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UTILIZATION OF PIGMENT OCHRES IN THE LATE PALEOLITHIC SITE OF ANETOVKA II (THE STEPPE OF SOUTH BUG RIVER, UKRAINE)

-Abstract-

The excavations from the Late Paleolithic site of Anetovka II (XIX-XVIII millenials BC), a settlement of bison hunters, situated in the Steppe of the South Bug (Ukraine), gave evidence of an intensive utilization of pigment ochres in form of mineral raw material, colored patches of soil, ochres decorations and articles, "mineral pencils", painted bison skulls and shoulder-blades. The collection of Anetovka II ochre items also includes minerals of various sizes, their total weight being of over 4 kg. The ochres of Anetovka II are of yellow, orange, red, cherry and claret-colored shades. The ochres of Anetovka II were studied by the geologist and petrographer V.F. Petrun, who undertook field and laboratory investigation (macro and micro, with polarizing microscope), that cleared up two main sources of ochres from Anetovka II – Krivoy Rog iron-stone basin ("foreign" raw material) and the area of the South Bug river (local raw material).

Particularly worth mentioning is the series of unique, specially manufactured, tiny (less than 1 cm) beads. These items were made of small red-shaded stones. Besides them, larger pendants with holes are also present.

Large pieces of ochre were utilized not only as the source of paints, but also for the manufacture of articles. Zoomorphic figures made of ochre minerals are present at the site among the items of mobile art.

The description and systematization of the different finds that are related to ochre utilization in this site allow us to reconstruct the different stages of paint manufacture and application "chain". The ochre finds on Anetovka II are related to different objects of the cultural layer and reflect certain stages of primitive culture development, being an "echo" of the ancient religious conceptions and aesthetic preferences.

Keywords: ochre, ritual complex, Late Paleolithic, North-West area of the Black Sea, Steppe of Bug, Anetovka II.

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UTILIZAREA PIGMENŢILOR DE OCRU ÎN SITUL DIN PALEOLITICUL SUPERIOR DE LA ANETOVKA II (STEPA BUGULUI DE SUD, UCRAINA)

-Rezumat-

Cercetările arheologice efectuate în situl Anetovka II (Paleoliticul superior, mileniile XIX-XVIII î.e.n.), o aşezare a vânătorilor de bizoni din Stepa Bugului (Ucraina), au scos la iveală utilizarea intensă a ocrului, sub formă de pigmenţi, material mineral brut, bucăţi de pământ colorat, decoraţii şi obiecte din ocru, „creioane minerale", cranii şi omoplaţi de bizon pictate. Colecţia obiectelor ce implică ocrul din situl Anetovka II conţine şi minerale de diferite dimensiuni, în greutate totală de peste 4 kg. Ocrul de la Anetovka II este de culoare galbenă, orange, roşie, vişinie sau de o nuanţă purpurie. Aceste tipuri de ocru au fost studiate de geologul şi petrograful V.F. Petrun, care a întreprins atât o cercetare de teren cât şi una de laborator (macro şi micro, cu ajutorul microscopului polarizator). Acestea au indicat două surse principale ale ocrului de laAnetovka II – zăcămintele de fier din zona Krivoy Rog-ului (materie primă "de import") şi regiunea Bugului de Sud (materie primă autohtonă).

Îndeosebi demne de a fi menţionate sunt nişte mărgele de tip unic, confecţionate într-un mod aparte, de dimensiuni foarte mici (mai mici de 1 cm). Aceste obiecte au fost confecţionate din pietricele de culoare roşie. De asemenea, sunt de găsit şi pandative mari, cu orificii.

Bucăţile mari de ocru au fost utilizate nu doar pentru producerea pigmenţilor ci şi pentru confecţionarea a diverse obiecte. Printre obiectele de artă mobiliară descoperite în acest sit, se găsesc şi figurine zoomorfe confecţionate din ocru mineral.

