. *KSIA* [Brief Reports of the Institute of Archaeology, Academy of Sciences of the USSR] 193:46–51.
- 1992 “K otsenke vozrasta paleoliticheskikh mestonakhozhdenii Vostochnoi Chukotki” [On Assessment of the Age of the Paleolithic Sites of Eastern Chukotka]. *Petr Alekseevich Kropotkin—gumanist, uchenyi, revolyutsioner. Rossiiskaya nauch.konf.: Sb. tez.* [Petr Alekseevich Kropotkin—Humanist, Scholar, Revolutionary. Russian Science Conference: Collection of Abstracts], pp. 79–82. Chita: Izd-vo Chit. pedin-ta.
- 1993 “An Early Holocene Site in the Siberian High Arctic.” *Arctic Anthropology* 30(1):13–21.
- 1996 “Pozднеpleistotsenovye-rannegolotsenovye drevnosti Severo-Vostochnoi Azii: obzor dannykh” [Late Pleistocene-Early Holocene Antiquities of Northeast Asia: Data Review]. *Arkheologicheskie issledovaniya na Severe Dal'nego Vostoka (po dannym Severo-Vostochno-Aziatskoi kompleksnoi arkheologicheskoi ekspeditsii)* [Archaeological Investigations in the Northern Far East (Based on Data from the Northeast Asian Interdisciplinary Archaeological Expedition)], pp. 5–16. Magadan.

Pitul'ko, V. V., and V. M. Makeyev

- 1991 “Ancient Arctic Hunters.” *Nature* 349(6308):374.

Pokhialainen, V. P.

- 1979 “Pervorechenskaya drevnekoryakskaya stoyanka na r. Penzhine” [A Pervorechenskaya Old Koryak Site on the Penzhina River]. *Novye arkheologicheskie pamyatniki Severa Dal'nego Vostoka* [New Archaeological Sites of the Northern Far East], pp. 148–152. Magadan: SVKNII DVNTs AN SSSR.

Ponkratova, I. Yu.

- 1996 “Keramika drevnekoryakskoi kul'tury (p-ov Koni, mys Alevina)” [Ceramics of the Old Koryak Culture (Koni Peninsula, Cape Alevina)]. *Arkheologiya, paleoekologiya i etnologiya Sibiri i Dal'nego Vostoka: Tez. dokl. k XXXVI RASK* [Archaeology, Paleoecology, and Ethnology of Siberia and the Far East: Abstracts of Reports to the 36th RASK], Pt. 2, pp. 160–163. Irkutsk.

Ponkratova, I. Yu., and N. E. Savva

- 1996 “Tekhnologiya keramicheskogo proizvodstva Severo-Vostochnoi Azii (predvaritel'nye materialy). Tez. dokl. i soobshch. Mezhdunar. nauch. konf. “Dal'nii Vostok v kontekste mirovoi istorii: ot proshlogo k budushchemu” [Abstracts of Reports for the International Science Conference “The Far East in the Context of World History: From Past to Future”], pp. 97, 98. Vladivostok.

Ponomarenko, A. K.

- 1985 *Drevnyaya kul'tura itel'menov Vostochnoi Kamchatki* [The Ancient Culture of the Itel'men of Eastern Kamchatka]. Moscow: Nauka.

