

## Two Churches on Anakopia Mountain (Abkhazia): An Attempt of Virtual Reconstruction\*

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**Abstract:** *The article is devoted to the experience of constructing three-dimensional models of two churches on Mount Anakopia (Abkhazia), which houses one of the richest lapidary collections with relief images (X-XI centuries) in Abkhazia. Two monographs by one of the authors of this study (E. Endoltseva) were devoted to a detailed study of this lapidary collection, the themes and plots presented on the reliefs, their classification and dating, as well as the architectural features of these buildings. This study continues these research efforts. The article describes in detail the additional research carried out and the principles of reconstruction of the two churches. The text is accompanied by drawings of reconstructed facades and altar barriers from these churches published for the first time. The reconstruction used fragments of stone plastic found on Mount Anakopia. The reconstructed images of churches are placed in the artistic context of the era (Middle Byzantine period, 9th – 11th centuries).*

**Keywords:** *medieval reliefs, three-dimensional image, zoomorphic images, polygonal model, principles of reconstruction.*

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The church, located in the citadel of the fortress on Mount Anakopia (New Athos, Republic of Abkhazia), housed one of the richest and most mysterious lapidary collections (about 90 fragments of stone carvings) in the territory of Abkhazia. When we started working with it (2007), the dating of the reliefs, the origin of the ornamental patterns that decorated them, the stages of history that they could reflect, etc. were unclear and did not add up to the overall picture. Since then, a lot has been explained, and most importantly, literally from small fragments, a complete image has been reconstructed.

In addition to fragments of architectural decoration, which since 2016 have been stored in the so-called Museum of the Abkhazian Kingdom<sup>1</sup>, on Mount Anakopia, the ruins of the so-called religious buildings (i.e. Christian churches) have been preserved, i. e. Church of St. Theodora and the foundation of the Lower Church.

The history of the study of Christian monuments on Mount Anakopia, as well as the main conclusions regarding the dating of the reliefs and considerations regarding the general cultural context to which they might belong, are presented in detail in three monographs<sup>2</sup>. Let us recall the main milestones and theses.

The fortified city on Mount Anakopia and its two Christian churches have repeatedly attracted the attention of researchers. In addition to mentions in the notes of Countess P. S. Uvarova<sup>3</sup> and descriptions made by Archimandrite Leonid<sup>4</sup>, mention must be made of V. V. Latyshev<sup>5</sup>, who first read the inscriptions made on reliefs from Mount Anakopia.

An important stage in the study of the history of Anakopia, its fortifications and the Lower Church was the archaeological excavations of the field seasons of 1957–1958 under the leadership of the famous Abkhaz

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<sup>1</sup> Endoltseva E. Yu. *Arhitekturnaja plastika Abkhaziji v period Abkhazskogo tsarstva (VIII – XI vv.)* [Architectural plasticity of Abkhazia during the period of the Abkhazian kingdom (VIII–XI centuries)]. Moscow, 2020. P. 32.

<sup>2</sup> Vinogradov A. Yu., Beletsky D. V. *Tserkovnaja arhitektura Abkhaziji v epohu Abkhazskogo tsarstva. Konets VIII – X vv.* [Church architecture of Abkhazia in the era of the Abkhazian kingdom. The end of the 8th–10th centuries]. Moscow, 2015. P. 103 – 104, 110 – 124. Endoltseva E. Yu. *Arhitekturnaja plastika Abkhaziji...* P. 32 – 187. *Iskusstvo Abkhazskogo tsarstva VIII – XI vv. Hristijanskije pamjatniki Anakopijskoj kreposti* [Art of the Abkhazian kingdom of the 8th–11th centuries. Christian monuments of the Anakopia fortress] / resp. ed. and comp. E. Yu. Endoltseva. St. Petersburg, 2011.

<sup>3</sup> Uvarova P. S. *Hristijanskije pamjatniki Kavkaza* [Christian monuments of the Caucasus]. MAC. IV. M.: A. I. Mamontov Printing House Partnership, 1894. P. 7 – 34.

<sup>4</sup> Archimandrite Leonid [Kavelin L.A.]. *Abkhazia i ee hristijanskije drevnosti* [Abkhazia and its Christian antiquities]. Moscow, 1887.

<sup>5</sup> Latyshev V.V. *K istoriji hristianstva na Kavkaze. Grecheskije nadpisi Novoafonskogo monastirja* [On the history of Christianity in the Caucasus. Greek inscriptions from the New Athos Monastery] // Collection of archaeological articles presented to Count A. A. Bobrinsky. St. Petersburg, 1911. P. 169 – 198.

archaeologist M. M. Trapsh<sup>6</sup>. L.G. Khrushkova<sup>7</sup> first published and analyzed images on some reliefs from Mount Anakopia; however, the dating she proposed was subject to significant adjustments later. The collective monograph of 2011 examines in detail various aspects of the history of Christian monuments on Mount Anakopia, separate chapters are devoted to the temple architecture of the Anakopia fortress (D. V. Beletsky, A. Yu. Vinogradov), stone reliefs (E. Yu. Endoltseva), epigraphy inscriptions (A. Yu. Vinogradov) and iconographic materials of antiquities (old photographs and postcards) (A. S. Agumaa)<sup>8</sup>. In this study, for the first time, a comprehensive analysis of the artistic features of relief images was carried out using data from archeology and epigraphy, and the historical context was identified. A catalog was published, which included all 89 reliefs discovered at that time in the altar of the church, which was considered to be dedicated to St. Theodora.

As a result, it was possible to show that the stone reliefs were most likely made during the reign of Constantine IX Monomakh (who is mentioned in the inscription on one of the reliefs)<sup>9</sup>, when the Byzantines were in the fortress. Regarding the Lower or Small Fortress Church, D. V. Beletsky and A. Yu. Vinogradov agreed with the opinion of M. M. Trapsh, who attributed it to the 10th–11th centuries<sup>10</sup>. However, later, in a monograph devoted to the church architecture of Abkhazia during the era of the Abkhazian kingdom, D. V. Beletsky and A. Yu. Vinogradov corrected this hypothesis in favor of the 10th century<sup>11</sup>. In construction works in the so-called Church of St. Theodore, the construction of the Lower Church and the production of reliefs, they saw traces of the active construction campaign of King George II<sup>12</sup>. In our opinion, there are not enough arguments for such precise dating, but the stylistic and iconographic features of the reliefs do not contradict it. More convincing, however, seems to be evidence of the improvement that was carried out in the fortress under the Byzantines (40s of the 11th century), so we will assume that the reliefs and the Lower Church were made between the mid-10th and mid-11th centuries<sup>13</sup>.

Let us recall that the main milestones in the history of the Anakopia fortress can be reconstructed thanks to archaeological and epigraphic data, which complement the chronicle evidence<sup>14</sup>.

