

https://dspace.org/

THE TREE PAINTINGS OF THE MATOBO HILLS ZIMBABWE

T Wilce; Benjamin Smith

https://hdl.handle.net/10539/47604
WOS

Downloaded from a DSpace repository. https://dspace.org/

Research Article

THE TREE PAINTINGS OF THE MATOBO HILLS, ZIMBABWE

TYLER M. WILCE[1,*] & BENJAMIN W. SMITH[1,2]

[1]*M257, School of Social Sciences, University of Western Australia, Perth WA, 6009, Australia*

[*]*Corresponding author. Email: tyler.wilce@outlook.com*

[2]*Rock Art Research Institute, University of the Witwatersrand, Johannesburg 2050, South Africa*

(Received November 2024. Revised February 2025)

ABSTRACT

While the environment around us, for most of human history, has been visually dominated by trees and plants, these subjects are rare in global rock art. Instead, most rock art traditions are either composed of animals and human depictions, or geometric designs. Almost the only country in the world with a significant number of tree and plant rock art depictions is Zimbabwe, in southern Africa. Here, we examine the rock paintings of trees. We draw upon the legacy private collection of Peter Genge, a local monuments inspector based at the Natural History Museum in Bulawayo. During the 1980s and 1990s he recorded more than one thousand rock art sites from the Matobo Hills in the south-west corner of Zimbabwe. Eighty sites in this collection contain images of 150 trees. We analyse the formal characteristics of each tree painting, in its painted context. A major finding is that, unlike in other parts of Zimbabwe, the rock paintings of trees in the Matobo area are overwhelmingly depicted as bare, with no leaves, flowers, or other species-specific details. We examine this unusual picturing choice and seek to provide an explanation for it.

Keywords: rock paintings, trees, rainmaking, spring season, leaves, Peter Genge

READING THE ROCK ART OF TREES

One of the distinctive features of the rock art of Zimbabwe is the widespread depiction of trees. In other parts of Africa, and indeed on other continents, rock art images of trees are either rare or entirely absent. All those who have worked on the rock art of Zimbabwe have commented on the presence of trees. As early as 1912, after conducting one of the first surveys for rock art in the Matobo Hills of Matabeleland, the journalist and amateur archaeologist Richard Nicklin Hall noted: "The trees portrayed include knobby thorns, baobabs, umbrella trees, palms, tree-ferns, euphorbias, kafir orange, aloes, wind-blown trees, and monkey ropes, as well as aerial and exposed roots. Plant life is general and lovely. There are flowers, flowering shrubs, some bi-coloured, also different grasses. The plants are numerous, and Mr Dowsett, the curator of the Matopo Park and Nursery, states that some of the trees and plants are African, but not Zambezian" (Hall 1912: 594). Hall's grandiose claims of plant species identification are characteristic of his writing (Garlake 1993: 2), but his confidence has not been shared by more rigorous recent researchers.

The Cambridge archaeologist Miles Burkitt visited the Matobo rock art site of Nswatugi in 1927 on his whirlwind tour to evaluate southern African archaeology with his doctoral student John Goodwin, but he did not comment on the trees in his description of the site (Burkitt 1928: 123–128). Immediately on his tail, the German ethnologist Leo Frobenius visited the area during his expedition to southern Africa from 1928 to 1930. He placed significant emphasis upon the tree paintings and published many illustrated examples (e.g. 1929 fig. 3; 1931a figs 20 & 21; 1931b figs 6, 7, 8, 14, 16, 18, 20, 34, 36–45). Frobenius diverged substantially from Hall by emphasising the highly stylised nature of rock art in Zimbabwe. He used this observation to argue for different historical lines of influence between the rock arts of what are now South Africa and Zimbabwe. In what he termed "the southern art", south of the Limpopo River, he believed he saw influence from the cave art of France and Spain, whereas in the "stern and sacred style" of the "northern art" (Zimbabwe), he claimed influences from "Egypt and the Persian Gulf" (Frobenius 1929: 333). He noted: "the southern pictures never show anything but animals and human figures, while in the northern pictures the representation of trees and plants is almost as frequent and varied as that of animals in the southern ones … There are not only trees or plants shown in these pictures, but also mountains, lakes – whole landscapes and representations of scenery" (Frobenius 1930: 338). It was two main features that suggested landscapes to him, trees and sets of large nested oblong forms to which he gave the name 'formlings'. He interpreted many of the formlings as hills, boulders and caves, but he also allowed that they probably had deeper symbolic referents. Their common association with trees (and sometimes trees even seemed to grow out of them) gave Frobenius the impression of landscapes (Frobenius 1931a: 303–306).

The mindset of landscapes in the art and fanciful connections to the Near East captured the imagination of many colonial settlers, and became further cemented by the work of the French archaeologist Abbé Henri Breuil who made three trips to Zimbabwe in 1929, 1948 and 1950. Breuil argued repeatedly for Egyptian and Near Eastern influences in Zimbabwean rock art (e.g. Breuil 1949a&b, 1952, 1954, 1966). His comments on trees were invariably influenced by these views: "Lower down than the serpentine bands, and partly superimposed on them, are eleven trees (perhaps palms) drawn with the technique common in painted vases of Negadah. At the foot of these trees wander fifteen small human figures, painted in the 'picnic style'… Since the type of landscape depicted (if it is one), with a great winding river and palm trees, resembles nothing in this country, one wonders if it does not represent some sort of earthly paradise in a 'Promised Land'" (Breuil 1966: 24).

The next generation of locally resident researchers imitated the early viewpoints on painted trees as indications of landscapes. For example, Elizabeth Goodall, who had formerly been an artist of the Frobenius expedition, commented that: "In the rock art of other countries one finds very few indications of trees, yet throughout the area between the Zambezi and Limpopo rivers, trees of many varieties and landscape indications are very numerous" (Goodall 1959: 62). However, Goodall and most of her contemporaries explicitly rejected the suggestion of exotic influences (e.g. Cooke 1959, 1969: 39; Goodall 1962) as promulgated by their immediate predecessors.

Patricia Vinnicombe (1976: 280) was the first to use San ethnography to consider why trees came to be painted in the rock art of Zimbabwe: "This curious absence of plants associated with food-gathering has been noted throughout the rock paintings of the Republic of South Africa, although in Rhodesia [Zimbabwe] they are more common. The reason for this is difficult to ascertain, but it is noteworthy that although the Southern Bushmen attributed magical properties to particular plants, their mythology gives no hint of any vegetable associations with their deity. Among the !Kung Bushmen of

the northern Kalahari, on the other hand, there are such references as Xue's son was a bobo plant, and he was a sao plant … and he was a naxane fruit, while the Naron believed that in olden times trees as well as animals were people. Drawings made by two young !Kung boys represent Xue as various trees bearing edible fruits and berries which closely resemble some of the Rhodesian paintings. It is possible that a greater religious significance was attached to specific plants by the Bushmen north of the Tropic of Capricorn than by those who lived on the open grassland further south."

After Vinnicombe, and influenced by the formative work of David Lewis-Williams in South Africa (e.g. Lewis-Williams 1981, 1983), all subsequent researchers have considered tree paintings within the context of San religion and spirituality. Peter Garlake (1995: 98), for example, focusing on central and northern Zimbabwe rather than the Matobo Hills, emphasised the strong association between trees and flecks – clouds of short pigment lines. This led him to suggest a special link between trees and supernatural potency. Nicholas Walker (1996) concurred with the link to potency for the 28 sites with trees, 14.8% of his 189 total sample, that he recorded in the Matobo Hills. Unlike the more impressionistic work of Hall, Walker noted that "species are seldom identifiable" (Walker 1996: 32; and see Parry 2000: 124; Nhamo 2020: 12). Siyakha Mguni (2009: 143–144) focused on the link between formlings and trees. In a series of publications (Mguni 2004, 2005, 2006a&b, 2015), he conducted a meticulous formal analysis on formling details and demonstrated that many were not depictions of rocks, as previously suggested, but that they draw upon the form and symbolism of termitaria. Using San ethnography, he explained the presence of trees in this context (Mguni 2009, 2013, 2015). He emphasised "trees as phenomena transcending and therefore interlinking material and nonmaterial realms" (Mguni 2015: 209). He argued that they represented the mediators between the underground realm, the surface and the sky realm, and concluded "that termitaria and trees are primordial symbols at the very core of San cosmological ideas of creation, fertility and supernatural potency associated with the Great God" (Mguni 2015: 171).

The most recent and comprehensive study of tree depictions has been that of Stephen van den Heever's MSc dissertation (2021). His sample included images of 268 tree and arboreal paintings from 68 sites across all of Zimbabwe. He provided the first formal classification for tree images in Zimbabwe as well as direct statistical support for observations made by a number of earlier researchers. For example, he confirmed Mguni's link between trees and formlings, showing that, "of the sites with tree paintings, 35% (24 of 68) have formlings accompanying them" (Van den Heever 2021: 172), and also Garlake's assertion of a strong connection to flecks, showing that flecks occur at more than 60% of all tree sites (Van den Heever 2021: 173). While Van den Heever agreed that the species of most tree paintings was uncertain, he supported Breuil's assertion in arguing that lobed and fronded trees may represent palm species (2021: 69–80, 168). Following Mguni, he sees the trees forming part of the San axis mundi, mediators between the spirit realms in the sky and the underground world. He concluded that the trees were conduits along which ritual specialists climbed and descended during their out-of-body journeys to the spirit worlds (Van den Heever 2021: 174).

