

**MUZEUL NAȚIONAL DE ISTORIE A ROMÂNIEI**

**CERCETĂRI  
ARHEOLOGICE**

**XXXI**

**1**



**CERCETĂRI  
ARHEOLOGICE**

**XXXI**

**1**

**BUCUREȘTI**

**2024**

#### COLEGIUL DE REDACȚIE:

Sorin Ailincăi, Dan Aparaschivei, Mihai Bărbulescu, Nikolaus K.O. Boroffka, Adina Boroneanț, Dragoș Diaconescu, Stela Doncheva, Gabriel Fusek, Florin Gogâltan, Martin Husár, Sergiu Matveev, Dragoș Măndescu, Ioana A. Oltean, Ioan-Carol Opriș, Liviu Petculescu, Constantin C. Petolescu, Zeno Karl Pinter, Ștefan Pop-Lazić, Ivan Radman-Livaja, Tudor Sălăgean, Victor Spinei, Agnieszka Tomas, George Trohani, Boaz Zissu

#### COLECTIVUL DE REDACȚIE:

Silviu Oța – redactor-șef  
Laurențiu Angheluță  
Bianca Olteanu  
Alexandru Rațiu  
Andreea Ștefan  
Maria-Magdalena Ștefan  
Ovidiu Țentea

Tehnoredactare și coperta: Petru Ureche

Ilustrația de pe copertile 1, 4: Poarta de nord a „cetății vechi” de la Axiopolis, vedere dinspre exteriorul incintei (după Netzhammer, R. 1918. Die christlichen Altertümer der Dobrudscha. București: Socec & Co: p. 118, fig. 37).

ISSN 0255-6812

[www.cercetări-arheologice.ro](http://www.cercetări-arheologice.ro)

<https://doi.org/10.46535/ca.31.1>

<https://doi.org/10.46535/ca.31.2>

Volum editat de Muzeul Național de Istorie a României  
Calea Victoriei 12, București, 030026, România

---

## CUPRINS/CONTENTS

30/1

### STUDII/STUDIES

|  |     |
|--|-----|
| Ana ĐURIČIĆ, More than Floors and Domes - Contexts around Ovens in the Late Neolithic of the Central Balkans .....   | 11  |
| Aurora PEȚAN, Cetatea dacică de la Cucuiș – Dealul Golu (jud. Hunedoara) în lumina datelor LiDAR .....   | 31  |
| Vasile IARMULSCHI, Fibule de tip Kostrzewski G din silvostepa carpato-nipreană .....   | 41  |
| Ghenadie SÎRBU, Jaroslav PESKA, Tomas TENCER, Sergiu HEGHEA, O necropolă plană sarmatică descoperită în bazinul râului Răut (Republica Moldova), grație unor cercetări non-invazive .....                | 53  |
| Adina VELCESCU, Les amphores découvertes dans la zone portuaire de Callatis (Mangalia, Roumanie) dans les années 1960-1970 .....   | 61  |
| Ioan MUNTEAN, The Sanctuaries of Iuppiter Dolichenus in the Danubian Provinces. A functional interpretation .....  | 83  |
| Csaba SZABÓ, Women and Roman religion in Dacia: the epigraphic evidence .....  | 99  |
| Remus FERARU, Gladiatori și spectacole în amfiteatru în cetățile grecești din Pontul Euxin. ....   | 123 |
| Vladimir PETROVIĆ, The Epigraphic Testimonies from Timacum Maius (Eastern Moesia Superior): The Important Clues for the Character and Organization of Naissus Region .....                               | 135 |
| Ioan Carol OPRÎȘ, Axiopolis. Stadiul actual al cunoașterii .....   | 143 |
| Fatih Hakan KAYA, Musa ALBAYRAK, Martin HENIG, Ergün LAFLI, Earrings from Nicaea in Bithynia (south-eastern Marmara) .....   | 179 |
| Nizam ABAY, Grylloi: A Being with Mixed Depictions from Konya .....  | 205 |
| Cüneyt ÖZ, Repair of ceramics in Antiquity: Examples from Myra (Lycia) .....   | 215 |
| Parastoo Masjedi KHAK, Seyed Mehdi Mousavi KOUHPAR, Hasan Kohansal VAJARGAH, Cui QILONG, Six Sassanian artworks engraved with hunters: king, crown prince, aristocrat, or pretender to the throne? ..... | 221 |
| Khachik HARUTYUNYAN, Newly Discovered Inscriptions from the Armenian Cathedral of St. James in Jerusalem .....   | 235 |
| Yaroslav CHENTSOV, The problem of the attribution of burials of medieval nomads on the territory of the Ukrainian steppe on the example of three burials from the Novosilsky kurgan complex .....        | 249 |
| Maria-Venera RĂDULESCU, Cavalerul în turnir, temă iconografică redată pe cahle medievale din Muntenia .....  | 261 |

---

## RECENZII/REVIEWS

- Tudor ULIȚĂ-SÎNJOAN, Recenzie: Lee I. Levine, Zeev Weis, Uzi Leibner, *Ancient synagogues revealed 1981-2022*, Israel Exploration Society, 2023, 300 p., ISBN 978-965-221-129-3. .... 271
- Aurora PEȚAN, Recenzie: Alexandru Berzovan, *At the Borders of the Great Steppe. Late Iron Age Hillforts between the Eastern Carpathians and Prut (5th-3rd centuries BC)*, Mega, Cluj-Napoca, 2022, 310 p., 35 pl., ISBN 978-606-020-494-7. .... 273
- Claudia-Valentina POPÎRȚAC, Recenzie: Maria Alexandrescu Vianu, *Une cité antique à travers ses sculptures. La sculpture en pierre à Tomis à l'époque du Principat (Ier-IIIe siècles)*, Editura Istros a Muzeului Brăilei „Carol I”, Brăila, 2022, 300 p., ISBN 978-606-654-492-4. .... 276
- Florian BOIȘTEANU, Recenzie: Lucrețiu Mihăilescu-Bîrliba, Ioan Piso (ed.), *Romans and Natives in the Danubian Provinces (1st-6th C. AD)*, Harrassovitz Verlag, Wiesbaden, 2023, 618 p., ISBN 978-3-447-12096-8. .... 278
- Tudor ULIȚĂ-SÎNJOAN, Recenzie: Annamária-Izabella Pázsint, *Private Associations in the Pontic Greek Cities (6th century BC–3rd century AD)*, Peeters, Leuven – Paris – Bristol, CT, 2022, 386 p., ISBN 978-90-429-4718-4. .... 280







CA

31/1



---

# THE PROBLEM OF THE ATTRIBUTION OF BURIALS OF MEDIEVAL NOMADS IN THE TERRITORY OF THE UKRAINIAN STEPPE ON THE EXAMPLE OF THREE BURIALS FROM THE NOVOSILSKY KURGAN COMPLEX

---

YAROSLAV CHENTSOV

---

## ABSTRACT:

The article is devoted to the problem of attributing monuments of medieval nomads from the Ukrainian steppe in the period of X-XIV centuries on the example of three burials from the Novosilsky Kurgan group located in the North-Western Black Sea coast. The attribution of such burials is problematic for the archaeology of Ukraine. The number of modern studies on this topic is rather small, which is determined by the somewhat biased attitude of scientists towards the monuments of medieval nomads of the 10th-14th centuries as those left by a certain homogeneous community, as evidenced by the still used term «late nomads». However, such a strong generalization does not reflect reality. During the Middle Ages, the steppe of Ukraine was replaced one after another by waves of multi-ethnic nomads who migrated here from Central Asia. The ethnic diversity of the Pechenegs, Torks, Cumans, and the Central Asian peoples who came with the Mongols, but also their similarities, including the significant similarity of funeral rites, made it difficult to attribute and identify features for certain ethnocultural groups and chronological periods. The purpose of this paper is to trace possible solutions to this problem. Modern technologies can also help with this - namely, 3-D modelling of artefacts from burials, which allows us to learn the detailed parameters of each object and visualize it in high resolution. For this work, three 3-D models were created - one object from each burial site, which will be characterized in the paper. The models also perform an important task of preserving cultural heritage, because unfortunately, since 2014, because of the armed aggression of the Russian Federation, nomadic monuments from the medieval steppe of Ukraine have been destroyed.