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<sup>6</sup> Trapsh M. M. Trudi [Proceedings]. T. IV: Materials on the archeology of medieval Abkhazia. Sukhumi, 1975. P. 88 – 149.

<sup>7</sup> Khrushkova L. G. Skulptura rannesrednevekovoj Abkhaziji [Sculpture of early medieval Abkhazia. V–X centuries]. Tbilisi, 1980. P. 26 – 32.

<sup>8</sup> Iskusstvo Abkhazskogo tsarstva...

<sup>9</sup> Ibid. P. 115.

<sup>10</sup> Ibid. P. 23.

<sup>11</sup> Vinogradov A. Yu., Beletsky D. V. Tserkovnaja arhitektura... P. 104.

<sup>12</sup> Ibid. P. 165.

<sup>13</sup> Endoltseva E. Yu. Arhitekturnaja plastika... P. 38.

<sup>14</sup> Ibid. P. 47 – 53.

Based on the results of the analysis of epigraphic data, it was concluded that the church in the citadel, together with other buildings of the complex inside the citadel, may have been decorated under Constantine IX Monomakh and consecrated in honor of St. Theodore in 1049. The basis for such conclusions was provided by four stones with inscriptions<sup>15</sup>.

The most serious archaeological research was carried out on the territory of Anakopia under the leadership of M. M. Trapsh in the field seasons of 1957–1958. The purpose of the expedition was to study the defensive lines of the fortress. Based on the features of the masonry, the scientist concluded that the construction of the walls of the citadel should be dated “to a time no earlier than the turn of the 5th–6th centuries.” The researcher noted that the towers of the citadel could have been built later, in the 7th–8th centuries. This statement does not specify the dating of its walls. When examining the church in the citadel, M. M. Trapsh discovered its repeated reconstructions. The scientist agreed with the opinion of A.S. Bashkirov, who believed that the main volume of the temple was erected before the 8th century, and dated the reconstruction of the temple to the 11th–12th centuries. When examining the cultural layer inside the towers of the second line of defense, the expedition found, among other things, the remains of ceramics and coins, from which M. M. Trapsh established the following chronology of the development of the settlement on Mount Anakopia: IV–II centuries BC – Hellenistic settlement on the slopes of the mountain; VII–XI centuries n. e. — the period of operation of the Anakopia fortress; VIII–IX centuries — the first period of intensive construction of defensive structures; XI century — the second period of intensive construction and renovation of defensive structures. The latter period is associated not only with the renovation and restoration of the towers and walls of the second line of defense, but also with the construction of civilian buildings and other facilities. These include a lime kiln discovered on one of the terraces of the fortress, and a small single-apse church (Lower Church), found in 1957 near the southern wall of the outer ring of defensive structures<sup>16</sup>.

The next archaeological research took place inside the citadel in 2004 in connection with preparations for the restoration of the eastern tower. The work was supervised by Yu. B. Biryukov. Examining the cultural layer inside the structure, the archaeologist came to the conclusion that, judging by the nature of the ceramics and fragments of carved slabs with wickerwork found in the upper layer, it can be dated to the 11th century. At the same time, Yu. B. Biryukov noted that the thickness of the cultural layer does not make it possible to talk about active construction activity here earlier than the 8th–9th

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<sup>15</sup> Ibid. P. 212 – 220.

<sup>16</sup> Trapsh M. M. Trudi [Proceedings]. T. IV: Materials on the archeology of medieval Abkhazia. Sukhumi, 1975. P. 147.

centuries. No traces of the existence of more ancient buildings on the territory of the citadel have yet been discovered. A. Yu. Vinogradov and D. V. Beletsky, rethinking some of their observations, proposed a more detailed chronology of work in the temple in the citadel and in the Lower Church. They suggested that the reconstruction of this building was carried out under George II, between 928 and 955<sup>17</sup>. Comparing epigraphic and archaeological evidence, which are in perfect agreement with each other, we can conclude that the temple inside the Anakopia fortress was built no earlier than the 6th century and no later than the beginning of the 10th century. It functioned until the 11th–12th centuries<sup>18</sup>. In the 11th century under the Byzantine emperor Constantine IX Monomakh, according to the inscription on the lost relief published by V.V. Latyshev (date 1046)<sup>19</sup> and the archaeological excavations of M.M. Trapsh, large-scale construction work was carried out in the fortress to strengthen the southern wall and towers of the second line defense. At the same time, a small single-apse church was built inside the fortress, and the main church of the citadel was possibly decorated (lined). A lime kiln found in the fortress indicates that building materials were made on the territory of Anakopia. From the reports of “Kartlis Tskhverba” it is clear that the battle with the Arab commander Mervan ibn Muhammad played a decisive role in the fate of the fortress. In 737 he approached the walls of the city, but was forced to leave Abkhazia<sup>20</sup>. From this moment a new page begins in the history of Anakopia as the main center of the independent Abkhazian kingdom. In the 80s VIII century The Abkhaz ruler Leon II abandoned the power of the Byzantine emperor and proclaimed himself king. The process of annexing neighboring lands begins, as a result of which the eastern border of the Abkhazian kingdom in the first half of the 10th century “extended to the Suram ridge, and in the south to the Chorokh River, that is, to the borders of Tao, Klarjeti and Kartli”<sup>21</sup>. By the beginning of the 11th century, a new state entity arose - the “kingdom of the Abkhazians and Kartlians” led by King Bagrat III, who, on his mother’s side, was the grandson of the Abkhazian king George II (929–957), and on his father’s side came from the Bagratid family<sup>22</sup>.

From the “Chronicle of Kartli” it is known that the second wife of King George I, the Ossetian princess Alda, together with her son Demetrius

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<sup>17</sup> Vinogradov A. Yu., Beletsky D. V. *Tserkovnaja arhitektura...* P. 123.

<sup>18</sup> Bgazhba O. Kh., Lakoba S. Z. *Istorija Abkhaziji s drevnejshih vremen do nashih dnei* [History of Abkhazia from ancient times to the present day]. M., 2007. P. 89 – 90. Khrushkova L. G. *Vostochnoje Prichernomorije v Vizantijakuju epohu. Istorija. Arhitektura. Arheologija* [Eastern Black Sea region in the Byzantine era. Story. Architecture. Archeology]. Kaliningrad–Moscow, 2018. P. 62 – 67.

<sup>19</sup> *Iskusstvo Abkhazskogo tsarstva...* P. 115.

<sup>20</sup> Anchabadze Z.V. *Iz istoriji srednevekovoj Abkhaziji (VI – XVIII vv.)* [From the history of medieval Abkhazia (VI–XVII centuries)]. Sukhumi, 1959. P. 93.

<sup>21</sup> Anchabadze Z.V. *Iz istoriji...* P. 117.

