

Press Package for Recent Discovery at Wonderwerk Cave, Northern Cape Province,
South Africa

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View of the Interior of Wonderwerk Cave (Photo Royden Yates)

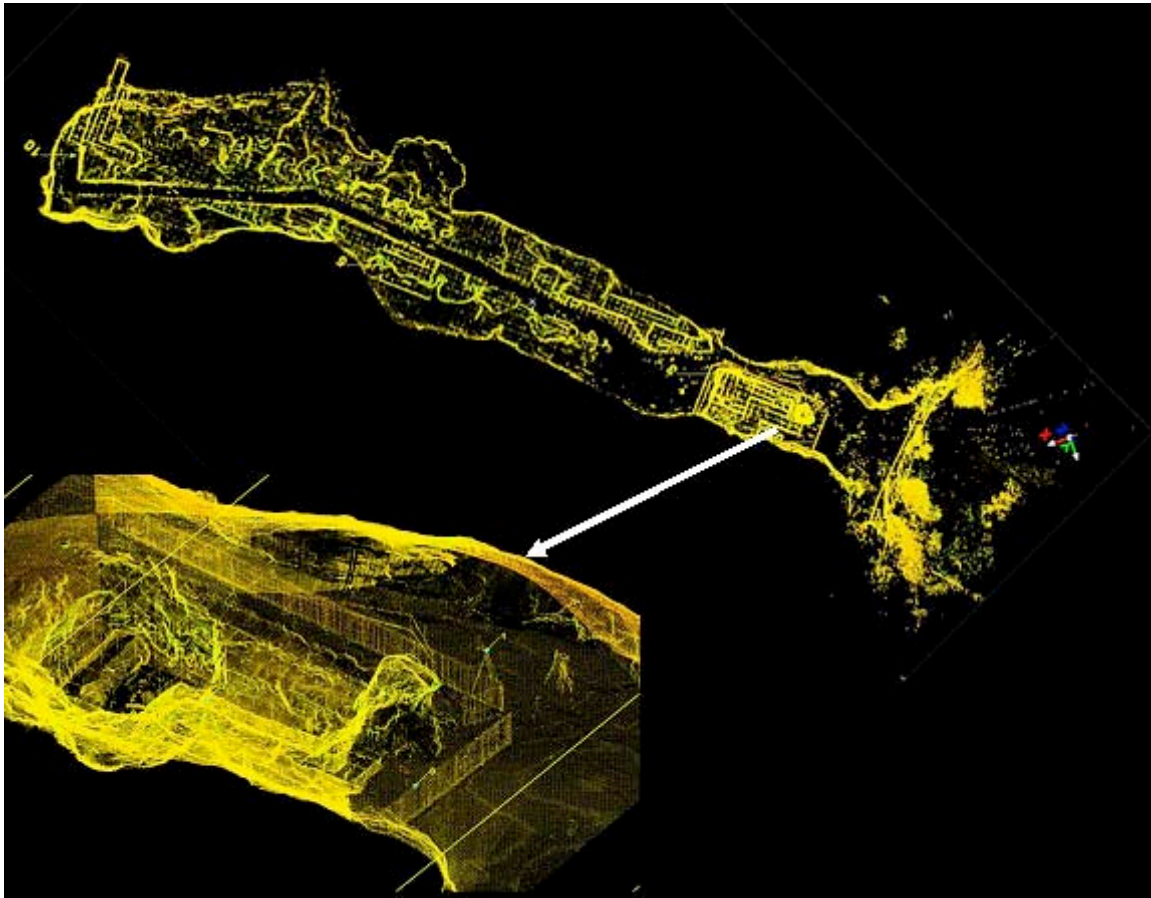
Wonderwerk Cave: Basic Information

Location: Northern Cape Province, South Africa between Danielskuil and Kuruman

How did the Cave Form: The cave formed by water action in the Dolemite rocks of the Asbestos Hills. This rock formation is over 2 billion years old, some of the oldest rock on earth, so we do not know when exactly the cave formed.

Basic properties of the cave; The cave runs 130 meters from front to back.

How was Wonderwerk discovered: Local farmers dug up large parts of the cave in the 1940's to sell the sediments for fertilizer. Subsequently a series of brief archaeological excavations began. Peter Beaumont of the McGregor Museum carried out major excavations at the site between 1978-1993.



Map of Wonderwerk Cave generated by 3-D scanning carried out by Heinz Ruther of the Department of Geomatics, University of Cape Town. The inset shows a view of the front excavation area where the dating project took place.

The Discovery

Using a combination of dating methods it has been possible to date the bottom level reached by Peter Beaumont in the front part of the cave to 2 million years ago.

A small number of very small stone tools have been recovered from excavations in this level.

Geological evidence indicates that these tools were deposited in the cave by human ancestors, not washed into the site from the outside.

The combination of stone tools indicating the presence of human ancestors and the dating of the level leads to the conclusion that human ancestors (hominids) were in the cave 2 million years ago.

This is the earliest evidence for intentional cave occupation by human ancestors.

There were a number of species of hominids in southern Africa 2 million years ago. The most likely candidate as the manufacturer of the stone tools found at Wonderwerk is *Homo habilis*.

The oldest known stone tools from sites in Ethiopia date to 2.4 million years. The Wonderwerk Cave discoveries are those close in age to the very earliest known stone tools and similar in date to the bottom levels at Olduvai Gorge.



One of the early stone tools from Wonderwerk Cave (Photo M. Chazan)

How Was the Site Dated

The deposits at Wonderwerk Cave built up over time so that the deeper one excavates the layers become older. The trick is to figure out exactly how old the levels are.

We used two methods that together provide a secure date.

For **Paleomagnetic Dating** Hagai Ron of the Hebrew University took small samples of soil from the entire sequence (over fifty samples). These samples allow him to measure changes in the earth's magnetic field and to correlate the Wonderwerk sequence with a global timescale for changes in the magnetic field (known as reversals).

For **Cosmogenic Burial Age** Ari Matmon, also from the Hebrew University, took soil samples and carefully prepared them in the lab. He then sent these samples to an atomic accelerator in the United States where a procedure to measure isotopes, much like the method used in carbon dating, was carried out. Unlike carbon dating, Cosmogenic Burial Age dating can provide very old dates.

Why was this so difficult? Most well dated early sites are in East Africa where there are volcanic ash layers that can be dated using the Argon method. In southern Africa we lack these ash layers so that we need to develop new methods. The first use of Cosmogenic Burial Age dating in South Africa was at the Cradle of Humankind. Our results show the value of this method, particularly when combined with Paleomagnetic dating, for archaeological research both in the region and globally.



Hagai Ron taking samples from the section at Wonderwerk Cave. (Photo M. Chazan)