

The Paleolithic finds from Bollschweil and the question of Neanderthal mammoth hunting in the Black Forest

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SUMMARY: From 1996 to 1998 excavations in Bollschweil, near Freiburg in Breisgau, yielded several hundred faunal remains and a small lithic assemblage. The finds were preserved in a small loess and rubble-filled valley on the edge of a limestone quarry. Biostratigraphic and cultural stratigraphic arguments, as well as ESR dates suggest that the accumulation dates to the penultimate glaciation, but the reworked nature of the sediments in the gully complicate the archaeological and chronological interpretation of the site. The lithic assemblage includes an amphibolite handaxe and a chert side scraper. The fauna is dominated by mammoth with fewer remains of horse, large bovid, woolly rhinoceros, red deer and bear. At least six mammoths are included in this assemblage, which is characterized by a wide range of body parts. The finds lack clear anthropogenic modifications. As is often the case at proboscidean sites, a definitive causal association between the faunal remains and hominid economic behavior is difficult to establish.

1. INTRODUCTION

After the site's discovery in 1995, amateur paleontologists E. Blattmann and R. Ritz began excavating the rich Pleistocene faunal remains exposed in a small, steep valley on the edge of the limestone quarry operated by the Koch company in Bollschweil, 10 km SE of Freiburg in the Black Forest of southwestern Germany. In 1997 the site, which had already produced scores of faunal remains and a small number of lithic artifacts, was called to the attention of the State Agency for Archaeological Heritage (*Landesamt für Denkmalpflege*) and the Department of Early Prehistory and Quaternary Ecology of the University of Tübingen. In the fall of 1997 a team of archaeologists from Tübingen conducted a salvage excavation focusing on clarifying the geological setting of the finds and augmenting the existing collections of faunal remains and lithic artifacts. This excavation (Figs. 1-3) ran for 10 weeks and yielded a wealth of new information about the site (Conard & Kandel 1999). Subsequent research has addressed the lithic assemblage from the site (Conard & Blattmann 2000) and

the chronostratigraphic assessment of the site (Rink *et al.* n.d.).

2. GEOLOGICAL SETTING

The Paleolithic site of Bollschweil is located near the northwestern edge of the Koch limestone quarry at an elevation of 370 m above sea level. The finds lay near the base of a small north-south oriented valley formed on its eastern border by Jurassic limestone bedrock and to the west by limestone blocks and sediments. While this small gully-like valley probably was fed occasionally by runoff, there is no indication that it was ever a perennial water course. The sediments filling the valley preserve a complex system of interbedding silts and clays containing abundant fragments of limestone and faunal material. Although a small number of bones were found in articulated position, the material appears to be in a jumbled context, perhaps as a result of slumping or solifluction from above. Even during the early phases of fieldwork, the great abundance of mammoth remains was readily visible. The presence of a cold period fauna including mammoth and

woolly rhinoceros along with the predominance of loessic sediments points strongly to an accumulation during a cool phase of the Pleistocene. The lack of a clear geostratigraphic markers forces the use of biostratigraphy,

cultural stratigraphy and radiometric dating for assessing the age of the deposits. Several lines of evidence including a series of ESR dates suggest a probable age within the penultimate glaciation (Rink *et al.* n. d.).

