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THE EARLIEST EVIDENCE (170 000 YEARS AGO) FOR COOKED ROOT VEGETABLES

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Hot, roasted root vegetables are comfort food, and a plateful of carbohydrate is both satisfying and nutritious. Our ancestors thought so too because we discovered the remains of starchy rhizomes cooked 170 000 years ago in Border Cave in the Lebombo Mountains that straddle KwaZulu-Natal and eSwatini (formerly Swaziland) (Fig. 1) (Wadley et al. 2020).

The Border Cave rhizomes were identified as *Hypoxis* angustifolia (yellow stars) (Fig. 2) by comparing their shape and internal anatomy to those of modern rhizomes. Today, this plant grows in countries along the eastern flank of Africa, extending into Yemen on the Arabian peninsula. If, as seems likely, *Hypoxis* had a similar distribution in the past, it would have provided a secure staple food for people travelling within and

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Fig. 1: Border Cave in the Lebombo Mountains

out of Africa. Wooden digging sticks or sharpened bones may have been used to dig rhizomes from the ground. *Hypoxis angustifolia* plants are gregarious and many can be harvested at once. The food was carried home to the cave, perhaps as a hide-wrapped



17 Sound and song lines in the rock art of the Cederberg – *Andrew Paterson*



Fig. 2: Hypoxis angustifolia

parcel or a bunch tied with leaves. Wood was collected for the cooking fire that probably burned to small coals and hot ash before the rhizomes were added directly to the ashes for roasting. Some South Africans are familiar with this cooking technique: as children we made 'as-koek' (ash cakes) straight on coals, tapping them on rocks to dislodge the ash before garnishing our culinary treasures with apricot jam.

Some of the thumb-sized Border Cave rhizomes were lost in the ashes where they were burned and thus preserved for excited, dusty archaeologists. We know that they were burned while still fresh and 'green' since the charred rhizomes have split surfaces

from expelled moisture when they were heated. Many starchy root vegetables can be eaten raw but their nutritional content is much greater when cooked (the human gut can then access the glucose better and absorb much more of it). Cooking made Hypoxis rhizomes easy to peel and rendered them digestible by releasing glucose and breaking down the fibre. Such treatment was particularly important for the aged members of the group and small children that might otherwise have had difficulty chewing the rhizomes. The food could easily have been consumed directly in the field by the collectors but the fact that it was transported to the cave and cooked adds extra information about social behaviour and sharing 170 000 years ago. Our find therefore provides a glimpse of ancient communal behaviour.

Food was the focus for satisfying physical and social hunger. The Border Cave occupants were modern

humans (Homo sapiens) with the same nutritional needs as us. We have large and 'expensive' brains, and for proper brain function we must consume about 100 g of carbohydrate per day. Hypoxis rhizomes may have fulfilled that need in the past. We know, too, that Border Cave dwellers ate meat because we have recovered the cooked bones of wild animals eaten in the cave. Richard Klein's (1977) earlier study identified a range of animals from buffalo to bush pig. African game meat is lean, especially in the dry season when animals lose weight. Lean meat protein cannot be metabolised by humans in the absence of either carbohydrates or fat (Speth & Spielman 1983). The addition of some carbohydrate to the diet would have enabled early humans to process protein effectively. A balanced, healthy diet with a combination of cooked carbohydrate and protein - the 'real' palaeo-diet increased human fitness and longevity.

Lyn Wadley discovered the first of the rhizomes while digging in Border Cave's ashy sediments dating to between 170 000 and 100 000 years ago (for Border Cave dates see Grün et al. 2003). In total, 55 whole charred rhizomes were recovered, all from the same species (Fig. 3). Rhizomes were not found by Beaumont in his earlier excavations (Beaumont 1978) but recent excavations at the site (Backwell et al. 2018) are concentrating on fine resolution work to recover material that was previously ignored.

Over a period of four years, Lyn Wadley and Christine Sievers collected modern plants with rhizomes so that



Fig. 3: Some Border Cave Hypoxis rhizomes. Left: profile and basal views (each rhizome is about 12 mm wide). Top left: a diagram of the internal structure of Hypoxis showing splits in the charcoal, mucilage cavities in black, white ovals representing xylem bundles. Right: a bundle of xylem vessels magnified 2 000 times under a scanning electron microscope.

they could identify and compare these with the ones found at Border Cave. With a permit from Ezemvelo KZN Wildlife, they dug out entire plants and created specimens for the herbarium at Wits. They surveyed a hillside near the cave, finding ticks and snakes as well as interesting plants with appropriate rhizomes. When a plant could not immediately be identified, it was planted in Wadley's vegetable garden to await flowering. Eventually the entire vegetable garden was given over to growing wildflowers.

When each plant had been firmly identified, its rhizome was charred, examined microscopically and compared with the Border Cave rhizome. Their patience was eventually rewarded by a combination of morphological (rhizome shape and size) and anatomical (internal vascular structure) evidence showing that the Border Cave rhizome was a Hypoxis. The plant is still used as food and some less palatable *Hypoxis* species also have medicinal value but dense rural populations have resulted in the overexploitation of the plants so that they are not as common as they would have been in the past. Hypoxis species were also eaten by Later Stone Age gatherers at Melkhoutboom (Deacon 1976) and Bushman Rock Shelter (Wadley 1987). Fragments from unidentified root vegetables date from 120 000 years ago at Klasies River (Larbey et al. 2019) but the Border Cave 170 000-year-old find is the earliest

identified cooked-root vegetable to be discovered anywhere in the world.

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'Untitled' by Xolile Mtakatya

To feature in the Cape Gallery exhibition 'Out and About', celebrating the lives and aspirations of the ordinary people living in the townships and communities of South Africa. The exhibition will open when Level 3 of the State of Disaster comes into effect.

TWENTY OF THE WORST EPIDEMICS AND PANDEMICS IN HISTORY

Owen Jarus, Live Science Contributor

Throughout the course of history, disease outbreaks have ravaged humanity, sometimes changing the course of history and, at times, signalling the end of entire civilisations. Here are 20 of the worst epidemics and pandemics dating from prehistoric to modern times.

North-eastern China: ca. 3000 BC

The discovery of a 5 000-year-old house in China filled with skeletons is evidence of a deadly epidemic. The bodies were stuffed inside a house that was later burned down. All age groups are represented. The archaeological site called Hamin Mangha is one of the best-preserved prehistoric sites in north-eastern China. Archaeological and anthropological study indicates that the epidemic happened so quickly that there was no time for proper burials. The site was not inhabited again. Another prehistoric mass burial dating to roughly the same period was found at another site called Miaozigou and this suggests that an epidemic ravaged the entire region.

Plague of Athens 430 BC

Not long after the start of the war between Athens and Sparta, a five-year epidemic ravaged the people of Athens. Some estimates put the death toll as high as 100 000. The Greek historian Thucydides (460-400 BC) wrote that 'people in good health were all of a sudden attacked by violent heats in the head, and redness and inflammation in the eyes, the inward parts, such as the throat or tongue, becoming bloody and emitting an unnatural and fetid breath' (The History of the Peloponnesian War, Richard Crawley, 1914). What exactly this epidemic was has long been a source of debate: typhoid and Ebola are suggested. Scholars believe that overcrowding caused by the war exacerbated the epidemic. Sparta's army was stronger, forcing the Athenians to take refuge behind a series of fortifications called the 'long walls' that protected their city. In 404 BC Athens capitulated.

Antonine Plague: AD 165–180

When soldiers returned to the Roman Empire from campaigning, they brought back more than the spoils of victory. The Antonine Plague, which is believed to have started after the war against Parthia and may have been smallpox, laid waste to the army and may have killed over five million people in the Roman empire, wrote April Pudsey, a senior lecturer in Roman History at Manchester Metropolitan University, in a paper published in *Disability in Antiquity*, Routledge, 2017. The epidemic contributed to the end of the Pax Romana, a period from 27 BC to AD 180 when Rome was at the height of its power.

Plague of Cyprian: 250–271

Named after St Cyprian, a bishop of Carthage, who described the epidemic as signalling the end of the world, this plague is estimated to have killed 5 000 people a day in Rome alone. In 2014, archaeologists in Luxor, Egypt, found what appears to be a mass burial site of plague victims. Their bodies were covered with a thick layer of lime, which is historically used as a disinfectant. Archaeologists found three kilns used to manufacture lime and the remains of plague victims burned in a giant bonfire.

Experts are not sure what disease caused the epidemic. 'The bowels, relaxed into a constant flux, discharge the bodily strength [and] a fire originated in the marrow ferments into wounds of the fauces (an area of the mouth)', Cyprian wrote in a Latin work called *De Mortalitate*, translated by Philip Schaff from the book *Fathers of the Third Century*, Ethereal Library, 1885.

