



SOUNDTRACK OF THE WORLD Sonorous stones and the rock of ages

Neil Rusch

Sound resides in the stillness of rocks.

The bell rock of Ntsikana – ‘*Intsimbi*’ ka Ntsikana – announced the Xhosa prophet’s unique African expression of Christianity, emanating from the Kat River Valley in the Amathole mountains. Ntsikana (c. 1780–1821) taught a creed striving for transcendence but his call to worship was voiced by the sound of ironstone. His followers heard ‘*Intsimbi*’ ka Ntsikana and came to Ntsikana’s place at Mhlangeni to listen to his sermons. Ringing rocks speak in many tones but the message from rocks is grounded in a dispensation older than colonisation and Christianity.

The connection between geology and theology is not unique to Ntsikana’s mission. For People of the Book there is a fundamental faith in rock: water gushes forth from rocks, kingdoms are built on foundations of rock and there is the idea of the rock of ages, a concept that equates rock with time and eternity.

My particular interest is in the sounds that rocks make, which is why I am fascinated by the bell rock of Ntsikana. My curiosity harks back to the sound that came out of a magical machine, a crystal radio receiver, that I made as a teenager. The sound received via the crystal happened to be LM Radio.

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Fig. 1: Dolerite rocks make ideal lithophones because of their high in metal content

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This was transgressive at that time. Messages and music from the underground could traverse borders and transcend boundaries. The realisation that vibration and sound can emerge from a crystal (crystalline galena) was neither profane nor sacred, but it was miraculous and political.

There is a line in one of Pasternak's poems from the 1920s in which he confesses: 'we were the music in the ice'. Literally, ice does produce sound. Tuning into YouTube I can listen to a frozen lake in Minnesota sounding like Star Wars. No two frozen lakes sound the same. Ice covering a lake in Sweden sounds ethereal by contrast; submerged, oceanic, cetaceanous, like the wail of whales underwater. In the Karoo the ice is gone. What remains are glacier-marked rocks.

'Listening' to prehistoric sounds

Palaeosonics is a field of study that 'listens' to prehistoric sounds. Reconstructing palaeo-soundscapes is possible but never easy. Imagine a glacier burdened by a cargo of rocks gouging and grinding its way south across the inland plateau of South Africa, cutting grooves in the underlying andesite pavement. The striations are linear and evenly spaced; not a readable notation, rather a pattern communicating sound from 420 million years ago. The glacier melted, creating large lakes while jettisoning millions of rocks.

Organisms that lived in the meltwater survive into the present as fossils. Fossils endure because organic material is replaced by minerals, creating inorganic replicas of bones, teeth and plants. It is an astonishing conversion, transforming organic to inorganic, animate to inanimate. These mute fossils are in one sense a primal record of acoustic activity: once-living sounds now embedded in stone. One fossilised bone in particular speaks to us now of speech and the first possibilities of human language. The hyoid bone, that small horseshoe-shaped structure at the back of our throats, supports the tongue and, along with a lowered larynx, is what allowed the hominin to turn shrieks and howls into speech, and song.

Language and all that goes with it, signals a watershed. Equipped with language, *Homo sapiens* have become louder. Soundscapes today are dominated by human-generated sound and electromagnetic vibrations. Unseen vibrations radiating from our communication devices augment the genie of language let out of the bottle. Does palaeosonics matter? Is a sound a sound if there was no one there to hear it? The question points to how far we have 'progressed' and how pre-possessed we are with human exceptionalism. As noted in a poem by Don MacLennan (1983), self-surrender and the expulsion of pretentiousness is marked by a shock of audible clarity, 'struck / as Bashō was / by hearing a cricket sing / in the dark

cavity / of an old helmet'.

In one remarkable reconstruction, palaeosonic researchers were able to conjure sound out of stone and make a cricket sing. How a chirping cricket in the Jurassic (*Archiboilus musicus*) can lend an echo of its chirping to listeners in the present is as clarifying and contagious as the sound coming from Bashō's old helmet. The fossilised cricket provides assurance against extinction if we imagine the rock as a haven embalming not only the cricket but the sound it made (Gu et al 2012).

Our assumption of rocks being inert

Is it human presumption to suppose that ancient sounds were not heard given the evidence that frogs, reptiles and mammals could hear the musicking cricket? An equally questionable assumption is to suppose that rocks are inert. Let me try to explain. Technically the lithophones of the Karoo are the same as the bell rock of Ntsikana in the Eastern Cape, although different because '*Intsimbi*' ka Ntsikana is ironstone whereas the Karoo instruments are composed of dolerite, an igneous rock that solidified from lava or magma. Dolerite rocks 'flowed' when they were extruded from the molten core of the earth. Much, much later with erosion they became the familiar Karoo koppies (Fig. 1). These rocks make ideal rock gongs because of their high metal content, borrowed from the centre of the earth. When struck, they ring like a bell.

There is no cultural memory that can convincingly account for why or when the Karoo rock gongs were used, even though the rocks bear recognisable impact marks left by former players. If you ask a Karoo resident what they are, or on what occasions the gongs were played, the answer in Afrikaans is usually, '*Dis 'n Boesman klavier*', a Bushman piano. The area where dolerite lithophones are mostly found is in IXam-ka !au (dust of the IXam), which in colonial times became known as Bushmanland and remains so named on maps to this day. Evidence, gradually accumulated, suggests that lithophones were instruments used by the IXam to work with the rain¹. '*Intsimbi*' ka Ntsikana served the same purpose and still does today. Indications are that cultural interaction between KhoeSan and Xhosa took place.

Dolerite rocks are not inert. Let us not forget that these rocks flowed before they solidified. There is a language that describes this view of active and animated materiality. The vocabulary and concepts are contained in Jane Bennett's book *Vibrant Matter*. The title is immediately relevant because it merges the idea of active matter with the notion of vibration. Bennett is interested in matter because she experienced a personal moment of insight: 'The items on the ground that day were vibratory – at one moment disclosing themselves as dead stuff and

at the next a live presence' (Bennett 2010: 5). This toggling between alive/vibratory/sonorous and inert/dead/silent is familiar territory for many of us and it likely has everything to do with the observer's state of mind and attention.

In Bennett's vocabulary this vitality is explained by the word actants. That is when supposedly inanimate materials gain agency. I am stunned each time stones act, as they did one day when we were recording the sound of dolerite rocks. We noticed that some small rocks, placed in a box with a loudspeaker, had attached themselves to the magnet housed in the speaker. Of course, it takes two to tango so let us also say that the speaker likewise attached itself to the rocks. Is it not surprising to discover that not only does dolerite vibrate but the rocks also 'act' when the right materials converge in the right circumstances?

I ponder the process of fossil formation in the light of actants acting. My mind is not fully adequate to the task, I know. Organic material is replicated identically over long periods of time. We are too fast and fleeting to meet the glacial slowness of fossil formation. What was organic and transitory is made permanent and immutable by elemental processes of chemistry and mineralisation. Context and conjunction of materials enacts the transformation. Just how contingent and transitory this is finds an apt example in the knowledge we have of ourselves as a species, which depends on the chance discovery of hominin fossils. More than that an assembly of unlike materials first had to converge and become actants. Magnetism and chemistry do explain what I have said. While true, these explanations are neglectful of complexity and dynamic ways of becoming that are material and creative, rather than mechanical and static. Einstein contra Newton, I suppose?

The sonic potential of rocks

Creativity in this sense includes archaeoacoustics. Interest in archaeoacoustics and the aural and auditory aspects of pre-history is not strictly distinct from palaeosonics. The two blur into one another. Consider that it may all have started with the sound produced by lithic tool production, perhaps linking the sounds of rock gongs with stone-tool making? Knapping, flaking and shaping one stone by hammering it with another is an ancient practice that goes back millions of years. Knapping was heard in the paleo-soundscape for millennia. This surely alerted our early ancestors to the sonic potential of rocks as instruments rather than tools serving strict functional purposes? This moment marks a transition between palaeosonics and archaeoacoustics when, on the road to becoming self-reflective animals, we gained an ability to consciously create and soon began to include sound in acts of self-expression and performance. Creativity extended incrementally to activities conducted in acoustically notable places

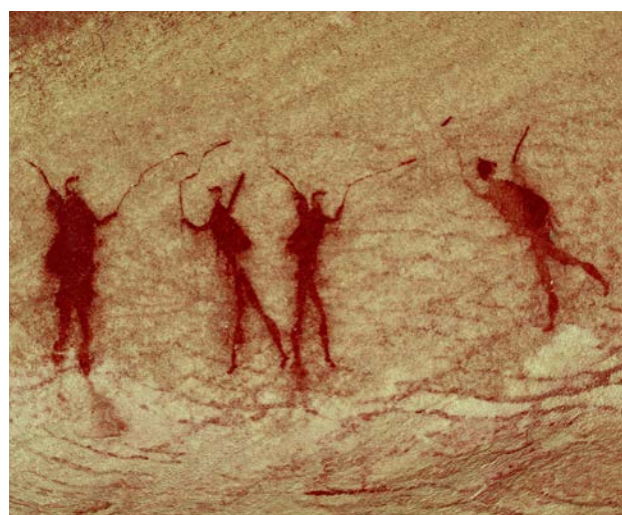


Fig. 2: A section of a Cederberg rock painting, digitally enhanced to illustrate the aerophone instruments that the four figures are playing

like caves and rock shelters where sound-enhancing phenomena occur. Archaeoacoustics takes note of places like this that have special acoustic qualities (Rusch & Wurz 2020; 2022). Such places are often indicated by the presence of rock paintings and more rarely depictions of music-making (Figs 2 and 3).

Palaeosonics on the other hand is more like the soundtrack of the world in the process of worlding (becoming the world), starting with the Big Bang. Although we may think so, human entry into the picture does not negate an ability to balance two states of mind (dual ontology). A geological timeframe, because it is not human, mostly defeats human comprehension. But there are moments of vibrant vision when matter acts on other actants. Like ice, in the right circumstances sonic rocks will sound regardless of human presence or intervention. This notion suggests the idea that sound is of its own making and that stones in their gravitas remain indifferent. I dare to think that we are attracted to stones in the first place by their still innocence. Regardless of the unfolding history of stones and the uses to which they have been put, their attraction lies in an implacable indifference to human ways of knowing. In their silence and serenity stones instil an understanding that sound is only meaningful because it is predicated upon silence.

