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Post-glacial rock avalanche causing epigenetic gorge incision (Strassberg gorge, Eastern Alps).

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In the western part of the Eastern Alps, the Strassberg gorge 1.5 km in length and down to 100 m in depth shows a marked asymmetry in height of its right/left brinklines. The gorge is incised into Upper Triassic dolostones, and parallels an older valley filled with Quaternary deposits. Upstream, the valley-fill consists of (a) glacial till (Last Glacial Maximum, LGM), overlain by (b) a rock avalanche deposit (RAD) at least a few tens of meters thick, and (c) alluvial deposits shed over the RAD (except for projecting boulders); the RAD is locally also downlapped by scree slopes. Downstream, the valley-fill consists of glacio-fluvial deposits overlain by LGM till and, on top, the RAD. The rock avalanche defaced from the west slope of mount Hohe Munde (2662 m asl), and consists exclusively of clasts of Wetterstein Limestone (Triassic p. p.). Rock avalanche defacement was tied to a system of NW-SE trending strike-slip faults (Telfs fault zone).

The rock avalanche descended before the old valley was significantly cleared of glaciofluvial/glacial deposits of the LGM. On a plateau west of the present bedrock gorge, LGM till is veneered over a large area by RAD; the till and the RAD both were later involved in slumping. The RAD covers a total planview area of $\sim$3.7 square kilometers. The fahrböschung of the rock avalanche is reconstructed between 16°-14.5°. In its proximal part, the rock avalanche propagated by dynamic fragmentation; in the distal part, propagation was by sheet-like 'plug flow', perhaps in part over a snow cover.

The filling of the old valley by the RAD led to: (a) formation and filling of a small intramontane basin directly upstream, and (b) incision of the present Strassberg gorge along a course westward-parallel to the old valley. Mean rates of bedrock incision required to form the deepest reach of the present canyon range from 1 cm/a (since 10 ka) to 0.7 cm/a (since 15 ka). In the considered area, talus breccias of pre-LGM age locally show zones of fractured clasts up to boulder size. Comparison with areas with intense neotectonism (e. g., Central Apennines) suggests that fracturation may have been caused by seismicity. For the area, historical earthquakes with Me 3–3.9 imply the incidence of stronger quakes on longer timescales. The considered rock avalanche thus perhaps was triggered by a seismic event.

The investigated RAD is the hitherto unappreciated, easternmost outlier of a cluster of rock avalanches in the area; these rock avalanches are grouped within a seismically active belt of strike-slip faults related to the Neogene to recent deformation of the Eastern Alps. This study links structural deformation with catastrophic mass-wasting which, in turn, caused incision of an epigenetic bedrock gorge. Surface exposure dating of boulders is intended to constrain the age of rock avalanching.