

First Arabians

REVEALING THE STONE AGE PREHISTORY OF SAUDI ARABIA

PHOTO: Eleanor Scerri

Today you would not survive the hostile deserts of Arabia without desalination plants and four-wheel drives – or, at the very least, deep wells and camels. Yet, as **Huw Groucutt** reveals, a wealth of rock art and quantities of ancient stone tools prove that people managed to survive here in the long-distant past.

ABOVE Spectacular, remote, and desolate sand dunes make up the familiar landscape of the arid Nefud Desert in northern Saudi Arabia.

It has long been argued that the Arabian Peninsula, at the crossroads of Africa and Eurasia, saw some of the earliest human migrations surging across it. Yet until just five years ago not a single Palaeolithic site had been excavated or dated in the whole of this key area. And though recent excavations in the United Arab Emirates and Yemen have since confirmed early human occupations, most of the Peninsula – particularly its core area Saudi Arabia – remains almost unknown.

New research in Arabia by the Palaeodeserts Project has led us to some truly remarkable locations. The spectacular, remote, and desolate dune fields are the most familiar face of Arabia, but this is a diverse land: from the grassland and forests of the highlands of southern Arabia to the bizarre geological formations of western Arabia, where tyre-shredding routes through the volcanic landscape lead to the rock art of Shuwaymis, given UNESCO World Heritage status in 2015.

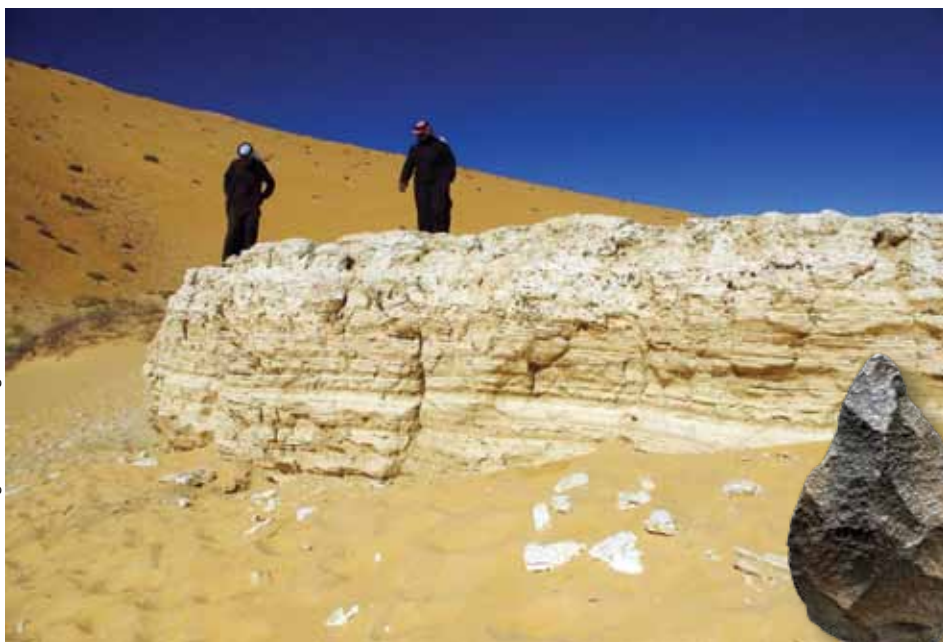
In the Dawadmi area of central Saudi Arabia a flat landscape is punctuated by long straight ‘dykes’ of igneous rock that tower above the landscape like walls. These dykes are made of particularly hard stone, good for making stone tools. The flanks of these features are often littered with thousands of handaxes. This close correlation between the landscape and its archaeological record was also noted



beside the remains of ancient lakes and rivers, next to which we often located traces of human occupation.