Descrierea şi sistematizarea diferitelor descoperiri care depun mărturie cu privire la utilizarea ocrului în acest sit permit reconstituirea diferitelor etape ale procesului de producere a pigmenţilor şi de aplicare a lor. Descoperirile legate de ocru de la Anetovka II constau din diferite obiecte găsite în stratul de cultură şi reflectă anumite etape ale dezvoltării culturii primitive, reprezentând un "ecou" al vechilor concepţii religioase şi preferinţe estetice.

Cuvinte cheie: ocru, complex ritual, paleolitic superior, regiunea de nord-vest a Mării Negre, zona de stepă a Bugului, Anetovka II.

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The excavations from the Late Paleolithic site of Anetovka II (XIX-XVIII millenials BC), a settlement of bison hunters, situated in the Steppe of the South Bug (Ukraine), gave evidence of an intensive utilization of pigment ochres in form of mineral raw material, colored patches of soil, ochres decorations and articles, "mineral pencils", painted bison skulls and shoulder-blades, tools for artifact manufacture (hammers, anvils). The collection of Anetovka II ochre items also includes minerals of various sizes, their total weight being of over 4 kg. The ochres of Anetovka II are of yellow, orange, red, cherry and claret-colored shades, that give yellow, orange, pink, cherry, claret or brown "bisquit" color. The ochres of Anetovka II were studied by the geologist and petrographer V.F. Petrun, who

undertook field and laboratory investigation (macro and micro, with polarizing microscope), that cleared up two main sources of ochres from Anetovka II – Krivoy Rog iron-stone basin ("foreign" raw material) and the area of the South Bug river (local raw material).

At present, the investigation of the ochre items of the site is undertaken by S.V. Kadurine and I.A. Losev, the fellow workers of the Faculty of Geology and Geography of Odessa National University "I.I. Mechnikov". Particularly, among the pigment ochres of the site, they identified haematite and magnetite – magnetic iron ore. The nearest finds of this kind of ochre to the site of Anetovka II is the region of Sinyuha river (a tributary of South Bug river).

Introduction

Since the oldest times, red color was the most significant for humans, among the various natural colors and shades. This color always attracted human attention, affecting his senses, evoking certain emotions and influencing his intellectual formation. Red is the color of blood, fire, rising and setting sun, association with life and death – it is one of the most important daily natural colors, with a sacral meaning. That's why man tried to reproduce it by means of the natural dyes. Different archaeological periods give a rich evidence of the wide use of various colorific pigments – for example, red and yellow ochres in the form of raw materials, ochre spots in cultural layers, ochre powdering of burials, painting of clothes, adornments, items of cult or art, dishes etc. The use of ochre paints is known since Paleolithic. Investigation of ochre minerals from different sites gives information about the color spectrum, connections between sites and mineral deposits, as well as about the routes of the movements of the ancient groups. N.D. Praslov undertook experiments of burning different ferrous combinations and obtained various shades of red, cherry and ochre tones. Burning of spherosiderite, limonite, goethite, hematite, magnetite showed the dependence of the shade on the burning time and mineral composition.[1]

The site of Anetovka II (a camp of bison hunters) gives the example of intensive utilization of pigment ochres.

The Upper Paleolithic site of Anetovka II (the Steppe of the South Bug, Ukraine) is situated on the promontory of the high right bank of Bakshala river (a tributary of South Bug river), on the platform of the third floodplain terrace, on the edge of v. Anetovka (Domanyovka district of Nikolayev region). The site was discovered in 1978, with further systematic investigation done under the guidance

[1] Н.Д. Праслов, *Использование красок в палеолите* in *Краткие сообщения Института Археологии,* вып.206, 1992, с. 95-100; А.Н. Рогачев, М.В. Аникович, *Поздний палеолит Русской Равнины и Крыма* in *Палеолит СССР*, М., Наука, 1984, с.162-271.

of V.N. Stanko (1978-2007) and I.V. Pistruil (since 2008). The results of these investigations were repeatedly published. The excavated area of approximately 2,000 sq.m gave about 2 mln. flint items, about 700 bone tools and about 500,000 fragments of animal bone.[2] The age of the site corresponds to the time of the last glacial maximum; C14 dates are: 18040±150 LE 2424; 19088±980 LE 4610; 19170±120 LE 2947.[3] The site was defined as a long-term year-round settlement of bison hunters.[4] The stone manufacture is characterized by complete cycle of knapping and processing (from pebbles and cores to tools). This flint industry is vividly Epigravettian (with predominance of micro-points and backed micro-blades).

