

World Heritage

papers

41



HERITAGE 4



Human Origin Sites and the World Heritage Convention in Eurasia

VOLUME I



In support of
**UNESCO's 70th
Anniversary Celebrations**

United Nations
Educational, Scientific and
Cultural Organization

Human Origin Sites and the World Heritage Convention in Eurasia

*Nuria Sanz, Editor
General Coordinator of HEADS Programme on Human Evolution*

HEADS 4
VOLUME I

Published in 2015 by the United Nations Educational, Scientific and Cultural Organization, 7, place de Fontenoy, 75352 Paris 07 SP, France and the UNESCO Office in Mexico, Presidente Masaryk 526, Polanco, Miguel Hidalgo, 11550 Ciudad de Mexico, D.F., Mexico.
© UNESCO 2015

ISBN 978-92-3-100107-9



This publication is available in Open Access under the Attribution-ShareAlike 3.0 IGO (CC-BY-SA 3.0 IGO) license (<http://creativecommons.org/licenses/by-sa/3.0/igo/>). By using the content of this publication, the users accept to be bound by the terms of use of the UNESCO Open Access Repository (<http://www.unesco.org/open-access/terms-use-ccbysa-en>).

The designations employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The ideas and opinions expressed in this publication are those of the authors; they are not necessarily those of UNESCO and do not commit the Organization.

Cover Photos:

Top: Hohle Fels excavation. © Harry Vetter
bottom (from left to right): Petroglyphs from Sikachi-Alyan rock art site. © Ekatrina Devlet; Kostenki 1 Female Figurine. © Andrei Sinitsyn; Excavation at Prai Rei Cortico, Peinche, Portugal. © Nuno Ferreira Bicho; Hand axes from Nadaouiyeh Aïn Askar © Jean Marie Le Tensorer

Photos and images presented in the texts are the copyrights of the authors unless otherwise indicated.

Supervision, editing and coordination:

Nuria Sanz, *General Coordinator, World Heritage Thematic Programme HEADS and Director, UNESCO Office in Mexico*
Anjelica Young, *UNESCO Office in Mexico*
Chantal Connaughton, *UNESCO Office in Mexico*

Coordination of the World Heritage Papers Series:

Vesna Vujicic-Lugassy, *UNESCO Culture Sector*

Graphic design: Recto Verso – realization by UNESCO/MSS/CLD

Cover design: Recto Verso – realization by UNESCO/MSS/CLD

Printed by Offset Santiago

This printer is certified Imprim'Vert®, the French printing industry's environmental initiative.

Printed in Mexico

This publication was made possible thanks to the ongoing support to the World Heritage Thematic Programme HEADS by the Government of Spain.



Table of Contents

Foreword <i>Kishore Rao, Secretary, World Heritage Convention</i>	■	Page 5
Scientific Perspectives: Eurasia and HEADS <i>Nuria Sanz, Head and Representative of the UNESCO Office in Mexico, General Coordinator of the HEADS Programme</i>	1	Page 7
How to use the World Heritage List of cultural and natural criteria to demonstrate the Outstanding Universal Value (OUV) of prehistoric sites in Eurasia, with particular reference to criterion (viii) <i>Robin Dennell</i>	—	Page 8
Europe: the Outstanding Universal Value of a marginal area of the Palaeolithic world <i>Margherita Mussi</i>	—	Page 26
The Middle East	2	Page 33
Prehistoric archaeological sites in Arabia and their potential for nomination to the World Heritage List <i>Michael D. Petraglia</i>	—	Page 34
Tracking Upper Pleistocene human dispersals into the Iranian Plateau: a geoarchaeological model <i>Saman Heydari-Guran</i>	—	Page 40
Regional Perspective of early human populations in Syria: the case of El Kowm <i>Jean-Marie Le Tensorer</i>	—	Page 54
The case of Mount Carmel: the Levant and Human Evolution, future research in the framework of World Heritage <i>Mina Weinstein-Evron</i>	—	Page 72
Western Europe	3	Page 93
Early Human Occupation of Orce <i>Robert Sala i Ramos</i>	—	Page 94
Ecological niches of the Iberian Peninsula: a comparative analysis of European coastal adaptations <i>Nuno Bicho</i>	—	Page 108

Eastern Europe

4

Page 127

**Rock art from the Russian Far East:
the Sikachi-Alyan Tentative World Heritage Site**
Ekaterina Devlet

Page 128

Natural and Cultural Complex the Bashkir Urals
Viacheslav G. Kotov

Page 142

The traces of the first humans in Eurasia
David O. Lordkipanidze

Page 153

**Perspectives on the Palaeolithic of Eurasia:
Kostenki and related sites**
Andrei Sinitsyn

Page 163

**Perspectives on the Upper Palaeolithic in Eurasia:
the Case of the Dolní Vestonice-Pavlov sites**
Jiří Svoboda

Page 190

Approaches to the Palaeolithic archaeological record in Eurasia

5

Page 205

Neanderthal adaptation: the biological costs of brawn
Fred H. Smith

Page 206

**Defining a Neanderthal site 'Cluster':
reasons for international collaboration**
Gerd-Christian Weniger

Page 220

Perspectives on the Palaeolithic of Eurasia: Kostenki and related sites

Andrei Sinitsyn

Russian Academy of Sciences – Russia

Introduction

The leading Palaeolithic archaeologist of the last century, François Bordes (1968), observed that there were three principal schools of prehistory: (1) French – stratigraphic; (2) Anglo-American – environmental; and (3) Russian – sociological.

The development of the Russian school was directly based on the Palaeolithic sites at Kostenki, where structured settlements and traces of large dwellings similar in form to those of Native American and Polynesian sites were found. From the early 1930s to the end of the 1960s, archaeological data were used to reconstruct family organization and marriage patterns in accordance with the ideas of Morgan and Engels.

At present, the Kostenki group (the Middle Don Basin, Voronezh District and the Central Russian Plain) (Figure 1) comprises 21 sites at Kostenki and five at the neighbouring village of Borshchevo. Ten of them are multilayered sites, containing from two to ten cultural layers and therefore actually contain nearly sixty occupations or settlements. Roughly forty of the latter are found in clear stratigraphic context, subdivided by sterile sediment and yield *in situ* remains of occupation, including dwellings, hearths, pits and associated debris.

While concentrations of Palaeolithic sites are not uncommon in areas that contain natural shelters, the density of open air sites at Kostenki is extraordinary and unknown elsewhere (including the famous Pavlov' Hill in Moravia). It is difficult to explain the high concentration of sites at Kostenki, because adjoining areas appear to possess the same geographic features but lack Palaeolithic sites (Sinitsyn and Stepanova, 2012).

The Kostenki sites (Voronezh region) have long occupied a critical place in the Palaeolithic archaeology and Quaternary geology of Eastern Europe (Pavlov and Rogachev, 1982; Klein, 1969; Hoffecker, 2002a). Together with the Molodova sites in western Ukraine, they provide the most important stratigraphic sequence for this part of the world and the chronological framework for most Palaeolithic sites in the vast region that lies between the Carpathian and the Ural Mountains. The chronology of the Molodova sites, which was developed by Chernysh (1973, 1987) and Ivanova (Ivanova and Tseitlin, 1987) has been subject to some recent revisions regarding the middle time range of sequence (for instance, Haesaerts et al., 2003, 2004b), while new revisions to the Kostenki chronology pertain to the earlier periods.

The history of research

The initial discovery of the Palaeolithic at Kostenki (Kostenki 1) was made by I. S. Poliakov, whose excavations in 1879 demonstrated an association of extinct mammoth remains with human chipped stone tools. The concentration of large fossil bones at Kostenki had been known for many years before 1879 (Kostenki means 'village of bones' in Russian). In the early eighteenth century, upon the instructions of Peter the First, the academic S. G. Gmelin undertook a study of bones in Kostenki and identified them as elephant remains.

Most leading Russian prehistorians took part at the excavations at Kostenki: P. P. Efimenko, S. N. Zamyatnin, P. I. Boriskovsky, A. N. Rogachev, and so on, thus making Kostenki a source for new ideas about the evolution and differentiation of the East European Palaeolithic.

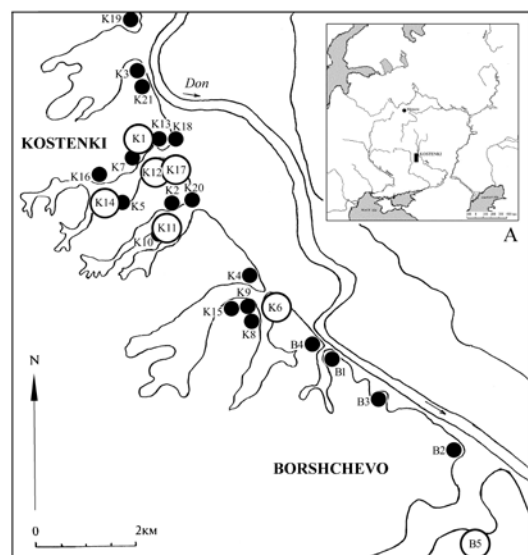


Figure 1. Kostenki-Borshchevo' group of Palaeolithic sites. Sites with visible lenses of volcanic ash are marked by big signs. A – position of Kostenki.

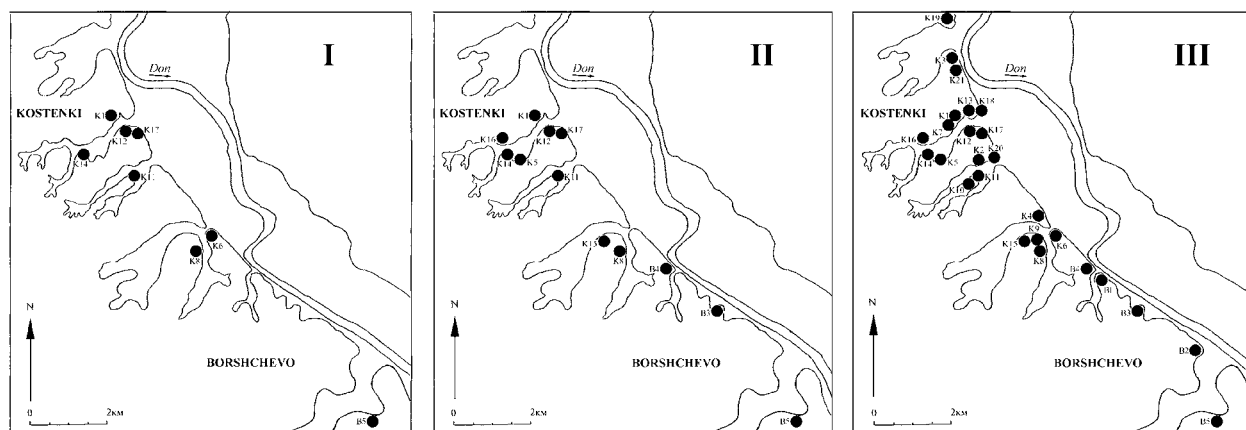


Figure 2. Sites of three chronological groups: I – ancient chronological group – 37-33 Ka (Cal: 42-39.5 Ka); II – middle chronological group – 32-27 Ka (Cal: 38-35 Ka); III – recent chronological group – 27-20 Ka (Cal: (now 23-20 Ka – 28-25 Ka Cal) (according to Velichko and Rogachev, 1969 with additions).

In many respects, the history of chrono-stratigraphic and palaeocultural studies at Kostenki parallels the development of both Russian Palaeolithic archaeology and palaeogeography. During the 1950s and 1960s, as a result of field research by A. N. Rogachev (1956; 1957; 1964) in consent with geologists M. N. Grishchenko (1950; 1961; 1976) and G. I. Lazukov (1954; 1957a; b), Sawicki (1964) and A. A. Velichko (1963), archaeological layers at Kostenki were subdivided into three principal chronological groups on the basis of stratigraphic position (Velichko and Rogatchev, 1969; Klein, 1969; Hoffecker, 1987). Cultural layers in the loessic loams underlying the modern chernozem were assigned to the late (third) chronological group. Layers assigned to the middle (second) and earliest (first) chronological groups were those deposited in the upper and lower humic beds, respectively, subdivided by the volcanic ash horizon (Figure 3A).

During the 1980s, a radiocarbon chronology was developed for all three temporal groups (Pavlov and Soulerjytsky, 1997; Sinitsyn et al., 1997; Sinitsyn, 1999; Sinitsyn and Hoffecker, 2006) (Figure 2):

- chronological group I: 36,000-32,000 years BP
- chronological group II: 32,000-27,000 years BP,
- chronological group III: 26,000-20,000 years BP (now 23-20 Ka),

At the same time, a number of new questions and problems arose, including the correlation of the temporal boundaries of the chronological groups with the past climate fluctuations as reconstructed by other studies (for example, oxygen isotope climate-stratigraphy). Especially important were questions concerning the age of the two older chronological groups and the dating of the volcanic ash horizon that separated them. After more than four decades of research, the primary stratigraphic subdivisions of these sites – loessic loams, upper humic bed and lower humic bed – remained unchanged, but debate continued regarding the absolute dating of the major units.

Seven of the Kostenki sites contain cultural layers of the earliest chronological group (I) (Figure 2): Kostenki 1 (V cultural layer), Kostenki 6, Kostenki 8 (IV cultural layer), Kostenki 11 (V cultural layer), Kostenki 12 (II, III, IV, V cultural layers), Kostenki 14 ('cultural layer in the volcanic ash horizon', IVa, 'horizon in fossil soil with Lashamp exursion', IVb-'horizon of hearths') and Kostenki 17 (II cultural layer), Borshchevo 5 (III, IV, V cultural layers). They constitute a total of sixteen occupation levels.

According to the widely published traditional point of view, the material culture of sites assigned to the earliest chronological group is represented by the Streletskian and Spitsynian cultures (Figure 3A) (Praslov and Rogachev, 1982; Boriskovsky, 1984; Hoffecker, 1988, 2002a; Anikovich, 1992, 1999, 2003; Amirkhanov et al., 1993; Cohen and Stepanchuk, 1999, 2000-2001; Djindjian et al., 1999; Chabai, 2003).

Sites of the middle chronological group (II) are more numerous: Kostenki 1 (III cultural layer); Kostenki 5 (III cultural layer), Kostenki 8 (II, III cultural layers), Kostenki 11 (III, IV, 'northern locality'), Kostenki 12 (I, II cultural layers), Kostenki 14 (II, III cultural layers), Kostenki 15, Kostenki 16, Kostenki 17 (I cultural layer), Borshchevo 3, Borshchevo 4, Borshchevo 5 (II cultural layer) – a total of 17 settlements (Figure 2). Four coexisting cultural entities (Streletskian, Aurignacian, Gravettian and Gorodtsovian) are recognized within the second chronological group (Figure 3A).

The most numerous are occupations of the recent chronological group (III), containing the following: Kostenki 1 (I, II cultural layers); Kostenki 2; Kostenki 3, Kostenki 4 (I, II cultural layers); Kostenki 5 (I, II cultural layers), Kostenki 7; Kostenki 8 (I cultural

layer), Kostenki 9; Kostenki 10; Kostenki 11 (I, II cultural layers); Kostenki 13; Kostenki 14 (I cultural layer), Kostenki 18; Kostenki 19; Kostenki 20; Kostenki 21 (I, II, III cultural layers); Borshchevo 1, Borshchevo 5 (I, II cultural layers) – a total of 25 settlements (Figure 2). These occupations contain various Gravettian entities (Sinitsyn, 2007b) and sites of non-Gravettian attribution.

Tardiglacial time is represented by 3 cultural horizons of Borshchevo 2, the dating of which remains problematic.