<sup>22</sup> Vinogradov A. Yu., Beletsky D. V. *Tserkovnaja arhitektura...* P. 17 – 89.

lived in Anakopia from 1027 and tried to organize a conspiracy to overthrow Demetrius's elder brother, King Bagrat IV (1027–1072). After a failed coup attempt, Demetrius surrendered Anakopia to the Byzantines, who held the city until the mid-1070s<sup>23</sup>. It was at this time that large-scale construction work was carried out here, reflected by archaeological and epigraphic evidence. In all likelihood, the reliefs from the Anakopia collection were made precisely at this time. It is possible that under the Byzantines, local craftsmen or those who came from Anatolia<sup>24</sup> worked in Anakopia, who in their work reproduced artistic forms that existed in the territory of the Abkhazian kingdom, Tao and Klarjeti or Cappadocia about half a century earlier. R. Shmerling explains this cultural phenomenon by the masters belonging “not to the younger, but to the older generation of artists of this time”<sup>25</sup>.

From about the 15th century the fortress falls into disrepair. After the annexation of the Abkhazian principality to the Russian Empire (1866), the territory of the Anakopia Mountain with ancient buildings was transferred to “the Russian part of the Greek-Russian brotherhood of the Russian monastery on Mount Athos (1875)”<sup>26</sup>. When landscaping the territory, the monks collected ancient reliefs (89 fragments) from the slopes of Mount Anakopia and mounted them in the form of an improvised iconostasis into the wall inside the apse of the church, which was believed to be consecrated in the name of St. Theodora.

In October 2016, by order of A.V. Argun, director of the National New Athos Historical and Cultural Reserve "Anakopia", without the sanction of the Ministry of Culture and Protection of Historical and Cultural Heritage of the Republic of Abkhazia, all reliefs were cut out and transferred to the foot of Mount Anakopia, to the newly opened Museum of the Abkhazian Kingdom, where they remain now.

The results of the stylistic and iconographic analysis of the reliefs originating from the altar part of the church in the citadel on Mount Anakopia are consistent with epigraphic and archaeological evidence. They can be attributed to the middle of X - beg. XI centuries<sup>27</sup>. Based on the nature of the images presented, they can be divided into three groups: zoomorphic images, crosses, woven geometric patterns of various types.

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<sup>23</sup> Anchabadze Z.V. *Iz istoriji...* P. 79. Seibt W., Jordanov I. *Στρατηγὸς Σωτηριουπόλεως καὶ Ανακούπης. Ein mittelbyzantinisches Kommando in Abchasien (11. Jahrhundert)*// *Studies in Byzantine sigillography*. 2006. Vol. 9. P. 231–239.

<sup>24</sup> *Iskusstvo Abkhazskogo tsarstva...* P. 97 – 98.

<sup>25</sup> Shmerling R. *Malije formi v arhitekture srednevekovoj Gruziji* [Small forms in the architecture of medieval Georgia]. Tbilisi, 1962. P. 115.

<sup>26</sup> *Iskusstvo Abkhazskogo tsarstva...* P. 227.

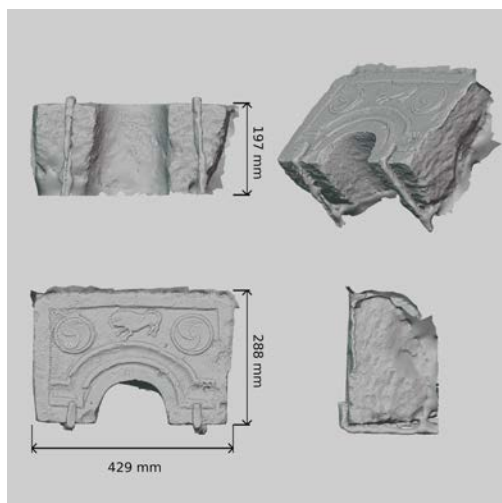
<sup>27</sup> *Ibid.* P. 101 – 207.

The task of the final phase of research into the lapidary collection originating from Mount Anakopia was to create a virtual reconstruction of the architectural decoration (including small forms) of each of the two churches, as much as possible, using reliefs transferred to the Museum of the Abkhazian Kingdom.

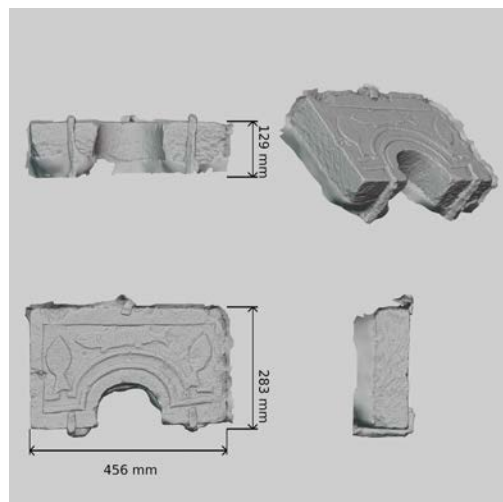
The project described in this work for the virtual reconstruction of the Upper and Lower Churches on Mount Anakopia synthetically uses the previous experience of domestic and international projects for the virtual reconstruction of monuments of cultural and historical heritage. The composition of scientific work on the reconstruction of the monument under study consisted of the following main stages:

- research and digitization of preserved sites and fragments;
- creation of 3D models, analysis and attribution of fragments (stones);
- creation and verification of a 3D model of the altar barrier and the building.

At the first stage, ground photogrammetric survey was performed to obtain a three-dimensional metric model of the temples at the site. In order to accurately preserve the scale, control measurements of the main structural elements, the length and width of the structure were obtained; additional measurements were taken of doorways and the height of individual sections of the preserved masonry. During the shooting process, marked tablets were used, which made it possible to automate the process of scaling a three-dimensional model. To orient the model in space, a GNSS receiver built into the camera was used.



**Fig. 1** Model of the upper window casing with the image of a lion.  
D. O. Dryga, A. D. Karnaushenko, L. K. Kazennova



**Fig. 2** Model of the upper window casing with the image of a fish.  
D. O. Dryga, A. D. Karnaushenko, L. K. Kazennova

While working on the church in the citadel, aerial photography and terrestrial laser scanning were also carried out.

As a result of photogrammetric processing, a surface triangulation model of the Upper and Lower Church was obtained, as well as orthophotomaps and digital models of their surfaces (Fig. 1, 2). The combination of an orthophotomap and a DEM made it possible to quite accurately identify the main contours of the walls at the site. The 3D model was subsequently used to create a virtual reconstruction.

In addition, three-dimensional models of some surviving fragments were obtained; they were located in the Museum of the Abkhazian Kingdom. Since the shooting was done indoors, an artificial light source was used to achieve optimal image resolution.

