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STUDYING OF LOCAL ANCIENT GREEK POTTERY OF OLBIA AND BORYSTHENES (historiographical aspect)

The article is devoted to the studying of ancient Greek pottery on the example of the centers of the Lower Buh River region in the works of Ukrainian and foreign scholars. An analysis of publications on the production of local ceramics, production areas of Olbia and the settlement on Berezan island at different times is offered; the main tendencies of studying the raw material base of the region are considered.

Key words: antiquity, Olbia, Borysthenes, pottery, historiography.

The establishment by the Greeks of an ancient settlement on the Berezan island, and later the Olbian polis, are the key moments in the history of the North-Western Black Sea coast in ancient times. The economic and cultural development of these centers, which for a long time had had common features, clearly demonstrates the features of Ionian colonization. Local ceramic production is one of the important aspects of archaeological research. The level of economic development of the ancient settlement can be judged by the presence of its local pottery. Archaeological research of the 20th and 21st centuries can convincingly state that the masters of ancient Olbia for a long period of its existence had been producing ceramic items that met the needs not only of the local population and settlements of its chora, but also went far beyond

it. Therefore, the issue on studying the Olbian ergasteria is the key to understanding the economic history of the ancient centers of the North-Western Black Sea coast. Mineral deposits in the immediate vicinity of the polis were bound to provide pottery as a leading branch of the Hellenic economy. Moreover, the choice of the place of establishment of the polis had to be connected to this factor.

For more than 100 years of archaeological research of ancient Olbia, its rural district and the settlement on Berezan island, there was a lot of evidence of the existence of local pottery. An attempt to collect and systematize existing in Ukrainian and foreign historiography research on this issue was made for the first time ¹.

In historiography, there can be identified problematic areas that indicate the study of ancient pottery of Olbia and Borysthenes: attribution of pottery with the separation of local ware; research of firing constructions and traces of pottery production; study of natural deposits in order to allocate pottery raw material. For optimal transmission of the scientific ideas evolution, it is necessary to begin the review with the attribution of ceramics, to which researchers paid attention in the first place. Another vector of Olbian and Borysthenes ceramics research emerged from the discovery of pottery workshops. The present stage is characterized by considerable attention to the deposits of mineral resources in the studied region.

One of the first works to assume local ceramic production in Olbia was an article written by E. R. von Stern in 1910 (Штерн 1910). Studying Hellenistic painted pottery, the author suggested that during the period of reduction of Attic imports to the poleis of the Northern Black Sea coast, local production was established here. This primarily applies to the manufacture of urns,

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¹ The article was prepared as a part of the Scientific and Research Work (SRW) of young scientists of the NAS of Ukraine 2021—2022: «Raw material base as a factor in the development of pottery of the ancient centers of the North-Western Black Sea Coast (Olbia and Berezan)» (state registration No. 0121U112024).

which were traditionally used in the funeral rites of the Greeks. According to the shape and method of ornamentation, E.R. von Stern attributed them to imitations of imported ceramics (Штерн 1910, с. 160). In the future, a historiographical gap is traced in the study of this topic, however, the mass material from the excavations gradually created a powerful source base for its future study.

In the article of T. M. Knipovych published in 1940, the author describes the findings of local (according to the author) ceramics of the second half of the 4th—1st centuries BC from the «И» sector, found during excavations in 1935—1936 (Книпович 1940, с. 129-170). Being a pioneer in publications of such kind, the researcher groups local ceramics by categories, applying the technological principle of classification: ceramics made on a potter's wheel (without coating; with glazed surface; painted) and handmade ceramics. In general, it should be noted that this was the first generalized attempt to systematize Olbian pottery. The hypothesis of local production of the pottery items found during this excavations is based on the author's visual observations, without the usage of chemical analysis, although the relevance of the latter is emphasized separately (Книпович 1940, с. 153). In particular, the author's observations on the specifics of pottery production in the Northern Black Sea region are important too. Like E. R. von Stern, she noticed that the local pottery of ancient centers traditionally followed the developed centers, but was delayed in terms of the evolution of types and shapes, so there were often products that were no longer in use in the central polis (Книпович 1940, с. 130).

Continuing the topic of local Olbian production of ornamented tableware, raised in the early 20th century, in 1941 there was published another article by T. M. Knipovych on painted ceramics from the Northern Black Sea coast, where the author considered well-known samples of Hellenistic items from Olbia and Bosphorus, in search of analogies to a painted jug from the funds of the Mykolaiv Local Lore Museum. Despite the thesis of the presence of local tableware in Olbia, in this article there was for the first time stated that one of the centers where such ceramics could have been made was Tauric Chersonesos. In general, most of the painted vessels from Olbia are attributed to the Black Sea production (Olbia, Bosphorus, Chersonesos), and are dated by the 3rd — first half of the 2nd centuries BC (Книпович 1941, с. 146-148).

