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ARTICLE

Natural Caves and Architecture Carved in the Rocks in Bosnia and Herzegovina

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ABSTRACT

Students of the Faculty of Architecture in Sarajevo, through the course Architecture of the Old Age, were able to get acquainted with “architecture carved in rock”, and only a very limited number of examples - the architecture of ancient Egypt, ancient Greek architecture in Asia Minor (Lycia), and the architecture of ancient Persia. Many examples of this architectural expression remained unknown to them: the architecture of ancient and medieval India, the architecture of ancient and medieval China, the architecture of the ancient Middle East (the area of today’s Israel, Jordan, Saudi Arabia), vernacular architecture around the world from different historical periods. As a teacher at the Faculty of Architecture in Sarajevo, the author, after switching to the education of architecture students in accordance with the “Bologna process” (2003), presented “architecture carved in the rocks” through a series of subjects, through all levels of education (undergraduate, master’s and doctoral studies), within the framework of processing narrower topics of architecture: constructive systems in architecture, bioclimatic architecture, architecture as an energy system, architecture in context. The complex process of creating architecture and explaining its appearance was elaborated by the author (1988) in his doctoral dissertation. The topic “Architecture Carved in Rocks” was elaborated according to this model, which on the one hand confirmed its applicability, and on the other hand enabled students to look at the highly dispersed appearance of architecture in an extremely systematic way, without losing sight of its basic elements: environment, man, boundaries and perspectives. The aim of this work is to show (and through examples in Bosnia and Herzegovina) that natural caves, with more or less “refining”, are still used today, and that “carving architecture into rocks” is an all-time and planetary phenomenon.

1. Introduction

Carved architecture appears in the most diverse architectural programs (types of architectural content): tombs,

sepulchral temples, temples, churches, teki, monastic complexes, hermit cells, stone carvings, amphitheatres, state administration facilities, production plants, slau-

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gherhouses, cattle sheds, shelters for people from enemy attacks, shops, terraces-pools for salt production... At the same time, each of these programs, depending on social circumstances (similar to architectural objects built on the ground), could have any other function. The time of the creation of architecture carved into stone rocks dates back to early prehistory to the present day. In recent times, among the architectural programs, hotels carved into rocks are a frequent occurrence, which satisfies the huge interest of people of all social classes and professions to personally experience the ambiance of architecture carved into rocks ^[1-6].

The methodology that deals with the topic of “architecture carved into rocks” is based on the Architecturally Defined Space (ADS) model and a new architectural typology (Figure 1). Architecturally defined space (ADS) is determined by the environment (natural and social), man (in a wide range of meanings of this term), borders (the place of “great change”, the place where the demands of man and the environment are met) are materialized by borders that are the physical manifestation of architecture) and Perspectives (a dynamic dimension of architecture that opens it to the future, respecting the past and the present), (Figure 1, left) ^[7].

The new typology of architecture recognizes the possibility of realizing architecture in the most diverse natural environments. There are four basic types of architecture: E (architecture created on Earth with numerous subtypes including EG (Earth-Ground, architecture created on Earth), EW (Earth-Water, architecture created under water),

EA (Earth-Atmosphere, architecture created in the Earth’s atmosphere), type S (Space, architecture created in Space) and SB (Space body, architecture created on other bodies in Space), (Figure 1, right) ^[8,9].

The architecture carved into the rocks belongs to the types EGA (Earth-Ground-Atmosphere) and possibly in the future XSB (where X refers to some body in the Universe).

The theme of “architecture carved into rocks” can be traced through a number of its aspects:

- Geographical and environmental specificities,
- Constructive specifics and the technology of its execution,
- Architectural-aesthetic specificities,
- Mental specificities (philosophy, religion, social status of man-individual)...

These aspects will be elaborated through the content of this paper.

This paper presents examples of natural caves (which have been more or less “modified” for the needs of the people who use them, such as Tito’s cave in Drvar) and of architecture carved into the rocks by man for various reasons: ensuring the safety and longevity of the burial mounds (Catacombs in Jajce), achieving the mysticism of the content and its physical safety (Behram Efendi’s mosque with kuija and turbet and Celija (The Cell) in Rataj near Miljevina), ensuring existence in conditions of an unfavorable social environment (Kastela near Fojnica), ensuring physical safety in conditions of extreme war conditions (Tito’s bunker ARK DO in Konjic and Tunel spasa (Tunnel

