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## ARTIFICIAL CAVES OF DIVNOGORYE (RUSSIA)

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### Abstract

Divnogorye is a chalk upland, situated on the right bank of the river Don in Liski district of Voronezh region (Russia). Museum-reserve “Divnogorye” was founded in 1991 for conservation of landscapes and unique cultural heritage. There are 6 sacred caves and cave complexes. For the first time they were mentioned in documents in the middle of the XVII century. It is also expected that caves could have been built in XIV century. Main cave complexes were created in the XVII-XIX centuries. After the 1917 Revolution they were spoiled and partly ruined. Up to the present moment cave complex in Malie (Small) Divy (Divnogorsky-1), Bolshie (Big) Divy (Divnogorsky-2) Selyavinsky (Divnogorsky-3) and Shatrishchegorsky have remained. There are also two small caves and fragment of the rock rooms which were cut out in the cliff. In the caves of Divnogorye there is a great amount of functional parts such as underground churches and crypts, long roundabout galleries, stair flights between the tiers, living quarters, sepulchral vault. Caves are decorated with architectural elements, such as imitation of intersecting vault. In some caves there are unknown parts which are cut off by the eboulement. To the west of Liski village, chalk mines are located. They were developed at the turn of the XIX-XX centuries. It was manual chalk excavation by the means of scraper. Today 10 mines with a total length of over 140 m are present.

**Keywords:** chalk, sacred caves, cave church, chalk mine-workings, Russia, Divnogorye.

### Riassunto

Divnogorye è un altopiano calcareo (chalk) situato sulla riva destra del fiume Don, a Liski, nella regione di Voronezh. Il Museo-riserva di Divnogorye è stato istituito nel 1991 per la salvaguardia del paesaggio e del patrimonio culturale. Ci sono 6 cavità sacre e complessi rupestri che per la prima volta compaiono citati nei documenti alla metà del XVII secolo e che si ipotizza possano risalire al XIV secolo. I complessi principali sono stati creati nei secoli XVII-XIX. Dopo la Rivoluzione del 1917 sono stati spogliati e in parte distrutti. Si conservano ancora i soli complessi di Malie (Small) Divy (Divnogorsky-1), Bolshie (Big) Divy (Divnogorsky-2) Selyavinsky (Divnogorsky-3) e Shatrishchegorsky e due piccole grotte che furono intagliate nella roccia. All'interno delle Cavità di Divnogorye si trovano chiese e cripte sotterranee, lunghe gallerie circolari, rampe di scale tra i livelli, zone adibite ad abitazioni, depositi sepolcrali. Le cavità sono decorate con elementi architettonici quali, ad esempio, l'imitazione della volta a crociera. In alcune cavità vi sono settori ancora inesplorati che sono stati oblitterati da frane. A ovest di Liskisi si trovano le miniere di chalk che si sono sviluppate a cavallo dei secoli XIX-XX. L'escavazione avveniva con metodo manuale e ausilio di un raschietto. Oggi si conservano 10 condotti minerari per una lunghezza totale di oltre 140 m.

**Parole chiave:** calcare tipo chalk, grotte sacre, chiesa grotta, lavorazioni minerarie, Russia, Divnogorye.

### Introduction

The Natural, Architectural and Archeological museum-reserve “Divnogorye” was founded in 1991 for conservation of landscapes and unique cultural heritage. It is situated 150 km S of Voronezh and 650 km S of Moscow (Fig.1). It is an open air museum. Divnogorye is located at the Middle Russian Upland. This place was called *divniye* (marvelous) mountains from the Russian word *divo* - a miracle. Here the meandering river Tihaya Sosna (Quiet Pine) flows into the river Don. In the middle of Divnogorye's hill are strange shape chalk poles-diva<sup>1</sup> - the creation of nature. In the XIX century there were more than 28 of such poles (now 9). In Divnogorye there are many archaeological sites. This place was inhabited 14-12,000 years ago in the Paleolithic era. Unique place of death of wild horses (*equus ferus*) is also dated by the same time. The most remarkable archeological site in Divnogorye is the medieval Mayatsky complex (IX-middle of X cc.), the NW outpost of the powerful Khazar Empire. There are

not only picturesque views, but also museum objects: “Divnogorye's farmstead” - ethnographic exhibition and archaeological park. Every year, during the tourist season (May-October) in addition to a wide variety of excursions, museum-reserve offers cultural and educational programs, festivals and new museum and volunteer projects.

In Divnogorye there are 6 sacred caves and cave complexes. For the first time they were mentioned in documents in the middle of the XVII century. It is also expected that caves could have been built in the XIV century. The main cave complexes were created in the XVII-XIX centuries.