The development of ideas for the attribution of ceramics to the local production of Olbia was observed in the 1970's. Having accumulated a

considerable ceramic material base for research, R. I. Vetshtein continued a series of articles devoted to the study of local Olbian pottery of the first centuries of the new era (Ветштейн 1975, с. 164 - 191). This time, the researcher examined ceramics collected during excavations in the 1930—1970's, including fragments with production defects, and molds for manufacturing. The importance of this work for the 1970's should be emphasized, as the researcher firstly systematized and comprehensively described the pottery of the first centuries AD, found in Olbia.

However, some of the author's positions on the local production of the selected vessels are questionable. For example, considering red clay amphorae with intricately profiled handles (type No. 75 according to the typology of I. B. Zeiest), the researcher has a rather weak evidence base for their local production, referring exclusively to the prevalence of this type of tare ceramics among studies in many areas of Olbia (Ветштейн 1975, с. 168). In addition, the presence of a large number of fragments of this type of amphorae in one of the basements of the Roman garrison in Olbian citadel (Ветштейн 1975, с. 170) and the discovery of 22 such complete amphorae dug into the floor of the house No. 1 on the mound near Kozyrka village (Ветштейн 1975, с. 170). However, this can hardly be considered as an evidence of local production of this type of amphorae². It should be noted that the wall fragments of amphorae type No. 75 with complex handle profiles (Зеест 1960, табл. XXXI, с. 167) have a ribbed surface, which is typical for many types of tare ceramics of the first centuries of our era (types according to I. B. Zeiest: Nos. 72, 76, 79, 80, 95, 96, 97, 100, 101, 102).

The second type of amphorae — grooved red clay amphorae of the Myrmekyon type (Ветштейн 1975, с. 171-172) — which was proposed to be considered of local production due to their large number found in Olbia, however, there is still no evidence for such a conclusion, as well as the mentioned differences in the morphology of the shape in comparison with products originating from the Cimmerian Bosphorus and other cities of the Northern Black Sea Coast.

Turning to the consideration of red slip lamps, R. I. Vetshtein points to their widespread presence

² As an analogy, we can also use the evidence of the «И» site research, where in the eastern house, in addition to basements, earthen cellars were found, in one of which there were 59 empty complete sharp-bottomed amphorae of the 4th century BC, most of which are of Heracleian origin (Славін 1952, с. 53), which also indicates in favor of storage hypotheses of tare vessels, rather than in favor of the production of this category of products.

in Olbia in the first centuries AD (Ветштейн 1975, с. 186-187), but the thesis of their local production (low quality) such as: «fuzzy contours of volutes», «handle made by hand», «dim glaze, covering the surface with an uneven layer» — cannot serve as an evidence in favor of their Olbian production. Fuzzy contours of some parts and ornaments on the lamps could be formed due to the «worn-out» mold for their manufacture (Шейко 2014, с. 31), and for the manufacture of handles, this is due to technological features of producing certain types (Шейко 2014, с. 31). As for the «dull slip-glaze» coating, it is more like vessels of Asia Minor centers, with low-quality varnish, the import of which was significant during the first centuries of the new era (Шейко 2015, с. 149).

Continuing the topic of local production of tableware ceramics, in 1982 К. I. Zaitseva published an article about a group of Hellenistic painted ceramics with floral ornaments from Olbia (Зайцева 1982). In it, the researcher examined the jars, some of which had already been published earlier. Speaking of local production, the author exaggerates the tradition of painting, talking about the mass production of painted vessels in Olbia in Hellenistic times (Зайцева 1982, с. 50). Visually distinguished macromorphological characteristics — red clay, black impurities, were attributed to the features of Olbian raw materials, although fairly conditionally (Зайцева 1982, с. 66, прим. 4). As for the shapes, К. I. Zaitseva pointed out that the production of jars was typical namely for Olbia (Зайцева 1982, с. 63), but this statement is also debatable.

The modern study of ceramics and pottery production is applied rather to Berezan island, where for the first time groups of local ceramics were instrumentally identified by comparing the mineralogical composition of the molding mass (Krutilov, Mommsen, Fornasier 2021). Particular attention is paid to the «gray clay» ceramics, the origin and distribution of which has been long debated.

