

Natural caves of the North-West of Russia. The use of caves in human culture

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Summary: This article discusses the study results of the natural caves of North-West Russia. The objects are located in the following parts of Russia: Leningrad Region, Pskov Region, Novgorod Region, as well as Karelia. Natural caves are formed in different rocks, such as limestone, sandstone, granite. According to the study, some caves were used in the human culture as shelters or cult places. Some cult caves have been expanded by man and included into the monastery complex.

Key words: cave in granite, cave in limestone, cave in sandstone, cave in diabase, pseudokarst, karst, suffossional caves, erosional caves, cult caves, North-West of Russia.

Introduction

The considered area has still not yet been sufficiently studied. For the time being, only a few local areas have been examined. However, we do have a general idea

about the spreading of the caves, characteristics of their development and their use in human culture. The urgency of this work is based on the fact that we consider the main types of caves in the area, their location and characteristics for the first time.



Fig. 1:
General map of natural caves of the North-West Russia (Leningrad Region, Novgorod Region, Pskov Region, Karelia) compiled by Ilya Agapov.

Based on the 2011 map Virtual Earth.

Legend:

1. Caves in limestone,
2. Caves in granite
3. Caves in diabases;
4. Caves in granite and sandstone,
5. Caves in sandstone.

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The main uses of natural caves in human culture in the North-West of Russia are:

1. Refuge
2. Cult
3. Place for the ascetic practices of Christian hermits
4. Honoring a spring flowing out of the cave (fusion of pagan and Christian traditions)
5. Mythological (dwelling place of mystical creatures in the folk imagination of people)
6. Artificial enlargement of a cave by man (for religious practices or household purposes)

Through the activities of the author and the Commission of Karstology and Speleology of the Russian Geographic Society some information on the natural caves, with more than 10 meters length, has been collected (fig. 1).

1. Caves in limestone: 5 pc. (total length = 1630 m)
2. Caves in granite: 3 pc. (total length = 55 m)
3. Caves in the diabases: 1 pc. (length = 8 m)
4. Caves in the granites and sandstones: 1 pc. (vertical depth of about 8 m)
5. Caves in sandstones: 20 pcs. (total length = 440 m)

Natural caves were formed by various geological processes, such as karst and erosion. We'll consider each group of caves separately.

1. Caves in limestone.

These caves are located in the Novgorod Region and the South-West of the Leningrad Region. A total of five caves with the total length ranging between 20 and 1420 m were formed by karst processes. The use of the caves in human culture throughout history has not been revealed.

Two particular caves are of the most interest:

The horizontal waterlogged karst cavern was opened in 1965 (GAZIZOV, 1971) by the mine barrel (shale mine) of the Leningradslanets Trust at around -56 m. It is partially waterlogged. The total length of the cave is about 40 m. The current condition of the cave is not known.

The Poneretka-1 Cave has an underground river as a main feature. Its total length is 1420 meters (figs. 2 & 3). There are two entrances to the cave. And the cave itself is one of the largest in the central part of the Russian Platform. One of the first surveys of the cave was carried out in 1965 (PROKOFIEV, 1966). The complex survey of the cave was carried out in 1974-75 by cavers from Leningrad (ALEKAS, 1978).



Fig. 3: Poneretka-1 Cave. Photo: Paul Miroshnichenko. 2006.