Two important chronological markers were identified in the Kostenki stratigraphic sequence. The most important is the horizon of volcanic ash in the sterile loam horizon dividing the humic beds. 7 Kostenki sites contain a horizon of tephra: Kostenki 1, Kostenki 6, Kostenki 11, Kostenki 12, Kostenki 14, Kostenki 17, Borshchevo 5 (Sinitsyn, 2003a) (Figure 1). It holds considerable significance for Kostenki with respect to both internal and regional correlation of the sites. According to analyses carried out in the last quarter of the twentieth century, the age of the volcanic ash is about 38,000 years and it is connected to one of the eruptions of Campi Flegrei (Phlegrean Fields) in southern Italy, in other words, the CI-Y5 event (Melekestsev et al., 1984; Zubakov, 1986). This is confirmed by more recent analyses (Pyle et al., 2006; Giacco et al., 2006; 2008; Hoffecker et al., 2008; Wood et al., 2012) that place the age of the CI eruption at 39.3 Ka.

The other is a series of four magnetic excursions (Blake, Laschamp, Mono, Gotenborg), all identified in a 'stratigraphic sondage' without cultural layers (Pisarevsky, 1983; Zubakov, 1986; Sinitsyn and Hoffecker, 2006). The most important of these for the Kostenki chronology appears to be Laschamp (Gernik and Guskova, 2002; Guskova et al., 2012; Løvlie, 2006; Pospelova, 2005; Pospelova et al., 2008), which dates to 41 Ka (Nowaczyk et al., 2012), identified in profiles at Kostenki 12, 14 and 17 and probably at Kostenki 16.

For archaeology, these short-term events are an excellent means for the chronological correlation of cultural layers. Although the first is limited by the spatial distribution of CI-Y5 tephra, the palaeomagnetic events are global in scale.

Research at Kostenki has been undertaken by many Russian, European and American teams. Important contributions have been made by P. Haesaerts and S. Pirson (Belgium, Brussels), the group of J. Hoffecker and V. Holliday (USA, University of Colorado, University of Arizona), the dating programmes of T. Higham and K. Douka (UK, Oxford), M. Otte (Belgium, Liege), Ph. Nigst (UK, Cambridge), S. Sedov (Mexico, University of Mexico), J.-I. Svendsen, J. Mangerud and R. Løvlie (Norway, Bergen) D. Pietsch, P. Kuhn (Germany, Tübingen), L. Lisa (Czech Republic Prague) and so on. Of principal significance is the participation in field work at Kostenki of the group directed by A. A. Velichko (Institute of Geography, Moscow) from 1952 to the present day.

Current cultural and chronological classification of the Kostenki Palaeolithic

New archaeological materials obtained from the excavation at Kostenki 1, 12, 14 and Borshchevo 5 (Sinitsyn; 2004a; 2009; Haesaerts et al., 2004a; Ankovich et al., 2008; Lisitsyn, 2004) during the last decade and new analyses have led to significant changes in the traditional interpretation of the structure, cultural affiliation and chronology of the Palaeolithic at Kostenki (Sinitsyn, 2003b; 2010; Ankovich et al., 2007; 2008; Hoffecker, 2009; 2011a). Of primary importance is the sequence at Kostenki 14 (Markina gora), because only this site contains three cultural layers beneath the volcanic ash with diagnostic archaeological assemblages (Haesaerts et al., 2004a, b; Sinitsyn, 2003a, 2004a; Sinitsyn et al., 2013; Sedov et al., 2010; Sedov

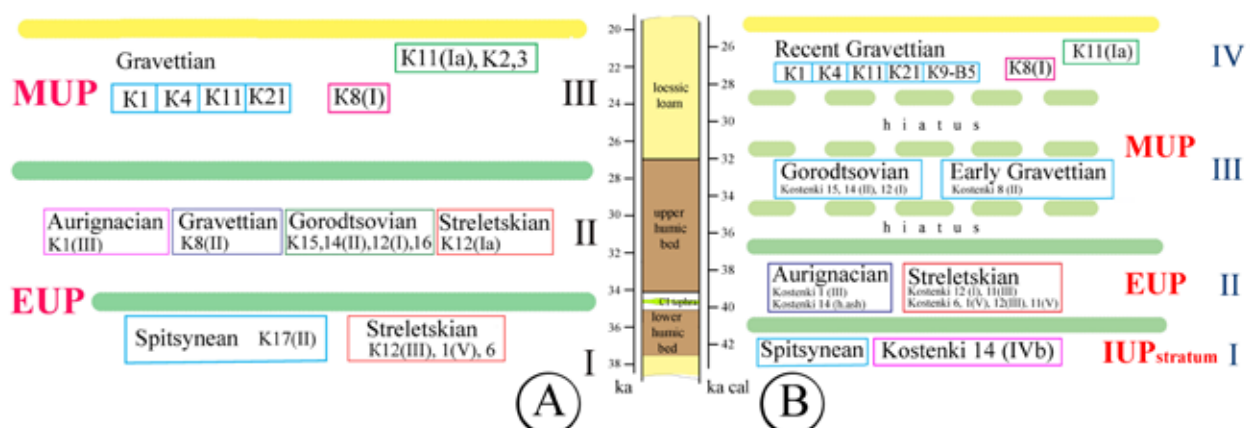


Figure 3 A & B. Models of Kostenki Palaeolithic. A – traditional model; B – modern model. EUP – Early Upper Palaeolithic, MUP – Middle Upper Palaeolithic, IUP – Initial Upper Palaeolithic. K – sites of Kostenki group, B – sites of Borshchevo group (in bracket – index of cultural layers). I-IV – chronological groups.

and Sinitsyn, 2012; Velichko et al., 2009; Panin and Nekrasov, 2013). Kostenki 14 provided the basis for modification of the traditional tripartite chronological scheme to a four-part model (Figure 3B) in which the lowermost unit has been subdivided into two groups: (1) Early Upper Palaeolithic (EUP) in the temporal range of 32–36 Ka (cal 36–40) with a typical European bi-modal structure comprising an Aurignacian of pan-European distribution and a series of local ‘transitional’ cultural unities (Streletskian in Eastern Europe); and (2) a more ancient ‘Initial Upper Palaeolithic stratum’ (IUP stratum) dating to 36–42 Ka (cal 41–46) represented by layers both at and below the level of the Laschamp magnetic excursion (41 Ka cal).

Initial Upper Palaeolithic stratum: Spitsyanean and IVb cultural layer of Markina gora

Reasons for distinguishing IUP-stratum appear to be as follows:

- more ancient stratigraphic /= chronological/ position than EUP in local sequences;
- non-Aurignacian and non-‘transitional’ affiliation (Sinitsyn, 2003b, 2010, 2014).

The recognition of assemblages older than and distinct from both Aurignacian and ‘transitional’ cultures is an important feature of the cultural sequence documented at Kostenki in the last few years. These assemblages include the Spitsyanean (cultural layer II of Kostenki 17 or Spitsyn site) and Layer IVb at Kostenki 14 (Markina gora). Uncalibrated radiocarbon dates of 36–37 Ka (Sinitsyn and Hoffecker, 2006; Holliday et al., 2007) should be considered the minimum age of these assemblages. The chronological position of these sites may overlap with the EUP assemblages, because their apparent place in the sequence of Upper Palaeolithic cultural development may or may not correspond to their chronological position, as in the case of the late ‘survival’ of the Mousterian in some regions.

Spitsyanean

The Spitsyanean industry is characterized by complete dominance of blade knapping technology based on uni- and bi-polar removal of blades from volumetric and semi-volumetric cores, a typical Upper Palaeolithic tool-kit (Figure 4), and a numerous and varied set of personal ornaments, including pendants on stone and fossil shell with holes for suspension made by bilateral drilling (Figure 5). A wide range of possible cultural affiliations has been suggested for this industry: J. K. Kozłowski (1986) placed it in the Gravettian sequence and later (see Djindjian et al., 1999) in the Aurignacian (also see Anikovich, 1992); the excavator, P. I. Boriskowsky (1963), on the basis of its techno-typological features, placed it in the ‘Early Magdalenian’ group of sites. At present, the Spitsyanean is identified as a separate cultural tradition of the Early Upper Palaeolithic (Rogachev, Anikovich, 1984). Nevertheless, both the technological and typological composition of the lithic assemblage seems to be more similar to those of the Magdalenian composition, than those of the Aurignacian and/or Gravettian.

Cultural Layer IVb at Markina gora

The artefact assemblage of cultural layer IVb (Figure 6) is also characterized by predominance of blade knapping technology employing various methods. Volumetric and flat uni- and bi-polar cores are identified, but the most numerous are cores on dolomite slabs morphologically similar to lateral burins. The technology of microblade production represents a separate method with some modifications reflected in the thick flakes and blades used as cores. The tools comprise end scrapers and burins of variable morphology, varied splintered pieces and items with concave and fluted working edges. Particularly noteworthy are several oval bifaces with plano-convex profiles. Also significant is the bone assemblage (Figure 7) containing a series of ‘mattock-like’ tools on bone, antler and mammoth tusk with ‘splintered’ extremities. The fragment of the head of anthropomorphic figurine, broken during the process of manufacturing, is the oldest known sculpted human image in the European Upper Palaeolithic. Especially intriguing is a bead with two holes on a *Columbellidae* shell (a tropical gastropod, the modern ecology of which is connected with the Mediterranean basin). Although some Aurignacian types of burins (burin buqué, burin de Vachona) are present as isolated artefacts (Figure 6, a, b), as a whole, the assemblage contrasts sharply to both the Aurignacian and the various ‘transitional’ industries.

A distinctive feature of the two assemblages in the IUP-stratum is the contrast in raw material procurement. All Spitsyanean artefacts were made on high quality Cretaceous black flint, the nearest sources of which are known at a distance of no less than 150 km from Kostenki (Boriskovsj, 1963). Siliceous limestone (dolomite) of local origin appears to predominate in cultural layer IVb at Kostenki 14, although a wide array of raw materials, including a few pieces of Cretaceous black flint are represented in the assemblage. Both cultural traditions are assumed to represent highly mobile groups, but with varying orientation. The Spitsyanean reflects use of distant, high-quality materials, while the occupants of cultural layer IVb at Markina gora emphasized the use of all available varieties of local raw materials.

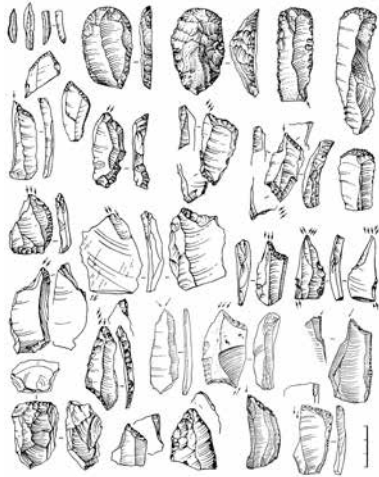


Figure 4. IUP-stratum. 36-42 Ka (cal: 42-45 Ka). Spitsyanean. Kostenki 17 (Spitsyn' site), cultural layer II. Lithic assemblage (according to Boriskovsky, 1963).



Figure 5. IUP-stratum. 36-42 Ka (cal: 42-45 Ka). Spitsyanean. Kostenki 17 (Spitsyn' site), cultural layer II. Personal ornaments.



Figure 6. IUP-stratum. 36-42 Ka (cal: 42-45 Ka). Kostenki 14 (Markina gora), cultural layer IVb. Lithic assemblage: a – busqued burins, b – Vachon' burin.



Figure 7. IUP-stratum. 36-42 Ka (cal: 42-45(Ka). Kostenki 14 (Markina gora), cultural layer IVb. Bone assemblage, artistic and personal ornaments.



Figure 8. EUP. 36-32 Ka (cal: 36-41 Ka). Aurignacian. Kostenki 14 (Markina gora), cultural layer 'in volcanic ash'. Lithic assemblage.



Figure 9. EUP. 36-32 Ka (cal: 36-41 Ka). Aurignacian. Kostenki 14 (Markina gora), cultural layer 'in volcanic ash'. Personal ornaments.

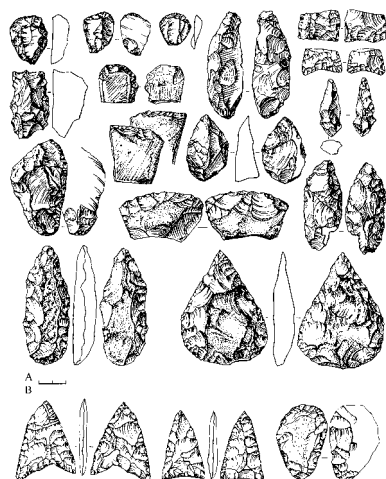


Figure 10. EUP. 36-32 Ka (cal: 36-41 Ka). Streletsian. A – Kostenki 12, cultural layer III. B – Kostenki 1, cultural layer V (according to Boriskovsky, 1984).



Figure 11. Early MUP 28-29 Ka (cal: 32-33.5 Ka). Early Gravettian. Kostenki 8 (Telman site), cultural layer II. Lithic assemblage.

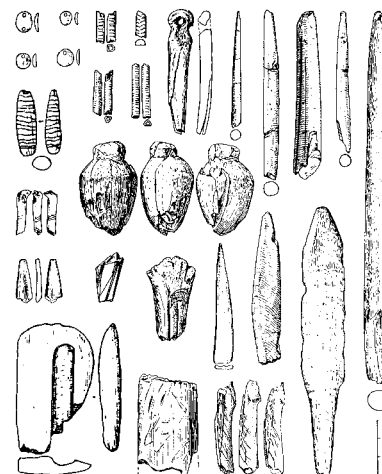


Figure 12. Early MUP 28-29 Ka (cal: 32-33.5 Ka). Early Gravettian. Kostenki 8 (Telman' site), cultural layer II. Bone assemblage, personal ornaments.

The Early Upper Palaeolithic: Aurignacian and Streletsian

Throughout Europe, the Early Upper Palaeolithic is characterized by a binary pattern, one component of which is the Aurignacian of pan-European occurrence, while the other is represented by a series of local 'transitional' cultures – in Eastern Europe by the Streletsian. Both Aurignacian and Streletsian at Kostenki are dated to 32-36 Ka (Cal: 36.2-41.5 Ka) (Dambon, et al., 1996; Sinitsyn, 1996; 1999; Sinitsyn et al., 1997; Sinitsyn and Hoffecker, 2006; Douka et al., 2010).

Assemblages assigned to the Aurignacian have been identified at three Kostenki sites: 1) the 'horizon in volcanic ash' at Kostenki 14 (Figure 8; 9); 2) cultural layer III at Kostenki 1 – both within the second chronological group; and 3) cultural layer II at Kostenki 1 in the loessic loams, but in a redeposited context. The assignment of all three assemblages is based on the techno-typological features of the Aurignacian techno-complex, including Dufour microblades of the Roc-de-Comb variety (Hahn, 1977; Sinitsyn, 1993; 2003a; 2007a).

The Streletsian industry (Figure 10) is based on flake technology and contains a wide variety of bifacial tools and (including the *fossil directeur* triangular point with concave base) (Bradley et al., 1995) numerous Mousterian tool types (mostly side-scrapers of various types). On the basis of the technology and Mousterian tool component, the Streletsian assemblages are traditionally identified as a 'transitional' industry with a problematic range of possible predecessors: Moldavian (Anikovich, 1983) and Crimea Mousterian (Anikovich, 1999; Anikovich et al., 2008), Central Russian Plain (Tarasov, 2006) and east Siberian (Gladilin and Demidenko, 1989).

The geographic distribution of the few indisputable Aurignacian assemblages in Eastern Europe includes Kostenki and Crimea (Suren 1-D) (Cohen and Stepanchuk, 1999; 2000-2001; Demidenko, 2000-2001; 2008; 2011; Demidenko et al., 2012; Vishnyatsky, 2004; Vishnyatsky and Nehoroshev, 2004). Streletsian assemblages have a more widespread area, including the Vladimir region (Sungir) (Bader, 1978; Bader and Lavrushin, 1998; Anikovich, 2005), Mid Urals (Garchi 1) (Pavlov and Indrelić, 2000) and the steppes of the Black Sea coastal area (Biryuchya Balka) (Matioukhin, 2012; Otte et al., 2006) and Vys (Zaliznyak et al., 2013). It suggests an adaptation of both cultural traditions to certain landscape-climatic and ecological zones.