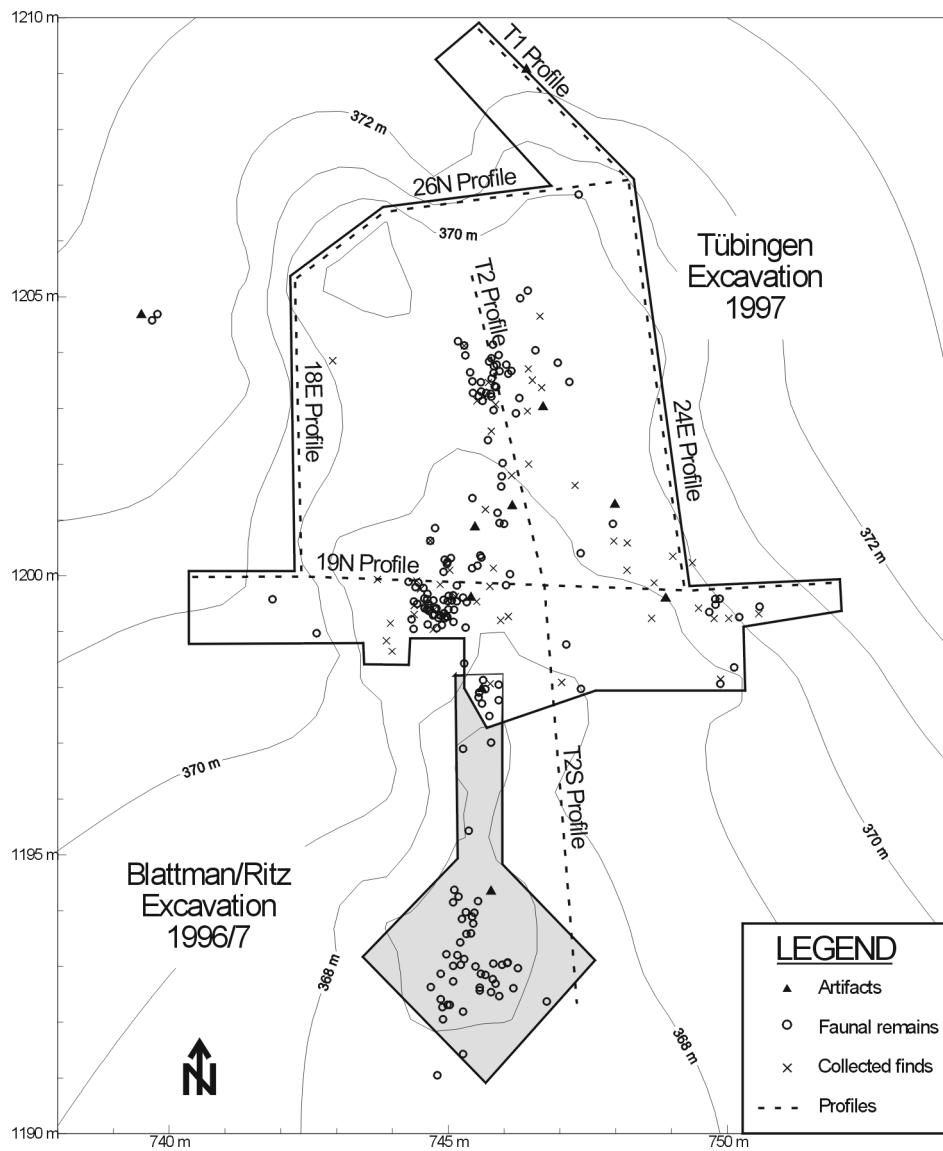


Fig.1 - Bollschweil. Topographic map of the excavation showing the location of faunal and lithic finds.



Fig.2 - Bollschweil. Overview of the excavation looking toward the northwest, October 1997.



Fig.3 - Bollschweil. 24E Profile showing coarse limestone debris and faunal remains, October 1997.

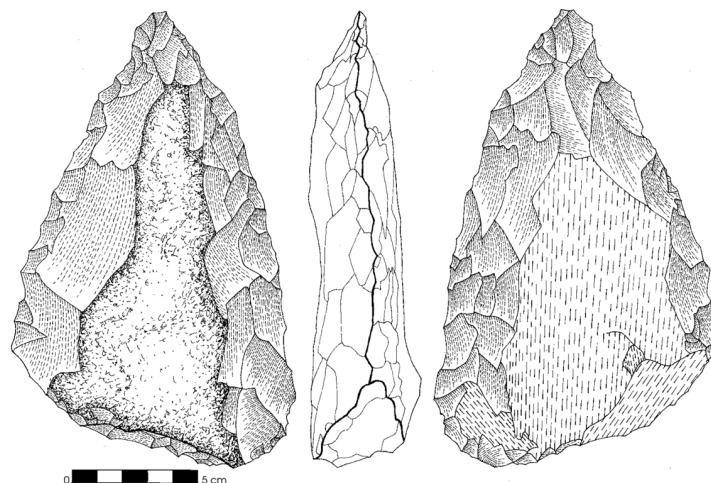


Fig.4 - Bollschweil. Amphibolite handaxe.