V.N. Stanko defined three structural and functional complexes in the site:

a) macro-assemblage of flint and faunal remains (up to 500 sq.m), that stretches along the S-E-N-W line and had painted bison sculls at its centre; it is considered a ritual complex;[5]

b) a group of separate micro-assemblages of flint and faunal remains (about 40) that are situated to the west of the macro-assemblage – complexes of prey utilization;

c) the area to the north of the macro-assemblage, that includes micro-assemblages of flint items and stone anvils, hammerstones etc.[6]

North-eastern area of the site. (ЕП/13-22 and ИП/23-27). The area ЕП/13-22 was investigated in 1992-2006 and is a manufacturing complex on the edge of the site[7]; it is also the part of a complex that consists of micro-aggregations. The investigation method included flushing of cultural layer (to avoid the loss of

[2] В.Н. Станко, *Охотники на бизона в позднем палеолите Украины* in *Археологический альманах*, № 5, 1996, p. 131.

[3] В.Н. Станко, *Некоторые итоги изучения позднего палеолита Северо-Западного Причерноморья (Южнобугская группа памятников)* in *Археология и этнология Восточной Европы: материалы и исследования*, Одесса, Гермес, 1997, pp.14-27.

[4] В.И. Бибикова, А.В. Старкин, Териокомплекс позднепалеолитического поселения Анетовка 2 in: Четвертичный период. Палеонтология, археология, Кишинев: Штиинца, 1989, pp. 8-16.

[5] Станко,1996, *op: cit*., p.131; Idem, 1997, *op: cit*, p.25.

[6] В.Н. Станко, Г.В. Григорьева, Т.Н. Швайко, *Позднепалеолитическое поселение Анетовка 2*, Киев, Наукова думка, 1989; Станко,1996, *op: cit*., p.131; Idem, 1997, *op. cit.*, p.25.

[7] А.В. Главенчук, *Раскопки производственного участка на Анетовке 2* in: *Археология и этнология Восточной Европы: материалы и исследования,* Одесса: Гермес, 1997, pp.76-86; Idem, *Производственный участок на позднепалеолитическом поселении Анетовка 2* in: *Археологические записки Донского Археологического Общества, Ростов-на-Дону*, вып. 3, 2003, pp.51-58; Idem, *Планиграфия находок и микростратиграфия культурного слоя участка ЕИ/13-22 на поселении Анетовка 2* in: *Stratum plus*, №1, 2005-2009, pp.225-242; Idem, *Рабочие места для кремневого производства на позднепалеолитическом поселении Анетовка 2 (по материалам северо-восточного участка памятника)* in: *Человек в истории и культуре,* Одесса – Терновка, 2007, pp.100-110.

material). The area ИП/23-27 is a structural "extension" of area ЕП/13-22; it was excavated by the same method.

The clearing of cultural layer included using of knives with thorough horizontal fixation of finds for every square (sized 1 x 1 meters) in each micro-horizon of sediment removal (5-7 cm deep). Since 1992 each square of the north-eastern area (except the first micro-horizon) was flushed through a fine sieve, that gave the possibility to avoid the loss of material (the total amount of material from this area is about 1 mln.).

The cultural layer of the site lies in deluvial loams of light-brown color. The layer is in "suspended" condition (from the present ground level to the depth of 1,6 meters), locally damaged by torrents and earth-moving animals. The thickness of ten (0-9) micro-horizons of removal is of 50-60 cm; taking into account the concentration of the finds and the peculiarity of the formation of the cultural layer (including human and natural factors), it is possible to attribute the micro-horizons 3-5 to a single "cultural" horizon of the past – "dwelling surface".[8]

The flint of Anetovka II is of a different quality and character of the patina; it also has a different origin (predominantly nodular, but partially pebble, of a higher quality). The other kinds of stones from the site are: quartzite, sandstones, rhinestone, obsidian, chalcedony wood, granite, gneisses, talcs, ochres (of various shades and quality of burning), kaolin. Besides, there are finds of processed animal bones and antler tools, fossils and shells, pendants and beads (made of teeth, bones and various small stones).