## ZUSAMMENFASSUNG: DAS PROBLEM DER ZUORDNUNG VON BESTATTUNGEN MITTELALTERLICHER NOMADEN AUF DEM GEBIET DER UKRAINISCHEN STEPPE AM BEISPIEL VON DREI BESTATTUNGEN AUS DEM NOVOSILSKY KURGAN-KOMPLEX

Der Artikel widmet sich dem Problem der Zuordnung von Denkmälern mittelalterlicher Nomaden der ukrainischen Steppe in der Zeit vom X. bis XIV. Jahrhundert am Beispiel von drei Gräbern aus der Novosilsky Kurgan-Gruppe an der nordwestlichen Schwarzmeerküste. Die Frage der Zuweisung solcher Bestattungen ist für die Archäologie der Ukraine problematisch. Die Zahl der modernen Studien zu diesem Thema ist eher gering, was auf die etwas voreingenommene Haltung der Wissenschaftler gegenüber den Denkmälern der mittelalterlichen Nomaden des 10. bis 14. Jahrhunderts als Hinterlassenschaften einer bestimmten homogenen Gemeinschaft zurückzuführen ist, wie der immer noch verwendete Begriff «Spätnomaden» beweist. Eine solch starke Verallgemeinerung entspricht jedoch nicht der Realität. Während des Mittelalters wurde die Steppe der Ukraine nach und nach durch Wellen multiethnischer Nomaden ersetzt, die aus Zentralasien eingewandert waren. Die ethnische Vielfalt der Peschenig, Torken, Kumanen und der mit den Mongolen eingewanderten zentralasiatischen Völker, aber auch ihre Gemeinsamkeiten, darunter die große Ähnlichkeit der Bestattungsriten, erschwerten die Zuordnung und Identifizierung von Merkmalen für bestimmte ethnisch-kulturelle Gruppen und chronologische Zeiträume. Der vorliegende Beitrag soll mögliche Lösungen für dieses Problem aufzeigen. Dabei können auch moderne Technologien helfen - nämlich die 3-D-Modellierung von Artefakten aus Gräbern, die es uns ermöglicht, die detaillierten Parameter jedes Objekts zu erfahren und es in hoher Auflösung zu visualisieren. Für diese Arbeit wurden drei 3-D-Modelle erstellt - ein Objekt von jeder Grabstätte, die in der Arbeit charakterisiert wird. Die Modelle erfüllen auch eine wichtige Aufgabe bei der Bewahrung des kulturellen Erbes, denn leider wurden seit 2014 infolge der bewaffneten Aggression der Russischen Föderation nomadische Denkmäler der mittelalterlichen Steppe der Ukraine zerstört.

KEYWORDS: Nomads, steppe of Ukraine, North-Western Black Sea coast, Novosilsky kurgan group, 3-D model.

SCHLÜSSELWÖRTER: Nomaden, Steppe der Ukraine, nordwestliche Schwarzmeerküste, Novosilsky-Kurgan-Gruppe, 3-D-Modell.

---

## Introduction

The study of archaeological sites of medieval nomads on the territory of modern Ukraine is a rather complicated problem. Few written sources of this period have survived to our time, so the urgent task is to study the known ones and to identify and introduce new archaeological sites of this period into scientific circulation; in the context of this work, this concerns the attribution of nomadic sites of the X-XIV centuries, namely, determining the ethnicity and attempts to date burials more narrowly. This issue in Ukrainian archaeology arises in the context of a small degree of study of this problem. An outdated and very generalized attitude to the complex of these monuments as those left by «late nomads» of the 10th-14th centuries, unfortunately, still exists in modern Ukrainian society. Undoubtedly, the task of defining and archaeological identification of materials marking a certain ethnic group that roamed the vast territory of the Ukrainian steppe at that time is important; unfortunately, it is impossible to single out a certain tribe from such an ethnic group using archaeology. These lands were home to many ethnic groups and tribes that were formed as part of these ethnic groups, but unfortunately, are not archaeologically distinguishable from them. Pechenigs, Torks and Cumans, nomads brought by the wave of Mongol conquests from East Asia, as well as Nogai, all these ethnic groups roamed the steppes of Ukraine. And, of course, all this multi-ethnic massif left behind monuments that have survived to this day, mostly of a funerary nature, because it is almost impossible to trace nomadic sites archaeologically. An additional problem is that, because of constant contact, the funeral rites of different ethnic groups and tribes were mixed and unified, so in some cases it is difficult to determine the specific ethnicity of the deceased. And, in the case of an uninventoried inlet burial, without the use of radiocarbon dating, this possibility disappears altogether. The use of radiocarbon dating can help partially, for example, we know that in the 10th and 11th centuries Pechenegs and Torks roamed the steppes of Ukraine, so if the dating shows such a chronological range, we can confidently attribute the buried person to one of these ethnic groups. Further, the situation is more complicated, because in the same period from the twelfth to the fourteenth centuries, representatives of many different ethnic groups simultaneously roamed the territory of Ukraine. Therefore, an important task is to identify and, through the use of modern research methods, try to take a step towards solving the existing problem of attributing monuments of medieval nomads, on the example of the analysis of three burial sites from the steppe of Ukraine.

## The context of the problem research

Since the topic of attributing the nomadic monuments of the 10th-14th centuries in the Ukrainian steppe is not sufficiently developed in modern historiography, there are not many studies and publications on it, especially in the recent period. The first to attempt to comprehensively address the issue of attribution of nomadic monuments of the 10th-14th centuries was the Soviet researcher G. O. Fedorov-Davydov, whose 1966 generalized monograph, after dividing the monuments into chronological periods and comparing the data with historical sources, attempted to identify possible types of burial monuments that could have ethnic ties. He found out that the number of «clear» complexes that could be attributed to a particular ethnic group with a high degree of probability was very small. Most of the sites were represented by mixed burial types, which confirms close ethno-cultural contacts.<sup>1</sup>

Also, this topic was dealt with by the well-known researcher S. O. Pletneva, who since the 1960s has been researching problems related to medieval nomads for more than 40 years. Commenting on the work of G. O. Fedorov-Davydov, she offers her own, slightly modified criteria for the typology and attribution of nomadic monuments. Her remark on the need to create a set of criteria for the funerary rite and material complex for the monuments of the Golden Horde period, which will help to establish ethnicity, is also important.<sup>2</sup>

Large-scale construction and reclamation works in the 1960s-1980s, especially on the territory of the steppe part of Ukraine, allowed to accumulate a significant source base because, of course, many archaeologists engaged in the excavation of mounds, faced the problem of attributing the nomadic monuments of the Middle Ages, since a large percentage of nomadic burials - which were the main type of monuments - were the entrance to the mound burials of earlier periods. Particular attention to such burials on the territory of the Dnipro region, their attribution and the history of medieval nomads is paid by V. M. Shalobudov, which is reflected in his works, regularly published since the early 80s.<sup>3</sup>

An attempt to attribute the monuments of the medieval nomads of the North-Western Black Sea region was made by A. O. Dobroliubskii. In his monograph of 1986, based on the periodization of G. O. Fedorov-Davydov and S. O. Pletneva, he attributed and chronologically identified nomadic burials in the region. The researcher also proposed a modernization of the typology of the funerary structure of H. O. Fedorov-Davydov, which allowed him to revise

<sup>1</sup> Fedorov-Davydov 1966.

