DOI: 10.53737/2713-2021.2024.26.77.006

Yana Lukpanova, Abai Seitov, Kyrym Altynbekov, Elina Altynbekova, Mikhail Antonov, Gaukhar Kaldybayeva, Takayuki Honda, Yuka Sasaki, Kazutaka Kobayashi, Shinya Shoda

THE WOODEN BOX FROM THE URYSAY-2 COMPLEX (WESTERN KAZAKHSTAN, 5th CENTURY BCE): AN INTERDISCIPLINARY RESEARCH EXPERIENCE*

The article is devoted to the study, restoration, and reconstruction of a poplar box originating from kurgan No. 13 of the Urysay-2 burial site. This box contained a set of ritual objects associated with a female "priestess". The box was positioned behind the head of the deceased and was a low, square container with straight sides and a separate flat lid. The specific set of objects found in the box included a mirror, a cedar block, a "spoon" with traces of paint, a small organic vessel (leather? felt?), and silk fabric, supplemented by a small stone altar and a set of tools found nearby. During fieldwork, the box was removed in one block. Subsequently, an MRI scan was performed; a comprehensive set of procedures was conducted to identify the material of the finds, their physicochemical composition, conservation, and restoration; a 3D reconstruction of the box and the items was carried out.

Key words: Urysay-2, kurgan, burial, Sarmatians, female "priestess", box.

About the authors: Lukpanova Yana[1], Senior Researcher, West Kazakhstan Regional Museum of LocalHistory; Seitov Abai[2], Researcher, Margulan Institute of Archaeology; Altynbekov Kyrym[3], Director, Scientific Restoration Laboratory "Ostrov Krym"; Altynbekova Elina[4], Restoration Designer, Scientific Restoration Laboratory "Ostrov Krym"; Antonov Mikhail[5], Researcher, Margulan Institute of archaeology; Kaldybaeva Gaukhar[6], Researcher, Margulan Institute of Archaeology; Honda Takayuki[7], PhD, Meiji University, Sasaki Yuka[8], PhD, Kanazawa University; Kazutaka Kobayashi[9], PhD, Tohoku University; Shoda Shinya[10], PhD, Nara National Research Institute for Cultural Properties.

Contact information: [1]Kazakhstan, Uralsk, Nazarbayev Ave., 184; [2,5,6]Kazakhstan, Almaty, Dostyk Ave., 44; [3,4]Kazakhstan, Almaty, Venetsianov St. 6/5; [7]Japan, Nakano 4-21-1, Nakano, Tokyo 164-8525; [8]Japan, Kakumamachi, Kanazawa, Ishikawa 920-1192; [9]Japan, Katahira 2-1-1, Aoba Ward, Sendai, Miyagi 980-8577; [10]Japan, Nijo 2-9-1, Nara 630-8577; e-mail: [1]yana_2004_75@mail.ru; [2]sajrim@mail.ru; [3]tengri05@mail.ru; [4]elina.altyn@gmail.com; [5]archaeology@live.ru; [6]odd_story@mail.ru; [7]t-honda@meiji.ac.jp; [8]sasaki928425@gmail.com; [9]cazutaca@gmail.com; [10]shodas7f@nich.go.jp.

Яна Лукпанова, Абай Сеитов, Кырым Алтынбеков, Элина Алтынбекова, Михаил Антонов, Гаухар Калдыбаева, Такаюки Хонда, Юка Сасаки, Кадзутака Кобаяши, Шинья Шода

ДЕРЕВЯННАЯ ШКАТУЛКА ИЗ КОМПЛЕКСА УРЫСАЙ-2 (ЗАПАДНЫЙ КАЗАХСТАН, V В. ДО Н.Э.): ОПЫТ МЕЖДИСЦИПЛИНАРНОГО ИССЛЕДОВАНИЯ

Статья посвящена исследованию, реставрации и реконструкции шкатулки из тополя, происходящей из кургана № 13 могильника Урысай-2. В ней находился набор ритуальных предметов женщины-«жрицы». Шкатулка располагалась за головой погребённой и представляла собой невысокий

*Статья подготовлена в рамках грантового финансирования Комитета науки МНВО РК 2022—2024, ИРН проекта AP 14870513.

Статья поступила в номер 22 сентября 2024 г.
Принята к печати 12 октября 2024 г.

© Yana Lukpanova, Abai Seitov, Kyrym Altynbekov, Elina Altynbekova, Mikhail Antonov, Gaukhar Kaldybayeva, Takayuki Honda, Yuka Sasaki, Kazutaka Kobayashi, Shinya Shoda, 2024.

подквадратный короб с прямыми стенками и отдельной плоской крышкой. Специфический набор предметов, представлен зеркалом, бруском из кедра, «ложечкой» со следами краски, сосудиком из органики (кожа? войлок?), шелковой тканью, который дополнялся каменным алтариком и набором инструментов, найденных рядом с женщиной. В полевых условиях шкатулка была изъята блоком. Затем — выполнено МРТ сканирование; проведён комплекс работ по определению материала находок, физико-химического состава, консервации и реставрации; осуществлена 3D реконструкция шкатулки и предметов.

Ключевые слова: Урысай-2, курган, погребение, сарматы, женщина-«жрица», шкатулка.

Сведения об авторах: Лукпанова Яна[1], старший научный сотрудник, Западно-Казахстанский областной историко-краеведческий музей; Сеитов Абай[2], научный сотрудник, Институт археологи имени А.Х. Маргулана; Алтынбеков Кырым[3], директор, Научно-реставрационная лаборатория «Остров Крым»; Алтынбекова Элина[4], дизайнер-реставратор, Научно-реставрационная лаборатория «Остров Крым»; Антонов Михаил[5], старший научный сотрудник, Институт археологи имени А.Х. Маргулана; Калдыбаева Гаухар[6], научный сотрудник, Институт археологии имени А.Х. Маргулана; Хонда Такаюки[7], PhD, Университет Мэйдзи; Сасаки Юка[8], PhD, Университет Канадзава; Кобаяши Кадзутака[9], PhD, Университет Тохоку; Шода Шинья[10], PhD, Национальный исследовательский институт культурных ценностей Нара.

Контактная информация: [1]Казахстан, г. Уральск, пр. Н. Назарбаева, 184; [2,5,6]Казахстан, г. Алматы, пр. Достык, 44; [3,4]Казахстан, г. Алматы, ул. Венецианова, 6/5; e-mail: [7]Japan, Nakano 4-21-1, Nakano, Tokyo 164-8525; [8]Japan, Kakumamachi, Kanazawa, Ishikawa 920-1192; [9]Japan, Katahira 2-1-1, Aoba Ward, Sendai, Miyagi 980-8577; [10]Japan, Nijo 2-9-1, Nara 630-8577; e-mail: [1]yana_2004_75@mail.ru; [2]sajrim@mail.ru; [3]tengri05@mail.ru; [4]elina.altyn@gmail.com; [5]archaeology@live.ru; [6]odd_story@mail.ru; [7]t-honda@meiji.ac.jp; [8]sasaki928425@gmail.com; [9]cazutaca@gmail.com; [10]shodas7f@nich.go.jp.

Introduction. In the archaeology of Kazakhstan and the Eurasian steppe, finds of organic artifacts are relatively rare. This is especially true for regions with a sharply continental climate, where organic materials are subject to degradation due to fluctuations in temperature, humidity, soil composition, and the action of microorganisms. Organic materials, such as wood, leather, and textiles, typically do not survive well under these harsh conditions and usually undergo rapid decay. However, in certain cases, such as areas with permafrost or well-protected burial complexes, these materials may be preserved to some extent. Such discoveries are particularly valuable as they offer insights into not only the technological skills of ancient craftsmen but also details of their daily lives, customs, and the complexities of cultural contact and exchange.

In modern archaeology, interdisciplinary integration is becoming increasingly relevant, serving as an indicator of research effectiveness and a prerequisite for comprehensive study of objects (see, for example: Altynbekov, Altynbekova 2019; Altynbekov et al. 2021; 2022; Nigmatova et al. 2021; Jumabekova et al. 2022; Sasaki et al. 2022; Beisenov et al. 2023; Loshakova, Antonov 2023; Loshakova, Usachuk 2023; Mukhametzyanov, Khabdulina 2024; and others). This article presents the interdisciplinary investigation of the wooden box from the Urysay-2 burial site and its contents, utilizing archaeological, paleobotanical, and chemical methods.

In 2021, kurgans No. 5, 13, and 14 of the Urysay-2 burial site were investigated. The site is located 3.5 km northwest of the Zhanakosh village and 4 km southeast of the Urysay village, on the second floodplain terrace of the lower Ilek River (Shyngyrlau District, West Kazakhstan Region, Republic of Kazakhstan) (fig. 1: *1*). The burial site consists of 14 kurgans arranged in an irregular chain along the northeast-southwest axis (fig. 1: *2*), forming two compact groups: eastern and western (for more details on the site, see: Lukpanova 2022; Lukpanova et al. 2023; 2024). In kurgan No. 13, a double burial of a man and a woman was discovered, accompanied by a unique set of items (fig. 1: *3*). The woman's skeleton was located near the northern wall of the pit, oriented with the head to

the west with a slight deviation to the southwest. A necklace composed of various beads, including eye-shaped, ridged, and smooth round beads of different sizes and colors, was found on the woman's neck; bronze bracelets adorned her wrists. To the left, at shoulder level, there were two iron knives, iron needles, and an awl, wrapped in a fine cloth dyed red. At the head of the woman was a small round stone sacrificial table (altar) with three legs shaped like the snarling face of a wild boar; two adult saigas and a baby saiga were depicted on the altar's frieze. A wooden box, square in shape, with a lid was found beside the altar (fig. 1: *4*). The box contained ritual items: a bronze mirror, a small organic vessel (leather? felt?), a cedar block, and a wooden "spoon". The box was removed as a single block, MRI-scanned, and subsequently sent for restoration to the "Ostrov Krym" scientific restoration laboratory.

Research methods. The study was based on a comprehensive interdisciplinary approach, combining archaeological and natural science methods. In the field, the box was extracted as a single block along with the surrounding soil and examined in the laboratory. A comparative analogy method was used to determine its cultural and chronological context. Botanical methods, physical-chemical sciences, and modern computer technologies were widely applied, including X-ray spectroscopy, microprobe analysis, computed tomography, restoration, conservation, 3D reconstruction, chromatography-mass spectrometry, microscopy, and others. These methods are discussed in greater detail below.

Documentation is an integral part of archaeology, and thus the decision was made to use computed tomography. The result was a set of raster images in the form of layered scans in the DICOM (Digital Imaging and Communications in Medicine) format, which is one of the most popular standards in medicine (fig. 2) (Mildenberger et al. 2002: 920—927). Computed tomography displays the density of objects using a tonal range from white (representing the highest density) to black (representing the lowest density). Unlike X-rays, computed tomography can display objects not only in two dimensions but also in three-dimensional space. By comparing horizontal and vertical cross-sections, it was possible to preliminarily determine the approximate location of objects inside the box both horizontally and vertically prior to its opening.

A series of studies were undertaken to develop a restoration plan. Fragments of the box's base and walls, as well as the cedar block, were analyzed at the Botanical Institute (St. Petersburg, Russia). Microprobe analysis of the mirror fragments was conducted at the National laboratory of collective use by priority "Technologies for hydrocarbon and mining sectors and their related service branches" at the Institute of Metallurgy and Ore Beneficiation (IMOB) (Almaty, Kazakhstan). Spectral analysis of organic dyes was performed at the Satpaev Institute of Geological sciences (Almaty, Kazakhstan).

A fabric sample was examined at the Tohoku University Botanical Gardens (Sendai, Japan). The fabric's morphology was observed using a digital microscope (KH-7700, Hirox). The sample was impregnated with 50% ethanol, dehydrated with an ascending series of acetone, embedded in epoxy resin (low-viscosity resin, Agar Scientific), and sectioned into 7—10 μm slices using a rotary microtome (HM350, Microm).

