



STRATIGRAPHY AND GEOARCHAEOLOGY OF THE MULTILAYER SETTLEMENT OF YAMGORT I IN THE SUBARCTIC ZONE OF WESTERN SIBERIA

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ABSTRACT

Objective: The purpose of the study is to reconstruct the natural and anthropogenic processes that took place on the territory of the Yamgort I settlement in the conditions of the North of Western Siberia. **Methods and Materials:** A study of the stratigraphic structure and geoarchaeology of the multilayer Yamgort I settlement located on the right bank of the Synya River in the northern part of Western Siberia is conducted. **Results:** It is established that humans lived on the territory of the settlement during the Eneolithic, the Late Bronze Age, and the Early Middle Ages. A consistent description of the geological horizons and cultural layers is given, and the genesis of the deposits composing the settlement is explored. **Conclusion:** The specificity of the structure comes from the alternation of different-age generations corresponding to the stages of change in natural conditions. Traces of stable soil formation are preserved in the places of formation of cultural layers. The identified soils of the settlement are a rare sample of northern subarctic paleo-urban soils that meet the criteria for inclusion of the object in the Red List of Soils of Russia.

Keywords: Paleosoils; Cultural layer; Multilayer settlement; River terrace; Paleoecology; Stratigraphy; Geoarchaeology.



ESTRATIGRAFIA E GEOARQUEOLOGIA DO ASSENTAMENTO MULTICAMADAS DE YAMGORT I NA ZONA SUBÁRCTICA DA SIBÉRIA OCIDENTAL

RESUMO

Objectivo: O objectivo do estudo é reconstruir os processos naturais e antropogénicos que tiveram lugar no território da colónia Yamgort I, nas condições do Norte da Sibéria Ocidental. **Métodos e Materiais:** É realizado um estudo da estrutura estratigráfica e da geoarqueologia do povoado Yamgort I de várias camadas localizado na margem direita do rio Synya, na parte norte da Sibéria Ocidental. **Resultados:** É estabelecido que os humanos viveram no território do povoado durante o Eneolítico, a Idade do Bronze Final, e a Alta Idade Média. É feita uma descrição consistente dos horizontes geológicos e das camadas culturais, e é explorada a génese dos depósitos que compõem o povoado. **Conclusão:** A especificidade da estrutura provém da alternância de gerações de diferentes idades, correspondentes às fases de mudança das condições naturais. Os vestígios de formação estável do solo são preservados nos locais de formação das camadas culturais. Os solos identificados do povoado são uma amostra rara de solos paleo-urbanos subárcticos do norte que satisfazem os critérios para a inclusão do objecto na Lista Vermelha de Solos da Rússia.

Palavras-chave: Paleosoils; Camada cultural; Assentamento multicamadas; Terraço fluvial; Paleo-ecologia; Estratigrafia; Geoarqueologia.

1 INTRODUCTION

Paleogeographic studies are of major importance to archaeology. One of the main types of archaeological sources is multilayered geoarchaeological objects, which are deposits of natural and mixed genesis with a predominance of the anthropogenic component. These particular objects both contain ancient material objects and other traces of human activity and reflect natural environmental processes (Demkin, 1997; Detiuk & Taranenko, 1997; Kolesnikov, 2016; Plekhanova, 2017). Pleistocene archaeological sites often feature alternating geological deposits with paleosoils, which are markers of a warming climate and function as cultural layers where the anthropogenic component dominates over the natural (Kolesnikov & Kolesnikova, 2012). Objects of the Holocene age are a somewhat different case, as not every one of these deposits reflects climatic changes. Archaeological materials are often adjacent to modern soil, in which it is even more challenging to distinguish the chronometric and stratigraphic framework of the formation of cultural layers (Berdnikov & Berdnikova, 2017; Gavrilov & Goleva, 2014; Korkina, 2001; Plekhanova, 2019). In the northern part of West Siberia, paleogeographic reconstructions of Holocene age objects are complicated, since the peculiarities of soil formation there produced thin paleosoils,

which often cannot be traced in the geological sequence of sedimentary deposits. For this reason, the study of multilayered settlements, in which cultural layers effectively serve as markers of paleosoils, acquires primary importance. Such multilayered objects allow for a more detailed reconstruction of natural and anthropogenic processes. In view of the topicality of the study of multilayered archaeological objects for reconstruction, the present paper reports on the results of the study of the stratigraphy of deposits from the multilayer settlement of Yamgort I.