Many ironstone and dolerite rocks ring, but not all ringing rocks were chosen as lithophones. Choices like this indicate the advent of human interaction with sonic rocks and a gentle form of intervention. There is no landscape modification other than impact marks on the rocks, but the practice as such modifies the soundscape. Mostly the rocks selected to be instruments are in elevated places (Rusch 2021). Other associations are noteworthy, such as flat areas nearby where performance or dance

may have happened. This is an inevitable outcome when sound-making percussion is introduced into a social setting, perhaps with chanting and clapping included. Rock engravings (petroglyphs), lithic artefacts and ostrich eggshell fragments typically occur alongside the Karoo lithophones, thus linking these with KhoeSan use and creation.

In the Eastern Cape we know certainly that hymns were sung in addition to the sound produced by *'Intsimbi' ka Ntsikana*. History tells us that Ntsikana's ministry was lastingly successful because he was a renowned singer and dancer. He composed hymns in the call-and-response style of the *imbongi* praise-singer poet when Dutch hymns failed to express the innermost feelings of his congregation. In various ways cultural behaviours are layered onto the landscape in the form of sound, recognisable in the first instance by the presence of lithophones and other cultural remains and artefacts.

Sound, human activity and ceremony

I stand in awe at the rock sounds and how they insinuate their way into human activities and ceremony. The sound itself, as I have witnessed, takes on a life of its own, reverberating in spaces I could not have imagined. Such spaces include the Baxter Theatre, the Children's Book Network, a puppet theatre production *Olifantland*, a sound-art installation, *Mother Tone Reflections* and, more recently, as soundscape in the film *!aitsa*. Astonishingly these various iterations trace their origin back to the day when the rocks attached themselves to the loudspeaker! How can I not be fascinated by sonic rocks and how they were used in the past, and the present?

Lithophonic percussive sound was included in the practice of working with rain¹ both in the Karoo and at Ntsikana's kraal. In the biblical narrative, Moses strikes a rock and water gushes forth. Working with rain is different and reveals fundamentally different cosmologies because, as we see in southern Africa, the rock (lithophone) is struck and, unlike in the biblical story, sound emerges rather than water. Sound connects the earth's things and the sky's things and this in turn influences *!Khwa*, the rain and water phenomena. As is conveyed in the IXam narratives the transactions between *!Khwa* and the



Fig. 3: Anthropomorph painted in a supine position with both hands holding a flute, Procession Shelter, Cederberg Mountains. The red/magenta in this image are enhanced, using Decorrelation Stretch software

IXam was conducted by means of sound and smell.

I owe much to Michael Wessels for the observation presented here. He notes that within Western traditions of belief and thought, 'The things of the earth possess a heavenly origin'. Within the internal economy of IXam discourse, by contrast: 'the things of the sky come from the earth' (Wessels 2008: 58). Heaven is transcendent and remote whereas the sky's things are intimate and present. Actants in IXam cosmology are co-creative. Interactions are constantly taking place between earth and sky based on reciprocities and relationship. The idea of material actants, and the entanglements between humans, non-humans and animals does not fall exclusively under the persuasion of humans as sole agents.

The sound of *'Intsimbi' ka Ntsikana* is supplication to God for benevolence, but the bell stone was also rung to summon rain. *!Khwa* has a malevolent aspect that had to be appeased in order to solicit co-operation. One means of working with *!Khwa* was achieved by using the smell of buchu but the sound of ringing rocks does also appear to have been effective. These beliefs and motives are understandable in a region beset by aridity and drought. Culture and beliefs of the Xhosa and KhoeSan are distinctly different but at the same time inextricably entangled with gong sounds. The influence on Ntsikana's theology is explicit. His faith is steeped in indigenous understanding; thus the new Christian faith is inflected with ancient traditions and is expressed in a truly African way.

Indigenous theology and understanding

Finally, I shall attempt to extrapolate elements of the indigenous theology and understanding, which

¹ Engaging with community in the Kalahari and with present-day descendants of the IXam, we are informed that working with rain is the preferred terminology rather than rainmaking.

might also explain why *'Intsimbi' ka Ntsikana* was incorporated into Ntsikana's services. Cultural influence can be either coercive, co-operative or both. Indications of cultural influence are the names *uThixo* and *uQamata* that have Khoe origin. Including implosive consonants (clicks), these words were borrowed and became designations for the Xhosa Supreme Being: *uThixo* and *uQamata*. Furthermore, the supreme power is located in the above, although this is not a place like heaven that is high above: 'in traditional thinking there was little sense of spatial dimension for heaven, and without a radical gap between the background god and the realm of nature there could be little understanding of the divine as a transcendent being' (Hodgson 1980: 42). In other words, if there was transcendence it was a specific form of transcendence imbricated with the grounding provided by nature.

It is reasonable to suppose that the sound of *'Intsimbi' ka Ntsikana* – audible over the same distance as a church bell – could be heard by *Qamata* because the supreme being was earthly and intimate, not distant. The point to note is that modern use of *enyangwaneni* conveys the Christian concept of heaven but two centuries ago it appears that *enyangwaneni* 'meant the high place where *Qamata* was thought to live rather than a spiritual place. This is illustrated by the traditional ritual of climbing a high hill or mountain during periods of prolonged drought to supplicate *Qamata* for rain, which is still practiced by the Xhosa today' (Hodgson 1980: 44).

There are obvious overlaps in what is described above, which links directly to the way in which IXam rain's men, known as *!Khwa: ka !ke*, worked with rain in the Karoo. Lithophones are typically located at high places on ridges and on high points provided by the dolerite koppies. *'Intsimbi' ka Ntsikana* is also situated on the hill above Ntsikana's kraal (near Hertzog in the Seymour district). IXam Instructions such as the following were given: 'The she rain is drawing her breath which resembles mist; you must therefore go and cut the rain at the great waterpits which are on the mountain'. Beyond the bounds of specific cultural determination there is common ground in the practices of asking and working with rain. Hilltops and ringing rocks feature prominently in the communications with the supreme being *Qamata* and with *!Khwa*. Neither of these two entities are distant or remote because neither resides in any spatially differentiated realm that is remotely beyond or above the earth.

Creating 'actualisations'² at places like *!Khwa* *ttu* and at the Living Landscape Project I have come to realise the power that ringing rocks hold as eco-art, not as objects but actants, with potential for

healing and regeneration (Rusch 2017). Their sound transcends boundaries and time. They act with artists, composers, musicians, poets, performers and playwrights to create vibrant spaces much as they did over aeons for our early ancestors.

Our African tradition tells us that rocks and gongs are alive because they vibrate. At the headquarters of the United Nations in the Quiet Room there lies a 6,5 t block of iron ore, placed there to instil awe and silence. Dag Hammarskjöld, as the Secretary General of the UN, took a personal hand in curating the room and in 1957 he described its purpose in this way: 'We want to bring back, in this room, the stillness which we have lost... The stone in the middle of the room reminds us of the firm and permanent in a world of movement and change... The block of iron ore has the weight and solidity of the everlasting. We want this massive altar to give the impression of something more than temporary... a meeting of the light, of the sky, and the earth...'

Hammarskjöld's description is amazing, but it misses one thing: sound is nowhere to be heard. I am convinced that if the ironstone, still in its geological form, was lifted and correctly balanced it would ring if struck. The Quiet Room would resonate. Hammarskjöld emphasises the stillness, the unchanging and the everlasting, but we know too that the Quiet Room ironstone will have been molten, noisy and moving. Rocks speak in many tones.

Acknowledgement

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² Actualisation is a term used in archaeoacoustics to convey the dynamic nature of acoustic experiments, rather than replication.

Archaeozoology of Southern Africa Workshop 2022

Annie R Antonites, Karin Scott, Louisa Hutten and Sharon Holt

The Archaeozoology of Southern Africa (AZOOSA) Working Group was founded in 2019 by a group of South African archaeozoologists in response to the need for greater cooperation amongst specialists in this subfield of archaeology.

One of the most enduring images of the African continent is that of its wildlife. Yet the deeper history of these animals, and their interaction with people, remain understudied from an archaeozoological perspective, especially when compared to other parts of the world. There are few archaeozoologists who practice locally, and a large proportion of such research in Africa is conducted by scholars based in the global north. The scarcity of dedicated positions for faunal specialists in southern Africa, few practicing local professionals, fewer professionals invested in capacity building and the increasingly specialised nature of the discipline can isolate practitioners. Without closer collaboration between established and emerging professionals, archaeozoology in southern Africa is at risk of stagnating.

Drawing on the dynamic nature of the international archaeozoological community, AZOOSA promotes closer cooperation and collaboration among archaeozoological professionals, archaeologists and students to strengthen the discipline in the region. To facilitate this vision, AZOOSA held its inaugural workshop in Pretoria from 8 to 11 September 2022. The workshop was originally planned for 2020 but had to be postponed because of the Covid-19 pandemic. In early 2022 arrangements for the workshop regained momentum and interested participants voted for an in-person event.

Twenty-five archaeozoologists, archaeologists and students from South Africa, Botswana, Lesotho and Zimbabwe attended the workshop. The main aims were to establish AZOOSA and to create a professional network to share skills, information and knowledge within the SADC region. Two days of intensive discussion on issues such as collections-based research, access to comparative skeletal collections, reporting standards for specialist contract work, local research agendas and the use of social media in raising the discipline's profile resulted in

positive and practical solutions and suggestions. Input from participants will be incorporated into a best practice document to provide guidelines for local archaeozoological practices.

The workshop included skills development sessions on the application of stable isotope analysis in archaeozoology, presented by Patricia Groenewald (UCT), and the identification of reptiles and amphibians in archaeo-faunal assemblages, presented by Marina Chorro-Giner (archaeology.biz). A behind-the-scenes tour of the Archaeozoology and Large Mammals Section at the Ditsong National Museum of Natural History concluded the workshop. Participants also had an opportunity to resolve specific species and taphonomic identification issues by drawing on the group's collective practical experience and the museum's extensive comparative skeletal collection.



The 25 participants who attended the Archaeozoology of Southern Africa Workshop in September 2022

Going forward, AZOOSA plans on hosting skills development sessions online and in-person on an annual basis. The already established AZOOSA Community WhatsApp group will continue to keep the network connected, informed on opportunities and news related to the discipline and facilitate resources and knowledge sharing. The AZOOSA website will be relaunched in 2023 and will include information on comparative collections and archaeo-faunal assemblages in museum and university collections in the region.

For more information on AZOOSA contact Annie Antonites at antonites@ditsong.org.za.