By neutron activation analysis (NAA), the team of researchers was able to determine the concentration of trace elements in the selected samples. Their unique number made it possible to search for coincidences, which can be interpreted as the common origin of the samples (Krutilov, Mommsen, Fornasier 2021, s. 265-269). Interestingly, such a genetic relationship of the samples from Borysthene and Olbia was found, which confirmed the joint economic development of these centers, at least in the 6th century BC. Interestingly, this year's paleogeographic studies have revealed stratigraphic similarity of sediments near Olbia and within the settlement on Berezan

island, and laboratory studies should prove the genetic relatedness of sediments as a potential raw material for pottery.

As for Olbia, at the present stage there is a tendency to study certain categories of ceramics, in which a group of products of local origin is gradually distinguished. Such is, for example, the article on the technology of production of ceramic ancient lamps, found in Olbia and its suburban settlements and Borysthene, including locally manufactured items (Шейко 2014, с. 29-35). Having studied the whole array of lighting devices of pre-Roman times, the author considered the dynamics of the shape of these specially shaped vessels and the peculiarities of their production, pointing to defective lamps, various impurities in the clay and the coating of finished products. However, the researcher mostly uses data from visual observations, although it is based on the recently discovered ceramic complex from the Borysthene settlement with gray clay lamps, and a lot of foreign works that contain information on the manufacturing of ancient lamps.

The issue of local production of painted tableware in Olbia has also found its continuation at the present stage. Thus, today we can question the historiographical thesis that Hellenistic tableware ornamented with stripes or floral plots are of local Olbian production. Being a reminiscence of the famous ceramics of the “Hadra” style, such vessels most likely came from the neighboring Chersonesos polis, where they are widely found, and have appropriate analogies in shapes (Котенко 2015; 2019).

The issue of terracottas attribution is also related to the definition of local ware. The art of coroplasty technologically should also be attributed to ceramic production, because the usage of local raw materials in the manufacturing of clay figurines is beyond doubt. Important in this respect is the article by М. М. Khudiak, which comprehensively considers Olbian terracottas from the excavations of the Hellenistic strata of 1935—1936 (Худяк 1940, с. 85-103). In this paper, the author presents a description of terracottas from area «И». In total, the author involved in the scientific circulation 36 statuettes, with a detailed description of the external features and with the famous analogies from the Northern Black Sea coast, as well as from the territory of mainland and island Greece. Determining the significance of this work for ancient historiography, it should be noted that the publication of these materials confirmed, among other things, the development of local coroplasty according to the found clay molds for the statuettes manufacture. The molds themselves, as the author

found out, were partly imported, others were already made on the spot, but stylistically they had already been modified (Худяк 1940, с. 102). Thus, in addition to making pottery, Olbia was also known for coroplasty workshops, and the vector of research was continued in the works of T. M. Shevchenko (Шевченко 2010; Shevchenko 2019; 2020).

The study of firing structures and traces of pottery production has also been covered in a number of publications. In addition, L. M. Slavin notes that during the late 1920's and 1930's archaeological excavations in the northern part of the «И» sector, which is located in the northern part of Olbia, the remains of a large pottery workshop with several late Hellenistic firing structures were discovered. One of them can be considered the largest among the known monuments of local Olbia of that time (Славин 1940, с. 12). Thus, the researchers have the first important data on the local production of ceramics within Olbian settlement.

One of the tasks of archaeological research of post-war years was to excavate objects related to the remains of Olbia's pottery production. At the «НГ» sector in 1947—1948, excavations were carried out in the area of ceramic workshops, which are dated by the 1st — 2nd centuries AD, and were located on the outside of the defensive wall of the post-Getian period, along which, on the inside, were the barracks of the Roman garrison (Козленко 2021, с. 364-374). In particular, a large pottery kiln for firing ceramics was investigated. Important finds were the molds for imbrices manufacturing, which were discovered near the kiln, as well as many fragments of large vessels *in situ* (Славин 1952, с. 55).

Molds for the manufacture of ceramic items are important finds that confirm the existence of Olbia's own pottery production. In addition, another cylindrical mold for the manufacture of round imbrices was found during research on the terrace part of the city (Буйских, Форнасье, Шейко 2019, с. 7, рис. 1), which due to the close location of the sites «НГ» and «Т-4» looks not accidental.