- 1987a Otchet ob arkheologicheskikh razvedkakh na zapadnom poberezh'e Kamchatki v 1987 g. (bassein r. Kovran) [Report on Archaeological Surveys on the Western Shore of Kamchatka in 1987 (Kovran River Basin)]. Petropavlovsk-Kamchatskii.
- 1987b Otchet ob arkheologicheskikh razvedkakh na Zapadnoi Kamchatke v Tigil'skom raione Kamchatskoi oblasti v 1986 g. (basseiny rek Tikhaya, Khairyuzova) [Report on Archaeological Surveys in Western Kamchatka in the Tigil' Region of the Kamchatka District in 1986 (Basins of the Tikhaya and Khairyuzova Rivers)]. Petropavlovsk-Kamchatskii.
- 1988a Otchet ob arkheologicheskikh razvedkakh Zapadno-Kamchatskogo otryada Severo-Vostochno-Aziatskoi kompleksnoi arkheologicheskoi ekspeditsii v basseine r. Utkholok [Report on Archaeological Surveys by the West Kamchatka Crew of the Northeast Asian Interdisciplinary Archaeological Expedition in the Basin of the Utkholok River]. Petropavlovsk-Kamchatskii.
- 1988b Otchet ob arkheologicheskikh razvedkakh Zapadno-Kamchatskogo otryada Severo-Vostochno-Aziatskoi kompleksnoi arkheologicheskoi ekspeditsii v basseine r. Belogolovaya [Report on Archaeological Surveys by the West Kamchatka Crew of the Northeast Asian Interdisciplinary Archaeological Expedition in the Basin of the Belogolovaya River]. Petropavlovsk-Kamchatskii.
- 1989a "Stoyanka Bol'shoi Kamen"—pamyatnik razvitogo neolita Yuzhnoi Kamchatki" [The Bol'shoi Kamen' Site—A Site of the Developed Neolithic of Southern Kamchatka]. *Kraevedcheskie zapiski* [Regional Notes], Issue 6, pp. 119–154. Petropavlovsk-Kamchatski: Dal'nevost. kn. izd-vo.
- 1989b Otchet ob arkheologicheskikh razvedkakh na zapadnom poberezh'e Kamchatki v basseinakh rek Moroshechnaya i Sopochnaya, proizvedennykh Zapadno-Kamchatskim otryadom Severo-Vostochno-Aziatskoikompleksnoi arkheologicheskoi ekspeditsii SVKNII DVO AN SSSR v 1988 [Report on Archaeological Surveys on the West Coast of Kamchatka in the Basins of the Moroshechnaya and Sopochnaya Rivers, Conducted by the West Kamchatkan Crew of the Northeast Asian Interdisciplinary Archaeological Expedition of the NEISRI FED AS USSR in 1988]. Petropavlovsk-Kamchatskii.
- 1991 "Arkheologicheskie pamyatniki doliny r. Tigil' i ee pritokov—rek Napana i Kul'ki" [Archaeological Sites of the Tigil' River Valley and Its Tributaries—the Napana and Kul'ki Rivers]. *Kraeved.zap.* [Regional Notes] 7:16–44. Petropavlovsk-Kamchatskii.
- 1993 "Novye arkheologicheskie pamyatniki Yuzhnoi Kamchatki i poluostrova Lopatka (K voprosu ob obitanii ainov na Yuzhnoi Kamchatke)" [New Archaeological Sites of Southern Kamchatka and the Lopatka Peninsula (On the Question of the Ainu Inhabiting Southern Kamchatka)], Issue 8, pp. 3–136. *Kraeved. zap. Petropavlovsk-Kamchatskii* [Regional Notes of Petropavlovsk-Kamchatski].
- Popov, A. N.
- 1992 "Boismana II—keramicheskii kompleks rakovinnoi kuchi" [Boismana II—The Ceramic Complex of a Shell Heap]. *Arsen'evskie chteniya: tez. dokl.* [The Arsen'evskii Readings: Thesis Reports], pp. 201–203. Ussuriisk.
- Powers, W. R., T. E. Goebel, and N. H. Bigelow
- 1990 "Late Pleistocene Occupation at Walker Road: New Data on the Alaskan Nenana Complex." *Current Research in the Pleistocene* 7:40–43.

Pribrezhnye ekosistemy. . .

- 1992 *Pribrezhnye ekosistemy Severnogo Okhotomor'ya. Ostrov Talan* [Coastal Ecosystems of the Northern Sea of Okhotsk. Talan Island]. Magadan: IBPS DVO RAN.

Prokof'ev, M. M.

- 1986 *K voprosu o tipologicheskoi klassifikatsii kostyanykh nakonechnikov garpunov okhotskoi kul'tury* (Sakhalin, Kuril'skie ostrova) [On the Question of Typological Classification of Bone Harpoon Heads of the Okhotsk Culture (Sakhalin and the Kuril Islands)]. Yuzhno-Sakhalinsk.

Ptashinskii, A. V.