A NEW SURVEY OF THE TREES OF THE MATOBO HILLS

A century of research into the tree paintings of Zimbabwe has therefore provided us with a general understanding of the images, their associations and their symbolism. What has also become clearer is that there is more regional variation in the trees. Some of the patterns noted by Van den Heever are not Zimbabwe-wide. For example, although 60% of all Van den Heever's tree sites have flecks (2021: 173), only a handful of the tree painting sites in Matabeleland have flecks. This is a major difference in the key associations of trees. In Mashonaland, flecks swirl and intertwine around almost all trees and they spread across vast painted surfaces, sometimes across entire cave walls (Garlake 1995: 101). Hall, Frobenius, Breuil and Goodall interpreted these as landscape features such as grass, streams, or lakes, but ethnographically informed modern readings have explained them as representing supernatural potency (Garlake 1995: 101; Nhamo 2014: 296). We agree with Mguni (2015) that the painted flecks of Mashonaland are highly variable in their form and could represent multiple things, but why the painters of Mashonaland chose to surround their trees with flecks, while those in Matabeleland did not, is worthy of further investigation. There is clearly some nuanced regional variation in the depictions of trees. Recognising this possibility, we decided that the regional understanding of trees had reached the level of maturity in which more specific and detailed localised research would be productive. We therefore undertook to study all the recorded tree paintings of the Matobo Hills in Matabeleland South.

The source material for this study is the legacy private collection of Peter Genge who worked as the monuments inspector in Bulawayo from 1980 into the 1990s, and continued recording rock art sites in the Matobo Hills long into his retirement. His official site records were lodged within the archive of the National Museums and Monuments of Zimbabwe (NMMZ); his private collection contains a minimum record of 1159 rock art sites. The sites were recorded in a series of field notebooks with sketches, descriptions, notes, and geographic locations in UTM. Photographs were taken on either 35 mm negative or slide film with film numbers and dates noted in the relevant notebook pages. All entries had a corresponding site card that noted the respective notebook pages and image references. The entire private collection has been digitised by the Digitisation Centre of Western Australia to preservation standard. The digital collection comprises 3744 field notebook pages, 4203 slides and 1545 photographs/negatives. The collection is still in the process of being organised and made searchable.

Without descriptive digital metadata in the collection, the identification of sites with trees was an immense task. From the keywords on the site cards, 24 sites with tree paintings were identified, however, some proved to be references to actual trees and ten of these were discarded. One of us (TW) then worked through every slide and photograph/negative and progressively found more sites. For the purposes of this study, only sites from Matabeleland South were included. This process yielded a total of 150 trees at 80 sites, all within or near the Matobo Hills. All photographs, slides, sketches and notes were collated together for each tree site, and a comprehensive site gazetteer was created for Matobo tree sites. Where Genge made a sketch or redrawing, these were used. Additional images of each tree painting were sourced from publications and archives to allow detailed examination of each tree under different lighting conditions and at different levels of magnification. All the collected tree images were then manipulated in Adobe Photoshop™ to seek out their finer details. Previous redrawings were checked and corrected, where necessary. Where no previous redrawings existed, the enhanced photographs were used to make a digital redrawing of each tree in its painted context. Each of the tree painting sites was then geo-referenced to allow for an examination of the placement and distribution of the tree sites.

A FORMAL ANALYSIS OF THE TREE PAINTINGS OF THE MATOBO HILLS

Our ability to recognise any subject in rock art, trees included, depends on learning the conventions by which the artists

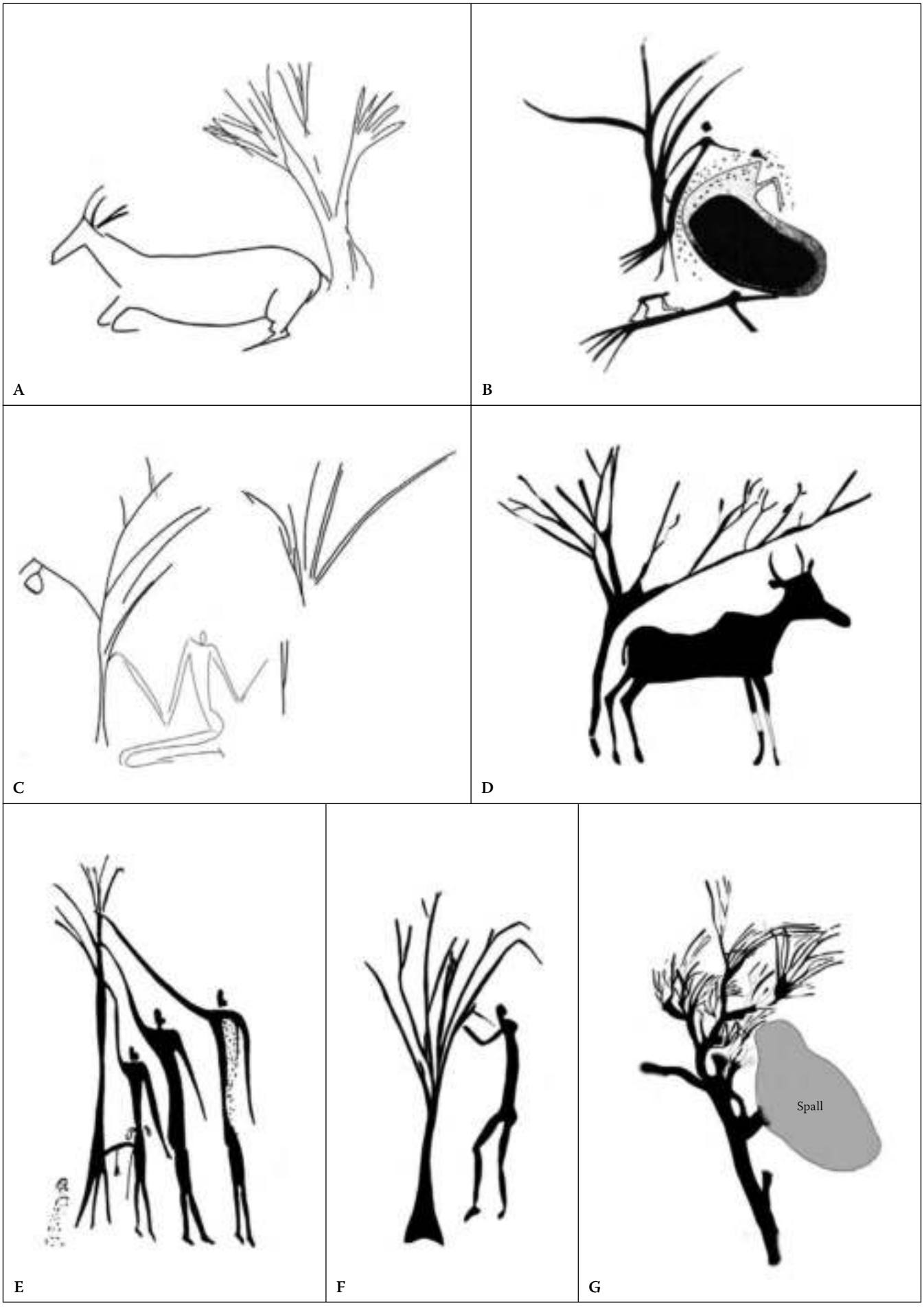


FIG. 1. *Examples of bare trees and associations with human and animal figures. All images by Peter Genge and Tyler Wilce.*

converted three-dimensional subjects into two-dimensional images (Deregowski 1995). Through formal analysis, we can learn the conventional picturing choices made by the artists (Smith 1998), including the selection of perspective, size, things to illustrate, things to emphasise, things to omit, as well as some technical choices such as the selection of pigments/colours, method of application, placement, and so on. Each of these choices can be informative because it may reveal aspects of the picturing purposes (Smith 1998). In the hunter-gatherer rock art of southern Africa, a high degree of naturalism is a typical convention of choice, with the inclusion of the finely detailed, species-specific traits that allow precise identification. Each antelope, for example, is typically shown with those traits that allow it to be exactly identified, often even to sex and approximate age. While side profile is most common, antelope can be shown from the front, back, even from above, but all profiles retain sufficient detail to allow easy recognition of the species (e.g. see Pager 1971).

For trees, Van den Heever (2021: 58, fig. 5.1) has identified five distinctive painted categories of trees: 1) bare, 2) solid, 3) lobed, 4) fronds, and 5) fruits and flowers. He then has separate classification items for 6) leaves, 7) fruits, and 8) flowers. To make our own work comparable and commensurate we endeavoured to use this existing classification as closely as possible, but we found that it needed minor modification. Category 5, for example, is not truly a tree type: fruits and flowers are appendages that can be found attached to any of the other four tree types. We therefore divide our tree classification into two levels: the 'primary characteristics' based on the overall tree shape, in other words, the overall painted form; for this we use Van den Heever's (2021) categories of bare, solid, lobed and fronded, but we add a fifth category, canopied, because there is a class of trees in the Matobo Hills that falls outside the other four categories. We then list 'secondary characteristics', which are various individual features that may constitute or be added to any of the primary tree forms. These features include trunks, branches, roots, groundlines, flecks, fruits, flowers, and leaves.

