



FOOTPRINTS OF THE KUISEB DELTA, NAMIBIA

Matthew R Bennett,¹ Cynthia M Liutkus,² Francis Thackeray,³ Sarita A Morse,⁴ Juliet McClymont³ and Dominic Stratford³

Tracking the evolution of our ancestors has so far simply been a quest for stones and bones, but for some studies these do not provide the whole answer.



Fig. 1: (A) General photograph of one of the Namibian footprint sites (Zeta) showing the setting with the encroaching dunes and the footprint surface below. (B) A series of human footprints forming a single trail of over 70 prints.

1. School of Applied Sciences, Bournemouth University, Poole, BH12 5BB, UK. Mbennett@bournemouth.ac.uk
2. Department of Geology, Appalachian State University, North Carolina, USA
3. Institute for Human Evolution, University of Witwatersrand, Johannesburg, South Africa. Francis.thackeray@wits.ac.za
4. Department of Musculoskeletal Biology, PREMOG, University of Liverpool, L69 3GE, UK

We know very little, for example, about the evolution of our ancestors' feet and the way in which they walked. Fossil foot bones are hard to locate given their size and propensity for being excluded from the fossil record, but even when they are found they provide little information about the dynamics of motion. Fossil footprints, however, not only provide anatomical information from the shapes and depths of the depressions, but also yield information about an individual's gait and locomotive style. Footprints also have a more immediate and emotive impact, as they provide direct evidence of the passage of one of our ancestors.

Perhaps the most famous hominin fossil footprint site is Laetoli in northern Tanzania, where prints dated to 3,75 million years ago were found in the late 1970s (Leakey and Hay 1979). Attributed to *Australopithecus afarensis*, they have been the subject of debate for over 30 years, with rival theories and interpretations being advanced in the absence of objective tools with which to evaluate varying hypotheses. Since the publication of these prints, other footprint sites have come to light, most notably in northern Kenya, where prints attributed to *Homo erectus* were reported in 2009. There are also a large number of much younger *Homo sapiens* footprint sites, mainly from the Pleistocene and Holocene.

Human footprints from Nahoon near East London in South Africa (Deacon 1966) have been dated at about 120 000 BP (Jacobs and Roberts 2009), and foot-

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prints of approximately the same age, and thought to be human, have also been found at Langebaan, north of Cape Town (Roberts and Berger 1997, Berger and Hilton-Barber 2000, Roberts 2008). Recently a site close to Lake Natron (Tanzania) has been dated to 120 000 BP as well, adding to the richness of early *Homo sapiens* sites in Africa (Brett et al. 2009).

Here we report on a much more recent complex of footprint sites from the Kuiseb Delta in Namibia, which not only have remarkable levels of preservation, but also a density of prints like no other reported site. They date from a range of time slices and show varying behaviour and faunal associations.

Kuiseb Delta, Namibia

To the south of Walvis Bay, scattered between giant dunes, are dried floodplains recording successive storm events of the Kuiseb River. Exposed on these surfaces by the movement of the dunes are an abundance of footprints, both human and animal (Fig. 1). The shifting nature of the dunes causes these surfaces to be revealed and buried in rapid succession. According to local sources, migration rates of up to 14 m per year are experienced (Du Preez pers. comm.), although published rates are more modest for the Namib Sand Sea (e.g. Bristow et al. 2005). One of these footprint sites was reported by John Kinahan (1996), but many other sites have been discovered by Fanie du Preez, a local tour guide and committed conservationist.

In this note we report preliminary observations from just two of these sites pending further investigations. In the absence of local names (and to protect the sites' locations) we refer to these sites simply as Gamma and Zeta.

Geology and geo-chronology

Geological investigation of several sites provides an initial suggestion that the surface resting beneath the active dunes is diachronous, formed at different times by flood episodes of the Kuiseb River as it broke through the dunes on its course to the sea. The underlying stratigraphy consists of packages of reworked dune sediment punctuated by silting surfaces associated with the desiccation of the floodplain following a flood event. A detailed dating programme is underway, but preliminary radiocarbon dates provide an age range for these surfaces from 500 BP to 1700 BP. Dating at Gamma, the largest footprint site investigated to date, has yielded ages at the younger end of this spectrum. The radiocarbon dates are based on organic material preserved within the printed surface. The older dates pertain to archaeological remains, including an extensive shell midden, located at a separate footprint site.

Gamma

This location consists of an extensive fluvial bar sur-

face extending over 300 m long by 80 m wide, with distinct micro-topography, including a runnel and drainage troughs. The surface contains an exceptional density of tracks, upwards of a couple of thousand individual faunal and human prints (Fig. 2 on p. 4). Faunal prints include hyena, goat/sheep, cattle, buffalo, elephant, giraffe and a variety of birds. These prints frequently form distinct individual trails. There is evidence of a number of well-defined game trails, as well as indications of movement in large herds.

There are many human footprints of a range of sizes, indicative of mixed-age population. The most notable human trail consists of over 70 prints with a remarkable level of preserved detail. Gamma's surface consists of fine-grained silty clay, which preserves rain-drop impressions, small micro-ripples, and a range of stem and vegetation casts.

Zeta

This site is located approximately 2,5 km from Gamma and is much smaller in size (Fig. 1A). It is closely surrounded by adjacent dunes that are actively encroaching upon it. The prints are representative of a single snap-shot in time during which a small group of children followed a herd of goats/sheep. The number of children is uncertain, since continuous trails are absent, but a range of print sizes is indicative of at least two to four individuals with a range of possible ages (Fig. 2). The smallest prints are under 100 mm in length. On the basis of modern growth charts these represent children as young as five years old (Grivas et al. 2008).

Within the geological record, prints of sub-adults are comparatively rare (Locksley et al. 2008), making the Zeta site very valuable. In addition, the prints predominantly represent the fore foot, ball, hallux and second toe, suggesting that the children may have been running or skipping. The surface is heavily desiccated, with individual cracks cutting across and displacing prints in some cases. Small beads made of ostrich shell have been found at the site, but may not originate here. The sedimentology is consistent with that at Gamma, with a package of re-worked dune sands overlain by a silting surface associated with waning floods. Site dating is currently unavailable.

Site investigation and preservation methods

Preservation of these sites is challenging for a number of reasons: (1) actively migrating dunes have been and continue to cover and uncover the sites; (2) active deflation of the surface crust occurs once it is broken by rain or human activity, such as unsupervised recreational use of vehicles in the dune field; and (3) natural abrasion from windblown sand. For these reasons, a preservation strategy must be focused on rescue archaeology supported by local conservation measures such as those practised by Fanie du Preez to control unsupervised recreational

vehicle use in the dunes. We have been practising the use of optical laser scanning as a method of recording soft-sediment footprint sites for a number of years (e.g. Bennett et al. 2009a & b; Bennett et al. 2010; Morse et al. 2010). Optical laser scanning provides a high resolution digital elevation model of a given print both as a basis for numerical description and analysis, and as a basis for preservation, since digital files can be distributed throughout the scientific community and used to produce accurate three-dimensional reproductions for museum display (Huddart et al. 2008).

This approach was used by us in our investigation of both the Gamma and Zeta sites. A VI900 Konica-Minolta optical laser scanner was deployed within a custom-designed rig, which provides stable horizontal mounting, control of ambient light, and protection from blowing dust and sand. The scanner produces images with a vertical accuracy of <0,09 mm with approximately 300 000 data points within a 0,5 m² area. Data was processed using the Konica-Minolta Polygon Editing Tool (PET), Rapidform 2006, as well as custom-written software developed by the authors. Scans were rectified to the orthogonal plane and minor holes filled as part of this process before the data was exported as point-cloud files for import into ArcGIS, where contour maps and linear measurements were made. An example of one of these images is provided in Fig. 2E, which illustrates the level of detail obtained from this approach, as well as the potential for detailed anatomical analysis and comparison with other footprint sites.

Ongoing investigation

Investigation of the footprint sites continues as part of a wider project, namely the African Footprint Programme led by Profs Cynthia Liutkus and Francis Thackeray. The aim of this project is to encourage cooperation between researchers working on African footprint sites of various ages and environmental settings to build a database of hominin footprint data of use to the whole scientific community. Optical laser scanning and/or stereophotogrammetry lies at the heart of this project and most recent footprint studies, since they allow objective and numerical-based intra and inter-site comparisons.

Specifically in the Kuiseb Delta the aim is the following:

1. To provide a more detailed depositional and geochronological model through further geological investigation of the area, including analysis of the palaeo-environments present.
2. To characterise the human population present using analysis of their prints.
3. To investigate the archaeological evidence of the Kuiseb Delta in order to produce a holistic archaeological interpretation of the region.
4. To provide a systematic preservation strategy for

this unique complex of footprint and archaeological sites, which are amongst the richest within the known footprint record to date.

5. To use the sites to explore the limits of footprint evidence and the influence of such variables as substrates and taphonomy.
6. To investigate the potential of footprints to build a picture of the faunal communities present in past times.

Conclusion

We are excited about the potential of these sites given the density of prints, the abundance of contextual archaeology and the diversity of faunal species present. The pioneering contribution of individuals like John Kinahan and Fanie du Preez has ensured that these sites have remained largely untouched to date.