Fieldwork in desert environments is challenging: more than once we had to frantically dig out a trapped vehicle from the soft sand as the evening sun rapidly set; some frosty mornings we shivered into activity, other times we panted and sweated in searing heat as we swung pickaxes into rock-hard sediments; and in between we endured rain, lightning, and sandstorms. However, we have been lucky to work with our Saudi friends and colleagues, and have always been welcomed by the local people – even arriving out of the blue at some remote part of Saudi Arabia, we would be greeted with smiles followed by the inevitable tea, coffee, and dates. Though focused on the archaeology, it is hard not to view the fast-changing yet traditional society of Arabia as an anthropologist.

Our research concentrates on a remarkable locality called Jubbah, in the Nefud Desert of northern Saudi Arabia,



LEFT Fossils of ancient animals and stone tools made by early humans are found in ancient lake sediments, dating to 125,000 years ago, in the Nefud Desert.

BELOW An example of a handaxe, 19.4cm long, from Dawadmi, central Saudi Arabia.



Cool tools

In Africa, *Homo erectus* began to produce handaxes about 1.8m years ago, the Acheulean period. Their function has been debated, but they are generally seen as a kind of Palaeolithic Swiss Army Knife: a handheld tool for tasks such as butchery, and possibly also a source of small sharp flakes.

These handaxes, typically in Arabia either quartzite or igneous rock such as andesite, are often found at the source of the raw material and adjacent to ancient lakes. Archaeologists have not had much success in trying to understand themes such as population dispersal by comparing handaxe assemblages. In part this reflects the fact that they are relatively simple technologies, but also because we lack accurate dating of sites – in Britain, by contrast, river terraces preserve detailed archaeological sequences, and we can identify different interglacial periods that are associated with distinctive types of handaxes.

We are still at a much earlier stage of research in Arabia but progress is rapid. Matching the pattern observed in Jordan, most handaxe assemblages we examined

belong to the Late Acheulean, and are relatively small and finely worked. We may yet find material belonging to the earlier part of the Lower Palaeolithic, but the abundance of Late Acheulean material suggests that relatively dense occupations occurred in the later interglacials of the Middle Pleistocene. The ability of these early humans to penetrate the challenging environments of Arabia may indicate a behavioural complexity and adaptability usually attributed to later humans.

In the East Mediterranean Levant, the transition from the Lower to the Middle Palaeolithic occurs about 250,000 years ago, at which point we see an abrupt change in material culture often attributed to population replacement. Though this transition occurs at different times around the world – in India, for example, we find Lower Palaeolithic sites that date to about 130,000 years ago – our research in Saudi Arabia suggests that in the north, at least, the change happens at the same time as in the Levant. We see significant technological innovations, with a shift from handheld tools, typified by the handaxe, to hafted tools produced ▶

where we have found evidence for repeated human occupations extending back hundreds of thousands of years. This oasis, surrounded by sand that stretches away in every direction for kilometres, is a remote basin formed by large sandstone outcrops, or jebels. These outcrops divert the flow of sand, which allowed lakes and marshes to form at several points in the past.

We currently have no clear idea of when the earliest humans set foot in Arabia, but we do know that sites to the north and east of Arabia date to almost 2m years ago – even earlier in Africa – so there may be evidence of similar antiquity here. The general global climatic trend over the last two millennia has been towards colder and more variable conditions, creating increasingly less hospitable conditions. Understanding how this affected advances in human adaptability remains a key question.

Ancient lakes provide significant evidence for environmental change in Saudi Arabia. There are hundreds, if not thousands, of these lakes. By sampling and analysing samples taken from the sediments and associated materials, such as fossils, we can draw a detailed picture of the local climate and environmental changes.

It is clear that few other places on earth saw such dramatic changes, but we have yet to see whether early humans took advantage of broad windows of opportunity in the Early Pleistocene and the earlier part of the Middle Pleistocene. There are several claims for 'Oldowan' assemblages, but they lack precise dating, and in some examples it is difficult to distinguish human artefacts from natural 'geofacts'. So the existence of Arabian 'Oldowan' remains an open question, but it is certainly possible that there were early, if ephemeral, occupations here.

