A SHORT HISTORICAL REVIEW OF CAVE MINERAL EXPLORATIONS IN SLOVENIA BEFORE 1930

KRATEK PREGLED RAZISKOVANJA JAMSKIH MINERALOV NA SLOVENSKEM PRED 1930

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Kranjc, Andrej: A short historical review of mineral explorations in Slovenia before 1930

First two cave minerals, mentioned in our literature, were calcite and ice formations. These two minerals interested Valvasor (1689) in particular. First more important descriptions derive from the 19th century (Hohenwart 1830-1832; Schmidl 1854). In the second part of the 19th century the mineralogical terminology in the slovenian language started to develop. Erjavec translation of Fellöcker's textbook (1867) and his later original work (1883) are the most important milestones. With works of Perko (1926, 1927) and Kunaver (1922) the modern times began.

Key words: karstology, speleology, cave mineral, history of speleology

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Kranjc, Andrej: Kratek pregled raziskovanja jamskih mineralov na Slovenskem pred 1930

Prva dva jamska minerala, ki sta omenjena v naši literaturi, sta kalcit in ledene tvorbe. Zlasti Valvasor (1689) se je zelo zanimal zanju. Prvi pomembnejši opisi so znani iz 19.stoletja (Hohenwart 1930-1832; Schmidl 1854). V drugi polovici 19.stoletja se je začela razvijati slovenska mineraloška terminologija. Erjavčev prevod Fellockerjeve šolske knjige (1867) in njegovo kasnejše originalno delo (1883) sta najpomembnejša mejnika.
Z deli Perka (1926, 1927) in Kunaverja (1922) se začenja moderna doba.

Ključne besdede: krasoslovje, speleologija, jamski minerali, zgodovina speleologije.

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First two cave minerals appearing in our literature, were calcite and ice formations, mentioned by VALVASOR (1689). Namely Valvasor was interested in minerals in general, specially in minerals occuring in Carniola. The XXIX. chapter of his III. book is entirely dedicated to minerals (FANINGER,1990).

As VALVASOR was very interested in caves, he wrote relatively a lot about flowstone and ice in caves, including flowstone growth and age. The best known is figure in his "Die Ehre ..." (I, 535), depicting speleothems as fantastic animals and human figures. These pictures are described in Valvasor's text too: "... there is stone figure or sculpture showing weaver at work, in the other corner ... there are hanging bacon, shoulders, hams, sausages etc. and they are natural and original, only petrified." And further on: "... elsewhere are numerous columns shaped so strange, that one can see different vermin, snakes and other animals, different monstruous figures and deformed faces, phantoms...". These pictures and text are probably the reason of thought that Valvasor saw petrified and mithological beings in speleothems, which were stroke by "the breath of evil spirit", in short, that could be a proof of Valvasor's superstition.

But this is not true, if we read his work with due attention. Valvasor himself said: "Similar petrified objects (concrementa) of different kind one can find in big number in many underground caves and holes here in Carniola. This is nothing else than the play of the nature, because petrifications do not originate neither by devil's breath nor by earthquake, but they are growing slowly from the dripping water (aqua stillantis)." (REISP,1987, 73).

Valvasor was not satisfied with simple statement, that speleothems are "petrified dripping water", which is in principle true and right, he was interested in flowstone as a type of stone. He boiled flowstone in the water, in the salted water, in the salt-ammoniac and he even burnt it (I, 487).

From the literature and from his field observations Valvasor knew that there are caverns where flowstone deposits extremely fast. Thus he mentioned such cave in Hungary and the cave near Tours in France (actualy called Savonnière) where water-drops falling from the ceiling transformed into the "stone nuts, almonds and other unusual forms" (I, 565), similar to fossils which he has found near Kropa in Gorenjsko. The process of flowstone deposition was not very clear to him, which can be seen from the fact that among the petrifications he mentioned also "petrified sodomite couple" near Tezrim in Africa, where in the middle of the meadow it is possible to see "complete figure of the man performing loathsomeness with the she-ass" (I, 486).

Valvasor mentioned also the growth of speleothems, the rate of speleothem growth respectively. In the Jama pri Predjami he noticed 70-80 years old inscriptions with thin cover of flowstone over them, thin as a knife-blade, in some other places those rocks (= concretions) have grown for the thickness of a

man's finger in the time of 20 years. From these observations he made conclusions that some bigger speleothems has to be pretty old, at least 300 - 400 years, some of them even few 1000 years (I, 484). As it can be seen from the articles concerning this topic, modern investigations show that the last speleothem generations in our caverns began to form in the beginning of the Holocene, about 10.000 years ago.