At the second stage of work on the project, the resulting groups of photogrammetric 3D models were divided into separate fragments. Each fragment was analyzed and classified according to its purpose: wall cladding, facade decoration, fragments of the altar screen, window and door frames and other architectural details. Thus, a complete catalog of all decorated stones was compiled, and a number of hypotheses was put forward about their location in the ensemble of the building.

At the third stage, reconstructions of the Upper and Lower Churches were created in the form of polygonal 3D models. Historical and architectural materials, measurements of photogrammetric 3D models of buildings, as well as the results of comparisons with the results obtained with similar



monuments of the era were used as sources. The fragments are placed in the proposed locations of the restored buildings, taking into account their shape, size and decorative features, physical properties and architectural feasibility. Thus, it was possible to visualize both the current state of the buildings and their conditional reconstructions, which show what the temples could have looked like at the time when they were operational. The original appearance of the buildings themselves is presented in the form of a low-poly model, with a roof, window and door openings.

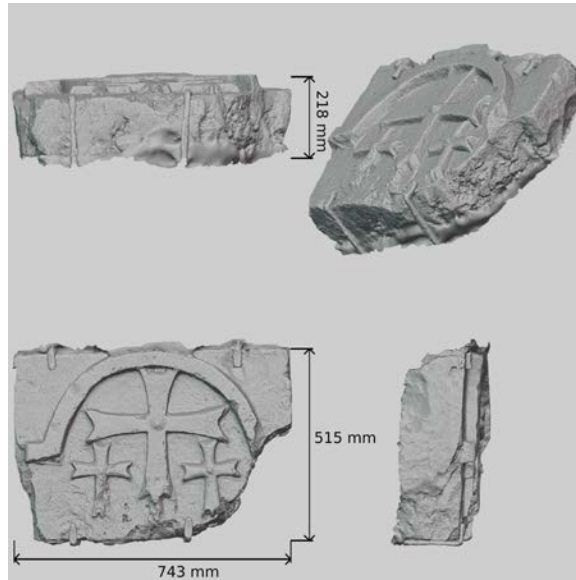
To demonstrate the results, a special virtual environment has been created, which allows you to view the reconstruction with the fragments placed in it from any angle. Additionally, for each individual fragment, images (renderings) were created indicating their dimensions, as well as a video to show the detail and the characteristics of each stone element<sup>28</sup>.

When developing the principles of reconstruction for both churches, the results of a visual analysis of some of the most characteristic reliefs were taken into account. Thus, among the studied fragments of the external cladding of churches, one can distinguish a group of five reliefs, which, judging by their shape, can be identified as the upper casings of slit windows. However, according to stylistic features and the depicted subjects, they clearly fall into two groups: reliefs with images of animals (a bull and a lion at the cross, a bull, a fish) and reliefs with images of crosses (“Golgotha crosses” and a single cross, in both cases - under the arches) (Fig. 3 - 5) Thus, it would be logical to assume that they come from two different churches (Fig. 6, 7).

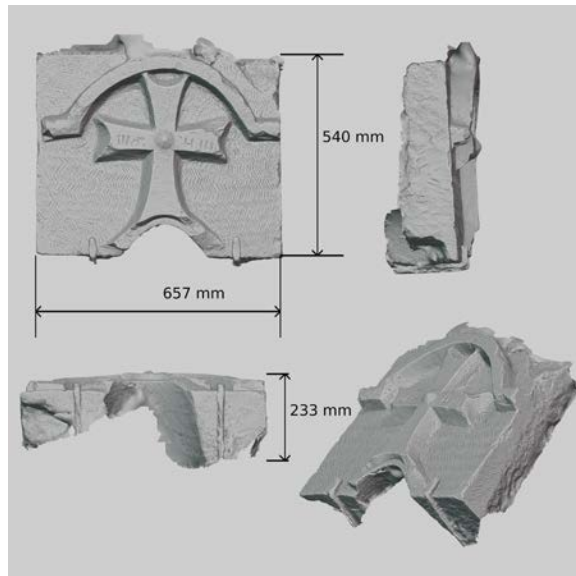


**Fig. 3** Lost upper window casing with a bull and a lion near a cross and an inscription. Endoltseva E. Yu. *Architectural plasticity of Abkhazia during the period of the Abkhazian kingdom (VIII-XI centuries)*. Moscow, 2020. pp. 80 – 83

<sup>28</sup> reference to the site: <https://arch.ivran.ru/>.



**Fig. 4** Model of the upper window casing with the image of three crosses. D. O. Dryga, A. D. Karnaushenko, L. K. Kazennova



**Fig. 5** Model of the upper window casing with the image of a cross. D. O. Dryga, A. D. Karnaushenko, L. K. Kazennova



**Fig. 6** Orthophotomap of the Upper Church on Mount Anacopia.  
D. O. Dryga



**Fig. 7** Eastern facade of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova

### **Principles of reconstruction of the Upper Church (the so-called Church of St. Theodore)**

During the field research, an orthomosaic map of the citadel and the church in it was made (Fig. 1). In constructing the 3D model of the Upper Church, we relied on photogrammetric surveys followed by construction of the model, as well as plans and drawings by A. S. Agumaa, D. V. Beletsky, A. Yu. Vinogradov<sup>29</sup>.

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<sup>29</sup> *Iskusstvo Abkhazskogo tsarstva...* App. 3 – 14.

Based on the data presented, the church was rebuilt during the medieval period. The most striking evidence of this is the pentagonal apse instead of the original semicircular one, the placement of side windows (southeast and northeast) in the apse of the temple, and significant thickening of the walls<sup>30</sup>.

The reconstruction reproduces the expected appearance of the temple after medieval reconstruction: a pentagonal apse with one central window, thick walls, barrel vaults with arches resting on pilasters, a door in the middle of the southern facade of the temple naos, two narthexes - these are the main elements of the temple after the reconstruction. Since at the moment the walls of the temple are of considerable height, it is even possible to determine where the arch of the apse began, and by one of the pilasters to determine the beginning of the girth arches of the vault. "Currently, on the southwestern corner pilaster there is an impost on which a girth arch rested, thrown onto a symmetrical pilaster in the northwestern corner: both of them are somewhat "recessed" into the thickness of the western wall. Undoubtedly, there were girth arches on all the pilasters of the church: there were seven pairs of them - accordingly, there were seven girth arches. Moreover, the easternmost of them partially covered part of the eastern wall located above the triumphal arch"<sup>31</sup>. It must be emphasized that the pilasters were not located clearly opposite each other on the opposite wall, but with some displacement, which is why the supporting arches are located not at 90 degrees to the axis, but at different angles. This was probably due to the fact that the existing windows, niches and doors corrected the location of the pilasters, that is, they were added later where possible.