Ochres. Thus, along with numerous flint items, bone tools and faunal remains, the collection includes also non-flint items (ochres particularly). Ochre rocks of Anetovka II consist of variously sized minerals (of a total weight of over 4 kg); they are of yellow, orange, red, cherry and vinous shades and give traces of yellow, orange, pink, red, cherry, vinous or brown color on the "biscuit" (porcelain unglazed plate). The total weight of the ochre minerals collected from the site between 1978-1991 is of 1 kg; the ochre collected between 1992-2010 is of over 3 kg (due to flushing). The area ЕП/13-22, ИП/23-27 also gave many small bones impregnated by ochre.

Ochre minerals (raw materials, painted soil) and related items (art items; "mineral pencils"; painted bison sculls, jaws and shoulder blades; red tools, such as hammerstones and anvils; paint pounders; "ochred" stones) give extra information about the activity of the ancient bison hunters. Ochre is variously present everywhere on the site; well preserved ochre spots indicate the dwelling surface;

[8] А.В. Главенчук, *Раскопки производственного участка на поселении Анетовка 2* in: *Археологія та етнологія Східної Європи: матеріали і дослідження*. – Одесса, Друк, 2002, pp.49-52; Idem, 2005-2009, pp.225-242.

above all, painted bison sculls, jaws and shoulder blades attest the existence of bison cult.

In the north-eastern area of the site, ochre is present in all the micro-horizons; the ochre spots are small and correspond to assemblages of flint and fauna (working places), especially to the location of anvils, hammerstones and pressure flaking tools. Some statistics are presented here (for example, for squares ЛП/13-22):

- micro-horizon 6: clearing gave 23 ochre pieces, flushing – 1393 ochre pieces, 18 kaolin pieces, 6 marl pieces;
- micro-horizon 7: clearing gave 12 ochre pieces, flushing – 1378 ochre pieces;
- micro-horizon 8: clearing gave 12 ochre pieces, flushing – 3018 ochre pieces.

The complex of bison sculls, jaws and shoulder blades, painted by ochre. It was investigated in 1981 and 1983 and was located on the southern edge of the macro-assemblage. It consisted of circularly laid out bison jaws, sculls and shoulder blades, as well as of a red-painted platform (3 sq.m) and pieces of pigment.[9] This complex is published and interpreted as a ritualic one.[10] V.N. Stanko supposed that it was a part of the site structure (the place of "bison fests"); G.E. Krasnokutsky argues that it is a non-synchronous and mixed complex, that gives evidence for various functional usages (every scull being a separate object of symbolic significance).

Finds related to paint production and infliction

First of all, there are many pieces of limonite with marks of burning (presumably, before grinding it into powder). The process of ore burning for obtaining ochre is well known in the Upper Paleolithic (even using a special hearth, as in Kostenki 1).[11] The areas ЕП/13-22, ИП/13-27 give several flints with clotted ochre: besides, there are a paint pounder, sandstone and limestone pieces painted by ochre, fragments of mat quartzite with ochre remains, flint chips with ochred edges, "mineral pencils".

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[9] Станко,1996, *op. cit*., p.131; Idem, *Анетовка 2 - позднепалеолитическое поселение и святилище охотников на бизонов в Северном Причерноморье* in: *Stratum plus* №1, 1999, p.323.

[10] Г.Є. Краснокутський, *Комплекс черепів бізонів на пізньопалеолітичному поселенні Анетівка 2 і його можлива функціональна роль* in: *Археологія південного заходу України.* Київ, Наукова думка, 1992, pp.43-48; В.Н. Станко, *К методике изучения микроструктур памятников палеолита.* in:: *Древности причерноморских степей,* К., Наукова думка, 1993, pp.3-6; Idem, 1996, *op. cit*., pp.129-138; Idem, 1999, *op. cit*., pp.322-325.