- 1989 "Novye stoyanki poberezh'ya Penzhinskoi guby" [New Sites of the Coast of Penzhina Bay]. *Kraeved.zap.* [Regional Notes], pp. 91–118. Petropavlovsk-Kamchatskii: Dal'nevost. kn. izd-vo.
- 1990 "Predvaritel'nye rezul'taty arkheologicheskoi razvedki na poluostrove Elistratova" [Preliminary Results of an Archaeological Survey on the Elistratov Peninsula]. *Drevnie pamyatniki Severa Dal'nego Vostoka* [Early Sites of the Northern Far East], pp. 87–99. Magadan: SVKNII DVO AN SSSR.

Religioznye. . .

- 1993 *Religioznye verovaniya: Svod etnograficheskikh ponyatii i terminov* [Religious Beliefs: A Set of Ethnographic Concepts and Terms]. Issue 5. Moscow: Nauka.

Rudenko, S.

- 1986 "Ostrov" [Island]. *Koryakskii kommunist* [The Koryak Communist]. 11 September.

Saiko, E. V., and I. S. Zhushchikhovskaya

- 1990 *Metody mikroskopii v issledovanii drevnei keramiki (Metodicheskie aspekty i praktika)* [Methods of Microscopy in the Study of Early Ceramics (Methodological Aspects and Practices)]. Vladivostok: DVO AN SSSR.

Sasaki, S.

- 1992 "Santan-koeki—torgovlya narodov Nizhnego Amura i Sakhalina v XVIII i XIX vekakh" [Santan-Koeki—The Trade of Peoples of the Lower Amur and Sakhalin in the 18th and 19th Centuries]. *B. O. Pilsudskii—issledovatel' narodov Sakhalina: Materialy Mezhdunar. nauch. konf.* [B. O. Pilsudskii—Investigator of Peoples of Sakhalin: Materials for the International Science Conference] 1:119–127. Yuzhno-Sakhalinsk.

Semenov, A. V.

- 1964 "O drevnei kul'ture Koryakskogo okruga" [On the Ancient Cultures of the Koryak District]. *Istoriya i kul'tura narodov Severo-Vostoka SSSR* [The History and Culture of the Peoples of the Northeast of the USSR], Issue 8, pp. 28–41. Magadan: SVKNII DVNTs AN SSSR.

Shcherbakova, N. M.

- 1980 "Arkheologicheskie pamyatniki Yany" [Archaeological Sites of the Yana]. *Novoe v arkheologii Yakutii* [News in the Archaeology of Yakutia], pp. 62–65. Yakutsk: YaF SO AN SSSR.

Shepard, A. O.

- 1965 *Ceramics for the Archaeologist*. Washington: Carnegie Institution.

Shrenk, L. I.

1899 *Ob inorodtsakh Amurskogo kraya* [On the Non-Russians of the Amur Territory]. Vol. 2. St. Petersburg.

1903 *Ob inorodtsakh Amurskogo kraya* [On the Non-Russians of the Amur Territory]. Vol. 3. St. Petersburg.

Shternberg, L. Ya.

1933 *Gilyaki, orochi, gol'dy, negidal'tsy, ainy* [The Gilyak, Orochi, Goldi, Negidal, and Ainu]. Khabarovsk.

1936 *Pervobytnaya religiya v svete etnografii* [Primitive Religion in Light of Ethnography]. Leningrad: Izd-vo Instituta narodov Severa TSIK SSSR.

Shubin, V. O.

1977 Lokal'nyi variant okhotskoi kul'tury na o. Sakhaline [A Local Variant of the Okhotsk Culture on Sakhalin Island]. Avtoref.dis. . . . kand. ist. nauk. [Abstract of Dissertation for Candidacy to Historical Sciences]. Novosibirsk.

1979 "Raskopki mnogoslonoogo poseleniya Ozersk I" [Excavations of the Multi-Component Ozersk I Site]. *Arkheologiya Amuro-Sakhalinskogo regiona* [Archaeology of the Amur-Sakhalin Region]. Vladivostok.

Shubina, O. A.

