

GONUR DEPE IN TURKMENISTAN – A PROTO-TOWN AT THE END OF THE 3RD MILLENNIUM BC.

"... If we look at Gonur from the board of a helicopter, we will see several separate complexes of already excavated buildings. The largest of them, archaeologists named it North Gonur, is also the earliest one. It is a compound ensemble of a Palace and Temple buildings. Their construction began, as proven by many radiocarbon dates, as early as 2300-2250 BC". V.I. Sarianidi¹

Situation.

Outstanding monuments of the Bronze and Iron Ages, which date back to the heyday of the state of Margush (Marghiana), were discovered over the recent decades in the north of the Murghab oasis, in the Kara-Kum Desert. The most grandiose of them – the site of ancient settlement Gonur Depe, was discovered in the 70s of the last century and then during many years has been studied by the experts of the archaeological expedition under the leadership of V.I. Sarianidi. The results of a comprehensive study and a detailed description of the settlement are presented by V.I. Sarianidi in his numerous publications of different years.² The architectural analysis and typology of ancient structures in Marghiana are covered in M. A. Mamedov's book.³ The first Russian publication of some of the architectural issues can be found in the yearbook of the Marghiana expedition.⁴

The site of ancient settlement Gonur Depe is located in the Kara-Kum desert about 70km away from Bayramali and consists of numerous buildings that are fast-built constructions with long life-time which existed at the extended late 3rd millennium BC.⁵ V.I. Sarianidi labels this period as *the first constructions period*, since all the buildings of this period discovered by the archaeologists are located on the mainland. The site consists of various complexes which were named in different publications as North Gonur (Kremlin, Palace), South Gonur (Temenos – a fortified sacred land, or a temple), Necropolis (city cemeteries), the Royal Necropolis (burial of the rich), and others. The total area of this outstanding monument in Turkmenistan, discovered during long-term excavation works, makes not less than 30 hectares. The geographical coordinates of Gonur Depe are 38°13' of north latitude and 62°02' of east longitude, the average height above the sea level is 185m.⁶

Let's outline the circle of questions raised in this article that relate to on-site full-scale scope and possible reconstruction of individual parts and several buildings of the Kremlin, taking into consideration their architectural and design features, not claiming to have an exhaustive and final study of their decision and assuming that the main answer is yet to come. Let's list them here:

1. *On-site fixation and full-scale description of the architectural and design features of the buildings.*
2. *Architectural analysis, possible options of the graphical recreation of the original appearance, sequence of construction.*
3. *A hypothetical space-functional model of the complex.*

¹ V.I. Sarianidi. The mystery and the truth of a great culture. Ashgabat, 2008. P. 55.

² V.I. Sarianidi. Antiquities of the State of Margush. Ashgabat, 1990.

V.I. Sarianidi. Bibliographic Index. The National Office of Turkmenistan for Protection and Exploration. Restoration of Monuments of History and Culture. Ashgabat, 1999.

V.I. Sarianidi. Margush. An ancient oriental kingdom in the old delta of the Murghab River. Ashgabat, 2002.

V.I. Sarianidi. Gonur Depe. City of kings and gods. Ashgabat, 2005.

³ M.A. Mammedov. Ancient Architecture of Bactria and Marghiana. Ashgabat, 2003.

⁴ V.I. Artemyev, A.M. Urmanova. Preliminary results of an architectural study of the North Gonur in 2007, in the book "On the Road of Discovering New Civilizations // Proceedings of the Marghiana archaeological expedition". Volume 3. St. Petersburg, 2010.

⁵ All of the known radiocarbon dates of the finds are within the range of 2300-1600 BC.

⁶ The exact coordinates of Gonur Depe: 38deg12min50sec of north latitude, 62deg02min15sec of east longitude, average height of 190m above the sea level.

4. *Possible image of an ancient drawing and the existence of a countable alphabet.*
5. *Architectural features of the Palace and their relationship with possible ritual processes.*
6. *Systematization of some reconstructable elements, in particular:*
 - *ritual furnaces and stepped niches, so-called "Blind windows";*
 - *overlapping – light wells and lanterns;*
 - *structure of entrance frames, columns;*
 - *domes and arches;*
 - *reconstruction of the "Sand Rooms" and of a complex of "cells";*
 - *a problem of recreating the interiors of the Palace.*
7. *Several town-planning aspects.*
 - *the problem of population growth and the size of a proto-town*
 - *the water supply problem and the hypothesis of the Proto-Amu Darya River mainstream.*

All the buildings of the complex were built on an ancient *Takyr* basis, elevated above the surrounding land not less than for 2 meters. This same *takyr*, that had perfectly horizontal surface because of its alluvial formation nature, apparently, drew attention of ancient builders of *Gonur* for its features and properties. The original structures were built on it without arranging special foundations,⁷ i.e. for the majority of the premises and courtyards the ground is the day surface of the *takyr*. The adobe bricks with average dimensions of 44x26x14cm were used for construction of all the mentioned facilities. We should note that the ancient masters intuitively took the average size of a brick in a ratio very close to the famous ratio of the "golden section" – approximately 5/8. This indicates high culture and knowledge of the ancient builders of *Gonur Depe*.

Two phases of construction were archaeologically stated: *the first* – the primary phase, when almost all the structures were built, and *the second*, the repair phase, after the great disaster⁸ and strong fire associated with it, when all the buildings of the Palace and of the Kremlin were rebuilt and strengthened by additional walls. Today, all the detected structures are preserved to a height ranging from 0.60 to 2.10m from the ground.

Architectural Analysis of the Structures in North Gonur.

Urban planning picture of the complex involves not only its simultaneity, as mentioned above, but also construction of all its elements on a single, pre-created project, which shows the overall high culture of this population, despite the lack of archaeological finds of written language. The analysis of drawings with measurements of sizes revealed indirect signs of some countable and symbol literacy. How was the old project presented? Perhaps, the drawing was a high relief on a clay plate or 3D model made of clay, as it was presented in the finding from Mari (for sure, ancient builders had lots of such charts or models).⁹ Large-scale construction works, not mentioning the ideally correct geometrical arrangement of construction plans, as well as their orientation in space would have been impossible without calculations. Hence, there should have been at least an elementary "Counting literacy", so necessary for preliminary layout on the ground, for measuring of dimensions, and for control over construction works.¹⁰ Summarizing the material studied, we will try to picture the hypothetical functional-and-spatial chart of the whole complex of North *Gonur*, which will allow to graphically present the initial idea of the ancient architect.¹¹

⁷ This phenomenon is well known in the soil structural mechanics, when centuries-old layers of mud turn to concrete-strong mass, which even the bucket of an excavator cannot dig through. In construction, there is even a special term – *stone loess*.

⁸ See V.I. Sarianidi. 2005. p. 58

⁹ See e.g. M.A. Mamedov, 2003. P.92, Fig. Finds of clay castle model in Mari.

¹⁰ The existence of such a script may probably be proved by the find of the so-called *tokens* (spherical clay fragments with schematic symbols on them), which were found at the north gates of the Palace. (V.I. Sarianidi, 2002. P. 286-287).

¹¹ Much of the original was later distorted, as is often the case in the history of buildings, but what reached us in the form of monumental sites yet to be fully comprehended, and this model may change significantly.

The walls and towers of the Kremlin. We see that all four gates of the Kremlin were linked with the churches, each of which carried a certain function in the aggregate rituals of the Palace. The entire territory of the Kremlin was also divided into functional areas listed in the Legend of the offered scheme. From the architectural point of view, the palace had a right symmetrical shape. A central place in the composition belonged to the Inner Hall (room 19), which was considered the main room not only functionally, as pointed out by archaeologists, but also because it was an important part of architectural-spatial construction of the ensemble, which will be shown later. The following architectural analysis is devoted to the problems of graphical construction of individual details and parts of the complex structures.

Let's suppose that the ancient architect, when organizing the placement of the entire royal ensemble, was mainly concerned about the mutual arrangement of the Palace and the Temple of Fire. From the architectural point of view, this relationship determines the direction of the principal planning axis of the future complex of the Kremlin – it is the "West-East" line, or the line of the spring equinox, as it was bound to the cult of the New Year in ancient times.¹² Perpendicular to this axis, near the Temple of Fire, was located the fortress wall with *five* identical towers. This was the eastern wall of the Kremlin, which is in fact oriented strictly in the north-south direction with a minor deviation of only half a degree. The entrance to the Kremlin along the above-mentioned axis comes straight from the sacred altars of the Temple of Fire.

We assume that *five* towers and *five* curtains are the base frame, a sort of city-planning module, which helped to implement the zoning as shown in the scheme. Measuring the sizes of all four sides of the designed square by this specified module, the architect got a complete layout of the future enclosed space of the Kremlin, consisting of 5 towers on all its 4 sides: total 20 towers. But in the perimeter walls there are 21 towers, which means that our hypothetical arrangement has one "extra" tower. This is the north-western corner tower, indicated in the diagram with the digits 00, which finalizes the whole composition of the Kremlin structure. The fact that this tower was labeled as 00 is no coincidence – the authors emphasize the primordial role of the tower not only in our plotting, but also, probably, in the ritual life of the Kremlin.

Several planning elements speak for the special significance of the tower 00. Apparently, it was extraordinary, starting from its location. Firstly, perhaps our described breakdown of the walls and towers by the specific module began precisely from the north-west tower 00, the way this process is shown by the arrows in the diagram. Secondly, probably from the tower 00 began also the breakdown of the walls of the Palace, as its walls happened to be parallel to the western and northern sides of the Kremlin, namely to those walls that are adjacent to the tower 00. And most importantly, we shall note the essential fact: next to the tower 00 there is located the so-called "Regal Sanctuary", a *micro-complex* that played one of the major roles in rituals of the entire ensemble (Sarianidi, 2005, p.116). And finally, seems like all the gates to all the other towers are drawn to the tower 00 – it is clearly demonstrated in the same diagram Fig. 9

If we turn to the analysis of its construction,¹³ we will see that "counting by *fives*" was used here, too: four sectors at the altar with *five* hum-pots represent the basis of its composition, the same as the four walls with *five* towers of the Kremlin. The twenty-first hum-pot, as described by V.I. Sarianidi, was ritually broken and buried in the altar space, whereas a special twenty-first tower exists in the perimeter of the Kremlin.

This, of course, might be called a coincidence, but a large altar Togolok-21, if desired, could freely place in a few hum-pots more. All the hum-pots were of different sizes, arranged chaotically, in a haphazard manner, as shown in the diagram. The only thing that unites their composition is their number in the segment, the number 5! In ancient times the cult of numbers was known in many cultures. I think that here we also deal with the worship of a magic number, and it is yet another proof of V.I. Sarianidi's thesis about existence of the counting

¹² Remember that this day is celebrated in *Zoroastrians* among the most important of the seven annual festivals and called *Nauruz*, especially revered as the beginning of an Avestan New Year.

¹³"The second altar happened to be more difficult to build. To erect it, the builders dug a three-meter deep and seven-meter wide vertical shaft ... installed two brick walls crosswise, which formed four segments, in each of these segment were placed ... *five* hum-pots of over a meter high" (Sarianidi, 2002, p.175).

alphabet in Marghiana. Another example of use of the number 5 can be seen among the finds from Gonur: a playing square board made of bone is lined into a 5x5 grid.¹⁴

But in this arrangement, with such a modular breakdown, the east wall got one "extra" twenty-first curtain. Thus, the east wall, following the logic of our (or old?) plotting, became longer for one curtain. So, the form of the Kremlin, by the plotting, now has a trapezoidal shape, demonstrating along the way its exclusively oriental contour, adjacent to the Temple of Fire. And finally, our hypothetical drawing actually matches the measuring layout for they both have the same basic parameters. The first architect of Gonur might have held a similar design-plan in his hands.

The towers of the Kremlin carried not so much guarding function as, apparently, a ritual function since each tower cell had the so-called two-chamber furnaces, which V.I. Sarianidi refers to the cult attributes of the complex. "In all of them (the towers) ... installed are the furnaces. Their complicated structure suggests that they had hardly been designed exclusively for heating of the guards who presumably carried out the duty-rotations around the above mentioned corridor. Because the entire complex was not only an administrative but also a religious site, it is more likely to assume that these furnaces could have been used for making a sacrifice or kindling the sacred fire on special days or hours".¹⁵

From an architectural point of view, the fortification of the Kremlin, even if it served a military purpose, had yet another purpose – more decorative and intimidating rather than functional and practical. First of all, low placement of narrow triangular "loopholes" – openings intended rather to illuminate the enclosed spaces of towers and cloister – indicates a "peaceful" nature of such fortification. The triangular openings along the perimeter walls of the Kremlin, conventionally called "loopholes" and preserved at the average height of 1.25m above ground level in some curtains and towers, were formed by two bricks laid angle-to-angle to each other on their longer side. These were light openings since every cell, as we remember, also had a ritual furnace that required constant presence of the personnel, and, therefore, of the natural lighting and ventilation of the chamber, too.

Thus, the walls of the Kremlin had another row of the real loopholes, if there was a second level of defense, or the walls ended right away with merlons with rifle slits. Fig.11-12.

Palace – the regal ritual-and-temple complex.

V.I. Sarianidi (in his above-mentioned publications) described the north facade and the entrance to the Palace as the most important – they played a special role in royal ceremonies. From the architectural-planning composition point of view, the front east facade is not less important and grandiose, the only one decorated with complicated stepped pilasters.¹⁶ It was already mentioned that the possible planning axis of the Kremlin is the west-east direction. The same axis, as was initially intended by the ancient architect, became the axis of symmetry in the basis of the construction plan of the Palace and coincided with the axis of the entrance of the Internal Hall (room119). There are evidences that point to the fact that originally there was conceived a strictly symmetrical plan of the entire composition. This diagram shows the initial conditional idea of the Palace construction plan. Later, as is often the case in architectural practice, in the process of building or later rebuilding of a south-eastern wing of the Palace, the "*symmetrical*" plan got lost. The diagram shows possible changes that occurred during the construction of the Palace. The elements in the northern part of the complex that coincide with the existing ones were circled. Perhaps in the final stages of construction, the southern part of the Palace had undergone significant deviations from the original plan. There were added several large courtyards, and, most importantly, the south-east part of the Palace was completely rebuilt.

Systematization of some architectural elements.

Ritual furnaces and stepped niches ("Blind Windows")

¹⁴ (see V.I. Sarianidi. 2002, p.153).

¹⁵ (see V.I. Sarianidi, 2008, p.57).

¹⁶This facade was also, perhaps, sort of a "background" for religious ceremonies because it faces the square that connects the Palace and the Temple of Fire.

These architectural elements are described in full detail by V.I. Sarianidi¹⁷ and meant, in his opinion, for ritual and religious purposes. We only mention some of the architectural and planning features of these important parts of the Palace; these features are clearly shown in this diagram (furnaces and niches are graphically highlighted).

Thus, we note the following. In the system of numerous premises and in the arrangement of furnaces and niches, chaotic at first glance, there is a certain visible pattern. The niches "Blind Windows" are located only in the longitudinal walls of the Palace, which means that there are exclusively oriented to the east or west. Only five of the Palace rooms contain ritual niches – these are the rooms that hold a central position in the Palace. It is hard to tell for what particular purposes these niches were used because they had no found traces of painting neither of mosaic, which could help us clarify the function of these architectural elements. The traces of architectural details or interior decor were neither discovered in the entire territory of the Kremlin. None of the niches had any religious items; neither there was trace of soot, which is always formed during long-burning of lamps. The only thing that determines their ritual function is a white coating solution, presumably, alabaster.