In the south wall of the naos there are two niches on either side of the door. Perhaps they "housed some revered shrines: it can be assumed that in one niche there was a church image of St. Theodore, and in the other - an icon of the Virgin Mary, which was considered at the end of the 11th century as guardian of the city"<sup>32</sup>. One of the stones with a semicircular ark is placed in a niche, as it resembles part of an icon.

The southern opening is arched; on the façade it has a portal frame, which has been preserved almost completely, and consists of two half-shafts that go around the opening on three sides: on the sides and on the top.

The south wall should definitely have arched windows. In the preserved part of the wall we have only 1 option, where there could only be 2 windows. One window is above the southern door, the second is a little to the west of it, since the wall has collapsed in this place. The placement of the window between the 4th and 5th pilasters adjacent to the southern entrance is

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<sup>30</sup> Ibid. App. 4.

<sup>31</sup> Ibid. P. 48.

<sup>32</sup> Ibid. P. 53.

logical. The second window is at the same height, but is located between the 3rd and 4th pilasters, if you count from west to east. The upper parts of the window were most likely no higher than the imposts on which the arches of the vault rested. We have 2 stones for the upper window frames, similar in theme and design: these are stones with a lion and with a fish. We placed these stones above the windows of the southern wall of the naos. Based on the parameters of these reliefs, the stones framed slit-like windows no more than 0.2 m wide.

In the Middle Ages, the temple was quite simple and hardly had the kind of substructure that we see now. The temple probably simply stood on top, with the northern part resting on a rock and the southern part on a retaining wall. There were windows in the northern wall, presumably three; traces of window openings in the walls can still be traced. We have stones with reliefs, which are possibly part of the arched frame above the window. The window opening in the northern wall makes it possible to conclude that the window width was no more than 0.6 m and the height was about 1 meter. The diameter of the arch of the proposed casing is also within 0.6 m. The windows of the northern wall fit between the 2nd and 3rd, 3rd and 4th, 5th and 6th pilasters. Inside the church, we modeled a platform that probably served as a seat during long services. “There is a low (a little more than half a meter) ledge along the northern wall. It could have been used for seating during long services (which may be an indication of a probable monastic character of the church). On the opposite wall, such a ledge was preserved only between the third and fourth pilasters from the west”<sup>33</sup>.

The landscape on which the church is built gives significant originality to the entire structure. The difference in heights from east to west and from north to south leads to the fact that all rooms have a significant difference in floor level. The altar space is raised above the floor of the narthex by almost 0.7 m, the floor of the naos is 0.6 m above the narthex, and the floor of the narthex is 0.9 m from the floor of the exo-narthex. Therefore, several steps lead to each subsequent room and to the altar.

When constructing the narthex and exo-narthex, there is data that was used as a starting point. The narthex, according to the drawings, has a maximum wall height of 9.41 m. The exo-narthex has 8.1 m. Probably the ceilings were cylindrical, and they could only begin above these heights. By adding the height of the vault (thickness of the vault stone + mortar + tiles), you can calculate the height of the roof. The narthex is wider than the church, so the walls of the narthex on the outside coincide with the walls of the church, but they are much thinner. Therefore, the distance from the southern to the northern wall is greater than in the temple. And since the vaults were stone, cylindrical or box-shaped, the vault of the vestibule began no higher than 9.3 m. Since its vault could not rise higher than the vault of the temple,

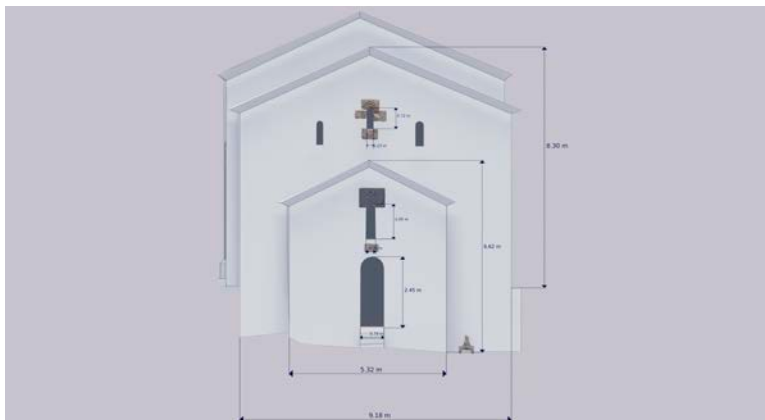
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<sup>33</sup> Ibid. P. 51.

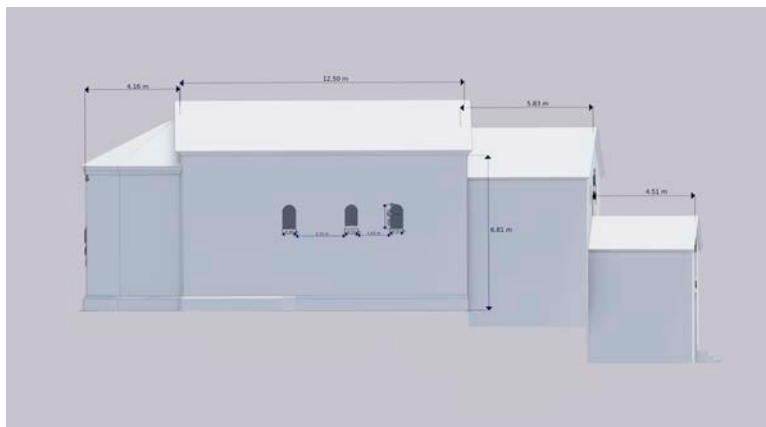
there were most likely no windows in the northern and southern walls, otherwise they would have been located low from floor, which made the building inaccessible. But on the western wall, above the roof of the exonarthex, there could be not one, but three windows. These three windows fit logically under the arch of the narthex vault and are located just above the gable roof of the exo-narthex.



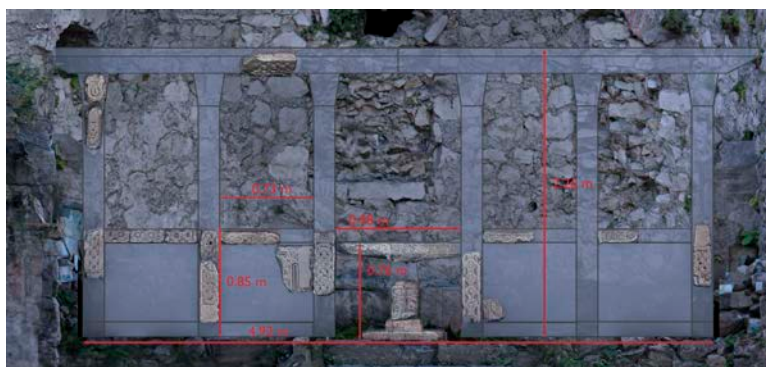
**Fig. 8** Southern facade of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova



**Fig. 9** Western facade of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova



**Fig. 10** Northern facade of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova



**Fig. 11** Altar barrier and altar of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova

Thus, the reconstruction of the eastern facade could probably look like this (Fig. 8) with individual stones from the analyzed collection. The southern facade in this case contains two of the three reliefs with animals as the upper frames of the windows (Fig. 9). The western one has a complex structure (Fig. 10) with images of individual stones, and the northern one could look like this (Fig. 11).