PRIMARY CHARACTERISTIC

Bare trees

Bare trees consist of networks of branches with no leaves, stretching outwards from a trunk (e.g. see Fig. 1). The trunk and branches are usually solid filled. The thickness of the trunks can vary depending on the overall height of the tree. Many trunks are as thin as 1 cm, but some can be as wide as 10 cm. Wide trunks are uncommon. Usually, bare trees are painted with a single dominant trunk, narrow and thickening towards the base. A few trees have codominant trunks, meaning two trunks of equal proportions branching out. By their nature, bare trees are inherently leafless. Bare trees make up a massive 84% of all the painted trees in the Matobo Hills (n = 126). This is a significant finding because in Mashonaland bare trees are a rare tree type, accounting for only 8% of all the tree depictions. In comparison the most common tree categories in Mashonaland are fronded (34%), lobed (30%) and solid (11%) (Van den Heever 2021: 170). Fruited and flowering trees outnumber bare trees in Mashonaland (Van den Heever 2021: 170).

Solid trees

Solid trees generally have similar characteristics to bare trees, except they are constructed with a solid-filled canopy instead of bare branches. Solid trees are made up of a filled shape sitting on top of a trunk. The filled shapes are crescent-like, or umbrella shaped in form and may be supported by branches extending from the trunk (e.g. see Fig. 2D & E). Solid trees appear like stylised representations of fully leafed trees. Solid trees are rare in the Matobo Hills <3% (n = 4) and are often in highly superimposed contexts making them hard to identify (indeed three in our original sample turned out on close inspection to be three ostriches viewed from behind!). Mguni has argued, on the basis of juxtapositions, that four of the so-called solid trees from one site in the Matobo Hills are not in fact trees but are more likely to be mushrooms (Mguni 2015: 99–100). We agree with him, and we have therefore excluded these four solid trees from our sample. This explains why we report fewer solid trees in Matabeleland South than Van den Heever (2021: 170). Of our remaining sample of four, most are unusually small for trees (>10 cm), and we suspect that some or all of these might also be mushrooms (e.g. Fig. 2E). While there are many clear-cut examples of solid genuine trees in Mashonaland (11%) (Van den Heever 2021: 170), they are almost absent from Matabeleland.

Lobed trees

Lobed trees have relatively large oval or rounded lobed attachments to their upper branches. The attachments form part of the structure of the tree, rather than appearing like hanging fruits. The lobes are usually solid, and there are examples that are filled with flecks. Only one lobed tree (<1%) was identified in the Matobo collection (2028 B3 142). Lobed trees are common in Mashonaland and Manicaland (30%) (Van den Heever 2021: 170). The pattern in the Matobo Hills is therefore again very different. The single potential lobed tree was between two solid trees (Fig. 2D), and all three images were heavily overlain. These paintings need closer, on-site inspection. They are anomalous and so we wonder if, like the mushrooms earlier, they have been misidentified. Van den Heever (2021) reports eight more lobed trees from Matabeleland South, but we note that these images are derived from early sketches by Hall and Frobenius. No recent researcher has found or photographed these trees, and we are sceptical of the way these images were interpreted and rendered by these early observers.

Fronded trees

The main identifiable feature of fronded trees is the clear division of the canopy into pinnate fronds rather than bifurcating branches. This distinctive appearance led Van den Heever (2021: 76) to suggest that this category might depict a species of palm. Generally, fronded trees have tall and slender trunks. We identified four examples (<3%) of what Van den Heever (2021) categorised as fronded trees. The Matobo examples are not particularly suggestive of palms, and all have a stronger appearance of finely painted bare trees (e.g. Fig. 2F).

Canopied trees

Canopied trees have a pronounced and clear form of canopy that evokes the overall crescent or umbrella shaped form of solid trees, but comprises arching parallel lines, sometimes broken into dashes, that give the impression of a dense canopy of branches (e.g. Fig. 2A, B & C). The canopy does not look like leaves and is therefore much closer in concept to the bare trees than to solid, lobed or fronded trees. Canopied trees occur at three sites and consist of 13 trees in total (<9%). There are six examples at one site (2028 D2 MISC-009; Mtshabezi Shelter). Most of the examples are smaller than other tree forms.

SECONDARY CHARACTERISTICS

Trunks

Trunks form part of every one of the 150 trees in our sample. Given that this is the only characteristic that is ubiquitous, the presence

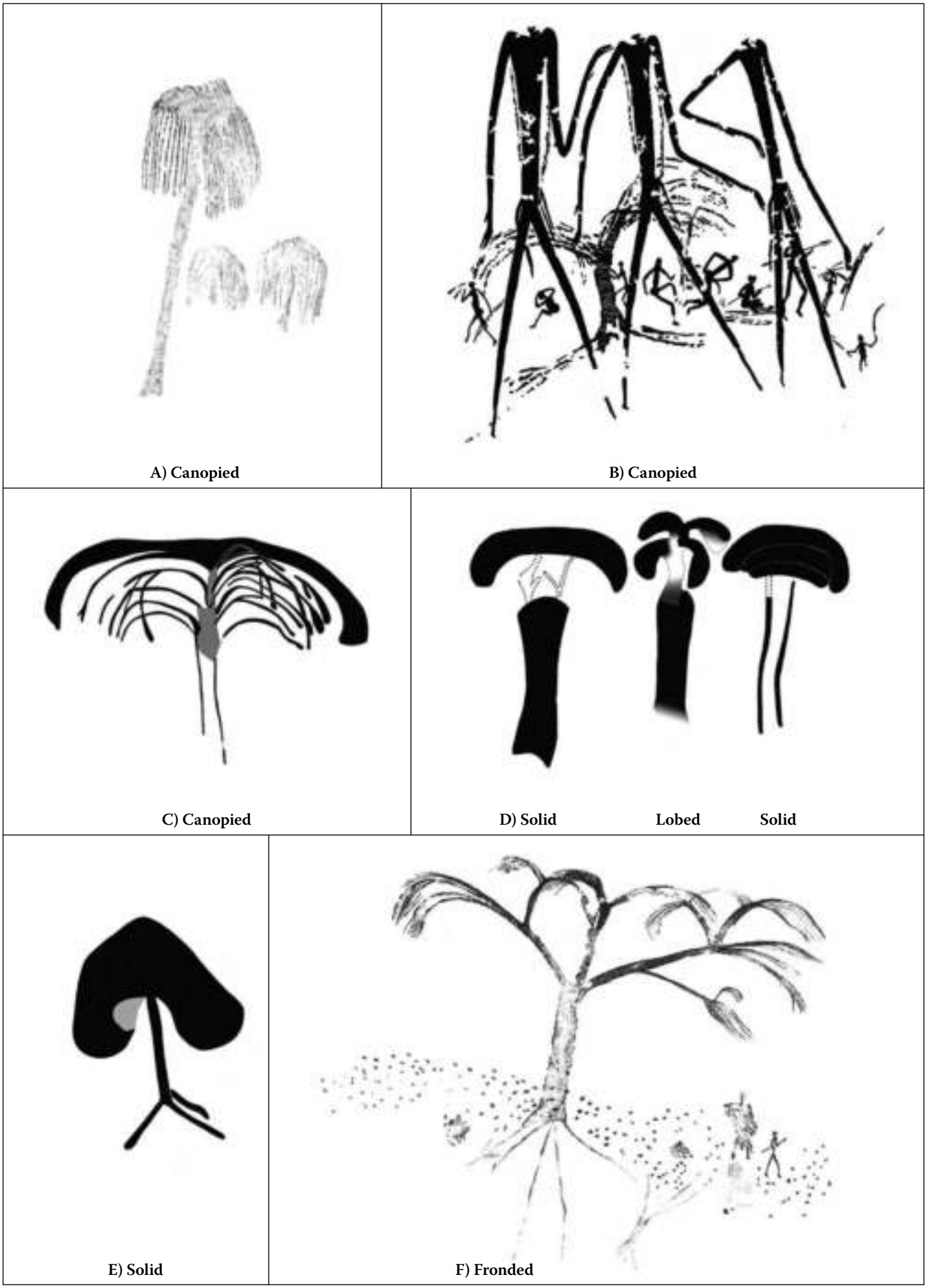


FIG. 2. *Examples of canopied, solid, lobed and fronded trees. A) & F) after Parry 2000: 96–97; B) after Garlake, unpublished. All other figures by Peter Genge and Tyler Wilce.*

of a trunk with other appended features should probably be considered the diagnostic identifying characteristic of a tree painting.

There are three distinct types of tree trunk: solid, outline and codominant. Usually, the trunks are solid infilled, but there are eight sites where only the outline of the trunk is depicted and the inside is left unpainted (2028 A4 132, B3: 142, 150, 214, and D1: 027, 056, 101 and 128). Of these outlined trunks, one is canopied, two are solid, and five are bare trees.

Branches

Branches are a characteristic found on almost all bare trees and some solid, lobed, fronded and canopied trees. Most trees have at least three or four branches. There is no regular upper limit to the number of branches, but on bare trees there are regularly more, sometimes as many as a dozen or more branches.