There were 12 ritual furnaces found in the Palace. These furnaces were also interconnected in the plan – almost all of them are located along the longitudinal axes-lines "north-south" and built into the walls of the premises. The only exception is a furnace placed in the middle of the room and its size is a little bigger than that of the rest (room 185). Remember that there were discovered 21 furnaces in the towers of the Kremlin, too. In total there were 33 furnaces, which tell about great significance that they had in the life of the Kremlin.

Organization Chart of Overhead Covers and Light Wells

In the planning of the Palace and adjacent premises of *the first* period, one can notice some patterns in the alternation of closed, half-open and open spaces. Their sequence and inter-relationship allows you to restore the long-lost *possible* overlapping of the complex.

Columns. According to archaeological data, the columns were made of wood: there were found traces of burnt wood in places of their bases. The burned beam or column discovered in the Throne Hall of the Palace is the actual proof of existence of the wooden structures. The overlapping system would not be possible without the use of columns, beams and sub-beams. Moreover, there probably existed lantern-lights (light wells) that were the only source of natural light to the interior premises of the Palace. Windows, as an architectural lighting element in the outer walls, are absent in buildings of that era.

The use of wood was probably exceptional. Wooden products, as some construction material, were used only in large ceremonial halls as post-and-beam overlapping systems and wooden ceilings – these are the elements that are essential in creation of the decoration of large spaces. Filling the openings with door frame-blocks has been nowhere recorded (archaeologists mention only a single deep track going into the threshold from the probable axis of the door).

Floors. In general, the floors are the surface of the natural *takyr* of the soil foundation, on which all the structures of the Northern Gonur were built. But in many special areas, such as ceremonial halls, temples and other ritual spaces, the floors are covered with white, probably, alabaster daubing – "sign of purity of the premises" (Sarianidi).

Domes and arches. Within the Kremlin area, there has been found no evidence of arches or domes, because the height of discovered walls is much below the estimated level of the abutment of a potential sprung-arch roof. There were two types of arches of narrow openings (up to 70cm) formed of two bricks set angularly to the arch thrust (Figure. 3). These few examples of the trapezoidal arches were found only in two places – one at the entrance to the bypass gallery of the Kremlin in the curtain wall n34 and another one at the arched entrance to the east contour near the tower e5 (Fig. 4). The version of domes closest to reality was a thrust-free dome formed by rows of overlapping brick (corbel, or console masonry) (Fig. 12). This was the way all the narrow rooms, bypass galleries and chambers of the Kremlin towers were overhead-covered. As a trace of a false dome, in one of the chambers of the south tower s5, there was detected a slight shift of several bricks in the upper row due to a natural disaster.

¹⁷ Ibid, V.I. Sarianidi, 2005. P.61-62.

"Sand Rooms". Cultures that developed on irrigation agriculture, regardless of their geographical location and time of existence, felt the need in systematic astronomical observations.¹⁸ Observations of the heliacal rising allowed the priests to predict the flood of rivers.¹⁹ Perhaps, the complexes of the so-called "Sand Rooms" located in the premises of the Palace were such cult-astral observation points. When the archaeologists discovered these rooms, they noted that the rooms were all filled with dense river sand and had no entrance openings. Most likely, they are the remains of the socle of a tall structure. In this case, there was used a specific property of sand which being confined in a closed space becomes almost incompressible. This allows you to build quite high and heavy constructions on its surface. At the same time, the sand is hygroscopic and it easily absorbs heavy streams of water without substantial deformation of the entire structure.

There are known cases when a structure similar to the above-described "Sand Rooms" could serve as a platform for a higher building, the plan of which is located right on the sand and does not coincide with the contour of the socle. The Palace of Toprak-kala is an example of the palace-temple on a high (14m) platform of sand and clay blocks, enclosed in a thick shell of mud-brick. One could climb onto it on the wide staircase that was guarded from the tower. Its particular features are – the walls of upper structures rest on the sand used as the fundament, and, simultaneously, the drainage of waters from open premises and roofs.²⁰

On the basis of the supposed astronomical and religious functions, the structure of the "Sand Rooms" must have been higher than that of the surrounding buildings. With a certain degree of confidence, we can determine the height of the upper levels of the platform and of the tower by analyzing the sizes of several remaining steps (room 88) and the length of the premises intended for the staircases. The entire planning of the graphic reconstruction was based on the module we have admitted – the size value of the used adobe bricks. Let's conditionally call the reconstruction of the complex "Sand Rooms" as "**tall temple-tower.**" The complex "**Temple-Tower**" consists of two levels of premises. The first level is a high platform completely filled with sand, which served as the floor of the temple. The second level is a multipurpose flat roofing of the temple premises, which the tower based on the monolithic structure (room 80) is facing. We should note the thickening of the walls exactly where the walls experience the highest pressure of sand masses.

In the new Assyrian Palace in Dur Sharrukin (the palace of Sargon II, the residence "L"), there is also a narrow staircase leading to the second level.²¹ Compositional planning of "Sand Rooms" to some extent fits the definition of *bit-hilani*: a temple of compact structure closed from outside, containing two long rooms whose principal axes are parallel to the facade. A narrow staircase to the second level is located outside the contour plan of the premises. But since the complexes of "Sand Rooms" are much older than the temples of the Northern Syria, called *bit-hilani*, it can be assumed that the planning composition of "Sand Rooms" could have anticipated such constructions as *bit-hilani*.²²

¹⁸ "We know that in Mesopotamia the sky with heavenly bodies was considered the possession of the king..." hereinafter refer to V.I. Sarianidi, 2005. P.69.

¹⁹ *Heliacal* rise – rise of some stars or heavenly bodies in the rays of dawn, just before sunrise. On the example of this unique monument of Khorezm we can assume the existence of an astronomical perspective in the ancient ritual cults: Koi-Krylgan-Kala – a cultural monument of ancient Khorezm of the 4th century BC – 4th century AD. On some astronomical functions of Koi-Krylgan-Kala. // Proceedings of the Khorezm Archaeological and Ethnographic Expedition. Volume V. Moscow, 1967. P. 251-264.

²⁰ See Y. Rapoport, E.Nerazik. Toprak-Kala. Palace // Proceedings of the Khorezm Archaeological and Ethnographic Expedition. Volume14. Moscow, 1984.

²¹ Dur-Sharrukin Palace (8th century BC). Description by E. Heinrich, "passing the reception hall, on the right hand from the residence "L" there is a staircase.... it takes you to the roof. The staircase has 10 steps and coated with alabaster, straight, arranged in narrow rooms strewn with construction waste (about 1.7m) premises 87, 88.". Heinrich, 1984, p.101, pp.154-156,162. Besides the "ladder to the roof," described by E. Heinrich, the room 121 of the residence "L" has an impressive wall thickening, compared to our example – a brick pillar-"pedestal" in the room 180. It seems that in both cases, they were the support for the construction of level 2. (III.29).

²² B.A.Litvinsky quotes from Frankfort:

"...*bit hilani*– is a palace (or temple) with two long narrow rooms, with their longitudinal axis parallel to the facade. One of them has a portico with one to three columns (in some cases two). A step climb to the 2nd floor is located near one of the sides of the portico | Frankfort, 1952, p.120 |", in some cases, there is a corner room for staircases. *Bit-hilani* – is a term of the Akkadian origin". B.A. Litvinsky, I.R. Pichikyan. Hellenistic temple of the Oxus in Bactria. (Southern Tajikistan). Volume I. Excavations. Architecture. Religious life. Moscow, 2000.

The probable versions of the reconstruction mentioned above express only the possible direction and the principle of construction of these essential components important to understanding of the entire architectural-functional image of the North Gonur, assuming the continuation of the research on their basis.

The Complex of "Cells"

The purpose of this unique architectural complex also remains vague. V.I. Sarianidi's²³ assumption about some reminiscence – construction of a model of the temple of ancestors, that some African tribes have even nowadays, is quite plausible from an architectural point of view. It is hard to imagine any utilitarian purpose of the rooms that no one could even enter. The ancient builders showed a surprising constancy in creating "useless", from our point of view, labor-intensive structures, for many times repeating this type of constructions in various parts of the temple in Gonur. The same type of structures was found in Iraq during the excavations in Yarym-Tepe in 1973²⁴. Researchers have found no practical application in other analogues and historiography. A very specific and ritual nature of this mysterious structure is indicated not only by its location within the sacred part of the Kremlin, but also by the fact that the same set of "cells" was created inside the Temple of Fire-3²⁵.

Town-planning aspects of reconstruction of the site of ancient settlement in Gonurdepe as the capital of the Marghiana civilization

At this stage of research, we can assert that the Kremlin and the Palace were parts of a large *proto-urban* formation, which apparently was the capital of this region, if not of whole Marghiana. The absence of residential areas and craft-and-residential suburbs in the excavations is quite understandable and can be explained by thousands of years of natural and anthropomorphic destructive impacts that led to total destruction of non-monumental buildings in Gonur.²⁶ Although the North Gonur was a Temple City where no one lived and people came here from the extensive surrounding lands (as V.I. Sarianidi repeatedly wrote about), still someone had to support the livelihoods of the Kremlin. The purpose of this urban-planning analysis presented here is to prove that this civilization was meant to appear from the point of view of an architect, to point out specific areas of interference between the farming culture of Gonur (the ecumene) and its nomadic periphery (the nomads). The single-scale alignment of all drawing of all authors with aerial photography, which was kindly provided to the author by the French explorer G. Dautiane in 2010, became the verification of the collected data. The following conclusions were then made on this basis.

It is very likely that Gonur, as a capital city, had to have residential buildings in the area around the Kremlin. It is easy to estimate that the number of such buildings should be enough for 5-15 thousand inhabitants. It was

Pp. 248-252, 257, contain references to the *bit-hilani*.

Also, by T.V. Kornienko gave name *Bitani* – a type of church-house with the second floor (the original temples of Mesopotamia. St. Petersburg, 2006, p.16), and further, with reference to I.M. Dyakonov, an interesting description: Mesopotamia temples had four features:

- 1 – layering of the centuries-old buildings in one place, leading to a succession of forms through many generations;
- 2 – a high artificial platform on which wide stairs or ramps lead to;
- 3 – three-part planning around a courtyard;
- 4 – division of the external facades onto a uniform rhythm of niches and pilasters. See P.177.

There is also a plan *bit-hilani* in *Dur-Sharrukin*, 8th century AD. Description: two halls elongated in their cross direction, one after another, the entrance from the long side, two-column portico. Hittite and Siro-Hittite architecture // VIA Architecture of the Ancient World, Volume 1. Moscow 1970. p.117.

Also, we read in V.I. Sarianidi: there are "... Hittite buildings in the type *hilani* – on the 2nd floor the king prayed and sacrificed to the gods (the temple Alalaha), its main tower dominates over all the buildings, "ibid, quote from Nauman - "above the fire lighted the ritual vigils" (unpublished manuscript).

²³ See V.I. Sarianidi 2005. P.72.

²⁴ Shown is a photo of a platform of the type of the "cells" described as a "granary". R.M. Munchayev and others. Research works of the Iraq expedition // Archaeological discoveries of 1973. Moscow 1974. P.542.

²⁵ See V.I. Sarianidi 2005. P.104.

²⁶ For a city with such a vast area and a variety of functions, a complete absence of residential districts is quite explainable. Remember that more than four thousand years had passed since the time of its construction, and it is quite clear that the most fragile structures, first of all residential buildings, have not survived to our times. Referring to the most recent history, we note that the standard wearing-out period of adobe dwellings in Central Asia is calculated to be no more than 50-100 years (Old Tashkent and Bukhara). The residential buildings in Gonur proved to be short-lived. We should also note that the Mesopotamian complexes are presented by only monumental "royal" structures. Ordinary buildings have neither been preserved there.

necessary for operation of the king's power-administrative personnel and religious apparatus of the Kremlin, who had to be supported by the infra-structure of security, temple, handicraft and peasant departments. The human resources, necessary only for uninterrupted supply of numerous ritual furnaces and altars in churches of the Kremlin and its surroundings, could make up to a thousand people. Consequently, there must have been residential settlements within walking distance.

One of the unsolved problems is that the archaeological finds lack any architectural details and interior decoration elements of the Kremlin and of the Palace. This is also explainable: the facilities in Gonur were left away not because of wars or natural disasters, in which cases we would have found some arte-facts in formed obstructions. The city was gradually abandoned by its inhabitants. They left, taking with them every valuable thing found in the Palace. The later human inhabitation of this settlement was of rather spontaneous nature destructive for *the first* period. Therefore maybe the architectural elements of furnishing and decoration, which had been there before, were then destroyed. All events indicate that the water left this region in the middle of the 2nd millennium, and with it was gone the urban culture of Gonur, which had been forming here for not less than eight centuries.²⁷

The geographical situation of the region in the late Third and early Second millennia BC, the natural habitat of simultaneous settlements.

We should note the presence of a large number of settlements, simultaneous to Gonur, as those already explored and well-known in the scientific literature, and those yet unexplored, under the common name of the Ancient Murgab Delta (see V.I. Sarianidi, 1990). It is yet to be that we put together the unrelated individual archaeological sites into the future town-planning system.

The town-planning picture of the complex Gonur is the most studied and involves not only the simultaneity of the idea of the ancient lord's of this region, but also the construction of all the elements of the compound ensemble of this *religious and dynastic center* based on a single, pre-created project, which shows the overall developed culture of this population despite the lack of archaeological finds of writing evidences. The fortification of this ensemble was rather advanced and consisted of three stages. The Palace and Temple buildings were surrounded by a similar-to-square fortress wall (appr. 115x120m) with towers, which in turn was surrounded by a so-called *square* (appr. 250x250m), also with the presence of rectangular towers in its composition. In addition, these structures were defended from the north and south by the ovals of irregular shape that also represented fortification walls of Gonur-depe.

When examining the above-mentioned drawings, there were defined several indirect signs of some sort of the linguistic and counting alphabets. How was the old project presented? Perhaps it was a drawing-high-relief on a clay plate or a 3D model made of clay, as was presented in the finding from Mari (surely, such table-charts or models were plenty in hands of ancient builders).²⁸

Large-scale construction works, not to mention the correct geometrical construction plans of all structures, their orientation to the cardinals would have been impossible without preliminary calculations. Presentation of sizes and directions of the walls from the large-scale model, height of overlapping ceilings, and other paraphernalia disclosures is the vital information, without which the construction of grandiose structures would be impossible for several generations. Hence, there was at least an elementary "counting alphabet" so necessary for preliminary zoning of the ground, for measuring the dimensions, for control over the construction works. Unfortunately, yet no signs of such "counting literacy" have been found during the excavation works.²⁹

²⁷ See, for example, the dating life of the monument, as well as that in 1500 BC the life on the monument stopped: G.I.Zaitseva, N.A. Dubova, A.A. Sementsov, P. Reimar, J. Mallory, H. Yungner. "The radiocarbon chronology of the monument Gonur Depe" // "Proceedings of the Marghiana archaeological expedition." V.2. Moscow, 2008. P.179.

²⁸ See, for example. M.A. Mammedov, "The ancient architecture of Bactria and Marghiana", Ashgabat, 2003. P.92, Fig. with the findings of the clay model of the castle in Mari (Syria).

²⁹ The existence of a countable alphabet may be proven by finds of so-called *tokens* (spherical clay fragments with schematic symbols on them), which were found at the northern gates of the Palace of Gonur. (Sarianidi, 2002. Pp.286-287).