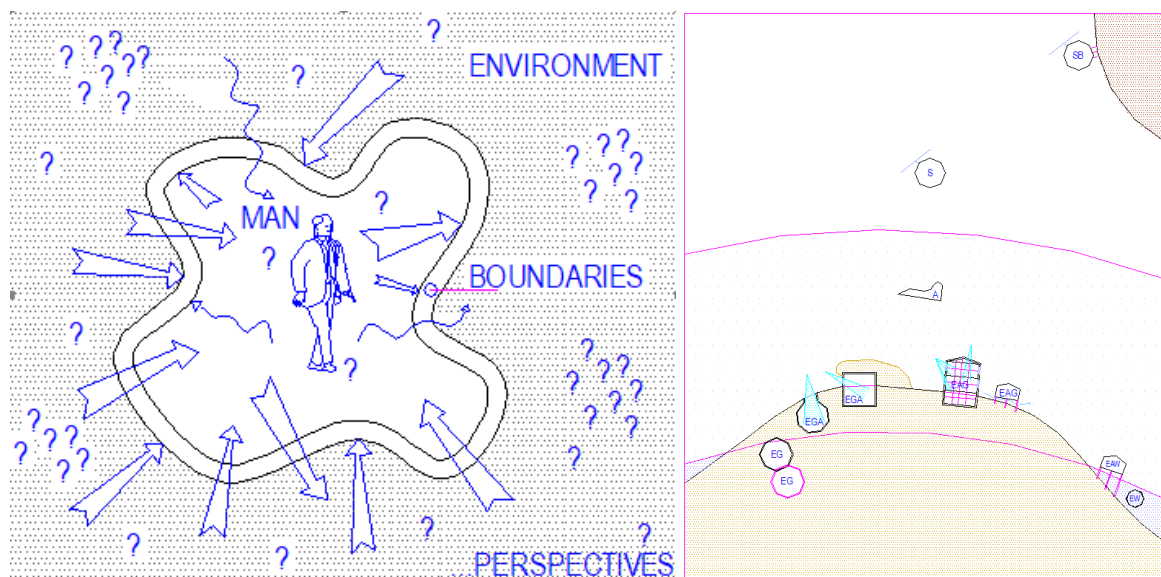


Figure 1. Left: Architecturally Defined Space (ADS). Right: Architecturally Defined Space (ADS) - Typology

Source: Author (1988, 2011)

of salvation) in Sarajevo), due to the need to develop an architectural structure in the narrow conditions of the location (Hotel Saraj in Sarajevo, for example).

Presenting examples of architecture carved into rocks in Bosnia and Herzegovina, the author contributes to a universal world theme that confirms the relevance of this form of architectural expression in all times and in all areas of the planet Earth ^[1-6].

2. Caves and Rock-cat Architecture in Bosnia and Herzegovina

Caves carved into the rock by human hands can be considered part of the sacred Bosnian underground, which served as hermitages or places for seclusion. These localities are hardly mentioned in domestic scientific and professional literature ^[10-12].

In the Tusnjici village near Visoko is Sehova pecina (Seh's cave, Sehovaca or Ljestvaca), (Geographical coordinates: 43°57'14.76"N, 18°07'01.15"E, elevation: 465). Sheikhs used to gather in the cave, and the forest path to the cave was maintained and marked. Above the main cave there is a smaller cave to which a wooden ladder leads (Figure 3). The lower (Great) staircase is

located at the entrance to the Trstionica river strait on the way from Kraljeva Sutjeska to the medieval royal town of Bobovac (Geographical coordinates: 44°08'08.41"N, 18°12'52.81"E, elevation: 594). The entrance to the cave is at a height of about 30 meters from the river bed and about 20 m from the upper edge of the rock. Access to the cave is very difficult, which was the reason why the cave remained unexplored until today ^[10].

Continuing on the road from Donja ljestvaca (Lower ladder) further along the Trstionica river bed, after a few hundred meters you come across a vertical section of rock in which two small caves are located. The locality is known as Gornja ljestvaca (Upper ladder) and is located directly below the town of Bobovac. The caves are located one above the other, high in the rock, so that access to them today is impossible without special equipment. Traces of the wall can be seen at the entrance to the caves. It is possible that both caves served as watchtowers towards the town of Bobovac. There are other points of view about the origin and purpose of these caves, and according to one of them, the Franciscan friar Andjeo Zvizdovic (in Bosnia, during the Ottoman administration, revered as a saint) lived there, where he died.



Figure 2. Geographical location of Bosnia and Herzegovina

https://visitmycountry.net/bosnia_herzegovina/bh/index.php/turizam/27-vmc/geografija, Accessed: 7.20.2022.

<https://cdn.britannica.com/30/6230-050-1DF72CE3/features-Bosnia-and-Herzegovina.jpg>, Accessed: 7.20.2022.



Figure 3. Sehova's cave (Sehovaca or Ljestvaca) near Visoko

<http://www.bhdokumentary.net/index.php/putopisi/134-stazama-misticnih-pecina>, Accessed: 7.20.2022.

Djevojačka pecina (The Maiden's Cave) in Brateljčevici near Kladanj is a natural cave (Geographical coordinates: 44°12'51.22"N, 18°38'44.31"E, elevation: 791). We mention it in this paper because of its great importance in the life of the people of this region and Bosnia and Herzegovina as a whole. Next to the Maiden's Cave, there is a landscaped area where a traditional outdoor prayer (dova) is held every year (Figure 4).