Leaves, Fruits and Flowers

Unlike in other parts of Zimbabwe, leaves, fruits, and flowers are extremely rare in the Matobo Hills. In the entire Genge Collection there is no tree painting with identifiable leaves; there is only one tree (Site 2028 A4 050) with possible flowers (coloured markings at the end of the upper branches of a bare tree, plausible but not diagnostic), and one tree (Site 2028 B3 214; Fig. 1C) with one possible fruit (a single small pendular object hanging from a branch, plausible as a fruit, but equally it might be a bag or honey sack).

Roots and Groundlines

Twenty-one percent (n = 32) of all the Matobo tree motifs have roots. Bare trees often have roots. In all cases, the roots are the same colour as their tree and they usually have a shallow spread outwards from the base of the trunk, sometimes extending deep down. Horizontal spreading of the roots is not seen. Where there is a horizontal line attached to the base of the tree, this is invariably a groundline upon which human and animal figures also stand. Trees painted on groundlines may also have roots. The roots are typically much more thickset and tapering in width, whereas the groundlines are regular thin lines extending neatly and horizontally from both sides of the base of the tree. Groundlines are associated with bare trees and one solid tree. Bare, solid and fronded trees are found with roots.

Flecks

Of the 80 sites in the collection that contain trees, flecks are only identifiable at three (2028 B3 112, D1 MISC-010 and D2 MISC-004; Gulubahwe), all in direct association with bare trees. Flecks are rare in the Matobo Hills when compared to Mashonaland and Manicaland where they are found at an overwhelming majority of all tree sites (Van den Heever 2021).

SIZE

Based on the height of the 76 trees within the collection which had measurements recorded, or had photographic scales from which a height could be calculated, the most common height is 20–29 cm (28%) with a data range of 6 cm to 69 cm. A range of 10 to 29 cm was most common for bare trees (60%). Solid and canopied trees are mostly less than 10 cm.

COLOUR

For the 105 trees within the collection for which colour could be determined, most are painted in four different shades of red and less commonly, yellow. This fits within the range of colours used for the most common animal and human subjects. A bright red was most common for all types of trees, with only bare and solid trees using yellow. Various darker shades of red, brown and mulberry exist, but these colours were often seen in better preserved contexts and may represent taphonomic factors rather than different pigment sources. There is no evidence at this stage that colour and form are linked, or that the trees can be placed into a sequence based on colour.

ASSOCIATIONS AND JUXTAPOSITIONS

For the purposes of our analysis, we consider all images on the same panel of rock art to be 'associated'. While a single instance of association cannot be taken as statistically significant, we consider that repeated associations – above what would be expected from a random distribution – are likely to be indicative of an intentional association (i.e. a choice by the painters to place these subjects together). A more immediate connection can be assumed for images that lie in close proximity, especially when they occur within the same scenic composition. We use the term 'juxtaposed' for such images. There is not space here for a full analysis of the thousands of associations and juxtapositions at our 80 sites. We confirm the veracity of the observation of the early recorders, as well as the more detailed recent analyses of Mguni (2015) and Van den Heever (2021) that there is a statistically significant association between trees and formlings (Van den Heever reported formlings at 35% of all Zimbabwean tree sites).

There is also a regular association with antelope and human figures, but since these subjects are found at almost all Matobo rock art sites, a strong association is not surprising. The animal and human juxtapositions with trees are more meaningful because the association is stronger and more demonstrably intentional. Many Matobo sites are densely painted and extensively overlain and it often requires careful judgement to decide whether images were placed next to one another with the intention of creating a 'scene'. We acknowledge that there is no universally accepted definition of the term 'scene' in rock art studies, and perhaps there will never be because definitions will differ by cultural context and art tradition (see Davidson & Nowell 2021). We use the term 'scene' here as a formal analytical construct. We define it in our context as a set of paintings made in spatial proximity and with the artistic intention that all included images be read together as an integrated whole. Common examples of 'scenes' in Matobo rock art include lines of walking human figures and family groups of animals. It is commonalities in the manner of depiction, use of colour, the state of preservation, and placement that guide recognition of 'scenes' in Matobo rock art.

Many bare trees are found in scenic relationship with humans and animals. We provide illustrative examples in Fig. 1. In all these cases, the trees are in the same pigment and have the same degree of fading as the juxtaposed animals and humans. We noted repeated patterns in the tree juxtapositions. Out of our sample of 150 trees, we recorded 15 human figures standing underneath a tree, 11 human figures reaching out to touch or to hold a tree, and three human figures climbing a tree. Most of the humans placed in juxtaposition with trees did not have diagnostic sex characteristics, but many carried items of material culture that are more closely associated with men (such as bows and arrows). In terms of animals, we recorded 18 animals standing or sitting under a tree. In many of these cases, the juxtaposition was clear-cut because the animal was placed standing or lying on the same groundline as the tree. There were also five examples of animals browsing on trees. The animals placed in juxtaposition with the trees were all larger antelope except for two giraffes.

DISCUSSION

FORM

Depictions of trees in rock art are rare in global terms, depicted frequently only in Zimbabwe. The Genge Collection from the Matobo Hills holds records of roughly one-third of all rock art depictions of trees, at least those that we know of. The analysis of the tree

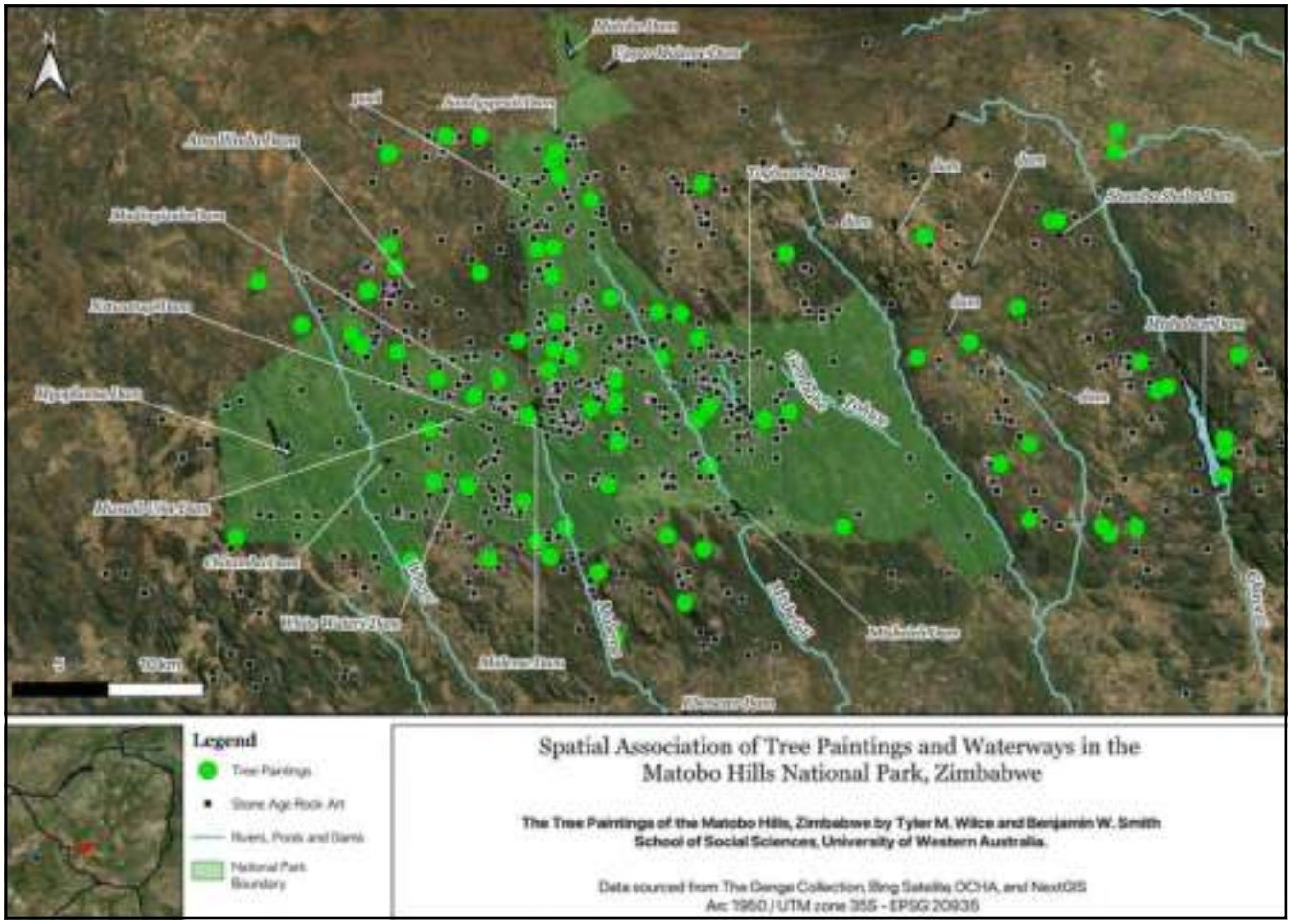


FIG. 3. *Map showing the location of the Matobo Hills within Zimbabwe, and the distribution of tree paintings (circles) in relation to other rock art sites (squares)*

depictions within this collection has revealed a set of patterns, the most significant of which we will discuss here.