Samples of the box's "lacquer" coating were analyzed at the School of Science and Technology at Meiji University (Japan). The analysis was conducted using pyrolysis-gas chromatography-mass spectrometry (Py-GC/MS). The resulting data were compared with analyses of Toxicodendron vernicifluum, the lacquer tree found in modern Japan, China, and Korea, and Toxicodendron succedaneum, the lacquer tree found in modern Vietnam and Taiwan.

Findings from the Urysay-2 burial site, including some items from the box, were photographed for further processing using photogrammetry. The resulting "duplicates" in the form of 3D models enabled various measurements and the creation of 3D reconstructions.

Description. The box with a lid is made of thin poplar boards[1], varying in thickness from 0.3 to 1.6 cm. The object is rectangular, with dimensions of 28 cm in length, 25 cm in width, and 11 cm in height (fig. 3; 6: *1*). The item is covered with a substance resembling lacquer[2]. Inside, various items were found. On top, a mirror was placed diagonally, fitting snugly against the box's walls, with the disc and the handle's end pressed into opposite corners, facing upward. The handle and disc were broken in several places (due to natural decay and/or intentional damage). To the right of the mirror, a deformed organic vessel was found in the corner of the box (fig. 3: *4*). To the left of the mirror, a ribbed wooden object and an oval-shaped wooden item resembling the functional part of a spoon with traces of red paint were found (fig. 3: *2*). Underneath the mirror's disc, a vertical wooden block (with its narrow side upward, supporting the mirror) and remnants of red-dyed folded fabric were found.

Detailed description of the box's contents

Bronze mirror. The mirror has a round disc (16.8 cm in diameter) and a long side handle (13 cm long), cast as one piece with wide ridged edges (fig. 5: *2*; 6: *3*). Due to significant corrosion, determining its original thickness is impossible. Where the corrosion is less pronounced, the disc's thickness ranges from 0.1—0.15 cm, and the handle and ridges measure 0.2—0.3 cm. The back of the disc features two low, flat concentric ridges, one along the edge and another closer to the center. These ridges form stepped layers, thickening from the edge toward the middle. The center of the disc has a round raised area. The handle is subrectangular, with sides gently curving inward toward the middle and widening at both ends (3 cm wide at the center, 4 cm at the ends). The end of the handle is semicircular. Yellow-colored metal particles are visible on the mirror's back.

Organic vessel. Severely flattened, making exact measurements difficult to determine (fig. 5: *1*; 6: *2*). It is miniature, with a reconstructed height of about 4.3 cm and a maximum diameter of 4 cm. The body of the vessel is ellipsoidal and greatly expanded, with a slightly flattened bottom. The neck is 0.7 cm high, funnel-shaped, and flares to a 2.5 cm diameter at the opening; the rim is flat. The vessel's wall thickness ranges from 0.2—0.3 cm. The body is decorated with 12 vertical ribs, forming the same number of wide flutes running from the neck's base to the bottom, which is shaped like a low ringed pedestal.

Wooden items. Two wooden items were found (fig. 5: *3, 5*). One is a small stick, 2 cm long and 0.4—0.6 cm thick, oval in cross-section (fig. 5: *5*). The item surface is decorated with corrugation. Another item, resembling an oval shallow bowl, measuring 3.8 cm in length, 2.7 cm in width, and 0.5 cm in thickness, was found nearby (fig. 5: *3*). It is flat, slightly concave, there are traces of paint on the surface. These objects likely belonged to a spoon used for handling dyes (fig. 6: *4*).

Cedar block. Trapezoidal in shape, 8.3 cm high, with the lower base measuring 9 cm wide and the upper base 6.1 cm wide. The thickness in the middle section is 4.2 cm (fig. 5: *4*). There are traces of red paint on the upper surface, while the lower wide side is smoothed, suggesting its use as a tool for grinding.

Folded fabric. Initially appearing as, a porous object, it turned out to be a fragment of relatively thin red fabric, folded in several layers (fig. 5: *6*). The thread thickness is about 0.3 mm, with slightly larger gaps between the loops.

Conservation and restoration of the box. All preservation and restoration work on the box was carried out at the "Ostrov Krym" Scientific Restoration Laboratory. At the time it arrived at the lab, it was an archaeological block, carefully removed from the excavation trench. The condition of the box wooden components at the start of work was extremely dried out and fragile. However, thanks to the meticulous and careful extraction of the box in the field conditions, a detailed study and preservation of the object became possible. The initial cleaning revealed traces of soil-dwelling

[1] Determination was given by Candidate of Historical Sciences A.V. Stepanova (Komarov Botanical Institute of the Russian Academy of Sciences).

[2] Determination was given by operator V.L. Levin (Laboratory at the Satpaev Institute of Geological sciences).

animals (likely rodents). Further disassembly of the box revealed that it was completely filled with soil. The activity of soil-dwelling animals had accelerated the degradation of the artifacts due to the regular introduction of food, bacteria, microorganisms, and insects.

Initial survey was conducted with the participation of the artifact's discoverer, archaeologist Yana Lukpanova. The box is a small wooden container with a flat wooden lid. Due to significant degradation, the lid had fragmented into small pieces. These pieces were transferred to a prepared surface, and the box was gradually disassembled. As the box was freed from soil, its walls began to emerge. To prevent the walls from crumbling, they were injected with a polyvinyl butyral (PVB) solution in alcohol as they were exposed. This method helped stabilize the material, though periodic impregnation and examination of the wood continue. Cleaning the box's components from the surrounding soil without stabilizing the wood would have been impossible. Therefore, the exposed wooden fragments were gradually injected with a 5% polybutyl methacrylate (PBMA) solution in acetone. This approach allowed for the systematic consolidation of all the walls and the lid during the disassembly process, preserving the shape of the surviving fragments.

The restoration process was complicated not only by the wood's condition — its fragility and excessive dryness — but also by the deformation and fragmentation of the bottom, walls, and lid of the box. Small, smooth, dark plates resembling lacquer were found on the box's surface, dried and fragmented. For further analysis, samples of this coating were sent to the School of Science and Technology at Meiji University (Japan).

Resinous samples were analyzed using pyrolysis gas chromatography-mass spectrometry (Py-GC/MS). As a comparison, the results were compared with those of a coating of *Toxicodendron vernicifluum*, a lacquer tree growing in modern Japan, China and Korea, and a coating of *Toxicodendron succedaneum*, a lacquer tree growing in modern Vietnam and Taiwan. The results showed that the sample from the Urysay site is composed of completely different components from lacquer. Squalene and cholesterol detected by the sample analysis are components of human sebum. The four sharp peaks appearing at the retention time of 15 to 17 minutes, which are characteristic of this sample, are components not registered in the database but are considered to be compounds with a common main skeleton, as they contain 93 and 120 in the fragment ions. In addition, each compound's parent ion (corresponding to the molecular weight) has an odd value, so it was judged that they are likely to be nitrogen- or sulphur-containing compounds.

Since there are no natural resins that match this spectrum in the data we currently have, it is assumed that raw materials specific to the region or country were used.

According to the studies conducted at the Botanical Institute (St. Petersburg, Russia), the wood of both the base and the walls of the box was identified as poplar *(Populus).* Poplar is a common tree species in the region where the box was found, suggesting that the box was likely produced locally.

During the reconstruction of the box, questions arose regarding its shape and the fastening system. Specifically, how the walls and base were connected, how the walls were fastened together, and whether there was a fastening mechanism on the box's lid. To address these questions, a macro-photographic study was carried out using a Nikon camera with 4K resolution, allowing for the observation of fine details with high precision. Macro lenses were also employed. The images were displayed on an 8K high-resolution Samsung screen, enabling not only the operator but all participants to simultaneously observe the object and discuss the images in real-time during the examination.

Box Contents. The first object revealed during the disassembly of the box was a bronze mirror. Due to the unfavorable environment, the mirror had undergone significant corrosion, and its surface was covered with a greenish patina. The mirror was fragmented, likely as a result of natural degradation or intentional damage. By the time the box was opened, the mirror had broken into several large and small, extremely fragile pieces, still in situ. One edge of the mirror had "joined" to the box's wall, while the other was on the wooden artifact described earlier as a block.

Microprobe analysis of a fragment of the mirror revealed that the bronze alloy was primarily composed of copper and tin (~10.6 wt.% Sn). One of the surfaces was plated with a yellowish-white metal, likely gold.

The subsequent reconstruction of the mirror was based on laboratory studies. The poor preservation of the mirror fragments prevented the removal of contamination. Therefore, various measurements of the surviving fragments were taken, particularly their thickness at different points.

The small vessel was found at the bottom of the box, diagonally from the mirror. During the ruination it had become significantly flattened, with a diameter of about 6 cm and a height of 1.5 cm. CT scans revealed that the vessel had been compressed from top to bottom but not destroyed, suggesting that the material it was made of was not brittle but rather flexible and soft. Initially, it was thought to be made of tin, as the vessel's exterior had a white color and powdery texture, similar to the effects of tin corrosion. However, further analysis revealed that the vessel's walls contained no metals, consisting solely of organic materials. Detailed examination of the vessel's walls showed that they were dark in cross-section, while the white color was a deposit on the exterior. A similar deposit was found at the bottom of the box, beneath the vessel. X-ray spectral analysis indicated that the vessel's walls were predominantly organic in origin (Laboratory of the Satpaev Institute of Geological sciences, operator V.L. Levin), possibly made of leather, felt, or other plant-based material. Further studies are necessary for a more precise identification of the material.

The fragmentation of the vessel allowed for the measurement of its wall thickness, which was approximately 2—3 mm, with a thickening at the neck.

Plant roots were found inside the vessel. Preliminary studies (Komarov Botanical Institute RAS. A.V. Stepanova) identified the presence of nodules, suggesting that the plant belonged to the bean family *(Fabaceae)*. More accurate results could be obtained with further research, although this may be challenging due to the poor preservation of the material.

The wooden artifact similar to a small block, has a wide surface at the bottom and a narrow one at the top. The block is thought to have been cut from a large branch. As mentioned earlier, the bottom wide part of the block was smoothed. Studies at the Botanical Institute indicated that this object is a fragment of a coniferous tree, specifically cedar *(Cedrus)*. Cedar is not native to the Western Kazakhstan region, indicating that this item was likely brought from another area. Red paint or some other red substance, initially thought to be ochre, was found on the top of the cedar block. However, X-ray spectral analysis revealed a low iron content (on average Fe = 0.77%), whereas ochres typically contain between 12% and 75% iron; instead, the substance had a predominantly organic composition (on average, oxygen = 29.01%, carbon = 56.68%), with small amounts of silicon (3.11%), calcium (4.43%), aluminum (2.2%), sulfur (2.79%), and trace amounts of manganese, phosphorus, chlorine, and potassium (less than 1%) (Yudina et al. 2016: 21—34).

Microscopic examination of the red substance revealed a fibrous and relatively loose structure. The fibers do not form a clear structure, as they would if it were fabric, but instead are arranged chaotically. The fibers are thin, barely visible under normal magnification. All of this suggests that the material is not ochre, but rather an organic substance, likely felt, dyed red. The presence of aluminum may indicate that the red color was achieved using an alum-based dyeing process. This evidence suggests that the mirror was stored in a red felt pouch, traces of which were imprinted on the block where the mirror was found. Upon examination the textile remnants appeared to be a porous red-and-white object (fig. 4: *1—2*). Subsequent analyses revealed that this was a folded piece of fabric. Apparently, the fabric's weave created the porous appearance. Although the fabric occupied a small area, it was quite voluminous. It is likely that this was a bundle of fabric placed inside the box.

For more precise analysis, a sample of the fabric was examined at the Tohoku University Botanical Gardens. The material investigated is a piece of textile (URY-4) of about 4 × 7 mm, sampled from a larger textile fragment excavated from the main body (fig. 4: *3—4*). This textile consists of five alternating layers of vermilion (URY-4-1) and dark brown (URY-4-2) fabric (fig. 4: *3*).