Almost as a rule, the prayer is held at the place of some trace of material culture from the past of Bosnia and Herzegovina (necropolis of stecaks, a grave with a tombstone...), at the site of an extremely valuable natural asset (a yew tree, for example, a permanent source of drinking water, a watercourse in a rich natural environment...). In the case of Dova in Brateljčevici (Prayer in Brateljčevici), Genius Loci consists of the Djevojačka cave and a mountain glade with the Bukovica river (a tributary of the Drin-jaca river), in the rich forest of the slopes of Konjuh. From the macadam road that leads from Brateljčevici to the end of the cave, climb up the arranged staircase (about 30 meters) to the entrance to the cave. From the spacious entrance, the profile of a huge triangle, it first descends into the cave, then it encounters a wide flat space (in which water sometimes accumulates), and then it climbs along a wide, amphitheatrical space to the end of the cave with several "terraces". As the end point of the cave, the pinnacle of the entire "natural composition", there is a well that can be approached completely bent over, almost crawling. The cave is located at 760 meters above sea level. The temperature inside the cave (14 °C) is constant, both in summer and winter. The girl's grave follows the direction of the Kaaba (Qible) with its axis. The well is the reason for a legend that has been alive in the people for more than four centuries, in which water and a girl are the main characters. This touching legend about a brave girl became the reason for the unprecedented popularity of the Maiden's Cave in Brateljčevici near Kladanj. It became the motive for performing a mass annual prayer (dova) in the open air, and visiting "people, women and children who are suffering from some kind of trouble". As this tradition continues today, new stories are constantly happening, which, from the real characters of today, will become part of the legend about the Maiden's Cave in Brateljčevici for some time^①.

If we exclude the legend about the girl, Djevojačka pecina (The Maiden's Cave) offers us many other interesting things: the space of the cave itself with a constant temperature (14 °C) is suitable for various manifestations,

from collective prayer, to theater performances, musical manifestations (and with a little decoration, and sports manifestation).

Cave drawings (on the wall to the left, after the entrance to the cave, which are still clearly visible today, and which stretch for about 15 meters), objects that can still be found there today, can be attractive to anthropologists and science in general. The visitors' attention is drawn to the drawings: a rider on a horse, hunting scenes, deer, human figures, abstract geometric figures (rectangle with dots), phalluses, arrows and various other figures whose meaning is yet to be understood. The drawings date from the Paleolithic (10,000 years ago).

The Zavala Monastery in Popovo polje is a construction attached to a cave where almost half of the building is under a stone vault. The cave to which the building is attached is partly artificially cultivated (Geographical coordinates: 42°50'59.71"N, 17°58'46.52"E, elevation: 319). There is no information about the traces of an earlier cult at that place, since the layers of possible earlier cultures are covered by construction. Not far from the Zavala monastery is the Vjetrenica cave with possible traces of a medieval hut. The time of construction of the monastery is not known. The year 1271 is on the monastery seal, but this does not necessarily mean the time of its construction, since it is known that many church documents were forged in order to obtain benefits and rights to property. The current buildings (and some monastery books) date from the 16th and 17th centuries. Some parts of the complex are arranged as hermit cells (Figure 5).

The cave under Sehova Korića in Sarajevo is poorly explored (Geographical coordinates: 43°51'27.84"N, 18°27'00.26"E, elevation: 614). Some authors state that in this cave dervishes spent erbein - seclusion for 40 days. The cave was part of a Sufi complex that consisted of Tekija on Bentbash, Šeh's koria, the Abu-Hayat spring on the way between them, the turba and chardak on Šeh's koria, and the Hodidjed fort. Across from the cave below Sehova Korića (across the Miljacka river) is the Orlovaca rock (today known as an alpinist training ground), (Figure 6). Today there is a cave there, which is closed with an iron gate and which has been turned into a warehouse for civil protection. The entrance to the cave is according to the measurements of the one in the cave below Šeh's koria. Next to this cave, at the very mouth of Moscanica in Miljacka, where Da Riva's tavern used to be, there is a typical artificial underground building in the rock (entirely lined with bricks, as was done at the turn of the 19th and 20th centuries).

Next to this cave, at the very mouth of Moscanica in Miljacka, where Da Riva's tavern used to be, there is an

① The author stayed in Djevojačka pecina (The Maiden's Cave) in Brateljčevici (August 3, 2011) accompanied by an official (Tufik Selimbasic, born 1965) who, in front of the municipality of Kladanj and the Tuzla Canton, is in charge of taking care of guests visiting the cave, including security electric lighting in the cave. Without this (or similar) lighting, it would not be possible to walk through most of the cave.



Figure 4. The Maiden's Cave in Brateljevici near Kladnje

The girl's grave in Djevojacka pecina (The Maiden's Cave). (Geographical coordinates: 44°12'51.31"N, 18°38'44.29"E)

Source: Author (8.3.2011.)

artificial underground building in the rock (entirely lined with brick, as was done at the turn of the 19th and 20th centuries). It can be assumed that this artificial object was also created from a natural cave or cave, which Da Riva expanded and used for the "ice house" of his tavern.

Celija (The cell) in Rataj is carved into the living rock (Geographic coordinates: 43°30'19.24"N,

18°38'30.82"E). According to the shape of the arch, it originates from the Gothic period (the year 1492 is carved above its entrance). The cell later served as a tekija, and a mosque was later built next to the rock itself (Figure 7). Some authors believe that this place has the property of a whole "grave and temple", such as the Catacombs in Jajce, Sehova tekija and the cave in Kozlogradske stijene



Figure 5. Zavala Monastery in Popovo polje (Geographic coordinates: 42°50'59.03"N, 17°58'46.50"E)

<https://arhiv.stav.ba/hram-srastao-s-krajolikom/>, Accessed: 7.20.2022.