Signs of the so-called "Capital fame" of Gonur Depe – the capital of Marghiana. One can assert that the Kremlin and the Palace are parts of a large *proto-urban* formation that was apparently a capital of this region, if not of the whole Marghiana. For a city with such a vast area and a variety of functions, a complete absence of residential areas in the excavations is quite understandable and can be explained by thousands of years of the natural and anthropomorphic destructive impacts that apparently led to total destruction of non-monumental buildings in Gonur. Remember that more than four thousand years have passed since the time of its construction, and it is quite clear that the most fragile structures, first of all residential buildings, have not survived to our times. Referring to the most recent history, we note that the standard wearing-out period of adobe dwellings in Central Asia is calculated to be no more than 50-100 years. The residential buildings in Gonur proved to be short-lived. We should also note that many Egyptian and Mesopotamian monumental complexes presented by only "royal" structures. Ordinary buildings have neither been preserved there.

The number and structure of its population, structure of the urban households, of maintenance of the palace and temples. Though Gonur was a temple town, in which no one had ever lived continuously, except for the royal family (which was repeatedly stated by V.I. Sarianidi), but still someone had to diligently and continuously support the livelihoods of the Kremlin, arriving from the vast surrounding neighborhoods. This means that there inevitably had to be some settlements in the area of walking distance.

The authors-architects assume that Gonur certainly had initial residential districts within the walking distance from the Kremlin. It is easy to see that the number of such buildings should have been enough for at least 5-15 thousand inhabitants, who were necessary for the operation of power-administrative personnel and religious apparatus of the Kremlin. These people, in turn, needed the maintained structure of the security, temple, artisan and peasant departments that supplied the Kremlin with food, water, firewood, and other items vital for ordinary life in a confined territory. Only for the purpose of uninterrupted supply of firewood to numerous ritual furnaces and altars of churches of the Kremlin and its surroundings, the human resources of Gonur could total to several thousand people ... Where could the anticipated residential neighborhoods be located? *Temenos* and the *Necropolis* of Gonur, discovered by now and dating back to the same *first* construction period, were located to the south and west from the Kremlin. The residential structures could not be built on these lands. Consequently, residential districts could be placed only to the north and east. But a vast area in the East has already been occupied by modern arable lands, which eliminates the chance to search for ancient structures here. There remains a small area to the north, where the search for possible traces of settlements related to Gonur might be carried out. The search for remaining of the Gonur housing should be focused in this particular place.

Transport links with neighboring states, waterways, watering and irrigation. Analysis of the region's urban development plan, the geographical and historical components of the problem of settlement and cultivation of the territory by ancient Gonur-citizens prove the close connection between its location and the choice of the construction site with water, or rather with a certain channel of an ancient river, on which flourished the civilization of Gonur, and perhaps of the whole BMAC³⁰ - **Bactrian-Marghiana Archaeological Complex**. Architect M.A. Mammedov clearly points to great similarity of architectural-constructional traditions both in Bactria and in Marghiana,³¹ which would have been impossible without direct economic ties between the two historical regions.

The analysis of economic-related water flow in Gonur shows that the power of the water-flow from the Murghab River would not be enough to support the life of all the settlements in the Ancient Murghab Delta.

The proposed riverbed of the Proto-Amu Darya River. The Xerothermic period during the second half of the 3rd millennium BC, mentioned by many oriental historians, contradicts to the high water sufficiency of the Murghab River, which was necessary for water supply to the large population of Marghiana. There appears a very probable suggestion of a possible extra run-off of the Proto-Amu Darya River through the Murghab oasis

³⁰ Abbreviation BMAC was introduced into scientific use by V.I. Sarianidi. See, e.g., V. Sarianidi *Antiquities of the State of Margush*, 1990, pp. 12-15.

³¹ M. Mammedov. "The ancient architecture of Bactria and Marghiana", Ashgabat, 2003. P.92, a picture from the findings of the clay castle model from Mari (Syria).

into the Caspian Sea in the period under review. This water run-off actually took place in prehistoric times, and possibly during the Holocene. However, some authors associate this water run-off with the functioning of Uzboi, meaning both Sarykamys and Kelif Uzboi³², But no specific data have been recorded in the scientific literature regarding the operation of the water line from the Amu Darya River into the Caspian Sea at the end of the third millennium BC.

Unbelievable at first glance, the assumption of existence of the Proto-Amu Darya River during the examined period has some indirect confirmations. Here they are.

- The only water-transport link between Bactria and Marghiana along the proposed riverbed of the Proto-Amu Darya River ensures the real existence of a common culture, recorded by the latest researches.
- There were no large settlements of the Bronze Age in Khorezm simultaneous to Gonur, due to the possible absence of the water-flow from the Amu Darya River into the Aral Sea at that time.³³
- The map-scheme based on satellite photography processed by Google objectively and graphically indicates the thalweg of the *Proto-Amu Darya River* with darker spots, whereas a simple estimation of the lowest points on this line (*thalweg*) shows also the contemporary probability of such a flow. This all means that a permanent lowering of the surface marks from the beginning of the *proto-runoff* (height 155bm "Baltic meters") to the inflow into the Caspian Sea (-23bm), at the same time exceeding the level of the left bank of the Amu Darya River in Chardjou makes not more than 5m above the level of its modern flow. Today to send the Amu Darya River waters along the mentioned thalweg it would be enough to dig a 5-meter-deep channel.
- According to V.Masson³⁴, the map of the population expansion of peoples shows that in the 2nd millennium BC the northern boundary of the settlement exactly coincides with the river-bed of the Proto-Amu Darya River located on the 39th parallel.
- According to N.Bunin³⁵, the scheme of the ancient agricultural zone of Afro-Asia (3rd -1st millennia BC), as the basis of ancient civilizations, shows the line of cultivation limited by parallels of the 39th and 20th degrees of the northern latitude, but the 39th parallel is where the track of the Proto-Amu Darya River lies.
- According to Yu.Chikin³⁶, a lebetina viper with a unique color endemic in the middle reaches of the Murghab River has an echolocation in the valley of the Amu Darya River below Chardjou and such relocation of the lebetina viper is possible only by water.
- A hypothetical map of Central Asia, compiled by verbal description of ancient authors, the so-called state of *Strabo*, demonstrates the existence of the above-mentioned route of the Proto-Amu Darya River.³⁷ However, it is known that in ancient times there was no constant flow of the Amu Darya River into the Caspian Sea, except for the rare and insignificant spillovers along the dry riverbed of the Uzboi River associated with the flood time of the Daryalyk River (the Sarykamys riverbed of the Amu Darya River) from time to time. Therefore, ancient authors relied on some kind of an ancient legend about the waterway from India to the Middle East, probably inspired by the possible existence of such a channel in the period from 2300 to 1800 BC. The historical brevity of the water-flow (not longer than 500-600 years) explains the absence of its obvious and visible traces in the present. All of these indirect factors of the existence of the Gonur Proto-Amu Darya River

³²See, in particular, D.D. Bukinich. The old riverbed of the Oxus and the Amu Darya problem (With regard to flooding of the Kelif Uzboi and Daryalyk) // Library of the "cotton case". 1926. Book. 4.

E.D. Mammedov, G.N. Trofimov. Paleo-climates and evolution of lakes in the Holocene ... and G.N. Trofimov. Paleo-hydrology of the Uzboi. // Bulletin of the commission on studying the quaternary period. - Moscow: Nauka, 1986. - N 55. - Pp. 107-111.

³³ B.I. Weinberg. Ethno-geography of Turan in ancient times. 7th century. BC – 8th AD. - Moscow. 1999. p.114.

³⁴ V.M. Masson. Altyn-Depe, Moscow. 1981. p.130, fig. 34.

E.V. Rtveldze. The Great Indian Road. St. Petersburg 2012.

³⁵ A.N. Bunin. The history of urban planning. Moscow. 1985. Fig. 45 p.67.

³⁶ Y.A. Chikin. Geographic variation of non-metric color characteristics of the Central Asian viper *Vipera turanica* // Taxonomy. Phylogeny. Leningrad. 1991. Fig. 3.

³⁷ K. Rappen. Trade route from India to Pontus: between mapping mirage and archaeological reality // Proceedings of the International Conference. "The road of Strabo" as part of the Silk Road, Baku. 2008. p.101. with ill.

Bregel, Yuri. A Historical Atlas of Central Asia. 2003. Fig. 26

can be confirmed or refuted only by hydro-geological study of soils on the proposed route, which will be the subject of further researches by future generations of scientists.

Thus, this publication is intended to denote the set of problems related to the deep study of the ancient town-planning in Marghiana, the civilization whose existence is very disputable today in the scientific world. The version about strong and direct influence of the Middle Eastern cultures on the appearance of a new civilization in the region is evidenced by numerous architectural and urban-planning analogies. But this problem also contains another no less important factor, which is the fact that this culture in its genesis is closely linked to local traditions of the influence from both the agricultural ecumene and the marginal edges of the nomads.

List of illustrations.

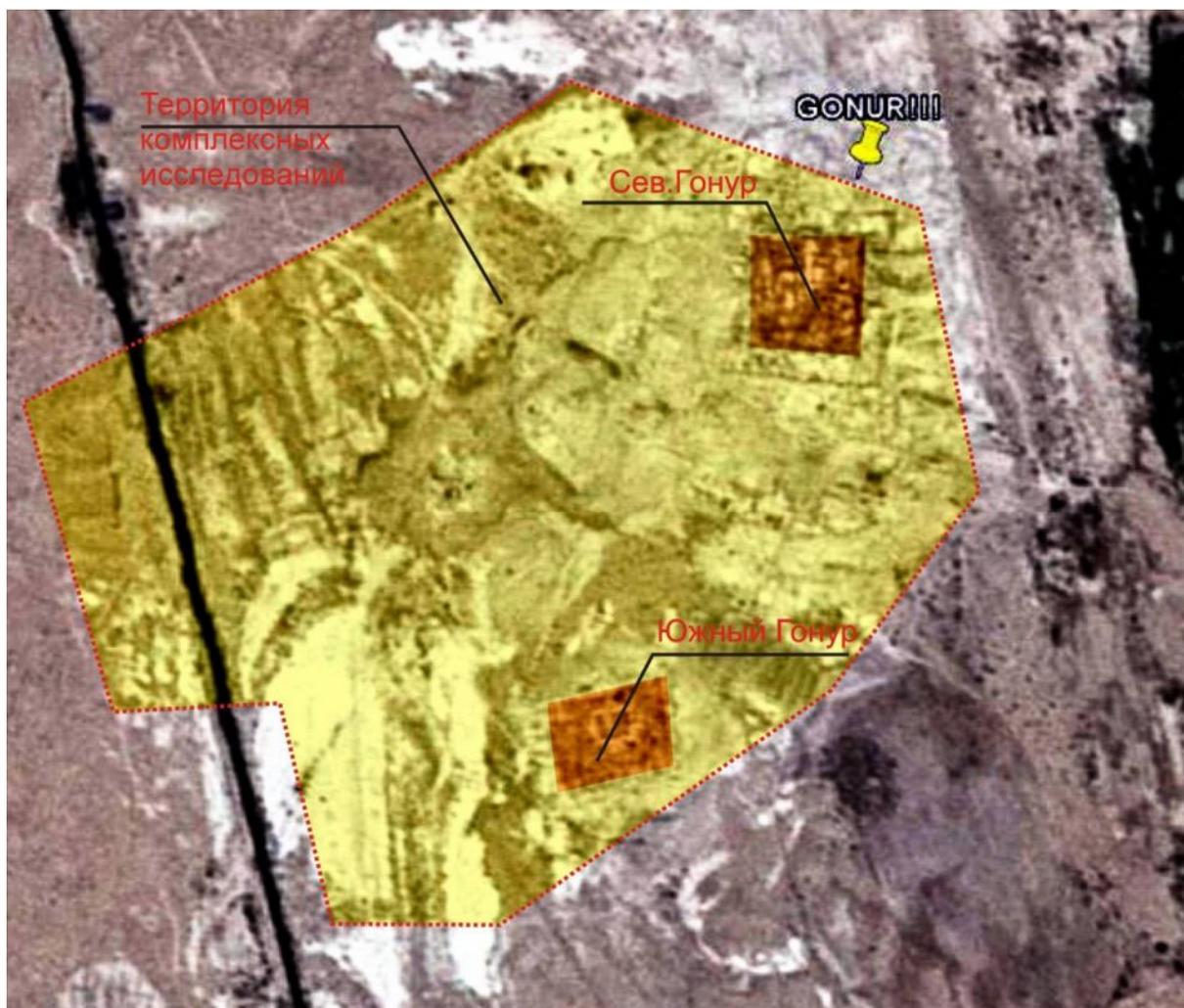
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1. Banner at the entrance to the site of ancient settlement Gonur Depe.
2. Situational scheme of the settlement complex Gonur Depe made by GOOGLE space-photography.
3. North Gonur. Aerial photography by G. Dautiane (2009), combined with the authors' instrumental measuring.
4. Examples of brick-masonry of the walls.
5. North Gonur. Arrangement of architectural elements with a brick-block module.
6. Traces of arches at the eastern tower e5 (photo from the north).
7. North Gonur. Palace. Axonometry of the general view.
8. North Gonur. Palace. Plan (the numbering of premises was done by V.Sarianidi). The cross sections of the Palace 1-1, 2-2, 3-3.
9. North Gonur. Palace. Scheme-model of a hypothetical plan by the ancient architect. A. The first period of construction. B. The second period of construction
10. Hypothetical scheme of splitting the contour of the future Kremlin and its towers by the ancient architects. The diagram shows a comparison of the proposed construction of the Kremlin contour and arrangement of a large altar Togolok-21.
11. Artifacts of counting and symbol literacy. Bone game board, lined in the form of a 5x5 grid.
12. Artifacts of counting and symbol literacy.
13. North Gonur. Kremlin. Curtain with light apertures into the bypass corridor.
14. Kremlin. Reconstruction of the walls and towers. Plans, cross-sections, facades. Legend (conventional signs): 1 – Main structures. 2 – Instrument case and buttresses. 3 – Line of preserved structures.
15. The Kremlin. Cross-section along the bypass corridor and tower.
16. North Gonur. Mosaic of rich tombs.
17. North Gonur. Palace. The scheme of reconstruction of the fragments of the eastern and northern facades. Images of buildings on porcelain plates from the Palace of Knossos (Island of Crete). Around 1600 BC. From the book "Architecture of the Ancient World", Moscow, 1970, p.168.
18. Palace. Diagram of a hypothetical plan by the ancient architect. A – the first period of construction. B – the second period of construction.
19. Analysis of a hypothetical construction plan of the Palace by the ancient architect: A – a diagram of symmetrical arrangement relatively to the main planning axis. B – a scheme of superposition of a hypothetical plan A onto the existing one. Highlighted are the matching places of the hypothetical fragments with the existing fragments.
20. Palace. Stepped niches "Blind Windows".
21. Kremlin. Ritual furnace in the tower s05.
22. North Gonur. Palace. Organization chart of ritual furnaces and niches "Blind Windows" in the main halls.
23. Palace. Organization chart of overlapping ceilings and light wells. Legend: 1 – overlapped rooms, 2 – half-open rooms, light wells on pillars, 3 – open rooms, courtyards, 4 – rooms on the 2nd level, tower-temples.
24. Palace. Cross-section 1-1. Organization chart of overlapping ceilings and light wells in the main rooms.
25. Palace. The scheme of reconstruction of buildings. Cross-sections 1-1, 2-2, 3-3. A – north-south cross-section 1-1. B – west-east cross-section 2-2. B – north-south cross-section 3-3 along the "Sand Rooms (North Complex)".
26. Palace. Conservation of the walls. Imitation of wood columns.
27. Palace. North Complex of the "Sand Rooms". First preserved stairs of the grand staircase.
28. Palace. North Complex "tall temple-tower." The scheme of reconstruction. Plan, cross-section, facade. Legend: 1 – the line of existing socle. 2 – a reconstruction line of the 2nd floor. 3 – floors, ceilings. 4 – brick walls. 5 – sand filling.
29. Mesopotamia. Dur-Sharrukin. Palace of Sargon II, 8th century BC. A – a staircase plan fragment. B – a plan of the residence hall "L" (by E. Heinrich, 1984, pp.146-150 ill.101).

