SUMMARY AND CONCLUDING REMARKS

Ancient man, his environment, culture, and adaptation strategies—all these research directions have been traditional for Stone Age archaeology for a long time. They are especially important for the archaeology of the Arctic regions. It can be said that the history of human occupation of the Arctic from the very beginning has been strongly influenced by the peculiarities of the local Pleistocene and Holocene environments.

The most important goal of this book is to present the data obtained from the unique Mesolithic site on Zhokhov Island and show its significance for the archaeology of the Arctic. This is the oldest site known in the high Arctic regions. These lands are sparsely populated even now while the site gives evidence of human habitation as far back as 8,000 years ago. This case of Arctic prehistory gave rise to new and interesting questions that cannot be answered without discussing a number of broader problems such as the development of the Late Quaternary environment in the Arctic, the timing of initial human migrations into arctic regions, and the historical dynamics of human adaptations in Arctic environments.

At the same time, it is important to give an overview of the history of archaeological work in the Russian Arctic. This work has an unexpectedly long history that started more than 200 years ago when Captain Sarychev began excavations at an Eskimo site some forty kilometers east of the Kolyma River estuary, near Cape Bolshoy Baranov. This happened on the 22nd of July, 1787, and became the day when Arctic archaeology was born. Moreover, this is also the birth date of Russian field archaeology as a whole.

Interestingly, the site was revisited and investigated by A.P. Okladnikov in the middle of the 20th century. This tells about the stability of the coast line for almost 200 years, which is quite unexpected since coastal dynamics in the Arctic regions are thought to be very high. Thus, in the New Siberian Islands, on banks where permafrost is exposed, it easily amounts to dozens of meters per year.

The history of Arctic archaeology in Russia, reviewed in the first chapter of this book, clearly falls into three major periods. The first is characterized by occasional collecting of archaeological materials by travelers, amateur archaeologists, etc., and by very rare archaeological field research projects. This period lasted for more than 100 years and ended roughly with the beginning of World War I (A.I. Schtukenberg, A.V. Zhuravsky, N.A. Kulik, N.I. Popov, A. Argentov). It is worthy of note that many fundamental ideas, which became the basis for archaeological and paleoenvironmental research in the Siberian Arctic, were put forward as early as this time (I.D. Chersky, W.I. Jochelson, A.Y. Tugarinov, V.K. Arsenyev, M.M. Yermolaev). It must be stressed that the most prominent ideas in the geology, paleogeography, and archaeology of Arctic Siberia advanced at the beginning of the 20th century were based primarily on results produced by the expeditions of Baron Edward Toll, one of the most famous Russian Arctic researchers.

The second period is much shorter, covering the 1920s–1950s. In fact, this is an extension of the first period, especially in the style of research activities: sporadic research projects, occasional collecting, with the most important role being played by metropolitan professionals primarily

from St. Petersburg (Leningrad). These projects brought important results which determined basic ideas and directions for future work in the Russian Arctic (B.F. Zemlyakov, M.E. Foss, N.N. Gurina, V.N. Chernetsov, A.P. Okladnikov).

The third period, the onset of which is connected with the appearance of regional research centers, is characterized by long-term research projects carried out in many Arctic regions such as the Kola Peninsula, the Taimyr, Sakha Republic, and the Chukchee Peninsula. These favorable changes in the development of Arctic archaeology took place in the 1970s-1980s but were terminated by the collapse of the Soviet/Russian economy in the 1990s. For the past twenty years no systematic research in the Russian Arctic has been done, with the exception of certain areas. However, even in times of the successful development of Arctic archaeology less has been accomplished than could have been because of poor coordination, unclear research priorities, and insufficient funding. All these problems have recently been complicated by negative tendencies in the economy and still exist.

If during the first two periods the archaeological studies of the Arctic were primarily associated with the activities of St. Petersburg (Leningrad) scientists and to a lesser extent their colleagues from Moscow, the third period is related mainly with the formation of regional research groups in Arkhangelsk, Syktyvkar, Yakutsk, and Magadan. But still, long-term projects were carried out on the Kola Peninsula (N.N. Gurina, V.Y. Shumkin), the Taimyr, and in the far northeastern part of European Russia (L.P. Khlobystin). Because of a large amount of non-archaeological research activity in the1960s and 1970s, a plethora of non-professional collections were delivered from different regions. Collecting of a more or less systematic character was done by geologist G.A. Chernov in the northeastern part of European Russia. In Yamal and adjacent areas several important research projects were done by A.V. Golovnev, N.V. Fedorova, and W.W. Fitzhugh. In Arctic Siberia a series of field projects conducted by N.N. Dikov, Y.A. Mochanov, and S.A. Fedoseeva, then by M.M. Bronstein and K.A. Dneprovsky, S.V. Gusev, S.B. Slobodin, and V.V. Pitulko should be also mentioned.

