A peculiar prehistoric artifact in the Tüttensee impact ejecta ("Bunte Breccia"; Chiemgau Holocene impact event)

by Till Ernstson

Since the beginning of the year 2006 about 40 excavation pits have been performed in the environs of the Holocene Tüttensee meteorite impact crater (Rappenglück et al. 2004, CIRT 2004, 2006) in order to investigate the stratigraphy and the composition of the impact ejecta (Bunte Breccia; CIRT 2006). Here, I report on the first find of an anthropogenic artifact encountered amidst the impact breccia from excavation pit No. 35.

In nearly all excavation pits within a radius of 1000 m around Lake Tüttensee, the stratigraphy down to a depth of 1.5 m exhibits (CIRT 2006):

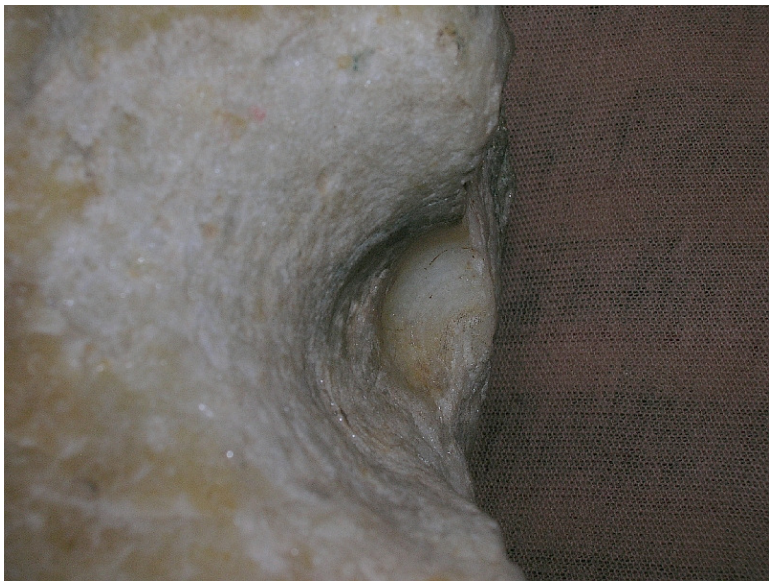
- recent soil and humus
- a layer of Tüttensee impact ejecta ("Bunte Breccia") composed of strongly shattered and heavily corroded cobbles and boulders in a clayey matrix also containing organic material (among others up to 5 % wood)
- fossil soil horizon or autochthonous ground (lacustrine clay) containing organic material (tufts of hair, bones, wood, teeth)

The artifact under discussion (Figs. 1 - 4) comes from the impact ejecta layer that is up to one meter thick. It contains smashed fluvio-glacial Alpine cobbles and boulders among them quartzites and various other metamorphic rocks, sandstones decomposed to sand, and most notably the fractured and skeletal corroded carbonate rocks (Fig. 5). The latter are assumed to have obtained their peculiar sculpture by impact nitric-acid dissolution and/or carbonate decarbonization/melting (CIRT 2006)

Fig. 1, Fig. 2. The drilled quartzite boulder recovered from the Tüttensee impact ejecta layer.

Within this material and at a depth of about 1 m of excavation pit no. 35, the externally intact 17.6 cm long and 8.4 cm thick quartzite boulder was found. A funnel-shaped "picked" dent passes over into a drilled hole that breaks off midway through the boulder (Figs. 1, 2). The initially picked cone with an upper 4.5-cm diameter and a 3 cm-depth (Fig. 1) suggests the use of a chisel, possibly an elongated quartzite chop.

A central rise at the base of the hole (Figs. 3, 4) proves it was made as a core drilling with a rapidly rotating hollow rod, possibly a linkage of deer antler, elder or hollow bone.



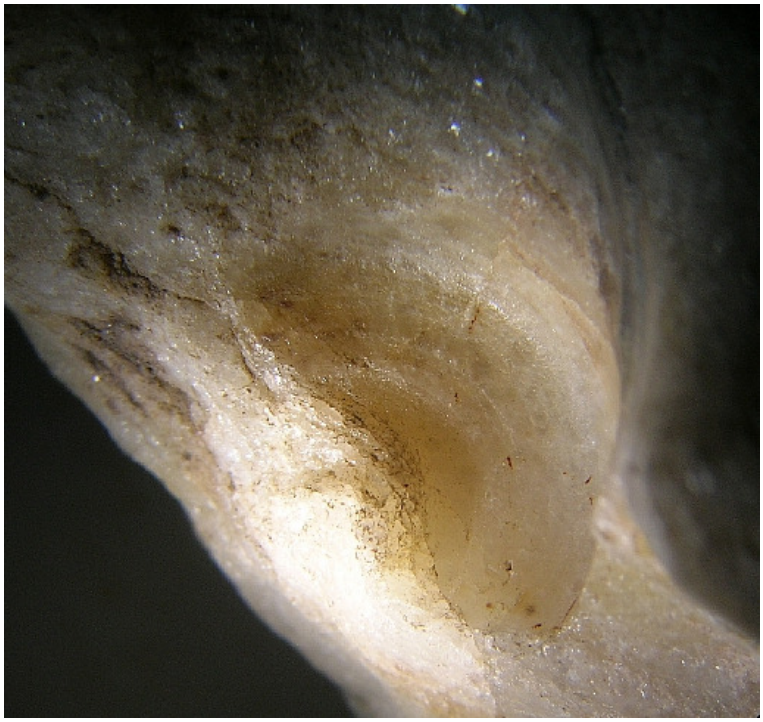


Fig. 3, Fig. 4. Close-up of the bore. The central rise at the base proves the use of a hollow rod, possibly a linkage of deer antler, elder or hollow bone.

A drilling in such a tough silicate rock has been shown to be possible, and it is referred to Lu et al. (2005) having described a drilled corundum axe from China. From Central Europe, however, a reference object is obviously not known. Not even from the Northern Germany megalithic culture, a drilled axe has been reported that was made of Silex (flint) and thus of a material of comparable hardness.

The purpose of this artifact is left to assumptions. A (weaving) weight or an anchor can definitely be excluded because of the extremely time-consuming work compared to materials like brick or limestone that serve the same purpose.

The extrinsic natural form of the boulder and the eccentric starting point of the bore suggest the artifact is the blank for a splendor stone axe. This hypothesis, however, poses the question why the rough outline of the axe was not framed by picking before drilling in order to lower the risk of fracture especially after completed bore.

Moreover, it remains unexplained whether the boulder already broke on drilling the hole or later from impact deformation. A few picking traces on the rear side of the boulder may point to the beginning of a second funnel to result in a doublet conical bore, and this may also have caused the disruption.

Likewise, the dating of the artifact is left to assumptions. Most probably, a span from Middle to End Neolithic must be assumed, however Bronze Age cannot be excluded (J. Weiner, pers. communication).

It is well known that artifacts were produced from impactites and impact glasses, resp., (e.g., Elgygytgin impact structure [Gurov & Gozhic 2006), Libyan Desert glass, tektites). Here, in the Tüttensee case, obviously the first find of an artifact within an impact rock is documented.

Fig. 5. Typical, strongly wrecked cobbles from the Tüttensee impact layer in excavation pit No. 35. Together with these cobbles the quartzite artifact was recovered. As noted in previous articles, the sharp-edged fracturing can only have originated from impact deformation, and the extreme corrosion of the clasts can be explained by impact nitric-acid dissolution and/or carbonate decarbonization/melting.

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