30. Khorezm. Toprak-kala, 2nd century. Construction diagram of the High Palace platform structure by M.S. Lapirov-Skoblo (Y.A.Rapoport, and others, 1984. P.26).
31. North Gonur. Palace. Complex of the "cells". Plan, cross-section 1-1.
32. General view of the site of ancient settlement North Gonur from the East (2005).
33. The general plan of the complex Gonur Depe.
34. Mari. Mesopotamia. Clay "model" of a monumental structure (from the book by M. Mammedov "Architecture of Ancient Bactria and Marghiana", 2003).
35. Scheme of the flow of a hypothetical route of the Proto Amu Darya River on its delta landscape (Google).
36. The scheme of urban culture distribution in Central Asia (by Masson).
37. The scheme of ancient agricultural zone in the 2nd millennium BC (By Bunin).
38. The distribution scheme of the Central Asian types of viper (by Chikin).
39. The scheme of the map by words of ancient writers – a "map of Strabo" (in Bunbury).
40. Scheme of the BMAC formation – Bactria-Marghiana Archaeological Complex created by satellite photography in Google.



1. Banner at the entrance to the site of ancient settlement Gonur Depe.



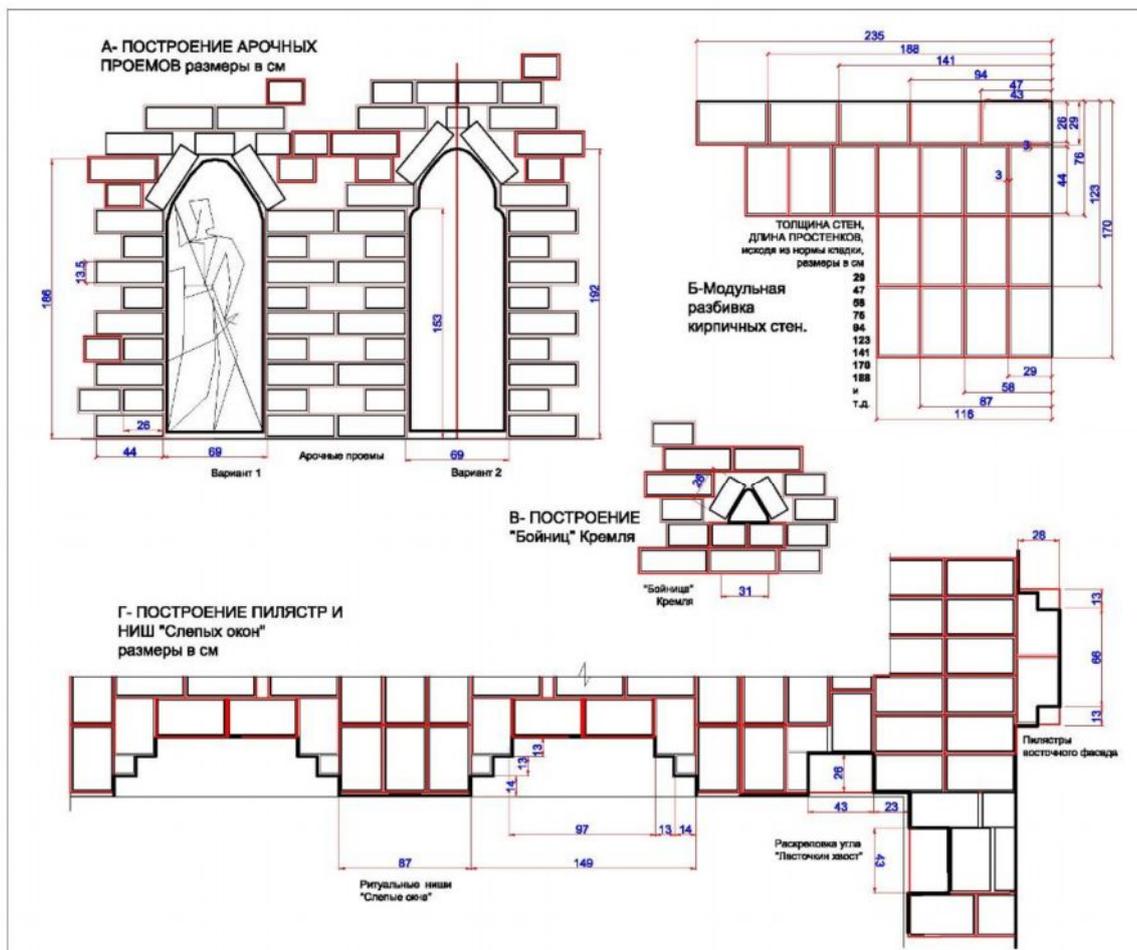
2. Situational scheme of the settlement complex Gonur Depe made by GOOGLE space-photography.



3. North Gonur. Aerial photography by G. Dautiane (2009), combined with the authors' instrumental measuring.



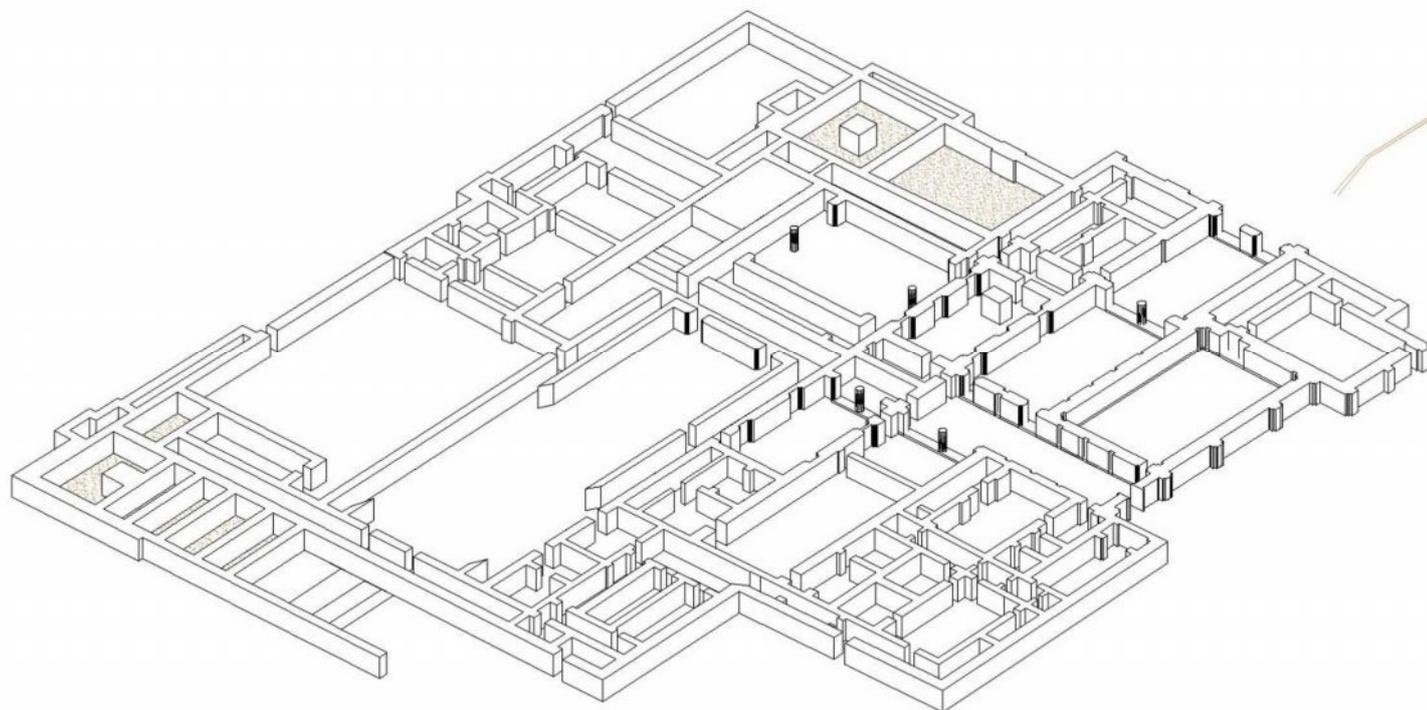
4.Examples of brick-masonry of the walls.



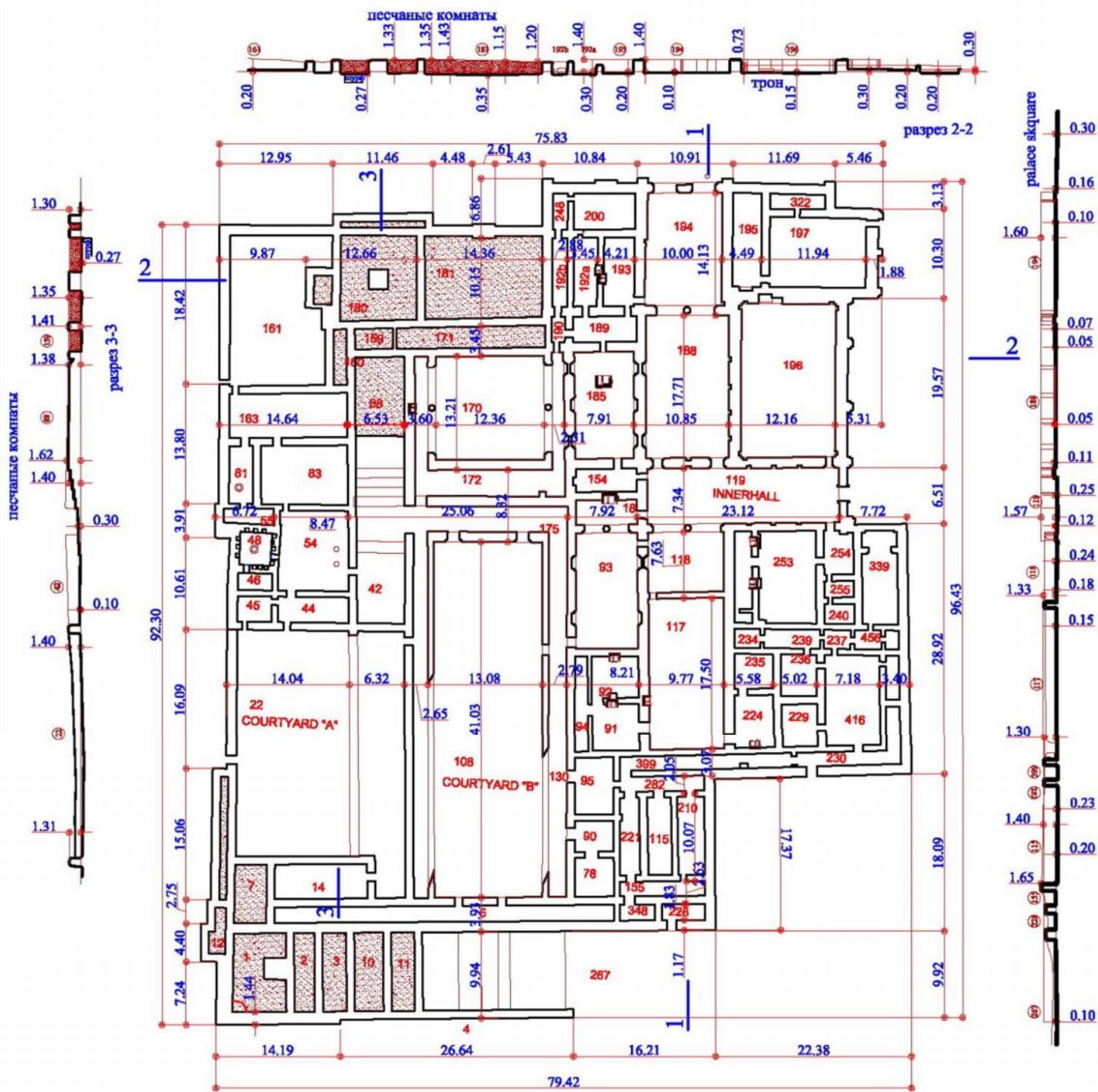
5. North Gonur. Arrangement of architectural elements with a brick-block module.



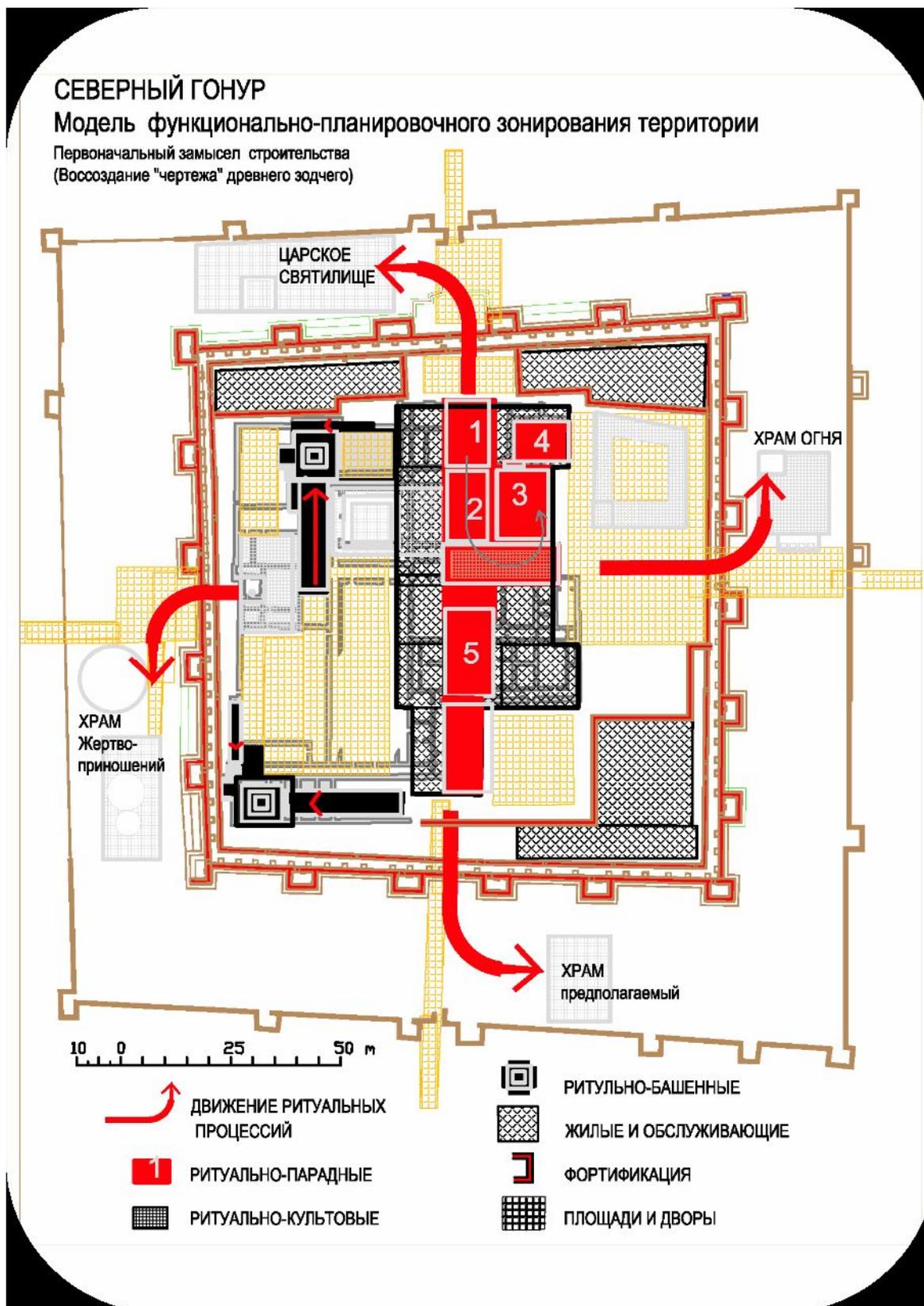
6. Traces of arches at the eastern tower e5 (photo from the north).