Acknowledgments

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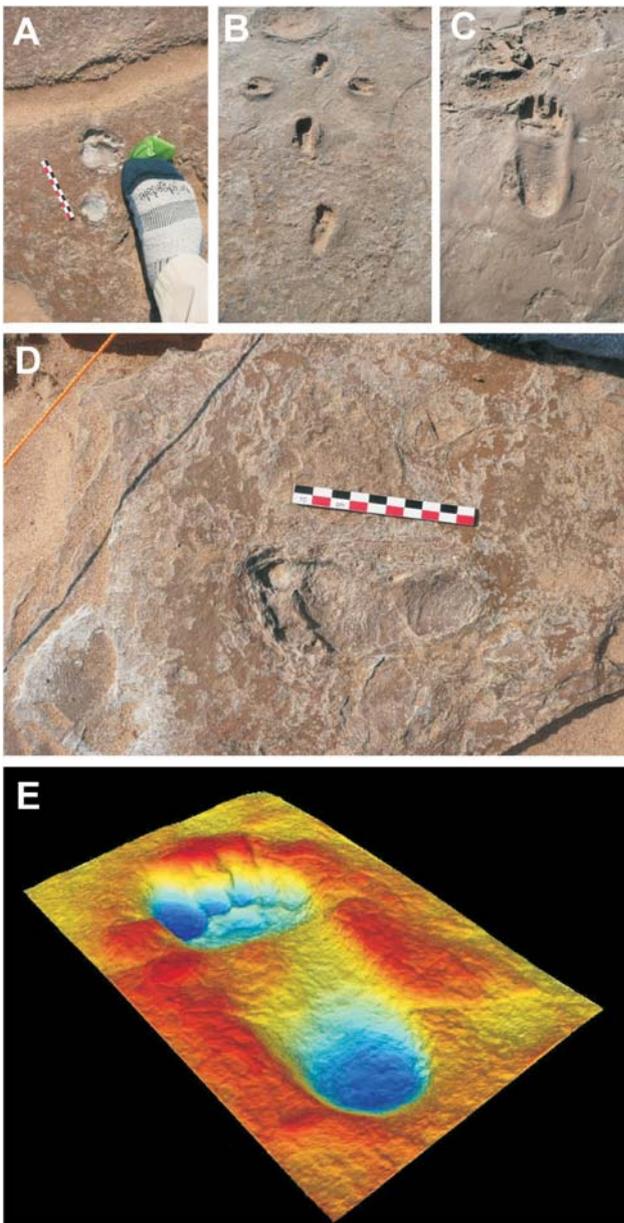


Fig. 2: (A) Right footprint of a small child at Zeta. (B) Series of human footprints at Gamma. Note the association with animal prints. (C) Close-up of a print at gamma. Note the excellent level of preservation, and the association with bird prints and rain drop impressions. (D) Left footprint of child at Zeta. (E) Isometric projection of a colour-rendered scan of one of the footprints at Gamma showing the level of detail that is preserved using optical laser scanning.

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WORLD ARCHAEOLOGY

Unearthed Aryan cities rewrite history

Bronze Age cities that could be the precursor of Western civilisation are being uncovered in excavations on the Russian steppe.

Twenty of the spiral-shaped settlements, believed to be the original homes of the Aryan people, have been identified, and there are about 50 other suspected sites. They lie buried in a southern Siberian region more than 640 km long near Russia's border with Kazakhstan. Thought to have been built 3 500 to 4 000 years ago, the cities are about the same size as several of the city states of ancient Greece, which started to come into being in Crete at about the same time.

The shape of each of the cities resembles an ammonite fossil, divided into segments with a spiral street plan. Housing about 2 000 people each, the same as an ancient Greek city such as Mycenae, they are all surrounded by a ditch and have a square in the middle. The first city, known as Arkaim, was discovered in 1989, soon after the Soviet authorities permitted non-military aerial photography. But the full extent of the remains is only now becoming apparent. Items that have so far been dug up include many pieces of pottery covered in swastikas, ancient symbols of the sun and eternal life.

Some of the strongest evidence that the cities could be the home of the Aryans comes from a series of horse burials. Several ancient Indian texts believed to have been written by Aryans recount similar rituals. The texts and hymns describe sacrifices of horses, the way the meat is cut off and the way the horse is buried with its master.

If archaeologists confirm the cities as Aryan, they could be the remnants of a civilisation that spread through Europe and much of Asia. Their language has been identified as the precursor of modern Indo-European tongues, including English. Words such as *brother*, *guest* and *oxen* have been traced back to this prototype.

The Sunday Times, 04/10/10

INTO THE LIGHT

An attempt to illuminate aspects of southern African and western European prehistoric art

J Francis Thackeray

In a recent issue of *The Digging Stick* (27(2), 2010: 5-6), in an article entitled 'Into the Dark: Upper Palaeolithic Caves in Western Europe', David Lewis-Williams contemplates art from several sites in Europe, including caves such as Rouffignac in the Dordogne, Chauvet (Ardeche) and Les Trois Frères (Ariege), where the famous 'sorcerer' is represented.



Rouffignac is impressive for its mammoths, one of which is illustrated by Lewis-Williams. This mammoth is notable in that it has several small stripes concentrated in two parts of the body. A bison represented on a stalactite at the back of Chauvet cave has a single stripe on its body. These stripes may represent symbolic wounds. Similar kinds of symbolism (fine incised stripes) appear to be represented on the rump of a zebra engraved on a small (broken) slab of stone excavated from Wonderwerk cave in South Africa, from a layer that was radio-carbon dated at about 4000 BP (Thackeray et al., *Science* 214, 1981: 64-67).

Perhaps the engraved stone was broken deliberately (it is approximately 2 cm thick, requiring considerable force to break it). In some cases, perhaps the act of 'wounding' an animal represented in a painting or engraving was associated with the belief that it would facilitate access to 'supernatural power' to control animals in a prospective hunt ('sympathetic hunting magic'). Perhaps the 'hundreds of hand-size stone plaquettes' with engraved images at Enlène in France, to which Lewis-Williams refers, were deliberately broken into pieces in rituals that were associated with 'sympathetic control', whereby the action of

A rock painting from the Melikane shelter, Lesotho, copied by Patricia Vinnicombe. One therianthrope (bottom right) has its head turned directly towards the viewer, similar in aspect to an image of a 'sorcerer' at Les Trois Frères in France (below). This copy of the Melikane painting is reproduced courtesy of the Natal Museum.



The famous 'sorcerer' in Les Trois Frères referred to by David Lewis-Williams in his article 'Into the dark' in the last issue of *The Digging Stick*

Director, Institute for Human Evolution, University of the Witwatersrand, Johannesburg. Francis.Thackeray@wits.ac.za

breaking an image was associated with a future act (including but not necessarily confined to a prospective hunt).

In the early 20th century in Namibia, Viktor Lebzelter provides a report of a !Kung 'Bushman' drawing an animal in sand, and then shooting arrows at the image: '*Dort, wo die Figur getroffen wurde, wird auch das Wild getroffen werden*' ('the place where the image of the animal is shot is the place on the body where the animal in the wild will actually be shot'). In the late 20th century, Louis Botha, an anthropologist based at Stellenbosch University, witnessed the same kind of ritual among San in the Kalahari (pers. comm.). In 1812, Heinrich Lichtenstein reported an instance in which a hunter took on the form of an animal and was symbolically wounded in a ritual, in the belief that this would contribute to success in a prospective hunt. Such ethnographic accounts provide support for the view that 'sympathetic hunting magic' prevailed to some extent in southern Africa.

The question that arises is whether 'symbolic wounds' in both southern African and Upper Palaeolithic European art might have been conceptually associated not only with a belief in 'sympathetic hunting magic', but also with shamanism. Perhaps shamans believed that they could access control over game by performing rituals in which an animal was represented in art, and then symbolically killed.

It is of great interest that the 'sorcerer' at Les Trois Frères appears to show a person with human legs, bending forward, and the head of an animal. This therianthrope has its face turned directly towards the viewer, which is potentially analogous to one of three therianthropes at Melikane in Lesotho, copied initially by Orpen and again by Patricia Vinnicombe. Woodhouse questioned whether they represented 'sorcerers' or hunters disguised with animal skins. Lewis-Williams used San ethnography to indicate an association with trance-related rituals. Perhaps the Melikane therianthropes represented 'medicine-men of the game' who took part in rituals and who also used animal skins in hunting contexts.

The actual use of skins in hunting contexts is known to stimulate 'curiosity behaviour' whereby an animal would stop, stand and stare at a disguised hunter, with ears 'pricked'. The ability to take advantage of curiosity behaviour was evidently perceived by San in terms of a shaman's 'supernatural potency', as noted by Francis Thackeray (South African Archaeological Society, Goodwin Series 4, 1983: 38-43), who witnessed curiosity behaviour among springbok when he disguised himself under a springbok skin. Not only did the springbok stop, stand and stare in the direction of the disguised 'hunter', some of the springbok even walked towards him, coming within range of a 'Bushman' arrow. The use of a skin disguise increased the probability of an animal coming within range of an

arrow. It is understandable that San hunters perceived this in terms of 'supernatural potency', taking advantage of curiosity behaviour.