After the 1917 Revolution they were spoiled and partly ruined. Up to the present, cave complex in Malie (Small) Divy (Divnogorskiy-1), Bolshie (Big) Divy (Divnogorskiy-2) Selyavinsky (Divnogorskiy-3) and Shatrishchegorsky have remained. There are also two small caves and fragment of the bell-tower which was cut out in the cliff.

Artificial caves are situated in the highplain, at elevation of 185 meters a.s.l., with slopes up to 30°

1) Diva is Russian term for chalk poles (outliers).



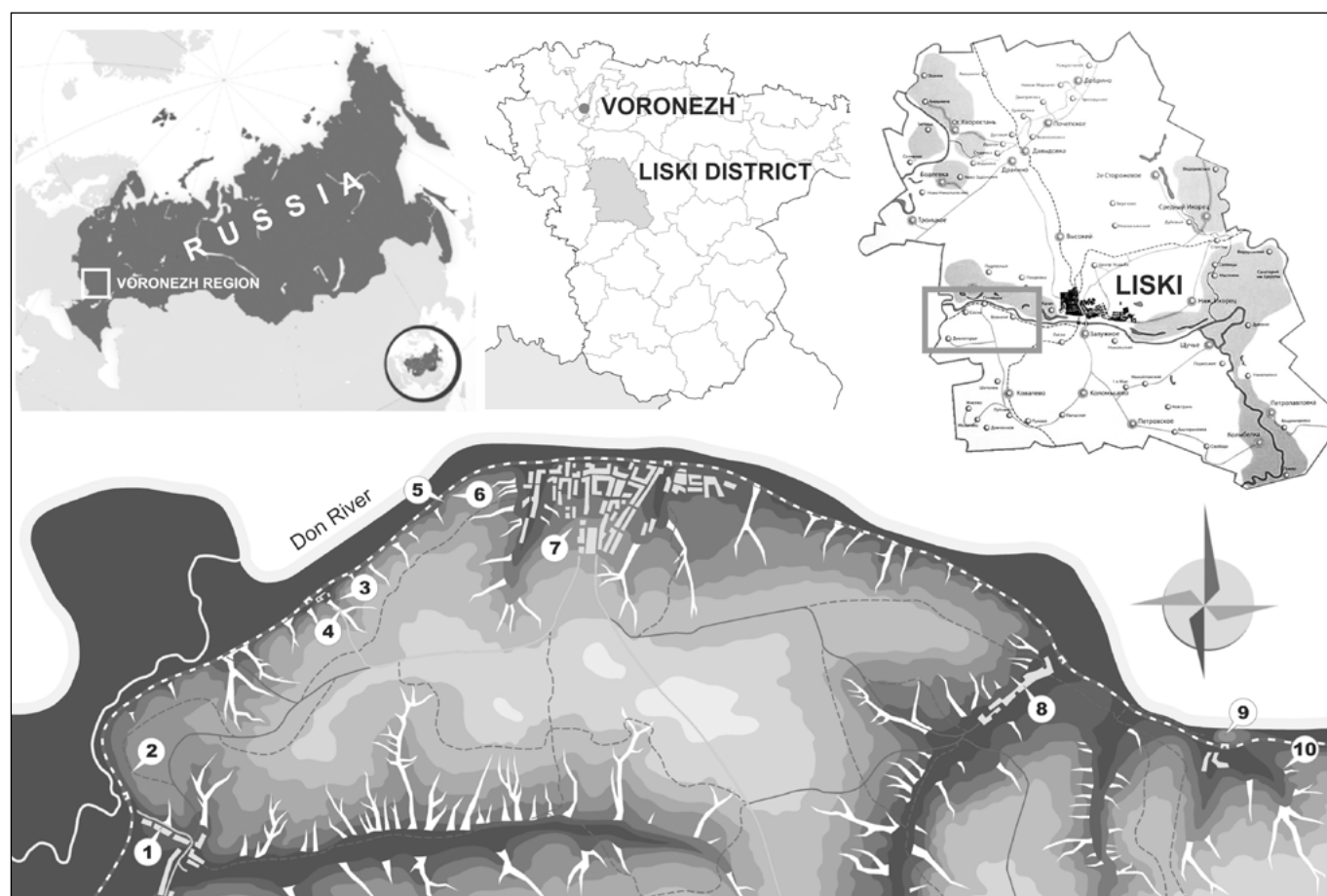


Fig. 1: the arrangement of objects on the territory of museum-reserve Divnogorye; 1) bowery Divnogorye; 2) cave complex in Bolshie (Big) Divy; 3) the Holy Dormition Divnogorsk male Monastery; 4) Cave complex in Malie (Small) Divy; 5) Selyavinsky cave complex; 6) Uliana's cave; 7) village Selyavnoe; 8) bowery Vyazniki; 9) Shatrishchegorsky cave complex; 10) Small Shatrishchegorsky cave.