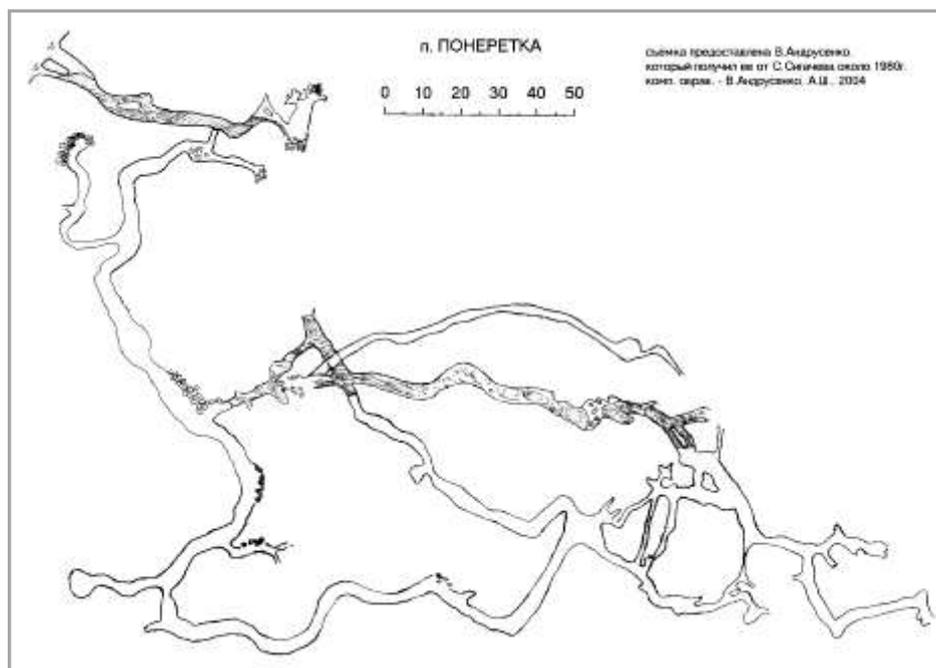


Fig. 2: Poneretka-1 Cave. Based on B. Andrusenko & S. Sigachyov, 1980.

2. Caves in granites.

Three natural caves in the granite, with the total length between 10 and 25 meters (figs. 4 & 5), were discovered in the north of the Leningrad Region. The caves are of the tectonic and erosional origin. All three of them are located in the same rock massif. For the time being, the caves have not been examined. Historically, this area had once belonged to Finland. According to Finnish sources, the caves were used by the local population as shelter during the war years. Also, they could have been home for mysterious creatures reflected in folk tales (SEPPO SIMONEN, 1951). Caves in the granite, similar to these, are known to exist in Finland (AIMO KEJONEN, 1997). Their length reaches up to 30 meters.

3. Cave in diabases.

There is one known cave in diabase, the Alexander Svirsky Cave. Its length is about 8 meters. The cave is located on the Svyatoy Island of Valaam Archipelago, on the Ladoga Lake in the Karelian area. It was formed due to the crack expansion by the Ladoga Lake's waves about 3000 years ago, when the lake water level was higher than it is at present (NIKONOV, 2009). The cave is first mentioned in the 16th century chronicles (OHOTINA-LIND, 1996) and is considered as a cult cave. It was used as a cell by a Christian hermit of the Valaam Monastery.

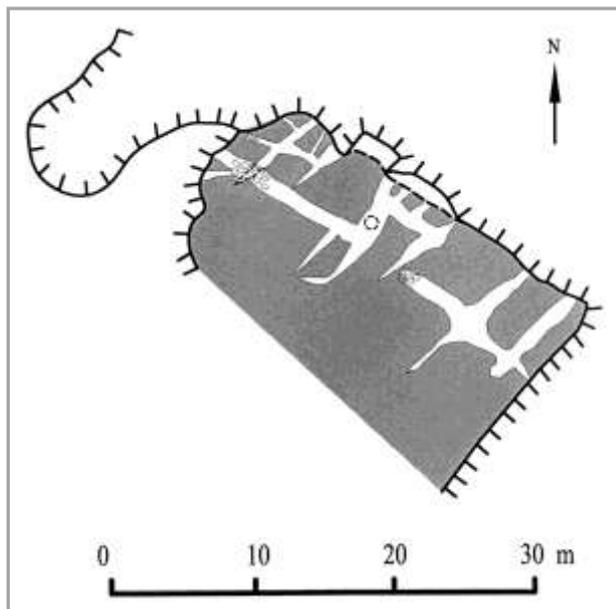


Fig. 4: Ristikirkoksi Cave (right), Sokanlinna Cave and Kolinanlinna Cave (Finnish names of caves). Schematic Plan (AGAPOV & PINCHUK, 2010).

4. Caves in granites and sandstones.

There is one vertical cave, Kozled-Egi Cave, (depth 8 m) known in the Karelian area (GEOLOGICAL NATURE MONUMENTS, 2006). Ice and snow remain at the bottom of the cave all year round. The current condition of the cave is not known.

