

**STUDY ON COLOURED STALACTITES AND COATINGS (II)
SOME GEOCHEMICAL AND KARST-HYDROLOGICAL ASPECTS
OF THE FORMATION OF COLOURATIONS IN CAVES**

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In the previous papers (17, 18) the author presented the results of the analyses made on coloured dropstones and coatings of some Hungarian caves. It was found that the colour of the black coatings derived partly from soot produced by human activity, and partly from manganese-containing iron oxides. The orange and brown coatings originated similarly in iron and manganese oxides.

In this paper some principal problems of the formation of colourations deriving from iron and manganese oxides are outlined, on the basis of experimental results, as well as some geochemical considerations concerning the structure of karstwater systems are discussed.

The black colouration occurring in the Baradla cave had drawn the attention of the investigators to itself already on the beginning of the speleological investigations in Hungary. The naive idea of RAISZ (19) that the rocks would have throughout been affected by fire and that the cave and the black colouration covering its walls would have been formed in this way, is succeeded by the interpretation of VASS (22) – which is, in part, adequate even up to date – that the black colour has been brought about by soot of prehistoric man's fire. While studying the microflora of the cave, DUDICH (7) found iron-manganese bacteria (*Leptothrix ochracea* KÜTZ and *Leptothrix crassa* CHOL.), and on this ground, he suggested that the black colouration might be partly a result of the activity by these bacteria. This theory has been accepted also by other workers (11), and it was recently supported by SZTRÓKAY (21) who laid stress on the fact that he had found grains of SiO_2 associated with ferrous segregations in the Baradla cave, and in attributing these grains to the life-functions of organisms, he considers their presence as an evidence for the biogene origin of the colourations containing Fe and Mn.

However, besides, the above observations, some additional pedological and related electrochemical and colloidal features must also be taken into account. Thus, the formation of Fe-Mn colourations may be attributed to the complex effect of following factors.