But clearly all activities in field archaeological research in the Russian Arctic began to decrease in 1991 because of the collapse of the Soviet Union and economic problems. In addition, a number of leading scientists passed away (N. N. Dikov, N. N. Gurina, L. P. Khlobystin) at the end of the 1980s and the early 1990s.

It can be concluded that during the time of fruitful research activity in the Russian Arctic (chiefly in the 1960s through the 1980s) almost all areas were preliminarily studied. That provided a sort of pilot knowledge for most of the regions of the Russian Arctic. However, many of them remain studied only in minimal degree. Thus, North European Russia, including the Kola Peninsula, have the longest history of research, while most of Arctic Siberia—Yamal, the northern areas of Western Siberia, the Taimyr Peninsula, and Northeast Siberia (except for Chukotka to a certain degree), in which archaeological research began in 1960s and 1970s—still remains poorly studied.

Most of the islands within the Russian Arctic remained unexplored even at the end of the 20th century. Some of them were surveyed in the mid-1970s (the discovery of the Devil's Gorge

site on Wrangel Island by N.N. Dikov) and in the second half of the 1980s when Stone Age sites were discovered in Vaigach Island (V.V. Pitulko and G.I. Ivanov) on the boundary of Barents and Kara Seas, and then on Zhokhov Island in the New Siberian Islands (V.V. Pitulko). These data provide a background for a new approach to the questions of human migrations into the High Arctic and cultural evolution in Arctic regions, as well as trace back the history of human adaptations in the Arctic.

To my knowledge, about 1,300 archaeological sites were known in the Russian Arctic in the early 1990s. That includes archaeological materials of past 10,000 years, and logically, most of them belong to the more recent times. It should be also stressed that the different areas of the Russian Arctic have been studied very unevenly. Blank spots alternate with studied areas. Some territories, such as the Kola Peninsula and to some extent the Taimyr, are well studied, while others, such as the far Northwest Siberia, either have never been surveyed or have yielded very poor and fragmentary data. Northeast Asia and the northern portion of European Russia have very specific taphonomic conditions determined by local geological processes and the nature of the matrix sediments. Thus, many sites have been redeposited; there are many mixed assemblages or non-diagnostic contexts. And even if it can be said that there has been great progress in Arctic archaeology in Russia, compared to the first half of the 20th century, the archaeology of the Stone Age in the Arctic has still not advanced far beyond the starting point.

However, the information acquired during these explorations was enough to raise the most important research questions, such as the time of initial human migrations to the Arctic regions of Eurasia, their connection with environmental changes, cultural evolution in the Arctic, and the history of human adaptations in the Arctic. There is no doubt that paleoenvironmental changes played the most important role in these processes.

An overview of the Late Pleistocene and Holocene environmental dynamics in the Arctic is presented in Chapter II from the point of view of the problem of initial human occupation of this region. Special attention is given to the period of the last glaciation in the Late Pleistocene. It is generally recognized that land glaciation is extremely interesting, and not just as a natural phenomenon itself, affecting climatic and environmental changes in the enormous territories of both hemispheres, the evolution of flora and fauna, and a cause of global ecological changes, but as important factor, or even one of the most important, affecting human culture, migrations, and peopling of the globe.

Availability of certain areas of the Arctic for occupation by the early people is a key limiting factor that makes a difference in the timing of the first migrations into the Arctic regions. There are two zones with very different features of environmental evolution and, respectively, different possibilities for humans to explore and populate them. Although many details still remain to be clarified, these questions are more or less solved for Scandinavia/the Kola Peninsula. It is supposed that the area became populated as early as 11,000–10,000 years ago, starting from the coastal regions as soon as they became deglaciated. For the rest of the Russian Arctic the situation is less clear since in many cases information on the earliest human habitation in the area is too unreliable to draw firm conclusions. Thus, the far north of European Russia was

probably populated earlier than 6,000 years ago, but there is no clear archaeological evidence of this. The earliest sites are dated to 6000 BP. The problem of the earliest colonization of this area by humans is clearly linked with questions of the last glaciation, i.e., how long the glaciation lasted and how quickly the territory was deglaciated. Data on environmental changes near the Pleistocene/Holocene boundary in the north of Western Siberia and the Taimyr Peninsula show that these territories were most likely populated as early as 10,000 years ago, although there is no direct archaeological evidence of this. The earliest dated sites for these territories are ^{14}C dated to ~8000 BP (the Korchagi site on the Lower Ob River) and ~6000 BP in the Taimyr.