<sup>2</sup> Pletneva 1981.

<sup>3</sup> Shalobudov 1984.

the attribution of several complexes and to note the existence of a local variant of the nomadic culture, which developed based on many ethnic groups such as Pechenegs, Torks and Cumans. The researcher also addressed this topic in his subsequent works, where he revised his attribution of some monuments of medieval nomads.<sup>4</sup>

For the Donetsk region, the researcher who studied the nomads of the 10th-14th centuries was M. L. Shvetsov. Having considered the data on the discovered structures with stone statues on the surface of the mounds in his 1979 work, the researcher determined that these were Cuman sanctuaries and proposed their typology. He also began a detailed chronological and typological examination of various categories of objects, including such finds as bronze cauldrons. In addition, he discussed the problems of settling the Donetsk region in the Middle Ages and characterized burial grounds of the Golden Horde period.<sup>5</sup>

The topic of medieval nomads and the problem of their attribution is also dealt with by Shvetsov's students - Kravchenko E.E. and Grib V. K., who have been publishing works on the medieval history of the region since the mid-1980s.<sup>6</sup>

Then, in the early 90s of the XX century, several works by O. V. Yevglevskiy and T. M. Potemkina appeared, which were devoted to the study of certain categories and types of items from the funerary inventory of nomads. In particular, these researchers have studied the typology and chronology of such things as pottery, hryvnias, flints and sabres. In addition, attention is paid to the semantic meaning of funerary equipment.<sup>7</sup>

Researchers such as G. N. Garustovych and V. A. Ivanov address the problem of attribution of nomads of the Ukrainian steppe in their works and offer their classification in this regard in a 2001 monograph. Although these scholars specialize in the study of problems related to nomads from other regions, their methods can be applied to the study of the inhabitants of the Ukrainian medieval steppe.<sup>8</sup>

At the present stage, works on the attribution of monuments of nomads of the Golden Horde period are rather sporadic and rather consider the nomadic component not separately, but in the aggregate general historical processes on the territories of the Ukrainian steppe or the general context of a certain multilayered archaeological site.<sup>9</sup>

It is also necessary to dwell on the interpretation of the term «Pecheneg-Tork population», which will be mentioned later in this paper. It is known that at the turn of the tenth and eleventh centuries, the bulk of the Turkic-speaking Torks-Oghuzes migrated from the steppes of the Caspian region to the west to the steppes of modern Ukraine. Before that, in the tenth century, a split among the Oghuz tribes began. The bulk of the Oghuz moved from Central Asia through the Iranian highlands to Asia Minor, where the Seljuk Turks formed a state in the second half of the eleventh century. The other part went to the Ukrainian steppes, where they became known in chronicles as Torks (from their self-name Turk), and there they somewhat displaced the Pechenegs.<sup>10</sup> Most researchers associate the reason for such a large migration of this ethnic group with the pressure of the eastern Cumans from the east on their western neighbours, the Oghuzes.<sup>11</sup> S. O. Pletniova believed that the Oghuzes roamed the territory of steppe Ukraine for a short period in the early eleventh century, and then were defeated by the Cumans, after which some of them went to Byzantium, and some went to serve the Kyivan prince and settled in Porossia, where they formed the Chornoklobuk Union in symbiosis with the Pechenegs.<sup>12</sup> It is also widely believed that the Torks had a significant mutual influence with the Pecheneg population that preceded them in the Black Sea region and formed a single ethno-cultural community with them, defined as the Pecheneg-Tork population.<sup>13</sup> But while there is no denying a certain influence of the successive waves of foreign nomads on each other, the strength of this influence and its results are still debatable.

Also, at present, despite many common features, there is a certain set of signs that differentiate Pecheneg and Tork burials, namely for the Torks, these are two burials under one mound, the location of a horsehide over the deceased on the backfill or floor, the presence of a bridle ornament of a tin strap, «kopoushka» pendants, bird-like pendants and a ring in the inventory of bridle ornaments; for the Pechenegs, a horsehide placed on the bottom of the grave to the left of the person and the presence of bone garter buckles in the inventory.

<sup>4</sup> Dobroliubskii 1986.

<sup>5</sup> Shvetsov 1980.

<sup>6</sup> Grib and Kravchenko, 2014.

<sup>7</sup> Evglevskij and Potemkina 2000.

<sup>8</sup> Garustovich and Ivanov 2001.

<sup>9</sup> Kovaleva and Marina and Romashko 2002; Cherkas, 2015.

<sup>10</sup> Pletneva 1981, 213-219.

<sup>11</sup> Bubenok 2012, 38.

<sup>12</sup> Pletneva 1981, 213-219.

<sup>13</sup> Dobroliubskii and Smirnov 2011, 20-60.

## Sites and methods

It is proposed to take a step towards solving the problem of attribution of monuments of medieval nomads of the Ukrainian steppe using photogrammetry - namely, 3-D modelling of a representative part of artefacts from nomadic burials, which will help in their cataloguing and typology, as well as in the analysis of already known burials in terms of modern concepts. Therefore, this paper will focus on three nomadic burials from the period of interest. They are located in the North-Western Black Sea region, namely in one of its parts - Budzhak (Fig. 1).

So, let us move on to the description of the monuments: all the burials that will be described in this paper were discovered during the Izmail new-building expedition of the Institute of Archaeology of the Academy of Sciences of the USSR in 1980 under the direction of A. V. Gudkova and with the participation of A. O. Dobroliubskii, G. M. Toshev, M. M. Fokeev. They were mentioned in the work of A. O. Dobroliubskii in 1986, but since then new methods of analysing archaeological material and concepts for attributing medieval nomadic monuments have emerged, some of which will be used in this paper. The mounds containing the burials we are interested in are part of the so-called «Novosilsky kurgan group», which was located on the northern outskirts of the village of Novosil'ske, Izmail district, Odesa region (in the monograph by A. O. Dobroliubskii's monograph and on the marks in the place of storage of artefacts from burials, these mounds are listed as located near the village of Plavni, which is located in the neighbourhood of Novosilsky village) (Fig. 2).<sup>14</sup>

*Kurgan 12, burial 2.* The height of the mound at the time of excavation was 0.8 m, diameter 28-30 m. Burial 2 was found 8.8 m from the centre of the mound, at a depth of 0.9 m. Initially, a stone foundation was found, stretched along the west-east axis. Its length was 1.4 m and its width was 0.4 m. The stones were not processed. Under the foundation was the skeleton of a man whose skull was destroyed by stones. The buried person was stretched out on his back, with his head to the West, his left hand placed along his body, the feet of his outstretched legs brought together. Fragments of bone and iron products were found next to the humerus of the left arm. Similar fragments were found near the elbow bent on the left half of the pelvis, next to and between the hip bones. Two arrowheads and a fragment of a third were found near the left arm, as well as fragments of other ironwork, an animal bone and an iron ring. To the right of the pelvis, a bronze buckle with fabric remains was found (Fig. 3).<sup>15</sup>



Figure 1. Map of Budzhak region.

(<https://uk.wikipedia.org/wiki/%D0%91%D1%83%D0%B4%D0%B6%D0%B0%D0%BA#/media/%D0%A4%D0%B0%D0%B9%D0%BB:Bugcadm.png>)



Figure 2. Map of the location of the burials. 1 – Kurgan 12; 2 – Kurgan 20, after Google Earth.