In terms of their manner of depiction, the Matobo trees stand out as an anomaly within the southern African hunter-gatherer rock art corpus. While, like most animal and human depictions, they are drawn as if seen from the side, few if any of them contain the species-specific details needed for precise identification. Leaves, fruits, flowers, and bark details are the kinds of features that modern botanists use to differentiate tree species (e.g. see Palgrave & Palgrave 2003), but these are seldom if ever depicted. There is a huge diversity of tree species within the Matobo landscape. Cotterill and his colleagues report at least 141 different species (Cotterill *et al.* 2018) surviving today and this extraordinary diversity will likely have been present throughout the Matobo painting sequence. There is considerable fine detail painted in many of the Matobo depictions of trees, enough to allow the inclusion of species-specific details had the artists wished to include them. Figure 2B, for example, has 20 fine line branches with incredibly precise and delicate detail, but oddly it contains no species-specific features.

Trees therefore receive different treatment to almost all other categories of rock art subject matter. Southern African hunter-gatherer art is one of the most finely detailed of all the world's rock arts, and this manner of depiction is naturally well suited to the depiction of species-specific details. The picturing choices of hunter-gatherer rock artists for almost all animals, including fish, birds and insects involve the inclusion of all those fine details needed to allow for precise identification. Antelope paintings, for example, include the outline form, body markings, horns, postures and behaviours needed to allow identification. For trees, however, a fundamentally different picturing choice has been made: to intentionally omit those details that would allow species identification. For the Matobo Hills tree paintings, it is what is absent rather than what is included that is most striking. More than 93% of the trees are bare or canopied and they only include a trunk and bare branches. We have raised questions over the intention for the other 7%. Unlike in Mashonaland, the picturing choice in the Matobo Hills was to depict leafless trees even though this choice negated the ability to portray species.

The size of the painted trees is also distinctive. They are depicted vastly smaller than their actual size and are out of proportion to other painted subject matter. They are often a similar height or smaller than associated and superimposed human and animal paintings. When juxtaposed, such as when being browsed by an animal or being held by a human figure, the trees are typically slightly larger than the juxtaposed figures (e.g. see Figs 1 & 6), but not larger to the significant extent that they would be in real life. In general, trees are often hard to notice in the larger Matobo rock art sites. They are overwhelmed in size and visual prominence by paintings of humans, animals and formlings (see Fig. 6). They give the impression of being in the background of other, more strongly emphasised subjects, rather than being the intended centrepiece or focus of the larger panels. They are not given the dominating formal visual presence that they have in the living landscape of the Matobo Hills.

PLACEMENT

While tree painting sites are found throughout the Matobo Hills, the pattern is not what one would expect from a random distribution (see Fig. 3). When compared to the overall distribution of all

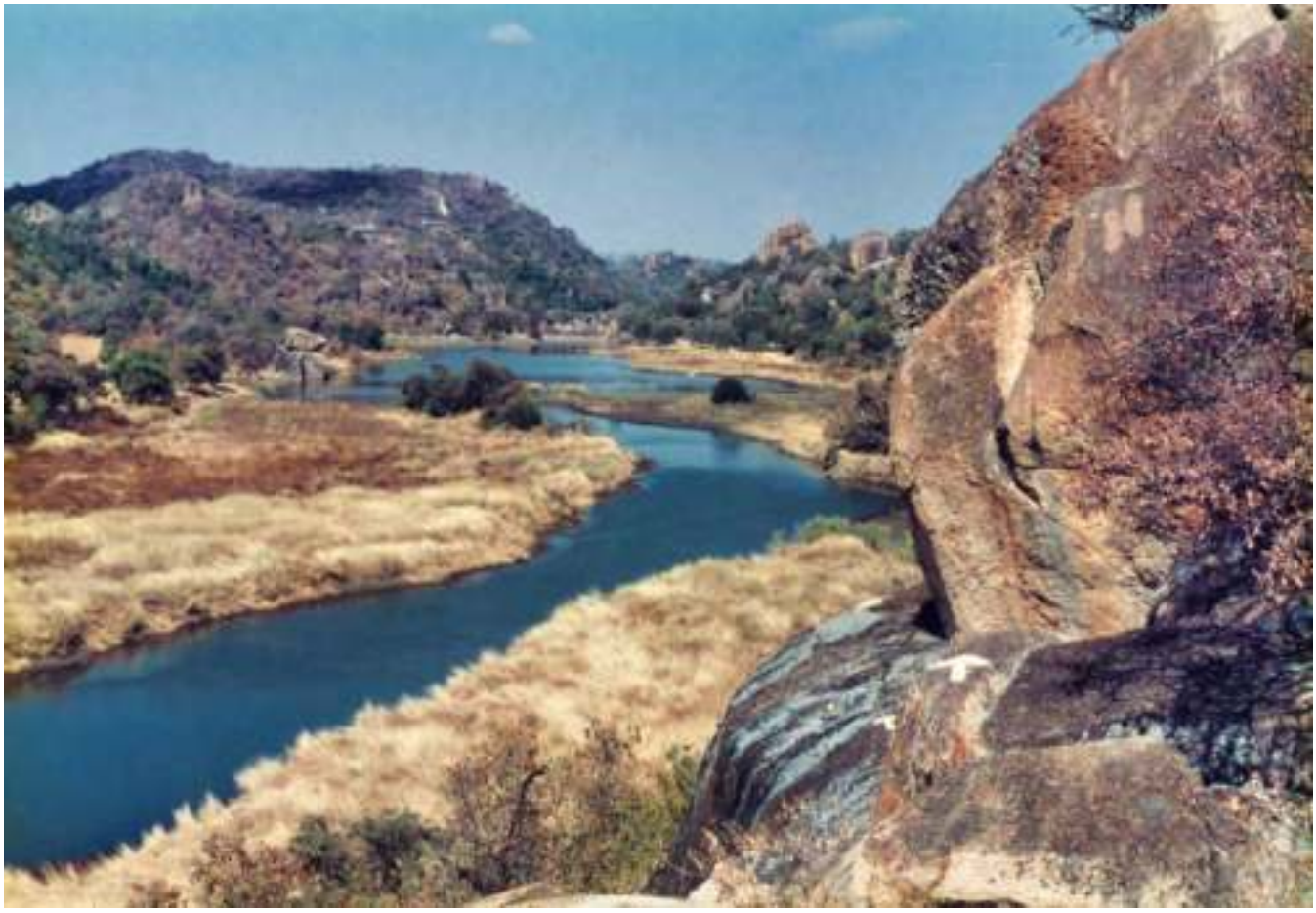


FIG. 4. *The typical riverine Matobo environment in which most of the Matabeleland South tree paintings are located. Photograph by Peter Genge.*

rock art sites recorded by Peter Genge, there is a marked concentration of tree sites within the central and southern portion of the hills. It is notable that most of the tree sites are found along the valleys of the major rivers and streams, and the densest concentration is in the areas that formerly had natural permanent waterholes – now the locations of the four major modern dams in the area: Mtshabezi, Toghwana, Mtsheleli, and Maleme Dams.

NOVEMBER RAINS

These pictorial choices in form and placement, when taken together, are strongly suggestive of a particular social context for the tree paintings. There are only a few months of the year in the Matobo Hills when all the deciduous tree species are leafless in the manner in which they are painted. Throughout summer and autumn, the trees in the Matobo area hold their leaves. The leaves fall in the dry part of winter, typically in late May or early June. The trees then remain bare throughout July and most of August before they shoot with new leaves and flowers in late September as the temperature warms up in the run-up to the rains. Bare trees are therefore a distinctive feature of the months of June, July, August and September. This is the time when there are no rains and the Matobo Hills become a haven for wildlife as one of the few places in the landscape where water pools survive into the driest months. The unique granite domed landscape of Matobo releases its internally held water much more slowly than the flatter and less rocky surrounding area, thereby ensuring that the Matobo area remains greener and wetter for longer. It is in those areas that remain most lush in winter that the tree paintings are concentrated (see Figs 3 & 4).

Despite the comparatively lush environment of the Matobo Hills, Matabeleland South is notorious for its short and erratic rainy seasons. This is a semi-arid landscape, lying just 100 km or so to the east of the edge of the Kalahari Basin. Historical sources describe droughts every five years or so, many of them severe (Goetz 1909; Shinn 1974; Musemwa 2014). In recent decades, annual rainfall has varied from as low as 273 mm (1991/92) to 1043 mm (1977/78) (World Bank 2024). In precolonial times, and even today, the Matobo Hills served as a centre for regional rainmaking. No fewer than six shrines, with rain-calling responsibilities, are known to have been located in the Matobo Hills (Schoffeleers & Mwanza 1978: 299; Bhebhe 2019). Indeed, even the Shona myth of the 'creation of water' refers to the Matobo Hills (Ranger 1999: 19). This intensity of focus has no equal in surrounding areas. The Matobo Hills are singled out as a special regional rainmaking centre. In addition to the shrines, early historical sources record family and village rain rituals and rain dances occurring in many other places in the hills, including in some of the large painted shelters such as Nswatugi and Silozwane (Tredgold 1956; Cooke 1974: 11; Walker 1996: 3; Ranger 1999: 20). Rainmaking ceremonies are still conducted in the area in September each year (Matutu 2023; Fig. 5). The leafless trees in the rock art therefore evoke a particular season, the time of year of the annual communal rainmaking ceremonies. Terence Ranger notes that there may have been continuity from the recent agriculturist rainmaking ceremonies back to hunter-gatherer times (Ranger 1999: 20). He states that there "have probably been rain ceremonies in the Matopos for thousands of years" (Ranger 1999: 20). This kind of continuity has been proven elsewhere in the region (e.g. Schoffeleers 1992: 25–32). We argue that the Matobo tree paintings provide additional support for this.