(Kozlograd rocks).

To the southeast of the rock-cell, in the immediate vicinity, there are the remains of the foundations of the former mosque, to the south is the active cemetery of the Cengic family, and to the north of the rock are the remains of a former turbet and an object of unknown purpose. About 150 m southwest of Pečina are the ruined remains of the tower of the Cengic family, who, as part of a large feudal family of Ottoman origin, moved from Anatolia to Bosnia in the middle of the 16th century.

The Rataj village of is located about one and a half kilometers west of Miljevin, on the right bank of the Govza river, about half a kilometer from its confluence with the Bistrica river. At the top of the village, in a prominent and elevated place, there is a solitary limestone rock, about 30 m in diameter, vertically embedded in a relatively flat terrain. About 150 m to the southwest is the tower of Cengic family - Ratajaca.

The entrance to the cell is not protected by anything, but gapes empty like the tomb inside. A small arch door leads to the interior of the rock, about two meters high and 70 centimeters wide. In the cell itself there is a grave crab

without a cover plate. It is entered from the south side, via three steps carved into the living rock. Above the entrance is a carved canopy. The rock is about six meters high and about 16 meters in circumference and occupies a central place in the complex with the remains of a mosque, a turbet and a cemetery, as well as walls that some researchers claim are the remains of a harem, while others claim that they are the remains of a medieval church. There is no historical information about it, except for the Cengic family. In addition to the mentioned material remains on the ground, there are only folk traditions, so various stories intertwine around this mystical place. According to one tradition, which was recorded in the Gazette of the National Museum in 1889, it says: "The cell served as a tekija, and a mosque was later built next to the rock itself. It is said that Hadji Hasan, a companion of Prophet Jesus, was buried there. That companion put a prayer on Rataj. The custom was that on the eve of every Friday, the girls go to Turbet, study two words in Turbet, ask for what you want, when you go, light a candle - in the morning, there is no trace of the candle, not even a trace"^[11].

Tito's cave in Drvar (Geographic coordinates:



Figure 6. Turbe on Sehova Korija and the spring of Ebu Hayat in Sarajevo (Geographic coordinates: 43°51'25.41"N, 18°27'00.31"E)

Source: Author (7.23.2022.)



Figure 7. Celija (The Cell) in Rataj near Miljevina

<https://bracobabic.wordpress.com/2021/12/28/arheolosko-podrucje-u-selu-rataje/#jp-carousel-10516>, Accessed: 7.20.2022.
<https://lh5.googleusercontent.com/p/AF1QipMy4y5uXVuhPKw7ug8DoDV00cU2wvWhwdqigfoh=h1440>, Accessed: 7.20.2022.

44°22'51.05"N, 16°23'13.60"E). The town of Drvar is located in the western part of Bosnia and Herzegovina, in the karst area. It is located on the road Livno-Bosanski Grahovo-Drvar-Bosanski Petrovac. It is 63 km from Knin in Croatia. The surroundings of Drvar are rich in forests (one of the richest and most beautiful forest complexes in Bosnia and Herzegovina) and karst pastures. Forests have a high level of flora and fauna biodiversity. The most important watercourses are the river Unac (10 km long) and the river Bistrica (1 km). Unac is rich in brook trout and grayling (Figures 8, 9).

In the Prekaja town there is Prekajsko jezero (area about 2 km²), which is rich in fish. In the area of Drvar, there is a case of bifurcation of a river belonging to two different basins.

On May 25, 1944, in Drvar a military operation by German forces called Rösselsprung ("Horse's Leap") took place, with the aim of destroying the NOV (Narodno oslobodilačke vojske - National Liberation Army) headquar-

ters with Tito at the head. The cave where Tito was with his staff has been called Tito's cave ever since^②. Today, Tito's cave is one of those places that attracts the attention of people from all over the world. In the future, as a place with character, with intense Genius Loci, it will be a resource for Drvar and Bosnia and Herzegovina as a whole.

Catacombs in Jajce is a popular term for an underground church carved into the rock (Figure 10), (Geographic coordinates: 44°20'22.14"N, 17°16'06.29"E). In their neighborhood is the Bear Tower, the Franciscan Monastery, the Church of St. Mary and the tower of St. Ports, the Women's Mosque and the clock tower, as well as caves and Roman sarcophagi. The church is the work of stonemasons from Jajač, whose rooms were carved out of living stone or were adapted into an already existing cave. Some historians believe that Prince Hrvoje Vukcic Hrvatinic (1350-1416) intended to transform this cave into a family tomb, since there are signs of his coat of arms carved at their entrance. The catacombs have differ-



Figure 8. Tito's cave.

Source: Google Earth.

Accessed: 7.20.2022.