The Melikane therianthropes (with human legs) are bending forward with two sticks to represent an animal's forelimbs. This is likely to be closely related to a 'buck-jumper' ritual photographed in about 1934 near the southern margin of the Kalahari, where a person was bending forward with two sticks, under the actual head and skin of a large antelope. The animal skin appears to have at least three stripes painted on it. In the case of the Melikane therianthropes and the 'buck-jumper' it is possible that both relate to rituals conceptually associated with the death of an animal and the symbolic death (or wounding) of a person identified with an animal during rituals. Indeed, one of the Melikane therianthropes appears to have at least three stripes that may represent symbolic wounds. These stripes may have been 'inflicted' some time after the artist had painted the scene, possibly in the belief that this would contribute to success in a forthcoming hunt.

As suggested by Lewis-Williams (*Man* 15, 1980: 467-482), the Melikane therianthropes are likely to be associated with 'medicine-men', shamanism and death in the context of concepts of control. However, there is no reason to exclude the possibility that the concepts of control developed in part from the use of skin costumes in hunting contexts and from the ability to take advantage of curiosity behaviour in animals. Nor is there reason to dismiss the principle of 'sympathetic control', whereby certain people (ritual functionaries or initiates) could have been associated with controlling powers over game in rituals in which they were identified with a wounded or dying animal, as documented by Lichtenstein. These issues are discussed in the article 'The wounded roan', published by Francis Thackeray (*Antiquity* 79, 2005: 5-18).

Lichtenstein's report is indisputable proof that a form of 'sympathetic hunting magic' did exist in South Africa at the time of historic contact with Europeans. It seems probable that the principle of sympathetic control prevailed in prehistory, as reflected, for example, by the engraved zebra with incisions on the rump from Wonderwerk cave.

Engraved stripes on small slabs of red ochre have been discovered at Blombos Cave, extending back about 100 000 years, as reported recently by Chris Henshilwood and his team. It is interesting to speculate as to whether these engraved lines were conceptually associated with wounds, and whether the ochre powder resulting from the incisions was symbolically associated with blood and concepts of control.

The presence of red ochre on hafted stone artefacts from Sibudu (recognised from residues analysed by Marlize Lombard) may also have had symbolic connotations.

A working hypothesis

I would like to propose a working hypothesis: that the ability to take advantage of curiosity behaviour in animals, especially through the use of skin disguises, has considerable time-depth, extending back to the time of the emergence of the human species; that skin costumes used as hunting disguises were also used in rituals associated with concepts of control over animals; and that concepts of 'controlling power' (associated with symbolic wounds, engraved lines, painted lines, geometrics and possibly the use of red ochre) persisted in the course of the dispersal of 'anatomically modern' humans out of Africa and into Europe in the Upper Palaeolithic.

Thus, for example, similarities between the 'sorcerer' at Les Trois Frères and the Melikane therianthrope, both with heads turned towards the viewer of the art, may be because of a common heritage in Africa in the late Pleistocene being conceptually associated with the belief that animals could be controlled (by taking advantage of curiosity behaviour). Likewise, the principle of 'sympathetic hunting magic', associated with engraved or painted lines and potentially related to symbolic wounds, may extend perhaps to the late Pleistocene, developing originally in Africa with the emergence of 'anatomically modern' *Homo sapiens*.

Acknowledgements

I thank Ben Smith, Azizo Da Fonseca, Gavin Whitelaw and the Natal Museum for assistance with access to Patricia Vinnicombe's copy of the Melikane therianthropes (NMSA PJV 01 166HC). This article is dedicated to Patricia Vinnicombe, whose encouragement was greatly appreciated when I was developing an interest in prehistoric rock art in the 1980s.



ARCHAEOLOGY IN AFRICA

Evolutionary leap at Pinnacle Point

Based on the latest research, people in South Africa initiated the beginnings of the use of fire in engineering, the origins of pyrotechnology and the bridge to ceramic and metal technology. The first evidence for the controlled use of fire appears about 79 000 years ago, when fire was used for simple tasks like cooking, heat production, light and protection from predators. Then, about 10 000 years ago, people began to use fire to make ceramics, while about 5 000 years ago fire was used to make metals. The bridging technology between the basic and advanced uses was a process called heat treatment, where heat from fire was used to improve the ability of stone to be flaked into tools.

Prior to a recent discovery at Pinnacle Point near Mossel Bay, heat treatment was widely regarded as first occurring in Europe about 25 000 years ago. The

latest findings push this date back by at least 45 000 years. There is no global consensus yet as to when modern human behaviour appears, but by 70 000 years ago there is good evidence for symbolic behaviour. Many researchers are looking for technological proxies for complex cognition, and heat treatment is one likely proxy.

Heat treatment technology begins with a 'eureka' moment: someone discovers that heating stone makes it easier to flake. This knowledge is then passed on and the technology is slowly ratcheted up in complexity as control of the heating process grows in sophistication. This creates a process that requires complex cognition and probably language or another way of communicating to teach and learn. The Mossel Bay discovery shows that early modern humans in South Africa had this complex cognition.

A global multidisciplinary team of scientists at Pinnacle Point has shown that early modern humans 72 000 years ago, and perhaps as early as 164 000 years ago, were using carefully controlled fires in a complex process to heat stone and change its properties. This heating transformed a stone called silcrete, which in its natural state is rather poor for tool-making, into an outstanding highly advanced material.

The team that made the discovery has been working at sites in the area since 1999. In *Nature* in 2007 the scientists documented the earliest evidence for the exploitation of marine foods and the modification of pigments. Prior to that, the oldest ochre was thought to be that found at Blombos near Stilbaai. Combined with the location of one of the oldest early modern human fossils dating back 120 000 years at Klasies River Mouth, the results sharply advance knowledge of modern human origins and show that something special in human cognition was happening during a crucial final phase in human origins.

Mail and Guardian, 28/08/09

New route out of Africa?

Researchers from the universities of Southampton, Bristol, Oxford, Hull and Tripoli have found a possible new route taken by early modern humans as they expanded out of Africa. A study published in the journal *PNAS* proposes a 'wet corridor' through Libya for ancient human migrations. During a period of increased rainfall in the Sahara, rivers once flowed from the central Saharan watershed all the way to the Mediterranean. This might have enabled modern humans to spread beyond their ancestral homeland about 120 000 years ago. The analysis of isotopes of different chemical elements in snail shells in the fossil river channels and from the shells of planktonic microfossils in the Mediterranean have also revealed a distinct volcanic signature to these shells for which the only possible source was water flowing from the volcanic mountains of the central Sahara.

BBC News, 14/10/08

NEW HONORARY LIFE MEMBERS OF THE SOCIETY

Bert Woodhouse and Neil Lee honoured

In May 2010, following nomination by the Trans-Vaal Branch, the Council of the South African Archaeological Society elected Bert Woodhouse and Neil Lee as Honorary Life Members of the Society. The honour was bestowed on them in recognition of their many years of dedication to rock art research and the Society. The Trans-Vaal Branch handed over the life memberships certificates at its lecture meeting of 16 September. Unfortunately, Bert could not attend as he was recovering from a fall.

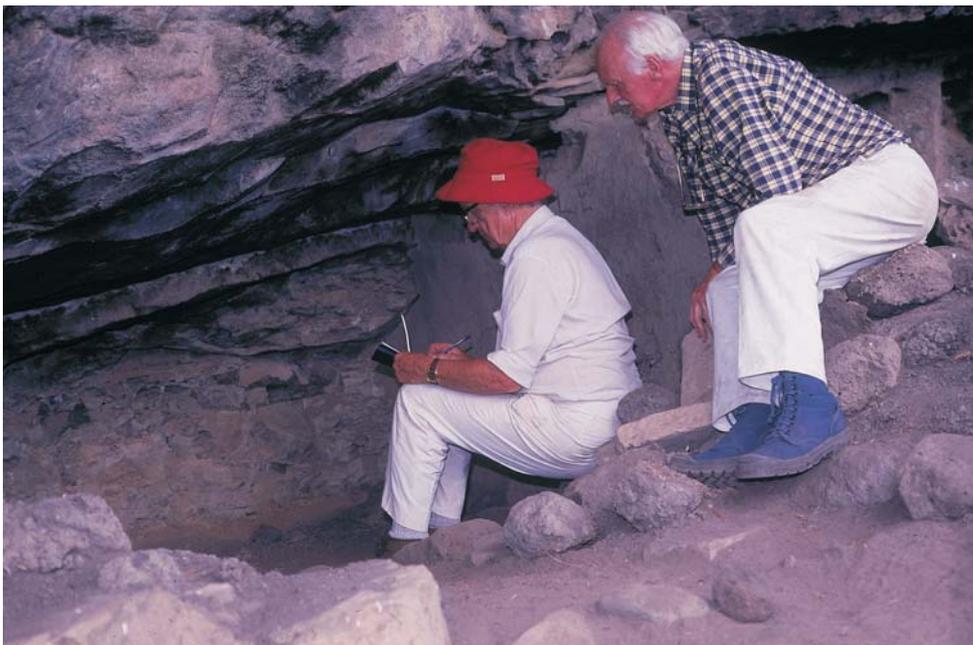
Both Bert and Neil are immigrants from the United Kingdom and arrived within a year of each other in 1947 and 1948 respectively. However, of the two, Bert knew a bit more about South Africa, as he had been stationed in the country by the Royal Air Force during the Second World War. Partly as a result of this, Bert was sent out to South Africa by Barclays Bank after the war. He subsequently moved to the Chartered Institute of Secretaries and then to the Management

Bert donated his rock art collection of photos, maps, papers and documents, which filled a whole room, to the Department of Anthropology and Archaeology at the University of Pretoria and was subsequently associated with the university in a voluntary part-time capacity. In this time, in 1996, he published a paper, 'A thematic approach to the study of rock art in South Africa', in the *South African Journal of Ethnology*.

