

**GROWTH OF SPELEOTHEMS BELOW  
THE KARST-WATER TABLE: CONSIDERATIONS ON  
THE GENESIS OF SULPHIDE STALACTITES FROM  
THE UPPER SILESIAN Zn-Pb ORE BODIES  
– A REPLY\***

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The J. Głazek's (1992) discussion on the origin of sulphide "stalactites" is welcome. We accept it as an important complement to our paper (Motyka & Szuwarzyński, 1989) dealing in its part with the precipitation of sulphides and potential mechanisms of the speleothem formation, especially of the coarsely crystalline ones.

We felt that this was the weakest part of our paper, apart of some interpretation errors, e.g. the acceptance of evaporation as a privileged process of speleothem formation, correctly questioned by J. Głazek. Physico-chemical properties of the substances which build the discussed sulphide accumulations are not known well enough to permit a reconstruction of the processes of their origin with enough confidence.

It was for this reason that we restricted our discussion on the mechanisms of sulphide precipitation in accordance with the actual state of knowledge at the end of 1988. Apparently no marked progress has been achieved since. J. Głazek (1992) also does not present any new results of studies on sulphide speleothems and the environments of their occurrence. He concentrates on the question of the speleothem origin, devoting much space to the reconstruction of the sulphide precipitation mechanisms.

In the light of the above, an argument on the final conclusions of J. Głazek's discussion would be purely rethorical, so we will leave them without our comment as the expression of their author's view. However, we feel that a

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comment is necessary about the structure of J. Głazek's judgment (it bears on the conclusions!). The judgment is based at some points on hypothetical genetic assumptions taken for granted, regardless of the fact that alternative hypotheses exist. This, of course, does not preclude a consideration of any variant. We will, however, point to some simplifications of this type, aiming at offering a more complete spectrum of factors to be taken into account.

1. The furthest going oversimplification is the acceptance, after M. Sass-Gustkiewicz (1985), that speleothems are typical of the last stages of karst evolution ("mature karst") when collapse breccias are a common phenomenon and an "integrated flow of hydrothermal solutions" is formed. This was accepted despite of the fact that in our paper (Motyka & Szuwarzyński, 1989, pp. 419-420) we documented the occurrence of speleothems in settings indicating their origin in "immature" karst forms or even in non-karstified cavities. Moreover, it is a matter of choice what shall we understand by "mature karst" and "integrated flow of hydrothermal solutions". The latter concept is not precisely defined in the literature on the subject. If we consider it as an antonym of "diffuse flow" (White, 1969), i.e. a flow in pore space, then we should accept that "integrated flow of solutions" relates to the flow in karst conduits or widely opened fractures.

2. As a consequence of the above, J. Głazek assumes the formation of all the now existing sulphide accumulations (including the speleothems) during one ore-forming process, (mineralizing solutions were supplied from one source which was active during several successive stages of mineralization). In this way, J. Głazek avoids discussion on the possibility of the speleothems formation in processes of remobilization (we have indicated this possibility in our paper – Motyka & Szuwarzyński, 1989, p. 417). So far there is no proof of a uniform nature of that ore substance that builds the speleothems and the one that occurs in the surrounding sulphide accumulations, except for the presence of similar minerals in both cases.

3. The above assumption leads to the third one – on the nature of the solutions taking part in the speleothem formation. These are supposed to be hot hydrocarbon-bearing brines saturated with sulphides (by the way, we have not fully rejected such possibility – see Motyka & Szuwarzyński, 1969, p. 425). The acceptance of this assumption leads to neglecting of the role of meteoric waters possibly warmed up, but to lower temperatures than those given by the authors quoted by J. Głazek, and, of course, less mineralized. It should be added that until now, the speleothems proved "mute" in the study of gas-liquid inclusions, and there is still no basis for the determination of the temperature of homogenization and possible composition of these inclusions.

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