Fig. 1: carta con la localizzazione dei siti nel museo-riserva di Divnogorye; 1) centro ricettivo di Divnogorye; 2) complesso rupestre di Bolshie (Grande) Divy; 3) monastero maschile della Santa Dormizione di Divnogorsk; 4) complesso rupestre di Malie (Piccolo) Divy; 5) complesso rupestre di Selyavinsky; 6) cavità di Uliana; 7) villaggio di Selyavnoe; 8) centro ricettivo di Vyazniki; 9) complesso rupestre di Shatrishchegorsky; 10) piccola cavità di Shatrishchegorsky.

and numerous outcrops of bedrock. The highplain consists of deposits of the Upper Cretaceous: Sands Cenoman (k2s), covered by writer's chalk Turonian and Coniacian (k2t+k). Cretaceous rocks are covered by a layer of Middle Eocene sands and Paleogene marls. Quaternary sediments are represented on the watershed by periglacial diluvium cover.

### Sacred caves

Divnogorye's group of sacred caves and cave complexes consists of 6 artificial caves, which are situated in the chalk highplain on the right bank of the river Tihaya Sosna and Don in Liski district of Voronezh region at a distance of 3.5-12 km from the district center of the small town of Liski (Gunko et al., 2014).

**Cave complex in Bolshie (Big) Divy.** It is located on the territory of MR "Divnogorye" on the right bank of river Tihaya Sosna, 0.5 km N of the bowery Divnogorye. The complex consists of two levels. It includes a cave church, the procession gallery and a number of rooms. The main entrance is in the bottom of the large chalk diva (Fig. 2A). A short gallery leads to church of Sicilian icon of Our Lady, oriented to the NE.

The main room of the temple is rectangular: 15 x 14.5 m (Figs. 2B and C). Vaulting is supported by pillars: 6 large (max thickness 2.8 m), 4 small central (max thickness 1.15 m) and 2 small in front of the altar (max thickness 1.4 m). Maximum height of the arch is 3.9 m. Altar space is 3.6 m wide and 3.7 m high. There are 7 ambries varying by depth and size. Gallery procession begins in the southern part of the temple, goes around the temple and reaches the temple in the NW wall. The width of the gallery is 0.8-1.2 m, max height is 2.7 m. Throughout the gallery and on the joint angles there are 10 chamber-expansion with small icon-cases.

The passage (0.7-0.8 m wide) to the upper level begins in the small gallery near the temple. There are 26 (27) stairs slightly ruined due to visitors passage. The upper level can be accessed through the separate entrance, 22 m N from the main entrance. Right behind it there is a rectangular space in the corridor, 8.5 m-long and 1.7 m-wide. From the NE-oriented corridor, a passage to the S leads into a small cell size of 2.2 x 1.9 m, high 1.96 m. There are 3 equally spaced carols in the N wall, with the last one ending in a passage into the room (size 6.4 x 2.9 m). Before the restoration there was the passage into the room through the central carol. In the

