

THE SIBIRYACHIKHA FACIES OF THE ALTAI MIDDLE PALEOLITHIC

A.P. Buzhilova

Moscow State University Institute and Museum of Anthropology,
Mokhovaya 11, Moscow, 125009, Russia
E-mail: albu_pa@mail.ru

**DENTAL REMAINS FROM THE MIDDLE PALEOLITHIC LAYERS
OF ALTAI CAVE SITES***

Two Middle Paleolithic cave sites in the Altai – Okladnikov and Chagyrskaya – have yielded dental remains (mostly isolated teeth) of individuals of various ages. A newly discovered mandibular fragment with teeth from Chagyrskaya Cave reveals a Neanderthal trait combination: anterior fossa and epicristid (midtrigonid crest) on molars, metaconid and crest on premolars. The totality of dental traits support the conclusion previously drawn on the basis of postcranial characters: Altai Neanderthals appear to be intermediate between other Eurasian Neanderthals and anatomically modern humans.

Keywords: Human evolution, Neanderthals, Mousterians, Gorny Altai, dental traits.

Introduction

Mousterian habitation horizons associated with Neanderthals were discovered in Okladnikov and Chagyrskaya caves in the piedmont zone of the northwestern Altai. Okladnikov Cave (formerly Sibiryachikha, named after a nearby village) was discovered in 1984 by A.P. Derevianko and V.I. Molodin. V.T. Petrin's excavations carried out in the same year revealed isolated human postcranial remains and several teeth representing individuals of various age in strata 2, 3, and 7.

Later, systematic excavations were conducted in Okladnikov Cave with the use of a variety of methods.

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The lithic industry discovered at the site differs from other industries of the Altai and Siberia by a predominance of butchering tools apparently used to process the carcasses of large animals. Evidently this was a Mousterian hunting and butchering camp site (Derevianko, Markin, 1992). Based on the results of uranium and radiocarbon analyses, all habitation horizons date to 45–40 ka BP (Derevianko, 2011).

A preliminary examination of hominin remains from Okladnikov Cave was conducted by V.P. Alexeyev, and the results were published posthumously, much later. Having compared these remains with others, Alexeyev noted the presence of distinctly archaic traits but refrained from attributing the finds to a specific geographic group (1998).

C.G. Turner II also examined the teeth from Okladnikov Cave. Having noted a number of

Neanderthal apomorphies, he concluded that the inhabitants of this cave were closer to European than Asian Neanderthals (Turner, 1990).

The same dental remains were revisited by E.G. Shpakova, in whose view, they differ from contemporaneous remains from Denisova Cave in being less archaic. Shpakova concluded that in certain respects the teeth from Okladnikov Cave resemble those of European Upper Paleolithic humans (Shpakova, 2000, 2001; Shpakova, Derevianko, 2000). Neanderthal apomorphies which, according to Shpakova, are absent in the Okladnikov Cave sample include the epicristid (midtrigonid crest) on the lower molar and a relatively wide talonid (Shpakova, 2001: 71). Also, the crown dimensions of the preserved teeth are similar to those of Upper Paleolithic Europeans. Based on these observations, Shpakova concludes that the Okladnikov Cave hominins were anatomically modern humans (Shpakova, Derevianko, 2000; Shpakova, 2001).

Recently an examination of these remains was undertaken by B.T. Viola (2009). Like his predecessors, he noted that interpreting the observations was difficult. On the one hand, archaic (specifically Neanderthal) features are no doubt present. These include the wrinkled occlusal surface of the lower molar, complexity of furrows, a distinct anterior fossa, and a sixth cusp. On the other hand, the first molar lacks the epicristid (Zubov, 1992), or midtrigonid crest, which is a characteristically Neanderthal trait – 96 %, according to Bailey (2002). The third molar of another individual from the same cave exhibits an incomplete crest, indirectly suggesting that the epicristid was present. Based on the CT scanning and a 3D reconstruction of all permanent teeth from Okladnikov Cave, Viola demonstrated the presence of epicristid on the dentin surface. Referring to Bailey's summary (2001), Viola concludes that continuous midtrigonid crests on the occlusal surface are exceedingly rare in modern humans but very common in Neanderthals (2009: 133).

The excavators' views concerning the presence of Neanderthals in the Altai and less straightforward observations made by specialists in dental anthropology have been convincingly supported by the results of DNA sequencing. This study revealed distinctly Neanderthal genes in Okladnikov Cave hominins (Krause et al., 2007).

In the same year, S.V. Markin discovered Middle Paleolithic habitation horizons at another site – Chagyrskaya Cave. In 2008–2009, the lithics from

that cave were shown to be similar to those from Okladnikov Cave (Derevianko, Markin, 2011). Like the Okladnikov assemblage, that of Chagyrskaya was described as Mousteroid (Derevianko, Markin, Zykin, 2009; Derevianko, Markin, 2012; Markin, Zykin, Zykina, 2011; Derevianko, Markin, 2011). These two cave sites strongly suggest that Neanderthals were present in the Altai.

Among the first dental remains from Chagyrskaya was a specimen that we identified as a lower deciduous canine crown (Buzhilova, 2011). While being relatively gracile, it resembles Neanderthal deciduous canines in shape. Dental and archaeological facts, then, jointly demonstrate that the Mousteroid tradition was introduced by the Neanderthal migrants to the Altai.

B.T. Viola, who studied two permanent teeth from Chagyrskaya, attributed them to Neanderthals, their poor preservation and heavy wear notwithstanding (Viola et al., 2011). Later, a preliminary analysis was published of a partial mandible with the right corpus and a canine, two premolars, M_1 and M_2 (Viola 2012). Despite a moderate abrasion, it was possible to detect anterior fossae and epicristids (midtrigonid crests) on both molars, and metaconids and crests on premolars – features typical of Neanderthals.

Materials and methods

Thanks to ongoing excavations at Chagyrskaya, the number of dental remains increased markedly. In this study, dental remains discovered by S.V. Markin in 2008–2012 are examined and compared with those from other Middle and Upper Paleolithic sites in Eurasia.

The preservation of several deciduous and permanent teeth from the Sibiryachikha layers of Chagyrskaya has enabled us to take standard dental measurements according to the technique used by Russian specialists (Zubov 1968). Teeth from other cave sites in the Altai – Denisova and Strashnaya – were also measured. Measurements were compared with those relating to other Middle and Upper Paleolithic Eurasians and to modern geographic groups. Also, nonmetric traits were assessed using the Arizona State University dental anthropology system (Turner, Nichol, Scott, 1991) for *Homo sapiens* and the standards proposed by S.E. Bailey (2002, 2005) for Neanderthals, with special reference to traits which we consider to be most diagnostic. We also

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