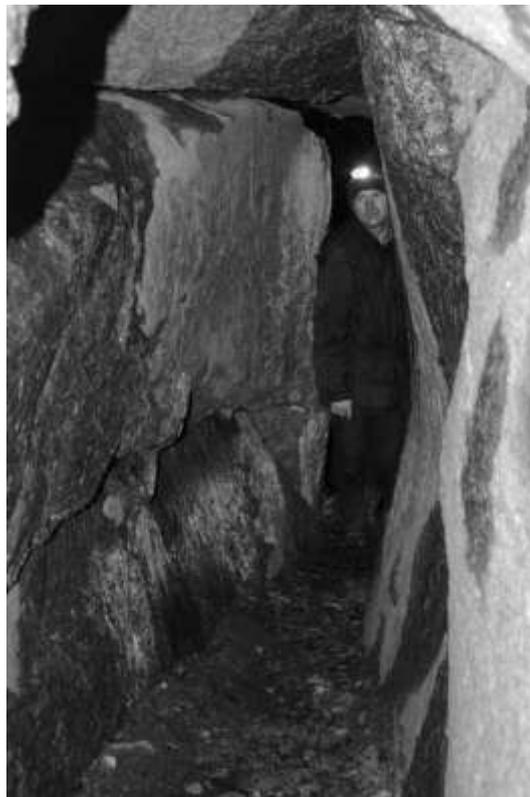


Fig. 5: Ristikirkoksi Cave.
Photo I. A. Agapov, 2010.

5. Caves in sandstone.

This is the commonest type of natural caves in the North-West of Russia. The caves are of pseudo-karst origin, and were formed by erosion and suffosional processes not earlier than 10'000 year ago (erosion is the process where water, flowing through fractures in the rock, expands them over time) (AGAPOV, 2010a). The greatest number of caves is situated in the South-West of the Leningrad Region and the North-West of the Pskov Region. Twenty caves are known to this day with their lengths ranging between 10 and 130 meters.

Caves of similar nature are also common in the neighboring Baltic countries, with the greatest number of them situated in Latvia. The length of the largest known natural cave in the sandstone is 346 m (SANDIS LAIME, 2009).

Many of these caves have long been used by humans throughout the history (AGAPOV, 2010). The best known reason for this is the belief in the healing power of the water of the spring flowing out of the cave. This water, according to the opinion of the believers, has a curative effect upon people.

Some natural caves were deliberately expanded to serve certain religious purposes, e.g. providing a cell for a Christian hermit, or a place for a Christian burial. Some natural caves could have been used as the base for a Christian monastery. During the building works, the caves would be undergoing significant changes and were a part of the ground complex of the monastery (AGAPOV, 2011).

