CAN IMPACT EJECTA SURVIVE FLUVIAL REWORKING? M. Schmieder[1] and E. Buchner, Institut für Planetologie, Universität Stuttgart, Herdweg 51, D-70174 Stuttgart, Germany; [1]martin.schmieder@geologie.uni-stuttgart.de.

Impact ejecta reworked by various sedimentary processes have been reported from a number of impact structures on Earth [1]. Tsunami-reworked layers of impact glass/spherules and shocked mineral grains at K/T boundary sections associated with the Chicxulub impact structure, Mexico, were described by [2] and [3]. At marine impact structures, such as Lockne, Sweden, impact ejecta are commonly reworked within submarine turbiditic 'resurge breccia' deposits [4]. At impact structures degraded by glacial erosion, e.g., the <1.9 Ga Paasselkä impact structure, Finland, glacial float may contain proximal ejecta material [5]. In contrast to the marine and glacial processes mentioned above, impact ejecta reworked by fluvial processes are sparsely mentioned in the literature, which suggests that shocked mineral grains and impact glasses are unstable when eroded and transported in fluvial systems.

Here we report impact ejecta that show sedimentological evidence for at least three steps of high-level fluvial reworking. Well-rounded Ries ejecta material (suevite-derived shocked quartz grains, diaplectic quartz/feldspar glass, and lithic clasts of Bunte Breccia and suevite within multi-generation sandstone pebbles) is distributed within post-impact fluvial sandstones locally known as the 'Monheimer Höhensande' [6] (Figs. 1-3); the latter were carried and deposited within a water distribution network that incised into the eastern part of the Ries ejecta blanket soon after the impact event. Our findings document, for the first time, that intensely shocked quartz grains and diaplectic glass can survive short-range multiple fluvial reworking.

References: [1] Simonson B. M. and Glass B. P. (2004) *Ann. Rev. Earth Pla. Sci., 32*, 329-361. [2] Smit J. (1999) *Ann. Rev. Earth Pla. Sci., 27*, 75-113. [3] Maurrasse F. J.-M. R. and Sen G. (1991) *Science, 252*, 1690-1693. [4] Sturkell E. F. F. (1998) *Geol Rdsch., 87*, 253-267. [5] Schmieder M. et al. (2008) *Meteoritics and Planetary Science* (in press). [6] Schmidt-Kaler H. (1974) *Geol. Blätter NO-Bayern, 24*, 101-105.

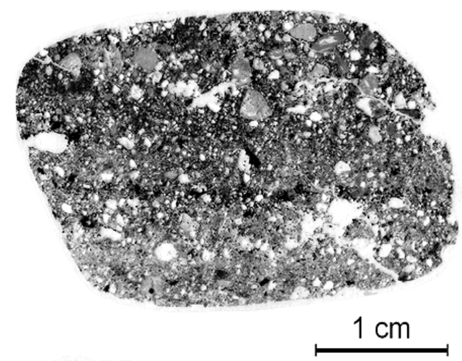

Fig. 1: Well-rounded, layered, and graded sandstone pebble (Monheimer Höhensande) that contains multiply reworked Ries ejecta material.

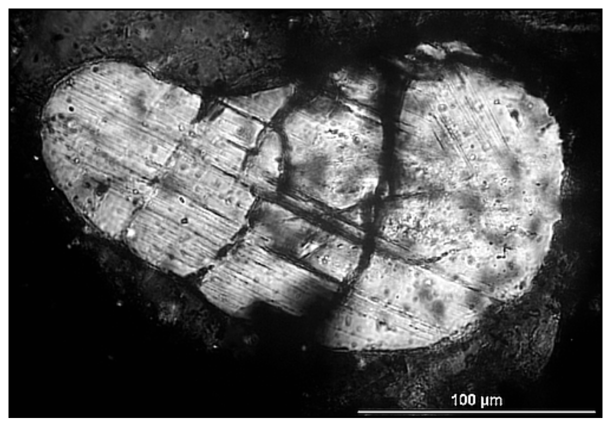

Fig. 2: Well-rounded shocked quartz grain with PDFs and planar fractures in sandstone pebble from the Monheimer Höhensande.

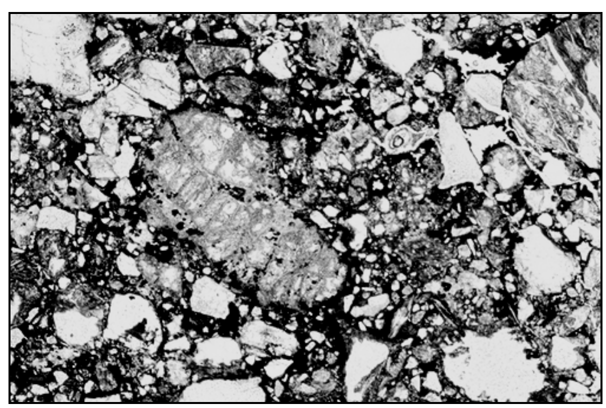

Fig. 3: Sandstone pebble with well-rounded grain of diaplectic quartz glass (kidney-shaped grain near centre) from the Monheimer Höhensande. Image width ~1.5 mm.