[11] А.П. Окладников, *Утро искусства,* Ленинград, Искусство,1967, p.87.

The paint pounder. The beater is a small quartzite sub-spheroidal pebble that was split and intensively polished (sizes are 3,2 x 1,5 x 2 cm). The mortar was made of elongated light-brown sandstone (sizes are 9 x 5,5 x 2,5 cm), unprocessed from the outer side; the upper edge is slightly chipped, the inner surface is hardly erased and bears the paint marks.[12] The authors of the monograph noticed that the great amount of paint at the site allows considering these two objects as a paint pounder.[13]

There are also some finds from the area ЕП/13-22, ИП/23-27 which can be interpreted as pieces of ochre grinders: these are several ochred sandstone and limestone pieces (one piece has the size of 5 x 3,5 x 2 cm) and over 20 pieces of hard-grained mat quatzite with ochre marks.

Flint chips with ochre marks and "mineral pencils". The area ЕП/13-22 also gave some flint chips with remains of slightly parched ochre (mostly on the edge): a middle blade, a microblade (О-18/5) and 3 flint flakes (П-18/5, П-15/4, П-22/4). These items could be used for obtaining ochre powder (by scraping) or sharpening the so-called «mineral pencils» (a similar item was found on П-18/5). Other stone fragments found in this area (flint, Carpathian pebble, quartz) also bear the marks of ochre but are not connected with its procession. Sometimes the surface is completely or partially "painted" by ochre but in other cases there are only few powdered fragments on a stone item. As a rule, such items were found in a context of ochre spots or of many tiny ochre pieces (the result of badly grinded pigment material used for powdering – for example, the find of "ochred" sandstone anvil, in square П-17/4. In such cases "ochre painting" of different chips or stone pieces is accidental. The so-called "mineral pencils" could be used for clothes or body patterning and often bear traces of ground-in as the result of use.[14] As V.F. Petrun notes (after the investigation of four small slab-like pieces of brown clayish aggregate, using polarized microscope), pigmentation is realized by the fine admixture of hydroxides of iron to the clayish base, that turned the aggregate into a pigment ochre of lush brown coloring, with high covering properties (regardless of stone, bone or skinny surface), even without rubbing or fixing by animal fat or plant resin.[15] An example is an engraved anthropomorphic image on a sandstone pebble (square Л-22/6), sized of 19.5 mm height, 12 mm wide (profile) and 19.5 mm (face) – the "human" head. This image has well-incised eyes, brows, mouth

[12] Станко et al., 1989, *op. cit*., p.67.
[13] *Ibidem*, p. 67.
[14] В.Ф. Петрунь, *О мелкоформатном, преимущественно некремнистом камне из промывок культурного слоя поселения Анетовка 2 на реке Бакшала.in: Археологические записки Донского Археологического Общества*, Ростов-на-Дону, вып. 3, 2003, p.61.
[15] *Ibidem*, p.61.

(intentionally curved), nose, moustache (?), hairstyle line and a hat (the top is red painted). Probably, the whole item was initially ochre-painted (marks of pink ochre on the "face").

The possible source of origin of these clayish slab-like fragments was either the brown-colored formations of Proterozoy metamorphic weathering crust of Krivoy Rog region or the section of the so-called mottled clays, taking the montmorillonite structure.[16]