2 MATERIALS AND METHODS

2.1 Area under study

The multilayer settlement of Yamgort I is located in the north of Western Siberia on the right bank of the Synya River, which is a left tributary of the Ob River and is formed by the confluence of the rivers Sukhaya Synya and Mokraya Synya at the foot of the eastern macro-slope of the Polar Urals at an altitude of 53 m above sea level.

At the research site, the valley of the Synya River widens considerably, and its channel reaches 300 m in width. Periodically, the river floodplain gets flooded during the spring high waters. The flow rate is 0.4 m/s. The average annual water flow amounts to 96 m³/s. The multi-year runoff minimum is observed in March (3.43 m³/s), and the maximum is recorded in June (348 m³/s). Synya freezes in October and breaks open in May. The river is fed from mixed sources, with a predominance of snow. The area along the banks of the river is quite sparsely populated. Some of the settlements on the river are only visited by residents in the summer, mostly during the spawning of commercial fish.

The climate is continental with long, cold winters and short summers. Frosts last until the end of June. Persistent frosts last from the second half of October to the end of April. The absolute minimum temperature is -45.4°C . Snow cover reaches an average height of 60 cm. The duration of the period with average daily temperatures below 0°C is 285 days.

The multilayered settlement of Yamgort I is located on the 3-meter high terrace of the Synya River, which is composed of sandy and loam sand sediments. The terrace surface is slightly sloped with small elongated ridges and rounded depressions, occupied by mixed sparse forests of north taiga landscapes. The tree layer is formed by cedar, spruce, and birch. The crown density varies from 5 to 7 points. Cedar height varies from 2 to 25 m, trunk diameter – from 5 to 20 cm; spruce height – from 2 to 23



m, trunk diameter – from 4 to 20 cm; birch height – from 1.8 to 23 m, trunk diameter – from 4 to 10 cm. The shrub-bush layer is represented by Ledum, juniper, rose hips, and hickory. The moss-grass layer is formed by horsetails, sedges, sphagnum, and green mosses. The total projective coverage of the moss-grass layer is 80-90%.

Under sparse coniferous and mixed forests with shrubby undergrowth, there form illuvial-ferrous podzols. The podzols form combinations and mosaics with illuvial-humus subburses. Taiga-surface-gley soils are formed on clay and loam substrates. Here the process of surface gleying suppresses podzol formation. Swamp soils are not very common.

The boundaries of the site are established with consideration of the visually identifiable contours of the remains of structures in the landscape, the topography of the terrain, and the size of the area required for habitation in the settlement. The boundary is defined by ten characteristic points and has the form of an irregular polygon in the plan. All boundaries are drawn 1-2 m from the edges of the troughs on the surface of the terrace of the Synya River (Figure 1).