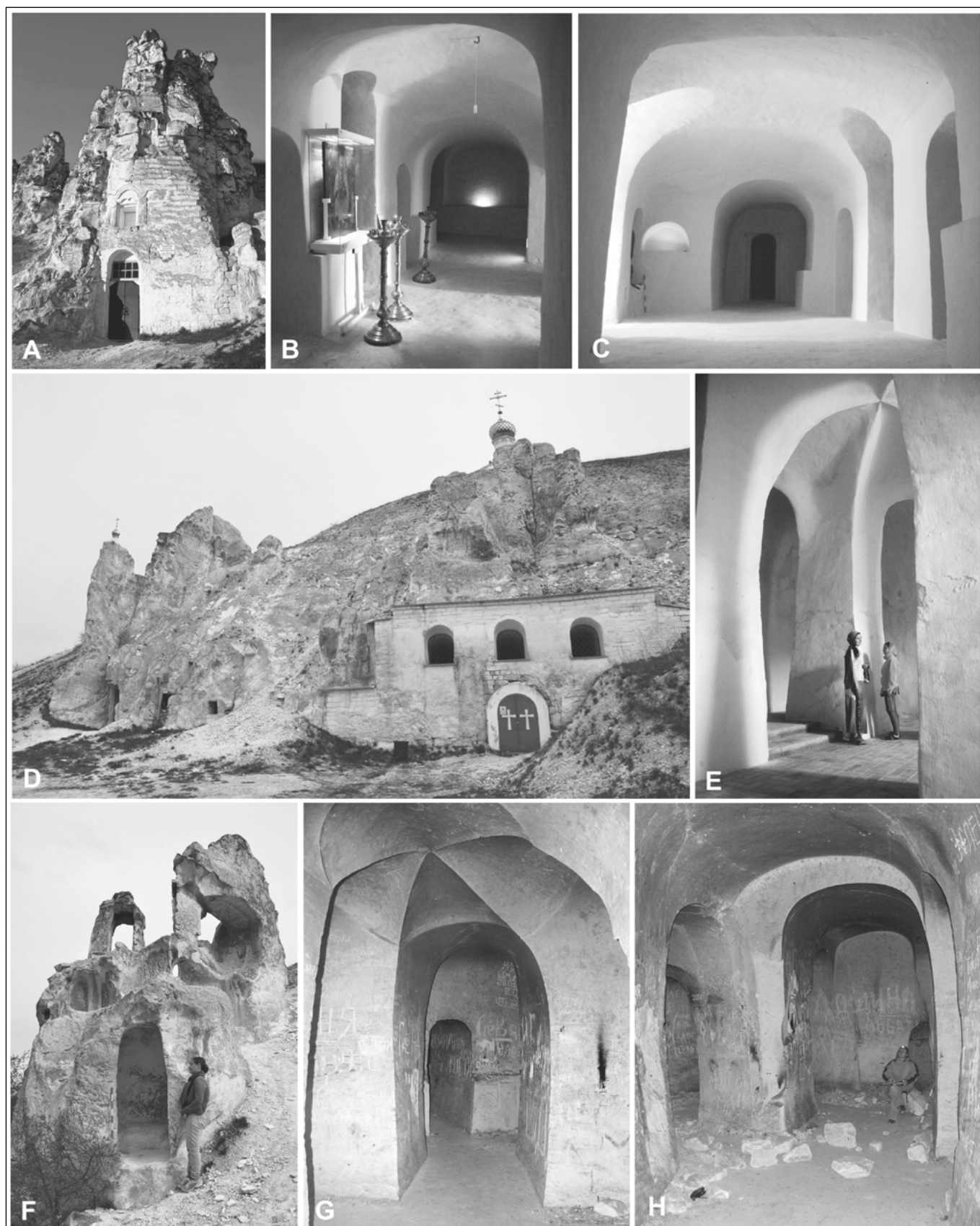


Fig. 2: cave complexes of Divnogorye (photo Gunko A.A., 2010-2014); A-C) complex in Bolshie (Big) Divy; D) entrance to the cave church in Malie (Small) Divy; E) columns of cave church; F) fragments of rooms in the chalk pole in Malie (Small) Divy; D-H) cave church in Selyavinsky cave complex.

*Fig. 2: complesso rupestre di Divnogorye (foto Gunko A.A., 2010-2014: A-C) complesso di Bolshie (Grande) Divy; D) ingresso della chiesa rupestre di Malie (Piccolo) Divy; E) colonne nella chiesa rupestre; F) resti di vani nel chalk pole di Malie (Piccolo) Divy; D-H) chiesa scavata nella roccia nel complesso rupestre di Selyavinsky.*