Plague of Justinian: 541–542

The Byzantine Empire was ravaged by the bubonic plague, which marked the start of its decline. The plague reoccurred periodically. Some estimates suggest that up to 10 per cent of the world's population died. The plague is named after the Byzantine Emperor Justinian (reigned 527–565). Under his reign, the empire reached its greatest extent, controlling territory from the Middle East to Western Europe. Justinian constructed a great cathedral known as Hagia Sophia ('Holy Wisdom') in Constantinople. Justinian contracted the plague but survived.

The Black Death: 1346–1353

This plague travelled from Asia to Europe, leaving devastation in its wake. Some estimates suggest that it wiped out over half of Europe's population. It was caused by a strain of the bacterium *Yersinia pestis* that is likely extinct today and was spread by fleas on infected rodents. The bodies of victims were buried in mass graves. The plague changed the course of Europe's history. With so many dead, a labour shortage brought about better pay for workers and the end of serfdom. Studies suggest that surviving workers had greater access to meat and higher-quality bread.

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TROUBLED TIMES: THE HISTORY AND ROCK ART OF BANDIT GROUPS IN THE WINTERBERG

Brent Sinclair-Thomson

European colonists first began to settle in the area around the Winterberg, in today's Eastern Cape, from the 1770s. Almost immediately, their farms and property were attacked by groups often described as 'Bushmen' or 'banditti' hiding out in the nearby mountains. During these attacks, livestock were stolen or killed and herd-keepers were frequently murdered. The bandits used horses and guns in the raids. A close reading of the historical accounts from the time, typically written by farmers and travellers in the region, reveals that these groups, in fact, consisted of members from many different backgrounds and were not what we may consider 'pristine' San. Indeed, several accounts, including notably that of the settler Thomas Pringle (1840), commented that the groups included 'Bushmen', 'Hottentots', military deserters and runaway slaves.

Fieldwork in the Winterberg, including around the Baviaans, Mancazana and Tarka Rivers, has revealed many paintings depicting people on horseback armed with firearms seemingly chasing cattle and sheep. Also shown are beasts best identified as rain animals described by 19th century San informants, indicating



that the groups had a Khoe-San¹ inflection. I argue that the paintings were the creations of the mixed groups of bandits and that their heterogeneous nature resulted from the coming together of individuals who had suffered under European colonialism. I draw on the work of Eric Hobsbawm (1969), notably his book *Bandits*, to analyse the formation and practices of these groups, the hardships they endured and how from this suffering they had developed a 'sense of injustice' that motivated them to turn to banditry against European settlers.

What is banditry?

It is necessary to outline Hobsbawm's (1969) key points and how they may apply to the bandits of the Winterberg. According to him, the people who turned to banditry experienced a 'sense of injustice'. I argue that in the context of the bandits of the Winterberg region, it was the devastating effects of colonisation that caused this 'sense of injustice'. Hobsbawm continued that bandit groups were typically heterogeneous and that they could include military deserters, convicts, slaves and others who sought to escape society.

> Importantly, this is an almost exact echo of groups described by Pringle (1840) and Napier (1849: 226). Napier wrote that the Mancazana river banditti included 'Bushmen, Hottentots and runaway slaves. Where indicated Hobsbawm that bandit groups typically resisted on a small scale against an oppressive force, I suggest that this resistance was the stock theft and destruction perpetrated against European colonisation. Hobsbawm further noted that bandits relied not only on their physical capabilities and weapons but also appealed to the spiritual realm by using protective magic. In the southern African

Fig. 1: Map of the study area. Sites found are indicated by the large dots.

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¹ For more on the term 'Khoe-San' as signifying an identity, see Besten (2011). For its application in rock art studies, see Hollmann (2007).

Causes of 'sense of injustice'

The causes that motivated each member of these groups to turn to banditry are likely many. However, I have identified what I believe to be five of the key factors that led to these individuals experiencing a 'sense of injustice'. These include the loss of hunting, gathering and pastoral land, mistreatment by masters, mistreatment in the military, slavery and the effects of commandos. I outline each of these below.

Loss of hunting, gathering and pastoral land

Although the Great Fish River was officially demarcated as the Cape colony's eastern boundary in 1778, Europeans had begun settling the region several years prior to this as they looked for better grazing lands for their livestock (Moodie 1838: 5; Penn 2005: 133). This region was, however, already inhabited by hunter-gatherers, pastoralists and African farming communities (Giliomee 1989: 424, 425) who needed to have access to both sides of the river since it fell roughly along the divide between the winter and summer rainfall regions to the west and the east respectively. Grazing stock and wild animals required access to both areas so that they could feed all year round (Penn 2005: 82). Those who relied upon the animals, had to travel with them. Following the establishment of a 'hard' border (Giliomee 1989), many groups in the region could no longer pursue their traditional lifeways. This forced them to look for alternative means to survive.

Mistreatment by masters

Many Khoe-San were left with little option other than to seek work on settlers' farms (Giliomee 1989: 430). This rarely marked much of an improvement following the loss of access to the land they needed. Khoe-San servants were often treated extremely badly and were punished harshly for any misdemeanour. The traveller John Barrow remarked that in many cases these individuals were treated worse than slaves (Barrow 1801: 236). For example, a man named Dragoener was nearly beaten to death by his master when he worked on a farm in the Tarka river valley. He fled for his life and later returned as the leader of a group of bandits who proceeded to steal livestock from the farms in the area until he was killed in 1826 (Pringle 1840: 98). Other farmworkers also absconded but they rarely left empty handed, often stealing guns and horses they had learnt to use while working on the farms (Barrow 1801: 236). Armed and mounted, they made effective bandits.

Mistreatment in the military

Other Khoe-San ended up joining one of the colony's military regiments. This was not always voluntary, as some recruits were forced to join upon arrest for vagrancy (Malherbe 2002). The 'Cape Corps' was based at Grahamstown from 1812 (Elphick and Malherbe 1989: 36). Conditions in the barracks were

terrible, sickness was rife, payments were delayed or cancelled, and members were frequently denied visits home (Blom 1990: 30, 31). These conditions led to many deserting, taking their equipment with them, and often either forming or joining other groups of bandits (Storey 2008: 45; Challis 2012).

Slavery

Slaves first arrived in South Africa following the arrival of the Dutch in 1652. While some slaves came from West Africa, the majority came from Madagascar, Indonesia, India and Sri Lanka (Armstrong and Worden 1989: 112, 116). The Dutch East India Company had expressly forbidden colonists from enslaving the local population (Worden 1985: 7). However, there was an illegal internal south African slave trade. For many of the poorer European farmers living in the borderlands of the colony, imported slaves were an expensive purchase. It was easier and more affordable to embark on a commando and attack a kraal of Khoe-San. The men would typically be killed, while the women and children were taken as slave labour (Adhikari 2010: 30). There were also mixed groups of Khoe and European descent, such as the Korana, who actively raided for slaves and traded them with European farmers (Barrow 1801: 404). Those slaves who could, often escaped and turned to banditry.

The effects of commandos

To combat stock theft by Khoe-San and others, the colony introduced the commando. This was a loosely organised military system that required European farmers to participate in patrols, or they could send a representative in their stead, usually a farm worker of indigenous or mixed descent. The brutality of the commando system was a major factor in encouraging Khoe-San to attack the colonialists since they literally had to fight for their lives (Penn 2013: 187).

Bandits and rock art

Rock art images of people on horseback with firearms have often been interpreted as depictions of Europeans (e.g. Vinnicombe 1976). However, as indicated, it was common for groups of bandits to have horses and guns. This was witnessed by many farmers in the region (e.g. Pringle 1840). A growing body of scholarship (Ouzman 2005; Challis 2012 inter alia) is focused on images such as these in other regions of South Africa.

Drawing on historical sources that attest to local groups using weapons and riding horses, Ouzman (2005) and Challis (2018 inter alia) argue that these are not necessarily images of Europeans but rather of the painters themselves. I believe it necessary to take the same approach to the art of the Winterberg, especially as we see scenes that appear to depict livestock raids. The bandits, mounted and armed, drive off cattle and sheep (Fig. 2).

Seeking assistance in the spirit world

Hobsbawm (1969)argues that bandits rely not only on their physical capabilities but that they may also use magic or turn to their religious beliefs and the spiritual world for assistance. We see this among southern African groups in their use of traditional medicines for protection and to ensure the efficacy of their weapons. It is also visible in the production of rock art, which is itself a spiritual endeavour, as it has been shown that



Fig. 2: From a site along the Tarka River. A human figure on horseback has a gun over its shoulder. Cattle and sheep as well as a large black rain bull are depicted.

images relate to the journeys undertaken by ritual specialists while in an altered state of consciousness (Lewis-Williams 2019).