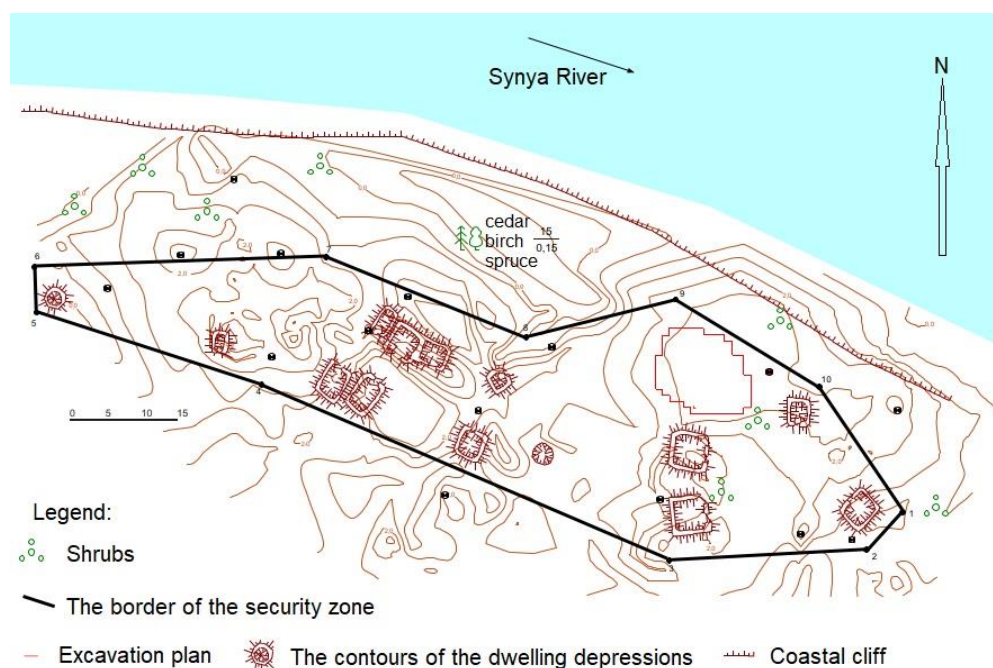


Figure 1. The layout of the boundaries of the studied object Yamgort I

The Yamgort I multilayer settlement is dated by analogies of pottery to: the Eneolithic era – 3rd millennium BC (part of the ceramics of the Yamgort I settlement has similarities with the ceramics of the Yasun culture of the Lov-Sang-Khum II settlement, dated to the 3rd millennium BC); the Late Bronze Age – 13th century BC (Kheyakha culture); the Early Middle Ages – 6th and early 7th centuries (Zelenogorsk group of the

Lower Ob culture).

2.2 Research methods

2.2.1 Methods of archaeological research

In planning the research strategy and the choice of excavation methods, we took into consideration both the multilayeredness of the complex and the diversity of its constituent objects (Figure 1). Out of the 16 depressions, 15 are rounded and relatively small in size, which is why, by numerous analogies, they are attributed to the Middle Ages. The 16th depression selected for the study is distinguished by elongated rectangular proportions and impressive size – about 145 m² on the outer contour of the embankment. In the center of the presumed dwelling, a pit measuring 3x10 m, about 2 m deep, with visible modern anthropogenic disturbances was recorded. The dwelling was preliminarily attributed to the Eneolithic epoch. In the work process, it became apparent that the deep ditch was not part of the dwelling under study, but represented an older structure. Thus, we studied two dwellings.

The excavation was conducted along the outer borders of the embankment, excluding large trees, which explains the stepped contour. The total exposed area was 145 m². The excavation was oriented in a north-south direction. The area of the excavation was not divided into sectors, as the technical capacities allowed us to make high-quality pictures of the total exposed area from a height of up to 100 m.

The numbering system was uniform for the entire marked area. Square plots measuring 1 m on each side were marked from south to north with letters of the Russian alphabet from A to O, excluding the letter З, which resembles the number 3; from west to east – with Arabic numerals from 0 to 14.

At all stages of the work were accompanied by photo and graphic fixation. Using a Trimble M 3 DR 5 total station, the surface of the excavation was micro-leveled according to conditional horizons, objects and color changes in the cultural layer were fixed, and finds were registered individually. The conditional zero (benchmark) was automatically determined as the station point. автоматически принята точка стояния станции. A reference point was selected to tie in and monitor the correct operation of the device. The Xiaomi Mi Drone 4K quadcopter was used to photograph large objects and general plans of the excavation.

The cultural layers were removed successively in conditional horizons up to 10 cm, with careful fixation of each find with the help of the total station. The electronic data



were transferred to the computer and processed in the specialized geodetic software IndorCAD 8. Auxiliary data and other observations were recorded in a field diary. Finds were recorded electronically in the device memory and transferred to the plan at a scale of 1:50 cm. Color changes in the cultural layers and objects were recorded with hand sketches on millimeter paper at a scale of 1:50 cm. After the completion of all works, the excavation was recultivated.

After individual fixation, the finds from the excavation were placed in separate bags with the number given by the device and the mark of the conventional horizon, brought to the chamber tent to be cleaned (by washing with water), dried in specially designed racks, and packed in dry bags and boxes by horizons. In the process of work at the excavation site, we also selected samples of coal for radiocarbon dating, samples of wooden structures for dating according to the dendrochronological method, as well as soil samples.

As a result of the conducted works, we explored 10 conventional horizons of cultural strata of the Eneolithic, Bronze, and Early Middle Ages. At the final stage, two horizons were separately removed from the pit of the dwelling. A collection of artifacts, including ceramics and stone objects, was obtained.

2.2.2 Methods of paleosoil research

In the course of the work, the sections were described macromorphologically according to the standard scheme of field study of paleosoils, and samples were taken in accordance with the methodological recommendations (Kolesnikov, 2016; Veklich et al., 1979).