Returning to the altar part, let us recall that there was a sintron in the temple, which can be seen to this day, it is modeled in the altar. When discussing the principles of constructing the altar barrier and the throne, you need to keep in mind the following considerations. Based on the existing width of the altar apse of about 5 meters, it is most likely to assume that the

altar barrier of the temple rested on 6 pillars-columns, had a central entrance about a meter wide, side openings blocked by slabs had a width of about 0.7 m. Width of the pillars of the altar barrier was about 0.17 m. We determined this width thanks to the existing stone reliefs, which are suitable as pillars of the altar barrier due to their proportions and because they have grooves on the sides, which could be grooves for fastening the altar barrier slabs. For a large temple, you can select several columns based on these parameters. Sometimes the columns have a certain indentation from the ground, that is, the ornament does not start from the beginning of the column, but at some distance. We admit that the ornament of the columns could be repeated, or could vary. We have two columns with intersecting circles and diamonds, both have an indentation from the edge of the slab, the same dimensions in cross-section, but the ornamentation varies in small details. These are “Relief depicting interlocking circles and rhombuses”<sup>34</sup> and “Relief depicting an ornament of interlocking circles and rhombuses”<sup>35</sup>.

There is a column “Relief with an ornament of mesh loops”<sup>36</sup>, which differs in its ornament, but in cross-section has the same dimensions. It also has grooves on the sides. Based on the fact that the ornament could be different, we include it as part of a column in the altar barrier of a large church.

If it is acceptable that the slabs of the entire altar barrier had different ornaments, then the solid part should have had a uniform ornament. Based on this, the available fragments were distributed into groups. Each group conventionally represents one integral fragment of the altar barrier.

The first group: “Relief depicting circles of small diameter and loops”<sup>37</sup>, “Relief depicting a woven geometric ornament composed of circles of small diameter and circles of small diameter with a drilled center”<sup>38</sup>, “Fragment of a slab with a geometric ornament composed of circles of small radius and circles of small diameter with drilled center”<sup>39</sup>.

The second group will consist of stones with intersecting circles and rhombuses, such as “Relief depicting an ornament composed of rhombuses and circles”<sup>40</sup>. There is a similar ornament on the altar columns.

The third group is “Relief with loop ornament”<sup>41</sup>.

The fourth group from one fragment “Relief with an ornament of woven circles of the same size”<sup>42</sup>.

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<sup>34</sup> Ibid. P. 179.

<sup>35</sup> Ibid. P. 173.

<sup>36</sup> Ibid. P. 168.

<sup>37</sup> Ibid. P. 156, № 24.

<sup>38</sup> Ibid. P. 158, № 26.

<sup>39</sup> Ibid. P. 160, № 28.

<sup>40</sup> Ibid. P. 176, № 44.

<sup>41</sup> Ibid. P. 170, № 38.



There is also one fragment, “Relief with woven ornament and fragment of a flourished cross”<sup>43</sup> which, judging by its shape and ornament, was most likely part of the architrave. This is indicated both by the location of the reliefs on planes located at an obtuse angle relative to each other, and by their ornament. Thus, the altar barrier, based on the above considerations, could look like this (Fig. 12).

“Relief depicting arches and pilasters”<sup>44</sup>. “It is difficult to determine the functional purpose of the slab. Perhaps it was used in the internal or external cladding of the building, or, as D. Beletsky and A. Vinogradov suggest, it was the basis for the leg of the throne or its lid”<sup>45</sup>. In the museum, this slab is currently turned towards the viewer with its smooth side, and not the side with relief. The smooth side is well processed and lines up in one plane. At the same time, the side with relief has a slight rounding. If this stone is a fragment of the throne cover, then this explains the smoothness and evenness of its one side and the presence of a groove for the foot of the throne on the other side. Square groove: width – 0.07 m, height – 0.10 m, depth – 0.05 m, round groove diameter – 0.02 m.

Around the recess (groove) there is a protruding relief part, the one called the pilaster. I think that this rectangular protrusion, measuring 0.26 x 0.19 m, coincided with the foot of the throne. The protrusion of the leg with dimensions slightly less than 0.10 x 0.07 x 0.05 fit into the groove of the cover. Perhaps the only straight edge of this fragment is the edge of the tabletop, and then the width of the upper part of the throne can be hypothetically assumed. If we measure the distance from the middle of the groove to the smooth edge of the fragment, we get 0.54 m, and then we can assume that the width of the tabletop is 1.08 m. Perhaps the arcs emerging from the corners of the relief protrusion around the groove were not arches, but led to corners of the throne. In this light, the slight roundness of the lower part of the tabletop is clear. The place where it connects with the leg is the deepest - 0.15 m. Towards the corners the depth decreases - 0.10. If you try to mentally complete the tabletop, then its width, as was said, will be 1.08 m, and its length will be at least 0.85 m. Having built the leg of the throne, we built its support based on the proportions of the tabletop. And it turned out that the support coincided in size with another fragment No. 61.

“Slab with a groove”<sup>46</sup>. “Limestone. Dimensions: wide 0.54 m, height 0.62 m. Protruding groove: wide. 0.23 m, height 0.28 m, depth 7.5 cm. Internal groove: wide. 0.12 m, height 0.14 m, depth 4 cm. According to the assumption of D. Beletsky and A. Vinogradov, it was the basis for the leg of

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<sup>42</sup> Ibid. P. 181, № 50.

<sup>43</sup> Ibid. P. 128, № 4.

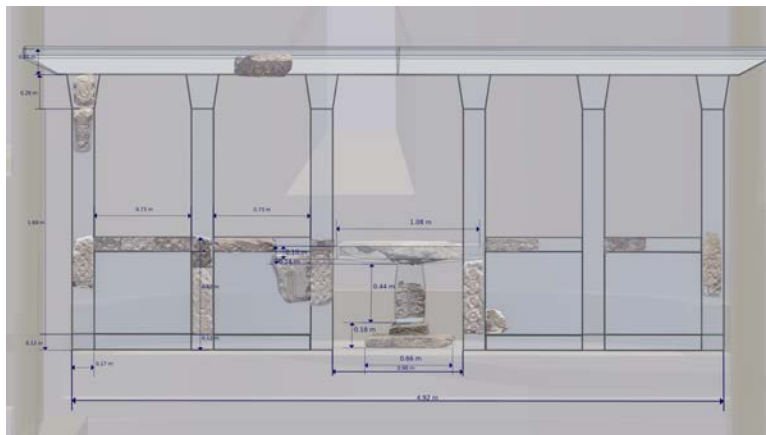
<sup>44</sup> Ibid. P. 189, № 60.

