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Classification of clastic cave deposits of the South Franconian Alb (Southern Germany)

M. Trappe

Department of Geography, Catholic University Eichstaett-Ingolstadt, Germany
(martin.trappe@ku-eichstaett.de)

Caves are subterranean karst features which are often filled up by sedimentary material. Among the clastic deposits different clays or loam ("Höhlenlehm"), sand or gravel and carbonate rock debris can be separated.

On the example of the South Franconian Alb, a karstic area showing limestones and dolomites of Jurassic Age in Southern Germany, clastic cave deposits were studied at superficial outcrops and within several caves. By means of an actualistic approach a sedimentpetrographic differentiation of clastic cave deposits was made. Purpose of the study was the classification of other cave deposits which did not exhibit relations to any developing process.

The decomposition of carbonate rocks by gradual solutional processes was documented within small fissures or bedding planes at different quarries. Further a continuous mixing of soil or cover deposits with residuum released during carbonate rock solution at the soil-rock interface can be observed within surface outcrops. Under the action of gravity or slowly percolating water this material is carried into the vadose zone of the endokarst. Research of fluvial cave sediments was done at selected cave sites showing a wide range of sedimentpetrographic features. Referring to the fluvial activity and facies the geologic and sedimentpetrographic attributes were determined.

The following classification of cave deposits observed in the South Franconian Alb is proposed:

1. Fluvial cave deposits (gravel, sand, silty sand/sandy silt, silt, clay) can be iden-

tified by their texture or classical sedimentpetrographic attributes (e.g. sorting, roundness). The assignment of a sedimentary facies normally is possible.

2. By action of gravity or slowly percolating water within small fractures clay and loam descend within the vadose karst zone. These sediments show a close relation to soils or loam resting upon the carbonate rocks at the surface.

3. Sediments resulting from the decomposition of the carbonate rocks are formed within protected areas of open fractures and spaces where transportation of material is limited. Such deposits occur in-situ and they are of local extent. The enlargement of cavities creates interconnections and the sediments are evacuated or mixed with allochthonous material from the surface.

4. The breakdown of carbonate rocks from the ceilings or walls of caves can create individual sediments but mostly this material is mixed with other cave deposits. Under the corrosive action of water such carbonate fragments will be removed especially within the phreatic karst zone.