<sup>14</sup> Gudkova 1980.

<sup>15</sup> Gudkova 1980, 18-19.



A. O. Dobroliubskii, using the classification of G. O. Fedorov-Davydov, made by him in his 1966 monograph, defines the burial type as AI or AVIII, where section A means a human skeleton with the head facing west, without horse bones, type I - burial in a simple pit, and type VIII - burial in a pit, in a rectangular stone box. According to these features, as well as the arrowheads in his description, A. O. Dobroliubskii attributes this burial to the II period.<sup>16</sup> Here it is worth noting the chronological division of the time of medieval nomads into four periods proposed by G. O. Fedorov-Davydov and still used today: I - the end of the IX-XI centuries, which is identified with the dominance of the Pecheneg population and includes a short period of the Tork invasion; II - the last quarter of the XI-XII centuries, which is determined by the arrival and conquests of the Cumans; III - the end of the XII-early XIII centuries - the dominance of the Cumans before the Mongol invasion; IV - the second half of the XIII-XIV centuries - the Golden Horde period.<sup>17</sup>

*Burial rite:* the orientation of the buried head to the west is usually associated with the Pechenegs, who dominated the steppes of Ukraine in the first period, or the Torks. At the same time, there is no horse skin, which is classical for this period - this is understood in the literature as a situation when internal organs and the main part of the skeleton were removed from the horse carcass, but the limbs and head remained intact in the area of the elbow and knee joints, which were placed in the burial together with the skin.<sup>18</sup>

Usually, the skin was placed near or over the deceased, although there are a sufficient number of burials from this period where horse bones of any kind are completely absent.

Another important marker is the presence of stones in the grave. Here the author cannot agree with A. O. Dobroliubskii, who refers to it as a type of burial with a rectangular stone box or simply ignores the presence of stones. Rather, it looks like a stone lining over a grave, which has analogues in the Eastern European steppe, including the Ukrainian part of it - from the Donetsk steppes to the North-Western Black Sea coast.<sup>19</sup> This element of burial, as well as the use of stones in the funeral rite in general, is characteristic of the ancient Turkic and Kimak tribes of Central Asia and is densely concentrated in the area of the upper course of the Irtysh River - the centre of the formation of the Kimak Khaganate. For the Ukrainian territory, this rite is associated with the arrival of the Cumans, or rather, some part of the nomads who, together with the Cumans, overcame the path from Central Asia to the steppes of Ukraine, after the collapse of the Kimak Khaganate, could have been representatives of the numerous Turko-Mongolian tribes of the Kuns, Kai, Basmils, Karluks, etc.<sup>20</sup> The Cumans themselves are more characterized by the presence of a whole horse skeleton in the burial and the eastern or southeastern orientation of the dead. Although, as in other cases, there is no clear differentiation between the sets of signs of the burials of the Cumans and these tribes. Such burials with stone structures, if we are talking about the period of the late 11<sup>th</sup> - early 13<sup>th</sup> centuries, which is the chronological boundaries of the Kipchaks' dominance in the region, are rather sporadically scattered across the Eastern European steppe and have no clear localization, nor are they widespread. But already in the Golden Horde period, burials with stone structures reappeared in the Ukrainian steppes in connection with a new wave of Central Asian nomads brought by the Mongol invasion.<sup>21</sup> At this time, it is already possible to trace a certain localization of such monuments, for example, in Ukraine, the area between the lower reaches of the Dnipro, the Siverskyi Donets

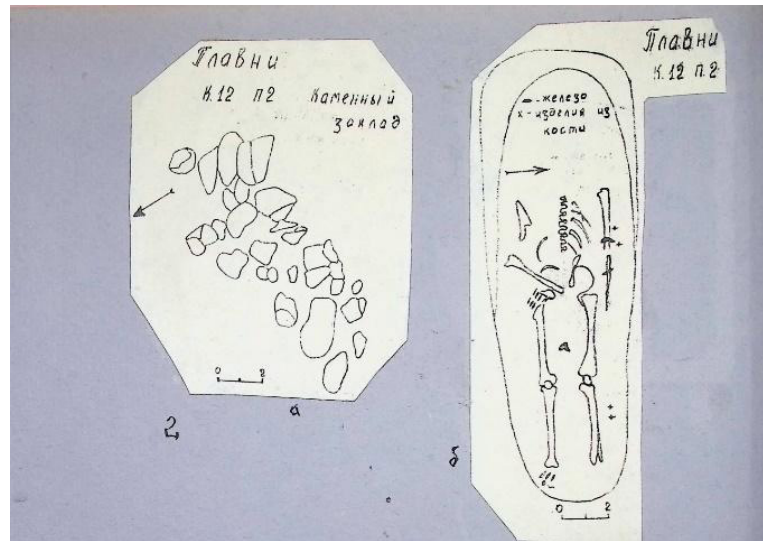


Figure 3. Photo of the scheme of burial 2 in kurgan 12. a - scheme of corpse. b - stone foundation over the burial (after Gudkova, A. and Dobroliubskii, A. and Toshchev, G. and Fokeev, M. 1980. *Otchet o rabote Izmail'skoi novostroyechnoi ekspeditsii Instituta Arkheologii AN USSR v 1980 godu.* OGIM 88252/2: Naukovyi arkhiv OAM NAN Ukrainy).

<sup>16</sup> Dobroliubskii 1986, 99.

<sup>17</sup> Fedorov-Davydov 1966, 9.

<sup>18</sup> Solovev 2008, 289-295.

<sup>19</sup> Kosikov and Grib 1985, 257-262.

<sup>20</sup> Kliashtorny 2002, 328-346.

<sup>21</sup> Ivanov and Garustovich and Pilipchuk 2014, 157-158.

and the Kalmius, although there are still some burials in other regions.<sup>22</sup>

*Inventory:* iron rings are quite common in medieval nomadic burials and have no clear link to a particular period or ethnic group, most likely they were used as an element of the harness.

The bronze lyre-shaped buckle, for which no direct analogues have been found, is also broadly dated and was probably part of a belt set.

As for the bone fragments, they may be part of a bone bowstring, but, based on the available parts, this can only be assumed (Fig. 4).

Only two arrowheads from the listed artefacts could be interpreted, and one of them was chosen to create a 3-D model for clarification, further documentation, and possible comparison with the burial inventory of other monuments of medieval nomads of the Ukrainian steppe (Fig. 5).

Both bits belong to the same type, namely, two-horned shearing bits belonging to type 60 according to A.F. Medvedev; more specific variants of this type for both bits are difficult to determine due to the degree of corrosion of the objects.<sup>23</sup> The presented specimens have an elongated forked flat nib with a cutout in the form of an equilateral triangle. The tip 1 has a truncated conical neck, and the tip 2 has a knotted stop. A detailed description of the parameters of hand-piece 1 is presented in Table 1. Also, thanks to the created model, we can measure a new parameter for this type of hand-piece - the diameter of the wooden part (Fig. 6).