San, Khoe and African farmers were known to use certain root medicines to protect themselves from enemy projectiles. The |*Xam* San informants to Wilhelm Bleek and Lucy Lloyd spoke of a medicine known as *so-/oa*. This root was burnt and the ashes rubbed into incisions on the user's wrist and hand to make his arrows fly straight (Hollmann 2004; Challis 2014). Among Xhosa-speakers, this medicine was known as *umabophe* (Challis 2014). Although first applied to arrows and spears, these medicines were later used with firearms when bullets were kept in the same pouches as the medicine to make them more

effective (Schapera 1930: 355; Sinclair-Thomson 2019). This medicine was also believed to protect the user from musket balls, most famously in 1819 when the Xhosa war doctor Nxele led a force against Grahamstown, and in 1850 during the Mlanjeni War, where the war doctor Mlanjeni provided Xhosa warriors with sticks of *umabophe* to chew and spit around themselves for protection (Challis 2014). In these examples it was believed to turn settlers' bullets to water (Sinclair-Thomson and Challis 2017).

Rain and raiding

Within the African belief system there was a strong link between water and conflict (Sinclair-Thomson and Challis 2017). Rainmakers in African farming communities typically took on the role of war doc-



Fig. 3: From a site on the Baviaans River. A human figure on horseback is accompanied by another human figure holding a rain bull by the nose.

tor in times of warfare. The war doctor would call upon the rain elements to create a mist to camouflage warriors. Where cattle theft occurred, the rain would likewise be controlled to wash away the tracks of stolen animals, making it impossible for pursuing commandos to recover them (Wright 1971; Vinnicombe 1976; Challis 2008, 2014). This also occurred among mixed raiding groups with a San, or a perceived San, connection. In one instance, the AmaTola 'Bushmen' of the Maloti Drakensberg called down rain upon their pursuers by one of their members blowing through an eland horn (Vinnicombe 1976; Challis 2008). Where this belief is perhaps most pertinent to us, is in the rock art of the bandit groups, where we see images of rain animals among the armed riders and livestock.

The testaments of 19th century San informants describe how rainmakers control the rain. While in an altered state of consciousness, the rainmaker would find the rain-animal or rain bull, known as the !Khwaxa-xoro, in a pool or other water source. The animal was led by the nose across the sky where it was either cut or milked, its blood or milk falling as rain (Bleek 1933: 32). Sites in the Winterberg include depictions of an unusual looking bovid that, following the research of others (e.g. Dowson et al. 1994), is best identified as a rain bull. In these depictions, a human figure, often brandishing a weapon, holds the rain bull by the nose (see Figs 2 and 3). A similar scenario is seen at a famous site at Bamboo Mountain, which has been argued to depict ritual specialists assisting raiders by calling upon the rain (Challis 2016).

That the sites in the Winterberg also include depictions of raids suggests that in these instances a ritual specialist called upon the rain to assist the bandits, and that the images were committed to the rock face as part of this ritual activity. The fact that these other-worldly creatures are shown along with the raiders demonstrates that the raiding scenes were not simply events that the artists had witnessed and decided to paint, as has so often been argued by earlier researchers (e.g. Vinnicombe 1976). Rather, like earlier forms of rock art, these paintings too were tied to spiritual beliefs.

The end of banditry in the Winterberg

In the late 1820s, banditry in the Winterberg ceased. This was partly the result of the devastating effects of the commandos. For example, further north of the study region, Colonel Collins in 1809 met with two farmers who had been on commandos that had killed nearly 6 000 Khoe-San in the area (Moodie 1838: 7). Following this, other bandits chose to abandon banditry and seek work on settlers' farms. This was the case with Lynx and Frolic, two of the most feared bandits of the Bamboesberg, who frequently raided the Tarka area in the Winterberg (Moodie 1838). Another option for bandits was to move out of the area and continue their activities elsewhere. Strong evidence suggests that some of those from the Winterberg region made their way up north to the Maloti-Drakensberg where they continued their raiding activities (Challis 2008: 2012).

Conclusion

The late 18th and early 19th centuries saw a series of attacks take place on settlers' farms in the Winterberg mountains. The perpetrators of these stock raids

were mixed groups of bandits whose members included Khoe and San, military deserters and runaway slaves. Armed with muskets, spears and bows and arrows, and mounted on horseback, these bandits furiously resisted colonialisation. They turned to the spirit world and used traditional medicines and ritual practices to aid their clandestine activities. Their endeavors finally came to an end in the late 1820s as the region was more densely settled and the efficacy of punitive commandos grew. Although banditry was finally crushed in the area, the concerns and beliefs of these groups remain captured in rock art images in the Winterberg.

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The South African Archaeological Society

APPLICATIONS FOR RESEARCH GRANTS FROM THE KENT AND WARD FUND

The Kent and Ward Fund was established as a result of two generous bequests by long-term members of the SA Archaeological Society. The first, in 1992, was from the late Dr Leslie Kent, a geologist in Johannesburg, while the second, in 2017, was from the late Valerie O'Hagan Ward, who organised the society's branch in KwaZulu-Natal for many years. The society has invested the income and the interest is distributed from time to time at the discretion of the society for contributions towards:

- i Financing of field work
- ii Research projects
- iii Analysis of archaeological material
- iv Publication or supporting the publication of the results of research

The Society invites applications for 2021 for awards in all categories.

Guidelines

- The work must be conducted in southern Africa.
- Preference will be given to researchers domiciled in southern Africa.
- Preference will be given to researchers who are starting a career in archaeology.
- Projects 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, and archival or bibliographic work.

- Proposals may also include the publication of the results of research that popularises archaeology for public education and community awareness.
- The fund will not contribute to purchase of expensive equipment such as cameras, microscopes or laptops for the analysis of results, or to living expenses during the writing of reports or publications.
- Successful applicants will be required to provide a digital copy of the report on work completed or submit a paper for publication to the *South African Archaeological Bulletin* or *The Digging Stick*.

The application form can be downloaded from the Society's website at www.archaeologysa.co.za, or is available from the Secretary, SA Archaeological Society, PO Box 15700, Vlaeberg 8018; tel. (021) 762 7347; e-mail archsoc@iziko.org.za, and must be submitted before 31 July 2020. All applications will be refereed by specialists. The successful applicant/s will be notified by 15 September 2020.

A ROCK PAINTING AT SNOWHILL CAVE IN THE DRAKENSBERG

J Francis Thackeray

The rock painting from Snowhill Cave in the Underberg region of the Drakensberg shown in the accompanying figure includes a trance-related shamanic therianthrope (part animal and part person) with human legs but an antelope head and body, probably that of an eland. It was copied by Patricia Vinnicombe (1976) and published in her book entitled *People of the Eland.* Similar to an iconic painting at Kamberg in the Drakensberg (Lewis-Williams 1981), the shaman is associated with a dying eland with its

ance-related displaying what I refer to as 'curiosity behaviour' of the kind when an antelope stops, stands and stares in the direction of a disguised hunter (or an ethologist in my case), as exemplified in a painting at the Fulton Rock Shelter (Thackeray 1983). Curiosity behaviour was evidently perceived in terms of the ability of a shaman to control animals, even to the extent of stimulating game to approach within the range of an arrow.

The Snowhill Cave panel is of further interest in the

sense that the therianthrope is depicted en face,

head down in the throes of death. Such scenes can be considered to reflect empathetic relationships between a 'dying' shaman in trance and a dying antelope.

Also related to the concept of dying is the fact that the Snowhill Cave therianthrope has a vertical line painted down the middle of the body and, as such, has been considered to be 'symbolically wounded' (Thackeray 2005a). This corresponds potentially to two examples of dated art on small



Rock painting at Snowhill Cave, Underberg district, Drakensberg, after Vinnicombe (1976). A therianthrope incorporating human legs but the head and body of an antelope, is juxtaposed with a dying eland (head down in the throes of death). The therianthrope has a line down the middle, interpreted as a symbolic wound associated with the 'death' of a shaman. Furthermore, the therianthrope (en face) displays 'curiosity behaviour' of the kind that enables a hunter to gain close access to prey. An ability to take advantage of such animal behaviour has been linked to shamanism (Thackeray 1983).

slabs of rock I have discussed previously (Thackeray 2005b, 2013). One is an engraving of a zebra from Wonderwerk Cave on the southern margin of the Kalahari (Thackeray et al. 1981), while the other is a painted therianthrope from the Apollo 11 Cave in southern Namibia (Wendt 1976). In both cases, the images of an animal or therianthrope are broken vertically down the middle, reminiscent of the vertical line in the Snowhill Cave scene. The Wonderwerk engraved zebra was retrieved from deposits dated at about 4 000 years BP and has incisions (cf. wounds) on its rump. It was probably broken deliberately (Bradfield et al. 2014), which in itself is a symbolic act. The Apollo 11 painted therianthrope has been dated at about 30 000 years BP and has been subjected to pecking on part of the image (Rifkin 2015), which could at least potentially relate to the concept of symbolic 'wounding'.