Photographic expertise

Neil Lee took his first photographs of rock paintings in a shelter in the foothills of Mount Amajuba in 1953. He realised straight away that general photography was not the way to go. He experimented with close-up photography using a detachable close-up lens, which was quite difficult as his camera did not have a 'through-the-lens' facility.

One evening he met Bert Woodhouse at a party.



Neil Lee recording rock art with Bert Woodhouse looking on

and Development Foundation (MDF) as director. The function of the MDF was to recruit sorely needed skills for South Africa from overseas. Bert spent the latter part of his career with Murray and Roberts as management development and training director.

Bert became fascinated by rock art after reading a book on rock art in South Africa. He met Neil and together they studied rock art in the field for decades. They were also involved by Professor Raymond Dart in the Institute for the Study of Man (ISMA). Bert joined the Transvaal Branch of the Archaeological Society in the early 1960s and became chairman of the branch a few years later.

Having a kindred interest, a long relationship developed that took them to many parts of the country. They eventually concentrated on paintings in the Free State and the Eastern Cape, where at that time, in comparison with the KwaZulu-Natal Drakensberg, little work had been done.

Neil joined the Archaeological Society in 1954. After his and Bert's first talk to the Society, held in those far-off days at the old Medical School in Hillbrow, they introduced their 'new' method of photography. The branch chairman at the time, Prof. Dart, remarked, 'We now have to look at the paintings all over again'.

Continued on page 16

THE SOUTHERN AFRICAN NEOLITHIC IN THE ELANDS BAY AREA

Towards improved chronology and understanding of group interactions

Antonieta Jerardino

Until a few years ago, conventional archaeological knowledge proposed that Khoi-speaking pastoralists originating in eastern present-day Botswana populated parts of the central and western regions of southern Africa nearly 2 000 years ago (Deacon and Deacon 1999; Smith 2006). On their way south, pastoralists encountered original populations of hunter-gatherers wherever they settled, including some of the more sparsely populated areas of the dry central Karoo (Sampson 2010).

dung (at times vitrified) in archaeological strata and a preponderance of livestock bones in the mammalian faunal remains as direct evidence for a predominant herding lifestyle. Nevertheless, relatively high frequencies (>30 per cent) of sheep bones at sites such as Kasteelberg in the Vredenburg Peninsula have been interpreted by the same author as representing feasting sites (Sadr 2004, 2008), while elaborate burials appear to have occurred mostly in historic times (Morris 1995) and dung remains could easily

A revision of these ideas about the origins and spread of domestic stock in southern Africa prompted Karim Sadr to argue strongly that the sheep found in southern African hunter-gatherer sites were actually herded by hunter-gatherers (a term used here interchangeably with that of 'foragers'). According to Sadr (2003, 2008), this form of low-intensity food production, which is characteristic of the Neolithic elsewhere in the world, appears to define much of the indigenous subsistence in southern Africa over the last 2 000 years. Sadr further proposed an economic continuum represented in its extremes by herders who hunted and gathered, and hunter-gatherers who kept some stock ('hunters with sheep'), while also conceding the existence of brief and localised episodes of more intensive animal husbandry (Sadr 2003). Furthermore, Sadr suggested, on the basis of archaeological signatures, that if pastoralists spread across southern Africa, they did so around the turn of the second millennium AD (Sadr 2008).

In his more recent evaluation of the current evidence for pastoralism (subsistence based primarily on livestock) in southern Africa, Sadr (2008) identifies the remains of stock enclosures and settlement layout, along with elaborate burials, the presence of livestock

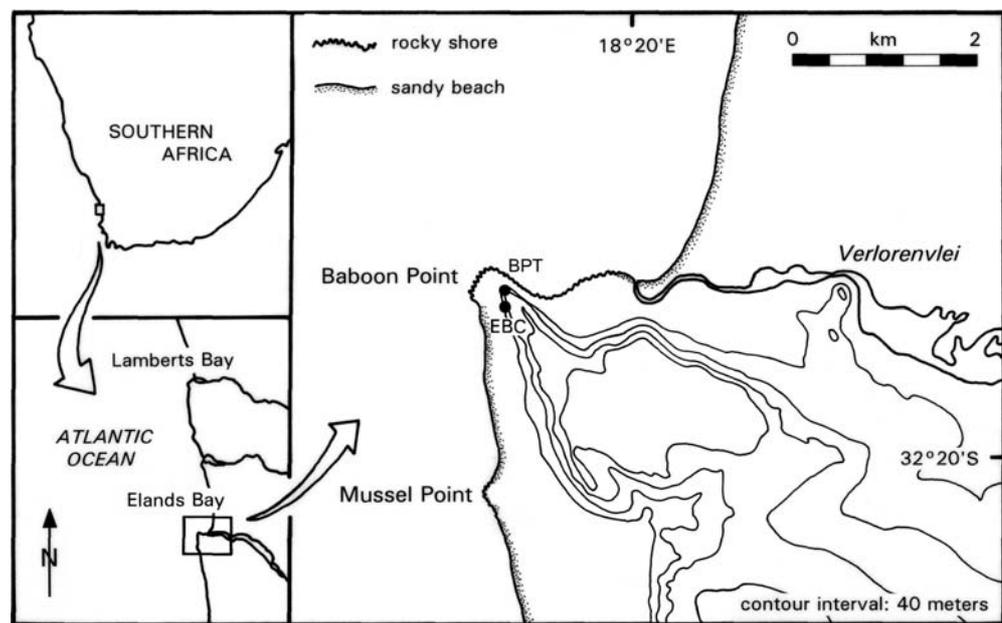


Fig. 1: Map of the study area showing the location of sites and places mentioned in the text (Baboon Point Terrace, BPT; Elands Bay Cave, EBC)

have been dispersed by taphonomic factors, rendering them more difficult to detect. Therefore, architectural remains revealing a settlement layout with stock enclosures appears to be a more reliable indicator of a pastoralist or herder way of life (Sampson 2010). Sadr (2008) points out that most of such sites, reported for Namibia, the central Karoo and the Breede River valleys, date to the second millennium AD and the colonial era.

A stone-built encampment with a relatively secure central enclosure at the top of Simon Se Klip (SSK) just south of Lamberts Bay (Jerardino & Maggs 2007) seems to be an exception to this chronological pattern. Many domestic features were located at the edge of the hilltop in positions that afford good views of the surrounding landscape. Three of these were radiocarbon dated c. 1450 and 1200 BP (see table), a time when some stock-keeping groups appear to

Antonieta Jerardino is Research Professor at the Catalan Institution for Research and Advanced Studies (ICREA/GEPEG), University of Barcelona. amsjerardino@ub.edu

have been relying more heavily on domestic stock (Sadr 2008). No local historical precedent for such an architectural arrangement is known. Sheep bones, or those of other domestic animals, are absent from the excavated material, no dung has so far been recognised from among the many built enclosures at SSK and neither were any burials encountered (Jerardino and Maggs 2007).

However, domestic stock was clearly important to SSK inhabitants, given its location atop of the kopje, as there was a great investment in building the stone arrangements and the location of some of the domestic features appear in places that offer good surveillance of the surrounding landscape. It was suggested that the placement of an encampment atop of SSK was in response to a heightened sense of threat to the people and their livestock (Jerardino and Maggs 2007). This scenario does hint at a possible competitive relationship between herders and other groups as suggested earlier by Parkington et al. (1986) for the entire ceramic period, but this contrasts with evidence from other local sites dating to the last 700 years where no such social configuration appears to have existed (Jerardino 2007; Jerardino, Dewar et al. 2009).

Baboon Point Terrace (BPT)

To some extent, reminiscent of SSK sites, a series of small and shallow accumulations of marine shell and the occasional indigenous ceramic fragments among rocks and small bushes are found on a cliff terrace at Baboon Point (Figs 1 & 2). However, no stone-built enclosures have been identified at this location. These occurrences are situated on a 35 m long and about 6 m wide flat rock floor, stepping up to a similarly long overhang abutting the cliff face, which seems to have been a living area. With the exception of a shallow deposit under a low-lying shelter on the western-most edge of this terrace (BPT1), most of these 'patches' appear to be in secondary context. Their material appears to have derived from a short occupation of the long overhang, or perhaps during brief visits over a few decades. Food remains, mainly marine shells, appear to have been tossed down-

slope and onto the terrace. It is assumed that patches closest to the long overhang (e.g. BPT2 and BPT3) have overall fewer admixtures from different tossing events, as more often than not food debris would be thrown as far away as possible when cleaning the living area.