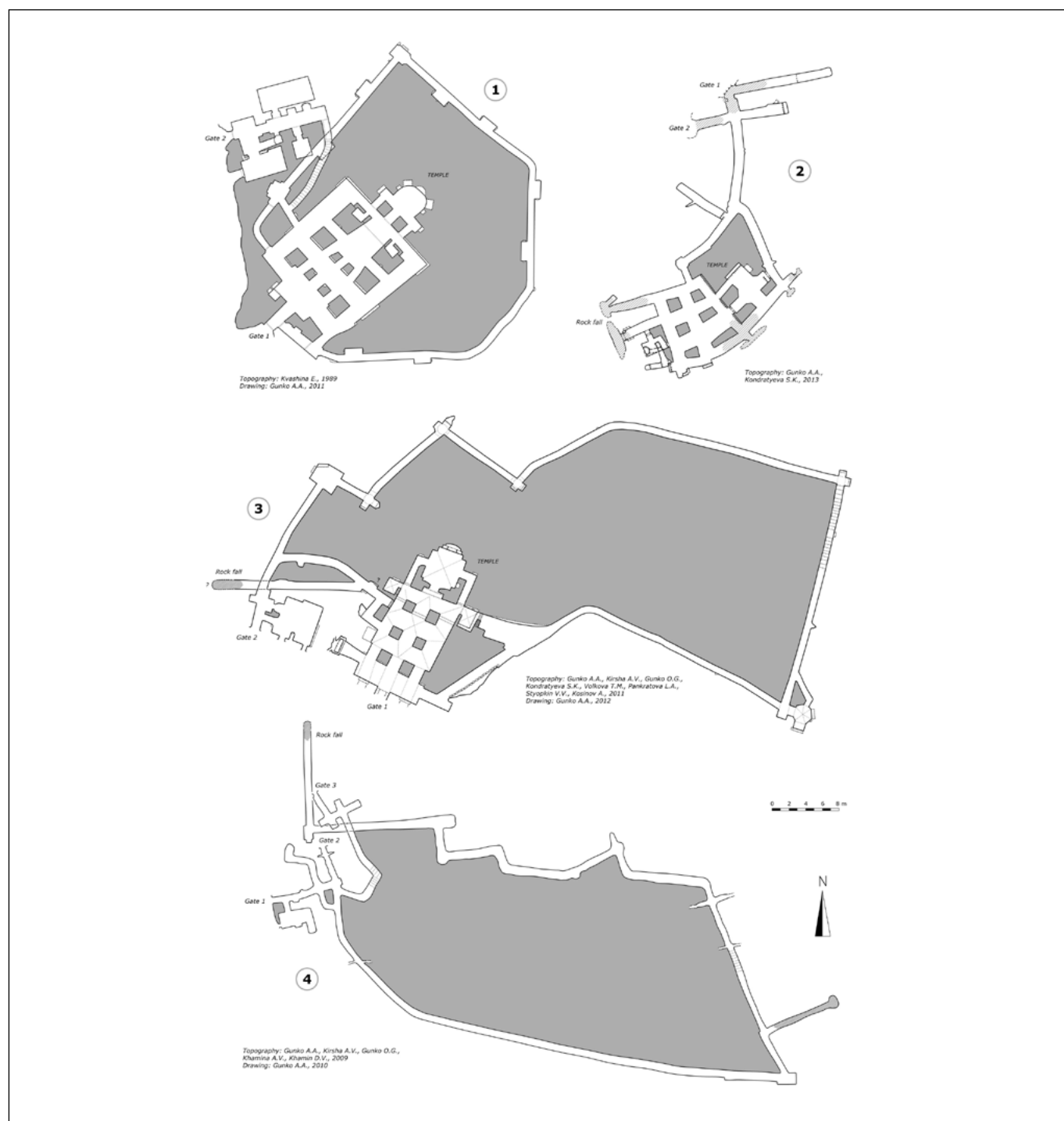


Fig. 3: plans of the caves; 1) cave complex in Bolshie (Big) Divy; 2) Selyavinsky cave complex; 3) cave complex in Malie (Small) Divy; 4) Shatrischegorsky cave complex.

Fig. 3: pianta delle cavit ; 1) complesso rupestre di Bolshie (Grande) Divy; 2) complesso rupestre di Selyavinsky; 3) complesso rupestre di Malie (Piccolo) Divy; 4) complesso rupestre di Shatrischegorsky.

southern part of the second level, another room (2.5 x 5.2 m) show traces of chimney and window. Maximum height of the arches of the upper level is 2.9 m.

The cave complex is restored and electrified, and has a total length of 300 m (Fig. 3.1). Currently it is one of the most visited in Russia.

**Cave complex in Malie (Small) Divy** (Figs. 2D and 3.3) Located on the territory of the Holy Dormition Divnogorsk male Monastery within the boundaries of the museum-reserve, at the confluence of the river

Tihaya Sosna and Don, 2.1 km NE of the bowery Divnogorye. Since 1997 the complex, NE-oriented, is under the jurisdiction of the Russian Orthodox Church (ROC).

The main space is the church of the Nativity of St. John the Baptist (Fig. 2E). The rectangular altar piece faces NE. There are 6 square (at the bottom) columns and 2 pillars in front of the altar. In the early 2000s fastening and restoration work were made at the temple. As a result, the columns were greatly expanded. The size of the church is 18.5 x 7.5 m and the area, excluding



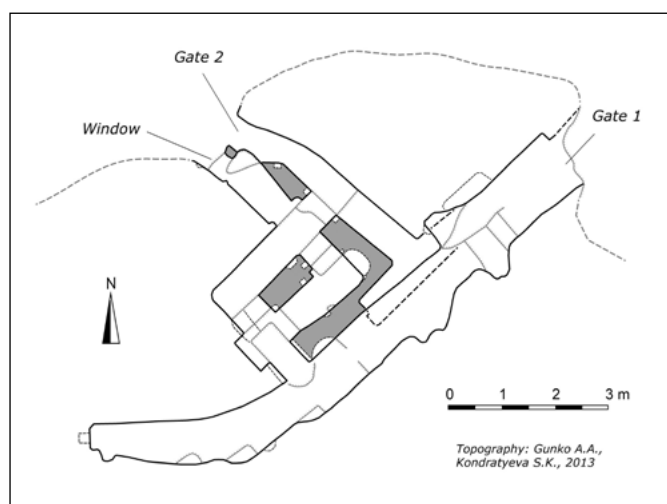


Fig. 4: plan of Uliana's sacred cave (topography Gunko A., Kondratyeva S.K., 2013).