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THE ESSENTIAL ROLE OF PIGMENT CHARACTERISATION AND COLOURING MATERIALS PROVENANCE STUDY FOR ROCK ART ARCHAEOLOGY

Dawn Green and Adelphine Bonneau

The characterisation of paintings

is an innovative development in archaeological research that is making a profound contribution to understanding the types of paints used, their composition and the potential for dating them. Paints are prepared from colouring materials, usually of geological origin. These materials occur in various archaeological contexts, from when humans first started using natural ochres (Hodgkiss 2021) to more recent times, where they have been included in coloured ceramics, glassware and beads (e.g. Janssens 2013; Dayet et al 2017). In the southern African context, paint characterisation has become an essential practice in understanding more about colouring material choices, the specific paint recipes used and obtaining chronometric dates for rock art (Prinsloo et al 2008; Hoerlé et al 2016; Bonneau et al 2017a, 2017b, 2022).

It is well recognised that establishing regional chronologies is a critical factor for interpreting diversity in rock art and understanding change through time (Bonneau et al 2017b). Identifying chronometric dates also allows us to combine the evidence from excavations and rock art to compare and refine our understanding of how people were thinking and doing in the past. Of equal importance is what colouring materials were chosen, their sources and the binders that were used in making paints. This evidence can tell us more about specific people living in specific areas and their contact and interactions with others. Recently, with support funding from the South African



Fig. 1: Adelphine Bonneau and Dawn Green en route to rock shelters in the central Maloti-Drakensberg to sample paintings

Archaeological Society, we conducted fieldwork with the aim to characterise and date a sample of paintings from the Maloti-Drakensberg and eastern Stormberg (Fig. 1).

The characterisation process

Adelphine Bonneau, with support from Prof. David Pearce (Rock Art Research Institute, Wits University), Prof. Peter Mitchell (University of Oxford) and colleagues at the University of Oxford and the Oxford Radiocarbon Accelerator Unit, has developed and refined a characterisation and chronometric dating process for rock paintings in southern Africa. This carefully tested process has resulted in the first, reliable radiocarbon dates for the rock art of specific areas in southern Africa (Bonneau et al 2017a, 2017b, 2022). To do so, a multi-step process with multiple protocols is used. The first step is collecting the samples (Fig. 2).

For archaeological research to be ethical, it is very important to engage with landowners and/or traditional authorities to obtain their understanding and permission to remove pigments from rock paintings. With this support and that of affiliated academic institutions, permits are applied for from the governing

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Prof. Adelphine Bonneau, University of Sherbrooke, Canada, is an archaeological scientist, specialised in colouring materials and paint characterisation, and in dating methods for rock paintings. Adelphine.Bonneau@USherbrooke.ca.



Fig. 2: Prof. Bonneau sampling a painting in the southern Maloti-Drakensberg wearing nitrile gloves and using a sterile scalpel

provincial heritage resources authorities. The size of the sample requested is dependent on the nature of the investigation. The more you want to know, the more you need to take. For characterisation, tiny (0,5 mm²) pieces of pigment are removed from sections of a painting (Fig. 3), preferably from areas that are already damaged by weathering. These samples leave a barely visible mark that is difficult to see (Fig. 4). The sample is stored in gelatine capsules. Nitrile gloves are worn and the scalpel blade used is cleaned with distilled water between each removal.

When it comes to the removal of black pigments for dating, larger samples are required that leave a noticeable mark (Fig. 5). In this instance, the gloves and scalpel blades are changed for each sample taken to avoid contamination and the sample is stored in sterilised aluminium foil that has been baked at 600° C for 12 hours. All samples are numbered and recorded,



Fig. 3: Example of the size of the sample removed and the gelatine capsule used to store the sample

and photographs of every stage are associated with the numbered sample. Of interest is that black pigments are not commonly used in large amounts in paintings in the Maloti-Drakensberg. Of the 1 278 paintings recorded in the central Maloti-Drakensberg, six paintings include black pigments, and of the 1 745 paintings recorded Maloti-Drakensberg, 48 paintings include black pigments. As a result, the choice for sampling can be limited. Because we do not have the expertise in South Africa to undertake the types of analyses that are required, the samples are analysed at Adelphine Bonneau's laboratory at the University of Sherbrooke. Before doing so, an export permit from the South African Heritage Resources Agency is needed.



Fig. 4: Example of a painting before (top) and after a sample is taken

Pigment analyses

Characterisation involves the use of a variety of instruments to analyse the morphology (size, shape and structure), elemental (atoms) and molecular (atoms held together by chemical bonds) composition of the pigments and surrounding alterations. This process allows us to determine what rocks, earths, minerals and plants were used in producing the paints. In a recent first, cremated bone was identified as having been used in white pigment and manganese oxide in brown (Bonneau et al 2022). One of the exceptional contributions of characterisation is the ability to identify the presence of carbon-based pigments in black paintings. This is important for three reasons.

First, the protocol can identify the type of carbon-based pigments used: charcoal, soot and carbon blacks. Carbon-blacks consist of products that are not completely combusted, such as fat, grease, resin, plant saps and that are short-lived (Bonneau et al 2017a: 327). Thus, these pigments will have been created by painters soon before use and the date obtained by the analysis will not be much older than the date of the painting (Bonneau et al 2017a: 327). In the case of charcoal and soot, contribution from old wood is possible and dates derived from these pigments are considered as maximum ages.

Second, the protocol characterises contaminants for radiocarbon dating that occur in the sample and provides an estimation of their concentration. It is then possible to adjust the chemical pre-treatment in the laboratory to remove all the contaminants prior to dating. If the concentration is high, the affected painting is not further sampled.

Third, the characterisation of black pigments from a tiny sample before collecting a larger one for 14C dating means that the paintings are not damaged unnecessarily. If no carbon-based pigments are identified, the paintings are not sampled for 14C dating and the tiny removal remains barely noticeable. If carbon-based pigments are present, an estimation of the sample size needed for successfully obtaining a chronometric date is possible, further eliminating unnecessary damage. Once the black pigment is removed for radiocarbon dating, a multi-step protocol is used to remove any potential contaminants and prepare the sample.

Preparation for AMS dating

The samples for Accelerator Mass Spectrometer (AMS) dating are prepared using a modified acid-base-acid procedure that is designed to remove identified radiocarbon contaminants from the pigments. This approach is modified for each sample depending on the sample size and characterisation results. The pigments are then freeze dried and a Fourier-transform infrared (μ -FTIR) micro-spectroscopy analysis conducted to confirm that previously identified contaminants have been eliminated prior to further preparation. This instrument is particularly sensitive to the presence of calcium oxalates, humic acids and calcium carbonates, all of which contaminate the radiocarbon samples and affect the 14C dates produced (Bonneau et al 2017a). Samples are then combusted to carbon dioxide in an elemental analyser isotope ratio mass spectrometer (EA-IRMS) and converted into graphite before AMS dating.

Justification for pigment removals in rock art

Archaeologists are bound by an ethical responsibility to conserve the evidence they use from the past. This means that, based on heritage legislation, the advantages and disadvantages of the destructive

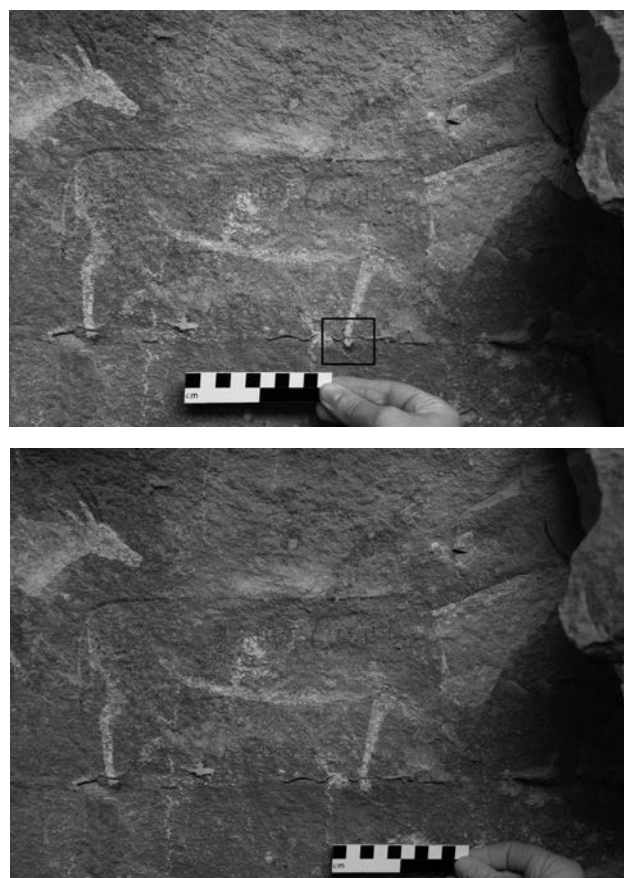


Fig. 5: Black pigment removal, before (top) and after (Photos DG Pearce)

processes used need to be weighed up. In excavations, small to large parts of sites are removed for analysis and stored for perpetuity. This is not the case in rock art sampling.

While a noticeable portion of black pigment is removed from a painting in the case of sampling for radiocarbon dating, the painting remains in situ. It is still recognisable as an eland, human figure or whatever the case may be. The details of the painting are recorded by photography and notes, which are stored on the South African Heritage Resources Agency Information System (SAHRIS) and other databases (university and museum archives, SARADA, etc.) for other researchers to access. The context remains unchanged: we can still investigate the painting, its placement and relationship to other paintings. Thus, the significance and value of the paintings are not affected. In addition, there are no extra expenses to store the samples in specific climatic conditions for long periods.

The paintings selected for sampling are often located in isolated rock shelters far from human habitation. The paintings and rock shelters do not form part of present-day communities' spiritual, social or economic activities. The impact of removing pigment samples on past, present and future communities is thus low and the benefits far outweigh the costs.

The success of collaborative research

The collaboration between Adelphine Bonneau and David Pearce has shown the importance of working together to find better, innovative methods and techniques for a fuller understanding of material remains from the past. Their combined efforts have meant that we now have secure methods for identifying the specific types of minerals, earths, rocks and plants used for making rock paintings in southern Africa. This is significant in any context, not only for rock art. We now also have a method of analysing what was mixed into the paint to allow it to be applied smoothly to the rock face. This information, extended across geographic areas, can show the similar and/or different choices people were making and possibly the way in which these people identified themselves through rock paintings.

Critically, we have reached a point of establishing chronometric dates for rock paintings, which means that we can begin the process of constructing regional chronologies and understand variation and change through time. We can also start using the evidence from rock art to cross-check that of the excavation record to find more nuanced and in-depth interpretations of the past. These types of successes act as inspiration because the strengths of multi-disciplinary and collaborative research are proven. This inspiration can act as a driver for innovative research projects both in southern Africa and worldwide.