The morphology of each fabric was observed with a digital microscope (KH-7700, Hirox). At that time, the textile fragment was soaked in 50% ethanol to remove sand and other materials adhering to the surface, and observation was conducted while soaked in 50% ethanol. A small piece (about 2 × 2 mm) of each colour fabric was taken as a sample for identification.

Samples were dehydrated with ascending acetone series, embedded in epoxy resin (Low Viscosity Resin, Agar Scientific), and sectioned into 7—10 μm thicknesses with a rotary microtome (HM350, Microm). Obtained preparations were identified with an optical microscope referring to extant specimens. The preparations are numbered URY-4-1 and URY-4-2 and preserved at Botanical Gardens, Tohoku University.

As a result of the analysis, it was found that three types of fibers were used as the fabric material:

Type 1. Single fibre with vermilion surface and pale-yellow inside.

Type 2. Single fibre with vermilion, dark brown or light brown surface and an internal cavity.

Type 3. Fibre bundles with about 10 fibres clustered tightly.

In all types, the cross-sections of the fibre cells were oval to polygonal in shape with rounded corners. The mean width of fibre cells (major axis × minor axis) for type 1 and type 2 was 18.5 × 10.0μm in the vermilion fabric (URY-4-1) and 16.9 × 10. μm in the dark brown fabric (URY-4-2), respectively. For type 3, the mean width of fibre cells was 10.6 × 6. μm. The fibre in type 1 was identified as silk based on the observation of a solid interior, cross-sectional shape and size, which are consistent with the characteristics of this natural fibre. Type 2 fibres were hollow, but other morphological characteristics were the same as those of type 1 fibres. It was inferred that only the coloured surface portion of the fibre remained, with the interior undergoing decomposition and destruction in the deposition environment. Consequently, type 2 fibres were identified as silk. The fibres in type 3 were narrower than those in types 1 and 2. It was postulated that the fibres could be an aggregation of narrow silk fibres or thin-walled, hollow plant fibres, but they could not be identified.

The cross sections of the yarns of the vermilion fabric (URY-4-1) and the dark brown fabric (URY-4-2) showed a mesh-like structure of the same colour as the fabric. In the cross-linked portions of the mesh-like structure, many linear materials, measuring approximately 15—20 μm in length and 3—4 μm in width, were observed with the sand grains. The linear materials were vermilion or brown, suggesting that the type 2 hollow fibres had collapsed. Large and small voids were found in the mesh-like structure. The large voids were about 40 × 3 μm for the vermilion fabric and about 30 × 2 μm for the dark brown fabric. These large voids were thought to be the collapse or decomposition of the fibre clusters or fibre bundles there. The small voids were the result of the decomposition of single fibres.

The two coloured fabrics were coarse-weaved, with a 0.5 × 0.8 mm gap. The yarn density of both fabrics (URY-4-1 and URY-4-2) was 10 × 20 (threads/cm), but the warp and weft yarns were indiscernible. The yarns were Z-twisted with an average width of 0.37 mm in the vermilion fabric (URY-4-1) and untwisted with an average width of 0.28 mm in the dark brown fabric (URY-4-2). It was presumed that the excavated textile fragment overlapped two different types of fabrics.

Discussion. The presence of various types of boxes in the burials of ancient nomads is a rare phenomenon, but perhaps most of them have not survived to the present day. Among Sarmatian-type sites, such finds are known from elite kurgans in the Ural-Ilek interfluve from the late 6th to 5th centuries BCE. For instance, from kurgan No. 23 of the Kyryk-Oba II burial site; in Western Kazakhstan, a rectangular faience box with a lid of imported origin was found (Gutsalov 2009: fig. 2, 5; Treister 2012b: 192, fig. 87—88). Other similar items were made of wood. During the looting excavations of the Pyatimary I—III burial sites, among other objects a “large rectangular box with a lid” was found (Smirnov 1975: 10). A walnut wooden box was found in a rich priestess burial in kurgan No. 6 of the Taksay-I burial site. Inside the box were a knife, a wooden comb, an alabaster vessel, a grinder with a pestle, a pebble, brushes, wolf fangs, and teeth. The contents of the box can be interpreted as a set for ritual actions (Lukpanova 2018: 230—231, fig. 4). The remains presumably of a box, containing various items (a mirror, a shell, paints, chalk, a pebble, a wooden block, pendants),

were recorded in kurgan No. 3 of the Tarabutak burial site (Smirnov 1975: 43). The Urysay box in terms of size is closer to the find from burial 1 of kurgan No. 2 of the Mechetsay burial site (30 × 30 cm), dated to the 5th century BCE. This box was made of thin planks and birch bark, and inside was a bronze mirror (Smirnov 1964: 138, fig. 20: *4*; 1975: 79—80, 90).

In the archaeology of Scytho-Saka and Xiongnu periods, lacquer-covered finds from China are well known. These are found in the Altai, Tuva, Transbaikalia, and Siberia— areas of pastoralists located closer to China and which had closer connections with Chinese lacquer production centers (Novikova et al. 2013: 112—124; 2018: 106—143; Dashkovsky, Novikova 2017: 116—126). The Urysay box was coated with a resinous substance unrelated to Chinese or East Asian lacquer. This "lacquer" seems to have originated from other centers or been of local production. It is possible that nomads had their own methods for giving wooden objects shine and protecting them from moisture, which further research may illuminate.

The shape of the Urysay mirror disc has no exact parallels known to us. However, in terms of the number of ridges and the presence of gilding, it can be compared to an example from the Saka Issyk kurgan, dated to the 5th century BCE (Akishev 1978: 28—39, tab. 33). Distant parallels also exist with so-called rattle mirrors or "musical" mirrors found in the Southern Urals (Mechetsay, kurgan 8; Yakovlevka-II, burial 4) and the Altai (Pazyryk, kurgan 2; Rogozikha-I, kurgan 5; Lokot-4a, kurgan 1), which feature two high ridges and a conical protrusion in the center. Some Altai mirrors (except Pazyryk) are also gilded. "Musical" mirrors, mainly dated from the 5th to the 4th centuries BCE, are considered to be Eastern, specifically Indian imports (Umansky, Shulga 1999: fig. 11—15; Shulga 2003: 91—92; fig. 53: *1—4*; Umansky et al. 2005: 28—32; Treister 2012a: 121—133, tab. 79—85; Tairov 2018: 350—352; and etc.).

Morphologically the Urysay mirror is more comparable to type X (according to K.F. Smirnov), characterized by one wide ridge along the edge of the disc and a flat side handle. Such examples are primarily found in burials in the Southern Urals and Western Kazakhstan, dating from the second half of the 5th century to the turn of the 4th—3rd centuries BCE (Smirnov 1964: 159; Tairov 2018: 349; Skripkin 1990: 150). They seem to begin appearing sporadically from the late 6th to the first half of the 5th century BCE, as evidenced by finds from the Besoba burial site (Kadyrbayev 1984: fig. 1: *51*; Degtyareva, Kuzminykh 2018: fig. 3, 4) and kurgan No. 5 of the Ilekshar I burial site (Gutsalov 2007: fig. 16: *III*: *4*).

More analogies can be found in the shape of the handle. Mirrors with a widening handle rounded at the end come from South Ural burial sites from the second half of the 5th to the end of the 4th century BCE. These include Filippovka-1 (kurgan No. 7; kurgan No. 24, burial 3; kurgan No. 15, burial 2) (Pshenichnyuk 2012: fig. 94: *10; 95, 1*; 152, *12*; Yablonsky 2013: 149), Akoba II (kurgan No. 1, burial 1) (Morgunova, Kraeva 2012: fig. 9: *1*), Imangazy-Karasu (kurgan No. 3) (Gutsalov 2000: fig. 101: *6*; Vasilyev 2004: 167, fig. 3: *11*), "Pobeda" (kurgan No. 3), kurgan Tulubai, and others (Tairov 2018: fig. 1: *1, 5, 8*).

The organic material vessel (leather? felt?), which is well preserved, is a unique find with no direct analogs. A relatively similar item in form and decoration is a silver cosmetic vessel from burial 2 of kurgan No. 1 of the Filippovka 1 burial site (late 5th—early 4th centuries BCE), featuring a similar body shape and fluting (Treister 2022: fig. 2: *3*, 8: *1—2*). Vertical flutes were found on various types of vessels, both imported from the Near East (silver amphorae, bowls) (Yablonsky 2013: 96; Treister 2018: 123, fig. 7: *1—3*), and on local ceramics from the Southern Urals (Mechetsay, kurgan No. 9, burial 1; kurgan Tulubai) (Smirnov 1964: fig. 46: *1l*; Ismagil, Sungatov 2013: fig. 38: *5*) and Scythia from the 5th — 3rd centuries BCE (Melyukova 1962: fig. 2: *2—4*; Marchenko 1972: fig. 3: *2—3, 7*; Puzikova 1969: 64, fig. 3: *8*).

The Urysay vessel seems to belong to the category of cosmetic vessels, widely used during the Sarmatian period. These were usually made of clay, small in size, and intended for storing various dyes, perfumes, and aromatic substances. Sometimes they were made of stone, glass, or leather. For

example, a leather flask tied with sinew containing a stick was found in kurgan No. 7 near the Sara village in Orenburg (Smirnov 1964: 161, fig. 35B: *15*; 1973: 166—179). A leather pouch containing a bone needle was found in a female burial at Filippovka-1 (kurgan No. 15, burial 4), and is presumed to be a tattooing kit (Yablonsky 2013: 51, 159).

The cedar wood artifact, of evident import, is a rare find for the Southern Urals. Cedar naturally grows in regions such as Northwest Africa, the Middle East (Lebanon, Syria, Turkey, Cyprus), and the western Himalayas (Lesnaya entsiklopediya 1985, 410; Drevesnye porody mira 1982: 99—100). Similar wooden blocks have been found in burial sites of early nomads from the Orsk-Ilek steppes of the late 6th—5th centuries BCE (Tara-Butak, kurgan No. 2, burial 3; kurgan No. 3; Novy Kumak, kurgan No. 19, burial 2; Yakovlevka, kurgan No. 2, burial 1). Most of these were found on or near stone altars and had the traces of treatment. Apart from the Novy Kumak find, these blocks were made of pine or juniper. All these burials have been interpreted by researchers as priestess burials (Smirnov 1964: fig. 18: *3*; 1975: 42—43; 1977: 24; Fedorov, Vasilyev 1998: 65—66, 72). A similar block made of maple was found in a case-box in burial 2 of kurgan No. 5 near the Bulgakovo village in the Northern Black Sea region (4th century BCE). The contents of the case were identified as a woman's set of objects for textile work (Daragan et al. 2022: 408, fig. 9).

The preference for coniferous woods (pine, juniper, cedar) is likely not accidental, possibly due to their aromatic, medicinal, and cosmetic properties (Urusov et al. 2007; Sklyarevsky, Gubanov 1970: 121—122, 162—164; Lesnaya entsiklopediya 1985: 410—414; Fedorov, Vasilyev 1998: 72). Herodotus describes a similar episode among the Scythians: "Their women rub pieces of cypress, cedar, and incense wood on a rough stone, adding water, and with this thick paste, they anoint their bodies and faces. This gives them fragrance. The next day, after removing the plaster, they appear both clean and glossy" (Dovatur et al. 1982: 129).

The ritual use of coniferous wood fragments is also possible. K.F. Smirnov suggests that pine blocks in Sarmatian burials were raw materials for incense or frankincense. He refers to well-known religious practices in India and Ceylon, where sandalwood is used for incense in Buddha worship due to its aromatic properties (Smirnov 1964: 167). V. K. Fedorov holds a similar view, suggesting that pine was ground into a powder for long-lasting smoke production (Fedorov 2001: 33). Among the Navajo of North America, cedar smoke was used during rituals (De Rios 1997: Pl. 5). These objects may also have been used as "pestles", as evidenced by the shape of the block from Yakovlevka kurgan, one side of which corresponds to the recess of a stone altar (Fedorov 2000: 66; Fedorov, Vasilyev 1998: 72).