Ethnographies from Kalahari San groups give added insight into the significance of the month of September within the annual



FIG. 5. *Rain ceremony in Silozwane Cave. Photographed with permission in 1987. Photograph by Peter Genge.*

cycle for hunter-gatherer groups in this region. A special seasonal name is given to the period around September and October: for example, among the G/wi it is called *!hosa* (Silberbauer 1981: 105), among the !Kung it is called *!gaa* (Lee 1984: 27). The anthropologist George Silberbauer notes that "*!hosa* is the most difficult [season] to bear. People become morose, depressed, and listless, and it is a time of disease, discomfort, and dis-interest … This season is bitterly resented" (Silberbauer 1981: 105). He further records that in the central Kalahari, this is a period of separation, a sad time when friends and kin are separated. Also discussing the central Kalahari, Carlos Valiente-Noailles notes that in September when the sun temperatures may reach 67°C and sand temperatures 80°C, "uneaten melons will have dried up. The game has all left and the only animals remaining are the small antelopes and the non-migratory fauna … The Kua are hungry and thirsty, worried as to whether there will be anything for them to drink tomorrow" (Valiente-Noailles 1993: 42).

To the north-west, Elizabeth Marshall Thomas characterised this time of year as "a season of whirlwinds, drought, and clouds of dust … a time of starvation, for the water in the waterholes gets very low until only a little remains on the bottoms and the wild roots push sap into their vines so that the vines turn green and sprout but the roots themselves are shrivelled. This was the worst season of the year for the people" (Marshall Thomas 1959: 148). She noted how all the small family bands in her area gathered during this time at one waterhole called Gautscha, where the water was especially cool and deep. Even there, food was scarce and people "got thin and very hungry" (Marshall Thomas 1959: 149).

Unfortunately, we have no details of this kind concerning the beliefs and traditions of the former hunter-gatherers of south-western Zimbabwe. This has been a farming area for the past two thousand years so memory of these things has long since gone. However, located close to the Kalahari fringe, the Matobo Hills would have been a special place for regional hunter-gatherer groups during the difficult *!hosa* season. The hills would have been far more comfortable than Gautscha. They would have offered both water and relatively plentiful food resources, comparable to the Okavango Delta immediately north of the Central Kalahari. For hunter-gatherer groups of the past, who were living close enough to travel to these places, they would have provided welcome refugia during *!hosa*. They would have been places where people came together as they waited out the "worst season", longing for the coming of the rains.

The archaeologist Nick Walker has sought to understand this refugia role of the Matobo Hills, and to place it within a chronological framework. He has argued that the usage of the hills may have changed somewhat throughout the Holocene. He records that during a wetter epoch at the end of the last Ice Age from 13 000 until about 10 000 years ago, Matobo occupation was only seasonal. People left the hills in about May and spent their winters in the Limpopo Valley and Lowveld Zimbabwe. As the temperatures rose in September they moved north to the cooler, higher elevation areas (>1500 m) around Matobo, then dispersing widely in the uplands areas before returning to the Matobo Hills in March to take advantage of the marula fruits (Walker 1995: 239–40, 1996: 15). The suggestion then is of a possible brief Matobo annual occupation in September and then a longer occupation from March to May. According to Walker, these early Holocene inhabitants only used the larger ceremonial cave sites during these annual sojourns in the hills. Between 10 000 and 9000 years ago, Walker records evidence of a considerable increase in painting activity (Walker 1996: 15) which he recognises from a massive increase in pigment preparation and in splattered pigment in the deposits at many sites. He also sees evidence of year-round occupation and an increase in population size (Walker 1995: 240–241, 1996: 15).

After this, the climate progressively became dryer and, by 6000 years ago, the resident population had become small. Painting activity decreased. Walker suggests a seasonal use of larger

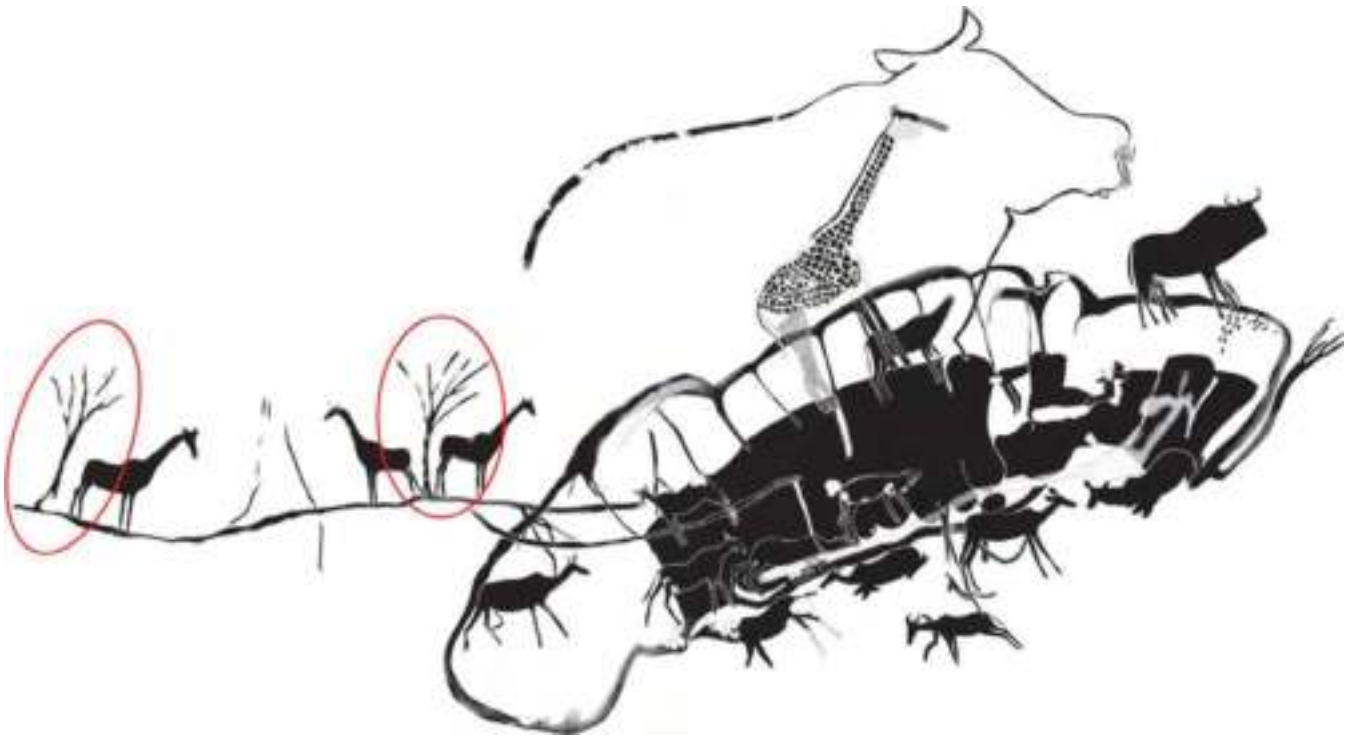


FIG. 6. *Tree paintings in their painted context, including a good example of a groundline. The trees are highlighted by oblongs on the left. Tracing by Siyakha Mguni, archived in the Rock Art Research Institute, University of the Witwatersrand, South Africa. Reproduced with permission.*

ceremonial cave sites throughout this time, similar to what had happened before 9000 years ago (Walker 1995: 241). Only after 4500 years does the population increase again and become more permanent, perhaps splitting into smaller bands for most of the year and then possibly aggregating in autumn (Walker 1995: 241). Some 2200 years ago, herders and pastoralists enter the landscape and by about 1700 years ago evidence of hunter-gatherer life in the Matobo Hills had disappeared (Walker 1996:15).

CONCLUSIONS

We don't know exactly in which of Walker's occupation periods the tree paintings of Matobo were made as none of the paintings has been dated yet, but it seems likely that many of them were made during what he characterises as the most intensive painting period from 9000 years ago until around 7000 years ago (Walker 1995: 241). This is a time in which rain would have become an increasing concern because there was a steady decline in annual rainfall during this period. There was some year-round occupation at this time, but no doubt the population swelled as it always had done during *!hosa* when many groups would have moved in from the Kalahari fringe to take advantage of the comparatively rich resources offered by the hills in this difficult season. Even if the paintings of trees were made during Walker's subsequent two periods of seasonal occupation, the evidence from the bare tree paintings suggests that they were likely made around September. If we accept the evidence presented by Walker, this means that the tree paintings were painted in larger group ceremonial contexts. At least in recent centuries the group ceremonial activities of September strongly relate to rainmaking.