ARCHAEOLOGY IN BRIEF

English museums to return Benin treasures

London's Horniman Museum has announced that it will transfer 72 Benin artefacts to the Nigerian government, while Oxford and Cambridge universities said earlier that they would return more than 200 between them. The Horniman is the first government-funded institution to hand back treasures looted by British forces from Benin City in 1897. About 10 000 objects looted during the raid on Benin are held in 165 museums and private collections across the world. The British Museum holds 900 of these. Nigeria is planning to house repatriated bronzes in the Edo Museum of West African Art, due to open in 2025. The Horniman collection includes 12 ancient brass plaques, known as Benin bronzes. Dan Hicks, professor of contemporary archaeology at the University of Oxford, described the announcements as 'immensely significant'. 'What is important about the Horniman news is their relationship to [government] in terms of their funding arrangement. Up until now it had been individual objects one at a time, in stark contrast to the over 1 100 that have been committed to be returned by the German government.'

Heritage Portal, 11082022

Acknowledgements

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SA ARCHAEOLOGICAL SOCIETY

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 Northern Branch on Thursday 4 May 2023.

Items for the Agenda should be submitted to the Assistant Secretary, Carole Goeminne, at secretary@archaeology.org.za before 1 March 2023.

Janette Deacon, Honorary Secretary

10 January 2023

RESPONSE BY PIETER JOLLY TO ALAN MORRIS

Personalities, squabbles and the discovery of the Saldanha skull

In a recently published book (Morris 2022a), and in an article in the April 2022 issue of *The Digging Stick* (Morris 2022b), Alan Morris presents an overview of the discovery of the Saldanha skull on the farm Elandsfontein, near Hopefield. In it he focuses on the people involved in the work at this site, specifically the people involved in and the events surrounding the discovery of the skull. None of these people, including my father, Keith Jolly, is still alive. It is my late father's role in the discovery of the skull and the events surrounding the discovery with which I am largely concerned here.

The first point that needs to be made is that the section of the book that relates to the finding of the Saldanha skull, a slightly edited form of which was published in *The Digging Stick*, has no place in an academic book. It is almost entirely concerned with the personalities of the people involved in the finding and study of the skull and there is no discussion whatsoever of the major scientific status of the skull and how it was studied. In particular it is difficult to see how it relates to the important subject of Morris's book: how South African scientists have studied race. What he has to say about the Saldanha skull is more akin to a tabloid piece, a gossipy account that has little, if any, academic merit and which trivialises the serious issue of the study of race by anatomists and archaeologists.

Perhaps Morris thought its inclusion would boost sales of his book. Quite likely it will, but it has also denigrated my father's work and achievements as an archaeologist, and slanders not only him but also two other members of my family. Although I would have much preferred not to open old wounds, Morris leaves me with no option but to address the serious charges he lays against them, particularly my father, as they cannot defend their reputations here.

Morris's first charge is that my father and, for good measure, my uncle Ted Keen (Morris 2022a: 95), who had a long and distinguished career as an anatomist, only got their posts at the University of Cape Town (UCT) through the influence of Aimée Jolly, my father's mother and Ted Keen's mother-in-law, who served on the UCT council. With regard to my father, Morris (2022a: 101; 2022b: 15) puts it plainly and unambiguously, giving no reference: '... his real claim

to employment at the Elandsfontein site was his mother's presence on the UCT council'. Morris (pers. comm.) got this information from Ronald Singer, whose lack of integrity is made clear elsewhere in this article. What Morris is saying, in other words, is that my father did not have the necessary qualifications to have been given the minor post of UCT Research Officer at the Elandsfontein site and needed his mother's influence to get the post.

This is not just an insult to my late grandmother and father, but it borders on the ridiculous. My father's credentials were impeccable. After graduating with a BA degree from UCT with class medals in archaeology and history, he went to Cambridge and passed with a First Class Part II of the Archaeological and Anthropological Tripos. He was made a Scholar of St John's College on the final part of the Tripos and was elected a Wright's Prizeman – a great honour. While at Cambridge he studied for a time under Gertrude Caton-Thompson. He had also gained excavation experience in the 1940s at Skildegat (Peer's) Cave and published on the Middle Stone Age at this site. So, we can dismiss Morris's and Singer's malicious speculation, presented as fact, concerning my grandmother's supposed role in getting my father (and uncle) appointed to posts at UCT. They were both, and particularly my father, easily well-enough qualified to get the posts for which they had applied.

Morris goes on to state, citing letters by John Goodwin, that my father was unprofessional and failed to advance the excavation at Elandsfontein, resulting in Matthew Drennan, Professor of Anatomy, who had employed my father and who effectively supervised his work (despite Goodwin being my father's official supervisor), wanting to fire him. This, Morris states, was blocked by the Vice-chancellor, TB Davie. One can assume Davie did this with good reason. Nevertheless, Morris states (Morris 2002a: 101; 2002b: 15, my emphasis: 'Jolly became more and more difficult to work with and the complaints against him from Singer and others continued until he was *finally* released from the site in 1954'. Elsewhere in his book and article, Morris states that my father had been 'removed' and 'fired'. He was not 'fired'. In May 1953, my father was given written notice by TB Davie that it had been his 'unpleasant duty' to inform the Hopefield Committee that 'the (financial) support for this project which had been hoped for from the Universities Finance Commission was not forthcoming', with the result that my father's appointment as field officer could not be renewed after June 1953 (letter from Davie to my father, in

Pieter Jolly is an independent researcher with interests in San rock art, generally, and the history of interaction between south-eastern San and southern Nguni and Sotho communities, particularly the impact that this interaction may have had on the overt and symbolic content of south-eastern San rock art.

my possession, dated 15 May 1953 - my bracketed addition). There was no suggestion of incompetence or unprofessional behaviour in this letter.

With regard to my father's registration for a doctorate at Cambridge, Morris, directly after listing a host of supposed problematic issues relating to my father's conduct, states that 'Cambridge *finally* withdrew Jolly's registration in December 1952' (Morris 2022a: 101; 2022b: 15, my emphasis). The implication is clear: Cambridge had *finally* had enough of my father and withdrew his registration, in the same way that, according to Morris, he was *finally* released/removed/fired from his post (Morris 2022a: 101; 2022b: 15, my emphasis). In fact, there is no evidence whatsoever that Cambridge, rather than my father, withdrew his registration. Morris (pers. comm.) denies that this is what he implies in his book and article, but the use of the word 'finally' in both these negative contexts makes it plain that this is, in fact what he implies.

Concerning Drennan's relationship with my father, it is true that my father, like others involved in the Elandsfontein project who were under Drennan's supervision, did not get on with him. From a copy of a letter, in my possession, written by my father in May 1953 to geologist Prof. Walker, one of the members of the Hopefield Committee, it is clear that Drennan was an extremely difficult person to serve under. He was lacking in archaeological expertise; was unwilling to provide funds for essential equipment such as a camera and transport, and proper shelter at the site; supplied no field laboratory; required my father to live at the site for long periods of time at his own expense; and regularly issued contradictory sets of instructions to my father. My father was working under very difficult conditions, in an extensive, hostile, semi-desert environment and Drennan's lack of support just made things a whole lot harder. He nevertheless persevered and, in early January 1953, discovered the skull, the 'fossil find of the decade in South Africa' (Morris 2022a: 98; 2022b: 14).

Morris also states that John Goodwin was highly critical of my father's work at Elandsfontein and elaborates at some length on this. Goodwin did have very little good and much bad to say about my father in the year or so before my father discovered the skull. There was clearly antipathy between them. However, once my father had discovered the skull, Goodwin, to his credit, recognised my father's archaeological abilities. Here is what he had to say about my father in an article in the *South African Archaeological Bulletin* that presented an overview of the work done and the findings at the Elandsfontein site a few months after the discovery of the skull:

'Keith Jolly has been collecting cultural material for most of the period of the work (at Elandsfontein). A *thoroughly competent archaeologist*, he has indicated that two stages of human culture are represented

in considerable abundance, and a few examples from a third' (Goodwin 1953: 44, my bracketed addition and emphasis). Furthermore, in a note in my possession addressed to the chairman of the Hopefield Committee, dated 3 July 1953, Goodwin recommended that my father, in collaboration with the geographer JA Mabbutt, be appointed to compile a detailed monograph titled 'The Archaeology of Elandsfontein' under his (Goodwin's) supervision.

It really could not be clearer. Contra Morris, Goodwin came to have a high regard for my father's abilities as an archaeologist and for the work he had done at the site, and wanted him to be the archaeologist author for a monograph on the site. Which begs the question why Morris does not include Goodwin's article, with its praise for my father, in his list of references. This is an important article on the work at the Elandsfontein site, a key reference.

Then there was the issue of who should take credit for the discovery of the skull. This was not just about ego but about being recognised for the hard work and study over the years that led to the find. It was also about being able to add this to one's CV and the serious matter of increasing one's chances of getting employment as an archaeologist at UCT or elsewhere. Morris (2022a: 213, my bracketed addition) states that the 'discovery of the Saldanha ancient skull ... put him (Singer) on the international map of palaeoanthropology'. Morris's statement not only suggests that Singer discovered the skull but also makes it plain how important the find was, both for science and for the career of the discoverer. Singer liked to consider himself as the joint and equal (Morris 2022b: 14), perhaps more than equal, discoverer of the skull and he made this clear in print. Here are three examples:

- '... on January 8, 1953, Keith Jolly ... and I discovered and identified 11 fragments of human fossilised cranial bones on the main site.' (Singer 1954: 349).

This is not true (see below). Singer found no pieces of the skull on this visit to the site – on which my father first found pieces of the skull.

- '... the author and a field assistant recovered fragments of a skull at Hopefield, that, when reconstructed, was indisputably akin to Rhodesian Man' (Singer 1962: 20).

In this publication, Singer does not even identify my father, merely referring to him as a 'field assistant', i.e. a low-ranking member of the team, one not necessary to name.

- In an article in the *Cape Argus* (31 July 1965) about work planned for the Elandsfontein site, in which Singer is described as the leader of the team of archaeologists conducting research there,

it was reported: 'Hopefield leaped into prominence some years ago when Professor Singer found the world-famous Saldanha man near there'.

A much later claim by Singer was that my father had discovered the first fragments but that he (Singer) had recognised that they were from a hominin (Singer 2003: 7). However, in publications on the skull, aside from those by Singer, my father was credited with the find (Drennan 1953a, b, c; Goodwin 1953: 45; Trevor 1953). In fact, Singer played a very minor role compared to that of my father and it is ironic that he was 'furious' that Drennan, rather than he, would be the person to describe the find in the literature (Morris 2022b: 14). Goodwin (1953: 45), however, makes it clear that my father was the person who discovered the skull. According to him:

– My father, alone, recovered nine contiguous pieces of the skull in early January 1953 while at the site with Singer.