Superb views of the long sandy beaches and dune field to the north of Elands Bay, Verlorenvlei valley and the surrounding Sandveld to the east, and long sandy beaches stretching south to Mussel Point and beyond are held from this location.

Sampling and dating

As with the others, BPT1 consists mainly of marine shell fragments from black mussels, several species of limpets, whelks and barnacles. Two tiny rock lobster (*Jasus lalandii*) mandibles were also recovered. A few bone fragments attest to the presence of tortoise, medium-sized bovid, penguin and microfauna. The few artefactual contents include lithics and Cape Coastal pottery fragments (coarse quartz temper). Ostrich eggshell fragments (OES) are also present. Historical additions to the artefactual assemblage are a beer bottle neck and a wire hook.

BPT2 is closest to the long overhang along the terrace. Marine shell was observed, with species represented in similar frequencies to BP1. Two broken rock lobster mandibles were also recovered from this patch. Bone remains are present in smaller quantities than at BPT1 and dominated by tortoise remains. OES fragments, a few ceramic fragments and traces of lithic debitage were also found. Two small white glass chips and a short and thin piece of wire point to a later historical presence. BPT3 is situated slightly downslope and north from BPT2, and has a more limited range of bone and artefactual contents when compared with the other two sampled locations. Contents are also dominated by marine shell and with a similar marine species composition to the other two patches.

Radiocarbon dates were obtained from the bottom-most material for BPT1 and BPT2 (see table). With a median of 1053 and 1169 AD for BPT1 and BPT2,

List of radiocarbon dates obtained for Baboon Point Terrace shell accumulations. Calibration for marine shell dates follows Marine 09.14c (Reimer et al. 2009). Corrected shell dates are corrected for global marine reservoir effect (?400 yrs) and calibrated shell dates are calculated with an added local marine reservoir effect $\Delta R = 224 \pm 51$ yrs (from the 14Chrono database at www.calib.org).

Locale	Material	Uncalibrated ¹⁴ C Date (yr BP)	Corrected ¹⁴ C Date (yr BP)	$\delta^{13}C_{\text{‰}}$	Calibrated Median age AD	Calibrated Date AD (1 σ)	Calibrated Date AD (2 σ)	Laboratory No.
BPT1	shell	1580 ± 30	1180 ± 30	0.3	1053	989 - 1129	910 - 1190	UGAMS#5672
BPT2	shell	1460 ± 30	1060 ± 30	0.0	1169	1099 - 1237	1048 - 1281	UGAMS#5673
SSK(F2)	shell	1610 ± 60	1210 ± 60	-0.1	1018	915 - 1101	831 - 1200	GX32341
SSK(F5)	shell	1710 ± 60	1310 ± 60	0.1	911	825 - 1001	722 - 1061	GX32342
SSK(F9)	shell	1840 ± 60	1440 ± 60	-0.3	781	691 - 859	640 - 965	GX32343

respectively, the probability age distribution of these two dates overlap considerably with each other at the level of 1 and 2 sigmas. If BPT1 and BPT2 ages are representative of the remaining shell patches, it seems likely that visits to Baboon Point Terrace took place over a period of about 400 years between 900 and 1250 AD. The age distributions of the two youngest calibrated dates from SSK (table; Jerardino and Maggs 2007) overlap with this 400-year-long period to a large extent. It is thus apparent that both of these locations with prime views of the surrounding landscape were visited several times over the same four centuries. Surveillance might have been the reason behind such a choice of settlement.



Fig. 2: Location of Baboon Point Terrace (BPT) and Elands Bay Cave (EBC) on Baboon Point cliff face as viewed from the west

Discussion and conclusions

What could have driven people to be particularly concerned with what was happening around them? The presence of predators, the movement of wild game and people, with and without stock, might have been the reason behind this choice of settlement. Predator and game movement would have been a frequent if not a constant concern to any group, foragers and stock-keeping people alike. Hence we would expect these high-placed sites to have been visited throughout prehistory for these reasons alone.

Nonetheless, this does not seem to have been the case. It is interesting to note that around this time a late Holocene warming trend, known as the 'Medieval Warm Epoch' (or Period) (800–1300 AD), took place in southern Africa and in several regions of the Southern Hemisphere (Chase and Meadows 2007; Seager et al. 2007). This climatic period brought warm and dry conditions, as well as warmer sea surface temperatures to the West Coast of South Africa. Namaqualand was occupied minimally during the Medieval Warm Epoch (Dewar pers. comm. 2010). However, the Elands Bay and Lamberts Bay areas further south were not abandoned during this time.

With the prevalence of warm and dry conditions, people and domestic animals would have needed to tie their movements between locally predictable sources of water, such as Verlorenvlei in Elands Bay and the Jakkals River in Lamberts Bay, and perhaps also the string of back dune lagoons south of Lamberts Bay. This restriction on group mobility would have been common if cattle were part of herds owing to their higher daily water demand (Smith 1992).

The cultural and economic landscape of the Elands Bay and Lamberts Bay areas is bound to have been highly dynamic and complex over the last 2 000 years. The nature of interactions among the many co-existing coastal groups that took on herding with varying degrees of intensity (or not at all) still needs to be explored beyond the possibilities offered by ethnographic accounts (Barnard 2008; Smith 1998). This is particularly relevant for a coastal environment, such as Elands Bay, as only few ethnographic accounts of West Coast coastal indigenous groups are available (Jerardino 2010).

Brief visits to BPT seem to have taken place over 400 years (900–1250 AD) and were broadly contemporary with those to SSK. Human presence at both these locations with commanding views of the surrounding landscape coincided temporarily with increased xeric conditions and overall low terrestrial and marine productivity as a result of a short warming trend. Could competition, resulting directly and indirectly from a shortage of water and general xeric conditions, and the need for monitoring the surrounding landscape for potential competitors have been the main reason behind this particular choice of land usage? It is probably too early at this stage to answer this question with any confidence. The focus should rather be directed towards evaluating these observations more broadly in the context of all other local sites occupied during the same 400-year-long period and any other sites with similar high-views over the surrounding landscape.

Acknowledgements

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A photograph from "In pursuit of Eden", work capturing the beauty of the Outeniqua mountain range, by Raquel de Castro Maia and Colin Stephenson



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HOMO SAPIENS HELMEI FROM FLORISBAD, SOUTH AFRICA

J Francis Thackeray

In 1935 Thomas Dreyer reported the discovery of a human cranium from Florisbad (see figure), a well-known Quaternary fossil site situated almost 50 km north-west of Bloemfontein in the interior of South Africa. The cranium was initially attributed to *Homo helmei* by Dreyer in honour of Captain RE Helme, who had funded excavations at the site. Dreyer suggested that the Florisbad cranium represented an ancestral stage in the evolution of modern humans in southern Africa. It was subsequently referred to as *H. florisbadensis* and thought to be an African 'Neanderthal'.

Singer (1958), Tobias (1968) and Rightmire (1978) noted similarities between the Florisbad cranium and southern African specimens from Elandsfontein and Kabwe, which have recently been attributed to *H. heidelbergensis*, or to a late archaic form of *H. sapiens*. Ron Clarke (1985) provided a revised reconstruction of the Florisbad cranium and noted that it resembled Middle Pleistocene specimens attributed to *H. sapiens* from Ngaloba and Omo 2 in East Africa. Grun et al. (1996) dated the Florisbad cranium to 259 000 ± 35 BP. Foley and Lahr (1997), McBrearty and Brooks (2000) and Tim White et al. (2003) have suggested that the original nomen, *H. helmei*, should be retained for the Florisbad cranium as an example of pre-modern human populations in sub-Saharan Africa.

Here it is proposed that the Florisbad skull can be attributed to *H. sapiens helmei*, closely related to the Ethiopian subspecies *H. sapiens idaltu* from Herto, described by White et al. (2003).

The Florisbad cranium as reconstructed by Clarke has been described by Schwartz and Tattersall (2003) as having a high cranial vault. The cranial vault height of the Florisbad skull is similar to that of the Herto specimen, BOU-VP-16/1, dated to 160 000 BP. The facial bones of the Florisbad skull are broken near the nasal region such that the degree of prognathism can only be estimated. However, the orthognathic face of BOU-VP-16/1 from Herto is similar to that of the Florisbad cranium. Both should be recognised as *H. sapiens*.

McBrearty (2000) questions whether mid-Pleistocene stone tool technologies in Africa relate to the behaviour of more than one hominid species. Here it is considered that the Herto and Florisbad specimens represent one species, different only at a subspecies level. The Herto subspecies of *H. sapiens* is associated with artefacts that include Acheulean and Middle Stone Age technology. The South African subspecies

from Florisbad, approximately 100 000 years older than the Herto specimens, seems to be associated with Middle Stone Age technology, but possibly also with Faure-Smith artefacts, a late expression of the Acheulean. This would fit the age of the Florisbad human cranium, dated to almost 260 000 BP.



