

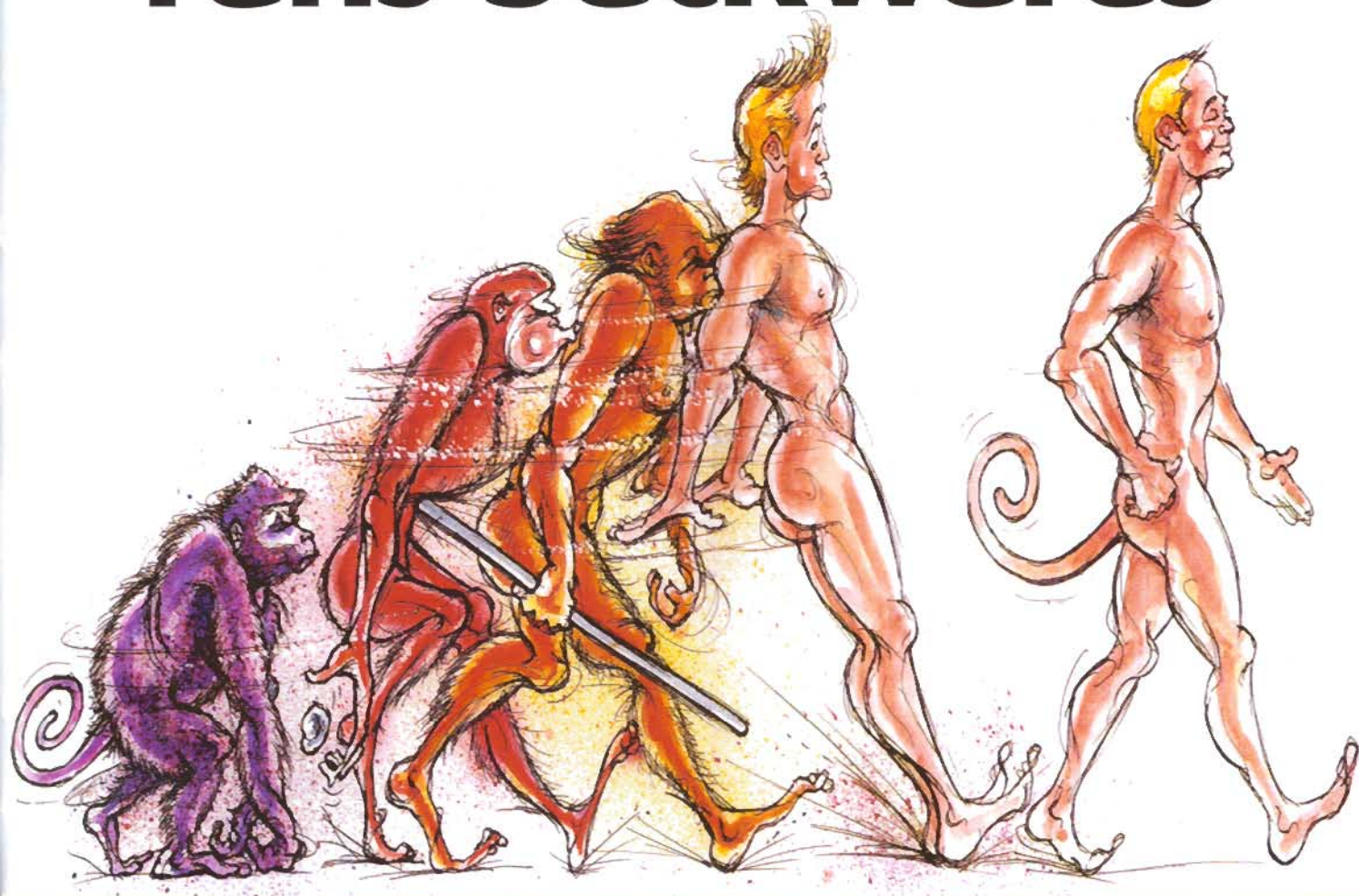
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Tel +44 (0) 20 7611 1200
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USA
600 Technology Square, Cambridge,
MA 02139
Tel +1 617 386 2190 Fax +1 617 397 2805

201 Mission Street, 26th Floor,
San Francisco, CA 94105
Tel +1 415 908 2348 Fax +1 415 704 3125

Australia
Tower 2, 425 Victoria Avenue, Chatswood,
NSW 1502
Tel +61 2 9422 2999 Fax +61 2 9422 2877