The physicochemical and chemical properties of paleo-soils were studied through generally accepted methods of assessment (Arinushkina, 1970). Organic carbon content was tested by the Tyurin method. Cation exchange capacity was assessed via the Bobko-Ashkenazi-Aleshin method as modified by the Central Scientific Research Institute of Agrochemical Service of Agriculture. Soil phosphorus was determined according to the Kirsanov method using the UNICO-1200 spectrophotometer, USA, 2012. The granulometric composition of the soil was tested by the pyrophosphate method. The content of oxalate-soluble compounds of iron was determined using Tamm's reagent on an Atomic Absorption Spectrometer Perkin Elmer AAnalyst 400, USA.



3 RESULTS

3.1 Stratigraphy of deposits

The upper part of the deposits is intensively altered by soil-forming processes, therefore, the identification of horizons is performed via soil horizon indexing. Stratification of the underlying horizons is conditioned by geological processes, and their designation is based on ordinal numbering.

Stratigraphy of the key section. The modern soil is represented by an illuvial-humus (O-BH-BF-C) podbur (Figure 2).

O (0-7 cm) – the litter horizon, gray with a russet-brown tint, composed of heterogeneous organic material of different botanical compositions with sandy filling. The degree of decomposition of organic material reaches 50%. The horizon lies under a layer of decayed coniferous and herbaceous-moss vegetation about 2 cm thick. The horizon is dry, unstructured, penetrated by roots of woody and herbaceous vegetation, the transition is gradual, and the boundary is undulating.

BH (7-18 cm) – the illuvial-humus horizon of russet color with spots of gray, sandy (sandy loam), in some places the material is mixed with sediments from the underlying cultural layer and its overlying horizon; unstructured, crumbly, dry, with roots of wood and herbaceous vegetation, a gradual transition in color, and a slightly undulating border.

BF (18-23 cm) – russet with ochre tones, sandy horizon, compacted, unstructured, with inclusions of charcoal from burnt ancient structures (?), roots of woody and herbaceous vegetation, a sharp transition in color, and an undulating border.

C 23-30 cm – the cultural layer, sand, heterogeneous in color, varying from gray to light gray, occasionally whitish, with a black charcoal layer up to 1 cm thick in the upper part of the horizon, dry, compacted, fine-clodded, crumbly, pierced by roots of woody vegetation, with roots of herbaceous vegetation, inclusions of ceramic debris, with notches and spilling into the underlying horizon on the remains of burnt wood, a sharp transition in color, and an undulating boundary.

30-40 (42) cm – russet with a gray tint, sandy, unstructured, compacted, dry, roots of woody vegetation, gradual transition, undulating border.

40(42)-50 cm – cultural layer, russet-ochre with a gray tint, sandy, fine-clodded, crumbly, compacted, dry, with occasional thin roots of herbaceous vegetation, inclusions of fragments of ceramics, gradual transition, the border is slightly undulating.

50-60 cm – russet with an ochre tint, sandy, fine-clodded, crumbly, compacted, dry,



small roots of herbaceous vegetation, gradual transition, undulating border.

60-78 cm – russet sand, acquires whitish shades when dried, unstructured, compacted, and moist; the transition is gradual, and the edge is undulating.

78-140 cm – medium-grained, cross-layered, brown sand with black detritus interlayers, rust-colored tin spots, unstructured, compacted, moistened.



Figure 2. Stratigraphy of the northern wall of the excavation site Yamgort I

Stratigraphy of the northern wall of the excavation (Figure 3):

1. 0-4 cm – litter horizon, gray with a brownish tint.
2. 4-18 cm – illuvial-humus horizon, white with a brownish hue and spots of gray, unstructured, crumbly, dry, penetrated by roots of woody and herbaceous vegetation, the transition to the underlying layer is gradual in color, the border is slightly undulating.
3. 18-26 (38) cm – sandy, heterogeneous in color, varying from gray to light gray, occasionally whitish, with charcoal inclusions in the upper part of the horizon. The horizon is dry, compacted, fine-clodded, crumbly, penetrated by roots of woody vegetation, with roots of herbaceous vegetation and inclusions of fragments of ceramics; on the remains of burnt wood, there are notches and spills into the underlying horizon, the transition is sharp in color, the border is undulating.
4. 26-56 (66) cm – mixed brown-yellow sand with a gray tint. Unstructured, compacted, dry, contains roots of woody vegetation, the transition is gradual, and the boundary is undulating. The layer is found in the filling of two shallow (30-40 cm) pits (probably trenches), connected by a thin bridge.
5. 56-70 (74) cm – russet-brown (occasionally russet-ochre with a gray tint) ferrous sand, fine-clodded, crumbly, compacted, dry, with occasional thin roots of grass

vegetation, inclusions of fragments of ceramics, the transition is gradual, the boundary is slightly undulating.