Systematization of information available at the beginning of 1950's on the pottery areas of Olbia was carried out in the work of R. I. Vetshtein in the form of an abstract of a dissertation research (Ветштейн 1953). The author has repeatedly returned to this issue, which is reflected in a series of publications. In addition to studying pottery workshops, she researched all the ceramic material of the first centuries of the new era, providing its technological characteristics and typology. R. I. Vetshtein divided locally produced pottery into handmade items and pottery made on the wheel, examining it by

category of ceramics, identifying the morphological features of the vessels and describing the visual characteristics of the vessels coating. The author is convinced that the period after the Gets' defeat of Olbia stimulated the emergence of a large number of handicraft items, and Olbia became a production center (Ветштейн 1953, с. 11), which served mainly the needs of the local market, as evidenced by a significant reduction in trade links with the Mediterranean centers (Ветштейн 1953, с. 13). The thesis that the local production of ceramic products has certain features — the presence of local traditions in the technique of manufacture, shape, ornamentation of vessels — makes sense in the role of influences on these processes of the local population. The researcher gives an example with Sarmatian features in Olbian ceramics of the first centuries AD (Ветштейн 1953, с. 11).

During the excavations of the Central temenos in the Upper City was discovered a deep cistern (south of the temple of Apollo), at the bottom of which, among others finds, 100 complete and approximately 1000 fragments of different terracottas (4th — 2nd centuries BC) were investigated together with some molds for their production (Леви 1959). Much later, in 1985, O. I. Levi wrote that in the place of accumulation of terracottas to the east of the temple of Apollo were found masonry walls and the remains of other masonry, which A. N. Karasiov associated with a workshop for the terracottas manufacture, which ceased to exist until the second half of the 2nd century AD, as a large number of pieces of raw clay, ash and traces of fire were found around the masonry (Леви 1985, с. 83-84). According to E. I. Levi, this object served as a warehouse for the raw materials of the mentioned workshop, and the discovered cistern, with the findings of complete and fragmented terracottas, provided the workshop with the necessary amount of water needed for production purposes. According to the researchers, these finds are of local origin³, and the workshop itself was probably located on the agora⁴ (Славин 1956, с. 28).

In 1958 R. I. Vetshtein writes about four revealed pottery workshops (northern, southern, eastern and western) in Olbia, which are dated by the 1st—3rd centuries AD (Ветштейн 1958, с. 62). In total, only nine kilns for firing various ceramic products from all four workshops that had been researched and described have survived. In addition, in 1953 another

³ Although, it should be noted that along with terracottas, fragments of imported tableware were discovered too (Славин 1956, с. 27).

⁴ It is significant that after some time the pottery workshop of the Hellenistic period was really explored on the agora

ceramic workshop was recorded, which was located in the central part of the Upper City (section «Е») with one rectangular kiln⁵, which can be dated based on the accompanying material by the 1st century AD (Ветштейн 1958, с. 61, зноска 1).

Among the items of these workshops dominated red and gray clay vessels, defective products, light clay jars with ribbed handles, tiles and molds for their manufacture mentioned above, and the so-called «matrix» — a round stamp for ceramics, made of an amphora handle (Ветштейн 1958, с. 62). From modern studies of the Terraced City («Т-4» sector) also comes the «matrix» in the shape of a four-petalled rosette, although made of an amphora foot (Буйских, Форнасье, Шейко 2021, табл. 21, с. 13).

The researcher suggests that the workshop on the site «И» was built not earlier than in the 1st century BC on the destroyed houses of an earlier period, at a considerable distance from the city walls of that time, and did not last long in this place, because at the turn of the 1st—2nd centuries AD the mentioned territory turns into a necropolis⁶ (Ветштейн 1958, с. 64). The article also contains a description and results of an experiment on firing imbrices using found molds for their manufacture from the «НГ» sector. The final item was very similar to those found around the

pottery kiln No. 3 in the mentioned area (Ветштейн 1958, с. 66). Pyramid-shaped sinkers, tiles, amphorae stands or large vessels stands for the firing process, red clay lids were found next to the finds in the kilns *in situ*, which unequivocally testify to their local production. Samples of red slip ware around one of the kilns were found after the time of its destruction, so this is not evidence of their Olbian manufacture.

The most important research of the ancient pottery of Olbia studying is the evidence that were taken from the site «С-3» in 1977 (Крыжицкий и др. 1978, с. 343-344), where were found pottery kilns for industrial purposes sunk into the ground, with accompanying material dated by the 3rd—2nd centuries BC, and isolated finds of amphorae of the 1st century BC — 1st century AD, which indicates the possibility of a production area on the outskirts of the city in late Hellenistic times.

In the monographic work on the material culture of Olbia of the 1st—4th centuries AD V. V. Krapivina dedicated a separate block to pottery kilns (Крапивина 1993, с. 68-79), gathering all the information available at the time. The book contains a separate appendix, which provides a description of the kilns from sections «И», «НГ» and «С-3» from the field documentation (Крапивина 1993, с. 167-169). The researcher criticizes the dating of S. D. Kryzhytskyi about pottery kilns from sections «И» and «С-3» by the late Hellenistic times (Крыжицкий 1985, с. 131-132)⁷, and proposes to date them by the turn of the century — 2nd century AD (Крапивина 1993, с. 71). In addition, the author is convinced that the significant distance of these production complexes from the defensive wall and the scattering of industrial and economic complexes⁸ — are characteristic features of this period (Крапивина 1993, с. 71).