Publishing Director Dominic Feltham
Publishing Assistant Henry Gomme

Marketing
UK Tracey Syrett, Louise Tivendale, Yin Mac,
Georgina Rushworth, Louise Mulholland,
Paula Van Den Brande, Sophie Ashworth
Tel +44 (0) 20 7611 1299
Fax +44 (0) 20 7611 1290

US Alissa Menovich, Dianne Schmitt
Tel +1 617 386 2192/2194/2195
marketing@newscientist.com

Display Advertising
Manager Jamie Labate
Team Jennifer Holmes, Edith Pick,
Amey Williams

Online Sales Lara Schonberger,
Michael McLoughlin
Tel +44 (0) 20 7611 1291

Recruitment Advertising

Sales Director Paul Cook
Tel +44 (0) 20 8652 4444
UK Toby Phelps, Anna Eccleston,
Mark Watson, Simon Wingate,
Stephen Reid, Gagan Mohoney
Europe Raffaella Ferrarides
Tel +44 (0) 20 8652 4749
US Director of Sales David Wilson
Tel +1 617 386 2190 Fax +1 617 397 2805

Australia Kristy Bain
Tel +61 2 9422 2891 Fax +61 2 9422 2895

Advertisement production

UK Simon Hall
Tel +44 (0) 20 8652 6233
US Tom Rooney

Enquiries
Tel +44 (0) 20 7611 1201
Fax +44 (0) 20 7611 1280
enquiries@newscientist.com

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Pharaohs from the

Remarkable discoveries on the fringes of the Sahara are forcing a rethink of the origins of ancient Egyptian civilisation. **Emma Young** reports

IT WAS February 1999, and Carlo Bergmann had spent five days wandering through the desert with just his camels for company. His eyes were sore from the dust and from scanning the ground in front of him. Then he spotted them – two shards of pottery lying in the sand. They didn't look like much, but Bergmann knew at once what they meant. This one-time Ford motor company management trainee with no formal archaeological training had discovered an ancient trail that had eluded professional Egyptologists for almost a century. Here was a key piece in the puzzle surrounding the origins of the great civilisation of the pharaohs.

Eight years on, and amazing discoveries by Bergmann and a small band of researchers in the desert west of the river Nile are forcing Egyptologists to reconsider the origins of this ancient civilisation. In the 5th century BC, the historian Herodotus described pharaonic civilisation as a gift of the Nile. It now seems clear that the culture, technology, religion, economy and possibly even the hieroglyphic text of the pharaohs had roots not in the valley but in the desert far to the west.

The story of these discoveries has all the romance of an Indiana Jones script, complete with ancient maps, bitter rivalries and struggles for survival in the unforgiving desert. Bergmann, the amateur, was once the best of friends with a trio of prominent German academics who have been studying the region for decades. No longer. "If you look at the history of African exploration, sometimes those men would fight almost to the death," says one of the Germans, Stefan Kröpelin, a geologist with the Arid Climate, Adaptation and Cultural Innovation in Africa (ACACIA) unit at the University of Cologne. "It looks as if this tradition continues with Carlo."

Much of the background is uncontroversial. The first pharaonic dynasty was founded some time around 3100 BC by a ruler whose precise identity is unknown. With a capital at Memphis, near modern-day Cairo, the kingdom stretched southwards along the Nile valley all the way to Aswan. Egyptologists searching for clues to the origins of this

Carlo Bergmann followed what he believes is the world's oldest map to find 10 "wells" in the desert



stone age



RESEARCHER PICTURES

civilisation have traditionally focused on the valley itself and on the desert to the east, between the Nile and the Red Sea, since hieroglyphic texts record many contacts with the Middle East via this route. Until the 1990s the only archaeological evidence of links to the now barren and hyper-arid region to the west was a mysterious pottery dump.

Discovered by Egyptologists in 1918, the site is known as Abu Ballas, or "father of the pots". Here, beside a hill about 200 kilometres south-west of the Dakhla oasis (see Map), early explorers found hundreds of complete and broken pots and amphorae, the oldest dating to the 6th dynasty, between around 2300 and 2100 BC. Since then, speculation about the site's significance has been rife. In 1939, the Hungarian explorer Lazlo Almsy, now famous as the central character in the book and 1996 film *The English Patient*, suggested that Abu Ballas might have formed a station on an ancient trans-Saharan trail leading west to Khufrah oasis in what is now Libya. Almsy searched for the trail, as did others after him, including Kröpelin's colleague, archaeologist Rudolph Kuper, all without success.