The distribution of sites across various habitats, along with the exploitation of local raw materials indicate a high degree of mobility and adaptive flexibility for both the Aurignacian and Streletsian populations.

The Problem of the EUP-MUP transition: Gorodtsovian and Early Gravettian

As in all of Europe, the beginning of Middle Upper Palaeolithic (MUP), which is associated with the appearance of the Gravettian techno-complex, significantly alters the earlier bi-modal EUP pattern (represented by coexisting Aurignacian and 'transitional' traditions) which are estimated as the 'Gravettian revolution' (Hoffecker, 2011b).

One of the salient features of the Kostenki sequence is the Gravettian appearance in association with Gorodtsovian assemblages.

Early Gravettian

The assemblage of cultural layer II at Kostenki 8 (Telmanskaya site) remains the most ancient manifestation of the Gravettian in Eastern Europe. Its stratigraphic position in the Upper Humic Bed and radiocarbon date of $27\,700 \pm 750$ (GrN-10509) (Cal: 31.7–33.0 Ka) may provide a possible upper limiting age.

Uni- and bi-polar flake production (in both macrolithic and microlithic form) are evident from the few cores, most of which are exhausted. The morphology of the blanks and tools on blades indicate the predominance of Gravettian technology (as opposed to Aurignacian blade technology). The typology of the macro-component is typical: burins of varying sub-types, including multifaceted (some of them undoubtedly are microblade cores); end-scrapers; perforators; and a number of notched blades. The micro-component is dominant: nearly 900 pieces or more than 40% of the tool-kit. Along with widespread Gravettian points and backed bladelets with abrupt and semi-abrupt retouch, bi-points, (quasi-) segments and trapezes are identified in the collection (Figure 11) (Rogachev, 1951; Litovchenko, 1969; Praslov and Rogachev, 1982). The bone assemblage and the personal ornaments while not numerous, are relatively diagnostic (Figure 12).

The composition of the lithic assemblage at the site, without obvious analogues in Eastern Europe, encouraged a search for parallels in other parts of Europe. Efimenko (1953; 1960) saw the closest analogies to this assemblage in the Gravettian of the western Mediterranean, specifically in 'Menton's grottoes,' with the local cultural tradition known as 'Grimaldian' (Efimenko, 1956: 47–48; 1958: 446).

The primary significance of the Gravettian appearance in Kostenki about 27–28 Ka (Cal. 32–33 Ka) is its relationship to the broader problem of the origin of the Gravettian techno-complex and the fundamental restructuring of the Upper Palaeolithic world – replacing of the binary pattern of the EUP with a relatively uniform MUP organization. At present, it is widely believed that the transition occurred suddenly and simultaneously in different parts of Europe at roughly 30–28 Ka, and the question of where it appeared first is open to debate (Palma di Cesnola, et al., 1996; Goutas et al., 2011; Kozłowski, 2013).

Gorodtsovian

As a separate cultural unity, the Gorodtsovian was defined by P. P. Efimenko (1956) following the excavations at the Gorodtsov site (Kostenki 15), on the basis of an unusual lithic and bone assemblage, especially the presence of a 'Mousterian' component (Figure 13). Large 'shovels' made on mammoth bones with 'nail-like' heads of the haft were identified as a *fossil directeur* for this cultural entity (Figure 14). The emphasis on flake technology and high proportion of tools on flakes (which are predominant in cultural layer II at Kostenki 14), the numerous and variable 'Mousterian' tool types (up to 50% in cultural layer II at Kostenki 14 – Sinitsyn, 1996; 2000) and the relatively rich bone assemblages (Figure 15) – all of non-Aurignacian and non-Gravettian character – establish these assemblages as a unique east European cultural entity without analogies in other parts of the continent.

The specific sites included in the Gorodtsovian has been the subject of much debate: Kostenki 15, Kostenki 4 (I), Kostenki 14 (I, II) according to P. P. Efimenko (1956; 1958); Kostenki 15, Kostenki 12 (I or locality B), Kostenki 2, Kostenki 3, Kostenki 1 (II) and outside Kostenki, Karacharovo (Oka basin) and the Talitsky site (Tchusovaya basin, Mid Ural) according to A. N. Rogachev (1957; Gvozdover and Rogachev, 1969). G. P. Grigorjev (1970) has confined the Gorodtsovian assemblages to sites of the second chronological group: Kostenki 15, Kostenki 14 (II), Kostenki 12 (I or locality B), Kostenki 16; A. A. Sinitsyn (1996) included all sites of the second chronological group of non-Aurignacian and non-Gravettian affiliation; M. V. Anikovich (1992) retains only the sites with the distinctive bone 'shovels'.

Current debate over the Gorodtsovian concerns: a) taxonomy – restricting the Gorodtsovian at Kostenki to the second chronological group, most probably its upper portion; and b) the geographic distribution of the Gorodtsovian outside the Kostenki area, specifically the possibility of including the Talitsky site (Urals) (for discussion of the current debate see Grigorjev; 2001; Sinitsyn, 1997) and Mira (Ukraine) (Stepanchuk et al., 1998; 2004). There remain the problems of the origin of Gorodtsovian and its evolution.

As in the case of the IUP, the Gorodtsovian and Early Gravettian provide evidence of differing patterns of adaptation. The wide spectrum of raw materials used in the Gorodtsovian contrasts with the uniform material base of the Gravettian assemblage at Telmanskaya, which was imported from Cretaceous flint sources outside the Kostenki area.

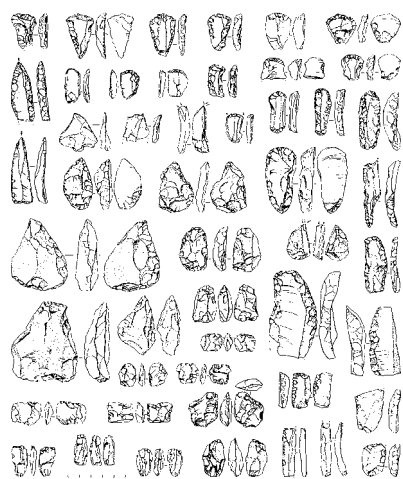


Figure 13. Early MUP 28-29 Ka (cal: 32-33.5 Ka). Gorodtsovian. Kostenki 15 (Gorodtsov site). Lithic assemblage.



Figure 14. Early MUP 28-29 Ka (cal: 32-33.5 Ka). Gorodtsovian. Shovels: A – Kostenki 15 (Gorodtsov' site); B – Kostenki 14 (Markina gora), cultural layer II.



Figure 15. Early MUP 28-29 Ka (cal: 32-33.5 Ka). Gorodtsovian. Kostenki 14 (Markina gora). cultural layer II. Bone assemblage, personal ornaments.



Figure 16. Recent MUP. Recent Gravettian. Kostenkovien. Kostenki 1, cultural layer I. Habitation area semi-underground dwellings and storage-pits.

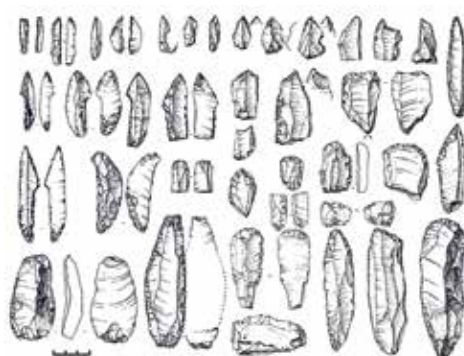


Figure 17. Recent MUP. Recent Gravettian. Kostenkovien. Kostenki 1, cultural layer I. Lithic assemblage.

Recent Gravettian and the problem of a hiatus

The current radiocarbon chronology for Kostenki indicates a temporal gap or hiatus between the cultural layers in the upper humic bed and the sites in the overlying loessic loams (Figure 3B). Its duration is estimated at roughly 4 to 5 thousand years: from 27–28 Ka to 22–23 Ka (cal: from 31 to 28 Ka). The archaeological data supports a cultural hiatus: both the Early Gravettian and Gorodtsovian traditions do not extend into the later period.

A principal feature of the Kostenki Palaeolithic is the great variety of cultural traditions in the interval 23–20 Ka (cal: 28–25 Ka). No other regional sequence of the European Upper Palaeolithic contains so many variants. The sites are found in a very tightly defined spatial and temporal context (corresponding to GS-4-3 – GI-3 in the Greenland ice core record) and the influence of climatic conditions on material culture probably was the same for all of them. The differences are found in all categories of material culture: technological methods and typological sets of both lithic and bone assemblages, personal ornaments, decorations on bone tools, art objects, dwelling constructions and probably funeral rites. This indicates that the variations cannot be accounted for in terms of functional differences among the sites and cultural tradition seems to be the most reasonable explanation for the variability.

At least four Gravettian varieties may be identified at Kostenki (Sinitsyn, 2007b). Neither the current radiocarbon chronology nor stratigraphy indicates any temporal distinctions among them; there is no evidence of more than one cultural layer of Gravettian affiliation in the loessic loams at any one site. The most reasonable interpretation is that all existed here simultaneously, at least in a geologic sense.

A separate problem is the coexistence of Gravettian variants with non-Gravettian sites, the most important of which are: layer I of Kostenki 8, layer I of Kostenki 4 (a complex of round dwellings) and sites of co-called Zamyatnin archaeological culture.

Kostenki-Avdeevo culture

The Kostenki–Avdeevo cultural entity remains a unique phenomenon represented at Kostenki by four sites and also by other sites outside Kostenki–Borshchevo. All sites are located in the Pokrovsky Valley: Kostenki 1 (I), Kostenki 13, Kostenki 18 on its left bank; Kostenki 14 (I) – on the right (Figure 2, III). The large and complex settlements are well known and probably were occupied for a very specific purpose. The basic camp (Kostenki 1 – Kostenki 13) reveals a characteristic habitation area – dwelling constructions (the first fully excavated, oval 36 x 14–15 m) (Figure 31) (Efimenko, 1954; 1958; Grigorjev, 1967; Praslov and Rogachev, 1982) with a line of hearths along a long axis and surrounded by series of semi-underground dwellings and storage-pits covered by large mammoth bones (Figure 16).

A triad of components, diagnostic for the Kostenki–Avdeevo cultural entity was defined following the first excavation of Kostenki 1 (Efimenko, 1928), comprising an association of realistic female figurines, shouldered points of specific proportions and the so-called Kostenki knife, manufactured with the ‘Kostenki thinning technique’. Later, the number of diagnostic features of this most famous and expressive Palaeolithic culture of Eastern Europe, were increased (Figure 17) (Praslov and Rogachev, 1982; Gvozdover, 1953; 1961; 1998; Gira and Bradley, 1998), but the three ‘index fossils’ remain a fundamental set of defining attributes. Although all three are tied to the Kostenki–Avdeevo phenomenon, for all practical purposes the presence of two of them are sufficient to assign an assemblage to it.

Principal significance has artistic and decorative assemblages (Figure 18), include numerous female figurines (Figure 19) and range of problems related to aesthetic sub-system of this cultural entity (Abramova, 1962; 1967; 1995; Gvozdover, 1995; Praslov, 1985; 1986; 1993; Kozłowski, 1992; Iakovleva, 1999; 2000; 2012; Dupuy, 2012; Sinitsyn, 2012).

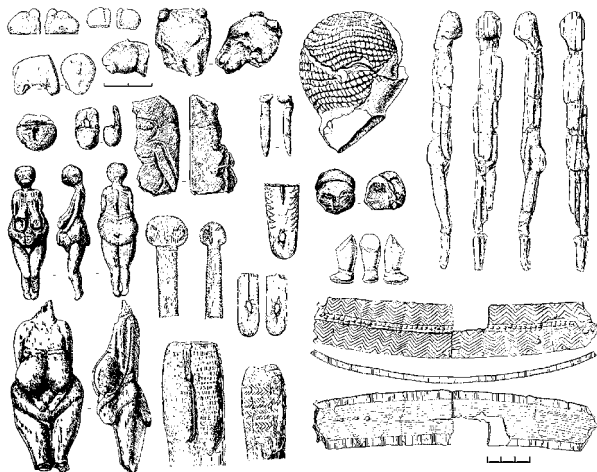


Figure 18. Recent MUP. Recent Gravettian. Kostenkovien. Kostenki 1, cultural layer I. Artistic assemblage.



Figure 19. Recent MUP. Recent Gravettian. Kostenkovien. Kostenki 1, cultural layer I. Female figurine.



Figure 20. Recent MUP. Recent Gravettian. Gmelim archaeological culture. Kostenki 21, cultural layer III. Lithic assemblage.

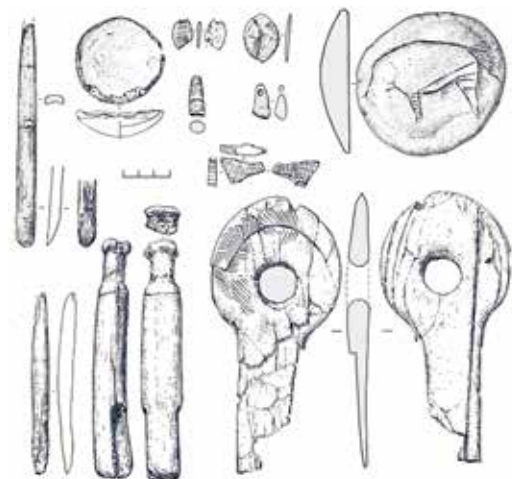


Figure 21. Recent MUP. Recent Gravettian. Gmelim archaeological culture. Kostenki 21 (Gmelin site), cultural layer III. Bone assemblage, personal ornaments.

Sites of the Kostenki-Avdeevo culture outside of Kostenki

The triad of diagnostic features of the Kostenki–Avdeevo culture was identified at the following sites:

- Avdeevo, a site nearly identical to Kostenki 1–I in all respects: the organization of the features, lithic and bone assemblages, arts, ornaments and others (Efimenko, 1953; Rogachev, 1953; Gvozdover, 1961; 1995; 1998);
- Zaraisk. After the discovery of female figurines in 2005, the cultural attribution of this site became absolutely clear. A unique feature is a bison sculpture, carved in an unusual style. Also unusual is the question of the duration of occupation, on the basis of a wide range of radiocarbon dates and microstratigraphic evidence (Trusov, 1994; 1998; 2011; Amirkhanov, 2000; 2009; Amirkhanov, Lev, 2002; 2004; 2007; 2008; Lev and Amirkhanov, 2002);
- Gagarino. The site differs from Kostenki 1–I and Avdeevo by some details of archaeological assemblage (Zamiatnin, 1934; Tarasov, 1979) and it may be more recent;
- Khotylevo 2. The site contains some features that distinguish it from typical Kostenki–Avdeevo assemblages. They pertain to both the structure of the habitation area and the style of the female figurines, ornaments and decorative elements, including unique decorations on the cortex of some flint tools (Zavernjaev, 1974; 1978; 1991; 2000; Gavrilov, 2008; 2012, Praslov, 1995). The affiliation of Khotylevo 2 with the Kostenki–Avdeevo culture remains more problematic than other cases;
- Berdyzh. Female figurines and Kostenki knives have not been identified at this site and a shouldered point of Kostenki–Avdeevo appearance remains the sole argument for a connection to the Kostenki–Avdeevo cultural tradition (Polikarpovich, 1968; Budko, 1972; Kaletchitz, 1984; Kaletchitz et al., 2010; Ksenzov, 1988).



Figure 22. Recent MUP. Recent Gravettian. Kostenki 4 (Alexadov site), cultural layer II. Lithic assemblage.