7. North Gonur. Palace. Axonometric of the general view.



8. North Gonur. Palace. Plan (the numbering of premises was done by V.Sarianidi). The cross sections of the Palace 1-1, 2-2, 3-3.



9. North Gonur. Palace. Scheme-model of a hypothetical plan by the ancient architect. A. The first period of construction. B. The second period of construction

10. Hypothetical scheme of splitting the contour of the future Kremlin and its towers by the ancient architects. The diagram shows a comparison of the proposed construction of the Kremlin contour and arrangement of a large altar Togolok-21.



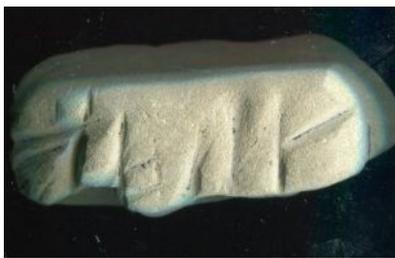
11. Artifacts of counting and symbol literacy. Bone game board, lined in the form of a 5x5 grid.



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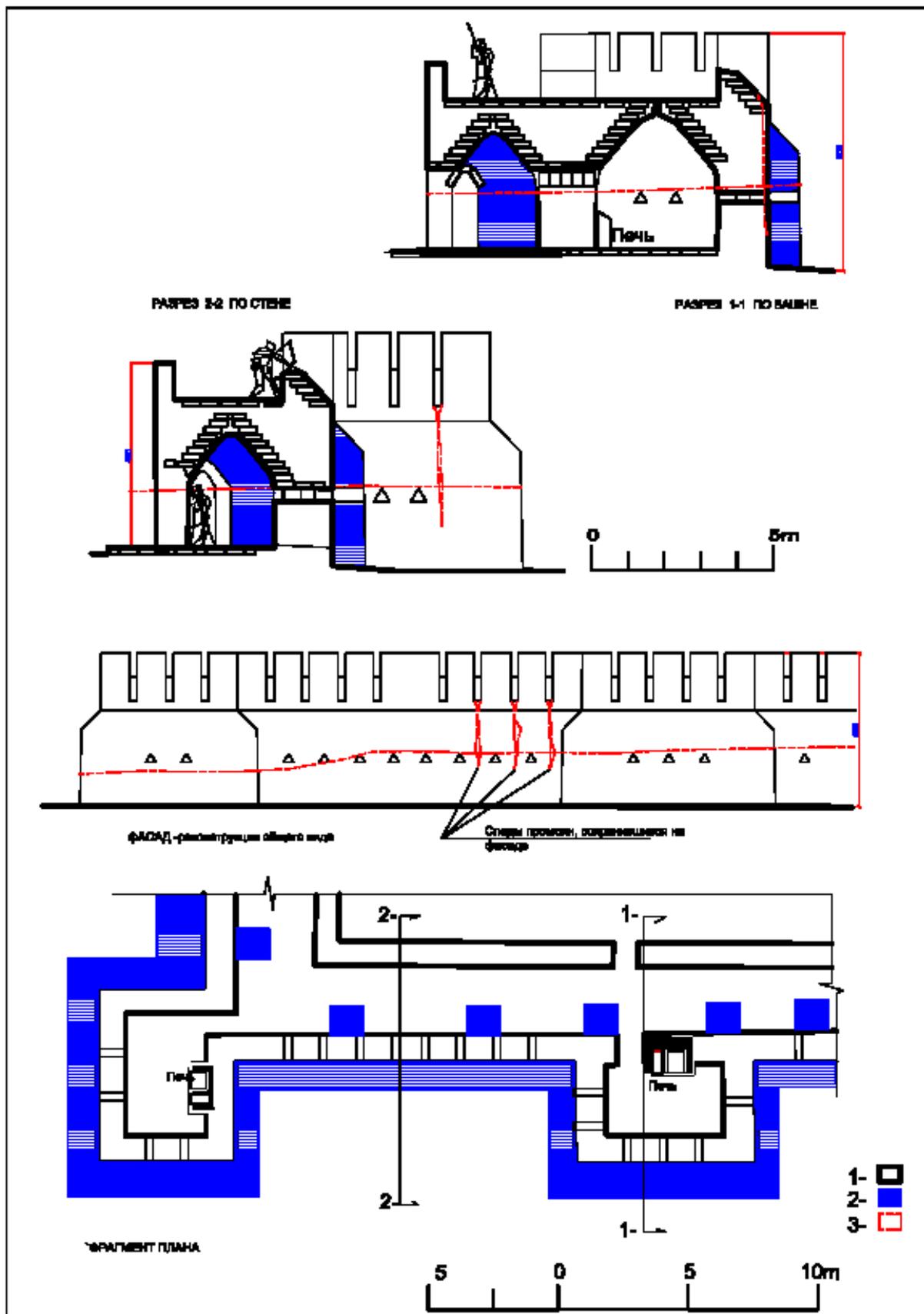
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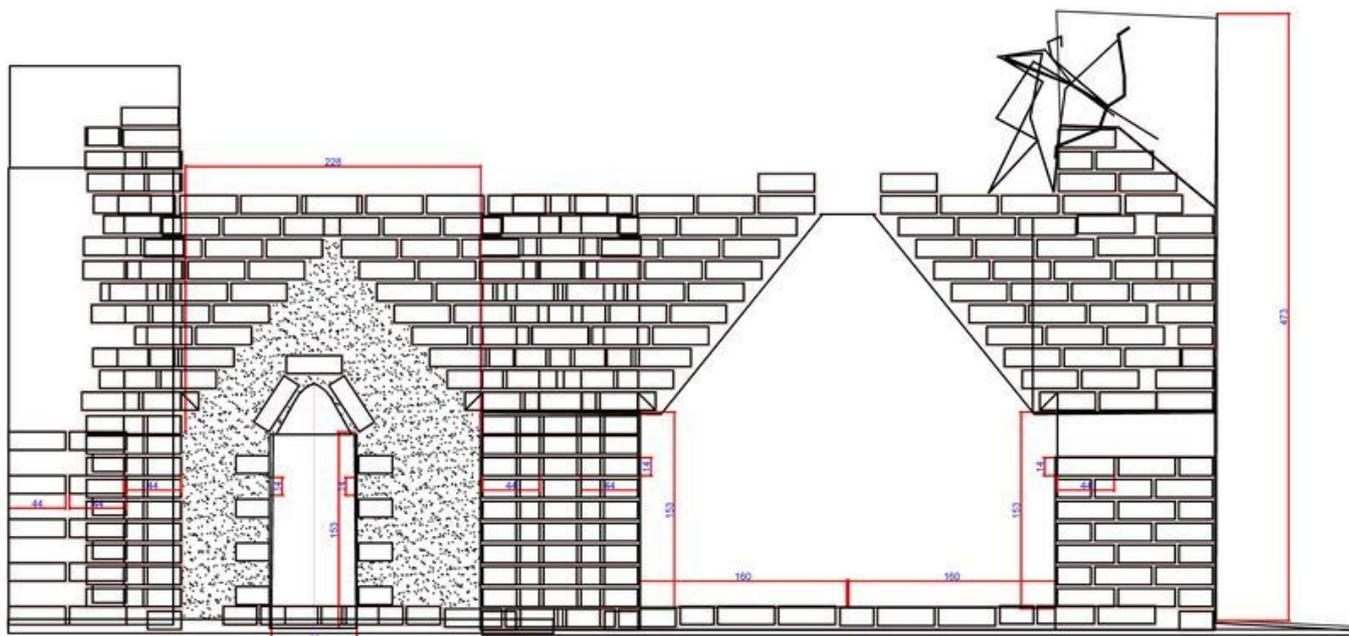
Artifacts of counting and symbol literacy.



13. North Gonur. Kremlin. Curtain with light apertures into the bypass corridor.



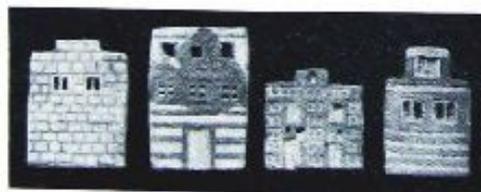
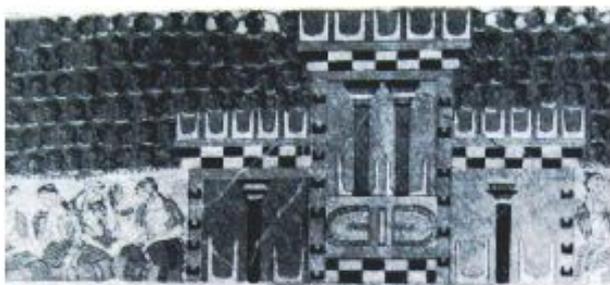
14. Kremlin. Reconstruction of the walls and towers. Plans, cross-sections, facades. Legend (conventional signs): 1 – Main structures. 2 – Instrument case and buttresses. 3 – Line of preserved structures.



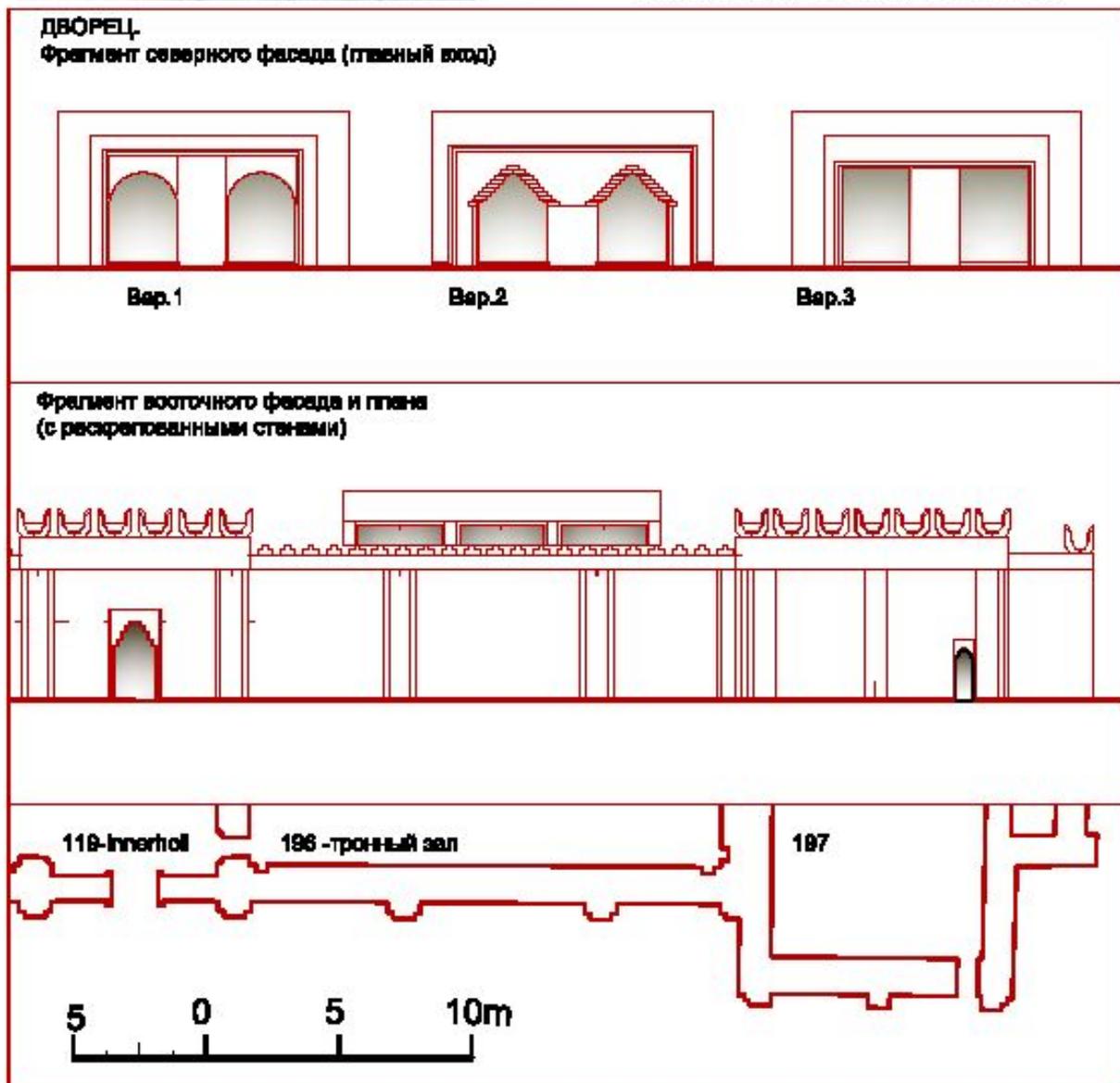
15. The Kremlin. Cross-section along the bypass corridor and tower.



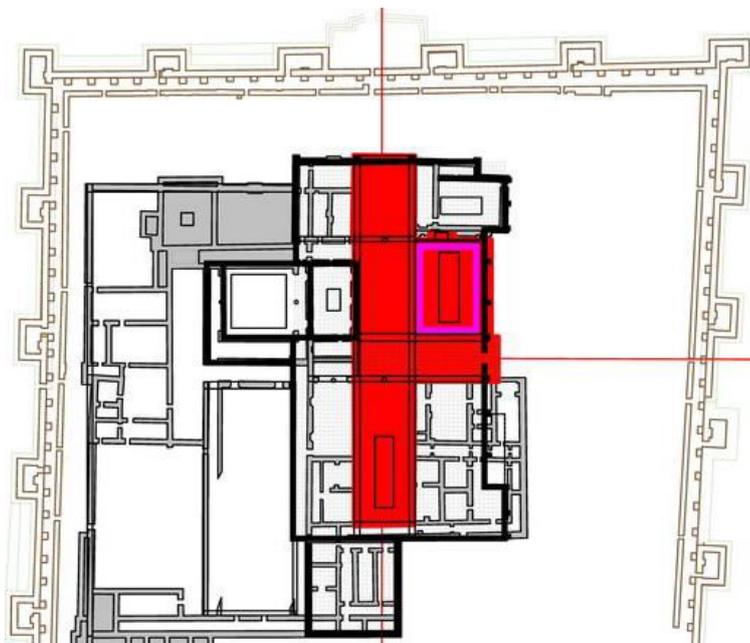
16. North Gonur. Mosaic of rich tombs.