3. LITHIC ARTIFACTS

The finds from Bollschweil include a dozen lithic artifacts of the following raw materials: chert, quartz, quartzite, amphibolite and siliceous slate (Fig. 4). The poor excavation conditions in the jumble of sediment, bone and limestone rubble, and the lack of a large sample of waterscreened sediment hindered the recovery of lithic artifacts.

Two finds are of typological importance. One piece is a ventrally retouched side scraper of Jurassic chert; the other is a large handaxe of amphibolite (Conard & Kandel 1999; Conard & Blattmann 2000). Typologically, the side scraper, though well documented in earlier and later periods, would most likely belong to the Middle Paleolithic. The cultural assessment of handaxe-bearing assemblages touches on several complex issues. While handaxes are the most important form of the Acheulean, in Germany handaxes are fairly common in the Middle Paleolithic as defined by Bosinski (1967). In southern Germany in particular, bifacially worked artifacts including diverse handaxe forms persist throughout much of the Würmian glaciation. Thus there is no sound basis for distinguishing Lower and Middle Paleolithic assemblages based solely on the presence or absence of handaxes (Conard & Fischer 2000).

4. FAUNAL REMAINS

At present the faunal remains from the excavations of the University of Tübingen and from E. Blattmann's collection are available for study. An unknown amount of material from the Ritz collection is not yet available for study. The combined Blattmann and Tübingen collections include 423 specimens of macro-mammalian fauna, of which 299 pieces could be identified to the level of genus or species (Tab. 1, Fig. 5). These include the remains of mammoth, horse, large bovid, woolly rhinoceros, red deer and bear in descending order of abundance. Many other remains could be placed in general size classes.

While mammoth is by far the best represented species, horse, large bovid, woolly rhinoceros and red deer are represented by 28, 22, 14 and five specimens respectively. The remains of horse represent at least three individuals and are characterized mainly by dentition and distal hind limb elements. Axial skeletal remains are lacking in the sample. Based on the teeth, most of the animals in the death assemblage were young adults. The large bovid assemblage includes remains from at least two animals and shows a very different representation.

With the exception of two distal limb bones and a rib fragment, all the specimens are either

Tab.1 - Bollschweil. Summary of the faunal remains from E. Blattmann's and the University of Tübingen's

Species	NISP	%NISP
<i>Ursus</i> sp.	1	0,2
<i>Mammuthus primigenius</i>	229	54
<i>Coelodonta antiquitatis</i>	14	3,3
Mammoth-/Rhino-sized	17	4
<i>Equus</i> sp.	28	6,6
<i>Bos/Bison</i>	22	5,2
Bovid/Equid-sized	5	1,2
<i>Cervus elaphus</i>	5	1,2
Unidentified	102	24
Total	423	100

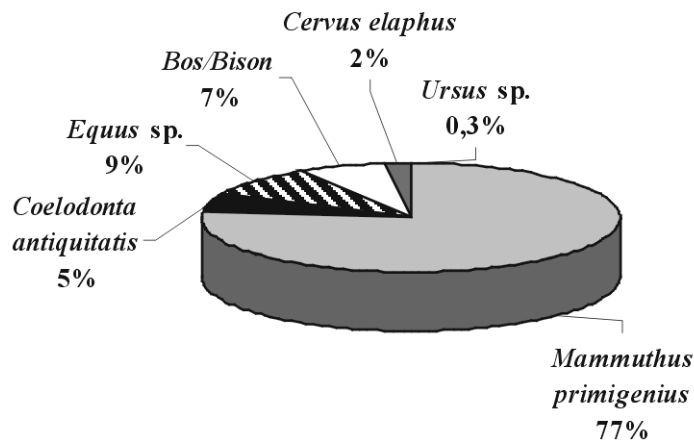


Fig.5 - Bollschweil. Relative abundance of macro-mammalian taxa based on NISP.

cervical vertebrae, pieces of horn core or other cranial fragments, including dentition. Woolly rhinoceros is represented by at least one individual. Other than a metatarsus and two long bone fragments, only teeth and tooth fragments have been documented. The five specimens from red deer include only antler, dental and cranial material. Bear is represented by a complete radius.

