Geophysical Research Abstracts,
Vol. 11, EGU2009-11293-2, 2009
EGU General Assembly 2009

Magnetic and paleomagnetic investigation of sediments of the Kostenki section

D.K. Nurgaliev (1), P. Yassonov (1), D. Gilmanova (1), A. Sinitsyn (2), and F. Heller (3)

(1) Faculty of Geology, Kazan State University, Kazan 420008, Russia (danis.nourgaliev@ksu.ru / +7 843 292 81 35), (2) Institute of the History of Material Culture, Russian Academy of Sciences, St. Petersburg, 119186, Russia, (3) Institute of Geophysics, Swiss Federal Institute of Technology Zürich, Zürich CH-8093, Switzerland

The Kostenki sites (Voronezh region) are considered as key position in the Paleolithic archeology and the Quaternary geology of Eastern Europe. Together with the Molodova sites in the western Ukraine, they provide the most important stratigraphic sequences for this part of the world and hence the chronological framework for most Paleolithic sites of the vast region between the Carpathian and the Ural Mountains.

The most significant challenge to the traditional point of view has emerged from dating and numerical chronology of the Chronological Group I at Kostenki. The cultural layers of this group underlie a volcanic ash horizon. Data from the following two chrono-stratigraphic markers, which are of particular importance for the dating of these layers, will be presented:

1. A volcanic ash horizon has been identified at seven Kostenki–Borshchevo sites and at other localities in the region and which was caused by the Campanian Ignimbrite eruption from the Phlegrean volcanic fields in southern Italy about 40,000 calendar years ago. The ash horizon is situated within the interval of the so-called Middle to Upper Paleolithic "transition". Its position can be precisely correlated with a number of other environmental events, such as for instance the Heinrich Event 4 (HE4), the Laschamp geomagnetic field excursion, and a particular cosmogenic nuclide peak (Fedele, Giaccio & Hajdas 2008). Samples from different stratigraphic levels containing tephra have been investigated with thermomagnetic methods and coercive force measurements; the latter were performed with a coercivity spectrometer. The magnetic mineralogy is dominated by titano-magnetites which were altered during transportation and reworking.

2. A paleomagnetic excursion was identified in the sediments and the fossil soils between the cultural layers IVa and IVb and represents the second chronological marker. The natural remanent magnetization direction shows a complicated behavior during thermal and alternating field demagnetisation. Apparently, primary remanence directions are partly overprinted by secondary magnetization directions resulting from recent water infiltration or by physical weathering causing sediment re-deposition. Nevertheless, a detailed image of this excursion was reconstructed using data from another outcrop with less distorted NRM directions. The obtained virtually geomagnetic pole (VGP) latitude data was then compared with known VGP records of Laschamp excursion. The latter has been dated to 40-43 *ka* (Weninger & Jöris 2008).