1986 "Zhilishcha aborigenov Severnogo Sakhalina po arkheologicheskim i etnograficheskim istochnikam" [Dwellings of the Natives of Northern Sakhalin Based on Archaeological and Ethnographic Sources]. *Materialy k izucheniyu istorii i etnografii naseleniya Sakhalinskoi oblasti* [Materials on the Study of the History and Ethnography of the Population of the Sakhalin District], pp. 5–22. Yuzhno-Sakhalinsk.

1991 "Arkheologicheskie issledovaniya poseleniya Bol'shaya Rechka 7 v Okhinskom raione Sakhalinskoi oblasti" [Archaeological Investigations of the Bol'shaya Rechka 7 Site in the Okha Region of the Sakhalin District]. *Kraeved.byul. Yuzhno-Sakhalinsk* [Yuzhno-Sakhalinsk Regional Studies Bulletin] 2:30–49.

1992 Otchet o polevykh arkheologicheskikh issledovaniyakh poseleniya Belokamennaya-chasi v 1992 g. [Report on Archaeological Field Investigations at the Belokamennaya-chasi Site in 1992]. Nauchnyi arkhiv SOKM [Science Archive of SOKM], op. 3, n. 119.

Shubina, O. A., and A. S. Kolosovskii

1988 "Arkheologicheskie razvedki v Okhinskom raione v 1988 g." [Archaeological Surveys in the Okha Region in 1988]. *Issledovaniya po arkheologii Sakhalina i Kuril'skikh ostrovov* [Investigations in the Archaeology of Sakhalin and the Kuril Islands], pp. 15–16. Yuzhno-Sakhalinsk.

Shumkin, V. Ya.

1988 "Mezolit Kol'skogo poluostrova" [The Mesolithic of the Kola Peninsula]. *SA* [Soviet Archaeology] 4:15–33.

Shyutt, V., et al.

1974 "O rasprostraneni pozднеpleistotsenovogo oledeneniya v Evropeiskoi Arktike" [On the Distribution of Late Pleistocene Glaciation in the European Arctic]. *Izv.AN SSSR.Ser. geogr.* [Bulletin of the Academy of Sciences of the USSR. Geographic Series] 5:112–119.

Simchenko, Yu. B.

- 1976 *Kul'tura okhotnikov na olenei Severnoi Evrazii* [The Culture of Deer Hunters of Northern Eurasia]. Moscow: Nauka.

Slobodin, S. B.

- 1988 "Novye neoliticheskie stoyanki Verkhnego Prikolym'ya (stoyanki na ozere Khurendzha)" [New Neolithic Sites in Upper Prikolym'e]. *Kraeved.zap.MOKM* [Regional Notes of the Magadan Provencial Regional Museum] 15:127–137. Magadan: Kn. izd-vo.
- 1993 "Novye arkheologicheskie pamyatniki Verkhnei Kolymy i Kontinental'nogo Priokhot'ya" [New Archaeological Sites of the Upper Kolyma and Continental Priokhot'e]. *Arkheologicheskie issledovaniya na Dal'nem Vostoke Rossii* [Archaeological Investigations in the Far East of Russia], pp. 26–33. Vladivostok: DVO RAN.
- 1994 "Tephrochronology of West-Beringian Archaeological Complexes." *Bridges of Science between North America and the Russian Far East* 2:41–42. Vladivostok: Dalnauka.
- 1995 Kamennyi vek Verkhnei Kolymy i Kontinental'nogo Priokhot'ya [The Stone Age of the Upper Kolyma and Continental Priokhot'e]. Avtoref.dis. ... kand.ist. nauk. [Author's abstract . . . candidate in historical sciences]. Novosibirsk.

Slobodin, S. B., and O. Yu. Glushkova

- 1992 "Stoyanka Kheta—pervyi stratifitsirovannyi verkhnepaleoliticheskii kompleks na Kolyme" [The Kheta Site—The First Stratified Upper Paleolithic Complex on the Kolyma]. *Paleoekologiya i rasselenie drevnego cheloveka v Severnoi Azii i Amerike* [Paleoecology and the Settlement of Ancient Man in Northern Asia and America], pp. 225–228. Krasnoyarsk.