Various types of spoons are frequently found in the burials of nomads from the Southern Urals; however, all are made of bone (Fedorov 2000: 66; 2013) with a few exceptions (Novoorsky II, kurgan No. 2, burial 2). Opinions regarding the purpose of bone spoons range widely, from their association with women's cosmetic use (Smirnov 1964: 160—161) to their connection with funerary rituals, particularly fire sacrifice (Luk'yashko 1997: 136—137; Fedorov 2013: 58—59). The paint traces on the Urysay "spoon" suggest it may have been used for mixing pigments. Mineral-based paints are frequently found in early nomadic burials, used for cosmetic, ritual, tattooing, and other purposes (Tairov, Bushmakin 2001). A similar spoon with a ribbed handle, but made of bone, was found in the Pyatimary I burial site (kurgan No. 4, burial 2) (Smirnov, Petrenko 1963: Pl. 22: *19*). The ribbing on the handle likely served not only decorative purposes but also improved grip.

The fabric fragment from the Urysay burial site appears to have been made using plain weave. A fabric with similar weave was found in burial 2 of kurgan No. 5 near Bulgakovo (Daragan et al. 2022: 413, fig. 12). It is important to note that the textile fragment from the box was folded in multiple layers, forming a volume, possibly suggesting something was wrapped in it.

The fabric materials were single fibres and fibre bundles, and the single fibres were identified as silk. The single fibres are solid and distinguished from hollow plant fibres (such as cotton: *Gossypium* spp. and hemp: *Cannabis sativa*). It is also distinguished from solid animal hair by the diameter and the presence of cuticles on the surface.

For fibre bundles, both silk and plant fibres are considered. If it is a plant fibre, the fibre cells have a very thin cell wall, and the mean width is narrow at 10.6 × 6. μm. The well-known plant fibre material is the bast fibre of *C. sativa (Cannabaceae)*, which is formed in the cortical layer of the stem, with several to several dozen fibre cells forming a fibre bundle. Although the bast fibres of *C. sativa* contain fibre cells with a narrow diameter comparable to those of the excavated textile, they differ in that the cell walls are thicker. Cotton, also used as a fibre material, is a seed fibre growing on the seed surface of *Gossypium (Malvaceae)* plant. It differs from the excavated textile in that the fibres are single fibres rather than fibre bundles, and the cell lumen is collapsed. Kapok is a plant fibre with thin cell walls and a wide cell lumen obtained from the fruit of *Ceiba pentandra (Malvaceae).* However, its fibres also differ from the relics because they do not form fibre bundles and have a wider fibre cell.

Fiber identification of the excavated textiles is done by comparison with living plant specimens. For the textiles excavated in Kazakhstan in this study, the microscopic specimens of living plants in our collection were mainly Japanese plants, so there were no plants in our specimens corresponding to the excavated textiles.

The fibers of the found textiles were identified by comparing them with samples of living plants, which in our collection were mainly of Japanese origin, so our samples did not contain plants corresponding to the found textiles.

As is well known, the spread of Chinese imports, including silk, among the nomads of Eurasia primarily began at the end of the 1st millennium BCE due to the increasing influence of the Celestial Empire towards the West, the emergence of the Silk Road, Chinese production of objects for the foreign market (Linduff 2009: 94; Liu et al. 2021: 1), and the expansion of the Xiongnu who had very close contacts with China (Barinova 2011). However, there are numerous examples of silk spreading beyond China in earlier periods. The oldest remains of silk fabrics, dated to the 2nd — early 1st millennium BCE, have been discovered in the burial sites of Xinjiang, indicating the development of silk weaving and the widespread use of silk garments there (Maitdinova 2004: 27). Early centers of silk spread also include regions of Central Asia. For example, in Bronze Age burials at the Sappalitepa settlement (southern Uzbekistan), remains of plain-woven silk fabric were found (Askarov 1973: 133—134). Numerous remains of plain-woven silk fabric dyed red (with madder dye) were discovered in the Altinasar 4 burial site (4th century BCE — 6th century CE) of the Jetyasar culture in the Lower Syrdarya region (Yelkina, Levina 1995: 37, 39).

The oldest samples of Chinese silk fabrics among nomads come from the Pazyryk kurgans of the Altai Mountains, dated to the 4th century BCE (Zhong, Hann 1989: 405). For instance, in kurgan No. 3, a pouch made of plain-woven silk fabric was found. The same technique was used to create a fabric similar to tussah silk, which was used as a cover for shabracque in the fifth kurgan (Rudenko 1953: 248, Pl. LXXVI: *2*; 1968: 81, Ill. 76; Lubo-Lesnichenko 1994: 28).

We should also mention the findings of plain-woven silk from the Zhou era in China itself. Fabric from the Western Zhou period (11th —7th centuries BCE) was found in a tomb in Chaoyang (Liaoning province). In the tomb of the feudal lord Huang Meng and his wife near the city of Xinyang (Henan province), several pieces of plain-woven fabric were found, dating to the Spring and Autumn period (8th—5th centuries BCE) (Lubo-Lesnichenko 1994: 24).

Silk finds from other Scythian-Sarmatian kurgans are not known to us. The only exceptions are the Sargat culture sites in Western Siberia, but these date no earlier than the last centuries BCE when Chinese imports had become more widespread. For instance, in the Dachnoye-2 burial site (kurgan No. 1, burial 2) in the Tobol river region (Kurgan Region), in a female burial (3rd — 2nd centuries BCE), crumpled pieces of plain-woven silk fabric were found inside a purse (Glushkova et al. 2015: 43, 47).

The sources of silk among the nomads of the Southern Urals could have been Chinese silk-weaving centers or the regions of Xinjiang and Central Asia (Nicola Di Cosmo 1994: 1109). The latter seems more likely, as the winter pastures of the Southern Ural nomads extended to the lower

Syrdarya and the Aral Sea region. However, we cannot rule out the possibility of silk imports through intermediary tribes, such as the Pazyryk or other Central Asian and Kazakh pastoralists. It remains to be hoped that further research will shed light on this issue.

Conclusion. The discovery of the box with items may provide insight into certain aspects of ancient technologies, external contacts, and the ritual practices of early nomads. Additionally, there is already a successful collaboration between the head of archaeological works and the scientific restoration laboratory "Ostrov Krym" with materials from another Sarmatian site, Taksay-1. This collaboration resulted in the restoration of original artifacts and the creation of a comprehensive scientific reconstruction of the so-called "Altyn Khanshayim" (in Kazakh — Golden Princess) or "Taksay Priestess" (Sdykov, Lukpanova 2013; Altynbekov 2013). The walnut box found in the burial of kurgan No. 6 of the Taksay-1 burial site likely served as a case for ritual items used by the "priestess".

The items from the box of Urysay burial site may be a ritual set used for religious or cosmetic purposes. The cedar block might have been used for burning incense or for cosmetic purposes. The vessel possibly contained plants used in rituals. The paint traces on the "spoon" suggest it may have been used for operations with dyes. These items in the box are complemented by a small stone altar and a set of tools including needles, awls, and small knives. Mirrors and altars in female burials are traditionally interpreted by archaeologists as objects associated with priestly functions.

The study of the box and its contents opens up new perspectives on ancient technologies, contacts, and exchanges. For instance, the coating on the box does not match the lacquer produced in East Asian centers, raising many questions about the origin of the coating. This could indicate that early nomads had their own methods for producing protective coatings similar to lacquer. Furthermore, poplar, the wood species from which the box was made, is widespread in the region.

Fabric remains in ancient burials are extremely rare. Plain weaving is a widely used technique among ancient peoples, but the use of silk as a material was a significant surprise for us. The silk from the Urysay burial site, along with that from Pazyryk, can be considered some of the earliest evidence of this fabric's spread among nomads. The question of where and how the Southern Ural nomads obtained silk remains open. It may have been acquired through trade, raids, or as a gift. The latter method is well-known in Chinese diplomatic practices with warlike nomads. It is highly unlikely that silk was delivered directly from China; more likely, it was obtained from tribes in contact with China or other silk-weaving centers. The Saka, who had contacts with Southern Ural nomads, could have acted as intermediaries. It is also possible that the silk came directly from Xinjiang or Central Asia, where silk use and possibly silk weaving have been known since antiquity. Moreover, the winter pastures of early nomads in Western Kazakhstan extended into the Syrdarya and Aral Sea regions. Perhaps the cedar wood, the nearest source of which is the Western Hindu Kush, was also obtained through Central Asian intermediaries. Further research is needed to answer these questions.

In general, based on the cumulative analysis of the accompanying objects and burial rite, burial 2 of kurgan No. 13 at the Urysay-2 burial site can be dated to approximately the mid-5th century BCE. This burial exhibits similarities to burials of the Southern Ural complexes, particularly with the burials of elite kurgans of the Orsko-Ilek nomads from the Sarmatian period, allowing for the classification of the studied site within this type of synchronous sites.

It should be noted that the entire complex of objects requires further treatment due to the significant degradation of the material, deformation, and fragmentation. Currently, the stabilization of the wooden artifacts and the bronze mirror has been achieved. Favorable conditions have been created for the artifact complex, preventing decay and moisture damage.

References

Akishev, K.A. 1978. *Kurgan Issyk. Iskusstvo sakov Kazahstana (Issyk kurgan. The art of Saka in Kazakhstan)*. Moscow: Iskusstvo (in Russian).

Altynbekov, K. 2013. *Vozrozhdyonnaya iz pepla. Rekonstruktsiya po materialam pogrebeniya zhritsy iz kompleksa Taksay I (Reborn from the ashes. Reconstruction based on the materials of the burial of a priestess from the Taksay complex I)*. Almaty: Ostrov Krym (in Russian).

Altynbekov, K.K., Altynbekova, E.K. 2019. Rekonstruktsiya zhenskogo golovnogo ubora IV—III vv. do n.e. po materialam kurgana Tasaryk v Vostochnom Kazahstane (Reconstruction of the female headdress of 4th — 3rd BCE on materials of the Tasaryk mound in East Kazakhstan). *Arkheologiia Evraziiskikh Stepei (Archaeology of the Eurasian Steppes)* 1, 6—11 (in Russian).

Altynbekov, K.K., Charlina, L.F., Altynbekova, E.K. 2022. Sohranenie rezby po gline iz tsitadeli gorodishcha Kulan (Preservation of clay carving from the citadel of the Kulan settlement). *Kazakstan arheologiyasy (Kazakhstan Archeology)* 1, 126—145 (in Russian).

Altynbekov, K.K., Charlina, L.F., Loshakova, T.N. 2021. Problemy konservatsii obuglennogo dereva (na primere nahodki s poseleniya Toksanbai) (Problems of charred wood preservation (using the example of a find from the settlement of Toksanbai)). *Kazakstan arheologiyasy (Kazakhstan Archeology)* 3, 98—107 (in Russian).

Askarov, A. 1973. *Sapallitepa*. Tashkent: "FAN" of the Uzbek SSR (in Russian).

Barinova, E.B. 2011. *Vliyanie kultury Kitaya na protsessy inkulturatsii Sredney Azii i Yuzhnoy Sibiri v domongolskoe vremya (The influence of Chinese culture on the processes of inculturation of Central Asia and Southern Siberia in the pre-Mongol period).* Moscow: Institute of Ethnology and Anthropology of the RAS (in Russian).

Beisenov et al. 2023: Beisenov, A., Panichkin, A., Shashenov, D. 2023. Zheleznyi topor iz tasmolinskogo kurgana mogilnika Kyzylzhartas: rezultaty metallograficheskogo i himicheskogo analizov (Iron axe head from the tasmola culture barrow in the Qyzylzhartas burial ground: results of metallographic and chemical analysis). *Materialy po Arkheologii i Istorii Antichnogo i Srednevekovogo Prichernomor'ya (Proceedings in Archaeology and History of Ancient and Medieval Black Sea Region)* 15, 102—120 (in Russian).