Even ice and ice stalagmites seemed interesting to Valvasor. He wanted to find out if it is normal ice, as "the surface one" or some sort of underground speciality. In the Ledenica (= Ice cave) pod Taborom he found ice stalagmites which were like winter icicles, with the only difference that in the cave they were much thicker and that they occured there during the summer but there are none of them during the winter. To be sure, he took out of the cave the piece of ice and he found out that it is melting like ordinary ice.

I am speaking little more about Valvasor because he was the first and because he had, specially for his time, interesting and even modern ideas. Hundred years later B. HACQUET (1778–1789) wrote about the dissolution of limestone, he even proved it by the aid of hydrochloric acid. What he thought about the second part of the cave minerals formation - the mineralisation of calcite from the solution, is not precisely known and detailed study of his work from this point of view is highly recommended.

F. HOHENWART began to excavate fossil fauna in Postojnska jama, soon after the discovery of its inner parts; he published detailed description of the cave (1830–1832) and was very interested in speleothems too. In his work he described the formation, the colours and the age of the flowstone. As the great benefactor of the Land's Museum in Ljubljana, he made donations of his collections to it. At the beginning already (in the year 1831) Ljubljana Museum has the collection of 116 speleothems and 46 aragonites, which were European rarity. In SCHMIDL's basic speleological work (1854) there is a special chapter from the author W. ZIPPE entitled "Einige geognostische und mineralogische Bemerkungen über den Höhlenkalkstein des Karst" dedicated to minerals. The author writes about carbon acid in the atmosphere, about iron oxides and flowstone in general. For him it was already clear that speleothems are formed by the limestone, deposited out of the water, and that stalactites have tube in the middle. Also the nucleus of cave pearls and different calcite crystal forms (so called Krystallform R) are mentioned.

In 19th century together with the investigations and advanced inventory of cave minerals the mineralogical terminology in slovenian language was developed in the lands which are nowadays Slovenia. ERJAVEC translation of FELLÖCKER's textbook (1867) and later his original work (1883) are the most important milestones. In the last mentioned book Erjavec stated that when the water drops coming through the limestone rock reach the open air, the lime in it hardens and deposits in the form of "Kalksinter" or "Tropfstein", sometimes in the form of nice crystal even.

Speleological works of KRAUS (1894) and later of KUNAVER (1922) and PERKO (1926, 1927) treat cave minerals in relatively modern way already, although one cannot speak of serious investigations of cave minerals in Slovenia before the end of the 2nd World War. For the conclusion I would like to say that on one side we can be proud that with ERJAVEC's analyses of cave loam we were on the World's level of investigations, but on the other side we can still read in our modern primary school textbooks (BINTER, 1974) that the

(only) reason of flowstone formation is water evaporation. I strongly hope that one of the results of this symposium would be also the popularization of the knowledge of cave minerals, of their origin, development, worth and their fragility.

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Povzetek

Prva dva jamska minerala, ki sta omenjena v naši literaturi, sta kalcit in ledene tvorbe. Zlasti Valvasor (1689) se je zelo zanimal zanju, vendar o teh dveh mineralih pišejo tudi drugi starejši avtorji. Prvi pomembnejši opisi so znani iz 19.stoletja (Hohenwart 1930-1832; Schmidl 1854). V drugi polovici 19.stoletja se je začela razvijati mineraloška terminologija v deželah, ki danes sestavljajo Slovenijo. Erjavčev prevod Fellöckerjeve šolske knjige o mineralogiji (1867) in njegovo kasnejše originalno delo (1883) sta najpomembnejša mejnika. Sočasna speleološka dela (Kraus 1894) tudi obravnavajo jamske minerale, a že na bolj sodoben način.

Z deli Perka (1926, 1927) in Kunaverja (1922) se začenja moderna doba. Tako smo po eni strani lahko ponosni, da smo bili z Erjavčevimi analizami jamske gline v prejšnjem stoletju na svetovni ravni takih raziskav, na drugi strani pa prav naši šolski učbeniki, ki so bili še pred kratkim v uporabi, uče, da se siga v jamah odlaga zgolj zaradi izhlapevanja.