But if the peopling of the European Far North and the northern areas of Western Siberia and the Taimyr Peninsula were affected primarily by regional glacial trends, these processes were of a different character in the East Siberian Arctic. The significant sea-level drop during the LGM exposed extensive portions of the shelves along the Arctic Siberian margin. At that time the Great Arctic Plain expanded from the Taimyr Peninsula to the Bering Strait area and up to 76°N including the New Siberian Islands and Wrangel Island. These lowlands, as well as the neighboring area of the Bering Land Bridge, became eroded and/or submerged by the pre-Holocene transgression of the Arctic Ocean. However before that it was a giant ecological niche providing unlimited food sources for potential human inhabitants. Clearly it was populated permanently or visited regularly in its eastern part adjacent to Bering Land Bridge some time before the New World became inaccessible by land. However, archaeological research carried out in that region both in Alaska and on the Chukchee Peninsula failed to find any indisputable materials that could be dated earlier than 11,000 BP. But it is also possible that this material does not exist there, and that the migrants, whoever they were, moved along the south shore of the Bering Land Bridge.

Although a single site, the Berelekh site, in fact documents Late Pleistocene human habitation in Arctic Siberia; there is no doubt that it all was populated at this time. The Berelekh site, discovered by N.K. Vereschagin and then excavated by Y.A. Mochanov in the early 1970s, was radiocarbon initially dated at 13,000–12,000 BP (additional dating shows that it might probably be some younger—about 11,000–10,000 BP). This northernmost terminal-Pleistocene site marks the northern boundary of known Palaeolithic occupation and shows that the continental Arctic was populated at least up to 71°N at this time. The Zhokhov site, which is some 3,000 years younger than Berelekh, has hidden potential for expanding the limits of human habitation in the Arctic at the beginning of the Holocene, or it may simply show the unknown limits of potentially possible survival and/or adaptation skills of early Arctic people.

Human dispersal in the Arctic, and not just in the Asian part, evidently became much extensive in the Early Holocene. Archaeological materials that tell about human culture of this time are rather scanty. But still there are thirty to forty sites in the region from the Taimyr to the Chukchee Peninsula. Not many of them are radiocarbon dated or have clear geology, but it can be concluded that microblade/Mesolithic technologies spread within the area no later than 8,000 years ago (in the Taimyr, however, the oldest dated site is Tagenar VI, dated to 6000 BP). It is remarkable that the spread of the microblade technologies that took place in Siberia at

around the Pleistocene/Holocene boundary was very fast. The Ust-Timpton and Sumnagin sites, located far south in Siberia on the Aldan River, are almost of the same age as the Tagenar VI site. It could probably be explained by the increased mobility of hunting groups that were forced to change their hunting specialization or subsistence strategies.

The Mesolithic site excavated in 1989 and 1990 on Zhokhov Island in the De Long Archipelago at 76°N belongs exactly to this period. Its age and material culture document the early and fast spread of prismatic microblade technologies with Northeast Asia. The New Siberian Islands and adjacent mainland clearly have a great potential for finding sites similar to the Zhokhov settlement. These areas are important because they contain relicts of the extinct Late-Pleistocene Arctic Plain, which was the westernmost part of Pleistocene Arctic Beringia, and thus may preserve part of the archaeological record important for problems of peopling of the New World.

Archaeological data on the initial population of the Arctic show that, in general, the peopling of Arctic territories was rather rapid. For many of the regions the time of actual initial migration cannot be determined, at least for now—with the exception of areas that were populated after deglaciation, such as Scandinavia, the Canadian Arctic, or the Kola Peninsula. The density of the population always remained minimal. Most likely the Arctic territories became occupied as soon they as they were available, but the earliest archaeological stages are poorly visible. Consequently, for Arctic Siberia the time of initial migration is limited only by the presence of anatomically modern humans in the Late Pleistocene. From the Zhokhov site it is clear that they were able to move north as far as 76°N at about 8,000 years ago. Another good example can be found in the Canadian Arctic and Greenland where paleo-Eskimo sites appeared about 4,500–4,000 years ago, immediately after deglaciation of the shorelands and the islands. Finds by Eigel Knuth in Peary Land at 82°N show that the tendency to occupy all available territories had occurred that time.