Table 1. Parameters of the arrowhead.

| Parameter                                 | Meaning |
|---|---------|
| Nib length, cm                            | 2,95    |
| Width of the fork between the "horns", cm | 1,67    |
| Diameter of the wooden part, cm           | 0,633   |

According to ethnographic data, such cutlasses were used for hunting game, but if necessary, they were also used in combat. Two-horned shears of this type date from the middle of the XI - XIV centuries, and at this time they are found in all ethnic groups known on the territory of the Ukrainian steppe, so they do not help us much in solving the issue of attributing the burial in which they were left.<sup>24</sup>

Thus, we have a burial with inventory that cannot help with its dating and with mixed signs of funerary rites. The stone lining over the burial does not allow us to date it to the period of Pecheneg domination of the Ukrainian steppes, but it is not a determining feature for attributing it to the Cumans or Golden Horde period. The combination of these factors allows us to assume that the buried person belonged

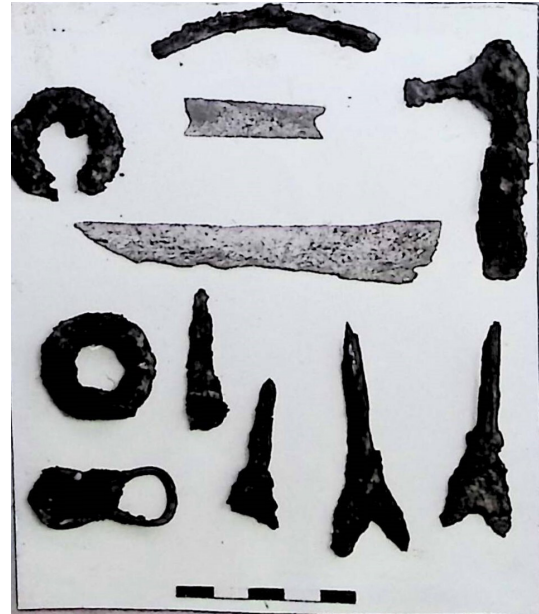


Figure 4. Photo of burial equipment from burial 2 kurgan 12 (after Gudkova, A. and Dobroliubskii, A. and Toshchev, G. and Fokeev, M. 1980. *Otchet o rabote Izmail'skoi novostroechnoi ekspeditsii Instituta Arkheologii AN USSR v 1980 godu*. OGIM 88252/2: Naukovyi arkhiv OAM NAN Ukrainy).



Figure 5. Orthophotographic projections from 3D model of the arrowhead. The artefact is stored in the collection of the Odesa Archaeological Museum of the NAS of Ukraine. Inventory ID: OAM №89079/1.



Figure 6. Measuring the diameter of the wooden part of the arrowhead. The artefact is stored in the collection of the Odesa Archaeological Museum of the NAS of Ukraine. Inventory ID: OAM №89079/1.

<sup>22</sup> Evglevskij 1992, 107-116.

<sup>23</sup> Medvedev 1966, 72.

<sup>24</sup> Medvedev 1966, 73.



to a certain ethnic group of Turkic-Mongolian origin, which could have come to the territory of the North-Western Black Sea region with the invasion of either the Cumans or the Mongols, for example, the Kuns, Kai, Basmils, Karluks, etc., which, unfortunately, cannot be distinguished through archaeology. It is also possible that the buried person belonged to the ordinary Mongol population, although it is known that the proportion of Mongols in Batu Khan's army was small. Therefore, the chronological boundaries of the burial can be defined as the end of the XI-XIV centuries.

*Kurgan 12, burial 4.* Another burial of a medieval nomad was found in the same mound, 3 m northeast of the centre, at a depth of 0.7 m. The authors of the excavations identified the identity of the buried person as Pecheneg-Tork. The skeleton was lying stretched out on its back, with the head to the west and the face to the north. The arms were slightly bent at the elbows, with the hands near the pelvis. The legs were stretched out in parallel. To the left and above the skull was a horse's skull, facing west. There were iron bridles in the horse's teeth. Near the left elbow, fragments of ironwork with wood residues were found. The skeleton was covered with a backfill in which a horse leg bone was found (Fig. 7).<sup>25</sup>

The burial was also characterised in the work of A. O. Dobroliubskii, who, using the classification and periodisation of G. O. Fedorov-Davydov mentioned here, defined the burial type as BX and assigned it to the II period. In this case, B means the skeleton of a human head turned to the west, with the bones or skeleton of a horse, and X is a burial in a wide pit where to the south of the buried person there are a skull and four legs of a horse, laid out in anatomical order, with the skull facing west.<sup>26</sup>

*The burial rite:* While the characterisation of the burial as belonging to Section B is not in doubt, the author of this paper disagrees with the designation of it as Type X. Firstly, Fig 8 clearly shows that the horse's head is located to the north of the buried person, and the burial is missing three legs of the horse, which are needed to recreate the anatomical order - the hide. In general, the burial rite is typical of Pecheneg burials, due to the location of the horse's skull and the western orientation of the buried person.

*Inventory:* In this case, the inventory can help us with the detailed attribution of the site. While the iron fragments with wood residues cannot be interpreted due to poor

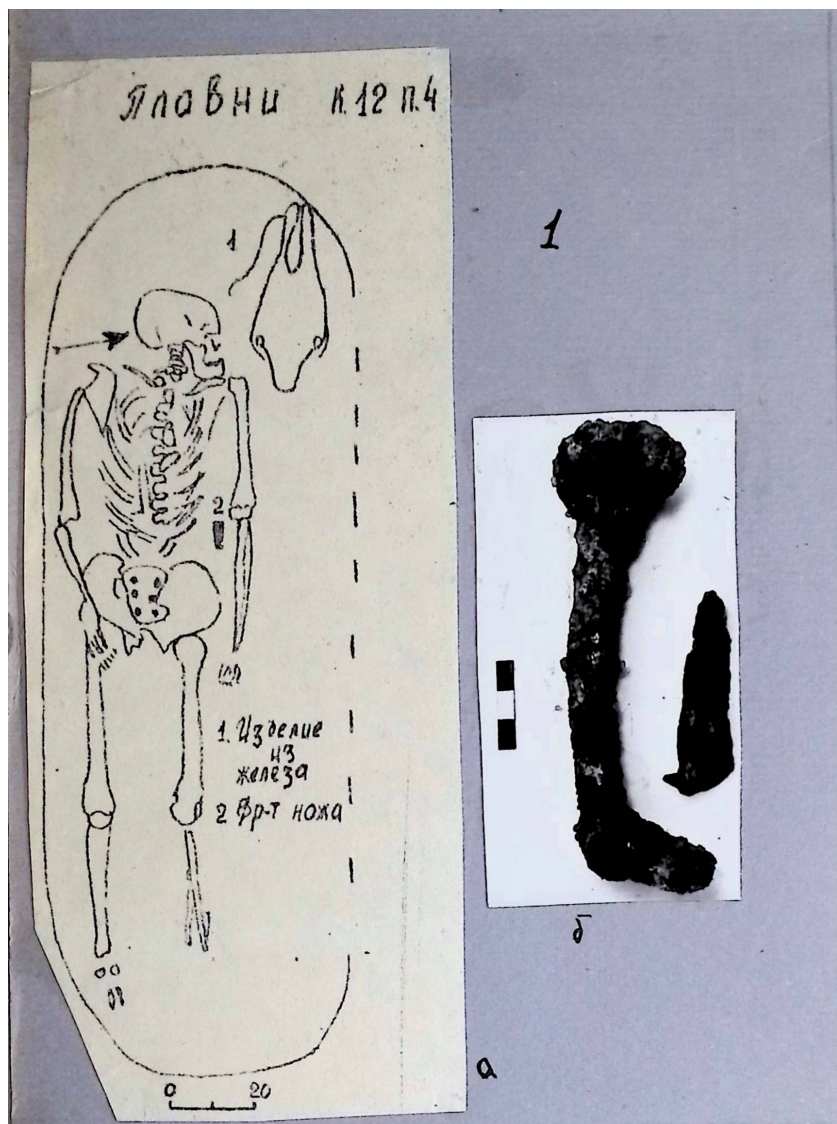


Figure 7. Photo of the scheme of burial 4 in kurgan 12 and artefacts from this burial. a – scheme of corpse and horse skull. b – iron artefacts. (after Gudkova, A. and Dobroliubskii, A. and Toshchev, G. and Fokeev, M. 1980. *Otchet o rabote Izmail'skoi novostroechnoi ekspeditsii Instituta Arkheologii AN USSR v 1980 godu*. OGIM 88252/2: Naukovyi arkhiv OAM NAN Ukrainy).