While the Matobo Hills are a major centre for rainmaking today and we know that this tradition extends back many centuries, thanks to research into important rain-shrines such as Njelele (Schoffeleers & Mwanza 1978; Bhebhe 2019), we do not have direct ethnographic records of hunter-gatherer rainmaking practices from south-west Zimbabwe. As we have noted, memories of former hunter-gatherer practices in this area have long since faded. Absence of evidence cannot therefore be taken as evidence of absence. Lorna Marshall who worked with hunter-gatherers in the north-western Kalahari noted that rain-calling occurred but was far less of a feature of Kalahari life in the 1960s and 1970s than it had previously been for the San of South Africa. However, during *!hosa*, or what her !Kung teachers called *!gaa*, if the people "had been long without rain when the rains were expected and [they] had become very anxious, the people might decide to try to call the rain with the rain horn" (Marshall 1999: 167). She describes how a duiker (small antelope) horn was used. It was filled with "rain medicine" and this was then sprinkled on the ground and the owner would "talk to the rain" (Marshall 1999: 167). Old Gaú, one of the old men who worked with Marshall, had a rain horn and he showed her how he used it.

Ranger's (1999) pushing back of aspects of recent agriculturist rainmaking traditions to hunter-gatherer times is therefore not unreasonable, especially in the context of extensive evidence of hunter-gatherer rainmaking practices in South Africa and Namibia (e.g. see Schmidt 1979; Lewis-Williams & Challis 2011: chapters 4 & 5; Kinahan 2020). In both South Africa and Namibia, rock art has provided crucial aspects of evidence for past rainmaking (e.g. Dowson 1998; Kinahan 2020). The same is true in the Matobo Hills. Other repeated characteristics of Matobo support both a seasonal and rainmaking contextual reading.

In terms of seasonality, Mguni has identified the formlings as termitaria and emphasised the presence and significance of flying termites in the rock art (Mguni 2004, 2005, 2006a, 2006b). Termites emerge and fly in swarms during September, before the first rains (Mguni 2015: 145). Mushrooms also appear at this same time, particularly termitomyces mushrooms that act as a marker of the onset of rain and which exist in a symbiotic relationship with termites (Van den Heever 2021: 101). Mguni has identified these mushrooms in the art as well, associated with formlings (Mguni 2015: 99–100). The trees therefore sit within a nexus of markers that all signify early spring and the anticipation of rain. We are not experts on animal behaviour, but it would not surprise us if an African ethologist is able to identify spring seasonality in many of the depicted animal behaviours.



FIG. 7. *Gulubahwe Cave. An example of the larger living and ceremonial sites in Matobo that typically contain rock paintings of animal headed snakes, formlings and trees. Photograph by Peter Genge.*

As well as the suggestion of seasonality, there are other painted features that more specifically evoke rainmaking. Mguni identifies some unusual and large quadruped paintings as the Matobo equivalent of the South African rain animals (Mguni 2015: 126–128; see also Van den Heever 2021: 148–150; Fig. 6, uppermost image). He notes that these creatures are found in association with formlings, and he adds later that "the association of formlings with rain symbolism seems particularly strong in these contexts" (Mguni 2015: 145; and see Fig. 6). One site that he illustrates to demonstrate this phenomenon is Gulumbezhe (see Fig. 6). This site contains what Mguni identifies as a large rain animal (Fig. 6, upper right), overlain by a large formling. There are dots in the top right corner of the formling which may represent termites. To the left of the formling, and attached to it by a groundline, are three giraffes standing beside two trees (Fig. 6, highlighted in red circles), either side of a termite mound. The trees are dwarfed by both the formling and the rain animal. We argue that the trees are not the intended symbolic centrepiece of the panel. They are peripheral and were included as a device to situate the panel in a late spring context. They perfectly complement the many other elements of the panel that reference the symbols of rainmaking. The group of giraffes is therefore in keeping; giraffe cluster in riverine vegetation areas such as Matobo only during the dry season, and then disperse much more widely in the landscape throughout the rains (Estes 2012: 204).

In other panels, researchers have also seen water-related imagery such as fish and women with fish tails as further evidence of rain and its symbolism (Walker 1996: 100–101; Van den Heever 2021: 127, 148–162). One group of paintings, characteristic of Matobo art, that often gets linked with rainmaking, is the large multimetre-long snakes with animal – mostly kudu – heads (Walker 1996: 71; Mguni 2015: 143; Stoll 2016; Van den Heever 2021: 150–154). These are a prominent feature at many of the sites that Nick Walker termed the larger "living and ceremonial sites" (Walker 1996: 73). Examples include Silozwane, Gulubahwe (Fig. 7), Amadzimba, Nanke and Buhwe. These are often the same large caves that contain the massive polychrome formlings for which Matobo is rightly famous. Most of these sites are known to have been used for rainmaking in the past, and some are still used today. They also invariably contain paintings of trees, although the trees are much smaller and usually take some searching out. The animal-headed snakes, the formlings and the trees seem to go together as a rain-related package.

We therefore read the picturing choice of depicting the trees in a bare state, as being a part of the creation of a set of paintings that were made and used during the annual rainmaking ceremonies which have occurred in the Matobo Hills in September probably over many millennia. We do not argue that all Matobo rock art is linked to rainmaking; indeed, we don't think that this is likely. We only see strong, rain-related symbolism in the particular set of motifs within which trees occur frequently. We also do not argue that all Zimbabwean tree paintings evoke rain symbolism or the ceremonial context of rainmaking. The plentiful tree paintings of Mashonaland and Manicaland are rarely painted bare, and they probably have their own specific symbolic contexts that still need precise identification.

RECOGNISING REGIONALITY

While archaeologists and anthropologists have considered hunter-gatherer conceptions of territory in other parts of southern Africa (e.g. Parkington 1972; Lee & DeVore 1976; Silberbauer 1981; Sampson 1988), there has been very little comparable work in Zimbabwe other than the seminal work of Walker (1995). We have presented direct evidence of regionality in the rock art of Zimbabwe (and see Van den Heever 2021). A tangential outcome of this study is therefore that it contributes to the growing focus on regionality in the hunter-gatherer rock art of southern Africa (e.g. see Smith 2006; Nhamo 2014, 2020; Laue 2021, 2022). Whether this

relates in any way to conceptions of territory remains to be investigated. Perhaps other strands of archaeological evidence overlap with the distribution of the particular tree painting types that we have described, and the difference can be explained by reference to regionalism in identity. Perhaps the difference was functional.

There are formal differences between both the primary and secondary painted tree characteristics in the rock art of Matabeleland and those of Mashonaland and Manicaland. The tree motifs in Matabeleland are characteristically bare or canopied, whereas those of Mashonaland and Manicaland are dominantly lobed and fronded. We see these stylistic differences as significant enough to justify the formation of two distinctive regional variants for tree paintings within Zimbabwe. One variant, the Matabeleland variant, seems strongly linked to rainmaking. The symbolism of the other (Mashonaland & Manicaland) needs to be explored in greater detail. The extent to which these two variants overlap in central Zimbabwe also needs further investigation.

ACKNOWLEDGMENTS

The authors owe a huge debt of thanks to the family of the late Peter Genge for giving us access to Peter's remarkable rock art archive. Without access to this archive, we could not have contemplated writing this paper. Tireless work over many decades has resulted in Peter Genge's magnum opus, an archival legacy that will be valued by many, long into the future. We thank the Rock Art Research Institute at Wits University and the School of Social Sciences at the University of Western Australia for their institutional support for this research. This research was undertaken without funding. Sanya Singhal, Parmida Ghorbanian and Sam Lloyd donated their time to entering data into the various database spreadsheets that underpin this research. Anna Biggs provided editorial support. We acknowledge the importance of comments made by Siyakha Mguni and Sven Ouzman that led us to refine the focus of this paper. We are extremely grateful to Stephen van den Heever for providing high-quality copies of his many original tree images, and Rob Burrett for providing a valuable set of his own Matobo rock art photographs. Sam Challis and Mbongeni Tembe offered generous assistance in locating additional Matobo site details, and scanned the redrawing used in Fig. 6. Two anonymous reviewers provided highly constructive recommendations that improved the paper. We thank Siyakha Mguni for his permission to use the image in Fig. 6. The views expressed in this paper are our own and may not reflect the views of those who have supported our research.

REFERENCES

Bhebhe, S. 2019. Understanding the traditional and contemporary purpose of the Njelele rainmaking shrine through the oral testimonies of local people in Matobo. *Oral History Journal of South Africa* 7(2): 1–13.

Breuil, H. 1949a. The age and the authors of the painted rocks of Austral Africa. *South African Archaeological Bulletin* 4(13): 19–27.

Breuil, H. 1949b. Some foreigners in the frescoes on rocks in southern Africa. *South African Archaeological Bulletin* 4(14): 39–50.

Breuil, H. 1952. The influence of classical civilisations on the cave paintings of South Africa. In: Leakey, L.S.B. & Cole, S. (eds) *Proceedings of the Pan-African Congress on Prehistory, 1947*: 234–237. New York: Philosophical Library.

Breuil, H. 1954. Rock paintings of South Africa. *Anthropological Quarterly* 27(2): 31–42.

Breuil, A. 1966. *Southern Rhodesia: The Districts of Fort Victoria and Other Sites*. Paris: Singer-Polignac Foundation/Trianon Press.

Burkitt, M. 1928. *South Africa's Past in Stone and Paint*. Cambridge: Cambridge University Press.

Cooke, C.K. 1959. Rock art in Matabeleland. In: Summers, R. (ed.) *Prehistoric Rock Art of the Federation of Rhodesia & Nyasaland*: 112–162. Glasgow: National Publications Trust.

Cooke, C.K. 1969. *The Rock Art of Southern Africa*. Cape Town: Books of Africa.