– On two subsequent trips, after considerable search, my father found additional pieces, including the occipital bone.

– On a trip to the site by Drennan, Mabbutt, Singer and my father, about a week after the trip on which my father first found pieces of the skull, Singer found a very small parietal fragment and the following day a mandibular fragment (Drennan to Goodwin, 30 March 1953).

Both fragments found by Singer were located about 500 m from the place where the first pieces of the skull were found by my father (Drennan and Singer 1955: 365), not, as Morris (2022a: 97; 2022b: 13) states, 'nearby'. At the time, Drennan was sure the mandibular fragment did not belong to the pieces of the skull that had already been found 'judging by colouration etc.' (Drennan to Goodwin, 30 March 1953). He later changed his mind about this and judged, with Singer, that they 'probably' belonged to the Saldanha skull (Drennan and Singer 1955).

Although the parietal fragment seemed to fit on a fragmented portion of the skull found by my father a week or so earlier (Drennan and Singer 1955: 364), it seemed strange to Drennan, as Morris (2022a: 99-101; 2022b: 15) has pointed out, that the two pieces discovered by Singer were found so far from the site where the skull was originally located. The circumstances in which Singer revealed the first fragment of the skull he had discovered were unusual, to say the least. It was only after a day spent by Drennan, Mabbutt, my father and Singer looking unsuccessfully for further pieces of the skull at the site where the initial finds had occurred, and only once they had returned from their tent at the site to the place where they were staying and were having supper, that Singer revealed he had found a piece of a skull that might be part of the Saldanha skull (Morris

2002a: 99-101; Morris 2022b: 14). Drennan described the strange manner in which Singer revealed his finds:

'We spent most of the first day sifting some square yards around the spot indicated but found nothing. That same night, whilst we were sitting round our supper table, Dr Singer suddenly planked (sic) a piece of bone about an inch and a fraction square on the table and said, "What do you think of that?" (UCT Special Collections, Cape Town, letter from Drennan to Goodwin, 30 March 1953).

Why did Singer wait until they were gathered for supper to tell the others about his find, rather than as soon as he saw them after finding the fragment? Did Singer find the pieces near to or at the original place at which the first pieces had been found by my father and then, to establish some claim to primacy greater than simply finding more pieces of the skull at the site, claim that he had been able to find more fragments at a place that he (Singer) had personally located? The chances of these very small pieces of the skull also having been revealed by the wind, but so far from the original site and without being put there by someone, and of their then being discovered, were extremely small. This worried Drennan at the time.

Clearly Singer was trying to persuade the scientific community that he was, at the very least, an equal discoverer of the skull but this assertion was false. He was not to be trusted and it is surprising that Morris draws uncritically on his interviews with Singer for (negative) information related to members of my family. My father was not the only person who had doubts about Singer's credibility and character, and was upset by his claims to have discovered the Saldanha skull. Prof. John Talbot, who built up the School of Geography at UCT over more than 40 years, was an informed yet disinterested judge of Singer's behaviour as he had no interest in publishing on the skull. As a member of the Hopefield Committee that was formed to make decisions on the Elandsfontein site, he was privy to the issues surrounding the Saldanha skull since his younger colleague, Jack Mabbutt, did most of the mapping/geographical work in the area of the site. A letter from Talbot to my father, written in August 1968 and in my possession, allows us to understand my supposedly 'difficult' father's legitimate feelings about Singer and the way my father's role in the discovery was minimised by him:

'Thank you for the loan of the files returned herewith. The detailed account of the site and discoveries at Hopefield published by our late friend AJ Goodwin in the *South African Archaeological Bulletin*, vol. 8 (1953), 41–6 establish explicitly your role in the discovery of the remains of Saldanha Man and the minor role of the other investigator (Singer) who has since endeavoured to claim the discovery, e.g. in *Natural History*, November 1962, p. 20 and

elsewhere. Such claims only discredit the integrity of the individual concerned and appear symptomatic of an egotism and academic dishonesty that are pathetic if not despicable.'

The truth is that Singer, having found two small fragments of a skull at Elandsfontein, ones that could not even be associated with the Saldanha skull with certainty, just could not resist claiming a major role in the discovery of the skull, something he believed, with good reason, would launch his career internationally. His proprietary attitude towards the skull reached a peak with his removing the skull from the South African Museum and taking it to the University of Chicago for study. Eventually, after the director of the museum, T Barry, had judged that he had had ample time to study it, he was asked to return it. He failed to do so and, after repeated requests from Barry were ignored, Barry was forced to travel to Chicago take the skull from Singer and bring it back to the museum himself (Morris 2022a: 218).

In conclusion, it is difficult to imagine anywhere in the world where a professionally trained archaeologist who had discovered an extremely important hominin fossil would be made redundant just months after discovering it – with just six weeks' notice given. To put my father's find in perspective, the archaeologist Donald Johansen has described the odds of making a fossil hominin find as poorer than that of finding the proverbial needle in a haystack, and it took Mary and Louis Leakey 24 years of excavation before Mary discovered *Australopithecus boisei*. Part of this is luck but the critical thing is to be well enough trained to be able to identify fossil hominin bones on the extremely rare occasions that they are revealed amongst the huge number of other fossils on a site such as Elandsfontein, which is about 5 km² in size. This my father was able to do, owing to his thorough archaeological training.

It is noteworthy, too, that no other hominin fossils have

ever been found at Elandsfontein, despite decades of work at the site and many finds of other species. It was a special find and my father deserved much better treatment than he received from those whose careers benefited from the find, as well as from Morris, who reports, often inaccurately and inappropriately, on 'personalities, squabbles and the discovery of the Saldanha skull'. Unforgivable, on Morris's part, is the fact that it is unlikely that the great majority of those who read his book will see my response here and will take his account of the discovery of the skull at face value; staining the reputation of my father and other members of my family for as long as his book is read.

Acknowledgements

Graham Avery kindly sent me articles related to the Saldanha skull and commented on a draft of this article. However, the views expressed here and any errors that may be found are my own. I thank Alan Morris for scans of correspondence related to the Saldanha skull.

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REPLY BY ALAN MORRIS

Pieter Jolly is very unhappy about my portrayal of his father's role in the discovery of the Saldanha skull. In our correspondence after the publication of my piece in *The Digging Stick*, I suggested he write something biographic about his father for the same publication. It would give us the chance to put him into context and emphasise his successes. I am pleased to see that he has done just that, providing both new information and an interpretation that is different from my own.

Although much of what Pieter has to say is valid and important, I really do need to clarify his comments that the story of the discovery of the Saldanha skull has no

academic merit in comparison to the 'major scientific status of the skull and how it was studied'. *The Digging Stick* piece is of course an edited extraction from a larger work. Pieter is quite correct that it was chosen for *The Digging Stick* precisely because many of the readers would be familiar with the skull and some of the people involved in its discovery but that does not detract from its importance in the book from which the story was drawn. *Bones and Bodies* is *not* about fossil specimens but about the scientists who made the discoveries and how their scientific, social and personal backgrounds affected the construction of scientific racial identity and how it

impacted on South African society. The book is very much involved with the personalities of researchers.

I am sad that Pieter feels my writing denigrates the career of his father and that I overemphasise the fact that Aimée Jolly may have had a role in the promotion of her son. Keith Jolly was certainly well received as an archaeologist and his two papers on the Skildergat cave are important documents on that site (Jolly 1947, 1948). The sad truth is that although he showed great promise in these early days, he was unable to build this expertise into a long-lasting career. The cause was never because he was incompetent, and I never made that statement in my writing. He died far too young and never did get the chance to express his full potential as an archaeologist. Other archaeologists have commented on the value of the Skildergat papers to the understanding of the South African Stone Age and have lamented that further details were never published (Sampson 1974, Deacon and Wilson 1992). Pieter is particularly angry about the role possibly played by his grandmother. I certainly do suggest that she had influence but perhaps less than Dr Jolly argues that I am implying. I doubt that Mrs Jolly had any influence in the hiring of Keith Jolly but I do suggest that she could have influenced the length of time that he kept his job at the site. Is it really difficult to imagine that a professionally trained archaeologist could be made redundant after such a spectacular find as the Saldanha skull? The more recent history of the conflict between Lee Berger and Ron Clarke suggests otherwise.

The relationships on the Elandsfontein site were both difficult and complex. Jolly quite correctly emphasises the pressure of having two 'bosses' (Drennan and Goodwin) had on the working conditions his father had to endure. Pieter's take on the relationship between his father and Prof. Drennan is very valuable but whatever Goodwin said at the end of project does not impact on Goodwin's opinion while the work was being done. Goodwin did not question Keith Jolly's archaeological competence. He complained in detail that Jolly was not managing to provide thorough reports and positional details of discoveries.

The role of Ronald Singer in all of this is pivotal. Dr Jolly feels (correctly) that Drennan was a difficult person to have as a boss, but Singer must have been a nightmare to work with. Carmel Schrire was a student at UCT Archaeology between 1958 and 1960 during the change over from Goodwin to Inskeep. She had the opportunity to work with both Singer and Inskeep at Elandsfontein and has provided a rather uncomplimentary description of Singer in her autobiography, *Digging Through Darkness* (1995).

Lived 50,000 years ago



Drennan, Davie and Jolly examine the Saldanha skull (newspaper cutting, date and source unknown)

Pieter's detailing of the friction between Singer and his father over attribution of credit about the discovery is enlightening. My own information came from Drennan's publications and his report on the discovery to Goodwin. Pieter provides much more detail and shows the reason for Keith Jolly's anger. There is no question that Ron Singer was attempting to claim priority. At one point in my interview with him, Singer accused Jolly of 'salting' the site (placing artefacts in the deposit so that they could be 'discovered' later). In fact, Drennan's report suggests that it might have been Singer rather than Keith Jolly who did the 'salting'.

Have I been unfair in my recounting of the Saldanha skull discovery? Pieter Jolly has filled in some details and changed the emphasis of some of my observations, but the truth still holds for the episode. Work relations between researchers was poor and the work environment could only be described as toxic. Although Pieter is mostly concerned with the reputation of his father, my interest lies more in the stories of Singer and Drennan. I am grateful for the additional information that Pieter has provided although our interpretations will continue to differ.