^② According to the Law on Nature Protection (Official Gazette of the SR BiH, number: 4/65, dated February 5, 1965), Tito's Cave was declared a Memorial Monument of Nature.



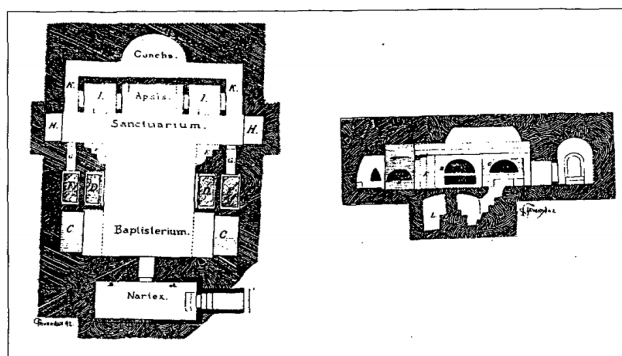
Figure 9. Tito's cave in Drvar

Source: Author (8.2.2011.)

ent stylistic features, Eastern (in imitation of Indian temples carved into the rock), Christian, characteristic of the “Bosnian Church” and thus symbolize several religions. The catacombs were probably intended to serve as a place for the rituals of the Order of Dragons to take place. The arches are of Eastern style and are reminiscent of Mithraism, in the lower part are the presbytery and the baptismal font in the Christian style, but it gives the impression of a place of worship of members of the Bosnian Church. There is also a cross in the lower part. Over time, the catacombs in Jajce had different purposes. The Franciscans in Jajce had a leprosarium there where the sick were housed. During the time of Omer Pasha Latas (1806-1871), Christian women and children took refuge there. Dervishes (a kind of Muslim hermits) used to retire there and spend time in prayers and fasting. According to traditions, the catacomb was also used as a dungeon.

Kastela is a locality about 11 km northwest of Fojnica

(Figure 11), (Geographic coordinates: 44°01'14.28"N, 17°56'00.24"E). There are several rooms with several floors here. The tradition about the friars who took refuge there before the invading Ottomans has been preserved in the people. According to another tradition, after receiving (in 1463 or 1464) a firman (Ahdnama) and a mantle from Sultan Mehmed II the Conqueror (1432-1481), Friar Andjeo Zvizdovic went to Kastela and spent there in solitude, as a hermit rest of life. The introduction of Friar Andjeo Zvizdovic into the tradition has been a common procedure for the conversion of pagan sanctuaries into Christian ones since Pope Gregory I (Pope Gregory I, 540-604). And here we should remember the belief of the “Bosnian Christians” according to which the Most High does not rest in buildings made by human hands, which is recorded by St. Jakov of Marka (active in Bosnia at the time of King Tvrtko I, 1338-1391). According to this, Kastela is connected to the tekija in Vukeljici, taking into account



Sl. 23. Osnova i presjek Katakombi (prema Truhelki, 1892.)



Left: Foundation and section of the catacombs in Jajce (According to C. Truhelka, 1892)

Right: Entrance to the catacombs in Jajce



Left: The interior of the catacombs



Right: Cross carved in rock

Figure 10. Catacombs in Jajce

https://lh5.googleusercontent.com/p/AF1QipMt2vXxhWrgBGQ0UPiTZ3eoi_31bhFsyKB4yoNp=h1440, Accessed

<https://www.agencija-jajce.ba/1240-1008-o-katakombama-u-jajcu/>, Accessed: 19.07.2022.

<https://furaj.ba/katakombe-jajce/>, Accessed: 7.19.2022.

the following facts:

- The area along the Kozica river is populated by Muslims. According to the belief of the inhabitants, before the establishment of the tekke, that area was not inhabited.
- The tekke in Vukeljici, judging by the basis of its old foundations, was built on the foundations of one of the "huts" and that a tekija was built on its foundations during the period of the holy place.
- Below the Kastela is a place called Jelenjaca (the deer symbolizes spiritual purity, strength, a symbol of light). It is a rock in the shape of a sofa, from which Sheikh Husejn-baba, according to tradition, lowered the tespah to the foot of the rock (height about 10 m). At the foot of the

rock there is a cave, and nearby there is a place associated with Sheikh Husejn-baba. In a way, it is again a cave, a cracked rock, the place of "Sheh's tub" on the Kozica river. There, the sheikh performed zikr, and there is also an inscription carved into the rock, which is in an inaccessible place and which no one from the "ordinary world" has yet read. As part of the tekke in Vukeljici, one room had the role of a cave for seclusion.

Therefore, one type of hermitage or seclusion was present among all three main confessions in Bosnia and Herzegovina. This fact alone gives a completely new dimension to the religious doctrine of Catholicism, Orthodoxy and Islam in our region.





Figure 11. Kastela near Fojnica

<https://furaj.ba/stari-grad-kastel-kod-fojnice/>, Accessed: 19.07.2022.

<https://www.youtube.com/watch?v=FVSpjGJRO8U>, Accessed: 19.07.2022.

https://furaj.ba/wp-content/uploads/2020/06/stari_grad_kastele_kons1.jpg, Accessed: 19.07.2022.