*Fig. 4: planimetria della grotta sacra di Uliana (rilievo Gunko A., Kondratyeva S.K., 2013).*

the adjacent chambers, is 127 m<sup>2</sup>. The entrance to the church is equipped with door. There are also three deep windows with semicircular arches. Next by the size is the space near the W entrance to the cave. At varying times it could have both residential and household purposes. These are two rooms connected in a single space with a small spandrel and windows. Their size is 2.2 x 4.6 m and 2.2 x 4.8 m. A system of channels is hollowed in the E wall. Among other rooms the small chapel in the extreme SE part of the complex (2.2 m diameter) and a burial chamber (1.8 m deep) are particularly interesting. All rooms of the cave complex are connected by galleries wide 0.8-1.0 m. On one of the sections, 10 m-long, there are stairs. The total length of the underground complex is 351 m. Gallery directed towards land monastery buildings is cut off by the eboulement. The length of inaccessible part can be over 50 m. At the present time the question of subsequent restoration of the complex is under consideration.

**Fragments of rooms in the chalk pole in Malie (Small) Divy** (Fig. 2F) 180 m SE of the Divnogorsk monastery chalk pole (outlier) with fragments of rock rooms is located. At the bottom the outlier has a wide base with a stepped top. In the upper part it is narrow, and 6 m high. On the surface of pole preserved the outlines of two rooms and fragments of doorways. Well preserved rock fragment with an arched passage, which originally contained the front door. This rock was destroyed in XVII-XVIII centuries.

**Selyavinsky cave complex.** Located 1200 m NE of Divnogorsk male Monastery and 800 m W of the village Selyavnoe, the cave was created by the peasants P. Kurbatov and N. Shatov in the middle of the XIX century. Since 1856 the cave complex is operated by Divnogorsk monastery. In the first half of the XX century the rock with Selyavinsky cave complex had been undermined. As a result, the proximal part of the cave complex was destroyed. A small section (13 m-long)

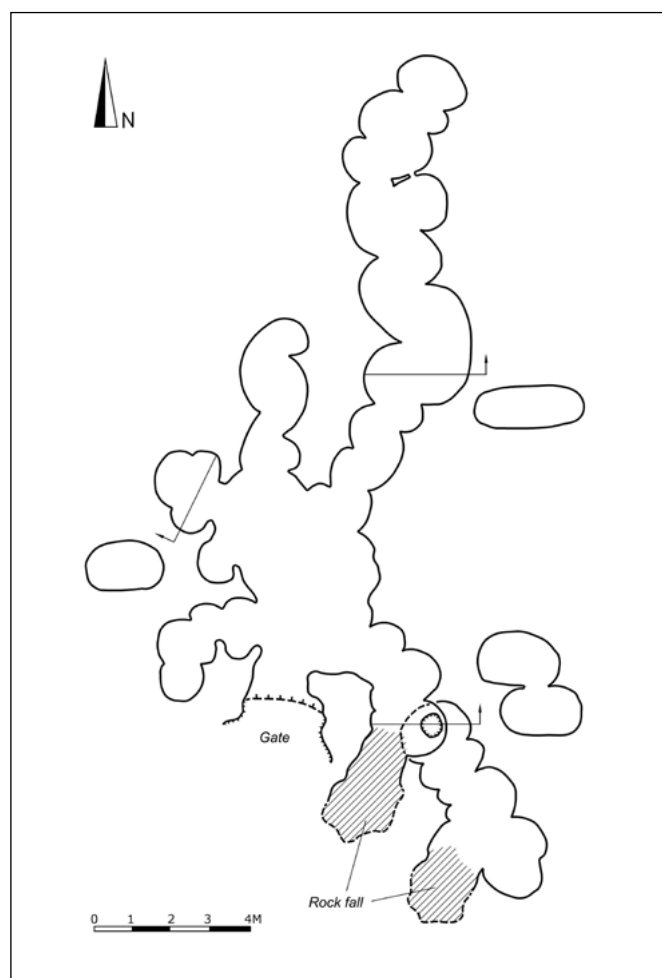


Fig 5: plan of chalk mine Liskinskaya-6 (topography Gunko A., Leontiev M., 2011).