<sup>25</sup> Gudkova 1980, 19.

<sup>26</sup> Dobroliubskii 1986, 99.

preservation, the bit found in the horse's mouth is a dating object. In the literature, bits consisting of a single link with ringed ends, usually with movable trenzelle rings inserted into them, are called kinkless or single-piece bits. In one of her early works, S. O. Pletneva noted the tendency of the bits «made of one iron rod» to be found in burials of the «first group» in shallow rectangular or oval graves, usually inlet graves, with a western orientation of the buried and a stuffed horse, which she dated mainly to the tenth century, not excluding the dating of some complexes to the ninth or tenth to eleventh centuries and correlated with the Pechenegs.<sup>27</sup> However, G. O. Fedorov-Davydov, when dividing the material into chronological groups, attributed the one-piece bridles (type B-1 according to his classification) to the group of items from the 12<sup>th</sup> century. This erroneous dating of the one-part bit (horse) has been accepted by some researchers. However, the hypothesis about the early chronological position of the bits without kink has not ceased to exist.<sup>28</sup> O. M. Kirpichnikov in his work dated the bits without kink (type VI according to his classification) mainly to the 10<sup>th</sup> -11<sup>th</sup> centuries and associated them with the Pechenegs, partly with the Torks (Oguzes).<sup>29</sup> V. A. Krieger, based on the study of medieval mounds in the Volga region and the Urals, found a stable correlation between such bits and the types of things of the late 9<sup>th</sup> - mid-11<sup>th</sup> centuries.<sup>30</sup>

S. O. Pletneva, returning to the issue of dating one-part bits on the materials of the nomadic cemetery near Sarkela-Bila Vezha, left, in her opinion, by the mixed Oguz-Pecheneg population, recorded their findings in the complexes of the 10<sup>th</sup> -11<sup>th</sup> centuries.<sup>31</sup>

G. M. Garustovych and V. A. Ivanov in their consolidated work on Oguz-Pecheneg antiquities of the Eurasian steppes noted that bits without a kink were found only in Pecheneg burials and were most common in the X-XI centuries.<sup>32</sup>

Therefore, the discovery of such bits in the site under consideration once again testifies to the attribution of the burial to a purely Pecheneg one, and also allows us to date it to the 10<sup>th</sup> -11<sup>th</sup> centuries, which corresponds to the first period according to H. O. Fedorov-Davydov.<sup>33</sup> In order to catalogue and visualize artefacts belonging to the medieval nomads of the Ukrainian steppe, a 3-D model of a bit without a kink from burial 4, kurgan 12 was created (Fig. 8).

Thanks to the model, we can see the detailed characteristics of the object and compare them with other artefacts of this type, which are presented in Table 2.

Thanks to photogrammetry, the diameter of the long part of the rod can also be added to the parameters (Fig. 8).

*Kurgan 20, burial 3.* The kurgan was 0.7 m high and 20-22 m in diameter. Burial 3, identified by the excavation authors as left by the Pecheneg-Tork population, was found 13 m to the southeast of the centre, at a depth of 1.2 m. The rectangular pit is elongated from west to east, measuring 1.98 x 0.5 m, with uneven edges. The buried person was lying stretched out on his back, head to the west, arms placed along the body, and legs parallel to each other.



Figure 8. Orthophotographic projections from 3D model of the bit (horse). The artefact is stored in the collection of the Odesa Archaeological Museum of the NAS of Ukraine. Inventory ID: OAM №89078/1.

Table 2. Bit (horse) parameters.

| Parameter                | Meaning |
|--------------------------|---------|
| Length, cm               | 13, 9   |
| Ring diameter 1, cm      | 1,62    |
| Ring diameter 2, cm      | 1,58    |
| Ring width 1, cm         | 3,84    |
| Ring width 2, cm         | 3,51    |
| Bit (horse) diameter, cm | 1,44    |

<sup>27</sup> Pletneva 1958, 153-165.

<sup>28</sup> Fedorov-Davydov 1966, 115.

<sup>29</sup> Kirpichnikov 1973, 17-18.

<sup>30</sup> Kriger 1985, 12.

<sup>31</sup> Pletneva 1990, 48-49.

<sup>32</sup> Garustovich and Ivanov 2001, 85-86.

<sup>33</sup> Fedorov-Davydov 1966, 9.



Three bronze bell pendants consisting of two halves were found on the chest. Flint and fragments of ironware were found on the pelvic bones, and iron arrowheads were found on the right side of the pelvis and on it. One bronze openwork plaque was found on the femurs (Fig. 10).<sup>34</sup>



Figure 9. Measuring the diameter of the bit (horse). The artefact is stored in the collection of the Odesa Archaeological Museum of the NAS of Ukraine. Inventory ID: OAM №89078/1.

This burial was also characterized in the work of A. O. Dobroliubskii who defined the type of burial as AI and defined a broad chronology for it - from I to IV periods. It should be noted that in this case the author fully agrees with the characterization of the outstanding researcher, but believes that in order to visualize the complexity of the attribution of the monuments of medieval nomads, it makes sense to analyse the said monument in more detail.<sup>35</sup>

*Burial rite:* fully corresponds to the classification determined by G. O. Fedorov-Davydov - section A - human skeleton, head turned to the west, without horse bones, type I - burial in a simple pit, exactly as in the indicated case. The researcher also notes that this type was widespread in the I period and is most common among the Pechenegs.<sup>36</sup>