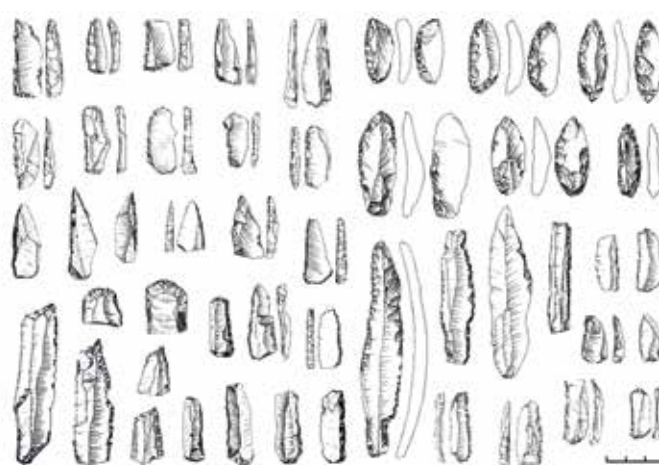


Figure 23. Recent MUP. Recent Gravettian. Kostenki 11 (Anosovka), cultural layer II. Archaeological assemblage.

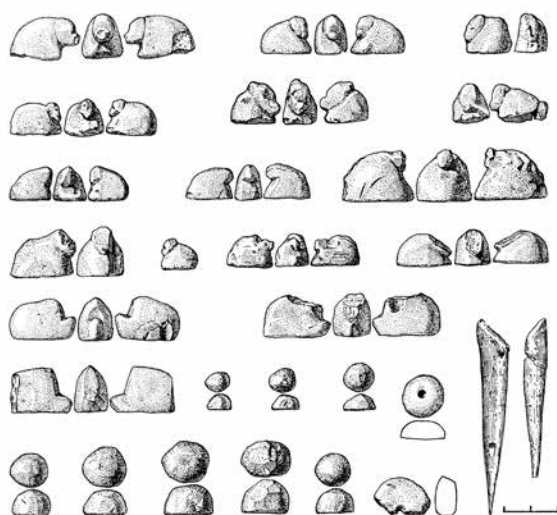


Figure 24. Recent MUP. Recent Gravettian. Kostenki 11 (Anosovka), cultural layer II. Zoomorphic figurines (according to Abramova, 1962).

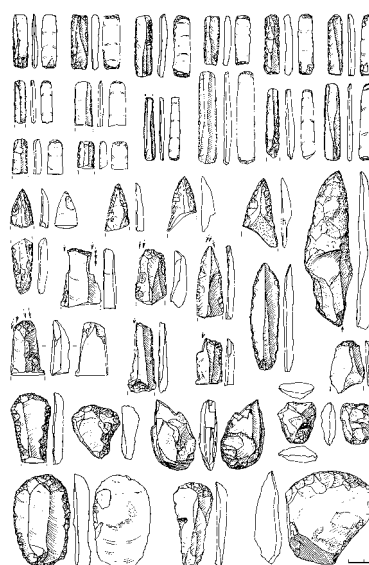


Figure 25. Recent MUP. Recent Gravettian. Borshchevo 5, cultural layer I. Lithic assemblage (according to Lisitsyn, 2004).

Diagnostic components of the Kostenki–Avdeev culture are found in layer IX at Willendorf 2 in Lower Austria (Felgenhauer, 1956–59; Otte, 1981; Broglio and Laplace, 1996). The affiliation of other widely distributed sites containing shouldered points remains under discussion (Kozłowski, 1969; 1970; 1986; 1998).

The range of problems concerning sites of this group is wide and embraces the full spectrum of issues related to the Upper Palaeolithic, because the relevant archaeological data are immense and highly variable. Ideas and opinions regarding the organization, chronology and differentiation of the Kostenki–Avdeev culture (or Kostenkovian) are equally wide and various: from the view that it is part of a larger Kostenki–Pavlov–Willendorf entity to its subdivision into a series of independent archaeological cultures; from the recognition of sites as contemporaneous (in a geological sense as isochronous) to efforts to arrange them in chronological sequences (Efimenko, 1958; Childe, 1956; Delporte, 1959; Grigorjev, 1970; 1993; Tarasov, 1979; Amirkhanov, 1998; Anikovich et al., 2008; Gavrilov, 2008; Soffer, 1985; 1987; 1993; Kozłowski, 1969; 1970; 1986; 1998; Otte et al., 1996; Hoffecker, 2002a, b).

Gmelin archaeological culture (Kostenki 21-III)

Despite the presence of some attributes that are common in the Gravettian techno-complex, the material culture of cultural layer III at Kostenki 21 appears to represent a separate cultural phenomenon. This observation is based on the lithic and bone assemblages, art objects, decorations and ornaments (Praslov, 1964; Praslov and Rogachev, 1982; Ivanova, 1985). Lithic ‘index fossils’ include shouldered points with proportions distinct from the shouldered points of the Kostenki–Avdeev culture, but similar to those of the south European Gravettian and backed points similar to federmesser points (Figure 20). The bone assemblage contains a series of characteristic tools in association with diagnostic pendants and – unique for the East European Palaeolithic – engraving on stone slabs (Figure 21).

Alexandrov archaeological culture (Kostenki 4-II)

The most diagnostic features of this cultural tradition are:

- a unique type of long oval dwelling construction/habitation area/ (35 x 5.5 m and 23 x 5.5 m) excavated into the surface (20–30 cm) with series of hearths on a long axis (Figure 31);
- a lithic assemblage dominated by backed blades and points of typical Gravettian form and a very high content of splintered pieces associated with a low index of burins and end scrapers (Figure 22).

According to the excavator, A. N. Rogachev (1955), the complex of the lower occupation layer of Kostenki 4 has no direct analogues among contemporaneous sites in Eastern Europe, but recent studies reveal a similarity with the south European Gravettian (Zheltova, 2013).

Anosov archaeological culture (Kostenki 11-II)

The presence of round, shallow semi-subterranean dwellings (about 6 m in diameter), a unique lithic assemblage and figurative art (the most indicative of which are small zoomorphic forms (Figure 24), provides a basis for defining a specific cultural entity.

The lithic assemblage is characterized by numerous and variable series of truncations including concave; a relatively low index of burins (15%) and very low index of end-scrapers (less than 1%); tanged pieces in combination with other tools; symmetrical leaf points that are plano-convex and bi-convex in cross-section with partial bifacial retouch; the dominance of backed points and blades/bladelets (more than 50% of tool-kit) (Figure 23) (Rogachev, 1961; Praslov and Rogachev, 1982; Popov, 1983; 2002; Popov and Pustovalov, 2004). A characteristic feature of this group is the sub-group of tools with morphology similar to federmesser, along with typical Gravettian points and blades. The Gravettian backed points and federmesser types, widely discussed during the 1970s, are principal attributes not only for cultural layer II of Kostenki 11, but also for Kostenki 21–III, where the same tools also were identified.

Kostenki 9-Borshchevo 5 variant

This Gravettian variant is defined on a quantitative basis: the percentage of backed blades, often with truncated edges (Figure 25) (Lisitsyn, 2004).

Non-Gravettian assemblages of the youngest chronological group

Along with the Gravettian assemblages, some industries of non-Gravettian affiliation have been identified at Kostenki in the temporal range of 23–20 Ka (cal: 28–25 Ka).

Kostenki 8 (I)

The site yields traces of round dwelling constructions (nearly 6 m in diameter) excavated 50–70 cm into the surface with a central hearth. The skull of a cave lion (presumably crowning the roof) was found at one of them.

A variety of points, including bi-points (frequently with ventral modifications) and tools similar to Mousterian points dominate the lithic assemblage. A diagnostic type is a leaf point, sometimes tanged, with partial bifacial retouch, similar to projectile points of the Jerzmanowice type and/or points in sites of the Lincombien–Ranis–Jerzmanowice entity dating to the Initial Upper Palaeolithic of north–south Europe. Other characteristic features of the assemblage are a very low index of scrapers, a number of side-scrapers on flakes and splintered pieces (Figure 26) (Efimenko and Boriskovsky, 1953).

Kostenki 4 (I)

The archaeological assemblage is characterized by round dwellings roughly 6 m in diameter, intruding 50 to 10 cm into the surface, with a central hearth at centre; unusual but numerous and variable lithic and bone assemblages; a series of pestle-grinders on granite, quartzite and sandstone; a very important series of about 200 of grinding/polished tools on schist; and bi-convex discs and hatchet-look tools. Some of the discs have traces of use as retouchers (Rogachev, 1955).



Figure 26. Recent MUP. Kostenki 8 (Telman' site), cultural layer I. Lithic assemblage (according to Efimenko and Boriskovsky, 1953).

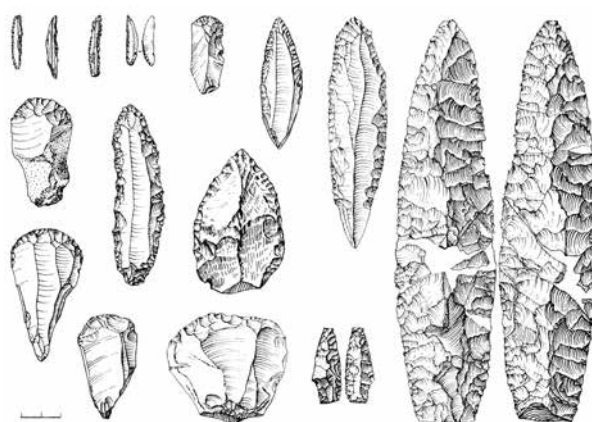


Figure 27. Recent MUP. Kostenki 4 (Alexadov' site), cultural layer I. Lithic assemblage.

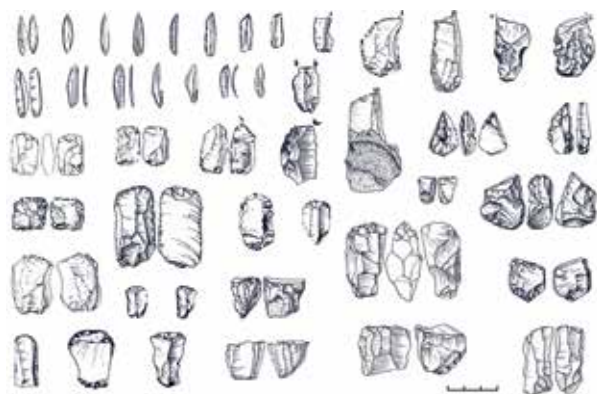


Figure 28. Recent MUP. Kostenki 11 (Anosovka 2), cultural layer Ia. Lithic assemblage.



Figure 29. Recent MUP. Kostenki 11 (Anosovka 2), cultural layer Ia. Remains of dwelling construction (Anosovo-Mezin type) in the museum exposition.



Figure 30. Kostenki. Archaeological museum. Museum exposition (at fore-part: remains of dwelling construction).

The quantity of these tools shows that grinding/polishing techniques were widespread in this cultural tradition. According to the excavator A. N. Rogachev (1973), the pestle-grinders suggest 'complex gathering' and the preparation of vegetal resources for long-term storage by means of special tools. Additional support for this hypothesis has been provided by the analysis of the Kostenki pestle-grinders in Italy, which documented traces of starch on their surfaces (Revedin et al., 2009, 2010).

Backed microblades of non-Gravettian appearance (~400), burins (~250) and some scrapers (75) are predominant in the lithic assemblage. Especially diagnostic are the bifacial tools, unfortunately not common: a leaf point that is bi-convex in cross-section, a shouldered point of Solutrean appearance and discoid tools.

The site provides rich and variable collections of bone, ornamental/decorative assemblages and art objects, including both anthropomorphic and zoomorphic figurines. The unusual combination of cultural features is without close analogues and its cultural affiliation remains the subject of debate.

Zamyatnin cultural tradition

A group of sites, probably the youngest at Kostenki, are sometimes combined as the Zamyatnin cultural entity: Kostenki 2 (or Zamyatnin site, eponymous for this tradition), Kostenki 2, Kostenki 3, Kostenki 11 (Ia) and Kostenki 19 (Rogachev and Anikovich, 1984). Because these sites yield highly variable lithic assemblages, it seems best to characterize them as a chronological rather than a cultural group.

The most important is cultural layer Ia of Kostenki 11, which contains three dwelling constructions of Anosovsko-Mezin type, the most impressive form of Upper Palaeolithic dwelling (Figure 29), similar to the mammoth dwellings at Mezhirich, Gontsy and Dobranichevka in the Dnepr Basin.

The most diagnostic features of the lithic assemblages are the microblades of very variable morphology, distinct both from the Aurignacian and Gravettian and numerous splintered pieces. Burins, end scrapers and truncations are represented by types that enjoy wide distribution in the Upper Palaeolithic (Figure 28).

Dwelling constructions

Along with traces of oval dwellings containing a central hearth (typically interpreted as tents similar to the chum or yaranga found among northern foraging peoples), which are widespread in the Upper Palaeolithic, the Kostenki sites yield evidence of large dwellings that have been used as a basis for reconstructing the social organization of their occupants (Rogachev, 1970). They include: (a) large former dwelling areas of Kostenki-Avdeevo type with a central line of hearth surrounded by semi-subterranean 'dwelling-pits' and storage-pits; (b) elongated former dwellings on the surface with a similar central line of hearths, found in the lower cultural layer at Kostenki 4; and (c) large dwelling constructions (up to 8 m in diameter) composed of numerous mammoth bones and tusks of the Ansovo-Mezin type (Figure 31), reconstruction of which are found in many museums and archaeological interpretive centres.

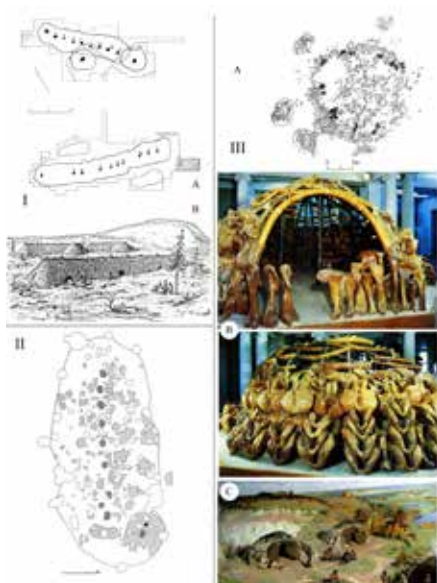


Figure 31. Principal types of dwelling constructions at Kostenki: I – Alexandrov' type (Kostenki 4, cultural layer II): A – schematic plan, B – reconstruction of the settlement (according to Rogachev, 1940; 1955); II – Kostenki-Avdeevov' type (Kostenki 1, cultural layer I, first habitation complex (according to Rogachev, 1970); III – Anosovo-Mezin' type: A – Kostenki 11 (Anosovka), cultural layer Ia (according to Praslov, Rogachev, 1982), B - reconstruction of dwelling (Mezhirich, dwelling I) in the Paleontological Museum at Zoological Institute, Kiev; C - reconstruction of the settlement (according to Pidoplichko, 1969; 1976).



Figure 32. Anthropological types of Kostenki inhabitants: A – Kostenki 14 (33 Ka – cal: 37.5 Ka), B – Kostenki 2 (23 Ka – cal: 28 Ka). Plastic reconstructions by M. M. Guerasimov (1955).

Anthropological remains

Information on the physical character of the people who created the various cultures found at Kostenki is as limited as our knowledge of Palaeolithic people in general. Only nine cultural layers at Kostenki have provided anthropological remains, mostly comprising teeth. Of considerable importance are five burials associated with clear traces of funerary ritual (Guerasimova, 1982; Guerasimova et al., 2007; Klein et al., 1971; Klein, 1978; Zubov, 2004; Sinitsyn, 2004b; Pettitt, 2011). Reconstructions of the individuals represented by two of the skeletons were undertaken by M. M. Guerasimov (1955): Kostenki 2 – the most recent /22–23 Ka – Cal: 27 Ka / (Figure 32B) – a typical Cro–Magnon and Kostenki 14 – the most ancient /33 Ka – Cal: 37–38 Ka (Marom et al., 2012) / (Figure 32A) – described for many years as australo–negroid anthropological type (Debetz, 1955; see Yakimov, 1980 for an opposing view), but now assigned to a mtDNA haplogroup (U) that is common in Europe (Krause et al., 2010) and related to Aurignacian cultural tradition.