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SOUTH AFRICA ARCHAEOLOGY

Heritage site status for six archaeological sites

Six South African sites have been declared National Heritage Sites. Three of the sites are in the Western Cape, namely Diepkloof Rock Shelter, Pinnacle Point Site Complex and Blombos Cave; two in KwaZulu-Natal, namely Sibudu Cave and Border Cave; and the sixth site is the Klasies River Cave in Eastern Cape. The caves were among the Emergence of Modern Humans: Pleistocene Occupation sites for consideration and inscription as World Heritage sites. South Africa's Cabinet stated that the sites collectively contribute to the understanding of the evolution of humankind. Furthermore, they showcased the long sequences of human occupation, with evidence dating to the period of the emergence of modern humans.

The Witness, 17/02/2022

A child of darkness

Prof. Lee Berger of Wits University and his team have revealed the first partial skull and teeth of a *Homo naledi* child found in the Rising Star Cave in the Cradle of Humankind. The child died almost 250 000 years ago when it was about four to six years old. The skull and its context is described by the team of 21 researchers from Wits and 13 other universities in two papers in the Open Access journal, *PaleoAnthropology*. The first paper, of which Prof. Juliet Brophy of Wits and Louisiana State University is the lead author, describes the skull, while the second paper, of which Dr Marina Elliott of Wits is the lead author, describes the context of the area and circumstances in which the skull was discovered. The child was found in a remote passage of the cave, some 12 m beyond the Dinaledi Chamber, the original site of discovery of the first *H. naledi* remains in 2015.

'*Homo naledi* remains one of the most enigmatic ancient human relatives ever discovered,' says Berger, project leader and director of the Centre for Exploration of the Deep Human Journey at Wits and an Explorer at Large for the National Geographic Society. 'It is clearly a primitive species, existing at a time when previously we thought only modern humans were in Africa. Its very presence at that time and in this place complexifies our understanding of who did what first concerning the invention of complex stone tool cultures and even ritual practices.'

Almost 2 000 individual fragments of more than 24 individuals at all life stages of *H. naledi* have been recovered. 'This makes this the richest site for fossil hominins on the continent of Africa and makes *H. naledi* one of the best-known ancient hominin species ever discovered,' says John Hawks, a biological anthropologist. The 28 skull fragments and six teeth of the child were recovered during further work in the cramped spaces of the cave in 2017.

The child's skull was found alone and no remains of its body have been recovered. The team have named the child 'Leti' (pronounced Let-e) after the Setswana word 'letimela', meaning 'the lost one'. When reconstructed, the skull shows the frontal orbits and top of the skull with some dentition. 'There were no replicating parts as we pieced the skull back together and many of the fragments refit, indicating they all came from one individual child,' says Darryl de Ruiter, a palaeoanthropologist who previously led a study of the adult skull of *H. naledi*. 'This is the first partial skull of a child of *H. naledi* yet recovered and begins to give us insight into all stages of life of this remarkable species,' says Juliet Brophy. Leti's brain size is estimated at around 480 cm³ to 610 cm³, which would have been around 90 to 95 per cent of its adult brain capacity, according to Debra Bolter, a specialist in growth and development.

It has yet to be established how old Leti's remains are. However, since other fossils found in the nearby Dinaledi Chamber are dated to between 335 000 and 241 000 years ago, Tebogo Makhubela, part of the geological team investigating the discovery, believes that it is likely that Leti is from a similar period, based on preservation and proximity. *Wits University, 10/8/2022*

Female archaeologist joins a cohort of change-makers

Keneiloe Molopyane, an archaeologist and biological anthropologist at Wits University, has been recognised as a pioneer by the National Geographic Society (NGS). She was appointed to the 2021 Emerging Explorer cohort. Recognition as a geographic explorer is a distinguished accolade that is reserved for individuals with 'transformative ideas' who aim to harness the power of knowledge to 'illuminate and protect the wonder of our world'. Molopyane's partnership with the NGS will allow her to pursue new projects, collaborate with other Explorers, amplify her work to NGS audiences and do educational outreach through the society. She will also participate in public speaking and media training.

Molopyane joined the Rising Star Cave research team in 2018 as a junior underground astronaut. The topic of her PhD in biological anthropology at Wits in 2020 was skeletal trauma. She then became involved in the UW105 cave excavations, where she took on a leadership role. She has since become the first post-doctoral research fellow at the Wits Centre for Exploration of the Deep Human Journey, which is headed up by fellow Witsie and NGS Explorer at Large, Prof. Lee Berger. Molopyane's post-doctoral research will entail deep exploration of the famous Gladysvale Cave system.

Wits University

MEDIEVAL ART, UNICORNS AND THE 'HORN OF ULPH' ELEPHANT TUSK: AN AFRICAN CONNECTION?

Francis Thackeray

At least some unicorns represented in early medieval European art may have African origins (Thackeray 2020). One particular unicorn (Fig. 1) is carved on an 11th century elephant tusk (<https://hoaportal.york.ac.uk/hoaportal/yml1414image.jsp?id=6&figure=1>) curated by York Minister in England (Kendrick 1937). Colloquially, it is known as 'The Horn of Ulph' but art historians refer to such early medieval tusks alternatively as 'Oliphants' as described by Shalem (2004) and by Shalem and Glaser (2015). Dugdale (1716) reports that historically the Ulph Oliphant was used to contain wine (a 'drinking horn'). It also served as a 'calling horn' (Backa 2015).

As yet, the source of the Ulph Oliphant ivory is not known. The question arises as to whether it was an African tusk that was brought to Europe by sea or overland. Historical evidence indicates that ultimately it was given to York Minster by a Norse nobleman named Ulph who lived in Yorkshire c. 1000 AD. Such elephant tusks were believed to be the horns of unicorns, as reported in the *Karlamagnussaga* in Norse prose compiled for Haakon V of Norway (Hieatt 1975).

The unicorn on the Ulph Oliphant (Fig. 1) was described by Shepard (1930) as 'probably the most remarkable relic in unicorn lore ... The designs carved upon it, wherever and whenever they were made, are ancient.' Unicorns came to be symbolic of Christ in medieval Europe. Since there is historical evidence that the Ulph Oliphant was used to contain wine and since it belonged to York Minister, one may ask whether such vessels served in particular to contain communion wine that is associated with the death of Christ. This possibility can be assessed in the context of medieval tapestries. Notably, a dying unicorn is represented in a French/Netherlands 15th to 16th century tapestry of the 'Holy Hunt' (Fig. 2), described by Cavallo (1998) as 'The Hunt of the Unicorn as an Allegory of The Passion of Christ'. It shows a hunter's horn being used to collect blood of a wounded unicorn, which is analogous to the use of a chalice to collect blood of a dying unicorn (cf. Christ) in the case of a Swiss medieval tapestry (Cavallo 1998, 51) discussed by Thackeray and Warren (2005).

Like the Ulph Oliphant, and at least symbolically, the horn in Fig. 2 served a dual purpose: in this case for hunting (to produce sound) and as a vessel (for

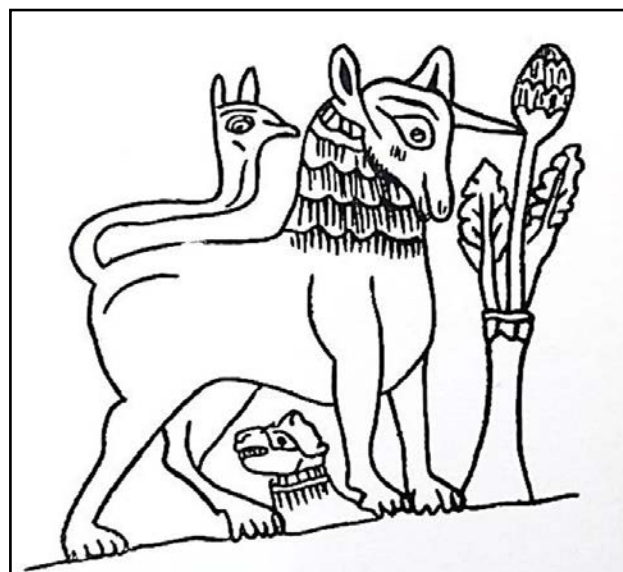


Fig. 1: A unicorn carved on the 'Ulph Oliphant' elephant tusk (Shepard, 1930). The horn of the unicorn touches the side of a symbolic tree, strongly reminiscent of unicorns in other medieval images.

blood). Dual use of horns (associated with both sound and liquid) is reflected in the *Canterbury Tales* (The Franklin's Tale) of Geoffrey Chaucer (c. 1340–1400): 'Janus sits by the fyr [fire] with double berd [beard], and drynketh of his bugle-horn the wyn'. Christ (communion wine) and a unicorn can be identified in the context of an early 16th century Spanish chalice curated at the Metropolitan Museum of Art in New York (catalogue number 17.190.372). It was manufactured in Cordoba and used in Seville. Manufactured in silver gilt, it has an inlaid enamel image of a unicorn. The inscription reads: 'Hic est envm calix sangvinis mei nvovi', associated with the Biblical verse (Matthew 26, 28): 'For this is my blood of the New Testament, which is shed for many for the forgiveness of sins'.

Oliphant 'horns' were associated with the concept of thanksgiving after victory in war, as indicated from Canto 267 of *Chanson de Roland* (Crosland 1999), written in 1098 AD. In this instance, an Oliphant 'horn' was brought to the Basilica of St. Seurin in Bordeaux after battle and placed on an altar upon which communion wine would be blessed. The Olifant horn in Roland's song may also have been used as a trumpet in rallying calls in contexts of war (Roland's *Chanson*, Canto 255). Indirectly related to this is a French 13th century stained-glass window from Sainte-Chapelle in Paris (currently curated in the Cluny Museum, Cl. 23721) depicting the use of a curved instrument (cf.