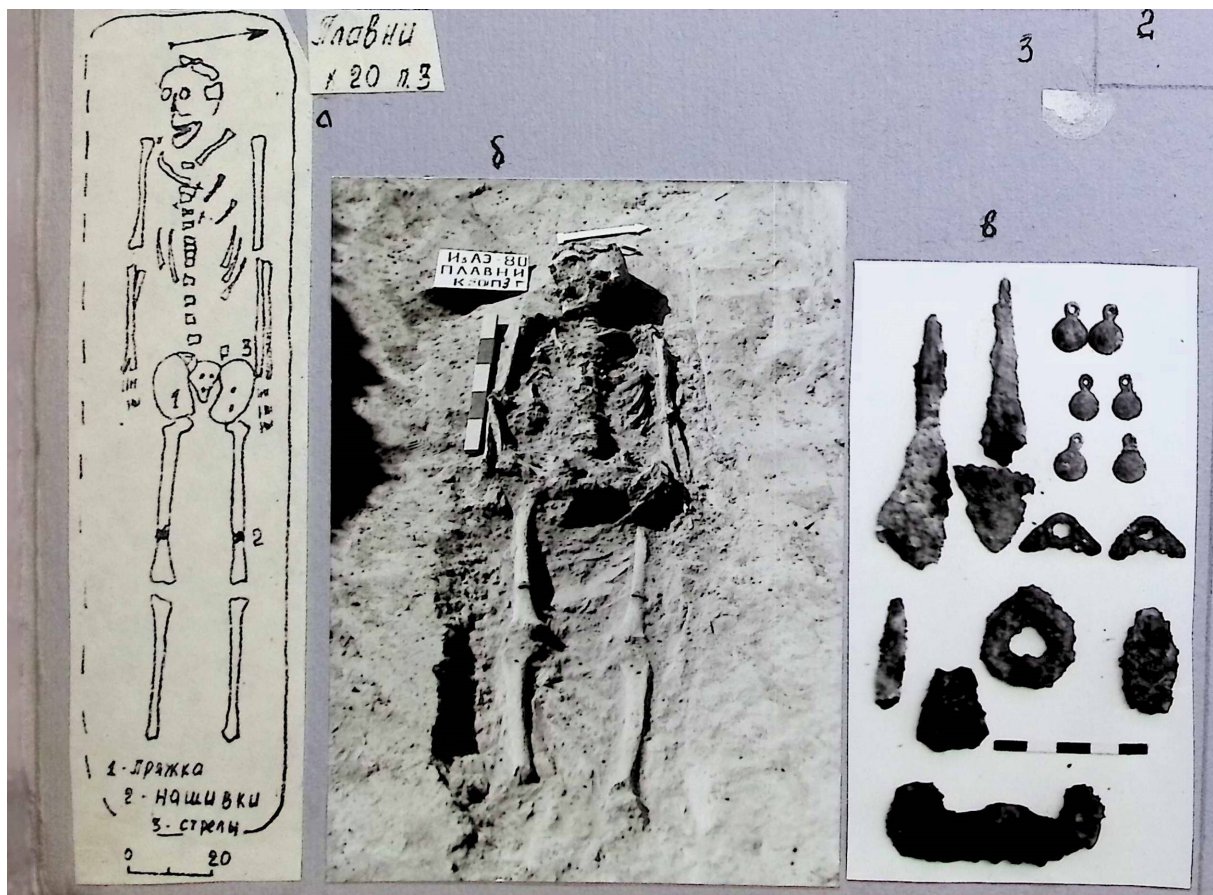


Figure 10. Photo of the scheme of burial 3 in kurgan 20 and artefacts from this burial. a – scheme of corpse and horse skull. b – photo of burial. в - photo of burial equipment. (after Gudkova, A. and Dobroliubskii, A. and Toshchev, G. and Fokeev, M. 1980. *Otchet o rabote Izmail'skoi novostroechnoi ekspeditsii Instituta Arkheologii AN USSR v 1980 godu*. OGIM 88252/2: Naukovyi arkhiv OAM NAN Ukrainy).

<sup>34</sup> Gudkova 1980, 33.

<sup>35</sup> Dobroliubskii 1986, 100.

<sup>36</sup> Fedorov-Davydov 1966, 9.

*Inventory:* Three bronze tambourine pendants, which consist of two halves - ball-shaped with a vertical cut, they are quite a frequent find in medieval burials of nomads and have a wide dating without being tied to a specific ethnicity. Most likely, such pendants were used as buttons, in this case, their position in relation to the skeleton is indirect evidence of this.

The fragments of iron products, in addition to fragments without the possibility of identification, represent several other artefacts.

Tinderbox, type BI according to G. O. Fedorov-Davydov, where B is the presence of one blade, and I is «colach-shaped» with a triangular protrusion on the inner side and straight ends. Tinderboxes of this type were also distributed throughout the rule of medieval nomads in the Ukrainian steppes. Evidently, the flint found nearby was in the complex with the armchair.<sup>37</sup>

An iron ring similar to the ring from burial 2 in kurgan 12.

Two fragmentary and heavily rusted arrowheads. It was not possible to determine the type due to their condition.

Two openwork bronze plaques. Unfortunately, the author did not manage to find analogies for these interesting artefacts, most likely they were used in a waist set. The plaques have the shape of a triangle with a hole in the middle and fastening elements on the inside. In order to visualize and document them, a 3-D model of one of the two identical plaques was created (Fig. 11).

Its parameters are presented in Table 3. It is hoped that this approach will help with finding analogies and determining the type of these findings.

In the northwestern Black Sea region, there was no clear change of one nomadic population to another.<sup>38</sup> According to archaeological evidence, the Cumans,

having reached these lands, did not begin to arrange their permanent

nomads here, but rolled back to the east, limiting themselves to periodic raids. The actual Cumans territory, which is marked by the spread of so-called stone «babas», is bounded in the west by the flow of the Ingulets River. So, although the Pechenegs were no longer full-fledged owners of these lands, they remained here until the Mongol invasion and the beginning of the Golden Horde rule. At the same time, the funeral rite, although in some cases influenced by the Cumans, remained unchanged. It is for this reason that it is impossible to accurately establish the period to which the burial that interests us belongs.

Table 3. Parameters of the belt plaque.

| Parameter          | Meaning |
|--------------------|---------|
| Length, cm         | 2,49    |
| Width, cm          | 1,3     |
| Depth, cm          | 0,266   |
| Rivet diameter, cm | 0,35    |
| Rivet heights, cm  | 0,303   |
| Bore diameter, cm  | 0,62    |

## Conclusion

So, on the example of the three characterized burials, one can see how difficult the problem of attributing the monuments of medieval nomads from the steppe of Ukraine is. It was possible to establish a more or less accurate chronology, as well as ethnicity, only in one case out of three, in the other two it was not possible to establish a chronological framework even within the generally accepted periodization, and the question of the ethnicity of the buried remains debatable. The reasons for this are due to many factors, first of all, it is the mutual influence of foreign ethnic waves of nomads who came to the territory of Ukraine one after another. The result of such symbiosis is the frequent similarity of burials of different times and origins and the interpenetration of features of one cultural community into another, which greatly complicates their attribution. On the other hand, there is the opposite problem, when in a certain territory it is impossible to trace the strength of such an influence, and sometimes even the fact of its existence. Thanks to this, it is possible to determine a certain preservation of the customs and rituals of the ethnic community for a fairly long period of time. The study of these complex processes is complicated by the frequent absence of dating material and modern typological collections of artefacts. It is the solution of this part of the problem that is proposed in this work. By comparing a wide selection of artefacts tied to the monument where they were found and by publishing of such a selection in high resolution using 3-D modelling can greatly



Figure 11. Orthophotographic projections from 3D model of the belt plaque. The artefact is stored in the collection of the Odesa Archaeological Museum of the NAS of Ukraine. Inventory ID: OAM №89081/1.

<sup>37</sup> Fedorov-Davydov 1966, 84.

<sup>38</sup> Dobroliubskii 1986, 100.

simplify for researchers the attribution of numerous monuments of nomads of the medieval steppe of Ukraine thanks to the accurate fixation of parameters about the object and saving this data in the network. A big problem is the lack of attention of modern researchers to the topic. It is also possible to change this state of affairs thanks to the methods of photogrammetry, which offers an opportunity for a comprehensive study of an artefact or a monument, at any point of access to the Internet. In this sense, the issue of preserving the cultural heritage of Ukraine, which, since 2014, has been destroyed as a result of the armed aggression of the Russian Federation, is also very important, of course, this also applies to the monuments of the steppe nomads of Ukraine of the X-XIV centuries. It is the 3-D modelling of artefacts that can ensure their further study and preservation, even in case of physical destruction. So, it seems that a step to solve the complex problem of attributing the monuments of medieval nomads, that are spread not only on the territory of Ukraine but also in many neighbouring countries, was also undertaken in this work.



*Fig. 12. Online access (QR code) to the digital catalogue of the collection.*

## Acknowledgments

The author is grateful for the cooperation of the Odesa Archaeological Museum of the NAS of Ukraine. The author is also thanks to Mariia Lobanova for her invaluable help and guidance in surveying.

## BIBLIOGRAPHY AND ABBREVIATIONS

### Abbreviations

OGIM – Odeskii gosudarstvennyi istoricheskii muzei (Odesa Archaeological Museum).