Behram-effendi's mosque with kuija and turbet. Kuija is an artificially constructed underground room next to the right side of the entrance to the Behram Efendija Mosque in Novoselia in Banja Luka (Geographic coordinates: 44°44'10.70"N, 17°09'29.65"E). It is accessed by five stone steps. Almost its entire height is buried in the ground, and the barrel vault barely protrudes from the ground. Its dimensions are 3.10 m × 1.60 m and the height is 1.90 m at the top of the vault (Figure 12). Next to the southeastern wall, there is an added part in which a small niche is conically shaped, but quite shallow, and represents a mihrab. On the left and right side there are two shelves on which candles, books or levhe could have been placed. Above the mihrab is a small window. The kuija,

like the mosque, is associated with Behram-effendi, who is said to have been a very learned man. In Kuija, he spent time in prayer (worship). On the other side, next to the mosque, there is the turbe of Bahram-effendi, built similarly to Kuija, of roughly hewn stone. This composition testifies to the medieval life of Bosnia (Church of Bosnia) based on the "temple and grebe".

Tekija (Tekke) at Vrelo Bune. Tekija (space where "ordinary" people, dervishes-sufis (persons who aspire to higher knowledge about God), express special respect for God through long prayers), (Geographic coordinates: 43°15'25.68"N, 17°54'12.87"E). Special religious-philosophical discussions on many issues of the world, man, knowledge, power.

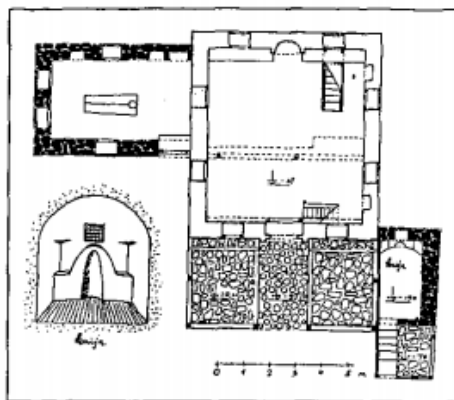


Figure 12. Behram Efendi's mosque with kuija and turbet

<https://soamaps.com/country/BA/28905/behram-efendijina-damija>, Accessed: 19.07.2022.

The tekija was built on solid rocky ground to the right of the spring, which is considered one of the largest in Europe (Figure 13). A high stone cliff (240 meters) stretches above the tekia. The walls of the medieval city of Stjepan Vukcic Kosaca still stand on that cliff.

This building belonged to various dervish orders, first the Bektashis, then the Halvetis and Kaderis. Today it is led by a vekil, deputy sheikh, of the Naqshbandi order.

Tekke at the spring of Bune was founded shortly after the fall of Herzegovina under Ottoman rule in 1446, and around 1520 at the latest. In written documents, tekija is mentioned for the first time (1664) in the travelogue (Sejahatna) of the Ottoman travel writer Evlija Celebija (1611-1682) [7]. In the tekija, immediately after its construction, respect for God was manifested through the teachings of the dervish order Bekteshija, and from the 18th century (after it was restored by the Mufti of Mostar, Zikajni Ahmed-ibn-Mustafa) through the teachings of the dervish order Halveti. The tekija was first restored in 1851 by order of Omer Pasha Latas (1806-1871), since then the ceremonies have been held according to the Kaderi dervish order. On that occasion, some elements of the “Ottoman-Turkish Baroque” (curved lines on the roof of the entrance facade) were given to the tekke building. Today, the rites in this tekke are performed in accordance with the Naqshibendi dervish order. The following sections were

built in the tekke complex: Turbe, Mejdan room (lecture room), Imaret - coffee-fireplace, Ribat, Hamam - Spa, Chila, Semahana, Mosque under the dome, Abdesthana with toilet, Kitchen - mutvaka and Bozadzinica (summer cooler with water)^③.

“Tito’s bunker ARK DO in Konjic” was built in great secrecy from 1953 to 1979 to shelter Tito and his 350 closest associates in the event of an atomic disaster (Geographic coordinates: 43°39’03.63”N, 17°57’43.81”E). This area made of reinforced concrete and carved into the rock was developed on about 6500 m², at a depth of about 300 meters below the surface of the earth (Figure 14). The facility has more than a hundred rooms and a completely preserved inventory (numerous residential rooms, a conference hall, many offices, and the “presidential block”). It was intended to ensure the smooth life of 350 people for six months. Until the 90s, the construction (in which 4.6 billion US dollars were invested) and the existence of this bunker was the most closely guarded military secret. Seen from the outside, you can see three ordinary houses in a natural setting. The building consists of three parts. The first one is visible and is called the masking part. It consists of three facilities: a supervisory residence, a facility for the close security of the former president of the SFRY Josip Broz Tito (1892-1980), and a facility that was supposed to house technical support personnel. When you