Daragan et al. 2022: Daragan, M, Leontyev, L., Radivojevic, M., Ørsted Brandt, L, Berghe, I., Margarita, G. 2022. The perishable material culture of the pontic steppe Scythians: scientific investigation of a fourth-century BC kurgan burial at Bulhakovo, Ukraine. *Oxford Journal of Archaeology* 41.4, 397—492.

Dashkovsky, P.K., Novikova, O.G. 2017. Kitaiskie laki iz mogilnika skifskoy epohi Chineta II (Altai) (Chinese Lacquerware from the Pazyryk Burial Ground Chineta II, Altai). *Arheologiya, etnografiya i antropologiya Evrazii (Archaeology, Ethnology and Anthropology of Eurasia)* 4 (45), 116—126 (in Russian).

Degtyareva, A.D., Kuzminykh, S.V. 2018. Modeli tsvetnogo metalloproizvodstva na Urale v rannem zheleznom veke (Models of color metal production in the Urals in the Early Iron Age). *Vestnik arheologii, antropologii i etnografii (Bulletin of Archaeology, Anthropology and Ethnography)* 2 (41), 41—60 (in Russian).

De Rios, M.D. 1997. *Rastitelnye gallyutsinogeny (Plant hallucinogens)*. Moscow: Publishing house "KSP" (in Russian).

Dovatur et al. 1982: Dovatur, A.I., Kallistov, D.P., Shishova, I.A. 1982. *Narody nashei strany v "Istorii" Gerodota. Teksty. Perevod. Kommentarii (The peoples of our country in the "History" of Herodotus. Texts. Translation. Comment)*. Moscow: Nauka (in Russian).

Drevesnye porody mira 1982: Vorobyov, G.I. (ed.). 1982. *Drevesnye porody mira (Timber Species of the world)*. Vol. 2. Moscow: Lesnaya promyshlennost (in Russian).

Elkina, A.K., Levina, L.M. 1995. Odezhda, tkani i kozha iz dzhetyasarskih mogilnikov (Clothes, fabrics and leather from the Dzhetyasar burial grounds). In: Sedlovskaya, A.N. (ed.). *Nizov'ya Syrdar'i v drevnosti. Dzhetyasarskaya kul'tura (The lower reaches of the Syr Darya river in ancient times. Jetyasar culture)*. Pt. 5. Moscow: Institute of Ethnology and Anthropology of the RAS, 31—104 (in Russian).

Fedorov, V.K. 2000. O funktsionalnom naznachenii tak nazyvaemyh "savromatskih zhertvennikov" Yuzhnogo Priural'ya (I) (On the functional purpose of the so-called "Sauromat altars" in the Southern Urals (I)). *Ufimskii arheologicheskii vestnik (Ufa Archaeological Herald)* 2, 49—69 (in Russian).

Fedorov, V.K. 2001. O funktsionalnom naznachenii tak nazyvaemyh "savromatskih zhertvennikov" Yuzhnogo Priural'ya (II) (On the functional purpose of the so-called "Sauromat altars" in the Southern Urals (II)). *Ufimskij arheologicheskij vestnik (Ufa Archaeological Herald)* 3, 21—49 (in Russian).

Fedorov, V.K. 2013. Kostyanye lozhechki v kolchanah rannih kochevnikov (Bone spoons from early nomad quivers). *Rossijskaja arheologija (Russian Archaeology)* 2, 44—61 (in Russian).

Fedorov, V.K., Vasiliev, V.N. 1998. Yakovlevskie kurgany rannego zheleznogo veka v Bashkirskom Zaural'e (Yakovlev mounds of the Early Iron Age in the Bashkir Trans-Urals). *Ufimskij arheologicheskij vestnik (Ufa Archaeological Herald)* 1, 62—96 (in Russian).

Glushkova et al. 2015: Glushkova, T.N., Maslyuzhenko, D.N., Ryabinina, E.A. 2015. Tekstil'nye materialy iz pogrebal'nyh pamyatnikov rannego veka i srednevekov'ya lesostepnogo Pritobol'ya (Textile materials, burial sites of Iron Age, forest-steppe Low Tobol basin). *Vestnik arheologii, antropologii i etnografii (Bulletin of Archaeology, Anthropology and Ethnography)* 3, 42—49 (in Russian).

Gutsalov, S.Y. 2000. The culture of the early nomads in the Orsk-Ural interfluve in the 7th — 1st centuries BCE: Thesis Candidate of Historical Sciences. Ufa.

Gutsalov, S.Y. 2007. Pogrebalnye pamyatniki kochevoy elity Yuzhnogo Priural'ya serediny I tys. do n.e. (Burials of the nomadic elite in the south Ural region (mid-1st millennium BCE)). *Arheologiya, etnografiya i antropologiya Evrazii (Archaeology, Ethnology and Anthropology of Eurasia)* 2 (30), 75—92 (in Russian).

Gutsalov, S.Y. 2009. Vostochnye importy v pogrebeniyah kochevnikov Zapadnogo Kazahstana serediny I tys. do n.e. (Oriental import in the burials of western Kazakhstan nomads (The middle of the first millennium BCE)). *Vestnik drevnej istorii (Journal of Ancient History)* 2 (269), 182—192 (in Russian).

Ismagilov, R., Sungatov, F.A. 2013. *Pamyatniki yaitskoy kultury poslednei chetverti V—IV vv. do n.e. na Yuzhnom Urale (Yaitskaya Culture sites of the last quarter of the 5th — 4th centuries BCE in the Southern Urals)*. Ufa: Belaya reka (in Russian).

Jumabekova et al. 2022: Jumabekova, G., Nigmatova, S., Altynbekova, E., Altynbekov, K., Bazarbayeva, G. 2022. Zhenshchina i ritual v kulture rannih kochevnikov: po materialam kurgana Tasaryk v Kazahstane (Woman and Rituals in the Early Nomadic Culture: with Reference to Finds from the Tasaryk Kurgan in Kazakhstan). *Stratum plus* 3, 359—380 (in Russian).

Kadyrbayev, M.K., 1984. Kurgannye nekropoli verhov'ev r. Ilek (Kurgan necropolises of the upper reaches of the Ilek River). In: Melyukova, A.I., Moshkova, M.G., Petrenko, V.G. (eds.). *Drevnosti Evrazii v skifo-sarmatskoe vremya (The antiquities of Eurasia in the Scythian-Sarmatian period).* Moscow: Nauka, 84—93 (in Russian).

Lesnaya entsiklopediya 1985: Vorobyov, G.I. (ed.). *1985. Lesnaya entsiklopediya (The Forest Encyclopedia).* Vol. 1. Moscow: The Soviet Encyclopedia (in Russian).

Linduff, K. 2009. Production of Signature Artifacts for the Nomad Market in the State of Qin During the Late Warring States Period in China (4th—3rd Century BCE). In: Mei, J., Rehren, Th. (eds.). *Metallurgy and Civilization: Eurasia and Beyond Archetype.* London: Archetype, 90—96 ((BUMA VI)).

Liu, Y., Li, R., Yang, J. et al. 2021. China and the steppe: technological study of precious metalwork from Xigoupan Tomb 2 (4th — 3rd c. BCE) in the Ordos region, Inner Mongolia. *Herit Sci* 9, 46 DOI: 10.1186/s40494-021-00520-5.

Loshakova, T.N., Antonov, M.A. 2023. Rekonstruktsiya zhilishcha poseleniya Toksanbai (Reconstruction of the Toksanbai settlement dwelling). *Kazakstan arheologiyasy (Kazakhstan Archeology)* 2, 166—185 (in Russian).

Loshakova, T.N., Usachuk, A.N. 2023. Kollektsiya kostyanyh izdeliy poseleniya Toksanbai (Severo-Vostochnyi Prikaspiy) (Collection of bone artifacts of Toksanbai settlement (North-Eastern Caspian Region)). *Kazakstan arheologiyasy (Kazakhstan Archeology)* 2, 166—185 (in Russian).

Lubo-Lesnichenko, E.I. 1994. *Kitaj na Shelkovom puti. Shyolk i vneshnie svyazi drevnego i srednevekovogo Kitaya (China on the Silk Road. Silk and external relations of ancient and medieval China)*. Moscow: Vostochnaya literatura (in Russian).

Lukpanova, Y.A. 2018. Kompleks ritualnyh predmetov iz elitnogo zhenskogo pogrebeniya v Zapadnom Kazahstane (A complex of ritual objects from an elite female burial in Western Kazakhstan). *Samarskij nauchnyy vestnik (Samara Journal of Science*). Vol. 7. No. 4 (25), 228—232 (in Russian).

Lukpanova, Y.A. 2022. Issledovaniya kurgannogo kompleksa Urysay-2 (Researches of the Urysai-2 kurgan complex). *Kazakstan arheologiyasy (Kazakhstan Archeology)* 2 (16), 74—93 (in Russian).

Lukpanova et al. 2023: Lukpanova, Y., Antonov, M., Jumabekova, G., Bazarbayeva, G. 2023. 'Mgnovenno ubivayushchiy vepr': po materialam kompleksa sarmatskogo vremeni Urysay-2 (Zapadnyi Kazahstan)

('A boar that kills at one stroke': based on the materials of the Sarmatian time complex Urysay-2) (Western Kazakhstan). *Kazakstan arheologiyasy (Kazakhstan Archeology)* 1, 177—197 (in Russian).

Lukpanova et al. 2024: Lukpanova, Y.A., Seitov, A.M. Antonov, M.A. 2024. Voinskoe zahoronenie V v. do n.e. iz Zapadnogo Kazahstana (Urysaj 2, kurgan № 14) (The Warrior's Grave of the 5th Century BC in Western Kazakhstan (Urysai-2, kurgan 14)). *Kratkie soobshcheniya Instituta arheologii (Brief communications of the Institute of Archaeology)* 275, 209—221 (in Russian).

Lukyashko, S.I. 1997. Ob izobrazheniyah na kultovyh predmetah skifo-sarmatskogo mira (k probleme kulturnyh vzaimodejstvij) (On the images on cult objects of the Scythian-Sarmatian world (on the problem of cultural interactions). In: Maksimenko, V.E. (ed.). *Donskie drevnosti. Sarmaty i Skifiya (Don antiquities. Sarmatians and Scythia)* 5, 134—142 (in Russian).

Maitdinova, G.M. 2003. Istoriya tadzhikskogo kostyuma. Genezis kostyuma tadzhikov: drevnost i rannee srednevekov'e *(The history of Tajik costume. The genesis of the Tajik costume: Antiquity and the Early Middle Ages).* Vol. 1. Dushanbe: OOO NPC OGRT (in Russian).

Marchenko, K.K. 1972. Lepnaya keramika V—III vv. do n.e. s gorodishcha u stanitsy Elisavetovskoy na Nizhnem Donu (Handmade ceramics of the 5th — 3rd centuries BCE from the settlement near Stanitsa Elisavetovskaya on the Lower Don). *Sovetskaya arheologiya (Soviet Archaeology)* 1, 122—134 (in Russian).

Melyukova, A.I. 1962. Skifskie kurgany Tiraspol'shchiny (po materialam I.Ya. i L.P. Stempkovskih (Scythian Kurgans of Tiraspol Region (Based on the Materials of I.Ya. and L.P. Stempkovsky)). In: Smirnov, K.F. (ed.). *Pamyatniki skifo-sarmatskoy kultury (The Scythian-Sarmatian culture sites)*. Moscow: Nauka, 114—166 (Materials and research on the archaeology of the USSR 115) (in Russian).

Mildenberger et al. 2002: Mildenberger, P., Eichelberg, M., Martin, E. 2002. Introduction to the DICOM standard. *European radiology* 12, 920—927.