Investigating the technical characteristics and size of pottery kilns found in the production areas of Olbia, V. V. Krapivina argued that the increase in

⁵ To the description of the pottery kiln, opened in 1953 by O. I. Levi and researched by R. I. Vetshtein in 1954 in the southern part of the «ЕЗ» sector (in the territory occupied by the Temenos in the pre-Gets period), is devoted a separate article (Ветштейн 1965, с. 206-208). It is after the study of this kiln, which is dated on the accompanying material by the 1st century BC — 1st century AD, the thesis of the existence of five pottery workshops in ancient Olbia first appeared (Ветштейн 1965, с. 208).

⁶ Evidence in favor of this is a lot of data that was obtained through archaeological research in this area. As early as in 1925, a series of burials dated by the pre-construction of town houses on the «И» sector was discovered there under construction remains. According to L. M. Slavin, this part of the city arose only after the construction of the northern defensive wall here, thanks to which the area adjacent to it from the south became a part of the city. Until now, this area was outside the city, and the inhabitants of Olbia used it as a necropolis. The discovery of four burials in this area allowed the author to claim that the area was previously occupied by a necropolis dated by the Archaic period, according to the accompanying material from the burials (Славин 1940, с. 10). Continuation of excavations in the 1930's and 1940's and the discovery of more than 35 burials confirmed the thesis that in the area «И» there was a necropolis that existed here till the 4th century BC (Славин 1940, с. 10; Славин 1952, с. 53). In addition, over the layer of the upper building of the upper terrace on the excavation site «И» was found a skeleton dating by the Roman times (Славин 1940, с. 46), which indicates that the existence of a pottery workshop in this area has a chronological boundaries of the 4th century BC — 1st century AD.

⁷ According to S. D. Kryzhytskyi, pottery kilns from sections «С-3» and «И», as well as synchronous slabs pavements, were located on the Hellenistic layer of the 3rd—2nd centuries BC (Крыжицкий 1985, с. 130-131).

⁸ It should be noted that materials dated exclusively by the post-Getian period in the studied «С-3» and «И» sectors are absent. According to S. D. Kryzhytskyi, if we assume the appearance of kilns in the post-Getian period, the question arises about their considerable distance from the northern wall of the city in the first centuries AD, because usually pottery kilns were located in close proximity to defensive lines, such as in Chersonesos, and at the Lower City sector in Olbia (Крыжицкий 1985, с. 130-131). In addition, the researcher is convinced of the existence diversity of both pottery and production areas, in the Upper and Lower cities, as to explain their co-existence in the first centuries AD is quite difficult.

their size in the 2nd–3rd centuries AD, compared with the beginning of the new era, indicates an increase in their capacity and technical improvement (Кривина 1993, с. 78). However, given the numerous reconstructions of the firing constructions during manufacturing processes, it can be assumed that the increase in sizes was also associated with the manufacture of large ware vessels.

The current stage of research on the study of ancient pottery and local production of Borysthenes, Olbia and the settlements of its chora is represented by several articles. 2011 was marked by the opening of a ceramic production complex of the 6th century BC at the settlement on Berezan island, which included five kilns for firing pottery (Крутилов, Бондаренко 2015). In the filling of one of them were found 11 gray clay one-nozzle lamps with a biconical profile (Крутилов, Смирнов, Бондаренко 2012, с. 233-237), which confirms the local production of this type of lighting devices. In addition, a significant array of defective products was found in the filling of the kilns. Its morphological characteristics, as well as ornamentation, confirmed the thesis that ceramics were made here, which imitated Ionic vessels. According to the authors, the production of ceramics in Borysthenes was aimed primarily at meeting local demand (Бондаренко, Чистов 2021). The research of the Borysthenes pottery district is currently in an active phase: not only field work continues here, but also interdisciplinary projects aimed at clarifying the origin of certain types of ceramics.

A cursory, but extremely important mention of the pottery kiln is contained in the article of A. V. Buiskykh, devoted to the production workshop of metal products in the Southern Temenos of Olbia (Буйських 2019, с. 327-333). The researcher notes that during the conversion to replace the bronze foundry, a large pottery kiln was recorded, which existed on the Southern Temenos of Olbia until the beginning of the last quarter of the 5th century BC (Буйських 2019, с. 328), which may indicate the presence of another, already the sixth, the earliest in terms of the existence of a production pottery workshop in Olbia.