Manufacture of the ochre art items and adornments. The area EP/13-22, IP/23-27 gave a great deal of yellow and red marl concretions (predominantly roundish) and also many small roundish stones of red shades: V.F. Petrun called these items as "ochred" kaolin and quartz of secondary origin for the cultural layer of Anetovka II (brought by people and not being part of the lithological structure of the culture layer loams). This fact indicates a purposeful selection of such tiny ochre crude for the manufacture of adornments. The areas ЕП/13-22 and ИП/23-27 gave a series of miniature (less than 1 cm) «beads» with waist – presumably, some sort of sewing decoration for the clothes.[17] They are made of small stones of red shades (ochre) in the main part, with a minor presence of white color (kaolin) and quartz. The waist was cut in the middle part of natural small semi-round and semi-oval pebbles. Along with the well preserved beads of good quality, there are unfinished or broken items: they could be lost during their usage, but also they could be wasted material. These beads have some analogies in the Upper Paleolithic: the waisted pivots of Kostenki 4 (upper layer – the Aleksandrovskoye settlement), Mezin, Pushkari 1[18]; however, the mentioned items were made of tusk and bone and were larger than those from Anetovka II. It is considered by authors that these items are button-like clasps (so-called "bead clasps"). However, the unusual material (tiny ochre stones sized of 0.5-1 cm and even less) and thin tiny waist-groove make them inconvenient for this kind of use. It is better to suppose that the "beads" from Anetovka II had more an aesthetic than a utilitarian function and they were used as stripes for clothes.

There are also three larger ochre pendants with holes (presumably, neck medallions), including two flat ones from the squares Л-21/4 and П-27/9. One of these round flat "medallions" (2.9 cm in diameter) has intensive attrition (presumably, as the result of the contact with skin clothes). The square К-13/4 gave a heart-like pendant (2 cm in diameter) with a hole, top-"ochred" and white inside, made of very tight infiltration formation of "white-eye fossil" type, with additions

[16] *Ibidem*, p.61.
[17] А.В. Главенчук, *О некоторых типах позднепалеолитических украшений (по материалам северо-восточного участка поселения Анетовка 2)* in: *Древнее Причерноморье*, вып. 9, Одесса, ФЛП «Фридман А.С.», 2011, pp.101-106.
[18] *Палеолит СССР*, 1984, pp.177, 200, 212.

of yellow clayish substance.[19] The origin was the roof of the mottled clays thick, at the north and at the east of the bay of Bakshala river.[20]

Large ochre pieces were also the material for the manufacture of mobile art items: the area ЕП/13-22 gave three zoomorphic figurines, made of ochre materials ("ochred" kaolin and limonites of different hardness).

Red-colored tools for the manufacture of flint items. Along with obtaining red paint from selected ochre materials, the inhabitants of Anetovka II also paid attention to the significance of the red color of the pebbles and slabs used for the manufacture process. Square O-18/5 gave an egg-like pressure flaking tool, made of cherry colored rounded "ochred" quartz pebble (2,8-3 cm in diameter). A similar limonite item was found on square O-19/7 during flushing. Two anvils, made of tight limonite, are present on square ЕП/13-22 (4 and 6 microhorizons). The red color of these items could bear some sacral meaning; however, there could be a rational use of the limonite refuse that was the source of the paint brought from far away, or otherwise, the stone of suitable form and color was intentionally taken for the manufacture process.

Sources for the ochre dyes from Anetovka II

1. Ferriferous brown iron ore – limonites (hardness is 1.5-4.5, according to Mohs scale) were the source of iron ore in later times; the concretions were grinded after burning for the purpose of obtaining a mineral paint (some pieces became unusable for grinding). Yellow earthy ochres, the kind of limonite ores (see Шуман 1986: 156), are also present in the cultural layer of Anetovka II. The origin is from Krivoy Rog iron ore basin.[21] Both burned and unburned pieces are present at the site.

2. Hematites – red iron ores (hardness is 6-6.5, according to Mohs scale) are a red ochre, used as dyestuff.[22] Similar pieces with bright cherry and crimson shades were found at the site. The territory of origin was Krivoy Rog iron ore basin.

3. Ferrous cherts – microquartzites (including jaspilites) as possible sources for the red-cherry or brown ochre paints. The territory of origin was the Krivoy Rog region.[23]

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[19] Петрунь, 2003, *op. cit*., pp.60-61.
[20] *Ibidem*.
[21] *Ibidem*.
[22] В. Шуман, *Мир камня.* В 2-х тт., т.1. *Горные породы и минералы,* М., Мир, 1986, p.156.
[23] Петрунь, *op. cit*., p.66.