PALAEODESERTS PROJECT

The 'Comprehensive Survey of the Kingdom' in the 1970s led to the discovery of hundreds of archaeological sites in Saudi Arabia, the largest country in the Middle East, but almost all of these occurred as surface finds that could not be accurately dated. More recently, Professor Michael Petraglia of the University of Oxford began to develop research in Saudi Arabia in collaboration with the Saudi Commission for Tourism and National Heritage (SCTH) and Dr Abdullah Alsharekh of King Saud University in Riyadh. This collaboration grew to include colleagues from across the world, including the present author, and thus the Palaeodeserts Project (www.palaeodeserts.com) was created. This project focuses on the long-term relationships between human populations and climate change in Arabia.

RIGHT Prof. Michael Petraglia oversees the excavation of animal fossils in the western Nefud.

BELOW A quartzite handaxe, 15.2cm long, from KM-2 in the Nefud Desert, Saudi Arabia.



IMAGES: Eleanor Scerri; Huw Groucutt

by prepared core technologies such as the Levallois technique. And we see a substantial increase in imported raw materials.

However, in other ways change was less abrupt: at sites where we can compare like with like, it appears that Middle Palaeolithic occupations were as short-lived and ephemeral as those of earlier periods.

In the Middle Palaeolithic (c.250,000-40,000 years ago) there is considerably greater spatial and temporal variation in stone-tool technologies. In Europe, the turnover from Neanderthals to *Homo sapiens* is associated with the Middle to Upper Palaeolithic transition. It took a lot of fieldwork in the lower latitudes to discover that this was not a global pattern, and that most evidence for *Homo sapiens* is associated with Middle Palaeolithic technology.

Many archaeologists have an essentially culture-historical view of Middle Palaeolithic variation, arguing that different human groups made different kinds of stone tools because that was what they did in their culture. Others go to the opposite extreme, declaring that almost all of the variability is driven by factors such as differences in raw materials. The truth is probably somewhere in between. Culture does seem to be an important driver, but so too are pragmatic influences.

It is also increasingly clear that some of these simple technologies were independently invented in unrelated contexts. This makes drawing conclusions on population movements based on perceived patterns of similarities in widely separated sites problematic. Research by Oxford's Dr Eleanor Scerri and others is now applying quantitative approaches to better understand the different levels

of stone-tool variability, in contrast to the old, traditional, *ad hoc* qualitative approaches.

Dispersal patterns

The early phases of the Middle Palaeolithic remain poorly understood. We now have two sites in the Nefud Desert that date to at least 200,000 years ago, during the Middle Palaeolithic. One is Jebel Qattar 1 at Jubbah, where, despite a huge excavation, we found only a few flakes. However, our more recent fieldwork at KAM-4 in the western Nefud has uncovered a much larger assemblage, which we are currently analysing.

The era between about 130,000 to 75,000 years ago has produced a far larger body of finds in Arabia. This period includes the Last Interglacial, when conditions here were more conducive to human occupation than they are today: the deserts turned green, and lakes and rivers sprung into life. This is also the period when we see evidence for the earliest expansion of *Homo sapiens* out of Africa and into the Levant – though this is generally regarded as a failed dispersal, ending with the extinction of early pioneers of our species. We have excavated several sites dating to this period where the current lack of fossil evidence – the oldest human fossils in Arabia are only a few thousand years old – means we have to rely on stone tools to test this hypothesis.

It has been claimed that stone tools from sites in Arabia are similar to assemblages from Africa. If so, this would suggest early dispersals of our



PHOTO: Michael Petraglia

LEFT The author with a handaxe in the western Nefud.



LEFT The author beside a scatter of stone tools at Mundafan, southern Saudi Arabia, dating to around 85,000 years ago.

BELOW LEFT Two stone tools from Mundafan, Saudi Arabia, dating to around 85,000 years ago: a 'core' (**TOP**) from which flakes were struck using a hammerstone, with the shape of the flakes produced depending on the particular ways in which the core was shaped in advance; and an example (**BOTTOM**) of a Levallois flake. These flakes have razor-sharp edges and can be used for a variety of tasks, then subsequently resharpened to rejuvenate the edges.

were, however, produced by different methods to those in the Levant, and are thus unique.