Slobodin, S. B., and M. L. King

- 1996 "Uptar and Kheta: Upper Palaeolithic Sites of the Upper Kolyma Region." *American Beginnings*, pp. 236–244. Chicago-London: the University of Chicago Press.

Suda, R.

- 1995 "Some Aspects of Recent Research of the Transitional Period of Tohoku and Hokkaido, Northern Japan." *Toadzia kekutinodoku po kigaen* [The Origin of Ceramics in Eastern Asia], pp. 105, 106. Sendai: Tohoku Fukushi Press.

Taksami, Ch. M.

- 1961 "Seleniya, zhilye i khozyaistvennye postroiki nivkhov Amura i zapadnogo poberezh'ya o. Sakhalin" [Settlements and the Living and Economic Structures of the Nivkhi of the Amur and West Coast of Sakhalin Island]. *Sibirskii etnograficheskii sbornik* [Siberian Ethnographic Collection] 3:98–166. Moscow-Leningrad: Izd-vo AN SSSR.
- 1975 *Osnovnye problemy etnografii i istorii nivkhov* [The Primary Problems of the Ethnography and History of the Nivkhi]. Leningrad: Nauka.

Tomskaya, A. I.

- 1989 "Klimat pozdnelednikov'ya i golotsena Yakutii" [The Climate of the Late Glacial and Holocene of Yakutia]. *Paleoklimaty pozdnelednikov'ya i golotsena* [The Paleoclimate of the Late Glacial and Holocene of Yakutia], pp. 109–116. Moscow: Nauka.

Troitsky, L., J. M. K. Punning, G. Hutt, and R. Ragamae

- 1979 "Pleistocene Chronology of Spitzbergen." *Boreas* 8(4):401–407.

Ukrainitseva, V. V.

- 1982 “Prirodnaya sreda i usloviya gibeli mamonta v verkhnem techenii r. Yuribei (Gydanskii polu-ostrov)” [The Natural Environment and Conditions of Demise of the Mammoth on the Upper Course of the Yuribei River (Gydansk Peninsula)]. *Yuribeiskii mamont* [The Yuribey Mammoth], pp. 19–30. Moscow: Nauka.

Vandiver, P. B.

- 1987 “Sequential Slab Construction: Conservative Southwest Asiatic Ceramic Tradition, ca. 7000–3000 B.C.” *Paleorient* 13(2):9–35.

Vartanyan, S. L., V. E. Garutt, and A. V. Sher

- 1993 “Holocene Dwarf Mammoths from Wrangel Island in the Siberian Arctic.” *Nature* 362(6418):337–340.

Vasilevskii, A. A.

- 1990 Formirovanie okhotskoi kul’tury na Sakhaline [The Formation of the Okhotsk Culture on Sakhalin]. Avtoref.dis. . . . kand. ist. nauk. [Abstract of Dissertation for Candidacy to Historical Sciences]. Kemerovo.
- 1993 “Osobennosti istoriko-kul’turnykh protsessov v zone perekhoda ot materikovoi k ostrovnoi sushe (o. Sakhalin, epokha pervobytnosti)” [Features of Historical-Cultural Processes in the Transition Zone from Mainland to Island (Sakhalin Island, Primitive Period)]. *Kraeved.byul. Yuzhno-Sakhalinsk* [Yuzhno-Sakhalinsk Regional Studies Bulletin] 4:63–65.

Vasil’evskii, R. S.

- 1971 *Proiskhozhdenie i drevnyaya kul’tura koryakov* [The Origin and Ancient Culture of the Koryak]. Novosibirsk: Nauka.
- 1985 “Stoyanka Suvorovo 3 i ee mesto v kamennom veke Dal’nego Vostoka” [The Suvorovo 3 Site and Its Place in the Stone Age of the Far East]. *Kamennyi vek Severnoi, Srednei i Vostochnoi Azii* [The Stone Age of Northern, Central, and Eastern Asia], pp. 86–95. Novosibirsk: Nauka.
- 1986 “Primorskaya sistema khozyaistva: genezis i evolyutsiya” [The Coastal System of Economy: Genesis and Evolution]. *Paleoekonomika Sibiri* [Paleoeconomics of Siberia], pp. 12–28. Novosibirsk: Nauka.