Frontal view of Ron Clarke's (1985) reconstruction of the Florisbad skull (courtesy of James Brink and the National Museum, Bloemfontein)

Biogeographic isolation between east and southern African faunas seems to have occurred within the last million years. The Herto and Florisbad hominin fossils may be considered as manifestations of genetic variability in populations that had become isolated in the late mid-Pleistocene.

Acknowledgements

Ian Tattersall, Leslie Aiello, James Brink and Darren Curnoe kindly commented on earlier drafts of this manuscript.

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ARCHAEOLOGY IN AFRICA

Oldest evidence of stone-tipped arrows found

The earliest direct evidence of stone-tipped arrows has been unearthed at Sibudu Cave on KwaZulu-Natal's north coast. During excavation, led by Prof. Lyn Wadley from Wits University, the archaeologists dug through layers deposited up to about 80 000 years ago. The stone artefacts considered to be arrowheads were unearthed from layers that are 64 000 years old.

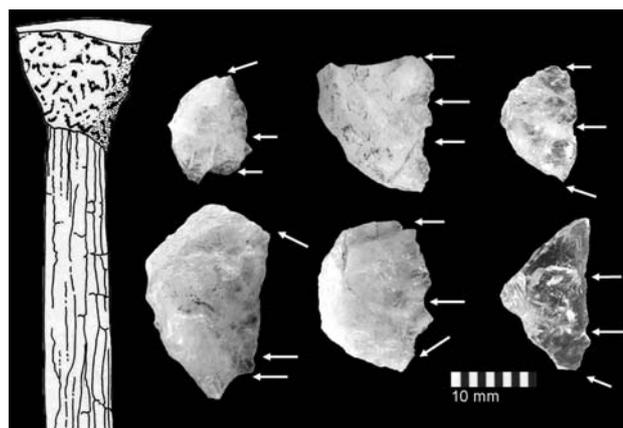
Closer inspection of the ancient weapons revealed remnants of blood and bone that provided clues about how they were used. Marlize Lombard from the University of Johannesburg led the microscopic examination of the findings, described by her as 'stone age forensics'. Because of the shape of 'small geometric pieces' of the stone tools, Dr Lombard was able to see exactly where they had been impacted and damaged. This showed that they were very likely to have been the tips of projectiles, rather than sharp points on the end of hand-held spears. The arrowheads also contained traces of glue, plant-based resin that was used to fasten the tips onto a wooden shaft. 'The presence of glue implies that people were able to produce composite tools – tools where different elements produced from different materials are glued together to make a single artefact,' Lombard said.

The discovery pushes back the development of bow and arrow technology by at least 20 000 years. Researchers are interested in early evidence of bows and arrows as this type of weapons' engineering shows the cognitive abilities of humans living at that time. According to a paper in *Antiquity*, 'Hunting with a

bow and arrow requires intricate multi-staged planning, material collection and tool preparation, and implies a range of innovative social and communication skills'. Dr Lombard explained that an ultimate aim was to accumulate evidence that can help to answer the 'big question': when did humans start to think in the same way that we do now? 'We can now start being more and more confident that 60 000 to 70 000 years ago, in southern Africa, people were behaving, on a cognitive level, very similar to us.'

Prof. Chris Stringer from the Natural History Museum in London said the work added to the view that modern humans in Africa 60 000 years ago had begun to hunt in a new way. Neanderthals and other early humans, he explained, were likely to have been 'ambush predators' who needed to get close to their prey in order to dispatch them. 'This work further extends the advanced behaviours inferred for early modern people in Africa, but the long gaps in the subsequent record of bows and arrows may mean that regular use of these weapons did not come until much later,' he said. 'Indeed, the concept of bows and arrows may even have had to be reinvented many millennia [later].'

Antiquity/BBC News, August 2010



Reconstructed arrow tipped with a transversely hafted segment, and segments and backed pieces from Sibudu and Umhlatuzana, KwaZulu-Natal, with impact fractures consistent to those observed on similar artefacts that were used as transverse tips in experimental arrows. (From: Lombard, M & Phillipson, L. 2010. Indications of bow and stone-tipped arrow use 64 000 years ago in KwaZulu-Natal, South Africa. *Antiquity* 84: 635-648.)

Nile releases city's deep history

Alexander the Great did not found the city of Alexandria. It now seems that this part of the Nile has been settled for at least 4 500 years. Researchers from France made the discovery by measuring the variations in lead concentration in a mud core from Alexandria's ancient harbour. Lead contamination, probably associated with human activities such as plumbing, fishing, building and ship-building, occurred between 2 686 and 2 181 BC and then again from 1 000 to 800 BC. Ancient texts mention a settlement named Rhakotis.

New Scientist, 22/04/06

CODE OF CONDUCT FOR VISITORS AT ARCHAEOLOGICAL SITES

Albino Jopela

Archaeological sites – remains resulting from human activities, older than 100 years, including artefacts (pottery, stone tools), rock art, wrecks and hominid remains – constitute the basic record of past human activities. Each archaeological site is a unique, non-renewable and irreplaceable part of South Africa's national cultural heritage that requires greater recognition and protection. All such sites are protected by the National Heritage Resources Act (No. 25 of 1999).

As a window on the past, archaeological sites allow us to look back in time to understand past cultures. They tell us about the traditions, the beliefs and the achievements of a country and its people. This knowledge of the past enables us to place our own time in the framework of history. Therefore, it is our duty to take care of archaeological sites because they convey diverse messages and values (historical, scientific, spiritual, etc.) that give meaning to people's lives. Because every heritage site is unique and irreplaceable, the deterioration or the disappearance of any archaeological site is a loss for the country and humanity as a whole.

Though many archaeological sites have survived for hundreds of thousands of years, this cultural heritage is not everlasting. Our archaeological heritage is deteriorating as a result of natural (physical, biological or chemical) changes that occur over time, as well as a result of human activities, such as inappropriate visitor behaviour at archaeological sites. Protection and proper management of archaeological sites is essential to enable archaeologists and other scholars to study and interpret them, on behalf of and for the benefit of present and future generations.

Archaeological sites are especially vulnerable to damage caused by visitors, so their protection cannot be based upon the application of archaeological techniques alone. This also requires active participation by the general public. The survival of archaeological heritage depends partly on the conduct of visitors. Therefore visitors to archaeological sites must observe certain rules and procedures:

- Please never attempt to remove any artefact (pottery, stone tool, stone walling or beads) from archaeological sites. Any transfer of elements of the heritage to new locations represents a violation of the principle of preserving the heritage in its original context, in situ.
- Avoid disturbing the natural setting of archaeological sites by digging, depositing garbage,

climbing, leaning on its components (e.g. murals, walls, objects, signage), or introducing any object that is not part of the original context of the site.

- Never carve, write or paint on any part of an archaeological site. Modern graffiti (including names, dates and any other kinds of drawings) is considered a crime that is punishable with fines and imprisonment.
- Under no circumstances attempt to 'clean' or 'fix' anything at archaeological sites. Things such as vegetation (shrubs, roots, lichens, fungus), animal droppings or nests, chalk or other graffiti marks can only be removed by professional conservators.
- Please treat archaeological sites with care and respect. Take only pictures and your experience; leave nothing but your footprints behind.

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Albino Jopela is with the Department of Archaeology and Anthropology, Eduardo Mondlane University in Maputo, Mozambique. albino.jopela@uem.mz.

GREAT MEDAL FOR ROCK ART SCIENCE

In June 2010 in Paris, the Great Gold Medal with Special Honours for Sciences was bestowed on French rock art expert Jean Clottes by the Société Académique Arts-Sciences- Lettres. That illustrious society has been in existence since 1915. Each year it gives one such medal to the arts, sciences and letters disciplines. It is the first time that a rock art specialist has received the medal and the second time it has gone to a pre-historian. The first pre-historian to receive it was Professor Yves Coppens a few years ago. The rock art discipline is thus honoured as a science. *International Newsletter on Rock Art, No. 58, 2010*

BOOK INFORMATION

The family story of the Thornycrofts

Thornycroft, Verity and Hugh. *Nigel and Corona: A family story of adventure, sport, wilderness and war from England to Africa*. 2010. Wales: Coch-y-Bonddu Books. R200 from ArchFox Books, fox@boers.org.za, tel: 011 803 2681.

Nigel and Corona is the story of Hugh's parents, Nigel and Corona Thornycroft, who gave up their privileged lives in England to pioneer a tobacco, game and cattle farm under eccentric conditions in Africa. They moved from 'civilised' early 20th century England, with weekend visits from King Edward VII and Queen Alexandra, to the trials and triumphs of pioneering a farm in Rhodesia, raising five sons and living, along with their ancestral oil paintings, for the first years in a wattle and daub hut, because every last cent of their inheritance had been embezzled.

The book is filled to the brim with stories, anecdotes and tales of a world most of us could hardly imagine. Corona and Nigel shared a great love for life and the outdoors and the book includes numerous stories of punt gunning with Sir Peter Scott, son of Captain Scott of the Antarctica; Nigel's 11 attempted escapes from the Gestapo in WW2; fishing camps for tiger and bream on Kariba, or for trout on the Pungwe and Gareizi in the Eastern Highlands; wildfowling, canoeing and spear-fishing down the Zambezi Valley (family silver and china sometimes in tow); fighting off trypanosomiasis (sleeping sickness) caused by tsetse fly and bouts of malaria, and the occasion when they were both nearly killed by a charging buffalo.

