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News and views

The Oldowan horizon in Wonderwerk Cave (South Africa): Archaeological, geological, paleontological and paleoclimatic evidence

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Introduction

In marked contrast to East Africa, where the emergence of stone tool technology (~2.6 Ma) is well documented at a wide range of sites (Semaw, 2000; Schick and Toth, 2006; Hovers and Braun, 2009), the earliest stages of tool production are known from only a small number of localities in southern Africa, none of which is interpreted as representing primary contexts (Kuman, 1998; Schick and Toth, 2006). Here we provide the first comprehensive description of an *in situ* Oldowan deposit from basal Stratum 12 inside Wonderwerk Cave, Northern Cape Province, South Africa.

The Wonderwerk Cave Earlier Stone Age sequence

Wonderwerk Cave is a ~140m phreatic tube formed in the dolomites of the Kuruman Hills (Northern Cape Province, South Africa) (Fig. 1a). Beginning in the 1940s, archaeological excavations were carried out at the site by Malan and colleagues (Malan and Cooke, 1941; Malan and Wells, 1943) followed by further investigations by other researchers (Butzer, 1984). The most extensive excavations were undertaken by Peter Beaumont from the 1970s to the early 1990s Beaumont and Vogel, 2006). Since 2007, our team has been engaged in fieldwork at the site, primarily in Excavation 1 located ~30 m in from the cave mouth (Fig. 1b–d). This work has focused on sampling for micromorphological analyses of sediments, pollen, phytoliths and for cosmogenic burial and paleomagnetic dating. All samples were taken from the freshly cleaned Earlier Stone Age (ESA) sections left by Beaumont (maximum ESA section height 2 m). In addition, limited test excavations aimed at *in situ* sampling of the lowest ESA horizon, Stratum 12, were carried out. Analyses of archaeological finds (lithics, fauna and macro-botanical remains) deriving from Beaumont's excavations of the ESA levels have also been undertaken.

During fieldwork, we subdivided the ESA sedimentary sequence into nine lithostratigraphic Units (Fig. 2). Overall, the sediments consist of reddish, powdery, bedded quartz silt and sand with

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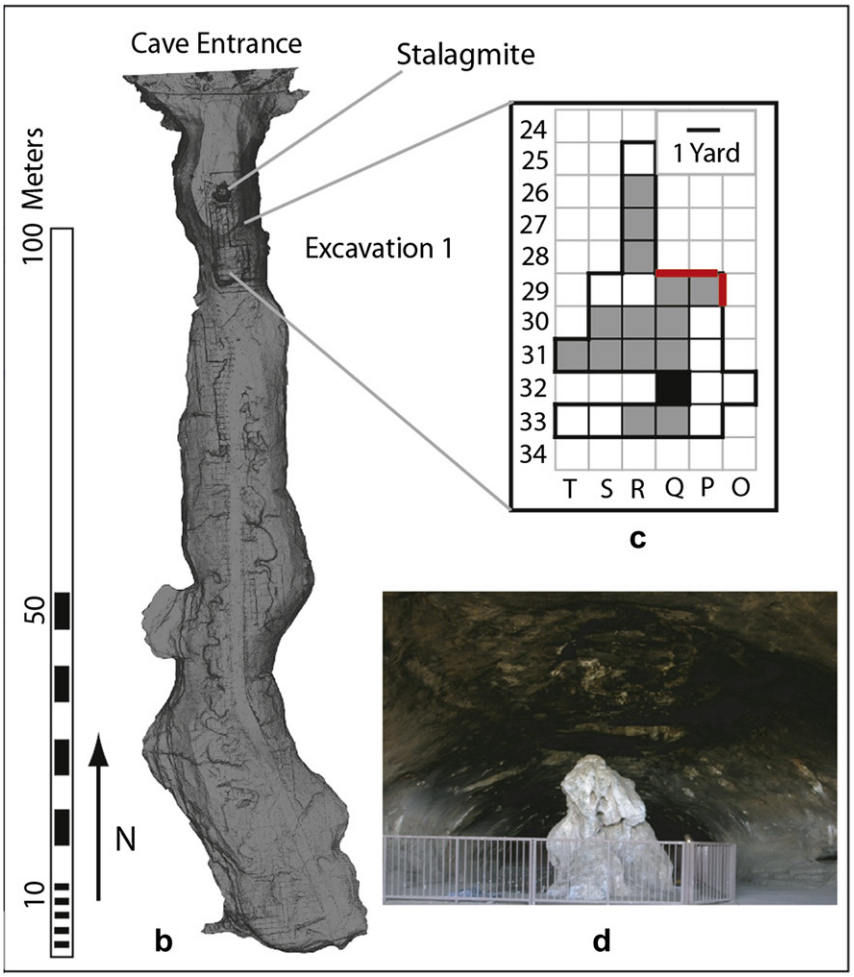

Figure 1. a. Map of the present day biomes of southern Africa showing the location of Wonderwerk Cave and other sites discussed in the text. b. Plan view of Wonderwerk Cave generated by 3-D scans showing precise location of Excavation 1 (courtesy of H. Rüther, ZAMANI project, University of Cape Town). c. Plan of units excavated by Peter Beaumont in Excavation 1. Grey indicates units that produced lithic remains; black indicates unit excavated by our team; Red line indicates main profile sampled by us for dating as shown in Fig. 2. d. Photo showing large stalagmite located just in front of Excavation 1 and the form of the dolomite cave roof. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)