The Snowhill Cave panel thus appears to incorporate concepts related not only to animals in the context of dying, trance and 'symbolic wounds' but also to beliefs related to curiosity behaviour and control over an animal. I propose that this is explicable in terms of an evolutionary process through time, in the order of thousands of years. In particular, the Snowhill Cave painting may be considered as a rare example of rock art reflecting the combined product of conceptual evolution, hypothesised here as having developed in the following kind of sequence:

- 1. Observations of curiosity behaviour (within the last 100 000 years), perceived by early *Homo sapiens* in terms of control over animals in relation to anticipated success in a prospective hunt. Representations of such behaviour are depicted at Fulton Rock Shelter, (Thackeray 1983).
- 2. Beliefs associated with rituals and beliefs exemplified by the c. 4 000-year-old Wonderwerk zebra, in which an image of an animal is symbolically wounded, related to so-called 'sympathetic hunting

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magic' in the context of expected success in a future hunt (Thackeray 2005b, 2019). Such rituals were documented in the 20th century by Lebzelter (1934).

- 3. Rituals in which a hunter takes on the form of an animal and is symbolically wounded in the belief that this will contribute to success in a forthcoming hunt. Such rituals were documented in the early 19th century by Lichtenstein (1812) and may relate to paintings of the kind depicted at the Melikane Shelter in Lesotho (Thackeray 2005), including therianthropes with mid-body vertical stripes that have been interpreted as symbolic wounds on the body (Thackeray and Le Quellec 2007).
- 4. Beliefs associated with trance-related shamanism that developed in an evolutionary sense from aspects of all three of the above and which are reflected in the painting at Snowhill Cave.

It is in this way that one might interpret southern African rock art in the context of an 'Evolutionary Development Hypothesis' (EDH), developing through time from beliefs associated with animal behaviour and rituals related to the symbolic wounding of an engraved or painted image of an animal, and/or rituals in which a hunter is himself wounded, leading to beliefs associated with 'dying' shamans and dying eland in the context of trance and concepts of control over animals.

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ARCHAEOLOGY IN AFRICA

First ancient DNA from west/central Africa

An international scientific team led by Harvard Medical School has produced the first genome-wide ancient human DNA sequences from west and central Africa. The data, recovered from four individuals buried at an iconic archaeological site in Cameroon between 3 000 and 8 000 years ago, enhance our understanding of the deep ancestral relationships among populations in sub-Saharan Africa, which remains the region of greatest human diversity today. The findings, published in *Nature* of 22/01/2020, provide new clues in the search to identify the populations that first spoke and spread Bantu languages. The work also illuminates previously unknown 'ghost' populations that contributed small portions of DNA to present-day African groups. Research highlights include:

• DNA came from the remains of two pairs of children who lived around 3 000 years ago and

8 000 years ago respectively during the transition from the Stone Age to the Iron Age.

- The children were buried at Shum Laka, a rock shelter in the Grassfields region of north-western Cameroon where ancient people lived for tens of thousands of years. The site has yielded a prolific number of artifacts along with 18 human skeletons. It lies in the region where researchers suspect Bantu languages and cultures originated. The spread of these languages, and the groups that spoke them, over the past 4 000 years is thought to explain why the majority of people from central, eastern and southern Africa are closely related to one another and to west/central Africans.
- Surprisingly, all four children are most closely related to present-day central African huntergatherers, who have very different ancestry from most Bantu speakers. This suggests that present-

day Bantu speakers in western Cameroon and across Africa did not descend from the sequenced children's population.

- One individual's genome includes the earliestdiverging Y-chromosome type, found almost nowhere outside western Cameroon today. The findings show that this oldest lineage of modern human males has been present in that region for more than 8 000 years, and perhaps much longer.
- Genetic analyses indicate that there were at least four major lineages deep in human history, between 200 000 and 300 000 years ago. This radiation had not been identified previously from genetic data.
- Contrary to common models, the data suggest that central African hunter-gatherers diverged from other African populations around the same time as southern African hunter-gatherers did.
- Analyses reveal another set of four branching human lineages between 60 000 and 80 000 years ago, including the lineage known to have given rise to all present-day non-Africans.
- The Shum Laka individuals themselves harbour ancestry from multiple deep lineages, including a previously unknown, early diverging ancestry source in West Africa. *Harvard Medical School*

Tiny brains of extinct human relative had complex features

What makes humans so smart? For a long time the answer was simple: our big brains. But new research into the tinv brains of Homo naledi discovered in the Cradle of Humankind may challenge that notion. Findings suggest that when it comes to developing complex brains, size is not all that matters. H. naledi is now thought to have lived 236 000 to 335 000 years ago. Based on the cranial remains, the researchers concluded it had a small brain only about the size of an orange. Imprints of the brain on skull fragments suggest that despite its tiny size, the hominin 's brain shared a similar shape and structure with that of modern human brains, which are three times as large. We have now seen that you can package the complexity of a large brain in a tiny packet,' says Lee Berger from Wits University and an author of the paper published in the Proceedings of the National Academy of Sciences. 'Almost in one fell swoop we have slayed the sacred cow that complexity in the hominid brain was directly associated with increasing brain size.' Not every scientist agrees with their interpretation.

Since its remains were first retrieved, *H. naledi* has puzzled scientists. From head to toe the ancient hominin displays a medley of primitive, apelike features and more advanced, humanlike characteristics. 'It is this mosaic that is unlike anything we have seen or expected,' said Dr Berger. *H. naledi* had small teeth like a human's but their shape more closely resembled that of an ape. Its shoulders were also apelike, but the arms, wrists and hands were more humanlike. The fingers, though, were long and curved, and the thumbs appeared particularly strong. The spine was a combination of primitive and Neanderthal-like, the pelvis resembled that of another more distant human relative, *Australopithecus afarensis* (dubbed Lucy) and the thighs also looked primitive. But below the knee, the legs were long and thin like a human's and the feet were nearly identical to our own.

Now, researchers have found that *H. naledi's* similarities with modern humans extend into the brain. After examining the imprints, or endocasts, from five skull fragments, the team found that the species had a frontal lobe very similar to that of modern humans and unlike that of an ape. The scientists also found that *H. naledi* had an asymmetrical brain, with the left brain appearing more forward than the right, which is also seen in humans. Asymmetry in the brain is associated with higher levels of behavioural complexity, according to the team. Based on the regions of the brain that *H. naledi* shared with modern humans, the authors suggested that it may have exhibited complex behaviour.

But what they did not say was what those behaviours may have been, said John Hawks, a paleoanthropologist at the University of Wisconsin and an author of the paper. 'Is that aspect of the brain evolution central to talking or stone tool making? We do not know enough to say that.' He added that the finding does not mean that brain size is not important to creating a complex brain – it is. Rather, size alone does not tell the whole story. 'There is something about shape that actually matters too,' he said.

'These new fossil hominids show that the evolution of hominins is much more complex than we thought before,' said Ralph Holloway, a paleoanthropologist at Columbia University and lead author of the paper. Emiliano Bruner, a paleoneurobiologist at Centro Nacional de Investigación sobre la Evolución Humana in Spain, said the finding still needs to be confirmed from a wider fossil record of the species that comes from outside the Dinaledi chamber fossil site. That would help with understanding any variation that appears within the species. Simon Neubauer, a physical anthropologist at the Max Planck Institute for Evolutionary Anthropology in Germany, said the finding did support the idea that both brain size and brain organisation are important to human evolution. But because of its age, the tiny-brained H. naledi might be an outlier in a general hominin trend toward increasing brain sizes.

Dr Bruner agreed: 'It is not reasonable to forget all that evidence because of a couple of outliers,' he said. 'Exceptions are, as always, expected. But this does not break the rule.'

Nicholas St Fleur, The Times, 14/05/2018

A VISIT TO THE CASCADES FEMALE FACTORY IN TASMANIA

A places of terrible suffering and inhumane treatment

Barry Jacoby

Most people associate the Sydney area of Australia with its convict history but not all that many realise that Hobart in the penal settlement of Van Diemen's Land (Tasmania) was home to a great number of convicts for many years. In this article I deal with a woman's only prison, which was one of the most important sites connected with female convicts in Australia.



Fig 1: The entrance to the factory

From 1788 to 1853, a staggering number of 25 000 female convicts was transported to Australia from

Britain. Nearly half of them ended up in Van Diemen's Land in one of the five women's prisons that were known as factories because they were sites of production. Many of the women were victims of circumstances, having lived in dire poverty in Britain. After conviction for their crimes, which were often of a minor nature, they were transported to the other end of the world.

Most women were incarcerated in the Cascades Female Factory, which was both a workhouse and a place of reform. Whether a factory was considered a workhouse or a prison, the effect was the same. They were places of terrible suffering and the most inhumane treatment. Women

would spend time in these places while awaiting

assignment as an unpaid servant to a free settler, or while awaiting childbirth and subsequent weaning, or as a punishment.