Изображения зданий на фаянсовых табличках из Кносского дворца. Около 1600г. до н.э. Архитектура Древнего мира, 1970, с.168

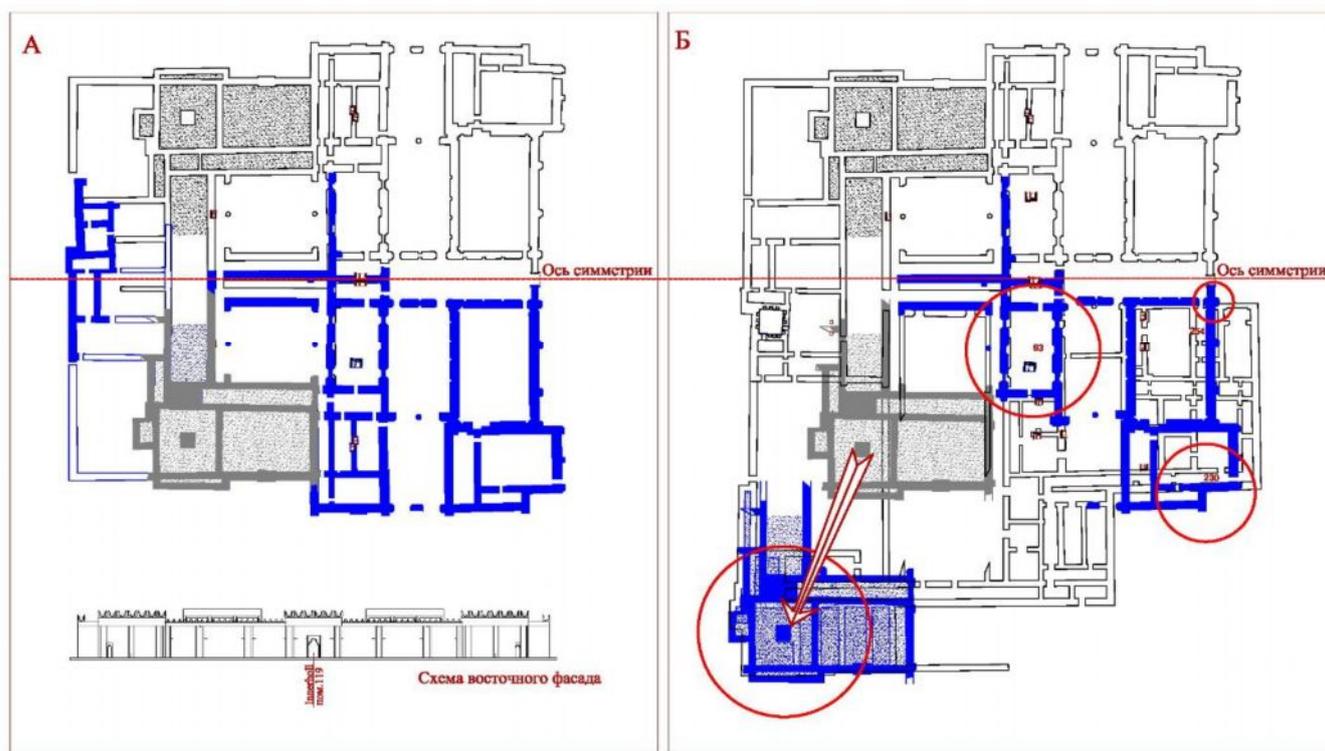


17. North Gonur. Palace. The scheme of reconstruction of the fragments of the eastern and northern facades. Images of buildings on porcelain plates from the Palace of Knossos (Island of Crete). Around 1600 BC. From the book "Architecture of the Ancient World", Moscow, 1970, p.168.



18. Palace. Diagram of a hypothetical plan by the ancient architect. A – the first period of construction. B – the second period of construction.

Analysis of a hypothetical construction plan of the Palace by the ancient architect: A – a diagram of symmetrical arrangement relatively to the main planning axis. B – a scheme of superposition of a hypothetical plan A onto the



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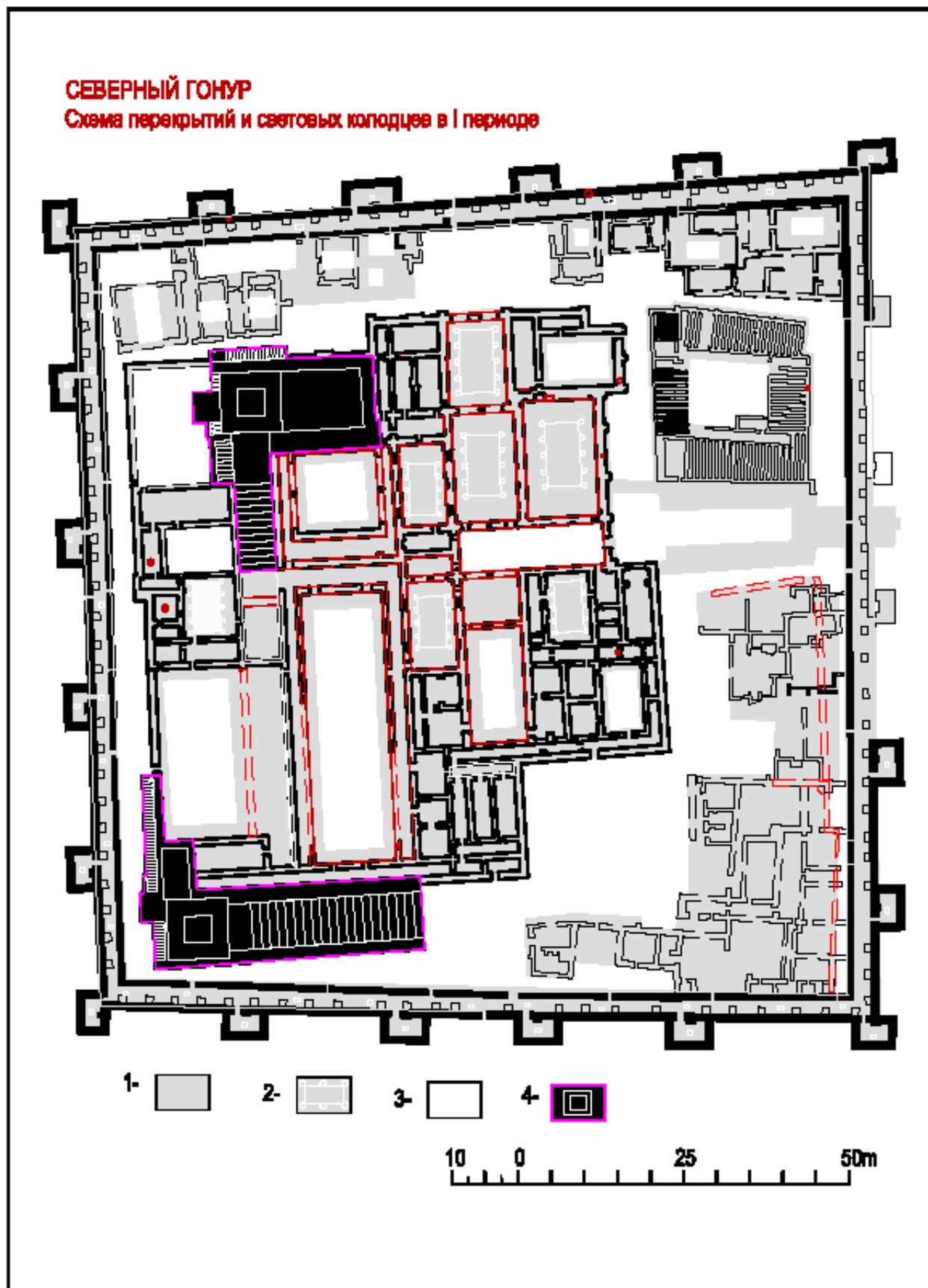
20. Palace. Stepped niches "Blind Windows".



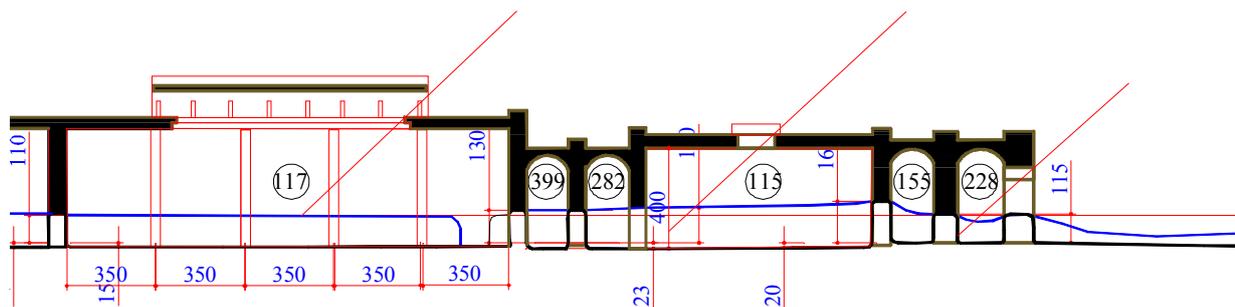
21. Kremlin. Ritual furnace in the tower s05.



22. North Gonur. Palace. Organization chart of ritual furnaces and niches "Blind Windows" in the main halls.



23. Palace. Organization chart of overlapping ceilings and light wells. Legend: 1 – overlapped rooms, 2 – half-open rooms, light wells on pillars, 3 – open rooms, courtyards, 4 – rooms on the 2nd level, tower-temples.



24. Palace. Cross-section 1-1. Organization chart of overlapping ceilings and light wells in the main rooms.



25. Palace. The scheme of reconstruction of buildings. Cross-sections 1-1, 2-2, 3-3. А – north-south cross-section 1-1. Б – west-east cross-section 2-2. В – north-south cross-section 3-3 along the "Sand Rooms (North Complex)".



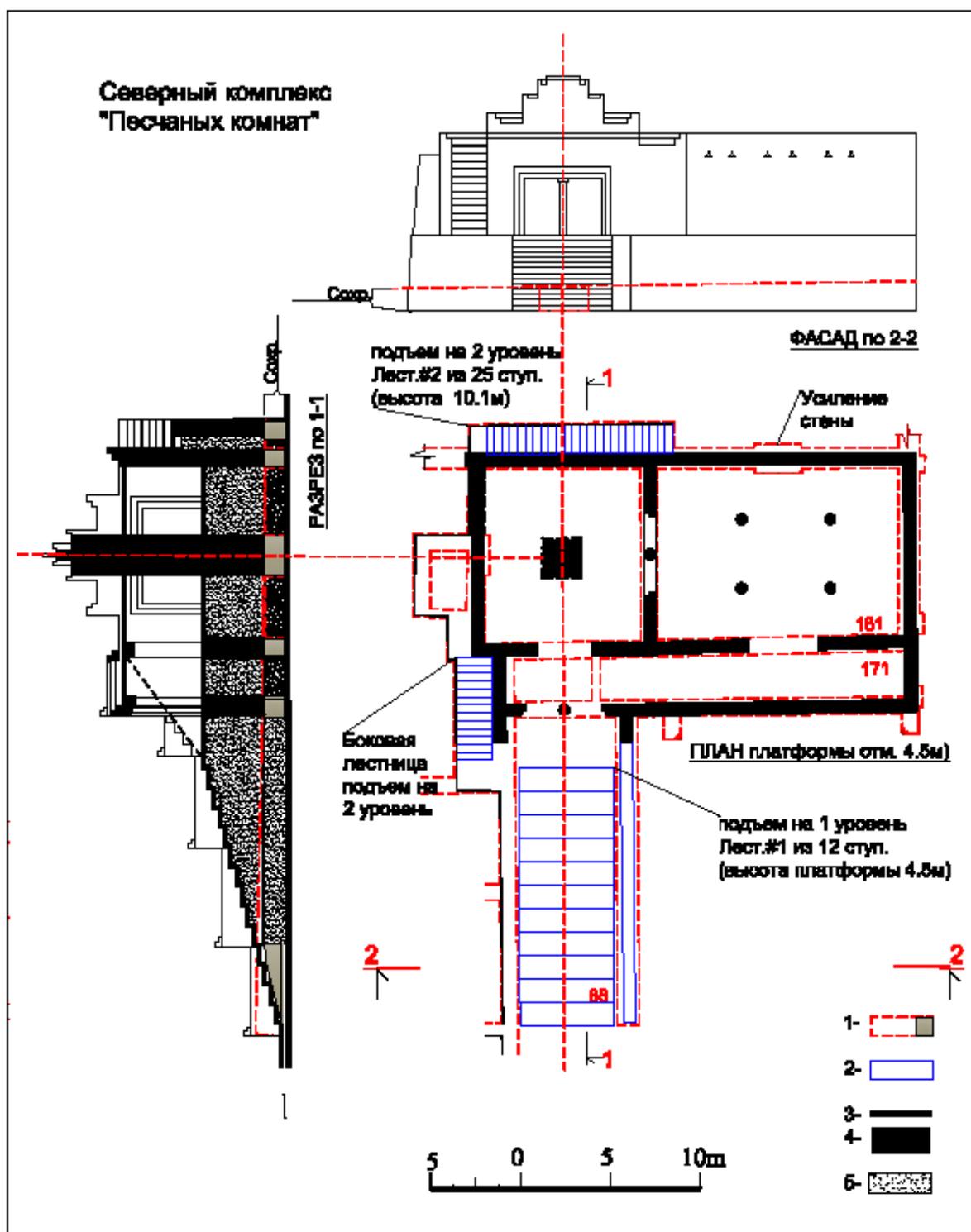
26. Palace. Conservation of the walls. Imitation of wood columns.



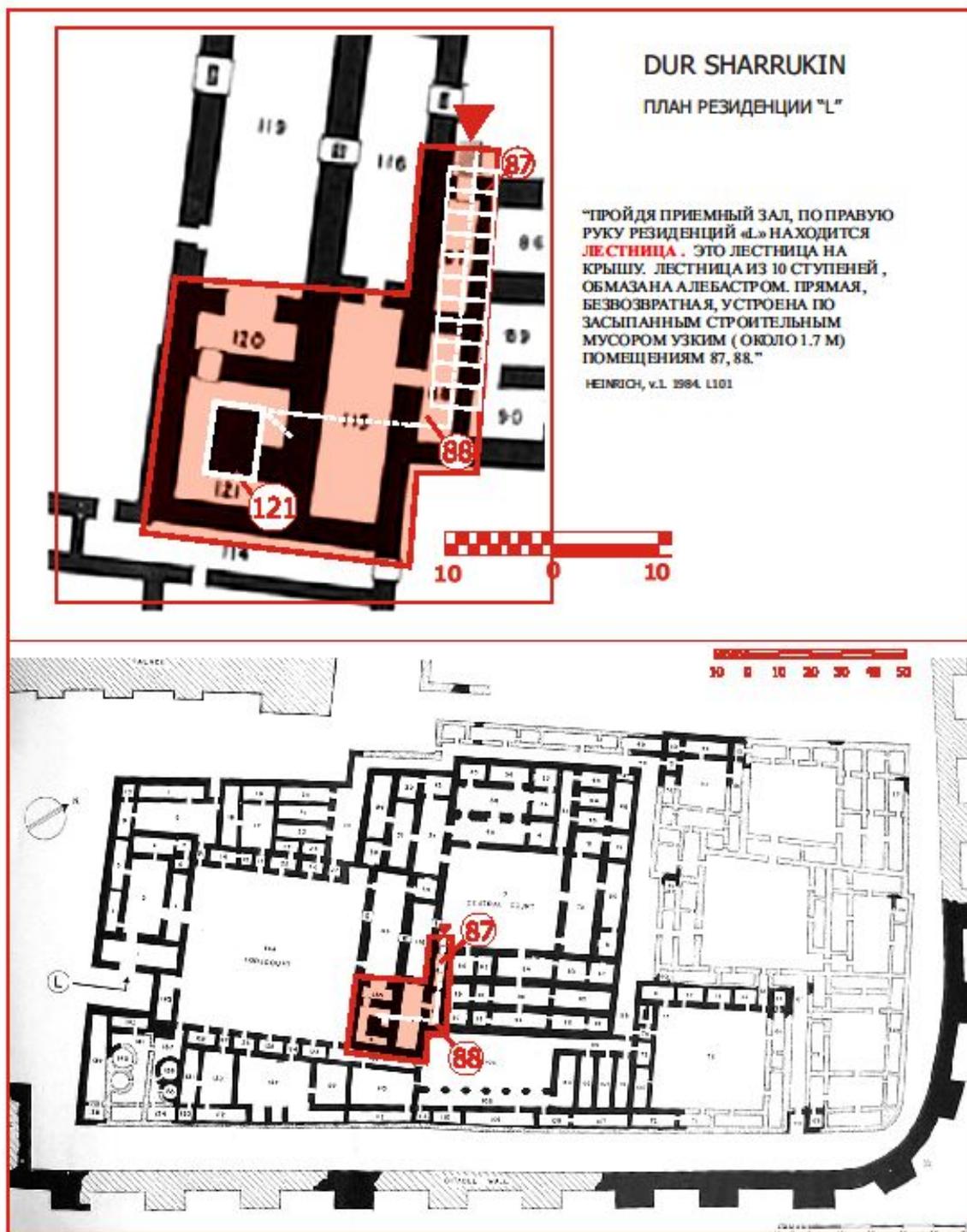
27. Palace. North Complex of the "Sand Rooms". First preserved stairs of the grand staircase.