Morgunova, N.L., Kraeva, L.A., 2012. Kurgannaya gruppa Akoba II (Akoba II kurgan group). *Arheologicheskie pamyatniki Orenburzh'ya (Archaeological sites of the Orenburg Region)* 10, 156—199 (in Russian).

Mukhametzyanov, A., Khabdulina, M. 2024. Ot traditsii k innovatsiyam: GIS v arheologii Akmolinskoy oblasti (From tradition to innovation: GIS in archaeology of Akmola region). *Kazakstan arheologiyasy (Kazakhstan Archeology)* 1, 115—129 (in Russian).

Nicola Di Cosmo. 1994. Ancient Inner Asian Nomads: Their Economic Basis and Its Significance in Chinese History. *The Journal of Asian Studies* 4 (53), 1092—1126.

Nigmatova et al. 2021: Nigmatova, S., Jumabekova, G., Altynbekova, E., Khasenova, B., Bazarbayeva, G. 2021. K izucheniyu elementov kultury pazyryktsev Kazahskogo Altaya po dannym mezhdistsiplinarnykh issledovaniy (To the Study of the Pazyryk Culture Elements in the Kazakh Altay Based on the Data of Interdisciplinary Research). *Stratum plus* 3, 181—203 (in Russian).

Novikova et al. 2018: Novikova, O.G., Marsadolov, L.S., Tishkin, A.A. 2018. Kitaiskie lakovye izdeliya v Zabajkal'e i na Altae v hunnuskoe vremya (Chinese varnish products in Transbaikalia and in Altai in the Xiongnu time). *Teoriya i praktika arheologicheskih issledovanij (Theory and practice of archaeological research)* 1 (21), 106—143 (in Russian).

Novikova et al. 2013: Novikova, O.G., Stepanova, E.V., Khavrin, S.V. 2013. Izdeliya s kitayskim lakom iz pazyrykskoy kollektsii Gosudarstvennogo Ermitazha (Articles with Chinese lacquer from Pazyryk collection of the State Hermitage). *Teoriya i praktika arheologicheskih issledovanij (Theory and practice of archaeological research)* 1 (7), 112—124 (in Russian).

Puzikova, A.I. 1969. Poseleniya Srednego Dona (Settlements of the Middle Don). In: Smirnov, A.P. (ed.). *Naselenie Srednego Dona v skifskoe vremya (The population of the Middle Don in the Scythian period*). Moscow: Nauka, 41—81 (Materials and research on the archaeology of the USSR 151) (in Russian).

Pshenichnyuk, A.K. 2012. *Filippovka: Nekropol' kochevoj znati IV v. do n.e. na Yuzhnom Urale (Filippovka: Necropolis of the nomadic nobility of the 4th century BCE in the Southern Urals*). Ufa: Institute of History, Language and Literature of the Ufa Scientific Center RAS (in Russian).

Rudenko, S.I. 1953. *Kultura naseleniya Gornogo Altaya v skifskoe vremya (The culture of the population of the Altai Mountains in the Scythian period).* Moscow; Leningrad: USSR Academy of Sciences (in Russian).

Rudenko, S.I. 1968. *Drevneishie v mire hudozhestvennye kovry i tkani iz oledenelyh kurganov Gornogo Altaya (The world's oldest artistic carpets and fabrics from the kurgan in permafrost of the Altai Mountains)*. Moscow: Iskusstvo (in Russian).

Sasaki et al. 2022: Sasaki, Y., Rakhimzhanova, S., Onggaruly, A., Kairmagambetov, A., Endo, E., Doumani Dupuy, P., Makulbekova, M., Spengler, R., Shoda, S. 2022. Otpechatki prosa na keramike rannego zheleznogo veka iz kurgana Tortoba v Zapadnom Kazahstane (Broomcorn Millet Impressions on Early Iron Age Ceramics from Tortoba Burial Mound in Western Kazakhstan). *Kazakstan arheologiyasy (Kazakhstan Archeology)* 4 (18), 116—132 (in Russian).

Sdykov, M.N., Lukpanova, Y.A. 2013. *Rannie kochevniki Zapadnogo Kazahstana (na primere kurgannogo kompleksa Taksay I) (Early nomads of Western Kazakhstan (on the example of the Taksay I kurgan complex)).* Uralsk: Polygraphservice (in Russian).

Shulga, P.I. 2003. *Mogilnik skifskogo vremeni Lokot'-4* (*The burial ground of the Scythian time is Lokot'-4).* Barnaul: Altai University (in Russian).

Sklyarevsky, L.Ya., Gubanov, I.A. 1970. *Lekarstvennye rasteniya v bytu (Medicinal plants in everyday life)*. Moscow: Rossiiskoe selskohozyaistvennoe izdatelstvo (in Russian).

Skripkin, A.S. 1990. *Aziatskaya Sarmatiya (Asian Sarmatia)*. Saratov: Saratov State University (in Russian).

Smirnov, K.F.1964. *Savromaty. Rannyaya istoriya i kultura sarmatov (The Sauromatians: early history and culture of the Sarmatians*). Moscow: Nauka (in Russian).

Smirnov, K.F. 1973. Kurilnitsy i tualetnye sosudiki aziatskoy Sarmatii (Censers and cosmetic vessels of Asian Sarmatia). In: Munchaev, R.M., Markovin, V.I. (eds.). *Kavkaz i Vostochnaya Evropa v drevnosti (The Caucasus and Eastern Europe in ancient times).* Moscow: Nauka, 166—179 (in Russian).

Smirnov, K.F.1975. *Sarmaty na Ileke (The Sarmatians on the Ilek River).* Moscow: Nauka (in Russian).

Smirnov, K.F. 1977. Orskie kurgany rannih kochevnikov (Orsk mounds of early nomads). In: Kuzeev, R.G. (ed.). *Issledovaniya po arheologii Yuzhnogo Urala (Research on the archaeology of the Southern Urals).* Ufa: Bashkir Brunch of the USSR Academy of Sciences, 3—51 (in Russian).

Smirnov, K.F., Petrenko, V.G. 1963. *Savromaty Povolzh'ya i Yuzhnogo Priural'ya (The Sauromatians of the Volga and Southern Urals).* Moscow: USSR Academy of Sciences (Corpus of Archaeological Sources D1-9) (in Russian).

Tairov, A.D. 2018. Yuzhnouralskie zerkala s valikom po krayu diska rannesarmatskogo vremeni (South-Ural mirrors with a roller along the edge of the disk in the Early Sarmatian period). In: Bissembaev, A.A. (ed.). *Margulanovskie chteniya—2018 (Margulan readings—2018).* Almaty; Aktobe: Margulan Institute of Archaeology, 349—354 (in Russian).

Tairov, A.D., Bushmakin, A.F. 2001. Mineralnye poroshki iz kurganov Yuzhnogo Urala i Severnogo Kazahstana i ih vozmozhnoe ispolzovanie (Mineral powders from the mounds of the Southern Urals and Northern Kazakhstan and their possible use): *Rossiyskaya arheologiya (Russian Archaeology)* 1, 66—75 (in Russian).

Treister 2012a: Treister, M.Yu. 2012. Bronzovye zerkala iz Yuzhnogo Priural'ya: blizhnevostochnye i yuzhnoaziatskie importy i mestnye podrazhaniya (Bronze mirrors from the Southern Urals: Near Eastern and South Asian imports and local imitations). In: Treister, M.Yu., Yablonsky, L.T. (eds.). *Vliyaniya ahemenidskoy kultury v Yuzhnom Priural'e (V—III vv. do n.e.) (The influence of the Achaemenid culture in the Southern Urals (5th — 3rd centuries BCE)*. Vol. 1. Moscow: TAUS, 120—133 (in Russian).

Treister 2012b: Treister, M. Yu. 2012. Predmety utvari iz razlichnyh materialov ahemenidskogo kruga iz Yuzhnogo Priural'ya (Utensils from various materials of the Achaemenid style from the Southern Urals). In: Treister, M.Yu., Yablonsky, L.T. (eds.). *Vliyaniya ahemenidskoy kultury v Yuzhnom Priural'e (V—III vv. do n.e.) (Influences of the Achaemenid culture in the Southern Urals (5th — 3rd centuries BCE))*. Vol. 1. Moscow: TAUS, 192—201 (in Russian).

Treister, M.Yu. 2018. Parfyanskie i rannesasanidskie 'importy' v pogrebeniyah kochevnikov Vostochnoj Evropy (Parthian and Early Sassanian 'imports' in the burials of the nomads of Eastern Europe (2nd century BCE—3rd century CE)). *Materialy po arheologii i istorii antichnogo i srednevekovogo Prichernomor'ya (Proceedings in Archaeology and History of Ancient and Medieval Black Sea Region)* 10, 118—210 (in Russian).

Treister, M.Yu. 2022. Novye nahodki serebryanyh i bronzovyh sosudov ahemenidskogo kruga v Yuzhnom Priural'e (New finds of silver and bronze vessels of Achemenid circle in the South Urals): In: Muhametzyanova-Duggal, R.M., Fedorov, V.K. (eds.). *Prizvanie — arheologiya: sbornik vospominaniy i nauchnyh statey (k 85-letiyu so dnya rozhdeniya A.H. Pshenichnyuka i 35-letiyu nachala issledovaniya Filippovskih kurganov) (Vocation — archaeology: a collection of memoirs and scientific articles (on the*

85th anniversary of the birth of A.K. Pshenichnyuk and the 35th anniversary of the beginning of the study of the Filippov mounds)). Ufa: Dialog, 466—486 (in Russian).

Umansky et al. 2005: Umansky, A.P., Shamshin, A.B., Shulga, P.I. 2005. *Mogilnik skifskogo vremeni Rogoziha-1 na levoberezh'e Obi* (*The burial ground of the Scythian time Rogoziha-1 on the left bank of the Ob River).* Barnaul: Altai University (in Russian).

Umansky, A.P., Shulga, P.I. 1999. Dva pogrebeniya s vostochnymi zerkalami iz Altaiskogo kraya (Two burials with oriental mirrors from the Altai Territory) In: Demin, M.A. (ed.). *Voprosy arheologii i istorii Yuzhnoy Sibiri (Issues of archaeology and history of Southern Siberia).* Barnaul: Barnaul State Pedagogical University, 56—94 (in Russian).

Urusov et al. 2007: Urusov, V.M., Lobanova, I.I., Varchenko, L.I. 2007. *Hvoinye rossiiskogo Dalnego Vostoka — tsennye ob'ekty izucheniya, ohrany, razvedeniya i ispolzovaniya (Coniferous trees of the Russian Far East as valuable objects of study, conservation, cultivation and use)*. Vladivostok: Dalnauka (in Russian).

Vasil'ev, V.N. 2004. K hronologii ranneprohorovskogo kompleksa (On the chronology of the early Prokhorov complex). *Ufimskij arheologicheskij vestnik (Ufa Archaeological Herald)* 5, 153—172 (in Russian).

Yablonsky, L.T. 2013. *Zoloto sarmatskih vozhdej. Elitnyj nekropol Filippovka-1 (po materialam raskopok 2004—2009 gg.) (The gold of the Sarmatian leaders. Elite necropolis Filippovka-1 (based on the materials of excavations in 2004—2009)).* Catalog of the collection. Bk. 1. Moscow: Institute of Archaeology RAS (in Russian).

Yudina et al. 2016: Yudina, E.A., Tonkushina, M.O., Kulesh, N.A., Ostroushko, A.A. Elementnyi analiz arheologicheskoy ohry: metodika i vozmozhnosti primeneniya rentgenofluorestsentnoy spektroskopii (po materialam neoliticheskih i eneoliticheskih pamyatnikov Srednego Zaural'ya i Zapadnoy Sibiri) (Elemental analysis of archaeological ochre: method and application of X-ray fluorescence spectroscopy (based on materials of Neolithic and Eneolithic sites of the Middle Trans-Urals and Western Siberia). *Vestnik arheologii, antropologii i etnografii* (*Bulletin of Archaeology, Anthropology and Ethnography*) 3 (34), 21—34 (in Russian).