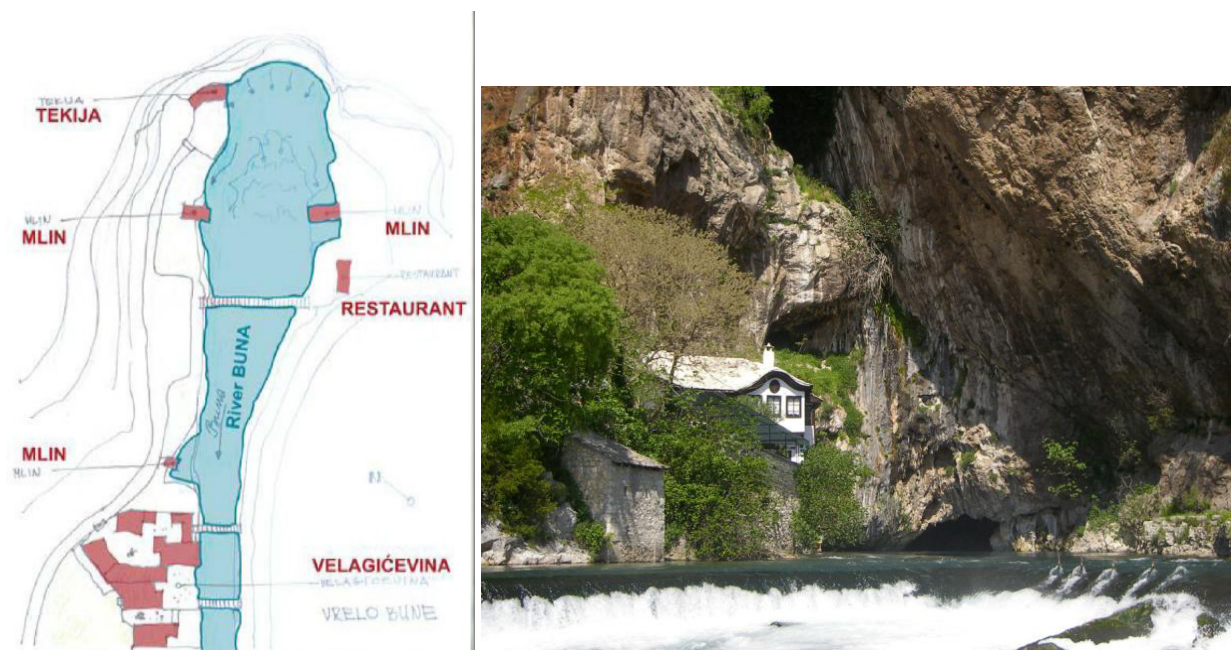


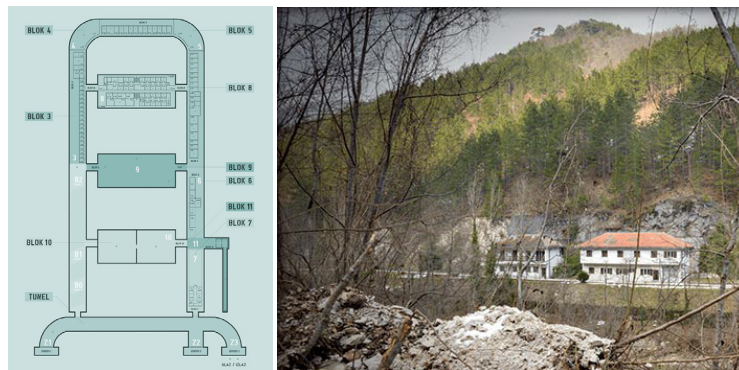
Figure 13. Tekija at Vrelo Bune

Source: Author (4.24.2006.)

③ The Commission for the Preservation of National Monuments of Bosnia and Herzegovina, by its decision no. 07.1-02-1029/03-37 from 5.5.2005. declared the historical city area of Blagaj a national monument of Bosnia and Herzegovina.

pass through the corridor of the first house, three heavy metal doors with a thickness of 1.20 meters open, behind which you can access a tunnel that leads to the center of the atomic shelter at a depth of 280 meters and a length of 202 meters. The tunnels connect the masking part with the third part of the facility - the atomic shelter, which can withstand a nuclear impact of 20 kilotons. The third part of the building is in the shape of a horseshoe and is a protected part, because it contains protection systems, a fire protection system, a system for protection against a nuclear attack, an air-conditioning system... It is divided

into 12 blocks. The most important are blocks 6 (communications), 8 (Tito's block), 9 (the lungs of the building-air conditioning), 10 (oil tanks) and 11 (water tank). In the event of a nuclear attack, the bunker was ready to receive 350 people from the highest military and political leadership of the former SFRY. They could stay there for six months without any contact with the outside world, because it contains everything necessary for a normal life. Today, five soldiers take care of the building, and it belongs to the Ministry of Defense of Bosnia and Herzegovina.



