

THE SIBIRYACHIKHA FACIES OF THE ALTAI MIDDLE PALEOLITHIC

**M.V. Dobrovolskaya<sup>1</sup> and A.V. Tiunov<sup>2</sup>**

<sup>1</sup>*Institute of Archaeology, Russian Academy of Sciences,  
Dm. Ulyanova 19, Moscow, 117036, Russia  
E-mail: mk\_pa@mail.ru*

<sup>2</sup>*A.N. Severtsov Institute for Ecology and Evolution, Russian Academy of Sciences,  
Leninsky Pr. 33, Moscow, 119071, Russia  
E-mail: a\_tiunov@mail.ru*

**THE NEANDERTHALS OF OKLADNIKOV CAVE, ALTAI:  
ENVIRONMENT AND DIET BASED ON ISOTOPIC ANALYSIS\***

*The discovery of a Mousteroid industry in the northwestern Altai represents a major finding in Eurasian Paleolithic studies. Isotopic analyses of bone collagen of late Western European Neanderthals have repeatedly indicated that they were extremely carnivorous. However, no corresponding information was previously available for the Neanderthals of the Altai. With this in mind, an isotopic study was conducted to assess the diet of the Middle Paleolithic inhabitants of Okladnikov Cave. Collagen was extracted from seven well preserved bone samples of adults and children and <sup>13</sup>C/<sup>12</sup>C and <sup>15</sup>N/<sup>14</sup>N ratios were calculated. The  $\delta^{13}\text{C}$  content suggests that all individuals were members of a local trophic chain based on plants of the moderate climatic zone. However, the  $\delta^{15}\text{N}$  content demonstrates that their trophic level was high. These findings suggest that the lifestyle of Neanderthals in the northwestern Altai was similar to that of the late European Neanderthals. Both evidently subsisted by hunting large herbivores.*

Keywords: *Neanderthals, Altai, isotopic analysis, paleoecology, dietary reconstruction.*

**Neanderthals of the Altai:  
Common versus local features**

Large-scale archaeological research in the northwestern Altai has resulted in new findings that are highly relevant to many issues of human evolution. The discovery of an Early Upper Paleolithic industry, apparently associated with anatomically modern

humans, and of a new archaic hominin population shown to have contributed to the modern human gene pool in certain regions, make the Altai a focal area in the history of the genus *Homo* and the species *Homo sapiens*. The discovery of a Mousteroid industry in the northwestern Altai is a major archaeological finding (Derevianko, Markin, 1992; Derevianko, 2007; Derevianko, Markin, Zykina, 2008). The sequencing of the mitochondrial genome of the Okladnikov Cave hominins, and the morphological study of their skeletal remains demonstrate unambiguously that the people who lived there at the end of the Middle Paleolithic were Neanderthals (Turner, 1990; Krause et al.,

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2007; Buzhilova, 2011; Mednikova, 2011). These discoveries have extended the assumed distribution range of those hominins 2000 km to the east.

After the publication by J. Krause et al. it became clear that the local southern Siberian Mousteroid tradition, named *Sibiryachikha* (the former name of Okladnikov Cave), was associated with Neanderthals. Whether “classical” Neanderthals lived in southwestern Central Asia, as the mtDNA analysis of Teshik-Tash appears to suggest (Krause et al., 2007), is a matter of debate. M. Glantz, based on an earlier morphological study (Glantz, Viola, Chikisheva, 2004), questions the presence of standard Neanderthal apomorphies in either Obi-Rakhmat or Teshik-Tash children. According to Glantz (2010), they might be hybrids between local humans and migrants from the north or east. Whatever the case, the reliably documented presence of Neanderthals in southern Siberia cannot be questioned.

Recent paleogenetic data have a direct bearing on assessments of the spatio-temporal distribution of Neanderthals in Eurasia. Based on the analysis of the hypervariable portion of mtDNA, V. Fabre, S. Condemi, and A. Degioanni (2009) tested several scenarios explaining between-group variation in Neanderthals. The sample included 12 individuals dated to various periods of the Late Pleistocene (100–29 ka BP) and inhabiting areas from western Spain (El Sidron) to the Altai (Okladnikov Cave). All except the Scladina individual are no earlier than 50 ka, so the conclusions basically concern late Neanderthals.

Fabre et al. concluded that three groups of Neanderthals existed – western, eastern, and southern. The eastern group includes Neanderthals from Teshik-Tash and Okladnikov Cave, the southern group, those from Spain, Italy, and the Balkans (El Sidron, Monte Lessini, and Vindija). The Mezmaiskaya individual falls in the western group. Fabre et al. believe that the three groups were not isolated and maintained contacts.

The conclusions made by Fabre et al. concur with the results of another paleogenetic study conducted by L. Dalen et al. (2012). According to these findings, there were two Neanderthal subgroups. The first included individuals from Scladina, Belgium (ca 100 ka BP); Teshik-Tash (ca 70 ka BP); Valdegoba, northern Spain (ca 48 ka BP); Okladnikov Cave, the northwestern Altai (ca 40 ka BP); Mezmaiskaya, the northwestern Caucasus (ca 36 ka BP); and Monte Lessini, Italy (ca 50 ka). The second group comprises

three individuals from Vindija, Croatia (42–38 ka BP), two from Feldhofer, Germany (39 ka BP), and two from El Sidron, northern Spain (49–35 ka BP). The results suggest that about 50 ka BP a demographic turnover occurred, resulting in an abrupt reduction of the Neanderthal population size. Following this event, only a small sub-population with a low genetic variation survived in Europe. Several millennia before the arrival of anatomically modern humans, the only inhabitants of Europe were descendents of this genetically consolidated subgroup. While the genetic variation in earlier Neanderthals was high and comparable to that in modern man, it decreased abruptly after the turnover. This, however, concerned only European Neanderthals but not Asian ones. Regrettably, the preservation of DNA in Near Eastern Mousterians is poor, and without them the pattern is incomplete.

In line with these findings, the appearance of Neanderthals in the northwestern Altai is regarded as a relatively short-term local episode. According to A.P. Derevianko, about 50 ka BP, a small Neanderthal group associated with a Mousterian-like lithic tradition migrated to Gorny Altai. Although this region has been studied in detail, only two such sites are known thus far – Okladnikov Cave and Chagyrskaya. Both contain habitation horizons with a Mousteroid industry – *Sibiryachikha* (Derevianko, 2011: 49).

In sum, dramatic changes occurred in the Neanderthal community, resulting in an abrupt decrease and redistribution of the genetic variation. Factors behind those changes are not clear. At present, a broad range of methods can be used to examine the issue. Some of them are aimed at reconstructing the lifestyle, environment, and adaptations of local Neanderthal groups.

### **Environmental approaches to the study of Neanderthal dispersals**

Peculiarities of the Neanderthal physical type have been traditionally regarded as adaptations to European landscapes and to the increasing harshness of climate over the millennia. In recent years this paradigm has been challenged. For example, results of the CT scanning and 3D reconstruction of Neanderthal nasal sinuses suggest that they are relatively no larger than in average modern Europeans (Rae, Koppe, Stringer, 2011), implying that the efficiency of warming the inhaled air was likewise no higher.

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