Vasil’evskii, R. S., and S. A. Gladyshev

- 1989 *Verkhni paleolit Yuzhnogo Primor’ya* [The Upper Paleolithic of Southern Primor’e]. Novosibirsk: Nauka.

Vasil’evskii, R. S., and V. A. Golubev

- 1976 *Drevnie poseleniya na Sakhaline. Susuiskaya stoyanka* [Early Settlements on Sakhalin. The Susui Site]. Novosibirsk: Nauka.

Vdovin, I. S.

- 1965 *Ocherki istorii i etnografii chukchei* [Essays on the History and Ethnography of the Chukchi]. Moscow-Leningrad: Nauka.
- 1971 “Zhertvennye mesta koryakov i ikh istoriko-etnograficheskoe znachenie” [Sacrificial Places of the Koryak and Their Historical-Ethnographic Significance]. *Religioznye predstavleniya i obryady narodov Sibiri v XIX–nachale XX v.* [Religious Ideas and Ceremonies of Peoples of Siberia in the 19th–beginning of the 20th Century], pp. 275–299. Leningrad: Nauka.

- 1973 *Ocherki etnicheskoi istorii koryakov* [Essays on the Ethnic History of the Koryak]. Leningrad: Nauka.
- Velichko, A. A.
1973 *Prirodnyi protsess v pleistotsene* [Natural Process in the Pleistocene]. Moscow: Nauka.
- 1979 “Problemy rekonstruktsii pozднеpleistotsenovykh oledeneniya i lednikovyykh pokrovov na territorii SSSR” [Problems of Reconstruction of Late Pleistocene Glaciations and Glacial Covers in the Territory of the USSR]. *Izv. AN SSSR. Ser. geogr.* [Bulletin of the Academy of Sciences of the USSR. Geographic Series] 6:12–26.
- Velichko, A. A., et al.
1988 “Paleogeograficheskie rekonstruktsii poslednego oledeneniya v Severnom polusharii” [Paleogeographic Reconstruction of the Last Glaciation in the Northern Hemisphere]. *Chetvertichnaya paleoekologiya i paleogeografiya Severnykh morei* [Quaternary Paleo-Ecology and Paleogeography of the Northern Seas], pp. 27–43. Moscow: Nauka.
- Vereshchagin, N. K., and Yu. A. Mochanov
1972 “Samye severnye v mire sledy verkhnego paleolita (mestonakhozhdenie Berelekh v nizov'yakh Indigirki)” [The Northernmost in the World Traces of the Upper Paleolithic (The Berelekh Site on the Lower Reaches of the Indigirka)]. *SA* [Soviet Archaeology] 3:332–336.
- Vereshchagina, I. V.
1990 “Mezolit na Krainem Evropeiskom Severo-Vostoke” [The Mesolithic in the Extreme European Northeast]. *KSI* [Brief Reports of the Institute of Archaeology, Academy of Sciences of the USSR] 200:48–52.
- Verkhovskaya, N. B.
1993 “Rezultaty palinologicheskogo izucheniya pamyatnika Ustinovka-3” [Results of Palynological Study of the Ustinovka-3 Site]. *Issledovanie dokeramicheskoi stoyanki Ustinovka-3 v Primor'ye* [Investigation of the Pre-Ceramic Ustinovka-3 Site in Primor'ye]. N. A. Kononenko, A. V. Garkovik, Kh. Kadzivara, pp. 29–33. Vladivostok: Dal'nauka.
- Verkulich, S. R., et al.
1989 Stroenie i geokhronologiya chetvertichnykh otlozhenii o. Benneta” [Structure and Geochronology of Quaternary Deposits of Bennet Island]. *Geokhronologiya chetvertichnogo perioda: Tez. dokl. Vsesoyuzn.soveshch., prokhodivshego v Moskve 14–16 noyabrya 1989 g.* [Geochronology of the Quaternary Period: Abstracts of Reports of the All-Union Conference Held in Moscow on 14–16 November 1989], pp. 16, 17. Tallinn.
- Volokitin, A. S.
1986 “Novye dannye po mezolitu Evropeiskogo Severo-Vostoka SSSR” [New Data on the Mesolithic of the European Northeast of the USSR]. *MAESV, 10* [Materials on the Archaeology of the European Northeast, 10]. Pp. 22–34. Syktyvkar.
- Vorobei, I. E.
1992 “Druchak-V—novaya dokeramicheskaya stoyanka v Severnom Priokhot'e” [Druchak-V—A New Preceramic Site in Northern Priokhot'e]. *Paleoekologiya i rasselenie drevnego cheloveka v Severnoi Azii i Amerike* [Paleoecology and the Settlement of Ancient Man in Northern Asia and America], pp. 43–45. Krasnoyarsk: IAaE ND RAS.