Cultural Heritage Museum

The discovery of a large structure composed of mammoth bones and surrounded by series of storage–pits at Kostenki 11 provided the basis for a museum, which was built around the exposed excavation floor and opened for the public in 1979 on the centenary of the first discovery of the Palaeolithic at Kostenki (Figure 30).

Natural events of particular meaning (heritage)

The Kostenki–Borshchevo locality provides evidence of a series of natural events, the most important of which is volcanic ash from catastrophic eruption at Phlegrean Fields in southern Italy (nearly 3000 km from Kostenki) at 39–40 Ka BP, one the most significant catastrophes in prehistory (Hoffecker et al., 2008; Openheimer, 2011), consequences of which remain the matter of debate.

Conclusions

The concentration of sites at Kostenki represents a unique phenomenon and remains without compelling explanation because the area does not seem to have possessed any features or attractions that are not found in adjoining areas along the Don River.

Although confined to a small area, the Kostenki sites represent a separate and unique locus of Upper Palaeolithic cultural development, because they exhibit a particular pattern of cultural evolution, comparable to other principal areas in Europe (for example, Mediterranean, Aquitanian, Moravian and so forth).

Kostenki yields evidence of the oldest known Upper Palaeolithic techno-complex (IUP stratum) in Eastern Europe, reflecting early movements of anatomically modern humans into northern Eurasia (42–44 Ka cal).

The earliest appearance of the Gravettian is identified at Kostenki at 28 Ka, simultaneously with the earliest manifestation of the Gravettian techno-complex in other parts of Europe (Masière, Geißenklösterle, Willendorf 2, Paglicci, and so on). In each area, the Gravettian emerges as a fully developed complex in the context of the later Aurignacian. Kostenki presents a more complicated situation owing to the additional presence of the unique Gorodtsovian cultural entity, unknown in other parts of the continent.

All major developments in the study of the East European Upper Palaeolithic have been tied to, and largely based upon, materials from Kostenki, which continues to attract both archaeological and natural-scientific research, now carried out in a number of international projects.

The association of unique cultural history (particular model of Upper Palaeolithic cultural evolution) and natural events (volcanic ash connected with CI eruption at Phlegrean Fields in southern Italy) at Kostenki invest it with special significance for cultural and natural World Heritage.

Acknowledgments

My sincere gratitude to Nuria Sanz (UNESCO) and N. Conard (Tübingen University) for the invitation to the meeting in Tübingen and the possibility of including Kostenki in the UNESCO World Heritage List. Thanks also to the organizers of this meeting and to J. F. Hoffecker (University of Colorado) for kindly correcting of my English-language text. Their assistance and support reflects the importance of Kostenki in the development of ideas about the Palaeolithic and its prominent place in the cultural heritage of all peoples. I also gratefully acknowledge supporting grant from the RFBR 14-06-00295.

Bibliography

Abramova, Z. A. 1962. Палеолитическое искусство на территории СССР [*Palaeolithic art in the USSR*]. Свод археологических источников [Series: Collections of archaeological records], Vol. A 4–3. Moscow–Leningrad. (In Russian).

_____. 1967. L'art mobilier Paléolithique en URSS. *Quartär*, 1967, Bd. 18, pp. 99–126.

_____. 1995. *L'art Paléolithique d'Europe orientale et de Sibérie*. Grenoble. Jérôme Millon.

Amirkhanov, H. A. 1998. Восточный граветт или граветтоидные индустрии Центральной и Восточной Европы [Eastern Gravettian or Gravettian industries of the Eastern Europe]. In: Amirkhanov, H. A. (ed. Восточный граветт [*The Eastern Gravettian*]). Moscow, pp. 15–34.

_____. 2000. Зарайская стоянка. [*Zaraisk site*]. Moscow.

Amirkhanov, H. (ed.) 2009. Исследования палеолита в Зарайске. 1999–2005 [*Palaeolithic studies in Zaraisk. 1999–2009*]. Moscow.

Amirkhanov, H. and Lev, S. Yu. 2002. Comparative characteristics and stylistic analyses of the bison figurine from Zaraisk site. *Archaeology, Ethnology and Anthropology of Eurasia*, Vol. 3 (11), Novosibirsk, pp. 22–31.

Amirkhanov, H. and Lev, S. Yu. 2004. Статуэтка бизона с Зарайской стоянки [Bison figurine from Zaraisk site]. H. Amirkhanov (ed. Проблемы каменного века Русской равнины [*Stone Age problems of the Russian plain*]). Moscow, pp. 299–321.

Amirkhanov, H. and Lev, S. Yu. 2007. Новые произведения палеолитического искусства с Зарайской стоянки [New finds of Palaeolithic art from Zaraisk]. *Rossiyskaya Archaeologia*, Vol. Moscow, pp. 22–35.

Amirkhanov, H. and Lev, S. Yu. 2008. New finds of art objects of the Upper Palaeolithic site of Zaraysk, Russia. *Antiquity*, Vol. 82, pp. 862–870.

Amirkhanov, A., Anikovich, M. V. and Borziak, I. A. 1993. Problème de la transition du Moustérien au Paléolithique supérieur sur la territoire de la Plane Russe et du Caucase. *L'Anthropologie*, Vol. 93, No. 2–3, pp. 311–330.

Anikovich, M. V. 1983. О возможных юго–западных корнях костенковско–стрелецкой культуры [To the possible south–western origin of Kostenki–Streletsk culture]. *Первобытные древности Молдавии [Prehistoric antiquities of Moldavia]*. Kishiev, p. 193–202.

_____. 1992. Early Upper Paleolithic industries of Eastern Europe. *Journal of World Prehistory*, Vol. 6, No. 2, pp. 205–245.

_____. 1999. The formation of Upper Paleolithic cultures and anatomically Modern Humans: the East European perspective. *Anthropologie*, Vol. 37 (2), pp. 115–123.

_____. 2003. The Early Upper Paleolithic in Eastern Europe. *Archaeology, Ethnology and Anthropology of Eurasia*, Vol. 2 (14). Novosibirsk, pp. 15–29.

_____. 2005. Sungir in the cultural–historical context and the problem of modern humans formation. *Archeology, ethnography and anthropology of Eurasia*, Vol. 2 (22), Novosibirsk, pp. 37–47.

Anikovich, M. V., Popov, V. V. and Platonova, N. I. 2008. Палеолит Костенковско–Борщевского района в контексте верхнего палеолита Европы [*Paaleolithic of Kostenki–Borschevo region in the context of Upper Paleolithic of Europe*]. Anikovich (ed. Труды Костенковско–Борщевской археологической экспедиции ИИМК РАН [Proceedings of Kostenki–Borschevo archaeological expedition IHMC RAS], Vol. 1. Saint Petersburg.

Anikovich, M. V., Sinitsyn, A. A., Hoffecker, J. F., Holliday, V. T., Popov, V. V. Lisitsyn, S. N., Forman, S. L., Levkovskaya, G. M., Pospelova, G. A., Kuz'mina, I. E., Burova, N. D., Goldberg, P., Macphail, R. I., Giaccio, B. and Praslov, N. D. 2007. Early Upper Paleolithic in Eastern Europe and implications for the dispersal of Modern Humans. *Science*, Vol. 315, pp. 223–226.

Bader, O. N. 1978. Сунгирь. Верхнепалеолитическая стоянка [*Sungir. The Upper Palaeolithic site*]. Moscow. (In Russian).

Bader, N. O. and Lavrushin, Yu. A. (eds.) 1998. Позднепалеолитическое поселение Сунгирь (погребения и окружающая среда [*The Upper Palaeolithic site of Sungir (graves and environment)*]. Moscow. (In Russian).

Bordes, F. 1968. *Le Paléolithique dans le monde*. Paris.

Boriskovsky, P. I. 1963. Очерки по палеолиту бассейна Дона [*Studies on the Palaeolithic of Don basin*]. Материалы и исследования по археологии СССР [*Materials and studies for archaeology in the USSR*] Vol. 121. Moscow–Leningrad. (In Russian).

Boriskovsky, P. I. (ed.) 1984. Палеолит СССР. Сер. Археология СССР [*The Palaeolithic of USSR. Ser.: Archaeology of USSR*]. Moscow. (In Russian).

Bradley, B.A., Anikovich, M. and Giria, E. 1995. Early Upper Palaeolithic in the Russian Plain: Streletskayan flaked stone artefacts and technology. *Antiquity*, Vol. 69, n. 299, pp. 989–998.

Broglio, A. and Laplace, G. 1996. Études de typologie analytique des complexes leptolithiques de l'Europe centrale. II. Le complexes gravettiens de la Basse Autrichw: Willendorf II. *Rivista di Scienze Preistoriche*, Vol. 21, pp. 303–364.

Budko, V. D. 1972. The Palaeolithic period of Byelorussia and adjoint areas. In: F. Bordes (ed.) *The origin of Homo sapiens* (Proceedings of the Paris symposium 2–5. IX. 1969 organized by UNESCO in cooperation with INQUA). Paris, UNESCO, pp. 187–198.

Chernysh, A. P. 1973. Палеолит и мезолит Приднестровья [*The Paleolithic and Mesolithic of the Dnestr area* (for the IX Congress of INQUA, New Zealand). Moscow]. Moscow. (In Russian).

Chernysh, A. P. 1987. Эталонная многослойная стоянка Молодова V. Археология [*The key multilayered site of Molodova V. Archaeology*]. I. K. Ivanova and S. M. Tzeitlin (eds. Многослойная палеолитическая стоянка Молодова V. Люди каменного века и окружающая среда (к XII конгрессу INQUA, Канада) [*The multilayered Palaeolithic site of Molodova V. Stone Age men and the environment* (for the XII Congress of INQUA, Canada, 1987)]. Moscow, pp. 7–93. (In Russian).

- Chabai, V. P. 2003. The chronological and industrial variability of the Middle to Upper Paleolithic transition in eastern Europe. J. Zilhao and F. d'Errico (eds.) *The Chronology of the Aurignacian and of the Transitional Technocomplexes. Dating, Stratigraphies, Cultural Implications* (Proceedings of Symposium 6.1 of the XIVth Congress of the UISPP). *Trabalhos de Arqueologia*, 33. Lisboa, pp. 71–86.
- Childe, V. G. 1956. Kostenki: 'East Gravettian or Solutrean'. *University of London Institute of Archaeology. Ann. Rep.*, Vol. 12.
- Cohen, V. Yu., Stepanchuk, V. N. 1999. Late Middle and Early Upper Paleolithic Evidence from the East European Plain and Caucasus: A new look at variability, interactions, and transitions. *Journal of World Prehistory*, Vol. 13, No. 3, pp. 265–319.
- Cohen, V. Yu. and Stepanchuk, V. N. 2000–2001. Middle to Upper Paleolithic transition in the Eastern Europe. *Préhistoire Européenne*, 16–17. Liège, pp. 111–132.
- Damblon, F., Haesaerts, P. and van der Plicht, J. 1996. New datings and considerations on the chronology of Upper Palaeolithic sites in the Great Eurasian Plain. *Préhistoire Européenne*, Vol. 9. Liège, pp. 177–231.
- Debetz, G. F. 1955. Палеоантропологические находки в Костенках [*Palaeoanthropological finds at Kostenki*]. Советская этнография, 1 [Soviet Ethnography, 1]. Moscow, pp. 43–53. (In Russian).
- Delporte, H. 1959. Les stations Paléolithiques de la région de Kostenki–Borchevo. *Pallas* (Ann. Fac. Lett. Toulouse), VIII–2. Toulouse, pp. 13–31.
- Demidenko, Yu. E. 2000–2001 The European Early Aurignacian of Krems–Dufour type industries: a view from Eastern Europe. *Préhistoire Européenne*, Vol. 16–17. Liège, pp. 147–162.
- Demidenko, Yu. E. 2008. The Early and Mid–Upper Palaeolithic of the North Black Sea region: an overview. *Quarter*, Vol. 55, pp. 99–114.
- Demidenko, Yu. E. 2011. The Late Middle Palaeolithic and Early Upper Palaeolithic of the north–eastern and eastern edges of the Great Mediterranean (south of Eastern Europe and Levant): any archaeological similarities? J.–M. Le Tensorer, R. Jacher, M. Otte (eds.) *The Lower and Middle Palaeolithic in the Middle East and neighbouring regions*. Liège, ERAUL, pp. 151–167.
- Demidenko, Yu. E., Otte, M. and Noiret, P. (eds.) 2012. *Siuren I rock–shelter. From Late Middle Paleolithic and Early Upper Paleolithic to Epi–Paleolithic in Crimea*. Liège, ERAUL, pp. 129.
- Djindjian, F., Kozłowski, J. and Otte, M. 1999. *Le Paléolithique supérieur en Europe*. Paris.
- Douka, K., Higham, T. and Sinitsyn, A. 2010. The influence of pretreatment chemistry on the radiocarbon dating of Campanian Ignimbrite–aged charcoal from Kostenki 14 (Russia). *Quaternary Research*, Vol. 73, pp. 583–687.
- Dupuy, D. 2012. L'incomplétude et le morcellement du corps féminin dans l'imaginaire Paléolithique : les sculptures gravettiennes de Kostenki 1–I (Plaine russe – 22,000–23,000 ans BP). In: J. Clottes (ed. *L'art pléistocène dans le monde / Pleistocene art of the world / Arte pleistoceno en el mundo, Actes du Congrès IFRAO*, Tarascon–sur–Ariège, September 2010, Symposium 'Art mobilier pléistocène'. No. spécial de Préhistoire, Art et Sociétés, *Bulletin de la Société Préhistorique Ariège–Pyrénées*, LXV–LXVI, 2010–2011, CD, pp. 1471–1491.
- Efimenko, P. P. 1928. Некоторые итоги изучения палеолита СССР [Some results of the Palaeolithic study in USSR]. *Человек [Man]*, 1, Moscow, pp. 45–59.
- _____. 1953. Первобытное общество [*Prehistoric society*]. Kiev. (In Russian).
- _____. 1954. Matériaux sur le peuplement Paléolithique de Kostenki 1/extrait de l'article de P. P. Efimenko, CA, XI. 1949, p. 113–126, traduction de A. Leroi–Gourhan. *Bulletin SPF*, 1954, t. LIII, fasc. 7, p. 322–325.
- _____. 1956. К вопросу о характере исторического процесс в позднем палеолите Восточной Европы (о памятниках так называемого селетского и гримальдийского типа [*The problem of historic process features in the East European Upper Palaeolithic* (assemblages of so–called Grimaldian and Szeletian types)]. *Советская археология [Soviet Archaeology]*, XXVI. Moscow, pp. 28–53. (In Russian).

Efimenko, P. P. 1958. Костенки I [*Kostenki 1*]. Moscow–Leningrad. (In Russian).

Efimenko, P. P. 1960. Переднеазиатские элементы в памятниках позднего палеолита Северного Причерноморья (к происхождению магденской культуры Восточной Европы) [*Middle-Eastern elements in the Upper Palaeolithic site of Pontic area (to the origins of the Eastern Magdalenian)*]. Советская археология [*Soviet Archaeology*], Vol. 4. Moscow, pp. 14–25.

Efimenko, P. P. and Boriskovsky, P. I. 1957. Тельманское палеолитическое поселение (раскопки 1937 г. [*Telman' Palaeolithic settlement (1937 excavations)*]). Материалы и исследования по археологии СССР [*Materials and studies for archaeology in the USSR*] Vol. 59. Moscow–Leningrad, pp. 191–284. (In Russian).

Felgenhauer, F. 1956–1959. *Willendorf in der Wachau. Monographie der Palaeolithfundstellen I–VII. Mitteilungen Prähistorisches Komission, 8/9*. Wien.