Zhong, H., Hann, M. A. 1989. Textile Manufacture in China during the Period of the Warring States (475—221 B.C.). *The Journal of The Textile Institute* 3 (80), 403—413. DOI: 10.1080/00405008908658295.

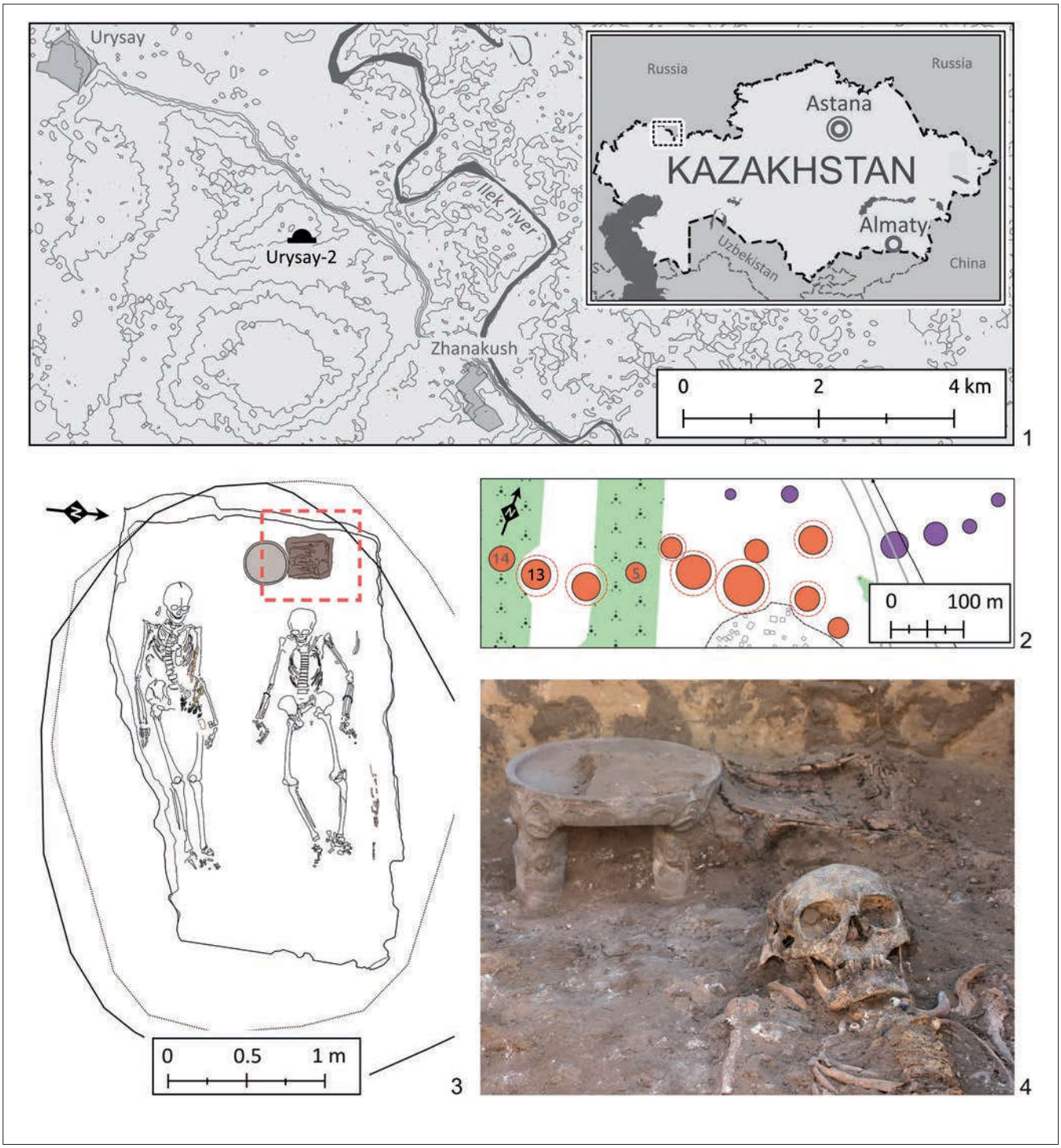

Fig. 1. Urysay-2 burial site, kurgan No. 13: *1* – location on the map; *2* – plan of the burial site; *3* – plan of Burial No. 3; *4* – the box's placement in the burial.

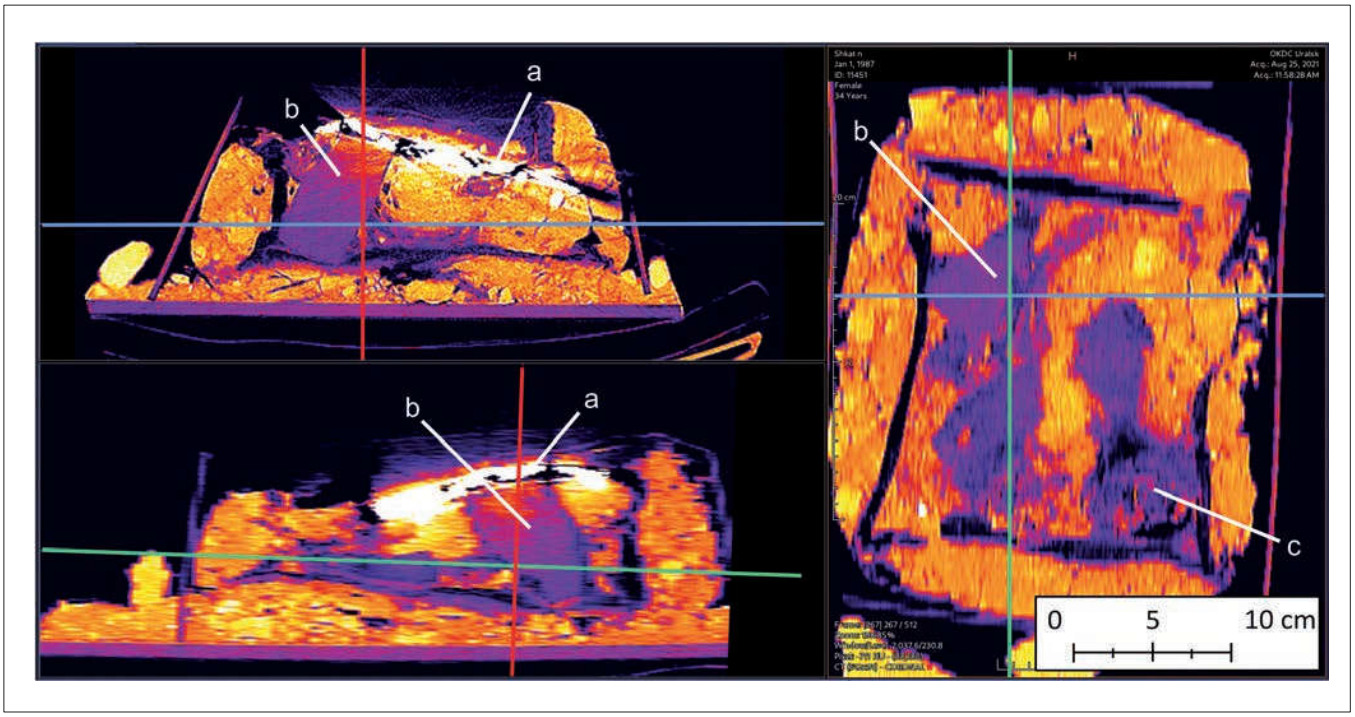

Fig. 2. Urysay-2 burial site, kurgan No. 13. Burial No. 2. CT scan of the box: *a* – mirror; *b* – block; *c* – small vessel.

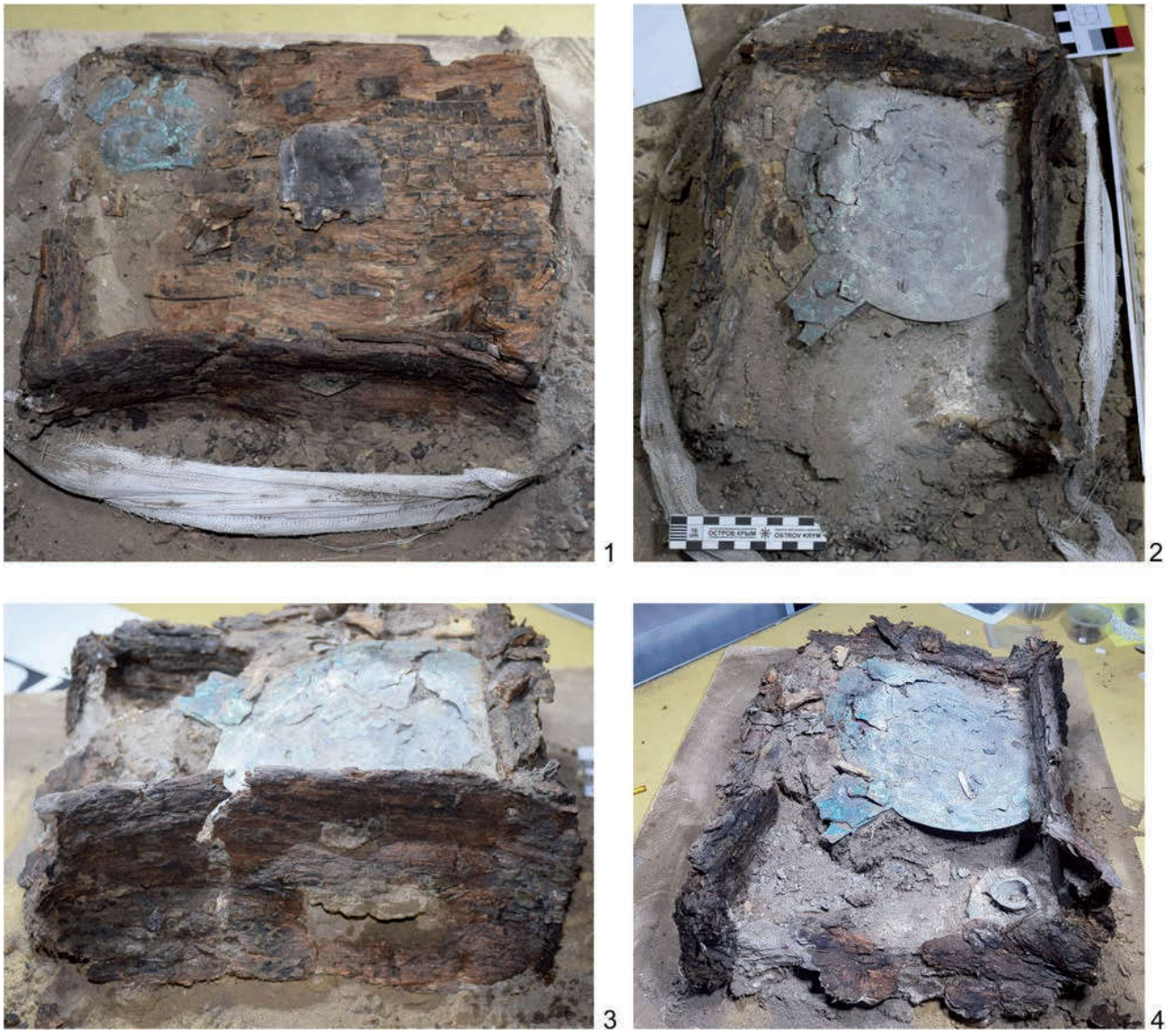

Fig. 3. Urysay-2 burial site, kurgan No. 13. Burial No. 2. Stages of restoring the box.