6. 56 (70)-80 (92) cm – russet sand with an ochre tint, fine-clodded, crumbly, compacted, moist, contains small roots of herbaceous vegetation, the transition is gradual, and the border is strongly undulating. It acquires a whitish hue after drying.

7. 80 (92)-150 cm – medium-grained, cross-layered, russet sand with black detritus interlayers, rust-colored tin spots, unstructured, compacted, moistened.



Figure 3. Stratigraphy of the northern wall of the excavation site Yamgort I

Stratigraphy of the western wall of the excavation:

0-5 cm – dark gray, medium to weakly decomposed plant remains, dry, friable, the transition is clear, and the border is faintly undulating.

5-26(27) cm – gray with a russetish tint, sandy, crumbly, dry, penetrated by roots of herbaceous and woody vegetation; the transition is gradual, and the border is undulating.

26(27)-34 cm – russet with a grayish-ochre tint, compacted, unstructured, with roots of shrubby and woody vegetation, the transition is sharp, the border is undulating.

34-37(38) cm – gray, sandy, with a black layer of charcoal in the upper part (0.5 to 0.7 mm thick), charcoal inclusions (0.2 mm in diameter), dry, compacted, fine-clodded, crumbly, clear transition, undulating edge.

37(38)-42 cm – whitish, the sand is dusty, compacted, fine-clodded, crumbly, with roots of woody vegetation, occasional remnants of modern decomposed vegetation, dry; the transition is sharp, and the border is undulating.

42-60 cm – medium-grained reddish sand, unstructured, crumbly, moistened, gradual transition, smooth boundary.

60-110 cm – horizontal-layered medium-sorted sandy sediments of a light russet color with a reddish tint and a light russet color with a grayish tint, unstructured, compacted, moistened.

Thus, there are three main parts in the structure of the section. The lower part consists of cross-layered sands. The middle part is represented by cultural layers. The upper part of the section is the profile of modern soil.

3.2 Results of archaeological studies

The sequential opening of the conditional horizons of the settlement revealed two objects, interpreted by us as dwellings. The Late Bronze Age dwelling (dwelling 1) was built on the site of an Eneolithic dugout (dwelling 2).

Dwelling 1 is a semi-dugout with a pit 70 cm deep from the ancient original ground. Wooden structures are barely detectable by the remains of decayed cedar. Pillar pits are also weakly expressed and are singular. A hearth in the form of amorphous calcite is found in the western part of the building. The dwelling is surrounded by a thick 1 m wide embankment. The objects found in the filling of the excavation are mainly pottery from the Late Bronze Age, belonging to the Kheyakha culture. There are also many fragments of pottery from the Eneolithic Yasun culture and singular finds of pottery fragments from the Early Middle Ages in the upper horizons. Since Eneolithic and Early Medieval ceramics are found exclusively in the redeposited state, and Late Bronze Age ceramics are in the original state, we should date this dwelling to the Late Bronze Age.

Dwelling 2 is a dugout 2 m deep from the modern original ground, the depth of the excavation recorded on the mainland is 75 cm. Therefore, it can be assumed that the real depth of the excavation from the ancient original ground might have been around 150 cm. The room measures 10 m in length and 3 m in width. Since the dwelling was destroyed by a later construction in antiquity and looting dug in modern times, only the floor and a small space above it have been preserved. At the bottom of the pit, we uncovered wooden structures, which present collapsed walls, roofs, or bunks. The remains of well-preserved lower parts of the supporting structures in the amount of 57 pieces are also found. The pillars made of birch have a small diameter of about 20 cm and are placed close to one another along the entire perimeter. The depth of the pillar pits ranges from 20 to 40 cm. In the opposite part of the dwelling, the floor was lined with dense, thick grass bedding, which served as the room's insulation. No traces of a hearth are found. On the floor and among the remains of burned structures we found only Eneolithic pottery belonging to the Yasun culture.