The plan of the bunker (left) and the entrance to the complex

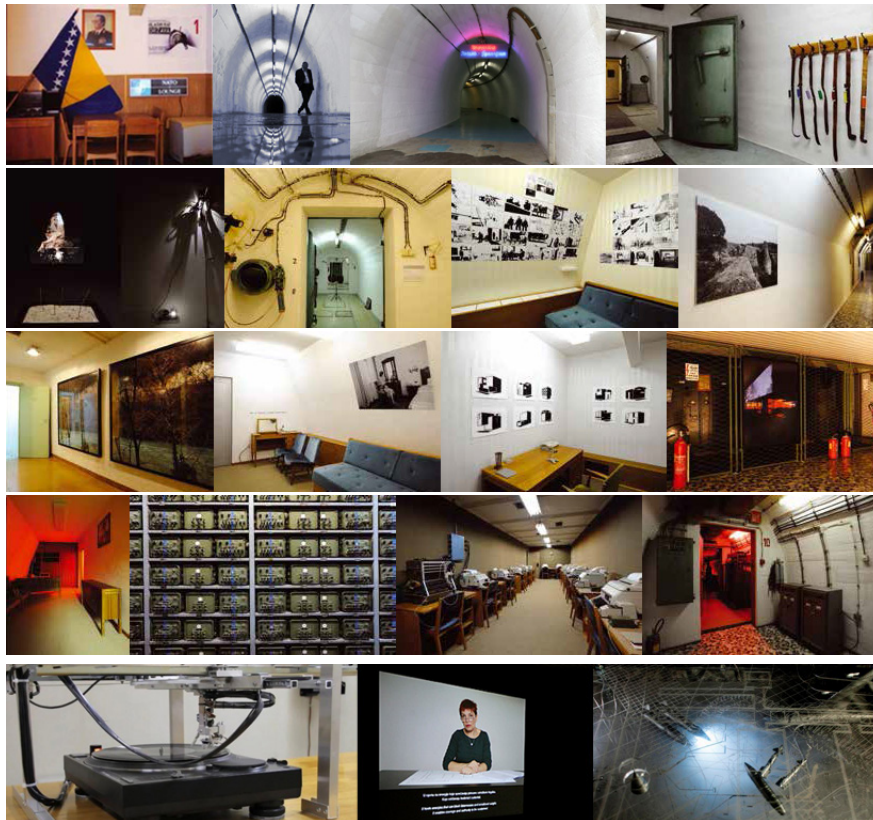


Figure 14. Tito's bunker ARK DO in Konjic

<https://titovbunker-posjete.com/>, Accessed: 7.20.2022.

<https://www.youtube.com/watch?v=UfBoFmuG7MQ>, Accessed: 7.20.2022.

“The Tunnel of salvation in Sarajevo” was built between March and June 1993 during the siege of Sarajevo by the Serbian army (Geographic coordinates: 43°49'11.18"N, 18°20'14.24"E). It was built by the Army of Bosnia and Herzegovina to connect the city of Sarajevo with the territory of Bosnia and Herzegovina on the other side of the Sarajevo airport, an area under the control of the United Nations. The tunnel connected the Sarajevo neighborhoods of Dobrinja and Butmir (for this reason it is also called “Tunnel D-B”) and thus enabled the supply of citizens under siege and the communication of citizens from besieged Sarajevo with free territories, within Bosnia and Herzegovina and the world as a whole (Figure 15). The tunnel became the main way of circumventing the international arms embargo and supplying weapons to

the defenders of the city.

“Hotel Saraj” in Sarajevo (Geographic coordinates: 43°51'34.30"N, 18°26'21.62"E) is about 250 meters from Baščaršija, a business district in the municipality of Stari Grad Sarajevo founded during the Ottoman rule. The hotel has 140 rooms (approx. 350 beds), a Wellness & Spa center, 6 conference halls equipped with multimedia with a capacity of 10 to 600 seats, three restaurants for all kinds of events such as receptions, banquets, weddings and other celebrations of various kinds.

The hotel was built in several stages (until today), rebuilt, extended and redesigned. It is interesting that, due to the limited available plot, many areas of the hotel are carved into the rock, and the rock is, in most cases, left barely visible (Figure 16).



Figure 15. Tunel spasa (Tunnel of salvation) in Sarajevo

<http://tunelspasa.ba/#Dobrodo%C5%A1li>, Accessed: 7.20.2022.



Figure 16. Hotel Saraj in Sarajevo (Architect: Aida Daidzic)

Source: Author (7.23.2022.)

3. Conclusions

Buildings and structures made of stone have accompanied man since his appearance on Earth. Some of them were found by man in nature (which were formed in the long history of the Earth as a planet) and he used them as his habitat in the state in which he found them, some he added and shaped according to his needs, and some he personally carved. Even an entire period of the development of human civilization was named after this material (Paleolithic). Stone is the oldest, most widespread and longest-lived building material in nature, traditional and contemporary, which man used in the creation of architecture as a set of inseparable and interdependent elements: function, construction and composition. These three basic elements cannot be observed separately and unambiguously, so the value of an architectural work is shown in the skill of establishing the mutual relations of the mentioned elements into a multi-layered whole that can be more or less successful.

By presenting examples of natural caves and rock-hewn architecture in Bosnia and Herzegovina, Bosnia and Herzegovina is drawing on the world map of this specific expression of architecture. Some examples (such as “Tito’s bunker ARK DO in Konjic”) are at the very top of this type of architecture in the world.

Rock-cut architecture can be found in all parts of the Earth as a planet ^[1].

Conflict of Interest

There is no conflict of interest.

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