Enter Bergmann. In 1982 he had left Ford and had taken his PhD in marketing to the

American University in Cairo, where he was investigating a model for promoting marketing strategies in Egypt and elsewhere in the region. Then a trip to the camel market at Ed Debba in Sudan changed his life. "I got acquainted with the Sudanese camel drivers and I was inspired by them," Bergmann says. "I saw a harsh but self-determined life." He gave up his work, traded his briefcase for a camel, and became a camel driver.

Trans-Saharan highway

As Bergmann travelled the desert, he started to take an interest in archaeological remains, and in 1999 this led him to set out in search of the Abu Ballas trail. His starting point was Mery's rock, an outcrop carved with Middle Kingdom inscriptions that lies 35 kilometres from Dakhla oasis in the direction of Abu Ballas. Unlike Almsy and more recent desert explorers who travelled by car, Bergmann moved around on foot with his camels. "I thought this might give me a different perspective," he says. "I walked around the region, and about 1.86 kilometres west-south-west of Mery's rock I found the first 6th-dynasty pot shards. They were just

lying on the ground. This is like an open-air museum." That November, Bergmann took Kuper, Kröpelin and Egyptologist Klaus Kuhlmann of the German Archaeological Institute in Cairo to see his finds. Two weeks later, the team started excavating there, and unearthed what turned out to be the first of many stations along the Abu Ballas trail.

Meanwhile, Bergmann was patiently mapping the trail. For the rest of the year and into 2000, he followed small piles of rock laid out to mark the route; they would have been invisible to anyone speeding through in a car. The trail ran 350 kilometres south-west of Dakhla to the Gilf Kebir plateau – and then vanished. No one knows where it ultimately led. It might have reached Khufrah, as Almsy speculated, or Gebel Uweinat, another site with permanent water 200 kilometres to the south-west. From there, it would have been possible to penetrate deeper into the continent, perhaps even as far as modern-day Chad, Kuper says.

The German team has now excavated 27 stations along the route, some of which may have served as camps for travellers on the Abu Ballas trail. "We even have almost 5000-year-old donkey footprints still visible – it's incredible," says Kröpelin. All agree that the trail is hugely significant. "It's the first trans-Saharan road – and it shows there were pharaonic expeditions deep into the desert," Kröpelin says. Kuper thinks it might have been used for trade – perhaps to transport ivory, ebony or gold from Africa's interior. The oldest pottery found along the route is from around 2300 BC, but Bergmann believes the trail itself could be much older, dating back perhaps to the Neolithic a few thousand years earlier. Kröpelin agrees, arguing that the first pharaonic ventures along that route could not have been accomplished without knowledge from earlier times.

So what does this mean for the origins of Egyptian civilisation? The trail itself gives only indirect hints of pre-dynastic contact with the region and people far to the west of the Nile valley, but elsewhere firmer evidence is emerging that pharaonic civilisation was underpinned by innovations in the western desert. First there is the important prehistoric settlement of Djara in the centre of the Egyptian limestone plateau, between the western oases and the Nile valley. ACACIA researchers have been excavating there since 1993, and have found a variety of bifacially retouched stone tools, including arrowheads and knives, dated to around 5500 BC. About 500 years later this same technology appears in the Nile valley, suggesting there had been contact between the two regions before the pharaohs' time. "It is clear that influence went from the desert into the valley," Kuper says.

THEY CAME FROM THE WEST

Discoveries made in the Sahara desert west of the Nile show the ancient Egyptians had strong links to the region, suggesting their civilisation may have originated there





Another western desert veteran, Fred Wendorf of the Southern Methodist University in Dallas, Texas, has uncovered hints of the origins of ancient Egyptian religious ideas in the desert. At a key Neolithic site called Nabta Playa, about 100 kilometres west of Abu Simbel, Wendorf and his colleagues have found remains of cattle that seem to have been ceremonially buried, which they have dated to about 7400 years ago. In the early dynastic period in the Nile valley, people also brought hundreds of bull heads to graves. "It seems obvious that this idea of worshipping cattle came from the desert," says Kuper. He points out that later, within the pantheon of gods of ancient Egypt, there is the cow-headed goddess called Hathor. "For the nomad, the cow was the centre of their lives. This ideology may be rooted among the desert pastoralists," he says.