4. Magnetites – magnetic iron ores (hardness is 6-6.5, according to Mohs scale; black trace on "biscuit"). The nearest sources to Anetovka II is the region of Sinyuha river (tributary of South Boeg river); another possible territory of origin – Krivoy Rog iron ore basin.

5. Clays. Tight pieces of colored clays (canary-yellow to red) were used without burning and were easily grinded. They are of local origin, from sections of mottled clays in the are of the South Bug.[24] Also, packed yellow-painted loam fragments could be used; these were of local origin, taken from the natural sections near the site. Marl concretions of red and brown shades were obviously of local origin and were used at Anetovka II along with small pebbles of "ochred" quartz for the manufacture of waisted beads. V.F. Petrun considered the region of the South Bug river as the area of origin of this type of raw material. Sometimes, clearing the cultural layer gives ochre spots of tawny, orange and brown shades, distinctly clayish; their origin is local. Clays must have been taken from natural (erosional) sections, near the site (worth mentioning is that the location of Anetovka II is on a promontory, between two ancient ravines). V.F. Petrun described the local forms of materials as belonging to two main types:

1) carbonate (significantly calcite) formations of "white-eyed" type (heightened strength was the result of selective litification), in many cases painted by a yellow clay substrate from Pleistocene loess horizons of the North-West Pontic region;

2) clayish (montmorillonite?) formations of yellow and sometimes red colors (pigmentation is conditioned by the fine admixture of ferric hydroxides that turned the aggregate of mottled clays into a pigment ochre).[25]

6. Kaolin formations and quartz pebbles, ochred by ferric hydroxides, which were grinded almost without burning (except several finds of burned quartz, painted by ferric oxidizing – probably an attempt to obtain dyestuff by burning, as in case of the limonites) or were used as tools for the manufacture of adornments (with utilitarian and/or sacred function). These items are of local origin.

7. Local sandstones of red color or shades, easily accessible in the region of South Bug river; they could be used for powdering ground surfaces or objects without burning (attempts to substitute materials with similar qualities). There are also burned sandstones, for example, large burned "ochre" piece of vinous color (one of the assemblages from the area ЛІІ/13-22).

[24] *Ibidem*, pp. 59-67.
[25] *Ibidem*, pp. 60, 61, 66.

Thus, the sources of the ochre materials from Anetovka II can be divided into two types:

1) located at a significant distance (about 100 km) – Krivoy Rog iron ore basin of Dnepropetrovsk region: this territory gave limonites, hematites and micro-quartzites (including jaspilit).

2) local: clay formations from the section of speckled clays of the Pleistocene loess horizons of the North Pontic region, including the nearest vicinities of the site.

Also, there is evidence of some attempts to adapt minerals that are not pigment ochres (sandstones, colored clays). Ochre materials were used not only for obtaining paints, but also for the manufacture of certain art items: "ochred" kaolines or "ochred" quartz are unusable for obtaining yellow or red dye, but are suitable for the manufacture of adornments or sculptured figurines of certain color. The raw materials for obtaining red dye can be divided into two groups: 1) that needs preliminary grinding before burning, 2) that is easily grinded without burning.

Sources for the paints of other colors. There are also artifacts at Anetovka II of white, black, blue colors. There are many white-colored formations of secondary origin (these don't relate to natural inclusions into the loam layer, such as "white-eyed" clay, that is found under the cultural layer, being one of its depth markers) – kaolin, marl (of grey or green shades), chalk, that could be used as white paint sources. There are also many "coals" – heavy burned bones, which could be used as black paint for body, clothes or other objects. Ashes and burned gneisses of grey color could be used for the same purpose (some are found in the area ЕП/13-22, they are easily grinded and "smear" hands). Squares ЛМ/14-15 (5-th microhorizon of removal) gave several small (but "intensive") blue spots that looked like "powdering" on yellow background of loams. After a visual observation (the quality of the material made a special analysis impossible), V.F. Petrun supposed the presence of lapis-lazuli in the layer, that gave such a color (V.F. Petrun, 2003, personal communication). Lapis-lazuli (hardness 5-6, according to Mohs scale) is a mineral of skeleton silicate, a natural blue paint – ultramarine.[26] Azurite (the hardness of copper azure is of 3,5-4) can also produce blue paint.[27] Lapis-lazuli and azurite, as well as limonites and hematites, are also of earthy aspects and could be used as sources of paint.