Gavrilov, K. N. 2008. Верхнепалеолитическая стоянка Хотылево 2 [*The Upper Palaeolithic site Khotylevo 2*]. Moscow.

Gavrilov, K. N. 2012. New female figurines from the site Khotylevo 2. J. Clottes (ed.) *L'art pléistocène dans le monde / Pleistocene art of the world / Arte pleistoceno en el mundo, Actes du Congrès IFRAO, Tarascon-sur-Ariège, September 2010, Symposium 'Art mobilier pléistocène'. N° spécial de Préhistoire, Art et Sociétés, Bulletin de la Société Préhistorique Ariège–Pyrénées, LXV–LXVI, 2010–2011, CD, pp. 1291–1297.*

Gernik, V. V. and Guskova, E. G. 2002. Палеомагнитные характеристики отложений разреза ст. Костенки 14 (Маркина гора) [*Palaeomagnetic evidence for sediment sequences of Kostenki 14 (Markina gora)*]. A. A. Sintsyn, V. Ya. Sergin and J. F. Hoffecker (eds., Особенности развития верхнего палеолита Восточной Европы [*Trends in the evolution of the East European Palaeolithic*]). – Kostenki in the context of the Palaeolithic of Eurasia. – *Proceedings of Kostenki expedition IHMC RAS, ser. Research. Vol. 1. Saint Petersburg, pp. 247–249.* (In Russian).

Giaccio, B., Hajdas, I., Peresani, M., Fedele, F. G. and Isaia, R. 2006. The Campanian Ignimbrite and its relevance for the timing of the Middle to Upper Palaeolithic shift. N. J. Conard (ed, *When Neanderthals and Modern Humans Met*. Tübingen, pp. 343–375.

Giaccio, B., Isaia, R., Fedele, F., Di Canzio, E., Hoffecker, J. F., Ronchitelli, A., Sinitsyn, A. A., Anikovich, M. V., Lisitsyn, S. N. and Popov, V. V. 2008. The Campanian Ignimbrite and Codola tephra layers: two temporal/stratigraphic markers for the Early Upper Palaeolithic in southern Italy and eastern Europe. *Journal of Volcanology and Geothermal Research*, Vol. 177, pp. 208–226.

Giria, Y. and Bradley, B. 1998. Blade technology at Kostenki 1/I, Avdeevo and Zaraisk. Amirkhanov, (ed, *Восточный граветт [The Eastern Gravettian]*). Moscow, pp. 191–213.

Gladilin, V. N. and Demidenko, Yu. E. 1989. К происхождению костенковско–стрелецкой культуры: Европа или Азия? [*Referring to the origin of Kostenkovsko–Streletsky culture: Europe or Asia?*]. A. L. Yanshin (ed, Четвертичный период. Палеонтология и археология [*Quaternary Age. Palaeontology and Archaeology*]) (for the XXVIII International Geological Congress, Washington, 1989). Kishinev, pp. 187–194. (In Russian).

Goutas, N., Klaric, L., Pessese, D. and Guillermin, P. (eds.) 2011. À la recherche des identités gravettiens: actualités, questionnements et perspectives. Actes de la Table Ronde sur le Gravettien en France et dans les pays limitrophes (Aix-en-Provence, 6–8. X. 2008). *Mémoire de la Société Préhistorique Française, t. LII*. Paris.

Grigorjev, G. P. 1967. A new reconstruction of the above-ground dwelling of Kostenki. *Current Anthropology*, Vol. 8, No. 4.

_____. 1970. Верхний палеолит [*Upper Palaeolithic*]. A. A. Formozov (ed. *Каменный век на территории СССР [The Stone Age of the USSR]*). Материалы и исследования по археологии СССР [*Materials and studies for USSR archaeology*]. Moscow. Vol. 166, pp. 43–6. (In Russian).

_____. 1993. The Kostenki–Avdeevo archaeological culture and the Willendorf–Pavlov–Kostenki–Avdeevo cultural unity. O. Soffer and N. D. Praslov (eds.), *From Kostenki to Clovis. Upper Paleolithic – Paleo-Indian Adaptations*. New York, pp. 51–65. (In Russian).

_____. 2001. Относится ли стоянка Талицкого к сибирскому палеолиту? [*Is the site of Talizki of Siberian Palaeolithic attribution?*] Kotov and Schelinsky (eds.), *Проблемы первобытной культуры [Problems of Prehistoric cultures]*. Ufa, pp. 21–22. (In Russian).

Grishchenko, M. N. 1950. Палеогеография Костенковско–Боршевского района эпохи верхнего палеолита [*Paleogeography of Kostenki–Borshchevo region in the Upper Palaeolithic epoch*]. Краткие сообщения ИИМК, XXXI, [Brief information of the Institute for the History of Material culture, XXXI]. Moscow, pp. 75–88. (In Russian).

_____. 1961. Стратиграфическое положение и геологические условия донских палеолитических стоянок [*Stratigraphic and geological position of the Palaeolithic sites at Don basin*]. Труды КИЧП, XVIII [Proceedings of the Commission for Quaternary studies. Moscow, Vol. XVIII, pp. 62–71. (In Russian).

_____. 1976. Плейстоцен и голоцен бассейна Верхнего Дона [*Pleistocene and Holocene of the Don basin*]. Moscow. (In Russian).

Guerasimov, M. M. 1955. Восстановление лица по черепу [*The reconstruction of the face of the skull*]. Труды Института этнографии, новая серия, т. XXVIII [Proceedings of the Institute of Ethnography, new series, t. XXVIII]. Moscow. (In Russian).

Guerasimova, M. M. 1982. Палеоантропологические находки [*Palaeoanthropological records*]. Praslov, N. D. and Rogachev, A. N. (eds.), Палеолит Костенковско–Боршевского района на Дону. 1979–1979. Некоторые итоги полевых исследований. [*Palaeolithic of the Kostenki–Borshchevo area on the River Don. 1879–1979. Results of field investigations*]. Leningrad, p. 245–257. (In Russian).

Guerasimova, M. M., Astakhov, S. N. and Velichko, A. A. 2007. Палеолитический человек, его материальная культура и природная среда обитания [*Palaeolithic man, its material culture and environment*]. Saint Petersburg.

Guskova, E. G., Raspopov, O. M., Dergachev, V. A., Iosifidi, A. G. and Sinitsyn, A. A. 2012. Geomagnetic field behavior in the past as derived from palaeomagnetic investigations of sediments of archaeological Paleolithic sites. V. N. Troyan, V. S. Semenov and M. V. Kubysheva (eds.), *Proceedings of the 9th International Conference 'Problems of Geocosmos'* (Saint Petersburg, Petrodvorets, 08–12. X. 2012). Saint Petersburg, pp. 43–48.

Gvozdover, M. D. 1953. Обработка кости и костяные изделия Авдеевской стоянки [*Bone technology and bone assemblage of Avdeev site*]. Moscow–Leningrad. Материалы и исследования по археологии СССР [*Materials and studies for archaeology in the USSR*], Vol. 39, pp. 193–226. (In Russian).

_____. 1961. Специфические черты кремневого инвентаря Авдеевской палеолитической стоянки [*Particular features of the lithic assemblage of Avdeev Palaeolithic site*]. Краткие сообщения Института Археологии, [Brief information of the Institute of Archaeology]. Moscow. Vol. 82, pp. 112–119. (In Russian).

_____. 1995. *Art of Mammoth Hunters. The finds from Avdeev*. Oxford, Oxbow Monograph, pp. 49.

_____. 1998. Кремневый инвентарь Авдеевской верхнепалеолитической стоянки [*Lithic assemblage of the Avdeev Upper Palaeolithic site*]. Amirkhanov, (ed.), Восточный граветт [The Eastern Gravettian]. Moscow, pp. 234–278. (In Russian).

Gvozdover, M. D. and Rogatchev, A. N. 1969. Развитие верхнепалеолитической культуры [Développement de la culture au Paléolithique Supérieur]. I. P. Guerassimov (ed.), Лесс – перигляциал – палеолит на территории Средней и Восточной Европы (для VIII конгресса ИНКВА, Париж) [Loess – Periglaciaire – Paléolithique sur le territoire de l'Europe moyenne et orientale (l'édition préliminaire pour le VIII Congrès de l'INQUA, Paris)]. Moscow, pp. 487–530. (In Russian).

Haesaerts, P., Damblon, F., Sinitsyn, A. and van der Plicht, J. 2004a. Kostenki 14 (Voronezh, Central Russia): new data on stratigraphy and radiocarbon chronology. *Acts of the XIVth UISPP Congress (Liège, 2001). General Sessions and Posters. Section 6. The Upper Palaeolithic*. M. Dewez, P. Noiret and E. Teheux. (eds.), *British Archaeological Reports (BAR), International Series*, 1240. Oxford, pp. 169–180.

Haesaerts, P., Borziak, I., Chirica, V., Danblon, F., Koulakovska, L. and Van der Plicht J. 2003. The east Carpathian loess record: a reference for the middle and late pleniglacial stratigraphy in central Europe. *Paros. Quaternaire*, Vol. 14, No. 3, pp. 163–188.

Haesaerts, P., Borziak, I., Chirica, V., Damblon, F. and Koulakovska, L. 2004b. Cadre stratigraphique et chronologique du gravettien en Europe Centrale. J. A. Svoboda and L. Sedláčková (eds.), The Gravettian along the Danube (Proceedings of the Mikulov Conference, 20–21. XI. 2002). *The Dolní Věstonice Studies*, Vol. 11, pp. 33–57.

Hahn, J. 1977. Aurignacien das ältere Jungpaläolithikum in Mittel und Osteuropa. *Fundamenta*, A9. Köln–Wien.

Hoffecker, J. F. 1987. Upper Pleistocene loess stratigraphy and paleolithic site chronology on the Russian Plain. *Geoarchaeology*, Vol. 2, No. 4, pp. 259–284.

Hoffecker, J. F. 1988. Early Upper Paleolithic sites of the European USSR. J. F. Hoffecker and C. A. Wolf (eds.), *The Early Upper Paleolithic evidence from Europe and the Near East. BAR, International Series*, Vol. 437, pp. 237–272.

_____. 2002a. *Desolate landscapes. Ice–Age settlement in Eastern Europe*. New Brunswick.

_____. 2002b. The Eastern Gravettian ‘Kostenki Culture’ as an arctic adaptation. *Anthropological Papers University of Alaska*, Vol. 2, pp. 115–136.

_____. 2009. The spread of modern humans in Europe. *Proceedings of the National Academy of Sciences (PNAS)*, pp. 1–6. (www.pnas.org/cgi/doi/10.1073/pnas.0903446106).

_____. 2011a. The Early Upper Paleolithic of Eastern Europe Reconsidered. *Evolutionary Anthropology*, Vol. 20, pp. 24–39.

_____. 2011b. *Landscape of the mind: human evolution and the archaeology of thought*. New York.

Hoffecker, J. F., Holliday, V. T., Anikovich, M. V., Sinitsyn, A. A., Popov, V. V., Lisitsyn, S. N., Levkovskaya, G. M., Pospelova, G. A., Forman, S. L. and Giaccio, B. 2008. From the Bay of Naples to the River Don: the Campanian Ignimbrite eruption and the Middle to Upper Paleolithic transition in Eastern Europe. *Journal of Human Evolution*, Vol. 55, pp. 858–870.

Holliday, V. T., Hoffecker, J. F., Goldberg, P., Macphail, R. I., Forman, S. L., Anikovich, M. and Sinitsyn, A. A. 2007. Geoarchaeology of the Kostenki–Borshchevo Sites, Don River Valley, Russia. *Geoarchaeology*, Vol. 22, No. 2, pp. 181–228.

Iakovleva, L. 1999. L’art dans les habitats du Paléolithique supérieur d’Europe orientale. *L’Anthropologie*, Vol. 103, pp. 93–120.

_____. 2000. The Gravettian art of Eastern Europe as exemplified in the figurative art of Kostienki 1. W. Roebroeks, M. Muss., J. Svoboda and K. Fenema (eds.), *Hunters of the Golden Age: The Mid Upper Palaeolithic of Eurasia 30,000–20,000 BP. Analecta Praehistorica Leidensia*, Vol. 31. Leiden, pp. 125–134.

_____. 2012. Les manifestations artistiques, un vecteur de la connaissance socioculturelle des sociétés du Paléolithique supérieur. In: J. Clottes (ed.), *L’art pléistocène dans le monde / Pleistocene art of the world / Arte pleistoceno en el mundo*, Actes du Congrès IFRAO, Tarascon–sur–Ariège, September 2010, Symposium ‘Signes, symboles, mythes et idéologie...’. N° spécial de Préhistoire, Art et Sociétés, *Bulletin de la Société Préhistorique Ariège–Pyrénées*, LXV–LXVI, 2010–2011, CD, pp. 1817–1835.

Ivanova, I. K. and Tzeitlin, S. M. (eds.) 1987. Многослойная палеолитическая стоянка Молодова V. Люди каменного века и окружающая среда (к XII конгрессу INQUA, Канада) [*The multilayered Paleolithic site Molodova V. Stone Age men and the environment* (for the XII Congress of INQUA, Canada, 1987)]. Moscow. (In Russian).

Ivanova, M.A. 1985. Структура Гмелинского палеолитического поселения (по результатам планиграфического и типологического анализа кремневого инвентаря) [Structure of the Gmelin Palaeolithic settlement (on the base of planigraphic and typological analyses of lithic assemblage)]. Abstract of the candidate these. Leningrad. (In Russian).

Kaletchyz, E. G. 1984. Первоначальное заселение территории Белоруссии [*Initial colonization of Bielorussia territory*]. Minsk. (In Russian).

Kaletchyz, E. G., Kolasau, A. U. and Abukhovskiy, V. S. 2010. Палеолітичні пам’ятки Білорусі [*Palaeolithic site of Bielorussia*]. Minsk. (In Russian).

Klein, R. G. 1969. *Man and culture in the Late Pleistocene: a case study*. San Francisco.

_____. 1978. Review of Early Man in the Soviet Union: the implications of some recent discoveries. *Antiquity*, Vol. 52, pp. 61–62.

Klein, R. G., Ivanova, I. K. and Debetz, G. F. 1971. USSR. K. P. Oakley, B. G. Campbell and T. I. Molleson (eds.), *Catalogue of fossil hominids*, pt. 2. Europe. London, pp. 313–335.

Kozłowski, J. K. 1969. Problem tzw. kultury Kostienkowsko–Willendorfskiej. Cz. I. Analiza inwentarzy kamiennych. *Archeologia Polski*, t. XIV, zesz. 1, pp. 19–85.

_____. 1970. Problem tzw. kultury Kostienkowsko–Willendorfskiej. Cz. II. Analiza inwentarzy kościanych I zabytków sztuki. *Prace Archeologiczne*, Vol. 12, Kraków, pp. 27–46.

_____. 1998. La géochronology de l'horizon à pointes à cran en Europe Centrale.. Amirkhanov (ed.), *Восточный граветт [The Eastern Gravettian]*. Moscow, pp. 81–89.

_____. 1986. The Gravettian in Central and Eastern Europe. *Advances in World Archaeology*, Vol. 5, pp. 131–200.

_____. 1992. *L'art préhistorique en Europe Orientale*. Jaca Boot.

_____. 2013. L'origine du Gravettien. In: M. Otte (ed.) *Le Gravettiens*. Paris, pp. 11–28.

Krause, J, Briggs, A. W., Martin Kircher, M., Maricic, T., Zwyns, N., Anatoli Derevianko, A. and Pääbo, S. 2010. A Complete mtDNA Genome of an Early Modern Human from Kostenki, Russia. *Current Biology*, pp. 20. (DOI 10.1016/j.cub.2009.11.068).

Ksenzov, V. P. 1988. Палеолит и мезолит Белорусского Поднепровья [*Palaeolithic and Mesolithic of BieloRussian Dnepr basin*]. Minsk. (In Russian).