The field inventory includes a total of 314 artifacts, including vessel ruins, fragments of corollas, bottoms, walls, and stone artifacts.

The collection of stone artifacts includes only two items:

1. Quartzite plate flake. Dimensions: 2.7x1.7x0.5 cm. The flake was taken from a quartzite nucleus. The outline of the piece is elongated, subrectangular; these markings may have been destroyed in the making of the product. Two-thirds of the fragment is covered by a sharpened edge formed during removal and bearing no additional treatment by retouching or incisive chipping. This natural ridge could have been used as a cutting edge. The size of the product and the location of the sharp edge theoretically give grounds to attribute this artifact to the category of scrapers or miniature carvers.

2. Fragment of a chopping tool blank made of fine-grained dense rock. Dimensions: 7.0x3.9x1.7 cm. The piece has an elongated trapezoidal shape, the transverse break is located along the wide part of the tool. The ribs of the future tool were formed on one of the planes along the long sides of the object by abrasive blasting, but the shaping was not completed. It can be assumed that the piece broke during fabrication, which is why the treatment was not completed. On the narrow end of the trapezium, the cutting edge of the tool is marked with abrasive sanding, but not completed. The general appearance of the tool can be interpreted as a blank of an adze (the cutting edge is slanted to one edge), which underwent primary shaping and broke during fine adjustments.

The ceramic complex of the multilayer monument Yamgort I can be subdivided into three groups of different times. The first group includes fragments of ceramic vessels whose distinctive features are: a double row of pits on the corolla, ornamentation of the walls with a continuous field of the impressions of a comb stamp, rounded bottoms, and the remains of ochre on all walls of the vessels. Direct analogies of this pottery are found at the Lov-Sang-Khum II settlement in the Shuryshkarskii district of the Yamalo-Nenets Autonomous Okrug (Rudkovskii, 2008), upstream of the Synya River from the investigated settlement Yamgort I. By analogies of ceramics, the complex is dated to the 3rd millennium B.C. In total, about 90 fragments belonging to the Yasun culture of the Eneolithic period were found in the dwelling.

The second and the largest group includes the fragments and ruins of vessels distinguished by ornamental compositions made from the impressions of small-streamed stamps, the presence of indentations under the corolla and on the corpus, and flat-bottomedness. The ceramic complex is identical to those of the Hayekha

culture settlements Kheyakha and Korchaga 1A (Khlobystin, 1967; Lashuk & Khlobystin, 1986) and the Salekhard-4 settlement (Tupakhina & Tupakhin, 2019) dated 13th-10th centuries BC by the radiocarbon method. Thus, the physical materials allow us to assert with certainty that the identified dwelling belongs to the Kheyakha culture of the Bronze Age.

The third group is the smallest and dates back to the Early Middle Ages. All identified vessel fragments belong to the Zelenogorsk stage of the Lower Ob culture. Characteristic features are a pot-like shape with a distinguished neck, as a rare exception – closed bowls and vessels of a cauldron shape and rounded bottoms.

3.3 Results of paleosoil studies

During archaeological excavations, paleosoils were found to be adjacent to cultural layers (Kolesnikov et al., 2020). The modern and buried soils have a sandy particle-size distribution with transitions within the profiles from sandy loam to loose sand through cohesive-sandy soils, which consistently allows comparing any particular characteristics of soils from different horizons and particular samples within the settlement. The background soil shows a transition from loam in the upper horizon to loose sandy sediments, with the grain structure becoming lighter further down the profile. The soil of the outskirts of the settlement has three maximums in the predominance of physical clay determined by the presence of peaks along the profile in the content of silt fraction. These peaks correlate with the fraction of fine sand (0.25-0.05 mm), yet all three of its maximums lie below the horizons with silt maximums. In the lower sample (at 100 cm), there is some excess in the silt fraction, possibly due to stagnant water processes in depressions of the microrelief. The particle-size composition in the section clearly reflects all three stages of construction of the building and exploitation of the territory. The buried soils demonstrate a heavier particle-size composition up to sandy loam in the middle part of the profile (25-55 cm) due to a silt fraction and a partially coarse dust fraction. The soil at the anthropogenic embankment site is clearly marked by the embankment-buried soil boundary. The embankment is composed of lighter loose sandy sediments (4% physical clay); the buried soil is weighted in the upper horizons up to 6-9% physical clay. The buried soil is weighted by silty and coarse-dust fractions.