*Fig. 5: planimetria della miniera di gesso Liskinskaya n. 6 (rilievo Gunko A., Leontiev M., 2011).*

is separated from the main galleries by eboulement. The total length of the complex is 202 m (Fig. 3.2). The main complex includes a church, a cell and a number of communication galleries. Temple is semicircular and the altar is oriented to the NE. There are 6 pillars and 2 pillars in front of the altar (Figs.2G and 2H). One of the galleries of the complex is cut into the side of the Uliana's cave. In a rectangular room in the SE part of the complex you can get through small hole size 0.4 x 0.7 m or through the breach in the wall of the temple. There are two manholes in the floor, through which you can go down to the low L-shaped passageway, likely used as ossuary. Cave walls were hardly affected by modern autographs. The inaccessibility of the cave ensured the safety of numerous pencil inscriptions in verse and prose reflecting the major historical events in the country and the world.

**Uliana's cave.** This is one of the shortest caves in Divnogorye. The total length of the cave is 29 m (Fig. 4). There are two entrances, the main one being in the left side of the cliff. There are no written data about the cave. According to local residents the cave was made by monks after 1870 for blessed Uliana who had problems with diction. In the 1980s members of the Voronezh speleological group called cave Casemate for



Fig.6: inside Liskinskaya-6 mine (photo Leontiev M., 2011).

Fig. 6: interno della miniera Liskinskaya n. 6 (foto Leontiev M., 2011).

its beautiful view. It is a system of intersecting galleries and manholes with small architectural elements. One of the galleries is cut into the side of the Selyavinsky cave complex (14 m diagonally). Perhaps the creators had a plan to connect the two caves.

**Shatrischegorsky cave complex.** Located on the territory of Natural and cultural complex Divnogorye in chalk massif, known as the Shatrische mountain. Shatrischegorsky Transfiguration Monastery was founded in the XVII century. Part of the cave with a temple and adjoining rooms were destroyed by quarrying in the XX century. The system of galleries and small cell size of 2 x 4.5 m were preserved. The main gallery, with an average width of 0.8-0.9 m and a height of 2.4 m, gently slopes down to the bottom of the chalk massif and converge to the lower gallery where the sandstones underlie the Cretaceous deposits. The lower part of the gallery was not finished. Previously there was a separate entrance in the middle of the slope of the mountain. At the present it is collapsed. Depth of the cave is 30 m. The total length based on research findings is 280 m without the size of the opened natural cave “VSS XX years”. Caves area is 370m<sup>2</sup>, and volume is 670 m<sup>3</sup> (Figs. 3.4; GUNKO, 2012).

#### **Small Shatrischegorsky cave**

The cave is situated 400 m SE of the Shatrischegorsky cave complex near small outlier-diva in the flat-bottom valley Shatrischev yar. History and time of appearance

of the cave is unknown. The cave is known as “Mother of God”, because according to local residents there was an icon in ambry for icon in diva. The total length of the cave is 27 m. There were two entrances but now one of them is clogged. Through a low manhole height of about 0.5 m you can get into a narrow corridor П- shaped cave. Galleries in the cave are 0.6-0.85 m wide. Flat ceiling are 1.86 m high. To the E there is a rectangular room (1.86 x 2.3 m) with intersecting vault. In the NW wall is the arched doorway, where a roughly carved elongated cavity appears. Probably it was adapted for the ascetic experiments of hermit or was a hiding place. It is the shortest of the Divnogorsky caves.

#### **Chalk mines**

Mining of chalk in Don Valley has a long tradition. Chalk was widely used in construction, both as a lime for whitewashing the buildings, and as blocks for construction of cellars. On the right bank of the river Don near Otkos station, a large industrial chalk-pit was functioning.

Old underground handicraft delfs near Liski village were first investigated by members of the Voronezh Speleological section in 1984. Along railway branch Liski-Rossosh for over 3 km can be traced traces of chalk mining such as dips, small pits, and heaps chalk grit. Complex of dips and pits with multiple entrances under the ground was discovered 500 m SW of the railway platform “672 km”. Unusual way of chalk

mining by scrubbing massive material was used. That is why there are unique morphology of the cavities with prevalence of oval section. There are 10 mines on a plot of 100 x 60 m (GUNKO & LEONTIEV, 2012), briefly described below.

**Liskinskaya-1.** The entrance (1,2 x 0,8 m) is located in the S wall of the pit. A short passage leads in a circular chamber wide 2.4 m. In the floor of it there is a hole leading into the lower part of the mine. Right under it there is the lower level, littered with large boulders. This part has a maximum width of 3.7 m, and develops to the E for 5.7 m, then turning NW for 5.3 m. Main entrance to the lower part previously was from NW, but today it is dammed. Arches and walls of the mine are circular. Average height of the passage is 1.1 m, whilst the total length is 13 m.