[26] Шуман, *op.cit*., p.56; *Советский энциклопедический словарь*, М.: Советская энциклопедия, 1983, p.682.

[27] Шуман, *op. cit*., p.52; *Советский энциклопедический словарь*, p.28.

CONCLUSIONS

The ochre finds of Anetovka II are connected with different objects of the cultural layer and reflect certain stages of cultural development of the society, being some sort of "echo" of the religious ideas and aesthetic preferences of the past.

The inhabitants of Anetovka II used ochre of various kinds in the following cases:

1) Using pigment ochres as red paint for:

- painting the bison jaws, sculls (or heads) and shoulder blades, soil areas, bones, stones, clothes (by means of "mineral pencils");
- body painting, that is likely to be confirmed by the kaolin spots, including the large one of secondary origin, investigated by V.F. Petrun[28];
- patterning, which is obvious from the anthropomorphic head (sandstone pebble) with ochre "hat".

2) Use of ochre for the manufacture of adornments and small art items.

3) Tools for flint items manufacture (significance of red color?).

Paint pounder and, possibly, grinders were used for the manufacture and application of ochre paints. In many cases, the location of large and small ochre pieces and spots correspond to the flint and bone assemblages of the area ЕП/13-22, ИП/23-27 (paint store or ward?).

The sources of the ochre raw materials, distant enough from the South Bug river (Krivoy Rog region), give additional information about the possible moves of the ancient hunters. It is possible to argue that the Upper Paleolithic inhabitants of Anetovka II that came from the east to the west (from Krivoy Rog region to Bakshala river) undertook such a long journey in search of raw stone materials. Besides, chlorite-actinolite, talc-chlorite-actinolite slates and quratz ore-free cherts also originate from the Krivoy Rog region.[29]

In spite of the mythological character of the ancient mind, the Stone Age, as a whole, and the Late Paleolithic in particular, can be characterized by a quite rational attitude of the people towards many economic, domestic and cultural aspects of life. Thus, Anetovka II shows a wide range of use of different materials, the mutual substitution of materials with similar properties, the use of the rejected materials for other purposes. Besides, along with practical skills, the Paleolithic inhabitants of Anenovka II had considerable knowledge of the properties of the different materials they used, making experiments with them (in case of necessity) during the process of achieving the assigned task. Thus, they could use rejected sources of paint as tools (ochre pressure flaking tools and anvils). Worth noting is

[28] Станко, 1996, *op. cit*., pp.131, 133; Idem, 1999, p.323.
[29] Петрунь, *op. cit*., p.59-67.

also the mutual replacing of the minerals when ochre powder was needed (limonites, hematites, magnetites, ochred quartzs and kaolines, mottled clays, yellow sandstones). For improving the quality of the ochre minerals, the same method was used, namely burning the limonites and hematites along with sandstones and the subsequent grinding of the material into powder.

The complex investigation of the minerals from Anetovka II gives extra information regarding their utilization as the source of paint production and for other purposes. The ancient hunters used local sources along with distant ones (brought to the site from distances up to 100 kms).

The ochre minerals and the related items are an extra source for the reconstruction of the activity of the Paleolithic bison hunters. Also, these minerals of Anetovka II are associated with various objects of the cultural layer and can illustrate certain stages of the cultural development of the society, reflecting religious ideas and aesthetic preferences of the Paleolithic. Pigment ochres and ochred minerals are broadly present at the Late Paleolithic site of Anetovka II. We stress the great significance of such materials for the Paleolithic inhabitants of Anetovka II, its wide use in the site, that reflected a sacral meaning of the red color for the spiritual life of the community of bison hunters that lived 18-19 thousand years ago in the periglacial steppes of the North-West Pontic region.

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