Important is the fact that Early Holocene assemblages from northern Central and Eastern Siberia are very similar. This uniform cultural character served as a basis for suggesting that they were components of a large cultural phenomenon that extended from the Taimyr to the Chukchee Peninsula, with a cultural influence that reached even to Alaska. This phenomenon, known as the Sumnagin culture, is the first in a sequence of Holocene Stone Age cultures covering this area (all are Neolithic except Sumnagin, which was first discovered in the southern Sakha Republic; I call it the "Yakutian Cultural Core").

The Mesolithic Zhokhov site is fully described in Chapters III and IV. Because of the excellent degree of preservation of organics, it yielded a number of wooden, bone, antler, and mammoth ivory artifacts that show the well-developed character of the Early Holocene human culture in Arctic Siberia, as well as its high technological level. In general, this is an almost "ethnographic" degree of preservation of 8,000-year-old archaeological material that shows how it might have looked. All this richness is usually long gone through taphonomic processes before the archaeologist can touch it. Thus, in the Zhokhov case, without the permafrost conditions, the collection would include few hundred microblades and flakes and a couple dozens microblade cores.

Due to the general features of the collection and the radiocarbon dating, a general background for the Zhokhov Island site can be easily found: it has to be placed within the Mesolithic relics of Northeast Asia that make up the Sumnagin cultural phenomenon, or the Sumnagin culture of the Holocene Palaeolithic, according to Y.A. Mochanov. The previous (Late Pleistocene) stage of human occupation of Northeast Asia is considered by Mochanov to be connected with the spread and development of the Palaeolithic Dyuktai culture. However sites of the Dyuktai culture are poorly represented in the area. Also, there is no evidence for a cultural connection between the Sumnagin culture and the preceding one, since the Sumnagin culture is a prismatic microblade industry with no bifaces, while the Dyuktai culture is based on wedge-shaped core technology with bifacial projectiles, "knives," and "spear points." The reason for this major cultural change at about Pleistocene/Holocene boundary is still under discussion, but, whatever it was, the uniform appearance of Mesolithic finds across Northeast Asia is fully accepted.

This "uniformity" (which allowed a uniform conclusion about the past existence of a Sumnagin cultural tradition covering almost all of Arctic and Subarctic Siberia) is most probably the result of a poor level of investigation in the area where there are few stratified radiocarbon-dated sites. Accordingly, these materials in most cases do not allow recognizing local and/or chronological cultural traditions. It has to be stressed that in most cases these are just lithic collections. As the number of well-studied sites increases, such "uniformity" becomes broken.

Thus, Slobodin (1999) was able to recognize the Uolba facies of the Sumnagin cultural tradition, which biogeographically corresponds to the taiga zone. Projectile points made on large blades were used as a new "type fossil". The Zhokhov site does not have such remarkable tools in the stone inventory, which makes it very simple—there are microblades and cores for producing them, and ground tools that have no known analogy in radiocarbon-dated synchronous sites within Northeast Asia. However, the microblade knapping technology reconstructed from the Zhokhov industry makes it possible to speak of the Arctic facies of the Sumnagin cultural tradition that probably was characteristic for the coastal lowlands of Northeast Asia and which extended into Chukotka and Alaska, and further south into North America and British Columbia (Pitulko 2001). However, how many cultural similarities can be discussed as "connections" still remains unclear.

One of the most important artifacts found at Zhokhov is a large fragment of sled runner. Together with some of the wooden artifacts that come from the site that are possibly uprights for sled construction and domestic dog bones, the sled runner serves as evidence that developed dog traction technology was known to the early Holocene hunters of Arctic Siberia. This is the earliest evidence for that. This also indicates that the idea of using dogs with sleds and the technology for doing this had to have been shaped long before humans arrived on Zhokhov Island and camped there. The ability to use dog teams probably served as a key to mobility for Arctic hunters and was an important feature of their culture and adaptation strategy.