As a mother, wife, archaeologist and artist in Africa, Corona made her mark in a number of unusual ways for her time. Her archaeological discovery of a 1450 AD gold burial in the Wedza mountains (the earliest to date in Zimbabwe) is on display in the Harare National Museum, as is 1260–1280 AD pottery identified by David Coulson, the world-renowned rock art expert. The book has a chapter on her rock art discoveries

and adventures.

Colourful descriptions of life on their family farm Merryhill and of the tight-knit Wedza, Marondera, Zimbabwe farming community, make the pages come alive: from vivid images of Googly, the hippo, who played hide-and-seek with the dogs in the dam, to the dassies, kudu, bush pig, duiker and baboon running free, and descriptions of the granite koppies, the open savannah and the msasa and munondo trees; and then sadly to the onset of the horrific war-time farm attacks. Corona stayed on her beloved Merryhill for 55 years, well into her nineties, until the farm was lost to the invaders in 2005.



Honorary life membership for Lee and Woodhouse

[Continued from page 8]

Neil became a committee member responsible for organising public programmes and eventually served two terms as chairman of the branch. During this time he organised six very successful overseas tours to Greece, Sicily, Turkey and Iran. On three of these tours he took the bold step of chartering a ship for the exclusive use of tour participants. The first time he did this, much concern was expressed by the committee, which made it quite clear that their involvement was entirely academic.

Joint book on rock art

In 1972, Neil and Bert co-authored a book, *Art on the Rocks*, which was, and they believe still is, the only book on South African rock art to have gone into a second edition. In addition, Neil has written a number of articles for local and overseas publications and has often lectured to various interest groups. He has helped to organise three international conferences and post-conference rock art tours.

He retired as an electrical engineer specialising in lighting in 1986 and donated his collection of some 15 000 colour slides to the Rock Art Research Institute (RARI) at the University of the Witwatersrand, and subsequently spent a few years with RARI as an unpaid, part-time research officer. In this role he helped to integrate his slides into the RARI's vast collection of material. This was a fitting climax to years of fieldwork.

Neil says that his retirement actually opened up not just windows but doors of opportunity to further his interests in archaeology and history, including Greco-Roman mosaics, the art of Ancient Egypt and the Bayeux Tapestry.

Branch chairman Reinoud Boers expressed the hope during the hand-over that both Neil and Bert would continue their participation in ArchSoc's activities for many years to come.



SOUTH AFRICAN ARCHAEOLOGICAL SOCIETY NOTICES

Applications for research grants from the Kent Bequest

The late Dr Leslie Kent, a long-time member of the South African Archaeological Society in Johannesburg, left a generous bequest to the Society in 1992. The terms of this bequest are that the proceeds must be invested and the income, which will amount to approximately R9 000 per annum at current interest rates, will be distributed from time to time at the discretion of the Society for –

1. financing of field work or expeditions to undertake research according to guidelines laid down by the Society;
2. grants to individuals or groups of individuals engaged in research, the subject of such research to be approved by the Society;
3. publishing or supporting the publication of the results of research whether or not the research has been financed by the Kent Bequest; and
4. awarding prizes for meritorious work in archaeology, especially by young researchers.

The Society has appointed a Kent Bequest Committee and invites applications in 2011 for awards in all categories. The members of the Committee are Dr J Deacon (Secretary), Mr Reinoud Boers, Professor T N Huffman, Dr T Maggs, Professor I Pikirayi and Mrs L Wynne. Please read the following guidelines and instructions carefully before completing the application form.

Guidelines

- The work must be conducted in South Africa.
- The subject matter may include archaeological work of any kind that enhances our knowledge of the lifestyle of humankind in southern Africa, such as excavation, rock art recording, site recording, artefact or faunal analysis, identification of plant or animal remains, dating, surveys, physical anthropology, analysis of archaeological collections in museums, experimental archaeology, archival or bibliographic work.
- Proposals may also include publications for public education and community awareness projects that popularise archaeology.
- The Kent Bequest will contribute fieldwork or printing expenses only, not costs involved in analysing results, or writing or editing reports, or publications.
- Applications for publication must be accompanied by two quotations from printers.
- Preference will be given to researchers domiciled

in southern Africa.

- Preference will be given to researchers who are starting a career in archaeology.
- Successful applicants will be required to donate one copy of reports or publications to the Society's library, one copy to the *South African Archaeological Bulletin* for review, and, in the case of publications, one copy to each of the Society's five regional branches.

Applications must be submitted by **30 April 2011**.

Application forms are available from The Secretary, South African Archaeological Society, PO Box 15700, Vlaeberg, 8018, tel. (021) 481 3886, e-mail archsoc@iziko.org.za, or may be downloaded from the Society's website: www.archaeologysa.co.za.

All applications will be refereed by specialists and referees' reports will be evaluated by members of the Kent Bequest Committee.

The successful applicant/s will be notified by 30 June.

Annual General Meeting

Notice is hereby given in terms of section 8(a)(i) and (ii) of the Constitution that the Annual General Meeting of the Society will be hosted by the Western Cape Branch on Tuesday 10 May 2011 at 18:00. The venue will be the SA Astronomical Observatory auditorium in Observatory.

Members should submit items for the Agenda in writing to the Secretary, PO Box 15700, Vlaeberg, 8018, or to archsoc@iziko.org.za, before 1 March 2011. Proposals must state in specific terms the resolution to be put to the meeting and the reasons therefor.

Janette Deacon
Honorary Secretary
5 January 2011

2011 subscription rates

Individuals		Institutes	
Ordinary (Single)	R230	South African	R450
Joint or Family	R245	African	R450
Junior Member	R160	Overseas*	R900
African Ordinary	R250	*Plus R100 for bank charges	
Overseas Ordinary	R450*		

Payments should be made through Cape Town head office. See panel on page 20.



WORLD ARCHAEOLOGY

Oldest modern human outside Africa found

A fossil human jawbone discovered in southern China is upsetting conventional notions of when our ancestors migrated out of Africa. The mandible, unearthed by palaeontologists in China's Zhiren Cave in 2007, sports a distinctly modern feature, a prominent chin. But the bone is undeniably 60 000 years older than the next oldest *Homo sapiens* remains in China, scientists say. In fact, at about a hundred thousand years old, the Chinese fossil is 'the oldest modern human outside of Africa,' said study co-author Erik Trinkaus from Washington University in St Louis.

Popular theory states that *Homo sapiens* migrated out of Africa about 60 000 years ago, at which point modern humans quickly replaced early human species such as *Homo erectus* and *Homo neanderthalensis* across the world. Finding such an ancient example of a modern human in China could drastically alter the time-line of human migration. The find may also mean that modern humans in China were mingling and possibly even interbreeding with other human species for 50 000 or 60 000 years. What's more, the find seems to suggest that anatomically modern humans had arrived in China long before the species began acting human. For example, symbolic thought is a distinctly human trait. The first strong evidence for this trait doesn't appear in the archaeological record in China until 30 000 years ago, Trinkaus said.

So far, genetic evidence largely supports the traditional timing of the 'out of Africa' theory. But the newly described China jawbone presents a strong challenge, said anthropologist Christopher Bae of the University of Hawaii, who was not associated with the find. 'They actually have solid dates and evidence of, basically, a modern human.' Still, the jaw and three molars were the only human remains retrieved from the Chinese cave, and the jaw is 'within the range' of Neanderthal chins as well as those of modern humans, added palaeo-anthropologist John Hawks of the University of Wisconsin.

Proceedings of the National Academy of Sciences/ National Geographic News, 25/10/10

Language and tool-making evolved together

Stone-age humans mastered the art of elegant tool-making in an evolutionary advance that boosted their brain power and potentially paved the way for language. The design of stone tools changed dramatically in human prehistory, beginning more than two million years ago with sharp but primitive stone flakes and culminating in exquisite, finely honed hand axes 500 000 years ago. The development of sophisticated stone tools, including sturdy cutting and sawing edges, is considered a key moment in human evolution, as it set the stage for better nutrition and advanced social behaviour, such as the division of labour and group hunting.

'There has been a long discussion in the archaeology community about why it took so long to make more complex stone tools. Did we simply lack the manual dexterity, or were we just not smart enough to think about better techniques?' said Aldo Faisal, a neuroscientist at Imperial College London. Faisal's team investigated the complexity of hand movements used by an experienced craftsman while he made replicas of simple and then more complex stone tools. Bruce Bradley, an archaeologist at Exeter University, wore a glove fitted with electronic sensors while he chipped away at stones to make a razor-sharp flake and then a more sophisticated hand axe.

The results showed that the movements needed to make a hand axe were no more difficult than those used to make a primitive stone flake, suggesting early humans were limited by brain power rather than manual dexterity. Early humans were adept at making



Archaeological artist.

Sketches of artefacts in pencil or ink.

