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A Neanderthal lower molar from Stajnia Cave, Poland

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ABSTRACT

The primary aim of this study was to conduct a taxonomic assessment of the second of three isolated human teeth found in the Stajnia Cave (north of the Carpathians, Poland) in 2008. The specimen was located near a human tooth (S5000), which was identified by Urbanowski et al. (2010) as a Neanderthal permanent upper molar. Both of these teeth were excavated from the D2 layer, which belongs to the D stratigraphic complex comprising the archaeological assemblage associated with the Micoquian tradition. An *Ursus spelaeus* bone and *Mammuthus primigenius* tooth that were also excavated from the D2 layer were dated to >49,000 years BP (by AMS ^{14}C) and 52.9 ka BP (by U-Th), respectively. The sediment overlying stratigraphic complex D was dated to 45.9 ka BP by the OSL method. The S4300 tooth is a lower first or second permanent molar belonging to an individual other than that who once possessed the S5000 tooth. The S4300 tooth exhibits a combination of traits typical of Neanderthal lower molars, including a mid-trigonid crest, large anterior fovea, taurodontism and subvertical grooves on the interproximal face, indicating that this tooth belonged to a Neanderthal individual. The S4300 tooth from Stajnia Cave is one of the oldest human remains found in Poland.

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Introduction

The current study describes S4300, a fossil human tooth found in Stajnia Cave. The cave is located in the Częstochowa Upland, (Southern Poland, 50°36′58″N, 19°29′04″E, 362 m.a.s.l.) within one of the limestone ridges which are typical of the Polish Jura formation in the Mirów-Bobolice Range (Fig. 1). Excavations began in 2006. Three human teeth were found during the subsequent four field seasons. The first tooth, S5000, was identified as a Neanderthal second upper molar (Urbanowski et al., 2010). The second specimen, S4300, is described in the present study, and the third tooth (S4619), which belonged to a child, exhibits morphological similarity to the Neanderthal upper molars (Nowaczewska et al., 2013), but its taxonomic assessment requires confirmation (Urbanowski et al., 2010). All of the teeth were excavated from the stratigraphic complex D, but they represent three different individuals. The stratigraphic complex D consists of three cave loams deposited under interstadial conditions (D1–D3), which contain rich Middle Palaeolithic archaeological finds of the Late Micoquian tradition, characterised by numerous asymmetrical backed knives, which are primarily unifacial. The archaeological finds mentioned above are accompanied by discoidal and Levallois flakes and points, as well as a significant number of raw flint nodules that were transported into the cave. The absolute dates support the geological and archaeological observations, including an OSL date for the unit overlying complex D: 45.9 ka BP (GdTL-1127); the open ^{14}C AMS date for the *Ursus spelaeus* from layer D1: >49,000 years BP (Poz-28892; Urbanowski et al., 2010) and the U-Th date for the mammoth tooth from the D2 layer: 52.9 ka BP (W1400 and W1417 det. H. Hercman). Other absolute dates (unpublished) provide additional support for these results, which allow for the reliable dating of complex D to the early stages of the MIS-3 period. Distinguishing between the units of complex D is not a simple process due to post-depositional disturbances and uneven contact zones between the layers. The stratigraphic position of S4300 suggests that it should be attributed to the surface of the D3 unit. However, S4300 was found within the archaeological feature measuring $2 \times 1 \times 0.7$ m filled with redeposited D2 deposit, which contained a significant amount of Micoquian flint artefacts (over 2000), and was sealed with D1 sediment (M. Żarski and M. Urbanowski, personal communication).

The spatial distribution of human teeth within the cave does not seem to be entirely random. The S4300 specimen was found very close to the S5000 molar. However, S5000 came from the uppermost part of complex D where layer D1 contacts D2, and both specimens were found within the aforementioned feature and came from the same square metre of the research grid, with only a 0.35 m difference in depth. The S4619 specimen was found 3 m away but was also located near the NW wall of the cave and in a similar stratigraphic position (bottom part of the D2 layer) (M. Żarski and M. Urbanowski, personal communication).

Vertebrate remains found in complex D create a non-analogue late Pleistocene assemblage typical of Central Europe (Nadachowski et al., 2009). Complex D consists of a mixture of species belonging to various ecological categories. The small and large mammal assemblage is dominated by dwellers of well-drained or wet tundra: lemmings (*Dicrostonyx gulielmi* and *Lemmus lemmus*), narrow-headed voles (*Microtus gregalis*) and reindeer (*Rangifer tarandus*) as well as species of high ecological specificity, e.g., root voles (*Microtus oeconomus*), water voles (*Arvicola terrestris*) and cave bears (*Ursus spelaeus*). The above-mentioned ecological categories of species constitute over 63% and over 30% respectively of all the studied remains of small mammals. Inhabitants of a dry-open or steppe environment, such as ground squirrels (*Spermophilus* spp.) and common hamsters (*Cricetus cricetus*), are far less numerous (4%). Large mammals of the cold-steppe assemblage include the steppe wisent (*Bison priscus*) and the horse (*Equus caballus*). The frequency of species inhabiting various kinds of woodlands is very low (ca. 2%). The coexistence of boreal, steppe and woodland species in one assemblage indicates the presence of a mosaic of habitats represented in complex D of Stajnia Cave.

The main aim of this paper is to conduct a taxonomic assessment of the S4300 human lower molar found in Stajnia Cave. It is worth stressing that the non-metric traits of the tooth morphology have been used mainly for the identification of major taxa/species (Condemi et al., 2010). The results of analyses concerning the non-metric traits of Neanderthal teeth did not indicate a distinction between the early (pre-70 ka) and late (post-70 ka) Neanderthal groups (Bailey, 2002a, 2007).