OAM – Odeskii arkeologicheskii muzei (Odesa Archaeological Museum).

NAN – Natsionalna Academiia nauk (National Academy of Sciences of Ukraine).

NAS – National Academy of Sciences of Ukraine.

AN USSR – Academiia nauk Ukrainskoi Sovetskoi Sotsialisticheskoi Respubliki (Academy of Sciences of Ukrainian Soviet Socialist Republic).

### Reference list

Bubenok, O. 2012. Ranni torky u stepakh Pivnichnogo Pryazovia. Kharkiv: Problemy istorii krain Tsentralnoi ta Skhidnoi Evropy.

Dobroliubskii, A. 1986. Kochevniki Severo-Zapadnogo Prichernomoria v epohy srednevekovia. Kiev: Naukova dumka.

Dobroliubskii, A., Smirnov, I. 2011. Kochovyky Pivdenno-Zakhidnoi Ukrainy v X-XVII stolittiakh. Kyiv: "Ilion".  
Evglevskij, A., Potemkina, T. 2000. On some types of pottery ceramics of Eastern European Nomads of developed middle ages. The European steppes in the middle ages 1: 209-226.

Fedorov-Davydov, G. 1966. Kochevniki Vostochnoi Evropy pod vlastiu zolotoordynskikh hanov. Moskva: MGU.

Garustovich, G., Ivanov, V. 2001. Oguzy i pechenegi v evraziiskikh: Ufa.

Grib, V., Kosikov, V. 1985. Parnoe kochevnicheskoe pogrebenie iz kurgana u sela Kamenka Donetskoi oblasti. Sovetskaia arkeologiya №2: 257-262.

Grib, V., Kravchenko, E. 2014. Istoria i materialy odnoi ekspeditsii na Dontse. Donetsk: Sviatogirskiy almanakh.

Gudkova, A. and Dobroliubskii, A. and Toshchev, G. and Fokeev, M. 1980. Otchet o rabote Izmailskoi novostroechnoi ekspeditsii Instituta Arkheologii Academiia nauk Ukrainskoi Sovetskoi Sotsialisticheskoi Respubliki v 1980 godu. Odeskii gosudarstvennyi istoricheskii muzei 88252/1: Naukovyi arkhiv OAM Natsionalna Academiia nauk Ukrainy.

Gudkova, A. and Dobroliubskii, A. and Toshchev, G. and Fokeev, M. 1980. Otchet o rabote Izmailskoi novostroechnoi ekspeditsii Instituta Arkheologii Academiia nauk Ukrainskoi Sovetskoi Sotsialisticheskoi Respubliki v 1980 godu. Odeskii gosudarstvennyi istoricheskii muzei 88252/2: Naukovyi arkhiv OAM Natsionalna Academiia nauk Ukrainy.



- Ivanov V., Garustovich G., Pilipchuk Y. 2014. Srednevekove kochevniki na granitse Evropy I Azii: Ufa.
- Kirpichnikov, A. 1973. Snariazhenie vsadnika i verhovogo konia na Rusi v IX-XIII vv.: Leningrad.
- Kliashtornyi, S. 2002. Kimaki, kipchaki I polovtsy. Kazan: Istoriia tatr s drevneishykh vremen.
- Kovaleva, I., Marina, Ch., Romashko, L. 2002. Kurgany eneolita-bronzy v krivorozhskom techenii Ingul'tsa. Dnepropetrovsk.
- Kruger, V. 1985. Kochevniki Iuzhnogo Priuralia i Zavolzhia v srednie veka: Moskva.
- Medvedev, A. 1966. Ruchnoe metatelnoe oruzhie (luk i strely, samostrel) VIII-XIV vv. Arheologiiia SSSR. Svod arkheologicheskikh istochnikov. Vyp. EI - 36. Moskva: Nauka.
- Pletneva, S. 1981. Kochevniki vostochnoevropeskikh stepei v X-XIII vv. Pechenegi, torki, polovtsy. Stepi Evrazii v epokhu srednevekovia. Moskva.
- Pletneva, S. 1958. Pechenegi, torki i polovtsy v Iuzhnorusskikh stepiah: Trudy Volgo-Donskoi arkheologicheskoi ekspeditsii.
- Solovev, A. 2008. Nekotorye aspekty semantiki obriada pogrebenia so shkuroi loshadi srednevekovogo naselenia predtaezhnogo Ob-Irtyshia ( voprosy rekonstruktsii ). Okno v nevedomyi mir: 289-295.
- Cherkas, B. 2015. Zakhidni volodinnia ulusu Dzhuchi XIII – XIV st.: suspilno-politychnyi ta ekonomichnyi rozvytok. Kyiv.
- Shalobudov, V. 1984. Kochevnicheskie kurgany Pravoberezhia Dnepra. Problemy arkheologii Podneprov'ia III-I tys. do n.e.: 166-173.
- Shvetsov, M. 1980. Kotly iz pogrebenii srednevekovykh kochevnikov. Sovetskaia arkheologiiia 2: 192-202.

## Liste der Abbildungen

- Figur 1. Karte der Region Budzhak. Übertragen von en.wikipedia auf Commons.  
<https://uk.wikipedia.org/wiki/%D0%91%D1%83%D0%B4%D0%B6%D0%B0%D0%BA#/media/%D0%A4%D0%B0%D0%B9%D0%BB:Bugcadm.png>.
- Figur 2. Karte der Lage der Gräber. 1 - Kurgan 12; 2 - Kurgan 20. Nach Google Earth.
- Figur 3. Foto des Schemas der Bestattung 2 in Kurgan 12. a - Schema des Leichnams. b - Steinfundament über der Bestattung.
- Figur 4. Foto der Bestattungseinrichtung von Grab 2 in Kurgan 12.
- Figur 5. Orthophotographische Projektionen des 3D-Modells der Pfeilspitze. Das Artefakt wird in der Sammlung des Archäologischen Museums der NAS der Ukraine in Odesa aufbewahrt. Inventar-ID: OAM №89079/1.
- Figur 6. Messung des Durchmessers des Holzteils der Pfeilspitze. Das Artefakt wird in der Sammlung des Archäologischen Museums von Odesa der NAS der Ukraine aufbewahrt. Inventar-ID: OAM №89079/1.
- Figur 7. Foto des Schemas der Bestattung 4 in Kurgan 12 und Artefakte aus dieser Bestattung. a - Schema des Leichnams und des Pferdeschädels. b - Eisenartefakte.
- Figur 8. Orthofotografische Projektionen vom 3D-Modell des Gebisses (Pferd). Das Artefakt befindet sich in der Sammlung des Archäologischen Museums Odesa der NAS der Ukraine. Inventar-ID: OAM №89078/1.
- Figur 9. Messung des Durchmessers des Gebisses (Pferd). Das Artefakt wird in der Sammlung des Archäologischen Museums von Odesa der NAS der Ukraine aufbewahrt. Inventar-ID: OAM №89078/1.
- Figur 10. Foto des Schemas von Bestattung 3 in Kurgan 20 und Artefakte aus dieser Bestattung. a - Schema der Leiche und des Pferdeschädels. b - Foto der Bestattung. b - Foto der Bestattungsausrüstung.
- Figur 11. Orthofotografische Projektionen des 3D-Modells der Gürtelplakette. Das Artefakt wird in der Sammlung des Archäologischen Museums der NAS der Ukraine in Odesa aufbewahrt. Inventar-ID: OAM №89081/1.
- Figur 12. Online-Zugriff (QR-Code) auf den digitalen Katalog der Sammlung.

YAROSLAV CHENTSOV  
 Odesa Mechnikov National University, Ukraine  
 yarik.chentsov1@gmail.com