Another vector of research of ancient pottery is the study of natural deposits in order to isolate ceramics and chemical and technical analysis. The most valuable interdisciplinary study, published in 1940, is an article by O. A. Kulska, which carried out a chemical-technological analysis of Olbian local deposits of clay and ceramics of this site (Кульська 1940, с. 171-185). Giving a description of local raw materials by geological section from the

territory of Olbia, the author notes the presence of a large number of plastic clays that the inhabitants of the settlement could use for the production of ceramics (Кульська 1940, с. 171-172). As it turned out, the pottery industry used gray-green clays, which chemically met the necessary requirements for manufacturing. To confirm the conclusions in the text the description of Olbian clays, pottery and handmade ware in percentage terms on dry matter is given (Кульська 1940, с. 172-174, Tab. 1 – 3). According to the author, the study of geological sections for these studies was conducted by I. H. Pidoplichko, and petrographic analysis of fragments of Olbian ceramics was carried out by the Institute of Mineral Resources (Кульська 1940, с. 172, 175). It is important that the article also described the features of the technological process of making tableware, which was done for Olbian ceramics for the first time.

The author's remarks are important in the issue that the chemical parameters of the analyzed Olbian clays correspond to the raw material from which the selected samples of ceramic vessels were made from sections «И» and «НГ» (Lower City), and their difference lies only in the processing of the ceramic mass — carefully or not quite careful (Кульська 1940, с. 175, 179). The objectivity of such observations is difficult to assess, as the sampling in this case was not indicative, and the chemical properties were determined only by the basic (mandatory for this type of raw material) elements. Moreover, the concept of diligence is hardly more important than the prescription composition of the molding compound, which was selected by professional potters. To detect the firing temperature of the samples provided for the research and to restore the stages of the technological process of their production, special samples were made from local clays. However, the researcher only briefly mentions this, without giving details of the process.

The second article of O. A. Kulska, devoted to the study of certain groups of local Olbian ceramics from the chemical-technological point of view (Кульська 1958, с. 77-91), is a continuation of previous interdisciplinary work performed by the researcher in 1940. Sample fragments were used for analysis of ceramic products from «НГ» and «И» sectors: gray clay with black paint; burnished; grooved; imported («Greek») (Attic and Asia Minor centers). To address the issue of production technology of these groups of ceramics, it was shown that due to the different firing temperature, the colour of the finished clay products changes accordingly (Кульська 1958, с. 79). In addition,

the author investigated the composition of the coating samples (Кульська 1958, с. 82), thanks to which it was possible to separate, for example, Attic samples from Olbian ones. Comparing the chemical composition of selected fragments of ceramics with geologically taken clays from the slopes of ancient Olbia, it was confirmed that gray clay ceramics can be considered as of local Olbian manufacture (Кульська 1958, с. 82).

There were also attempts in the 2000's of interdisciplinary studies of Olbian pottery and building materials. In the article written by N. O. Shevchenko there can be found information about geological and petrological research (Шевченко 2017). However, this information, despite the prospects of the tasks, did not provide a comprehensive answer about the raw material base of Olbia at certain stages of its existence.

Although ceramics is the main object of research in the development of local pottery in Olbia, special attention should be paid to the study of the raw material base of the polis and the work on paleoecological conditions in ancient times in the Lower Buh River region as a part of the North Black Sea region. Therefore, seeing the prospects of research in an interdisciplinary approach, it is advisable to make a short thematic historiographical digest with archaeological and paleogeographic components. As already mentioned, episodic finds of traces of pottery, and mass pottery from Olbia, kept this issue on the surface, but the comparison with local raw materials was delayed for a long time.

In the second half of the 20th century V. F. Petrun made a significant contribution to the development of interdisciplinary study of the finds and was one of the first to study archaeological objects from the point of view of natural sciences (Бруйко, Видейко, Сапожников 2005). Also important were the studies of F. M. Lisetskyi on spatio-temporal organization of landscapes, where, among other things, attention is paid to the agricultural system of Olbia (Лісецький 1994, с. 19-20) The natural environment of the region in ancient times studied M. M. Ievlev, in whose works the geographical factor in the development of the region is considered (Ієвлев 1997; Ієвлев 2014). Further research on Olbian pottery covers a modern stage. In particular, paleoecology and resource base of the economy of the ancient centers of the Northern Black Sea coast was considered in the monograph written by O. V. Odrin (Одрін 2014).

Modern field paleogeographic works on the territory of the Northern Black Sea coast in the context of archaeological tasks are sporadic, but productive.