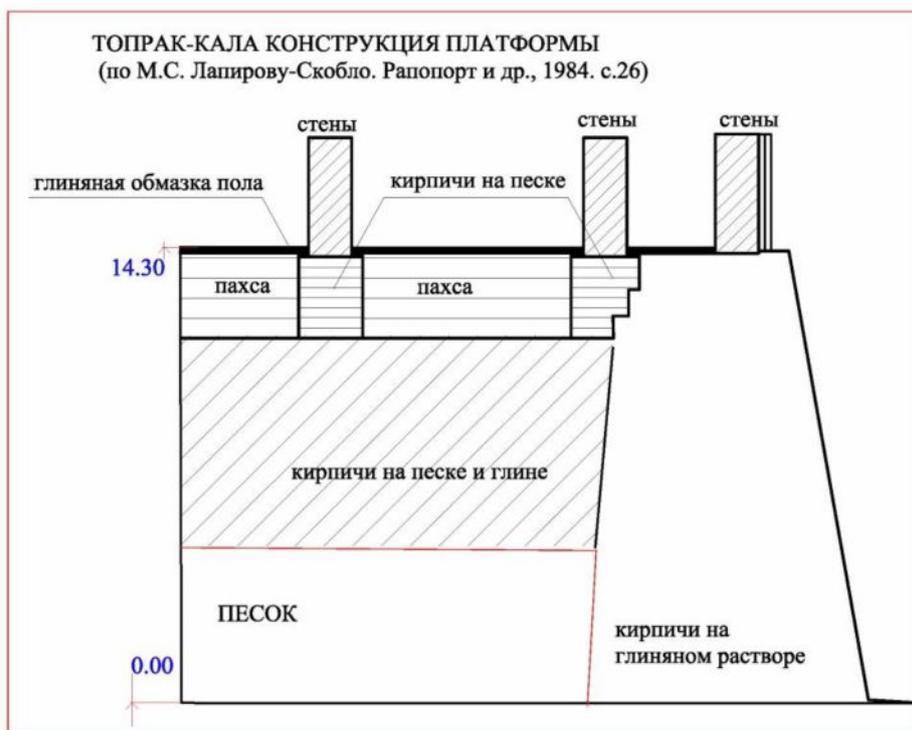
Palace. North Complex of the "Sand Rooms". First preserved stairs of the grand staircase.



28. Palace. North Complex "tall temple-tower." The scheme of reconstruction. Plan, cross-section, facade. Legend: 1 – the line of existing socle. 2 – a reconstruction line of the 2nd floor. 3 – floors, ceilings. 4 – brick walls. 5 – sand filling.

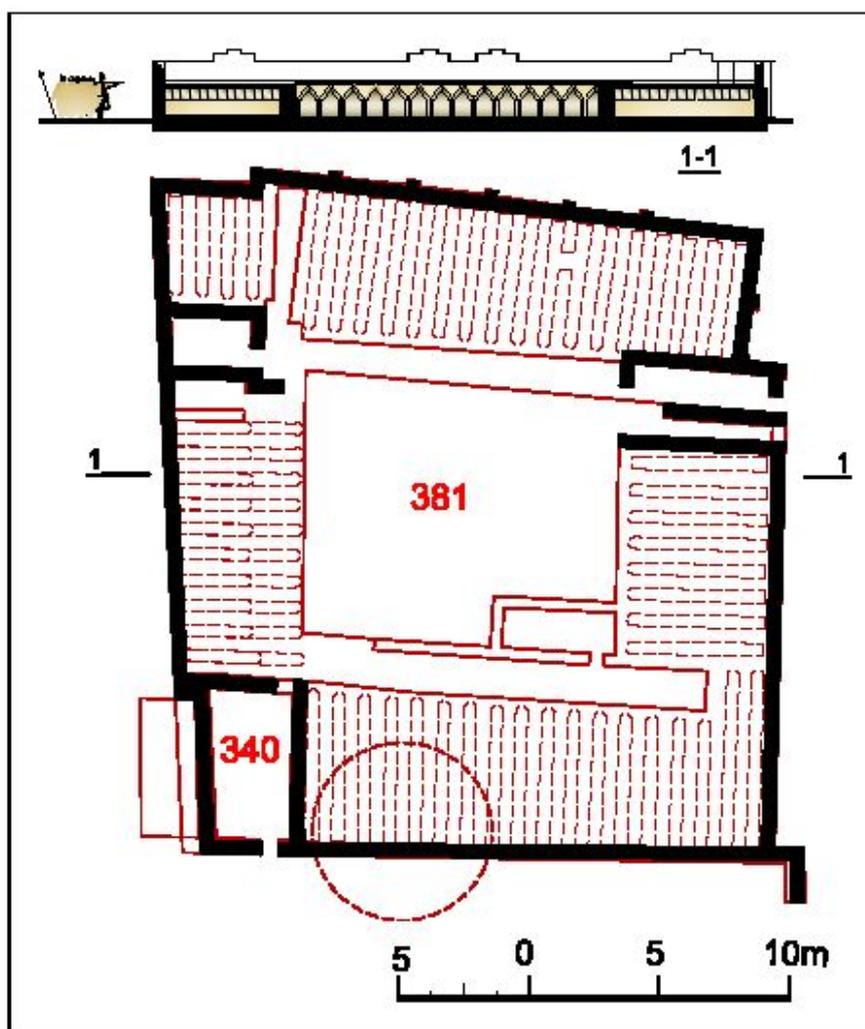
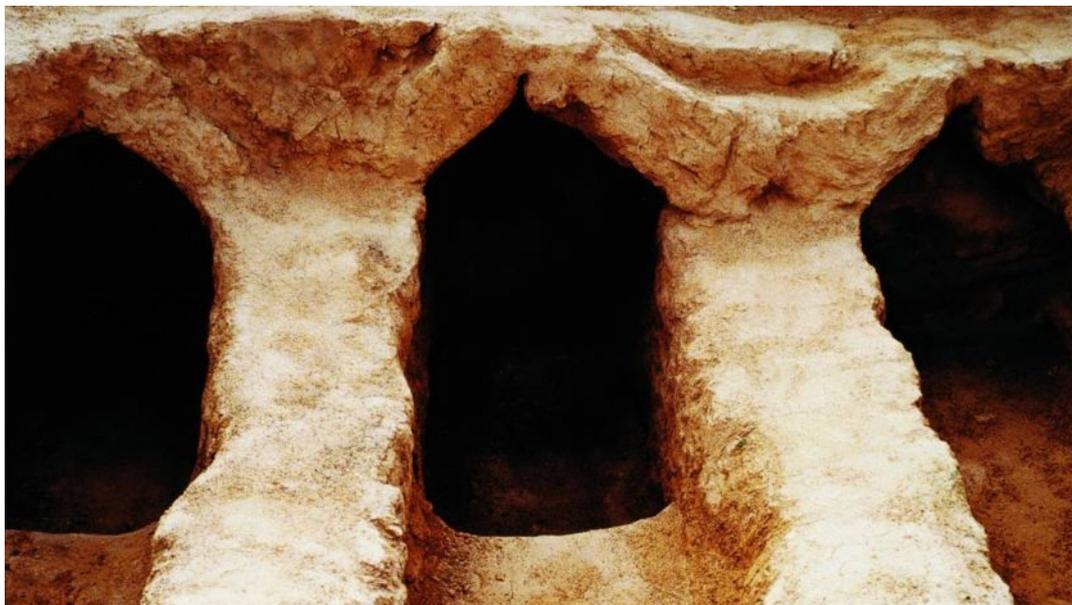


29. Mesopotamia. Dur-Sharrukin. Palace of Sargon II, 8th century BC. А – a staircase plan fragment. Б – a plan of the residence hall "L" (by E. Heinrich, 1984, pp.146-150 ill.101).

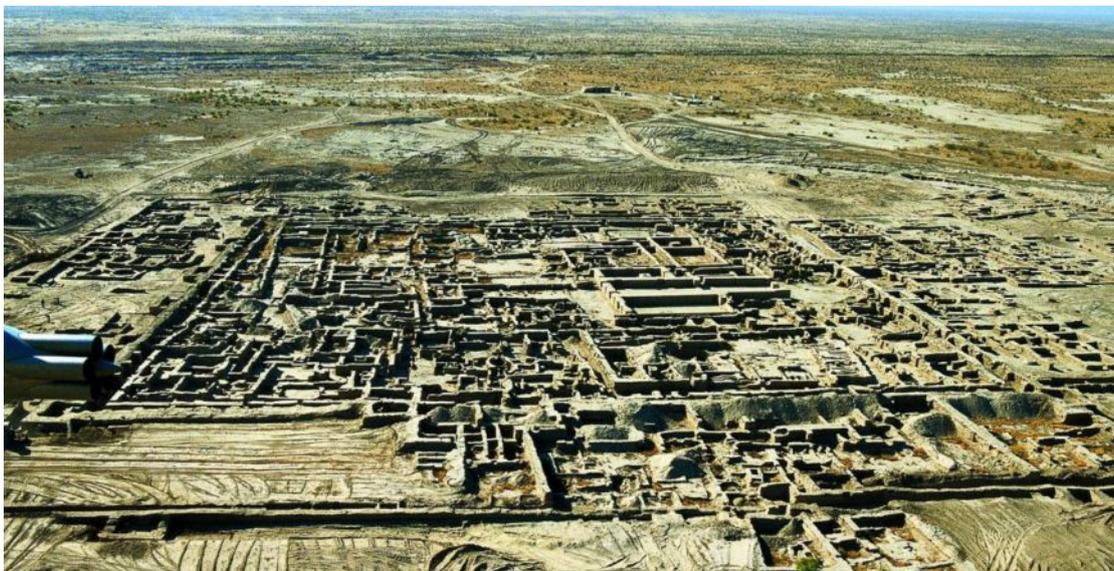


30. Khorezm. Toprak-kala, 2nd century. Construction diagram of the High Palace platform structure by M.S. Lapirov-Skoblo (Y.A.Rapoport, and others, 1984. P.26).





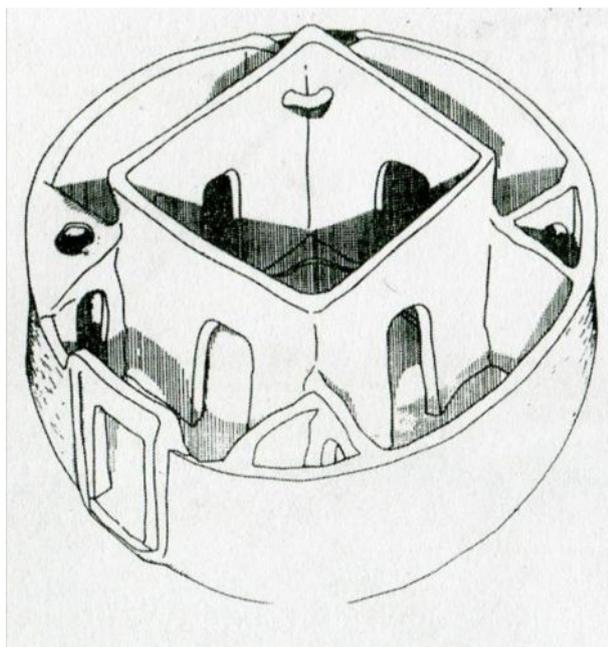
31. North Gonur. Palace. Complex of the "cells". Plan, cross-section 1-1.



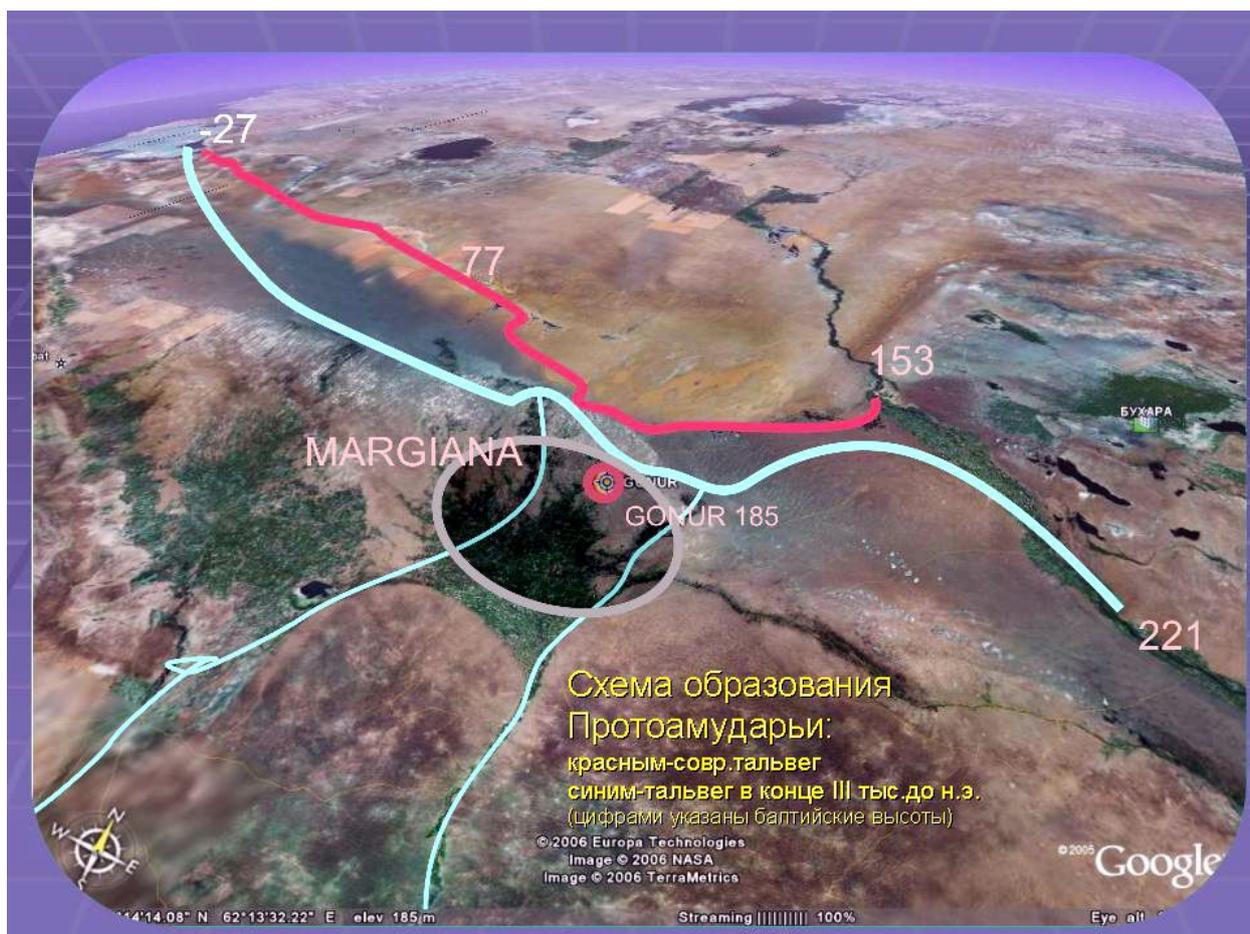
32. General view of the site of ancient settlement North Gonur from the East (2005).