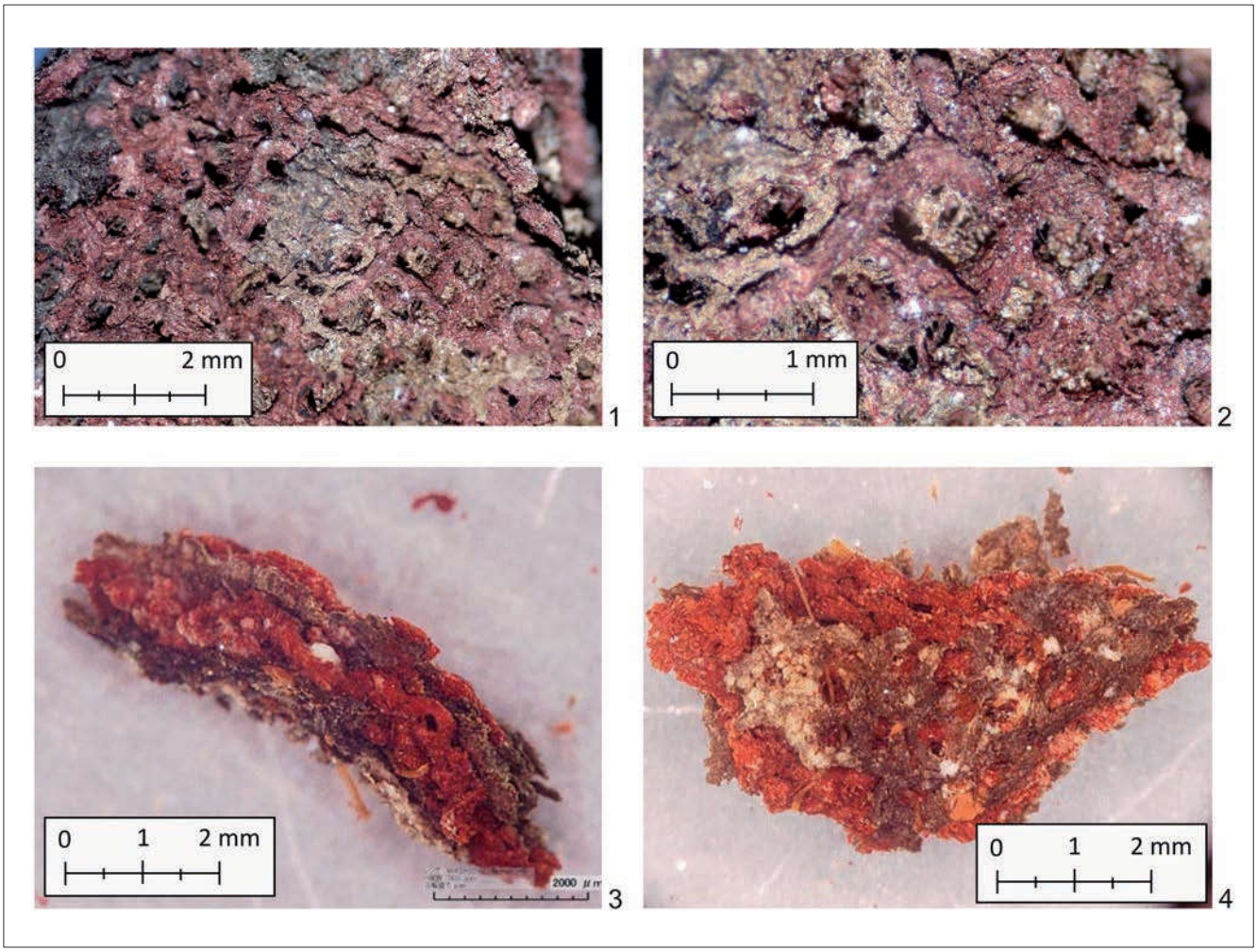

Fig. 4. Urysay-2 burial site, kurgan No. 13. Burial No. 2. Fabric from the box: *1* – macrostructure of the fabric sample (x25); *2* – macrostructure of the fabric sample (x50); *3* – cleaned in 50% ethanol fabric fragment, side view; *4* – cleaned in 50% ethanol fabric fragment, reverse view; 1–2 (Photos by A.V. Panichkin, B.M. Sukurov).

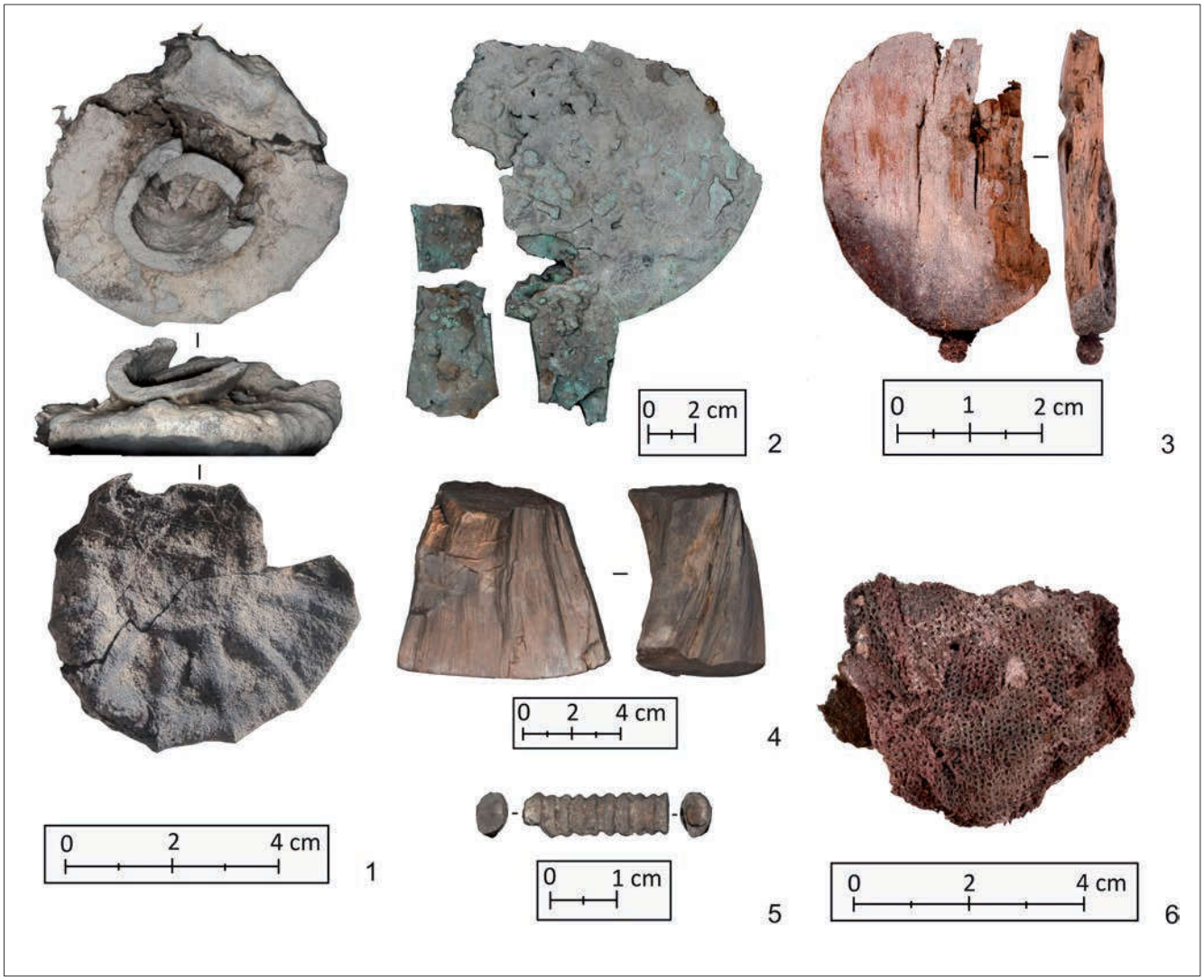

Fig. 5. Urysay-2 burial site, kurgan No. 13. Burial No. 2. Box contents: *1* – organic small vessel (leather? felt?); *2* – bronze mirror; *3* – wooden small bowl (part of a spoon?); *4* – cedar block; *5* – corrugated wooden item (handle of the spoon?); *6* – fabric.

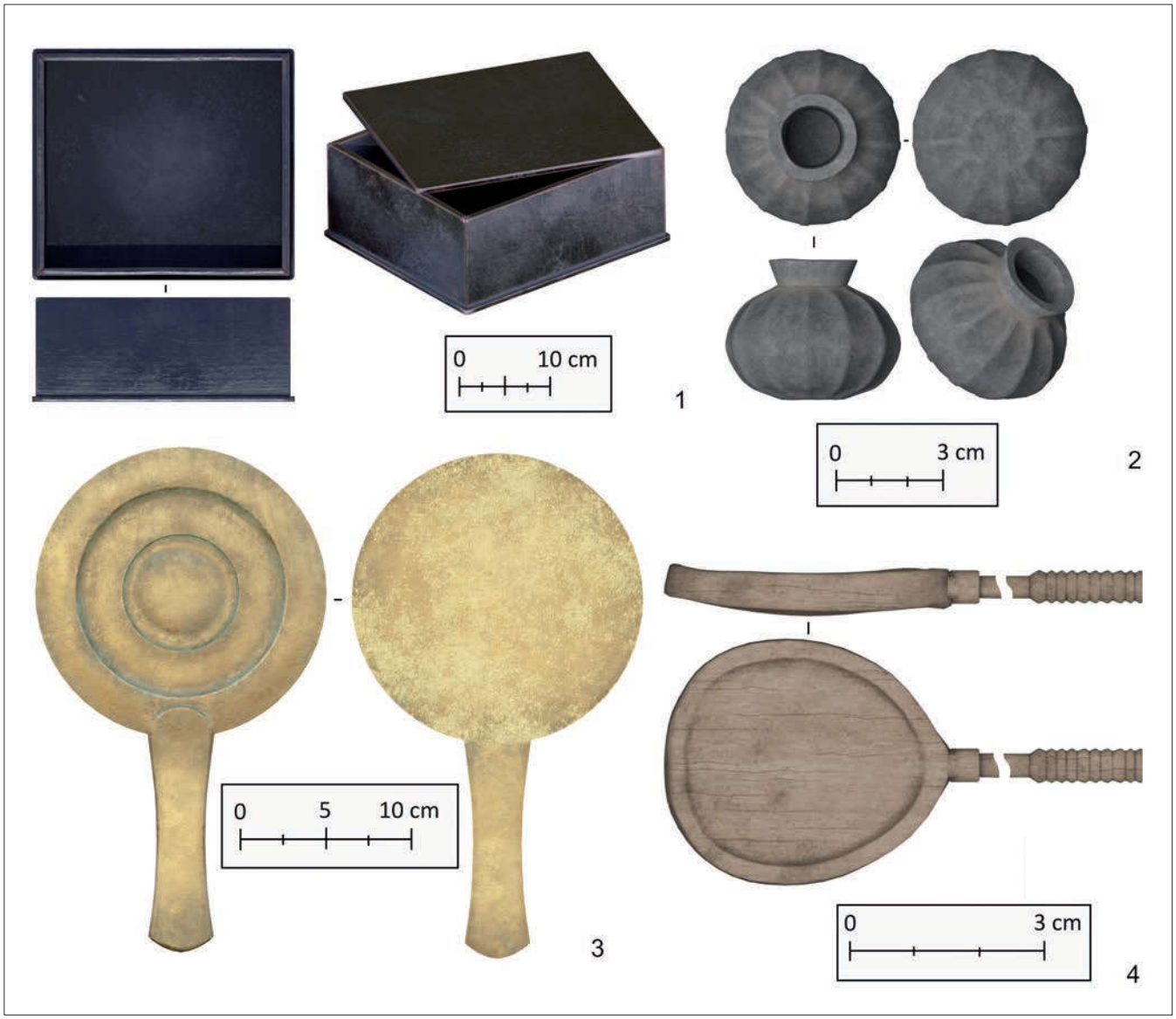

Fig. 6. Urysay-2 burial site, kurgan No. 13. Burial No. 2. 3D reconstruction of the box and its contents: *1* – box; *2* – small vessel; *3* – bronze mirror; *4* – wooden "spoon"