<sup>45</sup> Ibid. P. 190.

<sup>46</sup> Ibid. P. 190, № 61.

the throne or its lid<sup>47</sup>. The size and shape of a slab with the image of a flourishing cross is suitable as the foot of the throne<sup>48</sup>.

The size of this stone is suitable for the foot of a throne. Thus, the throne of the Upper Church could look like this (Fig. 12, 13).



**Fig. 12** Altar barrier and p altar of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova



**Fig. 13** Orthophotomap of the Lower Church on Mount Anakopia. D. O. Dryga

It is not possible to talk about the location of all the reliefs in certain places, but there are such grounds, although they are hypothetical.

<sup>47</sup> Ibid. P. 191.

<sup>48</sup> Ibid. P. 130 – 132, № 5.

### **Principles of reconstruction of the Lower Church<sup>49</sup>.**

The lower church of the Anacopia fortress in its architecture was single-apse, hall-shaped and had a modest size. Only the foundations of the walls have survived. The base of the apse has been partially preserved. The threshold of the western entrance is clearly visible. Using it, you can quite reliably determine the width of the doorway, which is equal to 0.85 m. As a result of field research, an orthophotomap of the Lower Church was made (Fig. 2).

The 3D model of the Lower Church was built using a photogrammetric model in Blender. According to the model, the length of the temple is 6.65 m, the width is 4.63 m, the width of the doorway is 0.85, the outer diameter of the apse is 3 m, the inner diameter of the apse is 1.84 m (Fig. 14).



**Fig. 14** Three-dimensional model of the Lower Temple. View from the southeast. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova

M. M. Trapsh dates the temple to the 10th–11th centuries, in which D. Beletsky and A. Vinogradov completely agree with him<sup>50</sup>.

In the book “Church architecture of Abkhazia in the era of the Abkhazian kingdom. The end of the 8th - 10th centuries” there is the

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<sup>49</sup> Endoltseva E. Yu., Bystritsky N. I., Dryga D. O., Karnaushenko A. D., Karnaushenko E. N., Kazennova L. K. *Niznaja tserkov na gore Anakopja (Novij Afon, Respublika Abkhazia): opit virtualnoj rekonstruktsiji arhitekturnogo ubranstva [Lower Church on Mount Anacopia (New Athos, Republic of Abkhazia ): experience of virtual reconstruction of architectural decoration]*// *ByzantinoCaucasica*. Vol. 3. Moscow, 2023. pp. 65 – 89.

<sup>50</sup> *Iskusstvo Abkhazskogo tsarstva...* P. 23.

following remark: “from the architecture of Abkhazia at the end of the 9th - 10th centuries the beam and rafter ceiling completely disappears: all hall churches and basilicas, not to mention domed churches, are covered with vaults”<sup>51</sup>. Based on this statement, it can be assumed that the church could have been covered with a semicircular vault. In addition, “... all the roofs known to us over the arches of the churches of Abkhazia at the end of the 9th - 10th centuries were gable”<sup>52</sup>. In this case, the roof was probably gable.

The floor “in the lower church of the Anakopia fortress is made of ceramic tiles”<sup>53</sup>. During further work on the model, it is possible to pave the floor with ceramic tiles.



**Fig. 15** Three-dimensional model of the Lower Temple. View from the northwest. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova

We placed windows in the church only in the most likely places. One window is in the center of the apse, the second is on the western wall above the door and the third is on the southern wall, a little closer to the altar. We did not place windows on the northern wall for two reasons: firstly, in the temples of Abkhazia they tried not to have windows on the northern wall, and secondly, the northern wall faces the hillside (Fig. 15). A set of two slabs with crosses under arches is placed above the windows on the southern and

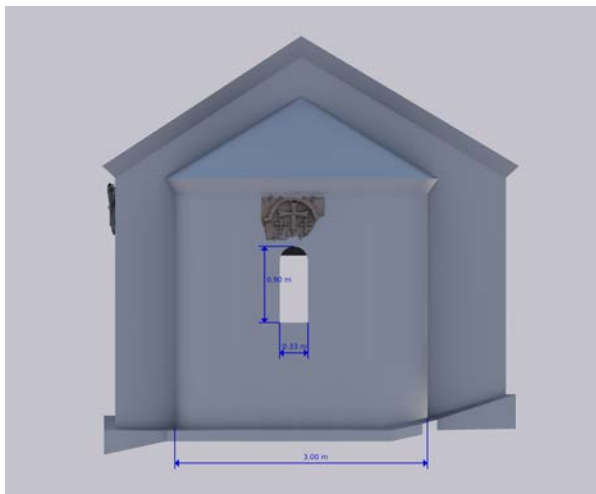
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<sup>51</sup> Vinogradov A. Yu., Beletsky D. V. *Tserkovnaja arhitektura Abkhaziji...* P. 268.

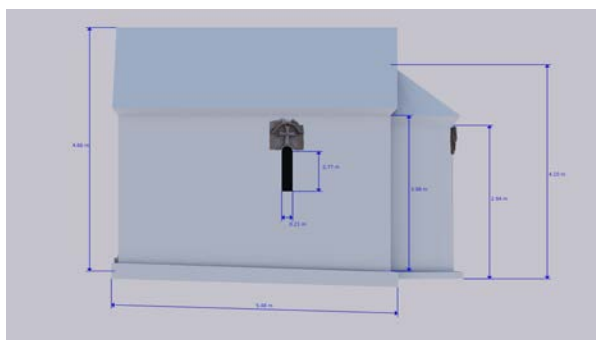
<sup>52</sup> *Ibid.* P. 269.

<sup>53</sup> *Ibid.*

eastern facades (Fig. 17, 18). The appearance of three Calvary crosses above the window of the eastern apse is due to the iconographic tradition recorded in some Christian churches in the Caucasus during the Middle Ages<sup>54</sup>.

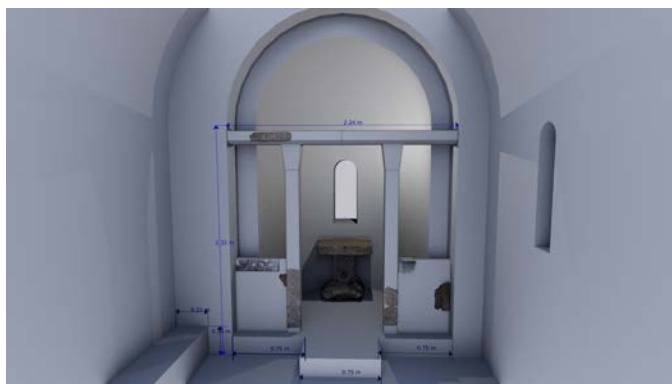


**Fig. 16** Eastern facade of the Lower Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova



**Fig. 17** Southern facade of the Lower Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova

<sup>54</sup> Rcheulishvili L. Kompozitsija iz treh krestov v arhitekturnom dekore gruzinskih hramov srednevekovija [Composition of three crosses in the architectural decoration of Georgian churches of the Middle Ages] // IV International Symposium on Georgian Art. Tbilisi, 1983. pp. 1 – 14.