Roots of a civilisation

Wendorf has also found large late-Neolithic sandstone slabs, aligned from north to south, and what appears to be a "calendar circle" of smaller slabs. The use of astronomical knowledge and devices to predict solar events, and an emphasis on cattle in religious beliefs, seems to have a long history at Nabta Playa, he observes. In the Nile valley, by contrast, both appear suddenly at around 3500 BC, in the late pre-dynastic era and early Old Kingdom. For Wendorf, it is clear where they came from.

It wasn't just ideas that spread to the Nile valley from the desert. The ancestors of the valley-dwellers who were united under the first pharaohs also seem to have come from the western desert. In August 2006, Kröpelin and Kuper published a detailed analysis of climate and archaeological data going back 12,000 years, from hundreds of sites across the Sahara (*Science*, vol 313, p 803). About 10,500 years ago, the western desert became more humid – and habitable. The earliest pottery in Africa appears here at around that time, as does the first evidence for the domestication of cattle (though this early date for cattle is disputed). By around 7500 years ago, the rainfall pattern had shifted, and the desert was starting to dry out, forcing people to flee to the oases or the Nile valley. This exodus from the western desert coincides with the rise of settlement along the Nile, they observe in their paper. "We are convinced this was not coincidental," Kröpelin says.

Kröpelin and Kuper suggest that before around 3500 BC the Nile valley may have been too marshy to offer a good permanent residence, but as the climate began to dry it would have become increasingly fertile and attractive. Nick Brooks, assistant director of the Saharan studies programme at the University of East Anglia in the UK, points out in addition that an influx of people into the region would have created a need for greater social organisation and provided a pool of workers for the monumental construction

Until recently the Dakhla oasis was thought to be the most westerly outpost of ancient Egypt

projects and armies initiated by the pharaohs.

Despite prompting a radical rethink about the origins of the pharaonic civilisation, these discoveries have proved remarkably uncontroversial among Egyptologists. The same cannot be said of another of Bergmann's findings. By 2000, he and the three German academics had become close friends and collaborators. Although Bergmann preferred to explore alone, they shared a passion for the desert and would avidly swap ideas. The toughness of the environment helped cement a bond. Temperatures can soar to 60 °C in the heat of the day and then plunge below freezing at night, with a wind chill that makes it feel far colder. Water is scarce, and on at least two occasions Kröpelin and Kuper saved Bergmann's life, they say, by guiding him to their water caches when his supplies had run out. But that December Bergmann found something that would change everything.

He was walking with his camels about 60 kilometres north of the Abu Ballas trail and 60 kilometres south-west of the Dakhla oasis when he came across an unusual flat-topped mountain. At its base was a natural terrace 3 to 4 metres wide and about 40 metres long, artificially enlarged to form a camp ground ▶

"Bergmann thinks this is a form of prehistoric hieroglyphic writing"

for an expedition. On the rock face close to the terrace were some extraordinary inscriptions, including prehistoric rock art and pharaonic hieroglyphs. "There were abundant texts and cartouches," Bergmann says. "It was clear to me that I had made a big discovery."

Bergmann recalls Kuhlmann's excitement when he took him to see the site in February 2001: "When we arrived, he was startled. He congratulated me." As Kuhlmann translated the texts, their significance became apparent. The longest records an expedition ordered by the 4th-dynasty ruler Khufu – also known as Cheops, the builder of the Great Pyramid at Giza – in which 400 men were sent into the desert to collect something called "mefat". The ACACIA researchers later uncovered extensive evidence of a soldiers' camp at the site, including whole roasted locusts, radiocarbon-dated to 2610 BC. The nature of "mefat"

remains uncertain, though Egyptologists have speculated that was a mineral or vegetable pigment used to paint Khufu's pyramid.

The mysteries do not end there. Among the hieroglyphic inscriptions and earlier rock art are some peculiar ideograms. These show horizontal zigzag or crenellated lines framed by a slightly rounded rectangle, the upper corners of which end in two small humps or in short lines. The zigzag lines resemble the ancient Egyptian hieroglyphic symbol for water, and the humps are similar to the symbol for a mountain. In one, the zigzags have been replaced by a cartouche of Khufu's son Djedefre, leading Bergmann to name the site "Djedefre's water mountain". It seems the ancient Egyptians set up camp around this flat-topped mountain because it would have collected rainwater, which would then slowly leach out, forming springs on its flanks long after rain pools in the desert had dried out.