Female factories were based on British prisons and workhouses and reflected 19th century moral and penal philosophies. One of their purposes was to 'remove women convicts from the negative influences and temptations of Hobart and to protect society from their immorality and corrupting influence'. The philosophy behind the factories was that by making the convict women work it would get them into a way of life that involved cleanliness, guietness, regularity and industry. The women were expected to be polite, docile and clean but because of their backgrounds and upbringing the opposite was often the case. Many were promiscuous in the extreme and drunkards. They also often absconded, especially if sent to an abusive master. When caught they were sent back to the factory for punishment.

The Cascades Female Factory

The facility is a grim stone-built building, the remains of which stand near the famous Cascades Brewery (Fig. 1). At its peak, it contained five yards for different classes of convicts. Today, only a few of the buildings survive; stones mark the outlines of those that were demolished (Fig. 2). Before the factory was built, the



Fig 2: Yard 1 with outlines of buildings

convicts were housed in the Macquarie Street gaol in Hobart. Originally a rum distillery stood on the female factory site but because of competition from 16 other distilleries in the area and other reasons it failed financially. The owner sold the three-acre site to the Colonial Secretary for redevelopment as a prison for women.

Barry Jacoby, a committee member of the Northern Branch of the ArchSoc, is a retired attorney, has authored two books of short stories and is an enthusiastic amateur archaeologist. He has excavated with Prof. Jose Braga at Kromdraai, worked with Dr Morris Sutton at Swartkrans over a seven-year period, and excavated his own site, Goldsmith's farm. Barrydane45@gmail.com.



The first convicts from the ship Harmony were transferred in 1829 to what was later to be called Yard Number 1. This yard comprised various twostorey buildings, one to house staff and the others providing day rooms for convicts, a kitchen, a nursery (many women gave birth but few infants survived) and a hospital. The yard was subdivided into seven spaces; the entrance and offices took up one, others served the nursery, hospital and kitchen, there was a yard next to the sleeping quarters, and there were workspaces for each class of convict. The yard also had a chapel, storerooms and twelve solitary confinement cells. Mothers were soon separated from their children, who would be looked after in the nursery. Many of the children there never saw their mothers again.

As the years went by and the prison population expanded, yards 2 to 5 were built to alleviate the overcrowding and insanitary conditions. Yard 2 was completed after 30 months of building work in 1832. It was smaller than Yard 1 and contained washing facilities for the laundry and also solitary cells, which, according to the *Hobart Town Courier*, had an awfully dismal and sepulchral appearance and must have had a salutary effect in forcing reflections and leading to self-examination and reform'. The new yard became known as the washing yard (Fig. 4).

By 1841 overcrowding had reached severe levels as more and more female convicts were sent from Britain. The new governor held an enquiry into conditions in the factory, which revealed that the inmates had too little space to work properly. Women even had to share the hammocks in which they slept. The staff had great difficulty in controlling riots or acts of unruly behaviour because of the crowded conditions. The population had swelled to over 500 in a space designed to hold 200 when another 112 women arrived. In 1842 some of the overflow was held in a new temporary establishment in New Town. Construction of Yard 3 began at the end of 1842 and by 1844 a third of its 112 single cells had occupants. The 3,65 m by 1,4 m cells were not punishment cells but served as accommodation units to keep the women apart from each other (Fig. 5).

A change in thinking about penal reform had led to the use of single cells rather than dormitories at this time. Incoming women now spent six months as probationers, being taught basic reading, writing, sewing and spinning before being assigned as domestic servants to

settlers, always provided they behaved well. During the probation periods, convicts were kept apart from each other 'to encourage reform and repentance'.

By the mid-1840s, female convicts were housed in several different places in Hobart as the Cascades Factory could not cope with the numbers. Many of the women were pregnant, either having become so on the voyage to Australia or during their time as servants in Hobart. Suitable accommodation was urgently needed as the death rate for infants in the women's factory was frighteningly high. Some pregnant convicts or those with babies were incarcerated on a convict hulk called *The Anson*.

Yard 4 was completed at the beginning of 1851. It had a large sun-facing nursery building with a veranda and was designed to hold 150 children and 88 women so that babies might be with their mothers until they were weaned. After that they were placed in the care of nursing mothers until they turned three, when they were sent to the Queens Orphan School. Soon after this yard opened it housed 750 women and 150 infants. Yard 4 also had an exercise yard, a cookhouse and a laundry. Various other sites were experimented with over the years for nurseries.

The final yard, Number 5, was built in 1852. Unlike



Fig 4: The washing yard (Google image, Alastair Bett)



Fig 5: Outline of cells

the other yards it was only surrounded by a 1,5 m high wall so more sunlight could reach it. Its two-storey building held passholders and probationers hoping for employment. This yard contained the factory's first flushing toilets.

Health conditions

Conditions in the facilities where prisoners were originally held were far from satisfactory and there was an urgent need to move them from the overcrowded and dilapidated places. The Cascades Factory was situated in an area of damp swamp land. This, together with overcrowding and unsanitary conditions, led to high disease and mortality rates amongst the occupants. The death rate of children was one in four, which was considerably higher than the rate in Hobart. The infant mortality rate was the subject of several commissions of enquiry and inquests. Many children died of diarrhoea and there was no place for children to exercise or play other than in the wet stone yard where the sun did not shine for four months of the year.

Classes of convicts and work categories

Convicts were divided into three classes. These were not permitted to associate or communicate with each other at all. The first class of convicts was made up of women that had arrived from Britain recently and who had been well behaved on the long voyage, as well as women returning from service as servants in Hobart and the surrounding areas or had 'graduated' from the second class.

Second class of convicts were those deemed to be suitable for employment, for the most part women guilty of only minor offences and who had been promoted from the 'crime' or third class. This third class comprised women who had been transported for a second time, who had been 'unruly' on the voyage or had been convicted of more serious offences either in Britain or in Van Diemen's Land. The different classes wore separate clothing and performed different daily tasks. First-class women were used as cooks, task overseers and attendants in the hospital. Second-class convicts made clothes for the inmates and prepared and mended linen, while those in third class slaved over the washtub, doing all the washing for the establishment, the nearby orphan school and the gaol. They also spent long hours carding, picking apart old ropes or oakum and spinning wool. It was policy to impose the utmost severity of work upon disorderly domestic servants so that they might repent of their errors and be returned to service.

Punishment and reform

As more and more women were transported to Van Diemen's Land there was insufficient need for their labour. On the other hand, they contributed in a major way to immorality. Reform through work was seen as the way to integrate female convicts into society, especially in Van Diemen's Land where men outnumbered women by ten to one.

The work done by the prisoners was often very hard and the hours were long, up to 12hours a day in summer, with severe punishments for even the slightest disobedience or breach of the many rules. Particularly unruly women were forced to wear a heavy iron collar for long periods of time, often for days. Shaving a woman's head to shame her was also used as a disciplinary measure. Punishment could also mean being demoted to a lower class or solitary confinement on a sparse diet of bread and water in a very small dark cell for periods varying from a week to a month. Another punishment meted out was to dose them with the nausea-producing drug *ipecacuanha* and put them on half rations.

The enlightened thinking of the time did not permit women to be flogged, but on occasion they might even be sentenced to a period of hard labour at rock breaking.

Closure of the Cascades Female Factory

In 1853 the transportation of convicts to Van Diemen's Land came to an end and new functions had to be found for unused parts of the factory. The main site became a gaol in 1856 and it housed male and female invalid depots in 1869, as well as a boy's reformatory. Other uses from time to time included a hospital for the insane, a contagious disease hospital and a lyingin home. During this time the factory only consisted of Yards 1 and 2 and part of Yard 5.

The site was finally closed as a prison in 1877 and the other institutions using the site had all left by 1904. Parts of the property were sold off and some of the buildings demolished, but in 1970 the Women's Electoral Lobby obtained Federal grant money and bought Yard 1, which it gave to the Parks and Wildlife Service. The Female Factory Historic Site Ltd bought Yard 3 and the matron's quarters in 2004. In 2008 the Tasmanian State Government acquired the rest of Yard 4 to form the historic site as it now exists.

Eleven convict sites, including the Cascades Female Factory, comprise the Australian Convict Sites World Heritage property, but the Cascades is the only surviving female factory.

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WORLD ARCHAEOLOGY

50 000-year-old string at Neanderthal site



A scanning electron micrograph of the cord fragment showing the twisted fibres. (Copyright PA MEDIA)

A piece of 50 000-year-old string – the oldest yet discovered – found in the Abri du Maras cave in France has cast further doubt about the idea that Neanderthals were cognitively inferior to modern humans. A study published in *Scientific Reports* said a tiny, three-ply cord fragment made from bark was spotted on a stone tool. It implies that Neanderthals had a cognitive understanding of numeracy and a context-sensitive operational memory. Twisted fibres provide the basis for clothes, bags, nets and even boats. Neanderthals are already known to have made birch bark tar, art and shell beads. They also controlled fire, lived in shelters, were skilled hunters of large animals and deliberately buried their dead.