The assemblage of mammoth remains includes 229 specimens and forms 77% of the identified specimens and a still higher portion of the assemblage on the basis of weight. There

is little doubt, that the majority of the unidentified very large (mammoth or rhino) size class remains are also from mammoth. With this comparatively large assemblage more can be said about the body part representation and age profile of this species. The assemblage includes the remains of at least 6 individuals based on maxillary molars. Tusks, mandible and humerus are also well-represented with MNEs of 3 (Fig. 6). Axial skeletal remains and limb bones are fairly well-represented.

Although foot bones and non-cervical vertebrae are underrepresented, the assemblage

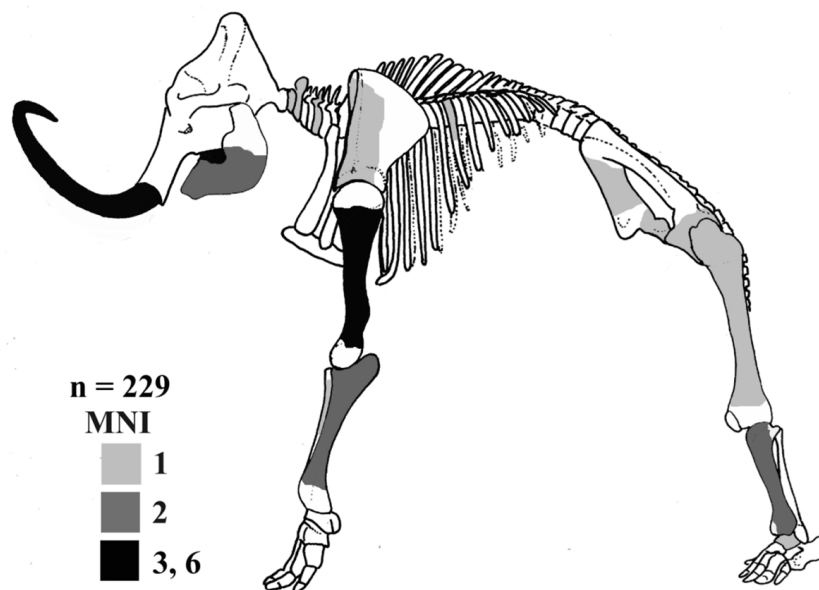


Fig.6 - Bollschweil. Body part representation of *Mammuthus primigenius*. Note that MNI of 6 refers to molars.

appears to reflect the remains of complete animals that either died in the gully or slid into the gully from the higher-lying surroundings. Among the teeth and dental fragments, 16 teeth could be aged using Haynes' (1991) criteria. The age classes 0-12 ($n = 3$), 13-24 ($n = 9$) and 37-60 ($n = 4$) African Elephant Years (AEY) are present, with the young adults in the range from 13-24 AEY best represented among both the maxillary and mandibular teeth. The mammoth finds preserve no clear signs of modification by humans or carnivores, but the relatively poor preservation hinders the identification of such features.

5. CONCLUSIONS

Bollschweil is the only open-air archaeological site in southwestern Germany characterized by an abundance of mammoth remains. The site probably formed during one or more cultural and sedimentary events during the penultimate glaciation. The occurrence of lithic artifacts with a rich faunal assemblage in a relatively small area of excavation suggests that hominids contributed to the faunal accumulation. However, in the absence of conclusive

arguments for predation or butchery by hominids, Bollschweil provides tantalizing indications, but certainly no proof, of Neanderthals hunting mammoths on the edge of the Black Forest. While ever more evidence for successful hunting by archaic European hominids accumulates (Conard & Prindiville 2000; Gaudzinski & Roebroeks 2000), the role of elephants in Paleolithic economies remains elusive (Haynes 1991). Only in remarkable settings such as Lehringen (Thieme & Veil 1985) and Gröbern (Mania *et al.* 1990) has it been possible to establish a causal link between the artifacts and the proboscidean skeletal remains. Finally in the southern German context, Bollschweil serves to remind researchers that many new discoveries are still to be made outside the region's many caves, if the necessary resources can be made available to pursue this line of research.

6. ACKNOWLEDGEMENTS

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