Large-scale lithological and paleogeographic studies of the Pliocene-Pleistocene and Holocene sediments of the Lower Buh River region were conducted by A. S. Ivchenko in 1980's (Івченко 1987). He studied almost fifty sections — three reference and 46 additional sections of wells, which allowed to conduct a detailed study of a set of methods (lithological-facial, geomorphological, pedomacromorphological, malacofaunistic, etc.), substantiated by the results of numerous physicochemical analyzes, stratigraphic analysis and Pleistocene continental formations. It is established that deposits of Neogene and Pleistocene age are directly involved in the structure of the district surface. The Neogene stratum is represented by sediments (clays, siltstones, limestones, sands, less often, marls, sandstones, siltstones) of the Sarmatian, Meotic, and Early Pontic epicontinental basins. Sediments of the Sarmatian basin (Middle and Upper Sarmatian) occur directly on Paleogene (Middle-Upper Eocene–Lower-Middle Oligocene) rocks. Subaerial Middle Pliocene sediments occur in the watersheds of modern interfluves and, in part, on their slopes.

The subaerial and subaquatic Middle-Upper Pliocene, less frequently, Lower Pontic, Meotic, and Upper Sarmatian sediments contain strata (10–18 m thick or more) of loams and, less frequently, clays of subaerial origin of Pleistocene age.

Previous paleo-soil studies within Olbia as an archaeological site were conducted by Zh. M. Matviishyna and O. H. Parkhomenko. Their research on the territory of the ancient city was conducted on two sites. The first site is located within the necropolis, where four soil profiles and the profile of the background (modern) soil were studied. The second section of the study was located within the territory of the Upper City, where three clearings were investigated, according to archaeological identification it is the «R-25» excavation site. As a result of their research, it was found that during the operation of the ancient city from the 4th century BC till the 4th century AD the climate was arid within the southern steppe zone, different from today.

Full-profile chestnut saline or saline soils were formed on the watersheds. Closer to the valley of the Buh River on the levels of lower terraces under wetter climatic conditions and more intensive development of accumulative processes, soils close to dark chestnut solonetzic or chernozems of southern solonetzic were formed. Dry steppe dominated in the elevated areas, and steppe vegetation prevailed on the lower levels, which developed on the chernozems of the southern or dark chestnut soils (Матвіїшина, Пархоменко 2017).

Research in this direction, but in order to study the raw material base of Olbia and Borysthenes, was continued in 2021. In particular, paleo-soil studies of Cenozoic sediments that reach the surface within the antient city of Olbia and the settlements of its chora, and the settlement on Berezan island. In terms of relief, this is the territory of the Black Sea lowlands, and Olbia and the surrounding areas are on the shores of the Buh estuary, which led to a certain decline of the territory and its dismemberment.

According to the climatic zoning of the territory of Ukraine, conducted in accordance with the classification of B. P. Alisov, the climate of this area belongs to the climatic region of the coast, which, in turn, is a part of the southern Atlantic-continental climate region. The main factor influencing the climate of this area is the breeze circulation.

The research conducted by the authors mainly concerned the study of sediments not in the city itself, but in the outcrops on the shores of the estuary and Borysthenes, in order to identify potential pottery used during the existing of the ancient city. The main method used in the study was a comprehensive paleopedological. In the course of research on each section (point) a detailed macromorphological description was performed and stratigraphic dissection of sediment strata was performed, as well as samples were taken for further laboratory studies. In total, during the research of potential pottery raw materials 12 points were inspected and samples were taken for further laboratory tests: 14 — for micromorphological analysis, 35 — for mineralogical analysis, 25 — for particle size analysis. Ultimately, particle size analysis will determine the suitability of raw materials for pottery, mineralogical — to compare

the mineralogical composition of potential raw materials with ceramics and confirm or refute the position of local/imported origin of ceramics, and micromorphological will help in linking the microstructure of potential raw materials and ceramic vessels, compare them and substantiate the conclusions in more detail.

At the moment, 44 sections with intact structure of deposits and ceramic products for research have already been made. Thus, at the present stage, the main prospects for further research are outlined and specific tasks are set to clarify the raw material potential of the centers of the Lower Buh River region.

In conclusion, it should be noted that the topic of the study of antient pottery is multi-vector and interdisciplinary. It has passed a difficult way of comprehension by advanced researchers of homeland classical school. The key to understanding the production process — from obtaining raw materials to firing and finishing the product — is in the objective comparison of the results of field research and a series of laboratory tests. Today we have grounds to create a database of raw materials of Olbia, Borysthenes and their suburbs. This will answer the current issues of pottery development of the antient centers of the Lower Buh River region of the entire period of their existence.