The cord fragment adhered to the underside of a 60 mm long, 0,5 mm wide stone tool found by a research team from France, the US and Spain lead by Bruce Hardy of Kenyon College in Ohio. The cord is believed to have been made with the inner bark of a conifer tree. Three groups of fibres were separated and twisted clockwise in an 'S-twist'. The strands were twined anti-clockwise in 'Z-twist' to form a cord. The study concludes that the production of the cord demonstrated that Neanderthals had a detailed ecological understanding of trees. BBC, 13 April 2020

Has China found world's oldest art?

Abstract patterns carved on rib bone fragments

discovered in China and dating back to between 105 000 and 125 000 years could be the oldest art ever made. The marks on two bones were found at a site in Henan Province thought to be populated by Denisovans, according to a new study in *Antiquity*. The markings contain traces of ochre on one specimen. This is the earliest evidence of the pigment's use for decorative purposes. The newly discovered artworks pre-date even the 73 000-year-old abstract markings found at Blombos cave.

'This discovery indicates that the production of abstract motifs, possibly used for symbolic purposes, was an integral part of the cultures developed by human populations who lived in China contemporary to the emergence of *Homo sapiens* in Africa,' said Luc Doyon. Researchers say it is unlikely that the carefully engraved markings were accidental or



Engraved human bone fragment found in China's Henan Province. Image courtesy of Francesco d'Errico and Luc Doyon.

utilitarian, which means they could be evidence that the early hominids were capable of symbolic thought and communication, capacities once thought to be exclusive to modern humans. The Chinese site was discovered in 1965 and has been home to continuous excavations since 2005. The engraved bones were uncovered in 2009 and the markings were first noted in 2016. More than 30 000 bone fragments have been unearthed from the site. *Sarah Cascone, 19/7/ 2019*

SOUND AND SONG LINES IN THE ROCK ART OF THE CEDERBERG

Those who were seen dancing were thought to be insane by those who could not hear the music

(Nietzsche, 1844-1900)

Andrew Paterson

The discovery of implied and painted sound in rock art is of significant consequence to our understanding and interpretation of this art (Paterson 2007, 2016, 2018, 2019). The current theory in South African rock art is that the thin red lines encountered are to be interpreted exclusively as entoptic images and hallucinations experienced in the mind of the San during altered states of consciousness. I suggest here that there is a realistic and reasonable alternative interpretation.



Fig. 1: Implied sound: the sounds of the San women's ecstatic dancing with hands in the air and in association with elephants and eland imply specific songs and dances of these animals.

To begin with, when talking of sound, we need to remind ourselves that we do not see, touch or smell sound; we can only hear and feel it. Human and animal sounds are produced by the vibration of the vocal folds in the larynx as air passes from the lungs through the larynx into the throat and out through the mouth. To appreciate the significance of unseen sound to the San, I have quoted mainly from the work of major researchers who spent years living in Namibia and Botswana, and experienced and documented the Ju/'hoansi San at first hand, namely Lorna Marshall (1999), Megan Biesele (1993) and B and H Keeney (2015). In this article I put forward an argument for implied and painted sound in rock art. Implied sound (Fig. 1), I define as the sound that one would logically 'expect to hear and feel' when observing the subject matter of the paintings. Sound can be implied from the placement and relative positions of the San figures and animals in a painting, the display of body and hand gestures from known San ethnographic behaviour, and from the known ethological behaviour of animals.

Painted sound (Fig. 4), I define as the artist's symbolic and graphic illustration of sound, using painted thin red lines to connect or surround the appropriate body parts that one would expect to produce or receive sound. However, I do not regard all painted thin red lines as sound lines only. For example, I consider some such lines as being the air that makes the sound. In reality, air and sound can obviously not be separated and both are n|om, the vibrant life force that the San believe animates all living beings.

The simplest way to argue for these two proposed sound classes is to present the paintings themselves. I discuss well-known paintings that I believe to be renditions of implied and painted sound. They display at least 12 different possible types of sound that I feel have been identified so far, namely speech, storytelling, clapping, stamping, dancing, singing, music, the sounds of at least four animals and of natural phenomena such as thunder and rain.

The sounds of voices and storytelling among the San (Figs. 2a and 2b)

According to Biesele:

 Not only is the number of Bushmen who tell stories competently quite large, but virtually every old person is able and usually willing to tell stories. Of many people whom I heard perform there were very few who could not tell the stories of the old time with confidence and vigour.

According to Liebenberg:

• The adaptive value of art can best be illustrated by the role that storytelling plays in hunter-gatherer subsistence. Throughout their growing years, children spend many hours listening intently to the conversation of their elders.

The significance of sound to the San

The ethnographic records of Marshall, Biesele and

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Andrew Paterson has for over a decade been studying the San rock art of the Cederberg with Prof. John Parkington of the University of Cape Town and the eCRAG rock art group of the South African Archaeological Society under the leadership of Prof. Janette Deacon. andypat@iafrica.com.



Fig. 2a: Implied sound: a group of San adults and children listening spellbound to a storyteller. Fig. 2b: Painted sound: two groups of San in conversation with one another through the medium of sound.

Keeney and Keeney over the past 70 years all reflect the vital importance of sound and songs to the San.

According Lorna Marshall, the San make music with their bodies:

- The !Kung are a music-loving people. Music is their art, their pleasure, and a vehicle for symbolic expression. Much if not most of the time in a !Kung encampment, someone is making music. (Fig. 2)
- The brilliant, shimmering music that the !Kung achieve with their voices, feet and hands is truly remarkable. It is achieved by structuring the music in contrapuntal form. Two or more rhythmic lines of the women's clapping ripple over the men's stamping patterns. The women in contrapuntal manner sing several lines of melody together with the basic melody of the song. The singing lines are beautifully coordinated with the lines of clapping and stamping. (Fig. 3)

According to Megan Biesele the San 'dance a song' – djxani tcxai:

• The music of the dance comes mainly from the part-singing and complex clapping of women. The dance is perhaps the central unifying force in Bushman life, binding people together in very deep ways which we do not fully understand. The singers' contribution is in making the sounds which act as indispensable musical protection for the curers as they traverse dangerous realms. The psychological effect of this uniting for common good may contribute to the group's survival. The dance thus embodies the values of egalitarianism and tolerance, and reinforces the idea of mutual effort against misfortune. In a generalised sense

all these values and attitudes have aided the Ju/`hoansi to make. even with their relatively simple technology, a successful, longadaption to lived their environment. (Fig. 4)

According to Keeney and Keeney:

 They are a dancing culture. They know through dance, and they dance their ideas, emotions, and laughter, as well as their bodies. Their world moves, like the changing seasons, and they move with it, valuing

constant movement and change more than any static moment. (Fig. 1)

 A n|om-kxao who is bent over stomping, in what the Bushmen sometimes identify as dancing with the ancestors, has an inner belly pump in motion that brings forth strenuous breathing and guttural sounds. In this situation the n|om-kxao sometimes snorts as he makes low rhythmic sounds. This intense action, involving heavy breathing through the nose, can bring on a nosebleed.

The significance of *n*|*om* **songs** According the Lorna Marshall:

• The most important repertory of !Kung music is



Fig. 3: Implied and painted sound: women clapping with fingers outspread. The nested U-shape in the palm of each decorated handprint could depict the explosive sound of San women's clapping.



Fig. 4: Painted female sound: naked women dancing the Great Eland Dance at a young girl's first menstruation initiation ceremony. Thin red lines illustrate the accompanying shimmering sound of women singing in cadences and the stamping-sound bracelets and strings of beads make to represent the eland's tail.

of the n|om songs. The belief that the songs are given by the great god to their composers, that the songs are charged with powerful n|om and are an essential element in the Ritual Healing Dance.

According the Megan Biesele:

- The songs of the dance, in contrast to everyday songs of the Ju/`hoansi, are said to possess n/om, a special kind of energy or spiritual power. N/om is invisible, dwelling in the n/om songs and in the bodies of the dancers. This is the way of the Bushman – being improvised, moved, danced, sung and touched by the mystery of n|om, inseparable from the longing and loving of the Sky God of all of creation. (Fig. 2)
- Nom is the vibratory life force that comes directly from God and is recognised by the Bushmen to animate all living beings and to be the source of all inspired energy. The whole Bushman way of life is about awakening, receiving and sharing n|om. It's about being danced by n|om. (Fig. 2) To the Bushman, nature is seen as a web of interconnected ropes, strings and threads of nom. Hunters are connected to eland, elephants and other animals by ropes, and gatherers are connected to the plants they collect by similar ropes of nom. For the Bushmen the web of nature is literal, and in an awakened state the nom-kxao may see the world as a giant spider web. Nom is sent throughout the entire weave and thereby contributes to the wellness of the whole ecology. (Figs. 1 and 7)

N|*om* songs and the sounds of animals

According to the ethnographic records there are numerous n|om songs. They come in the form of

animal songs and dances such as those of the eland *n*!ang djxani, elephant !xo djxani, giraffe \neq oah djxani, gemsbok g!o`e djxani songs (Fig. 6). There are also songs and dances of rain, sun, earth and sky, and of honey, grass and the g!oah tree (Fig. 7).

