

POSSIBLE IMPACT ORIGIN OF THE ENIGMATIC EARLY LATE DEVONIAN AMÖNAU BRECCIA, RHEINISCHES SCHIEFERGEBIRGE, GERMANY. C. A. Sandberg¹, J. R. Morrow², and W. Ziegler³, ¹U.S. Geological Survey, Box 25046, MS 939, Federal Center, Denver, CO 80225, U.S.A., sandberg@usgs.gov, ²Dept. of Earth Sciences, University of Northern Colorado, Greeley, CO 80639, U.S.A., jrmorro@bentley.unco.edu, and ³Forschungsinstitut Senckenberg, D-60325 Frankfurt am Main, Germany, wziegler@sngkw.uni-frankfurt.de.

Introduction: The Amönau Breccia, containing large blocks derived from Devonian reefs mixed with basalt clasts and glass shards and cropping out in two quarries in the village of Amönau, near Wetter, Germany, was originally interpreted to have resulted from “erosional destruction of a reef during a period of volcanic activity” [1]. We restudied this breccia to determine if it had been instantaneously emplaced by a single volcanic explosion, and if so, was the timing of this event the same as that of the Alamo impact breccia, which was emplaced in southern Nevada within the middle part of the *punctata* Zone [2, 3].

Amönau Breccia: Re-collection of conodonts from the Amönau Breccia and adjacent strata confirms its emplacement as an instantaneous event. However, we found that this Amönau Event occurred well before the Alamo Event and within the early Frasnian, late part of the Early *falsiovalis* Zone, at or close to the first occurrence of *Ancyrodella rotundiloba*. This timing coincides with a eustatic rise marking the start of the Late Devonian.

Related German localities: At Donsbach, 38 km WSW of Amönau, a limestone bed below a similar tuff breccia containing atrypid brachiopods was dated by conodonts as Lower *asymmetricus* Zone (= *transitans* Zone of current usage) [4]. Our re-study of the original collection shows that this bed and hence the overlying tuff breccia were misdated and are actually slightly older and thus the same age as the Amönau Breccia.

At Blauer Bruch, on the outskirts of Bad Wildungen and 40 km ENE of Amönau, the only bentonite within a thinly interbedded slope sequence of shales and limestone turbidites has precisely the same conodont dating as the volcanoclastic breccias at Amönau and Donsbach [5]. Thus, the Amönau Event coincides with the onset of volcanism along an ENE-trending transect, 78 km long, of the Rhenisches Schiefergebirge in central Germany.

Further evidence of the widespread instantaneous onset of volcanism is provided by the classic stratotype section at Martenberg, near Diemelsee and 40 km NW of Blauer Bruch. There, in a sequence of hematitic micrites deposited during nearby submarine exhalations, the time of the Amönau Event is represented by a 95-cm-thick bed of sedimentary hematite, the only thick hematite interbed in the sequence [5].

Conclusions: The Amönau Event is documented not only by volcanic explosions at two localities, 38 km apart, but also by the simultaneous start of volcanism

across a wide expanse of the Rhenisches Schiefergebirge. This coincidence was not recognized previously because of the lack of information due to the scarcity of exposures, except in a few quarries and stream cuts, in this region of predominantly highly weathered slate hills. We are now re-investigating other localities in the region to determine if the Amönau Event was strictly a volcanic event or whether the widespread volcanism might have been triggered by an early Frasnian subcritical, oceanic impact coincident with a eustatic rise.

References: [1] Bender, P., Hühner, G., Kupfahl, H.-G. and Voutta, U. (1984) *GJH* 112, 31–65. [2] Morrow, J. R., Sandberg, C. A. and Ziegler W. (1999) *AWIBP* 343, 66–69. [3] Morrow, J. R., Sandberg, C. A. and Ziegler W. (1999), *GSAAP* 31–7, A-64. [4] Krebs, W. and Rabien, A. (1964) *NHLAB* 92, 75–119. [5] Sandberg, C. A., Ziegler, W. and Bultynck, P. (1989) *CFS* 110, 195–230.