Contact: **Bronwyn Gomes**

Cell : 082 363 2289

Email: bonbongomes@yahoo.com

stone flakes, but these were so thin they were liable to break while being used. The movements needed to make advanced tools were no more difficult, but they had to be executed more intelligently to produce a tool that had a fat, sturdy body with a sharp cutting edge.

Brain scans of modern stone-tool makers show that key areas in the brain's right hemisphere become more active when they switch from making stone flakes to more advanced tools. Intriguingly, some of these brain regions are involved in language processing. 'The advance from crude stone tools to hand axes was a massive technological leap for our early human ancestors,' said Faisal, whose study appears in *PLoS ONE*. 'Our study reinforces the idea that tool-making and language evolved together, as both required more complex thought.' *The Guardian*, 03/11/10

Bronze Age Troy just keeps on growing

German archaeologists have made new discoveries at modern day Hisarlik, or ancient Troy, in north-west Turkey. These finds further confirm that the area occupied during the Bronze Age was not limited to the citadel; Troy VI and VII are much larger than originally thought. The three-year research project at Troy, led by Prof. Ernst Pernicka of the University of Tubingen's Institute of Pre and Early History, concentrates on the analysis and publication of materials found since the university started excavations at the site in 1988. But to investigate and resolve outstanding issues, Project Troia does undertake some smaller excavations. These digs, in combination with geophysical surveying and the drilling of test holes, allow the team to narrow down the Bronze Age occupation below Troy's citadel more closely.

In 2010, the team confirmed the layout of a 1 km long Late Bronze Age defensive system, a rock-cut ditch south of the Troy hill fort. A 5 m wide gate some 300 m south of the citadel wall and dated to about 1300 BC is now fully excavated. Late Bronze Age layers came to light in the vicinity of the gate, e.g. remains of walls, roads, storage pits and even an ancient oven, which suggest that the area was occupied from about 1700 (Troy VI) to 1100 BC (Troy VII). Further east, a second trench, as yet undated, was discovered, significantly deeper and wider than the excavated ditch.

Rather than being one ancient city, Hisarlik, first excavated in the 19th century by self-taught archaeologist Heinrich Schliemann, consists of multiple layers of ruins. From the early Bronze Age (3rd millennium BC) until the Roman Period (1st century BC) at least nine cities – Troy I to IX – existed at the site. The ruins are stacked up to 15 m high. Which of these remains, if any, are those of the Homeric city of Troy is still being debated. Schliemann nominated Troy I or II, but nowadays the Late Hittite Troy VII, which shows traces of fire and possibly warfare, is seen as the most likely source of inspiration for the Trojan myth. Its

remains are dated between the 13th and 10th century BC, whereas ancient Greek historians place the Trojan War somewhere in the 12th to 14th century BC.

That Troy VI and VII are far larger than originally thought – not a mere hill fort, but strongholds surrounded by a settlement with its own defensive structures – makes it more likely that Hisarlik is indeed the site of the legendary Troy, or Ilion, the siege of which was described by Homer in the *Iliad*.

Project Troia, 04/10/10

Discovery could rewrite the history of Egypt

For much of the twentieth century, Egyptologists shied away from explorations in the vast sand sea known as the Western Desert. An expanse of desolation the size of Texas, the desert seemed too harsh, too implacable, too unforgiving a place for an ancient civilisation nurtured on the abundance of the Nile. When Egyptologists finally began investigating the Western Desert, they gravitated to the oases. But in 1992, a young American graduate student, John Darnell, decided to take a different tack. The team began trekking ancient desert roads and caravan tracks. Today, Darnell, an Egyptologist at Yale, has succeeded in discovering a lost pharaonic city of administrative buildings, military housing, small industries and artisan workshops.

Umm Mawagir, as the city is now known, flourished from 1650 to 1550 BC. This was a dark, tumultuous period of Egyptian history. Entire villages lay abandoned in the Nile River Delta, victims perhaps of an epidemic. Taking advantage of the turmoil, Bedouin groups from Syria and Palestine edged westward under the leadership of wealthy merchants, gaining control of the delta. Meanwhile, far to the south, Sudan's powerful Kerma kingdom expanded into southern Egypt. In the wake of these incursions, Egypt's pharaohs presided over a diminished realm whose capital lay at Thebes (Luxor).

For decades, Egyptologists thought the foreigners roamed the Western Desert at will, controlling the lucrative caravan trade. But the discovery of Umm Mawagir, in concert with finds from the more westerly Dakhla Oasis, says Darnell, reveals how the Theban dynasty succeeded in extending its power more than 160 km into the desert, building an entire city.

To date, the team has excavated less than half a per cent of the sprawling site. While the strong desert winds have scoured down the city's ancient mud-brick walls, preservation at the site is excellent, with many walls more than a metre high. Darnell believes that the desert city will ultimately shed crucial light on a shadowy time in Egyptian history. For Darnell the real wonder is the administrative genius that went into creating a city in the desert more than 3 600 years ago.

Yale Alumni Magazine, Sept./Oct. 2010

Humans crafted complex tools earlier

Prehistoric people in southern Africa developed a highly skilled way of shaping stones into sharp-edged tools long before Europeans did. A technique known as pressure-flaking, which scientists previously thought was invented in the Upper Palaeolithic Solutrean culture in France and Spain some 20 000 years ago, involves using an animal bone or some other object to exert pressure near the edge of a stone piece and precisely carve out a small flake.

Researchers examined stone tools dating from the Middle Stone Age, some 75 000 years ago, from Blombos Cave, which they found had been made by pressure flaking. The technique provides a better means of controlling the sharpness, thickness and overall shape of two-sided tools like spearheads and knives. The findings were published in *Science*. The authors speculated that pressure flaking may have been invented in Africa and only later adopted in Europe, Australia and North America.

Discovery News, 28/10/10

Ancient wind held secret of life and death

The mystery of how an abundance of fossils have been marvellously preserved for nearly 500 million years in South Africa has been solved by a team of geologists from the University of Leicester's Department of Geology. They have established that an ancient wind brought life to the region, and was then instrumental in the preservation of the dead.

According to Sarah Gabbott, one of the world's most mysterious rock layers lies near Table Mountain. Just a few metres thick, and almost half a billion years old, it contains the petrified remains of bizarre early life-forms, complete with eyes and guts and muscles. The geologists investigated why these animals are so marvellously preserved, when most fossils are just fragments of bone and shell. The answer seems to lie in a bitter wind, blowing off a landscape left devastated by a massive ice-cap.

A microscopic analysis of the shale layers using a specially designed 'Petroscope' obtained with funding from the Royal Society has revealed remarkable and so far unique structures – myriads of silt grains, neatly wrapped in the remains of marine algae. The authors state in their paper in *Geology* that the silt grains are sedimentary aliens, much bigger than the marine mud flakes in which they are embedded. They could only have been blown by fierce glacial winds onto the sea surface from that distant landscape.

Arriving thick and fast, they carried nutrients into the surface waters, fuelling its prolific life. The deep waters, though, were overwhelmed by rotting, sinking vegetation, becoming stagnant and lifeless, which are ideal conditions to preserve the animal remains, down to their finest details. A cold wind, here, was key to both life and death.

Eurekalert, 29/11/10

The South African Archaeological Society

This is the society for members of the public and professionals who have an interest in archaeology and related fields such as palaeontology, geology and history. Four branches serve the interests of members. They arrange regular lectures and field excursions guided by experts, annual and occasional symposia, and longer southern African and international archaeological tours.

The Society was founded in 1945 to promote archaeology through research, education and publication. It is a non-profit organization – Registration No. 024-893-NPO.

Cape Town head office: PO Box 15700, Vlaeberg, 8018. Tel: +27 (0)21 481 3886. Fax: +27 (0)21 481 3993. Archsoc@iziko.org.za. www.archaeologysa.co.za.

Trans-Vaal Branch: PO Box 41050, Craighall, 2024
Membership Secretary: Mrs Pamela Küstner
012 365 3608
pmkustner@mweb.co.za
www.archaeology.org.za

Western Cape Branch: PO Box 426, Muizenberg, 7950
Chairperson: Ms Yvonne Viljoen
021 788 5620
yvonne1@pixie.co.za

KwaZulu-Natal Branch: c/o Natal Museum, P/Bag 9070, Pietermaritzburg, 3200
Secretary: Ms Christine Sievers
031 563 8659
christine.sievers@gmail.com

Trans-I-Gariep Branch: David Morris
053 839 2706
dmorris@museumsnc.co.za

The Society produces the following publications:

- South African Archaeological Bulletin**, a scientific publication of current research in southern Africa – twice a year
- The Digging Stick**, the Society's general interest magazine – three issues a year
- Goodwin Series**, an occasional publication on a specific field of archaeological interest

Subscription rates for 2011 are as follows: Individuals: Single – R230; Joint/Family – R245; Junior membership – R160; Africa ordinary – R250; Overseas ordinary – R450*. Institutions: Local and African – R450; Overseas – R900*. [* Plus R100 bank charges]

The Digging Stick

Editor and advertising: Reinoud Boers
PO Box 2196, Rivonia, 2128
Tel/fax: 011 803 2681
Cell: 082 566 6295
fox@boers.org.za

Layout: Marion Boers
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