Lazukov, G. I. 1954. Геолого–геоморфологическая характеристика Костенковско–Боршевского района и природные условия времени обитания верхнепалеолитического человека [*Geomorphological patterns of Kostenki–Borshchevo area and environments of Upper Palaeolithic times*]. Материалы по палеогеографии, вып. 1. [*Materials on Paleogeography*, Vol. 1]. Moscow.

_____. 1957a. Геология стоянок Костенковско–Боршевского района [*Geology of Kostenki–Borshchevo sites*]. Материалы и исследования по археологии СССР [*Materials and studies for USSR archaeology*], Vol. 59, pp. 135–173. (In Russian).

_____. 1957b. Природные условия эпохи верхнего палеолита в Костенковско–Боршевском районе [*Environmental conditions of the Upper Palaeolithic epoch at Rostenki–Borshchevo*] Советская археология [*Soviet Archaeology*], Vol. 3, pp. 84–104. (In Russian).

Lev, and Amirkhanov, Kh. A. 2002. Comparative description and stylistic analysis of the bison statuette from Zaiskaja site. *Archaeology, ethnography and anthropology of Eurasia*, Vol. 3 (11). Novosibirsk. pp. 22–31.

Lisitsyn, S. N. 2004. Хроностратиграфия стоянки Борщево 5 по данным раскопок 2002–2003 гг. [*Chronostratigraphy of the site Borshchevo 5 according to excavations of 2002–2003*]. М. V. Anikovich and N. I. Platonova (eds.), Костенки и ранняя пора верхнего палеолита Евразии: общее и локальное (материалы Международной конференции. Костенки 23–26. VIII. 2004) [*Kostenki & the Early Upper Palaeolithic of Eurasia: general trends, local developments* (Materials of the international conference. Kostenki 23–26. VIII. 2004)]. Voronezh, pp. 66–79. (In Russian).

Litovchenko, L. M. 1969. Тельманская палеолитическая стоянка (II культурный слой) [*Telmanskaya Palaeolithic site (cultural layer II)*]. Советская археология [*Soviet Archaeology*], Vol. 3. Moscow. (In Russian).

Løvlie, R. 2006. Paleomagnetic results from Kostenki archeological sites 1 and 14: preliminary report. M. V. Anikovich (ed.), Ранняя пора верхнего палеолита Евразии: общее и локальное (материалы Международной конференции к 125–летию открытия палеолита в Костенках. 23–26. VIII. 2004) [*The Early Upper Palaeolithic of Eurasia: general trends, local developments* (Materials of International Conference devoted to the 125th anniversary of the Palaeolithic investigations in Kostenki. 23–26. VIII. 2004)]. Труды Костенковско–Борщевской археологической экспедиции ИИМК РАН, вып. 4. [*Proceedings of Kostenki–Borschevo archaeological expedition IHMC RAS*, Vol. 4] Saint Petersburg, pp. 131–151.

Marom, A., McCullagh, J. S. O., Higham, T. F. G., Sinitsyn, A. A. and Hedges, R. E. M. 2012. Single amino acid radiocarbon dating of Upper Paleolithic modern humans. *Proceedings of the National Academy of Sciences (PNAS)*, 2012, p. 1–5. (www.pnas.org/cgi/doi/10.1073/pnas.1116328109) (supporting information at: www.pnas.org/lookup/suppl/doi:10.1073/pnas.1116328109/-/DCSupplemental).

Matioukhin, A. E. 2012. Бирючья балка 2: многослойный палеолитический памятник в бассейне Нижнего Дона [*Biryuchya balka 2: multilayered Palaeolithic site at the Lower Don basin*]. Saint Petersburg. (In Russian).

Melekestsev, I. V., Kirianov, V. Yu. and Praslov, N. D. 1984. Катастрофическое извержение в районе Флегрейских полей (Италия) – возможный источник вулканического пепла в позднеплейстоценовых отложениях Европейской части СССР [Catastrophic eruption at the area of Campi Flegrei (Italy) – a possible source of the volcanic ash in Upper Pleistocene sediments in the European part of USSR]. Вулканология и сейсмология [Volcanology and Seismology], 3. Moscow, pp. 35–44. (In Russian).

Nowaczyk, N. R., Arz, H. W., Frank, U., Kind, J. and Plessen, B. 2012. Dynamics of the Laschamp geomagnetic excursion from Black Sea sediments. *Earth and Planetary Science Letters*, Vol. 351–352, pp. 54–69.

Oppenheimer, C. 2011. *Eruptions that shook the World*. Cambridge.

Otte, M. 1981. Le Gravettien en Europe centrale, Vols. 1, 2. *Dissertationes Archaeologicae Gandenses*, XX. Brugge.

Otte, M., Matyukhin, A. E. and Flas, D. 2006. La chronologie de Biryuchya Balka (région de Rostov, Russie). M. V. Anikovich (ed.), Ранняя пора верхнего палеолита Евразии: общее и локальное (материалы Международной конференции к 125-летию открытия палеолита в Костенках. 23–26. VIII. 2004) [The Early Upper Paleolithic of Eurasia: general trends, local developments (Materials from International Conference devoted to the 125th anniversary of the Paleolithic investigations in Kostenki. 23–26. VIII. 2004)]. Труды Костенковско–Борщевской археологической экспедиции ИИМК РАН [Proceedings of Kostenki–Borschevo archaeological expedition IHMC RAS], Vol. 4, pp. 183–192.

Otte, M., Noiret, P., Chirica, V. and Borziak, I. 1996. Rythme évolutif du Gravettien Oriental. A. Palma di Cesnola, A. Montet–White, K. Valoch (eds.), XIII Congrès International d'UISPP, Section 6: The Upper Palaeolithic, Colloquim XII. The Origin of the Gravettian. Forli, pp. 213–226.

Palma di Cesnola, A., Montet–White, A. and Valoch, K. (eds.). 1996. *The Origin of the Gravettian*. XIII Congrès International d'UISPP. Section 6: The Upper Palaeolithic. Colloquium XII. Forli.

Panin, A. V. and Nekrasov, D. Yu. 2013. The Pokrovskiy Log balka history at the Kostenki 14 site. I. V. Kovda (ed.), *Paleosols, pedosediments and landscape morphology as archives of environmental evolution*. XIIth International Symposium and Field Seminar on Paleopedology (Kursk–Voronezh. 10–15. VIII. 2013). Moscow, pp. 74–79.

Pavlov, P. Yu. and Indreliid, S. 2000. Human occupation in Northern Europe during the period 35 000 – 18 000 BP. W. Roebroeks, M. Mussi, J. Svoboda and K. Fennema (eds.), *Hunters of the Golden Age: The Mid Upper Palaeolithic of Eurasia 30,000–20,000 BP*. *Analecta Praehistorica Leidensia*, Vol. 31. Leiden, pp. 105–172.

Pettitt, P. 2011. *The Palaeolithic origins of human burial*. London.

Pisarevsky, S. A. 1983. Исследование тонкой структуры палеомагнитного поля с целью разработки детальной магнитостратиграфической шкалы [Studies on the thin structure of the palaeomagnetic field in the perspectives for detailed magnetostratigraphic scale formation]. – Abstract of the candidate these. Leningrad. (In Russian).

Polikarpovich, K. M. 1968. Палеолит Верхнего Поднепровья [Palaeolithic of the Upper Dnepr]. Minsk. (In Russian).

Popov, V. V. 1983. Анализ кремневого инвентаря стоянки Костенки 11 (II культурный слой) [Analyses of lithic assemblage of Kostenki 11 (cultural layer II)]. A. T. Siniuk (ed.), Древние памятники на территории Восточной Европы [Ancient sites of the Eastern Europe]. Известия ВГПИ [News of Voronezh State pedagogic Institute], t. 227. Voronezh, pp. 5–13. (In Russian).

_____. 2002. Жилище ансовско–мезинского типа на стоянке Костенки 11 [Dwelling of Anosovo–Mezin type at Kostenki 11]. A. T. Siniuk (ed.), Археологические памятники Восточной Европы [Archaeological sites of Eastern Europe]. Voronezh, pp. 4–12. (In Russian).

Popov, V. V. and Pustovalov, A. Yu. 2004. Поселение 2-го культурного слоя стоянки Костенки 11 (Аносовка 2) [Settlement of the cultural layer II of Kostenki 11 (Anosovka 2)]. A. T. Siniuk (ed.), Археологические памятники Восточной Европы [Archaeological sites of Eastern Europe]. Voronezh, pp. 13–18. (In Russian).

Pospelova, G. A. 2005. Рекогносцировочные палеомагнитные исследования пород палеолитической стоянки Костенки 12 [The reconnaissance palaeomagnetic studies for sediments of the site Kostenki 12]. M. V. Anikovich (ed.), Проблемы ранней поры верхнего палеолита Костенковско–Борщевского района и сопредельных территории [The problems of Early Upper Palaeolithic of the Kostenki–Borschevo region and adjacent territories]. Труды Костенковско–Борщевской археологической экспедиции ИИМК РАН [Proceedings of Kostenki–Borschevo archaeological expedition IHMC RAS], Vol. 3, pp. 87–92. (In Russian).

Pospelova, G. A., Anikovitch, M. V., Tselmovich, V. A., Vodovozov, V. Yu. and Dudin, A. E. 2008. Петрофизические исследования осадочных пород верхнепалеолитической стоянки Костенки I [*The petrographic studies of sedimentary rocks at the Upper Palaeolithic site Kostenki 1*]. Девятая Международная конференция: физико–химические и петрографические исследования в науках о Земле (7–10. X. 2008) [*Nine International conference: physico-chemical and petrographic studies in Earth Sciences (7–10. X. 2008)*]. Известия Отделения наук о Земле РАН [*News of the Department of Earth Sciences RAS*], 1(26). Moscow, pp. 257–261. (In Russian).

Praslov, N. D. 1964. Гмелинская стоянка в Костенках [*Gmelin site at Kostenki*]. Краткие сообщения Института Археологии, [*Brief information of the Institute of Archaeology*], Vol. 97. (In Russian).

_____. 1985. L'art du Paléolithique supérieur à l'Est de l'Europe. *L'Anthropologie*, Vol. 89, pp. 181–192.

_____. 1986. Neue Frauenstatuetten des Paläolithikums aus Kostenki. *Das Altertum*, Vol. 32 (1), pp. 14–17.

_____. 1993. Eine neue Frauenstatuette aus Kalkstein von Kostenki I (Don, Russland). *Archäologisches Korrespondenzblatt*, Vol. 23 (2), pp. 165–173.

_____. 1995. A propos de la tête féminine de Khotylevo II ou le problème du portrait à l'époque Paléolithique. H. Delporte (ed.), *La dame de Brassempoy (actes du Colloque de Brassempoy, 1994)*. ERAUL, Vol. 74, pp. 215–220.

Praslov, N. D. and Rogachev, A. N. (eds.) 1982. Палеолит Костенковско–Борщевского района на Дону. 1979–1979. Некоторые итоги полевых исследований. [*Palaeolithic of the Kostenki–Borshchevo area on the river Don. 1879–1979. Results of field investigations*]. Leningrad. (In Russian).

Praslov, N. D. and Soulerjytsky, L. D. 1997. De nouvelles données chronologiques pour le Paléolithique de Kostienki–sur–Don. *Préhistoire Européenne*, Vol. 11, pp. 133–143.

Pyle, D. M., Ricketts, G. D., Margari, V., van Andel, T. H., Sinitsyn, A. A., Praslov, N. D. and Lisiryn, S. 2006. Wide dispersal and deposition of distal tephra during the Pleistocene 'Campanian Ignimbrite/Y5' eruption, Italy. *Quaternary Science Reviews*, Vol. 25, issue 21–22, pp. 2713–2728.

Revedin, A., Aranguren, B., Becattini, R. Longo, L., Mariotti Lippi, M., Sinitsyn, A. and Spiridonova, E. 2009. Alimenti vegetali a Bilancino e a Kostienki 16: il progetto dell'IIPP 'Le risorse vegetali nel Paleolitico'. *Rivista di Scienze Preistoriche*, LIX. Firenze, pp. 63–78.

Revedin, A., Aranguren, B., Becattinia, R., Longo, L., Marconi, E., Mariotti Lippi, M., Skakun, N., Sinitsyn, A., Spiridonova, E. and Svoboda, J. 2010. Thirty thousand–year–old evidence of plant food processing. *Proceedings of the National Academy of Sciences (PNAS)*.

Rogachev, A. N. 1951. О нижнем слое культурных остатков Тельманской стоянки в Костенках [*On lower cultural layer at Telman site in Kostenki*]. Краткие сообщения ИИМК [*Brief information of the Institute for the History of Material culture*], Vol. 37. Moscow–Leningrad, pp. 23–28.

_____. 1953. Исследование остатков пещерно–общинного поселения верхнепалеолитического времени у с. Авдеево на р. Сейм [*Study for the remains of prehistoric site at Avdevo village on the Seim River*]. Материалы и исследования по археологии СССР [*Materials and studies for archaeology in the USSR*], Vol. 39, pp. 136–191. (In Russian).

_____. 1955. Александровское поселение древнекаменного века у села Костенки на Дону [*Materials and studies for archaeology in the USSR*]. Материалы и исследования по археологии СССР [*Materials and studies for archaeology in the USSR*], Vol. 45. Moscow–Leningrad.

_____. 1956. Données nouvelles sur la stratigraphie du Paléolithique supérieur de la plain d'Europe Orientale. *Ann. Centre etude, et document, paleontologique*, pp. 18.

_____. 1957. Многослойные стоянки Костенковско–Борщевского района на Дону и проблема развития культуры в эпоху верхнего палеолита на Русской равнине [*Multilayer sites of Kostenki–Borshchevo area on Don and the problem of cultural evolution on Russian plain in the Palaeolithic epoch*]. Материалы и исследования по археологии СССР, вып. 59 [*Materials and studies for archaeology in the USSR*, Vol. 59]. Moscow–Leningrad, pp. 9–134 (In Russian).

_____. 1961. Аносовка II – новая многослойная стоянка в Костенках [*Anosovka II – new multilayer site at Kostenki*]. Краткие сообщения ИА [*Brief information of the Institute of Archaeology*], Vol. 82, pp. 86–96.

_____. 1964. Principal results and problem in the study of the Paleolithic of the Russian plain. *Arctic anthropology*, Vol. 2, No. 1, pp. 135–142.

_____. 1970. Палеолитические жилища и поселения [*Palaeolithic dwellings and settlements*]. Материалы и исследования по археологии СССР, вып. 166 [*Materials and studies for USSR archaeology*, Vol. 166]. Moscow.

_____. 1973. Об усложненном собирательстве как форме хозяйства в эпоху палеолита на Русской равнине [*On the complex gathering as an economic structure of the palaeolithic epoch on Russian plain*]. G. V. Lebedinskaya, M. G. Rabinovich (eds.), Антропологическая реконструкция и проблемы палеоэтнографии. Сборник памяти М. М. Герасимова [*Anthropological reconstructions and paleoethnographic problems. M. M. Gerasimov memorial volume*]. Moscow, pp. 127–142.

Rogachev, A. N. and Anikovich, M. V. 1984. Верхний палеолит Русской равнины и Крыма [*Upper Palaeolithic of the Russian plain and Crimea*]. P. I. Boriskowsky (ed.), Палеолит СССР. Сер.: Археология СССР. [*Palaeolithic of URSS. Ser. Archaeology of URSS*]. Moscow, pp. 161–271. (In Russian).

Sawicki, L. 1964. Problèmes stratigraphiques et chronologiques des stations Paléolithiques de Kostenki et de Borsevo. *Archaeologia Polona*, pp. 7.