Zapadnyi. . .

- 1852 “Zapadnyi bereg Kamchatki po opisyam Ushakova i Elistratova, 1742 i 1787 g.” [The Western Shore of Kamchatka Based on Descriptions of Ushakov and Elistratov, 1742 and 1787]. *Zapiski gidrograficheskogo departamenta Morskogo Ministerstva* [Reports of the Hydrographic Department of the Maritime Ministry], Pt. 10, pp. 136–155.

Zarudnyi, V. V.

- 1992 “Kratkoe fiziko-geograficheskoe opisanie ostrova Talan” [A Brief Physical-Geographic Description of Talan Island]. *Pribrezhnye ekosistemy Severnogo Okhotomor'ya. Ostrov Talan* [Coastal Ecosystems of the Northern Sea of Okhotsk. Talan Island], pp. 9–13. Magadan: IBPS DVO RAN.

Zhushchikhovskaya, I. S.

- 1988a “Syr'evoi faktor i traditsii keramicheskogo proizvodstva drevnikh kul'tur yuga Dal'nego Vostoka” [The Raw Material Factor and Traditions of Ceramic Production of the Early Cultures of the Southern Far East]. *Stratigrafiya i korrelyatsiya chetvertichnykh otlozhenii Azii i Tikhookeanskogo regiona* [Stratigraphy and the Correlation of Quaternary Deposits of Asia and the Pacific Ocean Region], pp. 119, 120. Vladivostok.
- 1988b “K kharakteristike obzhiga drevnei keramiki yuga Dal'nego Vostoka” [On the Characteristics of the Firing of Ancient Ceramics of the Southern Far East]. *Tekhnologiya drevnikh proizvodstv Dal'nego Vostoka* [The Technology of Early Productions of the Far East]. Vladivostok: DVO AN SSSR.
- 1990 *Goncharstvo drevnikh kul'tur yuga Dal'nego Vostoka SSSR kak sotsial'no-ekonomicheskoe yavlenie* [The Pottery Making of the Early Cultures of the Southern Far East of the USSR as a Socioeconomic Phenomenon]. Vladivostok.
- 1991 “Neoliticheskaya keramika s organicheskoi primes'yu na pamyatnikakh yuga Dal'nego Vostoka” [Neolithic Ceramics with Organic Temper in Sites of the Southern Far East]. *Kraeved. byul. Yuzhno-Sakhalinsk* [Yuzhno-Sakhalinsk Regional Studies Bulletin] 2:150–155.
- 1996 “Arkheologicheskaya keramika kak etnokul'turnyi indikator: metodicheskii aspekt” [Archaeological Ceramics as an Ethnocultural Indicator: Methodological Aspect]. *Tez.dokl. i soobshch. Mezhdunar.nauch. konf. “Dal'nii Vostok v kontekste mirovoi istorii: ot proshlogo k budushchemu”* [Abstracts of Reports for the International Science Conference “The Far East in the Context of World History: From Past to Future”], pp. 96–97. Vladivostok.

Zhushchikhovskaya, I. S., and B. L. Zalishchak

- 1990 “Voprosy izucheniya syr'ya i formovochnykh mass drevnei keramiki yuga Dal'nego Vostoka” [Questions in the Study of Raw Material and the Modeling Mass of Early Ceramics of the Southern Far East]. *Drevnyaya keramika Sibiri: tipologiya, tekhnologiya, semantika* [Ancient Ceramics of Siberia: Typology, Technology, and Semantics], pp. 144–157. Novosibirsk: Nauka.