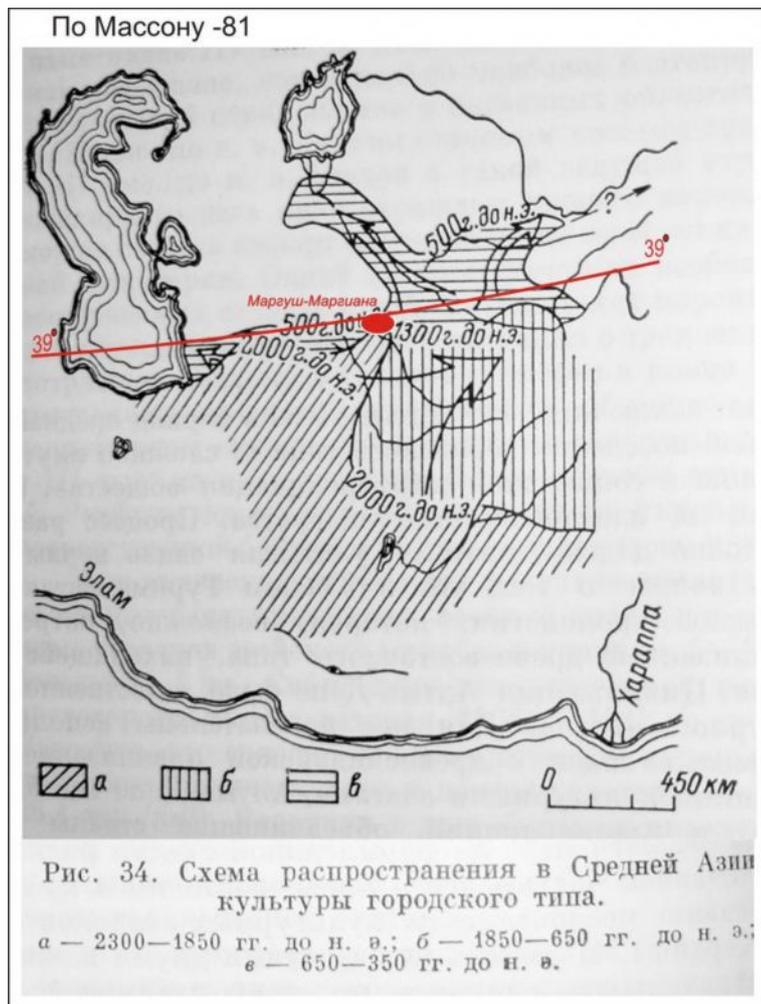
33. The general plan of the complex Gonur Depe.



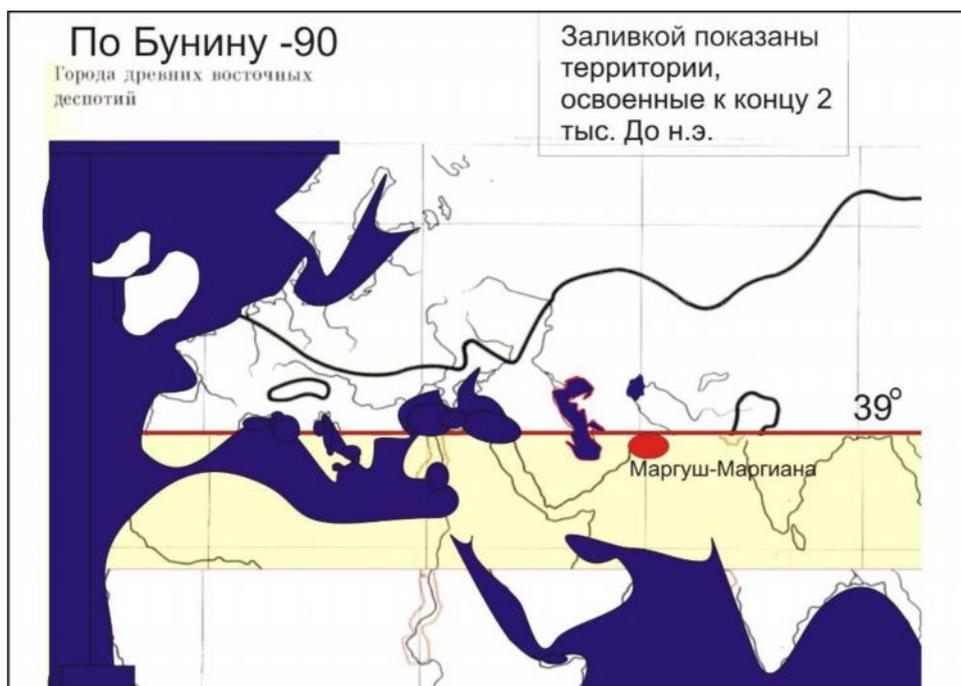
34. Mari. Mesopotamia. Clay "model" of a monumental structure (from the book by M. Mammedov "Architecture of Ancient Bactria and Marghiana", 2003).



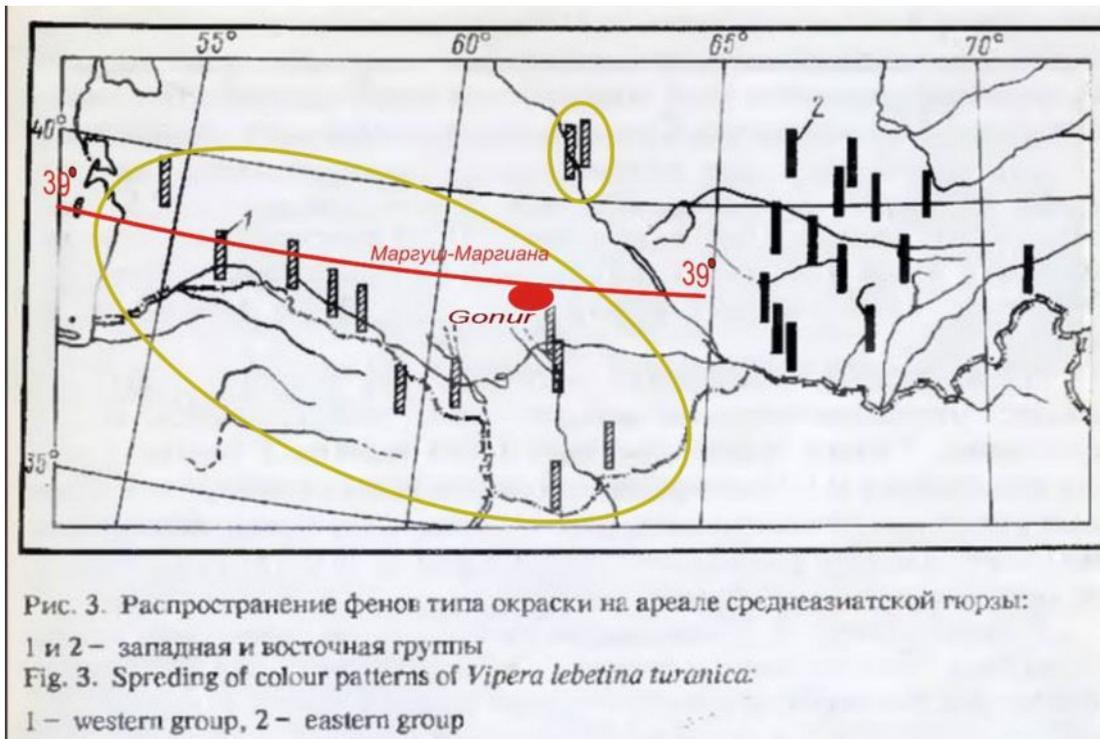
35. Scheme of the flow of a hypothetical route of the Proto Amu Darya River on its delta landscape (Google).



36. The scheme of urban culture distribution in Central Asia (by Masson).



37. The scheme of ancient agricultural zone in the 2nd millennium BC (By Bunin).



38. The distribution scheme of the Central Asian types of viper (by Chikin).

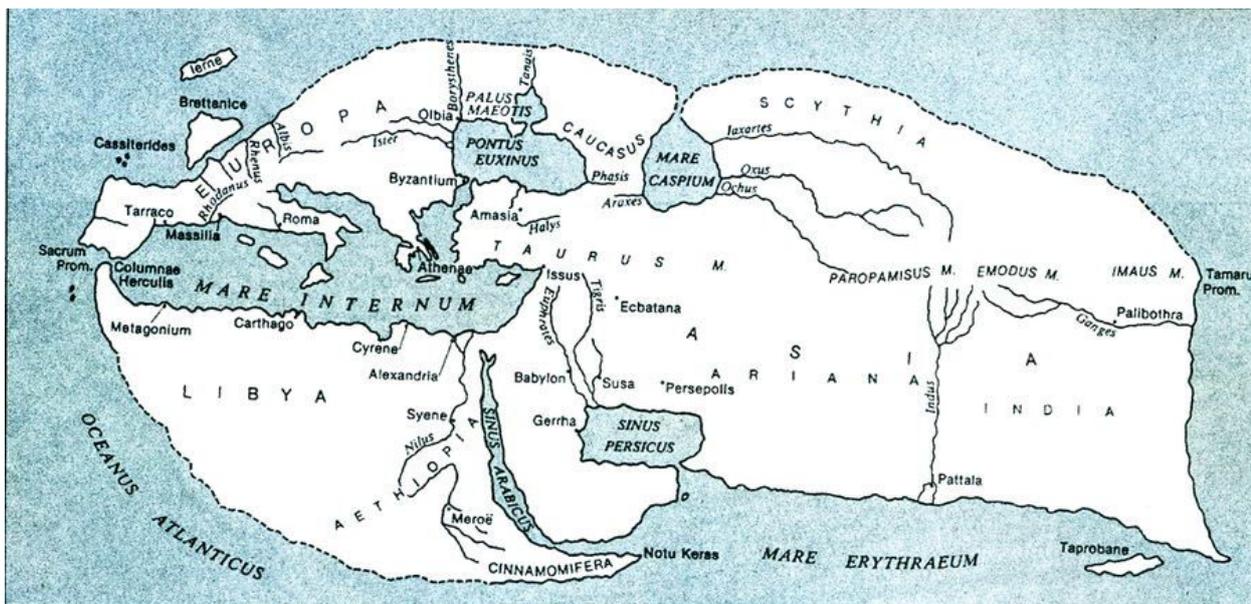
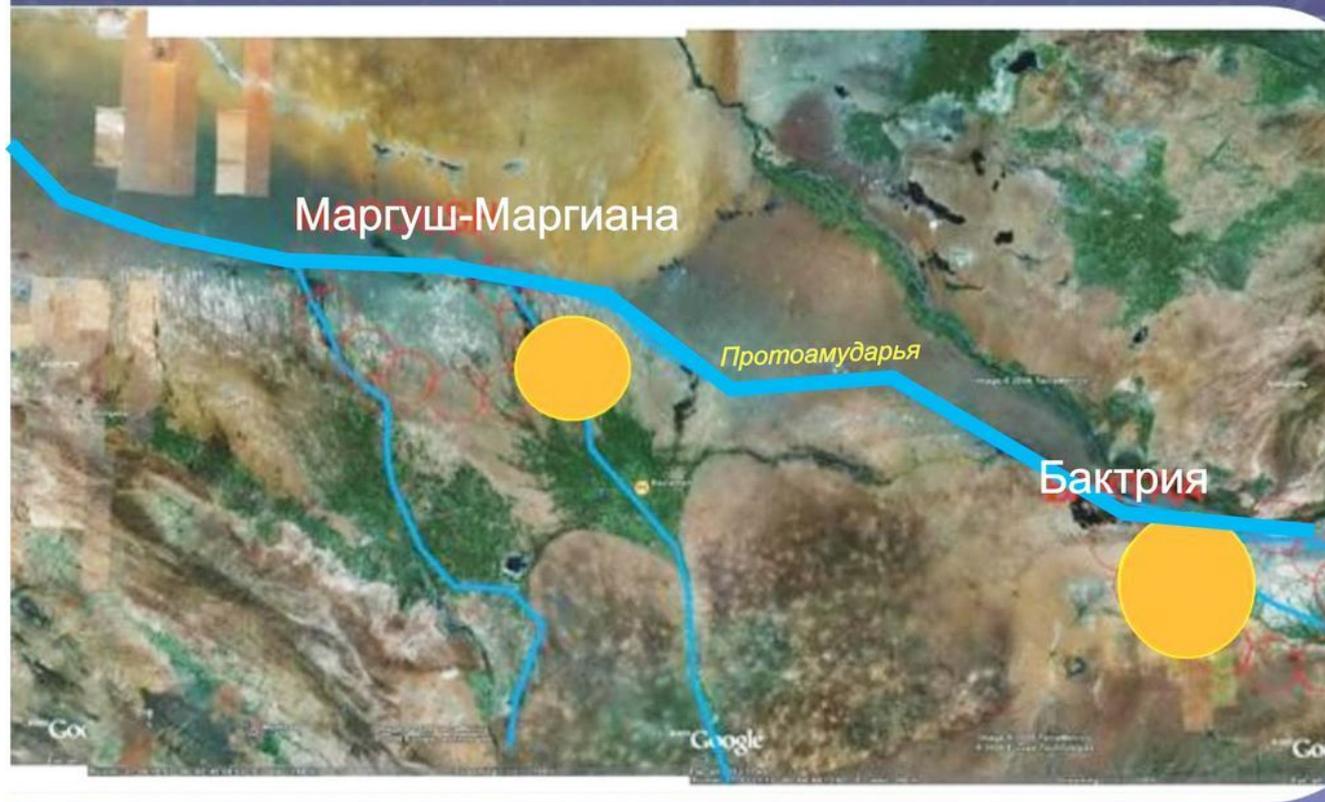


Рисунок 4.
Карта Страбона (по E. H. Bunbury, in *The History of Cartography*. Vol. 1.
ed. J. B. Harley and D. Woodward, Chicago & London, 1987, p. 175.).

39. The scheme of the map by words of ancient writers – a "map of Strabo" (in Bunbury).

Схема образования БМАК
(Бактрийско-Маргианского археологического комплекса)



40. Scheme of the BMAC formation – Bactria-Marghiana Archaeological Complex created by satellite photography in Google.