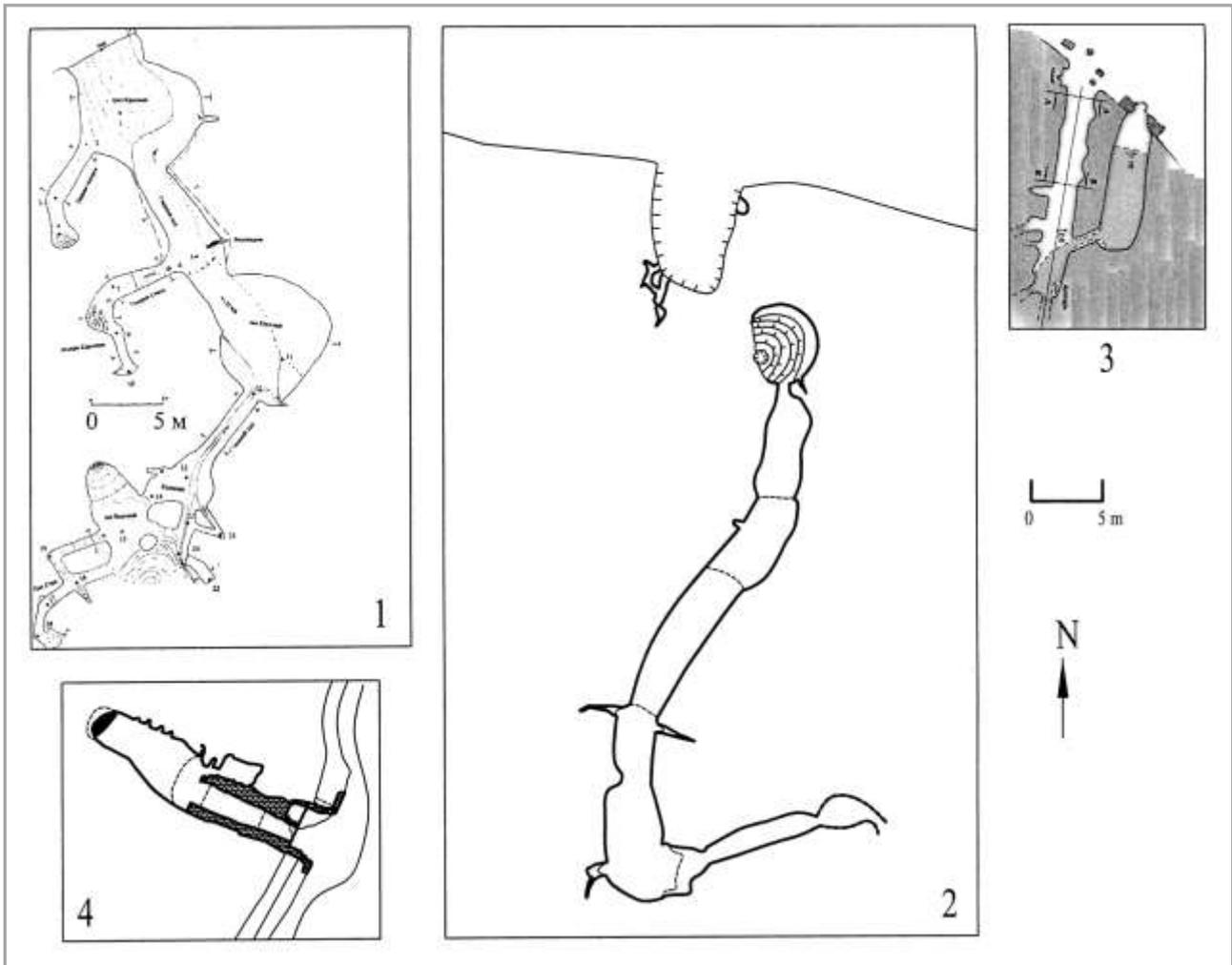


Fig. 6: Cave maps:

1. Svyataya Cave, one of the largest erosional-suffosional caves in the sandstone. (L=130 m). Topographic survey, 2006: Yu. S. Lyakhnitsky, I. Yu. Khlebalin & A.A. Yushko;
2. Pyat Komnat Cave (L=62 m). Topographic survey, 2009: I.A. Agapov & S.V. Kaminskii. Computer processing: I.A. Agapov;
3. Dolozhskaya Cave (L=21 m). Topographic survey, 2006: I.A. Agapov & I.Yu. Khlebalin. Computer processing: A.N. Zelenin;
4. Posolotino Novye Peschery Cave (L=21 m). Topographic survey, 2009: I. A. Agapov & S.V. Kaminskii. Computer processing: I. A. Agapov.

The largest natural cave is the Svyataya Cave (figs. 6-1 & 7), with the total length of the passages being around 130 meters, is situated in the Leningrad Region. The spring flowing out of the cave used to be considered medicinal. The cave has been under study since the year 1980 (MIROSHNICHENKO, 1992). The complex survey of the cave was conducted in 2006 by the Karstology and Speleology Commission of the Russian Geographic Society under leadership of Y. LYAKHNITSKY (2006).

The second longest cave is Pyat Komnat Cave (Five Rooms cave). This cave is situated near the village of Uzhovo in the Pskov Region (fig. 6-2). The total length of its compartments is about 62 meters, and the main feature of the cave is an underground river. The spring flowing out of the cave was considered as curative in the past. The cave was first examined by the author in 2009 (AGAPOV, 2010).

Quite interesting is the Arhimedova Cave with the total length of passages being about 30 meters (ASTASHENKO, 2007). The cave had never had a natural entrance through which people could enter. Cavities of this cave were ripped up by artificial tunnel worked by ASTASHENKO in 2004.

The Dolozhskaya Cave (known since the XVIII century) and the cave monastery, Posolotino Novye Peschery Cave (known since the XVI century), were parts of the Christian monastery complex. Their religious use is also associated with the worship of the healing spring. The total length of the cave is about 21 meters (figs. 6-3 & 4). The caves were artificially expanded and formed a part of the ground complex of the monastery.

Conclusions

Thus, we have examined the main type of natural caves in the region and their use in the human culture. The caves represent particular interest as monuments of geology, archaeology, history and religion in the North-West Russia. They call for further research and development of measures for their protection and exploitation as tourist and religious sites.



*Fig. 7: Svyataya Cave (Holy Cave). Entrance.
Photo Y. S. Lyakhnitsky, 2006.*

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