Therefore, the priority is to determine the resource potential of these sites, and thus the reconstruction of the economic model of these poleis. The obtained results, in the form of a map and an electronic database, will allow reproducing one of the most important aspects of the Hellenic economy of Olbia and Borysthenes. Through interdisciplinary research, it will be possible to single out locally produced pottery, which has been a debatable issue in antient historiography for quite a long period of time.

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Received 17.11.2021

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ВИВЧЕННЯ АНТИЧНОГО МІСЦЕВОГО ГОНЧАРСТВА ОЛЬВІЇ ТА БЕРЕЗАНІ (історіографічний аспект)

Античні центри Північно-Західного Причорномор'я належать до унікального історико-культурного регіону, який був охоплений давньогрецькою колонізацією з архаїчного періоду. На перетині вивчення культурної та економічної історії цих центрів перебуває питання розвитку ремесел і промислів, серед яких виготовлення кераміки займа-

ло важливе місце. Потужна джерельна база Ольвії та Березани, накопичена за майже сто років досліджень, представлена багатотисячним керамічним комплексом, який складається з виробів місцевої продукції та імпортованих речей. Але через відсутність прямої та вичерпної інформації про місцеве гончарство маємо особливу увагу звернути не лише на масові знахідки, а й на ресурсний потенціал Ольвії в давнину. Поклади мінеральної сировини у безпосередній близькості до поліса неодмінно мали забезпечувати цю провідну галузь еллінської економіки.

Науковий інтерес до місцевого виробництва кераміки в Ольвії виник ще на початку ХХ ст., коли почав формуватися керамічний комплекс пам'ятки. Перші узагальнюючі роботи, присвячені гончарству, з'явилися в 1940-х роках (О. А. Кульська, Т. М. Кніпович), де були зроблені перші класифікації кераміки та проведені хіміко-технологічні дослідження. Виявлення випалювальних споруд в Ольвії не було частим явищем, в окремих випадках це були вже зруйновані й переобладнані об'єкти. Серед досліджень другої половини ХХ ст. варто відзначити роботи Р. І. Ветштейн, В. В. Крапівіної.

Сучасний етап досліджень знаменувався відкриттям на Березани гончарного району та впровадженням комплексних міждисциплінарних студій. Окрім дослідження кераміки, в коло наукових інтересів потрапили також природні відклади, які є перспективними в плані дослідження гончарної сировинної бази.

Таким чином, історіографічний аспект дозволив простежити основні вектори наукових поглядів та методи дослідження гончарства Ольвії та Березани.

К л ю ч о в і с л о в а: античність, Ольвія, Березань, гончарство, історіографія.

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ИЗУЧЕНИЕ АНТИЧНОГО МЕСТНОГО ГОНЧАРСТВА ОЛЬВИИ И БЕРЕЗАНИ (историографический аспект)

Античные центры Северо-Западного Причерноморья относятся к уникальному историко-культурному региону, охваченному древнегреческой колонизацией начиная с архаического периода. На пересечении исследования культурной и экономической истории этих центров находится вопрос развития ремесел и промыслов, в которых изготовление керамики занимало принципиальное место. Мощная источниковая база Ольвии и Березани, накопленная за почти сто лет исследований, представлена многотысячным керамическим комплексом, который состоит из изделий местной продукции и импортных вещей. Но при отсутствии прямой и исчерпывающей информации о местном гончарстве особое внимание следует обратить не только на массовые находки, но и на ресурсный потенциал Ольвии в древности. Залежи минерального сырья в непосредственной близости от полиса непременно должны были обеспечивать эту ведущую отрасль эллинской экономики.

Научный интерес к местному производству керамики в Ольвии возник еще в начале ХХ века, когда начал формироваться керамический комплекс памятника. Первые обобщающие работы, посвященные гончарству, появились в 1940-х годах (О. А. Кульская, Т. Н. Книпович), где были сделаны первые классификации керамики и проведены химико-технологические исследования. Обнаружение сооружений для обжига керамики в Ольвии не было частым явлением, в отдельных случаях это уже были разрушенные и переоборудованные объекты. Среди исследований второй половины ХХ века следует отметить работы Р. И. Ветштейн, В. В. Крапивиной.

Современный этап исследований ознаменовался открытием на Березани гончарного района и внедрением комплексных междисциплинарных студий. Кроме исследования керамики, в круг научных интересов попали также природные отложения, перспективные в плане исследования гончарной сырьевой базы.

Таким образом, историографический аспект позволил проследить основные векторы научных взглядов и методы исследования гончарства Ольвии и Березани.

К л ю ч е в ы е с л о в а: античность, Ольвія, Березань, гончарство, історіографія.

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