Zubakov, V. A.

- 1972 *Paleogeografiya Zapadno-Sibirskoi nizmennosti v pozdnem pleistotsene i golotsene* [Paleogeography of the West Siberian Lowland in the Late Pleistocene and Holocene]. Leningrad: Nauka.

Zubov, A. A.

- 1968 *Odontologiya* [Odontology]. Moscow: Nauka.
- 1973 *Etnicheskaya odontologiya* [Ethnic Odontology]. Moscow: Nauka.

ABBREVIATIONS

AN—Akademiya nauk [Academy of Sciences].

AO—Arkheologicheskie otkrytiya [Archaeological Discoveries].

BKICbP—Byulleten' Komiteta izucheniya chetvertichnogo perioda [Bulletin of the Committee for the Study of the Quaternary Period].

ChOKM—Chukotskii okružnoi kraevedcheskii muzei [Chukotka District Regional Museum].

DAN—Doklady Akademii nauk SSSR [Reports of the Academy of Sciences of the USSR].

DVNTs—Dal'nevostochnyi nauchnyi tsentr [Far East Science Center].

DVO—Dal'nevostochnoe otделение [Far Eastern Division].

GIN—Geologicheskii institut [Geology Institute].

IBPS—Institut biologicheskikh problem Severa [Institute of Biological Problems of the North].

IG—Institut geografii AN SSSR [Institute of Geography, Academy of Sciences, USSR].

IGAN—Institut geografii, Akademii nauk [Institute of Geography, Academy of Sciences].

IIMK—Institut istorii material'noi kul'tury [Institute of the History of Material Culture].

KOKM—Kamchatskii oblastnoi kraevedcheskii muzei [Kamchatka District Regional Museum].

KSIA—Kratkie soobshcheniya Instituta arkheologii AN SSSR [Brief Reports of the Institute of Archaeology, Academy of Sciences, USSR].

KSIIMK—Kratkie soobshcheniya Instituta istorii material'noi kul'tury AN SSSR [Brief Reports of the Institute of the History of Material Culture, Academy of Sciences, USSR].

LGU—Leningradskii gosudarstvennyi universitet [Leningrad State University].

LOIA—Leningradskoe otделение Instituta arkheologii [Leningrad Division of the Institute of Archaeology].

MAE—Muzei antropologii i etnografii [Museum of Anthropology and Ethnography].

MAESV—Materialy po arkheologii Evropeiskogo Severo-Vostoka [Materials on the Archaeology of the European Northeast].

MGI—Materialy glyatsiologicheskikh issledovaniy [Materials of Glaciological Investigations].

MIA—Materialy i issledovaniya po arkheologii SSSR [Materials and Investigations of the Archaeology of the USSR].

MOKM—Magadanskii oblastnoi kraevedcheskii muzei [Magadan District Regional Museum].

RAN—Russkaya akademiya nauk [Russian Academy of Sciences].

RASK—Regional'naya arkheologicheskaya studencheskaya konferentsiya [Regional Archaeological Student Conference].

SA—Sovetskaya arkheologiya [Soviet Archaeology].

SO—Sibirskoe otделение [Siberian Division].

SOKM—Sakhalinskii oblastnoi kraevedcheskii muzei [Sakhalin District Regional Museum].

SSSR—Soyuz Sovetskikh Sotsialisticheskikh Respublik [USSR].

SVAKAE—Severo-Vostochno-Aziatskaya kompleksnaya arkheologicheskaya ekspeditsiya [Northeast Asian Interdisciplinary Archaeological Expedition].

SVKNII—Severo-Vostochnyy kompleksnyi nauchno-issledovatel'skii institut Akademii nauk [Northeastern Interdisciplinary Scientific Research Institute].

VINITI—Vsesoyuznyi institut nauchnoi i tekhnicheskoi informatsii [All-Union Institute of Science and Technical Information].

VSEGEI (LG)—Vsesoyuznyi nauchno-issledovatel'skii geologicheskii institut (Leningradskaya guberniya [All-Union Science Research Geological Institute (Leningrad)]).

YaF—Yakutskii filial [Yakutsk Branch].