Two major adaptation strategies are archaeologically known in Northern Eurasia (an overview of archaeological evidence for them is given in Chapter V). The western and the eastern portions of the region were the area of origin and existence of maritime adaptations. However,

if they are relatively young in Northeast Asia, they are much older in the European North, although natural conditions for that were even better in Northeast Asia than in the European North. The early involvement of the population in the exploitation of marine resources in Northern Scandinavia was supposedly determined by the peopling of the area through an ice-free coastal corridor between the glacier and the shoreline. The littoral of these areas was very rich in marine food sources, but also limited in terrestrial ones. The Chukchee Peninsula in the Bering Strait area (well known for maritime adaptation strategies practiced by local populations for approximately the past 3,000 years) was originally inhabited from the inland areas by terrestrial hunters. They started exploiting marine resources after being forced to do so by the modern geography, which was finally formed in the middle of the Holocene.

It can be said that Northern Scandinavia and the Kola Peninsula had a "deglaciation driven" area available for human population (expansion of the area), while Northeast Asia had an "oceanic-transgression driven" area (decrease of the area which was quite extensive initially and probably with relatively low population pressure). The Zhokhov Island site illustrates this well – the Zhokhov hunters lived on the margins of the Early Holocene Arctic population area, directly on the coast; they used driftwood for artifacts and for firewood but did not hunt sea mammals and did not use marine food sources in any form. They hunted reindeer and polar bears, but even the polar bear hunt was based on principals common for terrestrial hunters elsewhere.

It is well known that most of the Eurasian North was historically occupied by cultures with a subsistence economy based on reindeer. The remarkable feature of these cultures is high mobility and, most likely, flexible subsistence patterns. High productivity in fishing creates the basis for the appearance of semi-sedentism in areas especially rich in this resource. Simchenko wrote that the most characteristic feature of these cultures is so-called pendulum migrations, i.e., seasonal migrations in a more or less permanent area when the length, duration, and direction of the route depend on the reindeer.

It is most likely that the ancient inhabitants of the Arctic created arrangements of temporary (seasonal) camps within the bounds of the main hunting area. Khlobystin suggested that such systems were practiced in the Taimyr from 3,000 years ago or even earlier. Their use extended the adaptation capabilities of hunting groups. The groups used diverse strategies, both individual and collective. Perhaps the Zhokhov site was one such temporary/seasonal camp that was needed to control the territory, on one hand, and to exploit a particular food resource at the same time, or to accumulate resources for temporary storage. This strategy requires certain mobility that could be provided by the dog traction known from the Zhokhov site.

The Zhokhov materials are both an easy subject to discuss and a difficult one. Because of their early Holocene age and unique geographical position in northern Northeast Asia and the excellent preservation of different organics, which are usually absent in contemporaneous sites, the Zhokhov assemblage is undoubtedly one of the finest archaeological sites of the Stone Age in Northern Asia. It can be said that the Zhokhov materials of 7,800 years ago lack similarity with contemporaneous archaeological assemblages of Northeast Asia. However, there are numerous artifacts whose presence makes it possible to find broad analogies that are more illustrative of

general tendencies in Late Pleistocene/Early Holocene cultural development (e.g., development of inset tool technology), rather than just a few features of similarity or familiarity of the Zhokhov assemblage with neighboring sites and cultures. In my view, the Zhokhov site is even more important because the information "contained" in it exceeds the regional level of meaning. It is a real and important contribution to the general knowledge of human history.

Acknowledgements

Expeditions to Zhokhov Island done in 1989 and 1990 became the most unusual experience of my life. To be honest, I did not expect to find too much of the archaeological material and thought of what to do if the site does not produce enough of it to be busy the whole summer. Than bigger was the surprise …

Nothing would happen if Vyacheslav Makeyev did not find the man who found the first artifacts and tell then the story to Sergey Kessel who contacted Leonid Khlobystin, my Professor and chief of the expedtions to Russian European Arctic and Vaigach Island which gave me lots of experience. Khlobystin suggested to me to go there if there is a chance. The chance came up soon when Makeyev invited me for the expedition in 1989. That was about a year after Khlobystin died.

I will be always thankful to all of them for their attention to my work and support in different forms given to it as well as to my co-travelers in Zhokhov Island—Vyacheslav Makeyev, Sergey Zementov, Mikhail Samarsky, and Mikhail Anisimov without whose help the first excavations of Zhokhov site would be less successful. Enormous thanks to Richard Bland and Roy Carlson whose patience, help, and advice significantly improved the original English version of the book.

And, of course, my special thanks to the operators of the Zhokhov weather station for their logistic help and hospitality. We were 25 people on this tiny island—for half a year in the middle of nowhere. This is the place and time to which I would like to return. I wish I could.