According to Keeney and Keeney:

It is important to emphasise that each n|om song of an animal carries the n|om of that particular animal. If a healer is strong, a song will enter his heart, enabling him to enter first creation. He will properly see the song that rises out of his heart and feel it in the way it is correctly associated with the feeling for the animal. (Figs 1 and 7)

Songs are often combined, for example Lorna Marshall states that (Figs 6 and 7):

• The Rain Song and Great Eland Song have the distinction of being the only two !Kung musical compositions to be composed in an unusual and probably very old way. The Great Eland Song comes from the repertory of the Menarcheal Rite Music. Like the Rain Song it has been incorporated in the Healing Dance music because it is strong and beautiful, we were told.

Sounds in natural phenomena

In the Cederberg I have encountered a number of most unusual 'pod shaped' symbols surrounded by sinusoidal or wavy lines. Two such connecting pods are filled with seven elephants (Fig. 7a), which are believed by the San to be rain animals. Rain symbols occur throughout the Cederberg (Paterson 2018). I propose that the accumulated sound of the seven elephants could have been regarded by the San as being the sound of thunder. I suggest further that other similar pod shapes (Figs 7b and 7c) associated with rain symbols (Fig. 7d) elsewhere in the Cederberg are 'sound pods' of thunder clouds.

The connection between songs and paintings

This connection is vividly illustrated by an incident



Fig. 5: Painted male sound: San men's dancing rattles and the snorting guttural sounds made while dancing



The central premise of this article therefore is that, if *n*|*om* sound connected is to everything in the San's environment, as the ethnography suggests, being vital to their daily, creative and spiritual lives, then surely we would see this norm sound in their rock art. I believe we do, in fact, see this in San rock art. as the various tracings accompanying this article illustrate.

Song lines in the Cederberg

According the Lorna

Marshall:

Fig. 6: Painted animal sounds: (6a) elephant: low frequency vibration; (6b) eland: clicks from their hooves; (6c)hippo: low frequency sound and rain symbol; (6d): lion roar.

that occurred between George Stow and an aged Bushman couple in the Jammerberg. Although the rest of the Bushman tribe had been annihilated, the old man and his wife still clung to their ancestral haunts. According to Jeffreys (1978):

- When Stow showed them copies he had made of Bushman paintings, the woman started to sing the old songs that the paintings recalled. Her husband besought her; Don't! Don't! sing those old songs. I can't bear it. It makes my heart too sad.
- The most important repertory of !Kung music is of the n|om songs. They are very much part of daily life and are sung anywhere, anytime by anyone, more than any other music. They beguile leisure hours, enliven tasks, miles of walking and soothe and delight babies.

Conclusion

I have used song lines in three different contexts in this article. First, I have proposed that the San artists illustrated sound with straight, wavy, zigzag



Fig. 7a: Painted sound pods; elephant low frequency rumbles travelling tens of kilometres. Figs. 7band 7c: Thunder clouds with low frequency rumbles associated with the sound of elephants. Fig. 7d: Rain symbols.

or sinusoidal thin red song lines. Second, I have described lines of women singing and dancing as song lines. Third, I wish to suggest that if the San sang these n|om songs while walking between their painted shelters, then these shelters could possibly be thought of as being connected by imaginary song lines. This concept of song lines is much like, but obviously different to, the song lines of the Australian Aboriginal peoples. The Aboriginal song lines are from their Dream Time and its associated animals, whereas the San n|om song lines are from their time of the First Creation and its associated animals who were regarded as 'People of the early race'.

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ARCHAEOLOGY IN SOUTH AFRICA

Drimolen fossil skull rewrites human history

A large international team of researchers have unearthed and dated the earliest known skull of Homo erectus, the first of our ancestors to be nearly humanlike in their anatomy and aspects of behaviour. It goes by the lowly label DNH134, but the two-millionyear-old fossil skull found at the fossil-rich Drimolen cave system in the Cradle of Humankind is rewriting humankind's family history. Details and analyses appeared in Science on 3 April 2020. Co-author Dr Robyn Pickering, director of the University of Cape Town's Human Evolution Research Institute (HERI), said the age of the DNH134 fossil shows that Homo erectus existed 100 000 to 200 000 years earlier than previously thought. The skull, thought to belong to a two to three-year-old female, was reconstructed from more than 150 individual fragments excavated over a period of five years. Discovered in 1922, the Drimolen palaeo cave complex has yielded more than 155 hominin specimens, fauna, bones and tools.

Trobe Project director and head of La University's Department of Archaeology and History in Australia, Professor Andy Herries, said, 'The Homo erectus skull we found ... shows its brain was only slightly smaller than other examples of adult Homo erectus. It samples a part of human evolutionary history when our ancestors were walking fully upright, making stone tools, starting to emigrate out of Africa but before they had developed large brains.' Two million years ago our direct ancestor was not alone, said Herries. 'We can now say Homo erectus shared the landscape with two other types of humans in South Africa, Paranthropus and Australopithecus.

This suggests that one of these other human species, *Australopithecus sediba*, may not have been the direct ancestor of *Homo erectus*, or us, as previously hypothesised.'

Co-author Dr Justin Adams of Monash University's Biomedicine Discovery Institute said the discovery raised intriguing questions about how these three unique species lived and survived in the landscape. 'One of the questions that interests us is what role changing habitats, resources and the unique biological adaptations of early *Homo erectus* may have played in the eventual extinction of *Australopithecus sediba* in South Africa.' *University of Cape Town, 29/04/20*

Sibudu Cave to be declared a heritage site

Sibudu Cave, the prehistoric rock shelter above the uThongathi river, has been identified as having qualities so exceptional that it is eligible for declaration as a national heritage site, according to an announcement by Lungi Malgas, CEO of the South African Heritage Resources Agency (SAHRA). The cave is considered one of South Africa's most important archaeological sites, a cornerstone for understanding the behavioural origins of modern humans. It has received international recognition as one of the most important sites of its kind and has also been nominated as a World Heritage Site. The site is significant because it shows evidence of some of the earliest examples of modern human technology, having revealed a large collection of well-dated middle Stone Age deposits that are well preserved. It boasts a long record of occupation between 77 000 and 35 000 years ago.

Sibudu was first excavated in 1983 by archaeologist Aron Mazel of the Natal Museum. According to scientists, few places on earth have such a complete record from the Middle Stone Age as Sibudu. Friends of Sibudu chairman Derek Nicholson said: 'The various layers and the finds they have provided also document how human technologies changed though this period. Perhaps the jewel in Sibudu's crown are the 65 000-year-old bone arrowheads, the earliest yet discovered. Sibudu is also one of only three sites in Africa where seashell beads older than 70 000 years have been found.'

Studies have been conducted through a large collaborative effort involving many local and international scientists. 'Analysis of fossilised leaves shows they had chemical properties that repel mosquitoes', said Nicholson. Between 1998 and 2011, Wits University directed the site's excavations but since 2011 the excavations have been directed by Prof. Nicholas Conrad, chair of the early history department at the University of Tubingen in Germany. *University of the Witwatersrand*

Game Pass Rock Shelter a National Heritage Site

The Game Pass Rock Shelter in the Kamberg Nature Reserve in KwaZulu-Natal has been declared a National Heritage Site. Making this declaration in the Government Gazette, the SA Heritage Resources Agency said the San rock painting site was one of the most extensive painted panels in South Africa. Within the environmental and cultural context in which the shelter was located in KwaZulu Natal, the embodied spiritual experience was known as an Idlozi (spirit-medium/therapy) experience, among other interpretations, it commented. 'The rock paintings at Game Pass Shelter offer an opportunity to acknowledge the spiritual depth and social complexity of South African rock art that reinforces the significant links between tangible and intangible heritage that resonates with local communities, in particular, who continue to incorporate sites, such as Game Pass Shelter, into their living heritage, ancestral historical identity and cultural practices', SAHRA said.

Ernest Mabuza, 27/03/2020

Mining a threat to Redan rock art

An application by a coal mining company is threatening an up to 2 000-year-old rock art site just outside Redan on the Vaal River. The company has earmarked a 2 547 ha stretch of land between Vereeniging and Meyerton for development of its planned Springfield Colliery open cast mine. The Redan Rock Art site is located inside this area.