Sedov, S. N., Khokhlova, O. S., Sinitsyn, A. A., Korkka, M. A., Rusakov, A. V., Ortega, B., Solleiro, E., Rozanova, M. S., Kuznetsova, A. M. and Kazdym, A. A. 2010. Late Pleistocene paleosol sequences as an instrument for the local palaeographic reconstruction of the Kostenki 14 key section (Voronezh oblast) as an example. *Eurasian Soil Science*, Vol. 43, No. 8, pp. 876–892.

Sedov, S. and Sinitsyn, A. 2012. Late Pleistocene paleosols and environmental settings of first modern humans in Europe. M. Bronnikova and A. Panin (eds.), *Geomorphic Process and Geoarchaeology: from Landscape Archaeology to Archaeotourism*. International conference held in Moscow–Smolensk, Russia. 20–24. VIII. 2012. Moscow–Smolensk, pp. 241–244.

Sinitsyn, A. A. 1993. Les niveaux aurignaciens de Kostienki 1. *L'Aurignacien en Europe et au Proche-Orient. – Actes du XII Congrès de l'UISPP* (Bratislava, 1991). Bratislava, pp. 242–259.

_____. 1996. Kostenki 14 (Markina gora): data, problems, and perspectives. *Préhistoire Européenne*, Vol. 9, pp. 273–313.

_____. 1997. Проблема аналогий и культурной атрибуции стоянки Талицкого [The problem of the archaeological analogies and of the cultural attribution of the Talizki site]. Пещерный палеолит Урала (материалы Международной конференции 9–15. IX. 1997, Уфа) [*The cave Palaeolithics of the Urals* (proceedings of the International Conference. 9–15. IX. 1997, Ufa). Ufa, pp. 20–21. (In Russian).

_____. 1999. Chronological problems of the Palaeolithic of Kostenki–Borschevo area: geological, palynological and 14C perspectives. In: J. Evin, Ch. Oberlin, J. –P. Daugas and J.–F. Salles (eds.), *14C et Archeologie. 3eme Congres International* (Lyon, 6–10. IV. 1998). *Memoires de la Société Préhistorique Française*, t. XXVI et Supplement 1999 de la Revue d'Archeometrie. Lyon, pp. 143–150.

_____. 2000. Composants archaïques de l'assemblage lithique de Kostienki 14 (couche II). Z. Mester and Á. Ringer (eds.), À la recherche de l'Homme préhistorique (volume commémoratif de Miklós Gábori et de Veronika Gábori–Csánk). *ERAUL*, 95. Liège, pp. 295–304.

_____. 2003a. A Palaeolithic 'Pompeii' at Kostenki, Russia. *Antiquity*, Vol. 77, n, 295, pp. 9–14.

_____. 2003b. The most ancient sites of Kostenki in the context of the Initial Upper Paleolithic of northern Eurasia. J. Zilhao, F. d'Errico (eds.), *The Chronology of the Aurignacian and of the Transitional Technocomplexes. Dating, Stratigraphies, Cultural Implications* (Proceedings of Symposium 6.1 of the XIVth Congress of the UISPP). *Trabalhos de Arqueologia*, Vol. 33, pp. 89–107.

_____. 2004a. Earliest Upper Palaeolithic layers at Kostenki 14 (Markina gora): preliminary results of the 1998–2001 excavations. M. Dewez, P. Noiret, E. Teheux (eds.), *Acts of the XIVth UISPP Congress* (Liège, 2001). *General Sessions and Posters. Section 6. The Upper Palaeolithic. – British Archaeological Reports* (BAR), International Series, 1240. Oxford, pp. 181–190.

_____. 2004b. Les sépultures de Kostienki: chronologie, attribution culturelle, rite funéraire. M. Otte (ed.), *La Spiritualité. Actes du colloque de la commission 8 de l'UISPP (Paléolithique supérieur) (2003)*. ERAUL (Études et Recherches Archéologiques de l'Université de Liège), Vol. 106, pp. 237–244.

_____. 2007a. Réflexion sur la parure. De l'Atlantique à l'Oural. S. A. de Beaune (ed.), *Chasseurs–cueilleurs. Comment vivaient nos ancêtres di Paléolithique supérieur. Méthodes d'analyse et d'interprétation en Préhistoire*. Paris, pp. 209–220.

_____. 2007b. Variabilité du Gravettien de Kostenki (Bassin moyen du Don) et des territoires associés. *Paleo*, Vol. 19, pp. 181–202.

_____. 2009. Новые открытия в Костенках и проблема становления верхнего палеолита в Восточной Европе [New discoveries in Kostenki and the problem of Upper Palaeolithic formation]. N. A. Makarov (ed.), *Археологические открытия 1991–2004 гг. Европейская Россия [Archaeological discoveries 1991–2004. European Russia]*. Moscow, pp. 43–53. (In Russian).

_____. 2010. The Early Upper Palaeolithic of Kostenki: chronology, taxonomy, and cultural affiliation. Ch. Neugebauer–Maresch, L. R. Owen (eds.), *New aspects of the Central and Eastern European Upper Palaeolithic – methods, chronology, technology and subsistence*. – Österreichische Akademie der Wissenschaften. *Philosophisch–historische Klasse. Mitteilungen der Prähistorischen Kommission*, Vol. 72. Wien, pp. 27–48.

_____. 2012. Figurative and decorative art of Kostenki: chronological and cultural differentiation. J. Clottes (ed.), *L'art pléistocène dans le monde / Pleistocene art of the world / Arte pleistoceno en el mundo*, Actes du Congrès IFRAO, Tarascon–sur–Ariège, September 2010, Symposium « Art mobilier pléistocène ». N° spécial de *Préhistoire, Art et Sociétés, Bulletin de la Société Préhistorique Ariège–Pyrénées*, LXV–LXVI, 2010–2011, CD, pp. 1339–1359.

Sinit syn, A. A. and Hoffecker, J. F. 2006. Radiocarbon dating and chronology of the Early Upper Paleolithic at Kostenki. A. A. Velichko, A. E. Dodonov and N. R. Cato (eds.), *Loess and palaeoenvironments across Eurasia: dedicated to the memory of Márton Pécsi. – Quaternary International*, Vol. 151–152, pp. 164–174.

Sinit syn, A. A., Praslov, N. D., Svezhentsev, Yu. S. and Sulerzhitskiy, L. D. 1997. Радиоуглеродная хронология верхнего палеолита Восточной Европы [Radiocarbon Chronology of the Paleolithic of Eastern Europe and Northern Asia. Problems and perspectives]. A. A. Sinit syn and N. D. Praslov (eds.), *Радиоуглеродная хронология палеолита Восточной Европы и Северной Азии. Проблемы и перспективы [Radiocarbon Chronology of the Paleolithic of Eastern Europe and Northern Asia. Problems and perspectives]*. Saint Petersburg, pp. 21–66. (In Russian).

Sinit syn, A. A. 2014. L'Europe orientale. M. Otte (ed.), *Néandertal/Cro–Magnon. La rencontre*. Errance. Arles, p. 189–220.

Sinit syn, A. A., Sedov, S. N., Velichko, A. A., Timireva, S. N., Pisareva, V. V. and Konstantinov, E. A. 2013. Archaeological site Kostenki 14 (Markina gora) (MIS 3 & 2). I. V. Kovda (ed.), *Paleosols, pedosediments and landscape morphology as archives of environmental evolution*. XIIth International Symposium and Field Seminar on Paleopedology (Kursk–Voronezh. 10–15. VIII. 2013). Moscow, pp. 59–74.

Sinit syn, A. A. and Stepanova, K. N. 2012. Models of the landscape using in the Upper Palaeolithic. In: M. Bronnikova and A. Panin (eds.), *Geomorphic Process and Geoarchaeology: from Landscape Archaeology to Archaeotourism*. International conference held in Moscow–Smolensk, Russia 20–24. VIII. 2012. Moscow–Smolensk, pp. 258–261.

Soffer, O. 1985. *The Upper Paleolithic of the Central Russian Plain*. San Diego, AP.

_____. 1987. Upper Paleolithic connubia, refugia, and the archaeological record from Eastern Europe. O. Soffer (ed.), *The Pleistocene Old World. Regional Perspectives*. Plenum Press, New York, London, p. 333.

_____. 1993. Migration vs. Interaction in Upper Palaeolithic Europe. J. Chapman and P. Dolukhanov (eds.), *Cultural transformations in Eastern Europe. Worldwide Archaeology Series*, Vol. 6, pp. 65–70.

Stepanchuk, V. N., Cohen, V. Yu. and Pisarev, I. V. 1998. Mira, a new Late Pleistocene site in the Middle Dnieper, Ukraine (preliminary report). *Pyrenae*, Vol. 29, pp. 195–204.

Stepanchuk, V. N., Cohen, V. Yu., Gerasimenko, N. P., Damblon, F., Haesaerts, P., Zhuravlev, O. P., Kovalyukh, N. N., Petrougne, V. F., van der Plicht, J., Putshkov, P. V., Rekovets, L. I. and Turner, C. G. 2004. Багатошарова стоянка Міра на Срединьому Дніпрі:

основні результати розкопок 2000 року [The multilayered open air site of Mira in Middle Dnieper area: the main results of 2000 field campaign]. Кам'яна доба України [The Stone Age of the Ukraine], Vol. 5, pp. 62–98. (In Ukrainian).

Tarasov, L. M. 1979. Гагаринская стоянка и ее место в палеолите Европы [The site Gagarino and its place in the European Palaeolithic]. Leningrad. (In Russian).

_____. 2006. О формировании позднего палеолита Восточно-Европейского приледникового [Upper Palaeolithic formation at East European periglacial zone]. М. V. Anikovich (ed.), Ранняя пора верхнего палеолита Евразии: общее и локальное (материалы Международной конференции к 125-летию открытия палеолита в Костенках, 23–26. VIII. 2004) [The Early Upper Paleolithic of Eurasia: general trends, local developments (Materials of International Conference devoted to the 125th Anniversary of the Palaeolithic Investigation in Kostenki, 2004, 23–26. VIII)]. Труды Костенковско-Борщевской археологической экспедиции [Proceedings of Kostenki-Borschevo archaeological expedition], Vol. 4, pp. 203–206. (In Russian).

Trusov, 1994. Культурный слой Зарайской верхнепалеолитической стоянки [Cultural layer of the Zarsk Upper Palaeolithic site]. G. F. Poliakov (ed.), Древности Оки [Antiquities at Oka]. Труды ГИМ [Proceedings of the State Historic Museum], Vol. 85, pp. 94–116. (In Russian).

_____. 1998. Кремневый комплекс Зарайской палеолитической стоянки [Lithic assemblage of Zarsk Palaeolithic]. Amirkhanov (ed.), Восточный граветт [The Eastern Gravettian]. Moscow, pp. 279–298. (In Russian).

_____. 2011. Палеолит бассейна Оки [Palaeolithic of Oka basin]. Moscow. (In Russian).

Velichko, A. A. 1963. Стоянка Спицына (Костенки XVII) и ее значение для решения основных вопросов геологии Костенковско-Борщевского района [Spitsyn' site (Kostenki XVII) and its meaning for the principal problems of geology for Kostenki-Borshevo region]. P. I. Boriskovsky (ed.), Очерки по палеолиту бассейна Дона [Studies on the Palaeolithic of Don basin]. Материалы и исследования по археологии СССР [Materials and studies for USSR archaeology], Vol. 121, pp. 201–219. (In Russian).

Velitchko, A. A. and Rogatchev, A. N. 1969. Позднепалеолитические поселения на Среднем Дону [Les stations du paléolithique supérieur du Don moyen]. I. P. Guerassimov (ed.), Природа и развитие первобытного общества на территории Европейской части СССР (к VIII Конгрессу INQUA, Париж, 1969) [Milieu et développement de la société préhistorique dans la partie européenne de l'URSS (pour le VIII Congrès de l'INQUA, Paris, 1969)]. Moscow, pp. 75–87. (In Russian).

Velichko, A. A., Pisareva, V. V., Sedov, S. N., Sinitsyn, A. A. and Timireva, S. N. 2009. Paleogeography of Kostenki-14 (Markina gora). *Archaeology Ethnology & Anthropology of Eurasia*, Vol. 37/4. Novosibirsk, pp. 35–50.

Vishnyatsky, L. B. 2004. The Middle–Upper Paleolithic Interface in Former Soviet Central Asia. In: P. J Brantingham, S. L. Kuhn and K. W. Kerry (eds.), *The Early Upper Paleolithic beyond Western Europe*. University of California Press. Berkeley, Los Angeles, London, pp. 151–161.

Vishnyatsky, L. B. and Nehoroshev, P. E. 2004. The Beginning of the Upper Paleolithic on the Russian Plain. P. J Brantingham, S. L. Kuhn and K. W. Kerry (eds.), *The Early Upper Paleolithic beyond Western Europe*. Berkeley, Los Angeles, London, University of California Press, pp. 80–96.

Wood, R. E, Douka, K., Boscatto, P., Haesaerts, P., Sinitsyn, A. and Higham, T. F. G. 2012. Testing the ABOx-SC method: Dating known-age charcoals associated with the Campanian Ignimbrite. *Quaternary Geochronology*, Vol. 9, pp. 16–26.

Yakimov, V. P. 1980. New materials of skeletal remains of Ancient peoples in the territory of the Soviet Union. L.–K. Königsson (ed.), *Current argument on Early Man*. Oxford, New York, Toronto, Sydney, Paris, Frankfurt, Pergamon Press, pp. 152–169.

Zaliznyak, L. L., Belenko, M. M., Ozerov, P. I. 2013. Стоянка Вись та її місце у верхньому палеоліті України [The site Vys and its place in the context of Ukrainian Palaeolithic]. Кам'яна доба України [The Stone Age of the Ukraine], Vol. 15, pp. 75–105.

Zamiatnine, S. N. 1934. La station aurignacienne de Gagarino et les données nouvelles qu'elle fournit sur les rites magiques des chasseurs quaternaires. *Bulletin de l'Académie d'Histoire de la Culture Matérielle*, fasc. 88. Moscou-Leningrad.

Zaverniaev, F. M. 1974. Новая верхнепалеолитическая стоянка на реке Десне [New Upper Palaeolithic site on the Desna River]. Советская археология [Soviet Archaeology], Vol. 4, pp. 142–161. (In Russian).

_____. 1978. Антропоморфная скульптура Хотылевской верхнепалеолитической стоянки [*Anthropomorph sculpture of the Khotylevo Upper Palaeolithic site*]. Советская археология [*Soviet Archaeology*], Vol. 4, pp. 145–161. (In Russian).

_____. 1991. Кремневый инвентарь Хотылевской верхнепалеолитической стоянки [*Lithic assemblage of the Khotylevo Upper Palaeolithic site*]. Советская археология [*Soviet Archaeology*], Vol. 4, pp. 164–181. (In Russian).

_____. 2000. Остатки жилищно–бытового и хозяйственного комплекса на Хотылевской верхнепалеолитической стоянке [*The remains of dwellings and household assemblage at the Upper Palaeolithic site of Khotylevo*]. Российская археология [*Rossiyskaya Arkheologiya*], Vol. 3. Moscow, pp. 69–87. (In Russian).

Zheltova, M. N. 2013. Место каменных индустрий Костенок 4 в контексте верхнего палеолита Европы [*The place of lithic assemblages of Kostenki 4 in the context of European Palaeolithic*]. G. V. Sinitsyna (ed.), Проблемы заселения запада лесной полосы Восточной Европы в верхнем и финальном палеолите, мезолите. Культурно–исторические процессы на территории Русской равнины в позднем и финальном палеолите [*Problems of colonization of East European forest zone in Lower and Final Palaeolithic, Mesolithic. Culture–historical processes on the Russian Plain in Lower and Final Palaeolithic*]. Saint Petersburg pp. 86–109.

Zubakov, V. A. 1986. Глобальные климатические изменения плейстоцена [*Global climatic changes at the Pleistocene*]. Leningrad.

Zubov, A. A. 2004. Палеонтологическая родословная человека [*Palaeoanthropological genealogy of humankind*]. Moscow. (In Russian).