The content of organic carbon and humus in the soils of the settlement varies from 5.25% in the upper horizon of the background soil to a minimum of 0.1% in the mineral horizons. In the background soil, there is no illuviation of humus, and the values fall



smoothly along the profile with depth. However, illuviation in the buried soil is reflected in the profile from 0.8 to 2.3-2.5%. In buried soil and at 70 cm depth, the content of humus is found to be uncharacteristically high for deeper horizons, measuring 2.5%. The horizon also demonstrates horizontal lamination characteristic of water stagnation processes in microrelief depressions in ancient times. Buried soil at the site of the ancient embankment is marked by a fluctuation in humus content from 0.34 (embankment) to 1.28%. The soil of the housing depression margin has three maximums in the profile of humus content: up to 2.5% in the upper horizon, then up to 2% and up to 0.6%.

Phosphates in the embankment of the section are elevated (up to 40 mg/100 g soil, with background maximums of 15 mg/100 g soil) in all three samples. This finding points either to the embankments being soaked with organics during construction, or to their slow construction and the exposure of layers to strong anthropogenic influences with the embankment being enriched with organics and functioning as a cultural layer. We also note the preservation of phosphates at the points of entry and the lack of apparent mobility across the profile, despite the leaching regime of soils. The buried soil has within-profile maxima of phosphates, as well as some elevation at 70 cm depth. Abnormally high values of 88 and 92 mg/100 g of soil, which can only be explained by a very strong anthropogenic input of organic matter into the horizon (exceeding the background soil maximum by more than 6 times) are noted in the soil of the edge of the settlement at a depth of 50-60 cm.

4 DISCUSSION

Analysis of the obtained data demonstrates that at the initial stages of formation of the river terrace, the stratigraphy of the section is fully predetermined by the hydrological regime of the Synya River. Deposits from the interval 78-150 cm are mainly medium-grained, cross-layered, russet sands with interlayers of black detritus and rust-colored tin spots. At the stage of evolution of the terrace reflected in the interval between 78 and 150 cm, quite static alluvial sedimentation conditions are evident.

The depths of 50-78 cm are marked by a lack of lamination. In the interval of 60-78 cm, there formed russetish-ochre sands acquiring whitish shades after drying. The interval of 50-60 cm has a fairly high content of dead plant debris. The russet-ochre sands were formed in the cold humid climate of the subarctic. Later, they underwent

soil transformation, during which the processes of humus formation occurred.

The interval of 23-50 cm contains cultural layers (23-30 cm and 40(42)-50 cm). The cultural layers are richly packed with fragments of pottery. The interval also displays traces of active and consistent soil formation. The upper part of the deposits (0-23 cm) is intensively altered by modern soil formation processes.

The body of data on stratigraphy, planography, and the quantitative and qualitative composition of the collection evidences that the multilayered settlement of Yamgort I was a place of seasonal habitation by people in different periods of time. The first evidence of settlement dates back to the Eneolithic Era, the 3rd millennium BC. After a long break, approximately in the 13th century BC, a Late Bronze Age winter dwelling was erected presumably on the site of an Eneolithic dwelling. After the next archaeological site, there were two dwellings built in different periods of a long break. In the early Middle Ages, in the 7th century AD, 16 small, most likely also winter dwellings, with rounded pits were erected on the site of the monument.

The dwellings studied belong to the Kheyakha culture of the Late Bronze Age and the Yasun culture of the Eneolithic period. Recent archaeological research confirms that representatives of the Kheyakha and Yasun cultures developed a vast territory from the southern part of the Yamal Peninsula in the north to the basin of the Synya River in the south.

5 CONCLUSION

The materials of the multilayer settlement Yamgort I present a unique source for studying the establishment of economic adaptation of the ancient population in the Arctic and Subarctic conditions, as well as culturogenesis and other problems of the ancient history of the region. The examined materials also help to establish cultural continuity and determine the direction of cultural relations and migration routes.

The cultural layers of the monument contain 314 artifacts, including broken vessels, fragments of corollas, bottoms of vessels, walls with ornaments, and tools made of stone. Buried soils, clearly identifiable by their physical and chemical properties, are adjacent to cultural layers. The identified soils of the settlement are a rare sample of northern paleo-urban soils of the Bronze Age, which meets the criteria for the inclusion of the object in the Red List of Soils of Russia.



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