According to Professor David Morris, Head of Archaeology at Kimberley's McGregor Museum and Extraordinary Professor of the Sol Plaatje University's School of Humanities, the site was declared a National Monument in 1971. In terms of the National Heritage Resources Act of 1999 it is now regarded as a Provincial Heritage Site and is therefore a formally protected site. In a thesis based on this site, written by Margueritha Prins in 2005, the author observed: 'The site has a long and chequered history, varying from the enthusiastic efforts of a few concerned individuals to the apathy and disinterest of the official bodies concerned. ... In spite of its status as a declared national monument, the site has become progressively more neglected.'

Although the Klip Power Station and coal mine once stood near the rock art site, there are concerns about the impact the massive new mining development would have on the heritage site. Located on the farm Waldrift, the sandstone features 244 petroglyphs representing a few animal figures and many unusual geometric designs that are particularly interesting because of their unusual nature and symmetry.

According to Professor David Pearce of the University of the Witwatersrand's Institute for Rock Art Research, the imagery at Redan is of a type linked by some to Khoe-San herders. 'If this association is correct, the art would have been made within the last 2 000 years.' According to Pearce, all archaeological sites, including rock art sites, are automatically protected by the National Heritage Resources Act.

'As a declared site, Redan receives additional protections in terms of the act. The High Court review last year of the illegal mining at the Canteen Kopjie site (Northern Cape) made it clear that mining may not take place on declared heritage sites and that mining applications may not ignore heritage legislation,' Pearce said. *Website, 27/02/2020*

Barberton Mountains a World Heritage Site

The Barberton Mountain Land, or the Barberton Greenstone Belt in Mpumalanga was inscribed on UNESCO's World Heritage Site list in July 2018 in recognition of the region containing some of the most widely accepted fossil evidence for Archaean life, dating back 3,5 billion years. It also contains the best-preserved, oldest and most diverse sequence of volcanic and sedimentary rocks on earth. The well-researched outcrops provide a globally unique source of information about the earliest measurable conditions at the earth's surface.

The mountains have become known as 'the history of our planet cast in stone' as there are very few places where rocks of the Archaean period are visible. Most other sites are far removed and hard to reach. There are hundreds of geosites of interest in the Barberton Makhonjwa Mountains, which, when their information is combined, tell a richly consistent and, as yet, only partially explored story of when and where life began. *Website, July 2018*

HISTORY'S TWENTY WORST EPIDEMICS AND PANDEMICS

Continued from page 4

Cocoliztli epidemic: 1545-1548

The infection that caused the cocoliztli epidemic was a form of viral hemorrhagic fever that killed 15 million Central American inhabitants. Among a population already weakened by an extreme drought, the disease proved to be utterly catastrophic. 'Cocoliztli' is the Aztec word for 'pest'. A recent study that examined DNA from the skeletons of victims found that they were infected with a subspecies of *Salmonella* known as *S. paratyphi C*, which causes enteric fever, a category of fever that includes typhoid. Enteric fever is still a major health threat today.

American Plagues: 16th century

The American Plagues are a cluster of Eurasian diseases brought to the Americas by European explorers. These illnesses, including smallpox, contributed to the collapse of the Inca and Aztec civilisations. Some estimates suggest that 90 per cent of the indigenous population in the Western Hemisphere was killed off. The diseases helped a Spanish force led by Hernán Cortés to conquer the Aztec capital of Tenochtitlán in 1519, and another Spanish force led by Francisco Pizarro to conquer the Incas in 1532. When citizens of Britain, France, Portugal and the Netherlands began exploring, conquering and settling the Western Hemisphere, they were helped by the fact that disease had vastly reduced indigenous groups.

Great Plague of London: 1665–1666

The Black Death's last major outbreak in Great Britain caused a mass exodus from London, led by King Charles II. The plague started in April 1665 and spread rapidly through the hot summer months. By the time the plague ended, about 100 000 people, including 15 per cent of the population of London, had died. But this was not the end of that city's suffering. On 2 September 1666, the four-day Great Fire of London burnt down a large part of the city.

Great Plague of Marseille: 1720–1723

The Great Plague of Marseille started when a ship, *Grand-Saint-Antoine*, docked in Marseille, carrying a cargo from the eastern Mediterranean. Although the ship was quarantined, plague still got into the city, likely through fleas on plague-infected rodents. Over the next three years, as many as 100 000 people may have died in Marseille and surrounding areas, possibly up to 30 per cent of the population.

Russian plague: 1770–1772

In plague-ravaged Moscow, the terror of quarantined

citizens erupted into violence. Riots through the city culminated in the murder of Archbishop Ambrosius, who was encouraging crowds not to gather for worship. The empress of Russia, Catherine the Great, was so desperate to contain the plague and restore public order that she issued a decree ordering all factories to be moved from Moscow. As many as 100 000 people may have died. After the plague ended, Catherine struggled to restore order. In 1773, Yemelyan Pugachev, who claimed to be Peter III (Catherine's executed husband), led an insurrection that resulted in the deaths of thousands more.

Philadelphia yellow fever epidemic: 1793

When yellow fever seized Philadelphia, the US capital at the time, officials wrongly believed that slaves were immune. As a result, abolitionists called for people of African origin to be recruited to nurse the sick. Transmitted by mosquitoes that proliferated during Philadelphia's particularly hot and humid summer that year, it was only in winter that the epidemic ended. By then, more than 5 000 people had died.

Flu pandemic: 1889-1890

In the modern industrial age, new transport links made it easier for influenza viruses to wreak havoc. In just a few months, the disease spanned the globe, killing one million people. It took just five weeks for the epidemic to reach peak mortality. The earliest cases were reported in St Petersburg, Russia.

American polio epidemic: 1916

A polio epidemic, which mainly affects children and may leaves survivors with permanent disabilities, started in New York City and caused 27 000 cases and 6 000 deaths in the US. Polio epidemics occurred sporadically in the US until the Salk vaccine was developed in 1954. The last polio case in the US was reported in 1979 but worldwide it is not yet completely eradicated.

Spanish Flu: 1918–1920

An estimated 500 million people around the world fell victim to Spanish Flu. One-fifth of those died, with some indigenous communities pushed to the brink of extinction. The flu's spread and lethality was enhanced by the cramped conditions of World War I soldiers and poor wartime nutrition. Most likely, the 'Spanish' Flu did not start in Spain, which was neutral during the war, enabling its press to publish early accounts of the illness. The name Spanish Flu stuck.

Asian Flu: 1957-1958

The Asian Flu pandemic was another global showing for influenza. With its roots in China, the disease claimed more than a million lives. The virus that caused the pandemic was a blend of avian flu viruses. The disease spread rapidly, being reported in Singapore in February, Hong Kong in April, and the coastal cities of the US in the summer. The total death toll was over 1,1 million worldwide.

AIDS pandemic: 1981 to present

AIDS has claimed an estimated 35 million lives since it was first identified in the 1980s. HIV, which is the virus that causes AIDS, probably developed from a chimpanzee virus that transferred to humans in West Africa in the 1920s. AIDS was declared a pandemic by the late 20th century. Today about 64 per cent of the estimated 40 million persons living with HIV live in sub-Saharan Africa. For decades, the disease had no known cure but medication developed in the 1990s allows people with the disease to experience a normal life span with regular treatment. Two people were cured of HIV early this year.

H1N1 Swine Flu pandemic: 2009–2010

This pandemic was caused by a new strain of H1N1. It originated in Mexico and spread throughout the world. In one year, the virus infected as many as 1,4 billion people and killed up to 575 400. The swine flu pandemic primarily affected children and young adults. Eighty per cent of deaths occurred in people younger than 65 years old, which was unusual, considering that most strains of flu viruses, including those that cause seasonal flu, cause the highest

percentage of deaths in people aged over 65. But in this case, older people seemed to have already built up enough immunity to the H1N1group of viruses to be significantly affected. A vaccine that caused the swine flu is now included in the annual flu vaccine.

West African Ebola epidemic: 2014–2016

Ebola ravaged West Africa, with 28 600 reported cases and 11 325 deaths. The first case to be reported was in Guinea in December 2013 and the disease quickly spread to Liberia and Sierra Leone, where the bulk of cases and deaths occurred. A smaller number of cases occurred in Nigeria, Mali, Senegal, the US and Europe. There is no cure for Ebola, as yet. The first known Ebola cases occurred in Sudan and the Democratic Republic of Congo in 1976, and the virus may have originated in bats.

Zika Virus epidemic: 2015 to the present

The impact of the recent Zika epidemic in South and Central America will not be known for several years. In the meantime, scientists are in a race against time to bring the virus under control. The virus is spread through mosquitoes of the *Aedes* genus, although it can be transmitted sexually in humans. It is usually not harmful to adults or children, but can attack infants who are still in the womb and cause birth defects.

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.

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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.

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