



Hawking's Bold Prediction

The Motley Fool

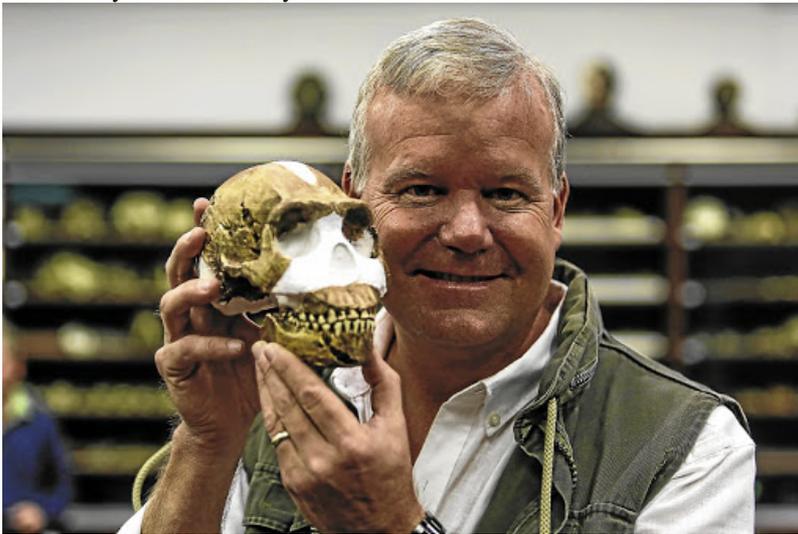
Stephen Hawking Predicts
"Biggest Event in the
History of Civilization"



News

Homo naledi: making sense of 300,000-year-old bones of contention

04 February 2018 - 00:00 By TANYA FARBER



Professor Lee Berger of Wits University's Evolutionary Studies Institute with a skull of 'Homo naledi'.
Image: Moeletsi Mabe

"Scientific shock": That is what Debra Bolter experienced when she first walked into The Vault at the University of the Witwatersrand and came face to face with the 1,500 fossils of *Homo naledi*.

From that moment on, the 190 pockmarked teeth of this strange species became the centre of her world, and the research she has done with her team has brought us closer to understanding the individuals discovered up to 300,000 years after they came to rest in a cave system at the Cradle of Humankind.

The team, led by Bolter, an anthropologist at Modesto Junior College in California, looked at what the teeth revealed about each individual's life span and found remains from every age class: infant, early juvenile, late juvenile, sub-adult, young adult and old adult.

Professor Lee Berger, of the Evolutionary Studies Institute at Wits, revealed *Homo naledi* in 2015, and Bolter was among the scientists he invited to study the fossils.

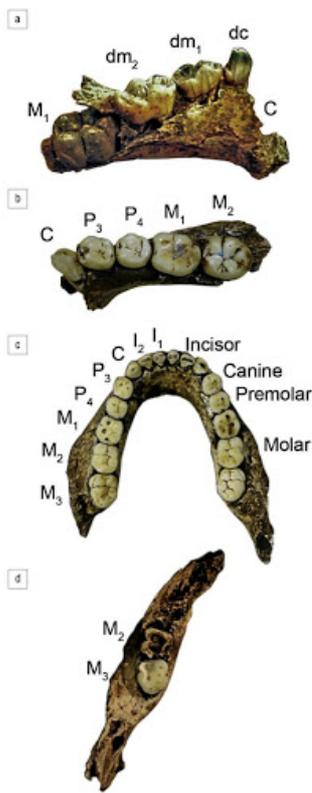
Inside The Vault, tables - each with a theme - had been set up. "I remember first entering and being in scientific shock over how many hundreds of specimens there were. It was a fossil treasure trove," said Bolter, who sat at a table labelled "demography, growth and development".

"We started with descriptions of the teeth. How many lower right first molars? How worn are the molars? How many baby teeth?"

Occasionally, they used a magnifying lens or microscope to see "really fine marks", but mostly, she said, "we relied on our eyes, our notes, our experience, and physically fitting teeth together".

Because teeth last so much longer than bones, they are a researcher's greatest friend. "In fossil research, teeth are so important. They survive more often than bones because they resist soil and chemical degradation, weathering, and crushing," said Bolter.

Because of this, they are the key to a life once lived. "How much were they like us? What secrets can these teeth and bones reveal about how they grew, about their adaptations, about how long they lived? Can the fossils themselves help us understand what they are doing down there in that cave?"



Some of the fossils Debra Bolter and her team examined.
Image: South African Journal of Science

In her work with simian skeletons, Bolter developed ways to categorise individuals into age groups using their teeth and bones. "We used those methods here," she said.

Bolter and fellow researchers confirmed earlier research which suggested 15 individuals had been identified. Then they sorted them into categories. "We separated infants from young adults, identified mid-aged juveniles, and identified an old adult with very worn teeth," she said.

Another key question is how they compare to modern humans, and knowledge of their life span becomes crucial to the answer. "How long does it take them to grow up? How long did they live? It's the pattern of their lives that we can get from teeth. We can see if it was slower, like us, or faster, like other apes," said Bolter.

Her team is not the first to use *Homo naledi*'s teeth to try to unravel the mysteries of this peculiar creature with its odd collection of biological features - a brain that was tiny but organised much like our own, and hands and feet that simultaneously suggest modern functions - such as walking upright and using tools - but also primitive ones like climbing a tree.

Late last year, biological anthropologist Ian Towle of Liverpool John Moores University revealed that *Homo naledi* probably had a unique diet. So chipped were the teeth, he said, that biting and chewing on hard or gritty objects - such as raw tubers dug out of the ground - seemed to have been part of the species' lifestyle. There were more dental fractures "than in all other closely related species studied", he said.

The next phase of Bolter's research is to correlate the bones with the teeth. "I'm working on how they match up," she said. "We can tell whether a bone is immature or adult if there is a growth plate still visible, from the overall size and shape of the bone."

Further excavations are under way and it is anticipated that more material will be recovered. Like everything that has already emerged, it will answer some questions but pose even more.

It's the addiction to this cycle that keeps Bolter and her ilk coming back for more. "That's the exciting thing about finding fossils: it's like a mystery to try to solve. We look for clues. We look for patterns."

ACADEMICS ARE DIGGING IN

Since *Homo naledi* was discovered in 2015, controversy has surrounded the fossilised remains found deep within the Rising Star cave system in the Cradle of Humankind. The age of the fossils and whether the species lived alongside humans were hotly debated. Claims that *Homo naledi* deliberately buried their dead were also a point of dispute.

A consistently critical voice has been that of Professor Francis Thackeray of Wits, who said far more research was needed before any such theory could be solidly proven.

"With a sense of humility, we do not have all the answers to a growing number of questions about the spectrum of human diversity through time," he said, after it was claimed that modern humankind lived at the same time as

Homo naledi.

This week, he said of new research on the species' dental remains: "I would like to congratulate Debra Bolter and co-authors on this very interesting and important study regarding *Homo naledi*."

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