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Evidence of Early Cannibalism

The oldest human remains and tools that have been discovered in southern Europe (from 780,000 years ago) were described in two recent reports: "Lower Pleistocene hominids and artifacts from Atapuerca-TD6 (Spain)," by E. Carbonell *et al.* and "Paleomagnetic age for hominid fossils at Atapuerca archaeological site, Spain," by J. M. Parés and A. Pérez-Gonzàlez (11 Aug., pp. 826 and 830, respectively). Additional studies of the lower Pleistocene human fossils, recently found in level 6 (TD6) of the Gran Dolina cave site at Sierra de Atapuerca provide evidence of anthropophagy. Striations on the small temporal bone fragment ATD6-16 (4 by 3.5 by 4.5 centimeters) were noticed during excavation, and subsequent analyses after careful cleaning have revealed similar marks on two podial phalanges. Scanning electron microscope analysis of replicas obtained from these human bones show clear features characteristic of cut-marks (Fig. 1). Comparison with marks on faunal remains indicate similar features, probably created by an identical type of stone tool raw material.

The temporal bone exhibits about 12 parallel striations on the mastoid crest where the sternocleidomastoid muscle was attached. Identical placement of cut marks on human skulls has been reported in Neolithic assemblages with extensive evidence of cannibalism (*1*). The proximal pedal phalanx (ATD6-30) has five striations on the dorsal surface of the proximal shaft, while the medial pedal phalanx (ATD6-33) shows two striations that affect the attachment area of the *flexor digitorum brevis* muscle. Location and distribution of cut marks are suggestive of dismembering (detachment of the head) and defleshing activities. Faunal remains exhibit similar patterns of butchering techniques, which suggests that human and animal carcasses were similarly processed, with no special or ceremonial treatment to humans, indicating, therefore, cannibalism (*3*). Cranial and postcranial human skeletons were not sorted out, and human elements were found disseminated

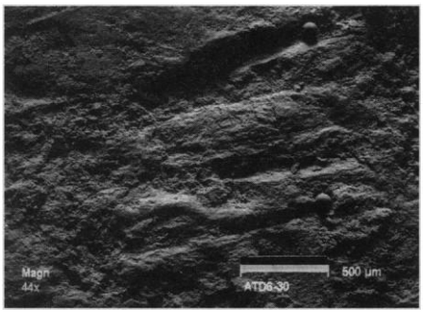

Fig. 1. Microphotograph of a set of cut marks from bone TD6-30 (human pedal phalanx I) at the dorsal face, showing internal V-section, microstriations, and herzinian cones. Scale bar, 500 micrometers.

and mixed with herbivore bone fragments. Bone remains were found along with many (100) stone tools defined as Pre-Acheulean technology. There was probably intensive activity at the site, given the unusual use of podial elements and the high abundance of small fragments and bone flakes.

Herbivore and human age and size were similar, with a high number of infant and juvenile individuals and a predominance of less than 50 kilograms of body weight. These features suggest that hominids transported bone remains to the cave. In-

fluence of carnivores in the site is given by five fossil remains of felids and mustelids (four individuals were adults). However, the low incidence of tooth marks (4% of the bone remains) especially in the joint attachments is not consistent with a pattern of carnivore priority access to the carcasses (*2*). On the contrary, the fossil assemblage of TD6 shows frequent dismembering and defleshing cutting marks on herbivore bone remains (7%). Further, most of the bone fragments show fractures produced when bones were still fresh, some of them with hammerstone impact notches likely produced during marrow extraction.

The bone assemblage from TD6 is consistent with butchering processes, and the presence of human remains at this site indicates conspecific consumption of human tissues.

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Extracellular Protein Kinases

While viewing a poster on the involvement of ectoprotein kinase in the maintenance of hippocampal long-term potentiation during the recent Annual Meeting of the Society for Neuroscience (*1*), many of our colleagues pointed out that they have been misled by a statement in the Research News