The distribution maps of Neanderthals have rather arbitrary limits, reflecting research history as much as anything else, and show Neanderthals as having reached as far south as Jordan. We have made some interesting discoveries in the Nefud Desert at the site of Al Marrat-3 (we are in the process of publishing our results). Here, a small lithic assemblage was identified that dates to 55,000 years ago.

Lithic technology at this site was again focused on producing points. Though similar to contemporaneous assemblages from the Levant, some characteristics do not match. Such findings suggest that Neanderthals dispersed further south than hitherto thought, challenging the view that they are essentially a European species adapted to the far north.

For now, the youngest known Middle Palaeolithic assemblages in Arabia, dating to around 40,000 years ago, are found at Jebel Faya in the United Arab Emirates. There is then a complete hiatus in human occupation across the Peninsula until the transition to the Holocene, about 12,000 years ago. We recently excavated at Al Rabyah in Jubbah, where we uncovered the first clearly Epipalaeolithic ▶

species. However, most of these sites are from the far east of the Peninsula, thousands of kilometres from the suggested points of origin in Africa. The Palaeodeserts Project looks to settle such debates through fieldwork in the intervening areas. Until then, such claims are interesting but unproven hypotheses.

In Saudi Arabia, at both Mundafan in the south, and Jubbah and Nefud in the north, we have found several Middle Palaeolithic sites with broadly similar stone-tool technologies to contemporary assemblages in the Levant and in East Africa, where they are associated with early *Homo sapiens*. However, the similarities are broad – certainly not of the smoking-gun variety.

But, given the wider environmental setting, the climatic amelioration of the Saharo-Arabian arid belt, and the latest genetic analyses that indicate a gradual divergence of 'Africans' and 'non-Africans' beginning around 130,000 years ago, we think it probable that these sites in Arabia reflect the presence of *Homo sapiens*, and that there were multiple waves of dispersal into Arabia,

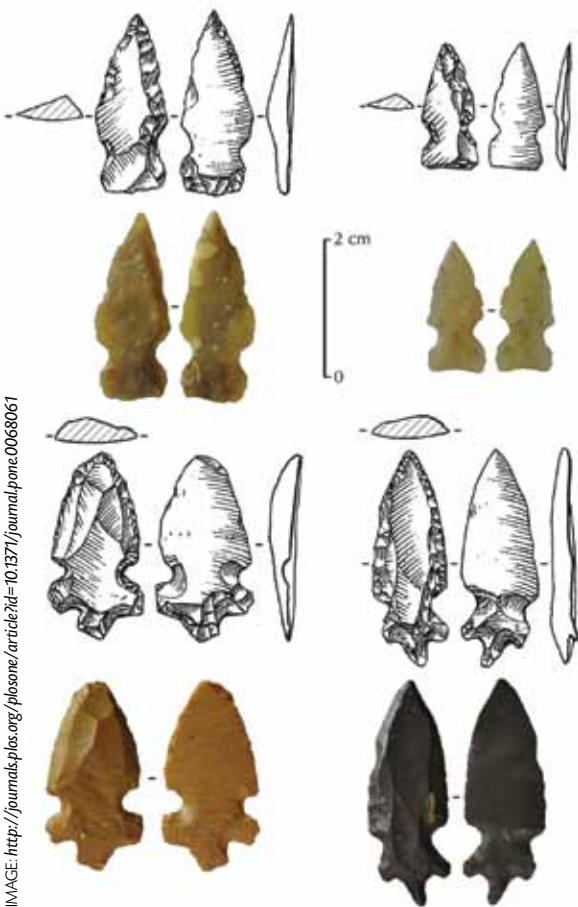
followed by a complicated pattern of localised extinctions, interactions, and localised adaptive processes.

Next wave

No archaeological sites are currently known for the period of around 70,000-60,000 years ago. At this point, there was a sharp climatic downturn, resulting in a marked reduction in rainfall. If populations did survive, they would be in the more humid areas to the south of Arabia, but there is also a good chance that they all simply perished.