**Liskinskaya-3.** Located 31 m NE of *Liskinskaya-1* at the base of the outcrop. The height of low entry is 0.4 m and the width is about 0.9 m. It leads to the dip-slope screes to the mine. From the entrance in the NW direction there is the passage 2.3 m-wide. In 2.7 m it turns SW and ends by dumb drift. From the entrance in the south the length of the passage is 4 m. In the NE wall there is a breach into the small chamber, that was the part of the nearby mine from which it is cut off by the eboulement. Walls and ceilings are rounded. The average height of the mine is 1.1 m and the total length is 22.5 m.

**Liskinskaya-4.** It is situated 24 m NE of *Liskinskaya-3*. The entrance (0.4 x 1.0 m) has a semicircular arch. Directly after it the mine expands to 2 m breadthways, with height of 1.4 m, and length of 7.5 m to the NE. In the dumb drift of the gallery a small holing leads to the bottom level of the mine. Width of the chamber is about 4 m. From this part the mine stretches in three directions. The SW gallery is 3 m-long, and ends by another holing where eboulement chamber, 5 m-long, is situated. The NE gallery is 4.5 m-long, with a small chamber to the S (1.6 x 2.6 m). The E gallery is cut off by the huge eboulement. Thus, there are 3 mines which were connected by holing during exploitation. Two parts of the bottom level are separated by the eboulement and now can be accessed only through the entrance to the upper level. Arches and walls in both levels are round. On the upper level there are rounded niche depths up to 0.5 m. Total length of the mine is 23 m.

**Liskinskaya-6.** Located 26 m SE from *Liskinskaya-4*. The size of the entrance is 1.1 x 1.9 m. It is situated in the NE part of the erosion crater at the base of the Cretaceous outcrop. There is a scree cone after the entrance through which you can pass into a big room up to 6 m-wide. In this room there are 4 passages in different directions. To the SW there is a small passageway (5 m-long, 0.9-high, and 1.4 m-wide). The

passageway to the N has a length of 5.5 m, a width of 1.5 and a height of 0.8 m. Curving gallery to the NE is 13 m-long, 2.8 m-wide and 0.9 m-high. In this part the mine is "meandering" and is morphologically similar to natural caves. In the SE of the central chamber branches the passageway a length of 6 m, which leads to the gob. In the middle part of the course in the floor near the wall is a jack hole with lower tier, which has a SE stretch of 6 meters. On this level there is the passageway to the S, 3.5 m-long, which is blocked by the eboulement. Previously, this passageway was probably the way to the surface. The total length of this the largest of the inspected mines is 57 m (Figs. 5 and 6).

The main tool which was used during mining was an old carpenter's tool - the scraper. The scraper is a curved sharp metal blade with two wooden handles, used for smoothing or carving wood in hand woodworking. Judging by the low arches (0.8-1.1 m) craftsman miners had to work in difficult conditions - reclining and breathing chalk dust. For excavating small mines there was no need for artificial lighting. Daylight penetrates deeply inside, gleaming off the white walls. On distant from the surface areas there are small deepenings (with traces of sooty) which were used as a place for candles. Underground method of chalk working allows you to work all year round and in any weather. However, there was also the open-mining. This comprehensive development of mineral resources, apparently led to a gradual destruction of the underground mines.

## Conclusion

Cave complex in Bolshie (Big) Divy is completely restored and equipped with Led lighting. Multimedia exhibition is also inside the complex. Every year it is visited by about 30,000 people. Cave complex in Malie (Small) Divy operated by the monastery and also actively visited by pilgrims and tourists. In four other sacred caves free access for amateur tour is opened. This fact worsens condition of complexes which need restoration. Cleaning parts of the caves, installation of doors that do not impede natural circulation of air and flying bats, installation of safe ladders is planned. To preserve the historic appearance of these complexes museification, research and inclusion in sightseeing tours is needed.

## References

- GUNKO A.A., 2012, *Shatrishchegorsky cave (current conditions)* Divnogorskiy collection: papers of museum-reserve "Divnogorye", issue. 3, Voronezh: Nauchnaya kniga, pp. 298-304.
- GUNKO A.A., KONDRATYEVA S.K., STEPKIN V.V., 2014, *Cave complexes of Divnogorye. Atlas and Guide*, Voronezh: Nauchnaya kniga, p. 42.
- GUNKO A.A., LEONTIEV M.V., 2012, *Chalk mines near the village Liski (Voronezh region)* Caves: collection of scientific papers, issue. 35, Perm, pp. 61-66.