**Fig. 18** Altar space of the Lower Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karnaushenko, A. D. Karnaushenko, L. K. Kazennova

When reconstructing the altar space, the following considerations were taken into account: “the space of the altar in almost all churches of Abkhazia, not only the hall ones (except for the Lesnyanskaya I Basilica and the croix libre at Krion Nero), is highlighted by raising the floor (up to 0.5 m, in the Monastery and Aba Ante), according to the usual practice of the Byzantine East. <...> Judging by the churches in Achanua and the Monastery, the altar barrier in the hall churches ran directly along the line of the apse abutment”<sup>55</sup>. Based on this, there is a slight elevation in the altar. The altar barrier is along the apse junction line.

When reconstructing the altar screen and altar, several key details must be taken into account (Fig. 16). From the Lower Church comes a stone slab with a relief in the form of a braided pattern with intertwined rhombuses and circles, and a slab with intertwined squares (catalog no. 88, 89)<sup>56</sup>. According to Trapsch, both reliefs from this church can be dated to the 11th century. The remaining fragments for the reconstruction of the altar barrier were selected by analogy with the two above mentioned.

The shape and size of the semicircular slab with an inscription on the end suggests that it could have been used as a throne cover<sup>57</sup>.

“Relief with a Maltese cross and circles on the corners of the crossbars<sup>58</sup>: “Limestone. Dimensions: wide 0.27 m, height 0.48 m, diagonal (lower left - upper right) - 0.41 m, diagonal (lower right - upper left) - 0.39 m. Relief depth from 0.4 to 1.2 cm. Groove dimensions: width. 3 cm, h. 6.5 cm, depth 2.2 cm.” This piece may be a throne leg, since its lower part was probably inserted into a groove in the throne support. The slab has a rather

<sup>55</sup> Vinogradov A. Yu., Beletsky D. V. Tserkovnaja arhitektura...

<sup>56</sup> *Iskusstvo Abkhazskogo tsarstva...* P. 208 – 209.

<sup>57</sup> *Ibid.* P. 218 – 219, № 4.

<sup>58</sup> *Ibid.* P. 132, № 6.

skillful relief depicting a cross, at the base of which there is a relief element in the form of a house or temple, in the middle of which there is a small niche. This niche looks like a hole for placing relics. Its framing may refer to both the image of the temple and Golgotha, especially since it is located at the base of the cross.

It is important to note here that the inscription on the end of the slab, which can be considered the lid of the throne, is the only inscription that mentions the fact of lighting a certain church in the name of St. Theodora. Thus, if the proposed reconstruction is correct, then we can say that the dedication in the name of St. Theodora did not have the Upper Church in the citadel, as previously assumed, but the Lower Church. In this case, the Upper Church may have been consecrated in the name of the Mother of God (since, according to legend, it was in it that the miraculous icon of the Mother of God was kept). The combination in one place of two small churches with consecration in the name of the Mother of God and a holy warrior (for example, St. George) has analogies in some regions of Georgia. For example, in the village of Akhalsopeli (Bza) there are also two churches of the same time and similar in design and architectural decoration as the churches from Anakopia. One of them is consecrated in the name of the Mother of God, and the second, smaller one, in the name of St. George.

Thus, in the course of the conducted research using virtual reconstruction methods, it is possible to formulate a reasonable hypothesis about what the architectural decoration of the Upper and Lower Churches on Mount Anakopia could have looked like. Judging by the available data, the appearance of these churches was typical of small church buildings in mountainous regions or fortresses in the Caucasus, starting from the second half of the 10th century. Paradoxically, it combined the features of the “severe” style characteristic of western and central Georgia, South Ossetia, etc. (for example, two churches in Akhalsopeli (near the Trialeti range, Kvemo Kartli) and others, Ubisi (Imereti), Armaz, in fragments - Nadarbazev, Kasagina, Kvaisa, etc.) and decorative motifs that were spreading throughout the territories of the Byzantine Empire from the Greek provinces (workshops of Thebes, Skripou, Peloponnese) and Asia Minor (woven ribbon ornaments, such as, for example, on the altar barriers from Hosios Loukas), starting from the 9th century<sup>59</sup>.

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<sup>59</sup>Endoltseva E. Yu. Pletenij lentochnij ornament na Kavkaze v period Makedonskoj dinastiji: istoki i znachenije motiva [Braided ribbon ornament in the Caucasus during the Macedonian dynasty: the origins and significance of the motif (using the example of architectural plasticity)] // *ByzantinoCaucasica*. Vol. 2, Moscow, 2022. pp. 131 – 158.

**List of illustrations:**

- Fig. 1** Model of the upper window casing with the image of a lion. D. O. Dryga, A. D. Karanushenko, L. K. Kazennova
- Fig. 2** Model of the upper window casing with the image of a fish. D. O. Dryga, A. D. Karanushenko, L. K. Kazennova
- Fig. 3** Lost upper window casing with a bull and a lion near a cross and an inscription. Endoltseva E. Yu. *Architectural plasticity of Abkhazia during the period of the Abkhazian kingdom (VIII-XI centuries)*. Moscow, 2020. pp. 80 – 83
- Fig. 4** Model of the upper window casing with the image of three crosses. D. O. Dryga, A. D. Karanushenko, L. K. Kazennova
- Fig. 5** Model of the upper window casing with the image of a cross. D. O. Dryga, A. D. Karanushenko, L. K. Kazennova
- Fig. 6** Orthophotomap of the Upper Church on Mount Anakopia. D. O. Dryga
- Fig. 7** Eastern facade of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 8** Southern facade of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 9** Western facade of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 10** Northern facade of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 11** Altar barrier and altar of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 12** Altar barrier and p altar of the Upper Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 13** Orthophotomap of the Lower Church on Mount Anakopia. D. O. Dryga
- Fig. 14** Three-dimensional model of the Lower Temple. View from the southeast. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 15** Three-dimensional model of the Lower Temple. View from the northwest. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 16** Eastern facade of the Lower Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 17** Southern facade of the Lower Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova
- Fig. 18** Altar space of the Lower Church. Reconstruction. D. O. Dryga, E. Yu. Endoltseva, E. N. Karanushenko, A. D. Karanushenko, L. K. Kazennova

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