The next wave of human occupation, still associated with a Middle Palaeolithic technology occurred about 60,000 to 55,000 years ago. This was first identified by an extremely rich site (Shi'bat Dihya 1) excavated by Dr Anne Delagnes and colleagues from the University of Bordeaux. Here, stone-tool production was geared towards making pointed flakes. These look broadly similar to tools produced at this time by Neanderthals in the Levant – where they had migrated when the global climatic downturn forced them to move south. The Yemeni tools

“THE EPIPALAEOLITHIC IN THE LEVANT IS A CASCADE OF CHANGES LEADING TO THE BEGINNING OF THE NEOLITHIC.”



LEFT Arrowheads from JQ-101, Jubbah.
ABOVE Rock art from Shuwaymis in Saudi Arabia, showing the hunting of an equid. Note how some parts have been re-engraved.

site discovered in Arabia, dating to about 10,000 years ago.

The Epipalaeolithic can be seen in the Levant as a cascade of changes that lead to the beginning of the Neolithic, with the emergence of sedentary lifestyles and controlled food production. Stone tools at Al Rabyah are similar to those found in the ‘Geometric Kebaran’ phase in the Levant, but our site is several thousand years younger. The assemblage is dominated by high-quality, non-local raw materials, indicating a highly mobile people producing extremely fine and small tools.

Neolithic revealed

A major debate in recent years has concerned the process by which the Neolithic way of life developed in Arabia: was it imported from the Levant, or of indigenous origin? Our findings suggest a bit of both. The evidence comes from both stone tools and the rock art found on sandstone cliffs in Arabia, which date to the earliest phases of this period, the Holocene wet phase (about 10,000–5,000 years ago).

At the 8,000-year-old lakeshore site called Jebel Qattar 101, at Jubbah, our key finds include El Khiam and Helwan points – probably arrowheads. Similar artefacts had previously been found, but no closer than hundreds of kilometres to the north in the Fertile Crescent, and they were manufactured differently. In the Fertile

Crescent such points were made from finely shaped blades, whereas at Jubbah they began as crude flakes produced from multi-platform cores, and then intensively retouched to attain the similar shape. Thus we were not looking at a case of simple population dispersal, but rather of some form of cultural diffusion.

This idea is supported by the results of Saudi rock-art analysis conducted by Oxford’s Dr Maria Guagnin. Her investigations developed a timescale for the engravings, indicating what was engraved earlier and later, as well as what was re-engraved (thus revealing what remained culturally relevant), and what was ignored and so allowed to fade.

At the remarkable site of Shuwaymis, Dr Guagnin shows that the ‘Neolithic’ rock art reflects at least two phases. The first is associated with hunter-gatherers. These images often show species such as equids, hunting dogs, and human figures with bows. The second phase is associated with pastoralism, and shows cattle but no hunting scenes. In certain examples the pastoralists re-engraved some of the hunter-gatherer images, but in a selective fashion. Humans, for example, were sometimes re-engraved, but the bow and arrows they were holding were not.

Along with findings from southern Arabia, these stone tool and rock art findings suggest a complex process of ‘Neolithisation’, involving both

continuity and change: Arabia was not simply an empty space into which people moved. We can probably say the same for many earlier periods of the past.

Remains to be written

Our fieldwork in Saudi Arabia is revealing an astoundingly rich body of findings. We now know the ‘chapter titles’ – the basic events and processes that occurred – for the last 500,000 years or so. But we still have much work to do to fill in the pages and paragraphs. And the period before half a million years ago is still entirely unknown. While diverse interpretations have been, and will be, made of findings from Arabia, one thing is certain: the area can no longer be ignored in accounts of human prehistory. For hundreds of thousands of years, human populations have repeatedly spread into Arabia. Finding out what happened to them once they arrived is as crucial as understanding where they came from. ■

BELOW Rock art from the site of Shuwaymis in Saudi Arabia, belonging to more recent periods (possibly Bronze or Iron Age), which often emphasise camels.



SOURCE Dr Huw Groucutt, School of Archaeology, University of Oxford.