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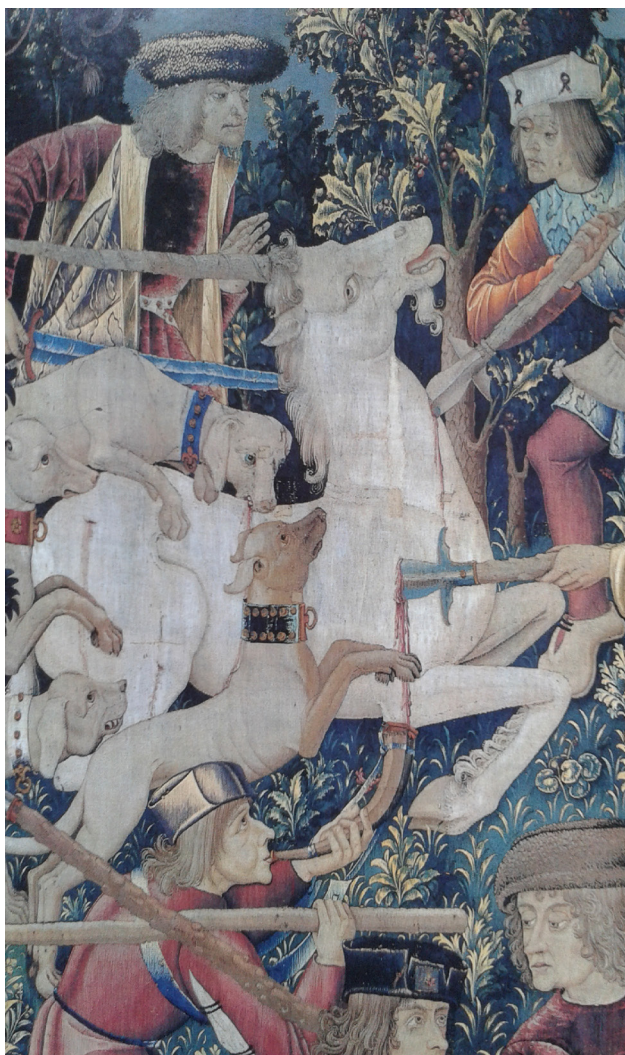


Fig. 2: Medieval tapestry of the 'The Holy Hunt'. Blood of a wounded unicorn is collected in a hunting horn comparable in shape to that of the early medieval Ulph Oliphant tusk. Source: 'The Hunters Return to the Castle'. Unicorn Tapestries; wool warp with wool, silk, silver and gilt wefts; French (cartoon)/South Netherlandish (woven), 1495–1505; 68 x 42 in. (172 x 106 cm); The Metropolitan Museum of Art, New York, Gift of John D Rockefeller Jr, 1937 (37.80.5).

trumpet) similar to the Ulph Oliphant tusk in terms of shape and relative size.

Conclusion

It is entirely possible that the Ulph Oliphant tusk was used not only as a 'calling horn' or trumpet (to summon congregants of York Minster) but also as a chalice for communion wine (for forgiveness of sin) related to the blood of Christ and having associations with unicorns, one of which is engraved on the Ulph Oliphant with its horn touching the side of a symbolic tree (Fig. 1). The latter is strongly reminiscent of medieval unicorn scenes associated with the Tree of Knowledge in the Garden of Eden in which 'Original Sin' was committed (Thackeray and Warren 2005).

Chemical analysis of elephant ivory can facilitate

the identification of areas from which elephant tusks originated, as demonstrated by a South African archaeological team including Nick van der Merwe, Julia Lee-Thorp and myself (Van der Merwe et al 1990) and by an international team including Judith Sealy (De Flamingh et al 2021). Potentially the source of the 'Horn of Ulph' and other carved elephant tusks in European museums can be determined from the analysis of carbon, nitrogen and strontium isotopes. It is hypothesised that the early medieval Ulph Oliphant originated from Africa rather than from India. An African origin would be consistent with the possibility that at least some early medieval (c. 12th century) European art depicting curved-horn unicorns developed originally from beliefs associated with African animals (Thackeray 2020), whereas 15th to 16th century beliefs in straight-horned unicorns were primarily associated with Arctic narwhal tusks.

Acknowledgements

I thank the following for opportunities to see materials examined in this study: the curators of the Treasury at York Minster, the medieval collections at the Metropolitan Museum of Art in New York and at the Cluny Museum in Paris. Peter Knox-Shaw and John Cunnally provided valuable advice with regard to earlier versions of the manuscript of this article. I am grateful to Dr Helen Rawson (Head of Heritage and Participation, York Minster), Barbara Boehm and Charles Little (Metropolitan Museum of Art in New York), and Jean-Michel Massing (King's College, Cambridge). This article is dedicated to Oriane Braga.

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THE SEARCH FOR THOMAS BAIN'S COPIES OF ROCK PAINTINGS

Kate McCallum

Once upon a time, not very long ago, enforced rest made me read more than usual and I eventually came to the bottom of my to-read pile. Panic ensued. I drew from the in-an-emergency-read-this pile and found myself reading the 1984 illustrated biography of Thomas Bain, the roadbuilder (not Thomas Baines, the artist) by Patricia Storrar, called *A Colossus of Roads*. I sat upright when I got to the chapter detailing his interest in rock paintings and the fact that he carried a sketch book with him to copy rock paintings whenever he surveyed a planned mountain pass. Storrar's book also mentioned that he had presented a number of 'Bushman paintings in the Clanwilliam division' to the South African Public Library in 1878.

Having been a member of ArchSoc's eCRAG (eastern Cederberg Rock Art Group) for six years, which looks for and records rock art for the SAHRIS database, I regard rock art much as a cat might regard catnip. Thinking that Janette Deacon's encyclopaedic knowledge of rock art would encompass this little nugget, I sent a diffident email labelled 'An Unimportant Question' to her and Nic Wiltshire asking if they knew of Thomas Bain's sketch book and the fact that 'Ginger' Townley Johnson had seen it. According to the bibliography, he had written an article in *The Lantern* 17(1) of 1967 entitled 'Thomas Bain: his priceless little drawing-book of rock-paintings redrawn'.

Neither had known of either. All three of us were excited. The significance of the sketch book was that we would be able to match the paintings to the ones in the SAHRIS database, see what we had already found and recorded, see which ones still needed to be found and then go and look for them. It would also allow us to assess how much the condition of the rock art had deteriorated over 150 years.

Since the bibliography listed the papers of Andrew Geddes Bain and Thomas Bain as having been donated to the Manuscripts Collection of the UCT Library, my first action was an email to a member of my walking group, Lesley Hart, who had been the manager of the library's Special Collections section, to ask if she knew whether the sketch book, the article or the paintings were among the papers, since I had been unable gain online access. She helpfully sent me a list but none of the three items were among the papers. She confirmed that the SA Public Library had

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Fig. 1: Anthony Storr Lister holding Thomas Bain's sketch book

become the SA National Library, suggested trying the National Library and Iziko and gave me names of contacts.

In the meantime, I had re-read the Acknowledgments in the book and seen that the author had been shown the sketch book by Mrs JNS Lister of Kenilworth, which made me suspect that the sketch book might still be in the possession of the family. (Mrs Lister's phone number was still in the phone book but gave a disconnected signal when I tried it.) It so happened that I had been invited to join the Owl Club late in 2021 where I had met Anthony Storr Lister at my second dinner. I also remembered, from reading the history of the last 25 years of the Owl Club given to me at the first dinner, that Anthony was a descendent of Thomas Bain and had given a talk on his two talented forebears to the Owl Club. So, I emailed him, explaining what I was after and why, and asking if he knew where the sketch book was. 'I have it', came the prompt reply, adding generously, 'and you're welcome to come and photograph it'.

It was in removal boxes, so he had to hunt for it, but two weeks later I was around on a Sunday afternoon



Fig. 2: Page 5 of the sketch book, showing a bi-chrome painting labelled 'Bidouw, CW [Clanwilliam]'. The tracing done on the following page shows through onto this page as a black outline

standing on a stool excitedly photographing each of the 38 pages of a somewhat battered hardcover sketch book in landscape format, slightly bigger than A4, with dark red Florentine marbled covers (Fig. 1). The early sketches were painted in full colour in water colours but the later pages were pencil sketches with the colours indicated by B, R and Y (black, red and yellow). I surmised that he did the initial sketches or tracings on site, then painted in the colours back at his camp or at home. Patricia Storrar described the book as having sheets of tracing paper interspersed with each page of cartridge paper onto which he had traced the outline of the images, then scored over the tracing paper to impress the outline on the cartridge paper. The scoring was so hard that it sometimes emerged onto the other side of the page, she wrote.

However, the book I saw had no tracing paper in it and I wondered how he would have been able to hold a book up to the rock face with one hand while tracing on the delicate facing sheet with the other, unless of course there was someone with him to hold the book and tracing paper while he traced the images. Another possibility is that he traced on loose sheets of tracing paper and then discarded them. If his method was indeed to trace the images, then we would know that the images in his sketch book are to the same scale as the originals.

The paintings were not dated but labelled with a caption, such as 'Boontjes River, CW' [Clanwilliam] or 'Bidouw Cave, Clanwilliam' (Fig. 2). The first 21 pages of the sketch book were of paintings in and around Pakhuis, so we could assume that they were copied when he was engaged in building his ninth pass, the Pakhuis Pass, from 1875 to 1877.

It is always easier to think about something when one has the actual object in one's hands. In the absence of the actual sketch book, I had a facsimile made from my photographs, with the pages printed back-to-back

in the correct sequence. I drew up a spreadsheet listing the paintings and their locations, realising once I had done so that it was a chronological record of where he had been. If the first 21 pages were of paintings in the Pakhuis Pass, pages 22 to 28 were a return to Bain's Kloof (built by his father, Andrew Geddes Bain) and the Tradouw Pass (Bain's eighth pass built during 1869 to 1873); pages 32 to 38 were of paintings in the Karoo, Calvinia and Lamberts Bay.

Janette ('I can't wait for the next instalment!') and Nic immediately identified one of the paintings as being from the Sevilla Trail and a second one possibly being from another Sevilla Trail site (Figs 3 and 4). Janette went through her rock art books by Townley Johnson and Jalmar and Ione Rudner to see if there were any matches to the Bain recordings but there seemed to be none other than those from Sevilla. By this time, I was relaying each development to Janette, Nic, Cilla Williams and my walking group, who followed the hunt avidly. The next step was to visit the SA National Library, where Melanie Geustyn had found the copy of *The Lantern* with Townley Johnson's article. This confirmed that Townley Johnson had seen the sketch book. So that was Item 2 ticked off the list. Now for



Fig. 3: Pages 20 and 21 of the sketch book showing the dinosaur/ lizard-like figure at Site 2 of the Sevilla Trail



Fig. 4: Enhanced photograph of Fig. 3 (photo: Janette Deacon)



Fig. 5A: Page 18 of the sketch book: with the frieze of antelope



Fig. 5B: Page 19, continuation of the antelope frieze

Item 3, the 38 paintings donated by Thomas Bain.

Although Janette had found a reference in Jalmar and lone Rudner's book, *The Hunter and His Art* (1970), to 38 copies of rock paintings by Thomas Bain being in the Grey Collection, this was not the case. Melanie had looked in all possible indices without success. Much to my pleasure, she had the Board minutes for those years brought down from the safe to see if there was any record of a donation or transfer. These were large hardcover ledgers in marbled paper covers, with the minutes in faded but legible black copperplate handwriting. There was no record of any donation. Melanie pointed out that the Grey Collection had been donated by Sir George Grey in 1863, while the donation by Bain had been in 1878, and that it was rare for a significant intact collection to have items added to it. She thought the paintings might have been directed to the SA Museum/Iziko, which had shared a building with the National Library for some 30 years. She emailed a colleague there.