Bergmann suspects they were not the first to exploit this natural resource. He points to another set of strange inscriptions at the site, which he believes form a map – the oldest ever found – showing 10 wells and several irrigated fields, two connected to a water source. Using this to guide him, Bergmann had no difficulty finding 10 outposts of Djedefre's water mountain, between 6 and 9 kilometres to the south-west, each inscribed with the same zigzag-hump symbols – the wells. What's more, since the "map" is overlaid with a Neolithic-style image of an animal, it seems

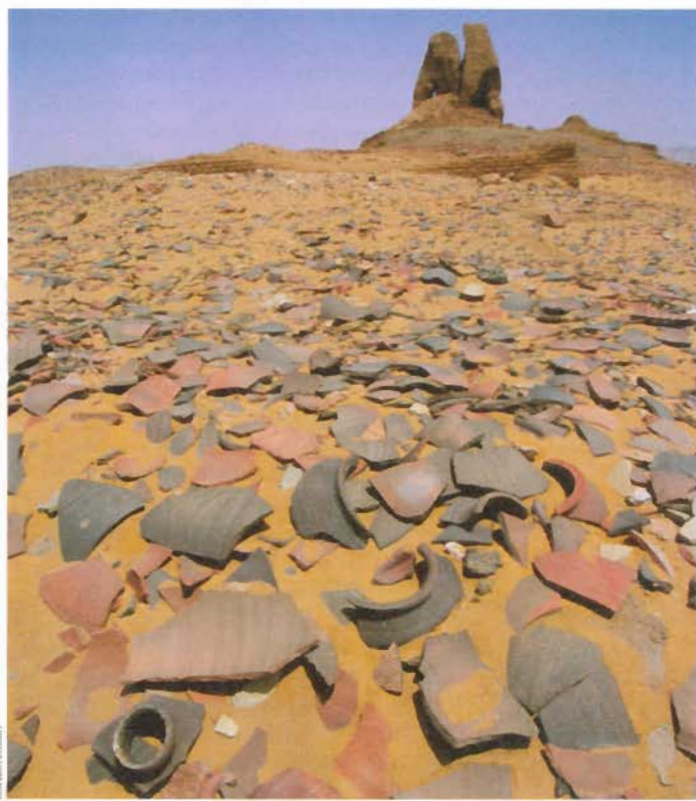
to be pre-pharaonic. Bergmann's radical conclusion is that the "water mountain" ideograms represent a form of prehistoric hieroglyphic writing, created by people living at least temporarily in the desert.

This is where Kuhlmann and Bergmann part company. Kuhlmann thinks Bergmann has misinterpreted the findings at the site, especially the hieroglyphs. He maintains that they were made by 4th-dynasty pharaonic expeditions. "There is no comparable representation from a pre-dynastic or even prehistoric context anywhere in Saharan rock art," he says. Bergmann is sticking to his guns. "Kuhlmann turned from friend to foe," he says. His relations with Kuper and Kröpelin have also soured, and he believes they are sidelining him academically.

Despite this rift, the German trio acknowledge that Bergmann's efforts have led to the two greatest pharaonic-era finds in the western desert to date, and Kröpelin supports many of his controversial interpretations. "Despite our bad relationship these days, I would go along with 80 per cent of what he is claiming," he says. "Maybe the roots of hieroglyphs are in the desert." In some respects, Kröpelin is now pushing the boundaries even further than Bergmann. Last March he discovered exactly the same "water mountain" symbols at a site with a flat-topped hill 700 kilometres further south, in the Sudanese desert west of Dongola, suggesting that there were pre-dynastic contacts between Egypt and Sudan. Kröpelin says it also raises the possibility that the water mountain symbol – and even early hieroglyphic writing itself – could have originated in Sudan. He believes his find "should cause a sensation in archaeology" when it is published, but along with Kuper cautions that "more evidence is needed to narrow down speculation".

That means more research. In November 2006, Kröpelin headed to north-east Chad, which remains one of least investigated parts of the Sahara. Kuper and his team have been working at an Egyptian site close to the Libyan border. They are also carrying out more excavations at Djedefre's water mountain.

Bergmann too has returned to the region around the Djedefre site, taking paying tourists to fund his trip. He is also investigating what he thinks are new trails from Dakhla oasis and other pottery sites that he is keeping secret for now, and insists that further great trans-Saharan trails remain to be discovered. "Egyptologists say now that no ancient Egyptian set foot west of Djedefre's water mountain. But they said that about Dakhla, before my discoveries," he says. "It is good for them to have a bit of competition – and to see that what the Egyptologists say might not be the last word." ●



Fragments of pots and amphorae as much as 4300 years old litter parts of the western desert