Cooke, C.K. 1974. *A Guide to the Rock Art of Rhodesia*. Salisbury: Longman Rhodesia.

Cotterill, F.P.D., Fitzpatrick, M.J. & Duprée, J. 2018. *The Natural History of the Matobo Hills*. Bulawayo: Matobo Conservation Society.

Davidson, I. & Nowell, A. 2021. *Making Scenes: Global Perspectives on Scenes in Rock Art*. New York: Berghahn Books.

Deręgowski, J.B. 1995. Perception/depiction/perception and communication: a skeleton key to rock art and its significance. *Rock Art Research* 12(1): 3–11.

Dowson, T. 1998. Rain in Bushman belief, politics and history: the rock-art of rain-making in the south-eastern mountains, southern Africa. In: Chippindale, C. & Taçon, P.S.C. (eds) *The Archaeology of Rock-Art*: 73–89. Cambridge: Cambridge University Press.

Estes, R.D. 2012. *The Behaviour Guide to African Mammals*, 20th Anniversary edition. Berkeley, CA: University of California Press.

Frobenius, L. 1929. The mystery of South Africa's prehistoric art: newly discovered rock-drawings of divergent style – the problem of their age and affinities. *The Illustrated London News* 24 August: 333–335.

Frobenius, L. 1930. Prehistoric art in South Africa: "The King's monuments" – a unique series of rock-drawings recently discovered in Southern Rhodesia. *The Illustrated London News*, 1 March: 338–339.

Frobenius, L. 1931a. *Erythräa: Lander und Zeiten des heiligen Königsmordes*. Berlin: Atlantis Verlag.

Frobenius, L. 1931b. *Madsimu Dzangara*. Graz: Akademische Druck.

Garlake, P.S. 1993. The first eighty years of rock art studies, 1890–1970. *Heritage of Zimbabwe* 12: 1–23.

Garlake, P.S. 1995. *The Hunter's Vision: The Prehistoric Art of Zimbabwe*. London: British Museum Press.

Goetz, E. 1909. *The Rainfall of Rhodesia*. London: Waterloo and Sons.

Goodall, E. 1959. The rock paintings of Mashonaland. In: Summers, R.F.H. (ed.) *Prehistoric Rock Art of the Federation of Rhodesia and Nyasaland*: 3–111. Salisbury: National Publications Trust.

Goodall, E. 1962. Rhodesian rock paintings. *Man* 62: 23–24.

Hall, R.N. 1912. Bushman paintings in the Ma-Dobo Range ("Matopos"), Southern Rhodesia. *Geographical Journal* 39(6): 592–596.

Kinahan, J. 2020. *Namib: The Archaeology of an African Desert*. Windhoek: University of Namibia Press.

Laue, G. 2021. Rock art, regionality and ethnography: variation in southern African rock art. *Rock Art Research* 38(2): 138–151.

Laue, G. 2022. A history of research into regional differences in southern African rock paintings. In: Hampson, J., Challis, S. & Goldhahn, J. (eds) *Powerful Pictures: Rock Art Histories Around the World*: 116–125. Oxford: Archaeopress.

Lee, R.B. 1984. *The Dobe !Kung*. Fort Worth: Harcourt Brace College Publishers.

Lee, R.B. & DeVore, I. 1976. *Kalahari Hunter-Gatherers: Studies of the !Kung San and Their Neighbors*. Cambridge, MA: Harvard University Press.

Lewis-Williams, J.D. 1981. *Believing and Seeing: Symbolic Meaning in Southern San Rock Paintings*. New York: Academic Press.

Lewis-Williams, J.D. 1983. *The Rock Art of Southern Africa*. Cambridge: Cambridge University Press.

Lewis-Williams. J.D. & Challis, S. 2011. *Deciphering Ancient Minds: The Mystery of San Bushman Rock Art*. London: Thames and Hudson.

Marshall, L.J. 1999. *Nyae Nyae !Kung Beliefs and Rites*. Cambridge, MA: Peabody Museum of Archaeology and Ethnology Harvard University.

Marshall Thomas, E. 1959. *The Harmless People*. New York: Alfred A. Knopf.

Matutu, D. 2023. Communities still uphold rain-making rituals. *The Chronicle*, 31 March.

Mguni, S. 2004. Cultured representation: understanding 'formlings', an enigmatic motif in the rock-art of Zimbabwe. *Journal of Social Archaeology* 4(2): 181–199.

Mguni, S. 2005. A new iconographic understanding of formlings, a pervasive motif in Zimbabwean rock art. *South African Archaeology Society Goodwin Series* 9: 34–44.

Mguni, S. 2006a. Iconography of termites' nests and termites: symbolic nuances of formlings in southern African San rock art. *Cambridge Archaeological Journal* 16(1): 53–71.

Mguni, S. 2006b. King's monuments: identifying 'formlings' in southern African San rock paintings. *Antiquity* 80(309): 583–598.

Mguni, S. 2009. Natural and supernatural convergences: trees in southern African rock art. *Current Anthropology* 50(1): 139–148.

Mguni, S. 2013. God's termites' nests and trees as overlapping concepts in the Khoesan cosmology and belief systems. In: Manyanga, M. & Katsamudanga, S. (eds) *Zimbabwean Archaeology in the Post-Independence era*. Harare: Sapes Books.

Mguni, S. 2015. *Termites of the Gods: San Cosmology in Southern African Rock Art*. Johannesburg: Wits University Press.

Musemwa, M. 2014. *Water, History and Politics in Zimbabwe: Bulawayo's Struggles with the Environment, 1894–2008*. Trenton, NJ: Africa World Press.

Nhamo, A. 2014. Characterizing hunter-gatherer rock art: an analysis of spatial variation of motifs in the prehistoric rock art of Zimbabwe. Unpublished PhD thesis. Harare: University of Zimbabwe, Faculty of Arts.

Nhamo, A. 2020. People, plants, animals, and formlings in the rock art of Zimbabwe. *Oxford Research Encyclopaedia of Anthropology*. **https://doi.org/10.1093/acrefore/9780190854584.013.244**

Pager, H. 1971. *Ndedema: A Documentation of the Rock Paintings of the Ndedema Gorge*. Graz: Akademische Druck.

Palgrave, K.C. & Palgrave, M.C. 2003. *The Trees of Southern Africa*. 3rd edition. Cape Town: Struik Publishers.

Parkington, J.E. 1972. Seasonal mobility in the Late Stone Age. *African Studies* 31(4): 223–244.

Parry, E. 2000. *Legacy on the Rocks*. Oxford: Oxbow books.

Ranger, T. 1999. *Voice from the Rocks: Nature, Culture and History in the Matopos Hills of Zimbabwe*. Oxford: James Currey.

Sampson, C.G. 1988. *Stylistic Boundaries among Mobile Hunter-Foragers*. Washington, DC: Smithsonian Institution Press.

Schmidt, S. 1979. The rain bull of the South African Bushmen. *African Studies* 38(2): 201–224.

Schoffeleers, J.M. 1992. *Rivers of Blood: the Genesis of a Martyr Cult in Southern Malawi, c. A.D. 1600*. Madison, WI: University of Wisconsin Press.

Schoffeleers, J.M. & Mwanza, R. 1978. An organisation model of the Mwari Shrines. In: Schoffeleers, J.M. (ed.) *Guardians of the Land: Essays on Central African Territorial Cults*. Gweru: Mambo Press.

Shinn, A. 1974. The early European settlement of the south western districts of Rhodesia. *Rhodesiana* 30: 13–33.

Silberbauer, G.B. 1981. *Hunter and Habitat in the Central Kalahari Desert*. Cambridge: Cambridge University Press.

Smith, B.W. 1998. The tale of the chameleon and the platypus: limited and likely choices in making pictures. In: Chippindale, C. & Taçon, P. (eds) *The Archaeology of Rock-Art*: 212–228. Cambridge: Cambridge University Press.

Smith, B.W. 2006. Reading rock art and writing genetic history: regionalism, ethnicity and the rock art of southern Africa. In: Soodyal, H. (ed.) *The Prehistory of Africa*: 76–96, 176–181. Cape Town: Jonathan Ball.

Stoll, A.Q. 2016. Where the rain snakes hide: the rock art of Silozwane Shelter, Matopo Hills, Zimbabwe. *Rock Art Papers* 18: 153–158.

Tredgold, S.R. (ed.) 1956. *The Matopos*. Salisbury: Federal Department of Printing and Stationery.

Valiente-Noailles, C. 1993. *The Kua: Life and Soul of the Central Kalahari Bushmen*. Rotterdam: A.A. Balkema.

Van den Heever, S. 2021. Botanical motifs in the rock art of Zimbabwe. Unpublished MSc dissertation. Johannesburg: University of Witwatersrand.

Vinnicombe, P. 1976. *People of the Eland*. Pietermaritzburg: University of Natal Press.

Walker, N.J. 1995. *Late Pleistocene and Holocene Hunter-Gatherers of the Matopos*. Uppsala: Uppsala University Press, Studies in African Archaeology 10.

Walker, N.J. 1996. *The Painted Hills: Rock Art of the Matopos*. Gweru: Mambo Press.

World Bank. 2024. Climate change knowledge portal. **https://climateknowledgeportal.worldbank.org/country/zimbabwe/climate-data-historical**