By this stage I suspected that the 38 paintings were worked up and painted copies of the 38 pages of the sketch book. The numbers matched and it was unlikely that Bain would have found a further set of sites to draw and paint. I also surmised that they would be done in watercolour (watercolours being easily portable, quick to dry, readily available) and be the same size and scale as the sketch book ones.

The next day Wilhelmina Seconna of Iziko replied to say that Iziko had eight copies of rock paintings by Bain. She wrote: 'I did an inventory check and can confirm that Iziko Archaeology has 8 watercolour copies all painted by Thomas Bain. These have all been digitised on SARADA's website (the Southern African Rock Art Digital Archive) but registered as "Historical Copies" and doesn't include the artist's name, hence the reason why my initial search proved fruitless. In the past, artefacts coming into the museum were allocated a registration number (in this case all

eight reproductions were given the same registration number which complicates things now). This has since changed, and objects are now allocated a unique accession number. This is a project we are hoping to tackle with our Rock Art Reproductions. I hope this helps and I'll keep my eyes peeled as we



Fig. 6: Iziko photograph of the painting of antelope in its collection (photo: Iziko Museum)

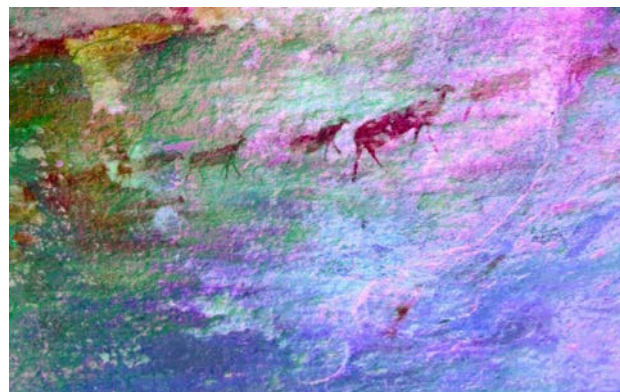


Fig. 7: D-Stretch enhanced and enlarged photograph of Fig. 6

have yet to unpack hundreds more and many of these paintings have “no information”.

I immediately sent her the photographs I had taken of Bain’s sketch book to see whether there was a match. The next day she sent me copies of the images by Thomas Bain in Iziko’s collection. ‘I can confirm that all images ... have been compared and confirmed to be those in Thomas Bain’s sketch book.’ The notes attached to the Iziko paintings confirmed that the sizes of the paintings match the size of the pages in the sketchbook. Now we knew that the Bain paintings went to Iziko and that the remaining 30 paintings await unpacking and identification.

A visit to the Sevilla Trail in the northern Cederberg in April 2022 with Janette and others confirmed that two of the Bain paintings were from Sites 2 (the dinosaur/lizard figure) and 3 (flying black birds). Further excited hunting revealed another unrecorded site, not on the formal trail but close to Site 2. It was a frieze of antelope, which was also one of the paintings found at Iziko (Figs 5A and 5B, 6, 7). When comparing Bain’s paintings with the original rock paintings, it was clear that, like most artists and photographers, he had cherry-picked his images from a scene. He was not attempting to document an entire site as a researcher (or eCRAG) would do but was recording what appealed to him.

Did Bain have more than one sketch book of rock paintings? Patricia Storrar refers to his lifelong interest in fossils, geology, botany and his natural history collections. He was a polymath, building significant collections of the things he was interested in. If his interest in rock paintings was lifelong, it would suggest that he filled several sketch books as he travelled extensively around the countryside. However, there are no further references to other sketch books. The way he filled the current sketch book also suggests it was the only one: the first 20 pages are colour paintings, then pencil sketches thereafter – as though he had become too busy to continue painting in detail.

Now eCRAG needs to find and re-record those sites painted by Bain that are not on the SAHRIS database. Watch this space!

Acknowledgments

Grateful thanks are due to the following, whose work contributed to the team effort: Janette Deacon, archaeologist specialising in heritage management and rock art conservation, author, founder of eCRAG and member of international panels on rock art; Nic Wiltshire, archaeologist and owner of OpenHeritage and Cedar Towers, member of eCRAG; Lesley Hart, retired manager of Special Collections, UCT Libraries; Anthony Storr Lister; Melanie Geustyn, National Library of South Africa; and Wilhelmina Seconna, Iziko.

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DO ROCK PAINTINGS IN SOUTH AFRICA REPRESENT A DISTANT GEOGRAPHICAL LOCATION?

Ilhaam Manan

In this note I discuss visual similarities between the rock features of a shelter at Truitjieskraal Site 1 (TS1) in the Matjiesrivier Nature Reserve (Fig. 1) and rock paintings found at Salmaanslaagte Site 1 (SS1). The two sites are around 80 km apart and are both situated in the Cederberg area of the Western Cape.

Is it possible that the San artist at SS1 aimed to depict the rock shelter at TS1? There are some visual similarities between the physical rock formation of the shelter at TS1 and certain elements of enigmatic rock paintings found at SS1. I came to this conclusion when I visited the sites within a period of six months, the paintings at SS1 in August 2021 and rock formations at TS1 in February 2022. The parallels between the rock formations at TS1 and rock art at SS1 are outlined in the following table.

Notable features as parallels between Truitjieskraal Site 1 and Salmanslaagte Site 1

	Truitjieskraal Site 1	Salmanslaagte Site 1
a)	Two areas next to each other; weathered rock on the left and rock shelter on the right (Fig. 1)	Two paintings next to each other; one oblong on the left, one rounded on the right (Fig. 2)
b)	Rock on the left is weathered in a lobed fashion or crenellated/undulated pattern (Fig. 3(b) above)	Painting on the left has lines of crenellated/undulated pattern (Fig. 3(b) below)
c)	There is a stepped ceiling in the rock shelter on the right (at least three steps) (Fig. 3(c) above)	Nested curves or 'U' shapes in the rounded painting on the right (at least three prominent curves) (Fig. 3(c) below)
d)	There is a weathered hole in the rock above the shelter on the right. (Fig. 3(d) above)	There is a hole above the rounded painting on the right, where a pebble or stone could have fallen out (Fig. 3(d) below)
e)	Paintings at TS1 depict groups of women, elephants and zebra/quagga	Paintings at SS1 depict groups of women, elephants and zebra/quagga

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Fig. 1: Looking up at TS1

Interpretations of the pair of paintings at TS1

Initially, bizarre descriptions like 'magic carpet' or 'phoenician galley' (Fig. 2) were given to these two paintings (Slingsby 2017) but more recently the nested 'U' shapes/curves and crenellated patterns found in both paintings have been linked to entoptic visions seen in trance via dance (Lewis-Williams 2019). This theory developed further by the addition of a layer of representation linked to visual similarities with wild honeycomb/beehives. Honey is an important and potent substance among the San peoples of southern Africa and will have been an important part of the worldview of those creating paintings (Lewis-Williams, 2019).

Beehives and their relationship with sound, vibration and acoustics become particularly significant when explored in conjunction with !xam San ethnographical references to 'Honey Songs' (Rusch 2018). When

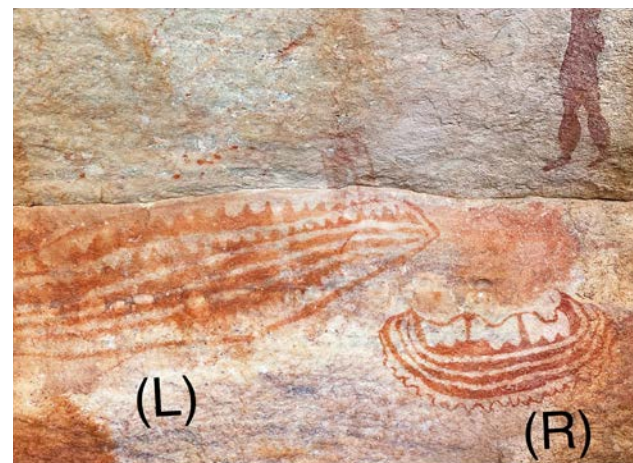


Fig. 2 Rock art paintings at SS1

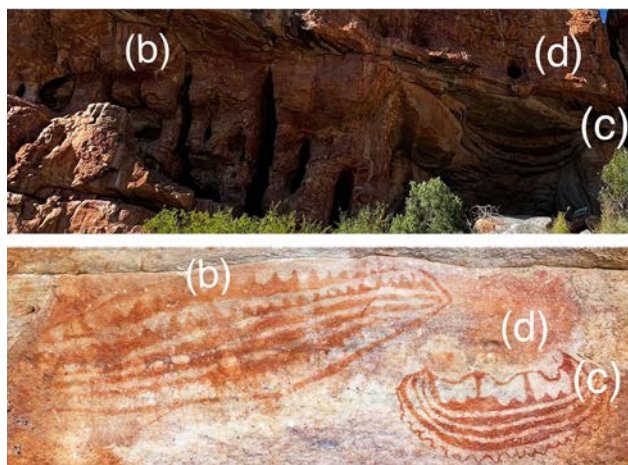


Fig. 3: Notable features and parallels between TS1 (above) and SS1 (below)

looking at these paintings we could be seeing song induced trance dances, leading to entoptic visions that are interpreted as potent honey producing hives; hives which tremble and hum, bees that wiggle and dance.

Conclusion

Should the paintings found at SS1 be representations of, or at least in part symbolise the geographical and

physical place that is TS1 (Fig. 3), this adds a new layer of meaning to both. In addition, it would reinforce the significance of nested 'U' shapes and crenelated patterns – whether it be in weathered rock formation or paint – as well as their interpretations related to entoptics and potency, and vibro-acoustics. Many years ago, in the same area as TS1, archaeologists found a mummified San baby (Slingsby 2017) that could be another indicator of this particular location having held special meaning for the San.

If the artist who created the pair of paintings at SS1 intended to reference TS1, what could the reasons have been? Perhaps he was drawing upon its power as a well-known site of symbolic potency, maybe a particularly strong trance vision was interpreted as TS1 and then recorded in paint, or maybe the paintings served as a visual recollection of a previous ritual event that may have taken place at TS1.

It would be interesting to visit TS1 on a rainy day, to observe the ways in which the rainwater flows down and through all of the weathered holes and crevices, and even to listen to the sounds that these trickles, streams, spouts and drips would make. Trickles, streams, spouts and drips that continue to create the forms of these potentially meaningful weathered rocks today.

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.

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