

# Fragments of the hunt

## Persistence hunting approach to rock art

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*Hunter Gatherer Research* 6.3–4 (2023 [for 2020]) © International Society for Hunter Gatherer Research ISSN 2056-3256 (Print) <https://doi.org/10.3828/hgr.2020.4> ISSN 2056-3264 (Online)

Citation APA:

Ijäs, M. R. (2020). Fragments of the hunt: Persistence hunting approach to rock art. *Hunter Gatherer Research*, 6(3-4), 247-281.

**Abstract:** This paper looks at some of the oldest examples of visual art that show evidence of experiences of altered states of consciousness reported by the last persistence hunters. Persistence hunters relied on endurance and stamina to pursue their prey until it collapsed and was easily killed. Persistence hunting has been studied from viewpoints of paleontology and ethnography, this article offers a psychological connection between persistence hunting hypothesis and origins of symbolic culture. the article outlines the persistence hunting hypothesis describing its significance for future studies of the prehistoric cultures and their achievements. It covers persistence hunting and tracking methodology, its possible origins and how it may explain bigger brains in our species. It also describes the connection between endurance running and altered states of consciousness, and its connections with some shamanic practices.

The article presents visual evidence, or fragments, that can be interpreted through persistence hunting and tracking, covering recurring topics such as hoof prints, blood trails, vulva imagery, therianthropes and nasal bleeds. Archaeologist David Lewis-Williams has proposed a shamanic explanation for rock art interpretation. this approach was based on ethnographic studies of Southern African hunter-gatherers. He suggested that African rock art often depicts trance hallucinations experienced by the shamans. this article offers an alternative and additional naturalistic explanation of prehistoric imagery based on the hunting methods used by the prehistoric hunter-gatherers. Combining the main outlines (persistence hunting hypothesis and its visual evidence.

In prehistoric rock art) this article offers a novel approach to rock art research which involves the history and documented experience of persistence hunting and tracking among the early hunter-gatherer societies.

**Keywords:** persistence hunting, tracking, running, hunter-gatherers, art history, visual culture, shamanism, rock art, prehistoric art

The connection between altered states of consciousness (ASC) and prehistoric art was made famous by South African scholars David Lewis-Williams and Thomas Dowson (1988). Lewis-Williams stressed the significance and widespread nature of the shamanic traditions including ASC throughout his works. He has given examples of imagery and themes depicted in rock art correlating with the statements reported in indigenous trance states and with recent studies on ASC. He does not imply that shamanic practices gave rise to the renderings of figurative images, nor does he imply that images were made in trance. The shamanic approach described by Lewis-Williams offers an interpretative model of the activity and the experience behind the earliest examples of figurative art.

However, Lewis-Williams has mostly neglected the aspects of hunting to understand figurative art made by the hunter-gatherer (HG) societies. This might have been due to the historical and scholarly baggage which the hunting magic approach (introduced by Abbé Henri Breuil) to rock art has carried. Lewis-Williams largely neglected tracking but made a crucial observation as he notes that animals depicted in the Lascaux cave typically are endowed with hoof prints instead of actual hoofs (Lewis-Williams 2002:194). Only a tracker would have thought of depicting a print instead of the hoof that made it. The one who made the picture was a tracker and a hunter.

Scenes with someone pointing a spear or a bow at a prey animal are rare in prehistoric rock art, but it does not mean we could not find evidence of fragments of the hunt just like Lewis-Williams has tried to find fragments of the dance (Lewis-Williams & Pearce 2004; Lewis-Williams & Hollmann 2006; Lewis-Williams 2010). The Lascaux hoof print can be considered such a cue or a subtle indication of tracking. It does not explicitly show tracking, but rather it is like a part of a larger puzzle, hence the use of the word fragment.

The question is whether we could find more such fragments from prehistoric art. Could we find fragments that repeat throughout the time and location? Could we find elements or subjects repeated throughout the rock art traditions almost everywhere where humans settled? The shamanic hypothesis presented by Lewis-Williams and Dowson (1988) was based on the idea that all humans shared the same nervous system. They proposed it was possible to explain at least some of the features in prehistoric art through 'a neurological bridge' between all mammals. They argued that the contemporary reports of ASC reflect the same cognitive processes associated with prehistoric imagery.

But was the prehistoric consciousness similar? I believe it was; they were humans just like us. We might suppose that their nervous system was the same, but its functions are

always cultured by environment and interaction, including symbolic systems, which can be different. We are animals shaped by our culture. Therefore, we might ask if it is possible to understand the cultural cues left by the prehistoric people. The psychedelic experiences of trancing hunters appear to revolve around the fattest non-human prey animals they were trying to pursue.<sup>1</sup> The hunter's experience, in this respect, might have been similar as long as humans were hunters. Therefore, we should not expect to understand the minds of the prehistoric hunters completely, but we might suppose there was a connection between recent HGs and their prehistoric counterparts.

To clarify, modern humans have always shared the same principal biology, but their culture and environment has varied, giving us all somewhat unique minds while growing up. Contemporary HGs are also not living examples of prehistoric culture, but their culture as hunters might help us to understand also the prehistoric hunters.

The aims of this article arose from the question: is there a psychological connection between recent HGs and prehistoric hunters? Could it be found from their shamanic ceremonies, as Lewis-Williams has argued? Or was there something in the process of hunting itself, which might have caused psychedelic ASC experiences similar to the experiences in the shamanic ceremonies?

According to Guthrie (2005) prehistoric imagery is tied to practicalities of hunting. Guthrie claims that the Lascaux depictions of hoof prints instead of hoofs were important for the hunters who painted them. One of his examples is the blood trailing, which is also depicted by the ancient HGs (Figures 1 & 2).

I am indebted to Guthrie's ideas, which made me investigate what kind of images and symbols might be related to the fragments of the hunt. Certainly, the obvious depictions of tracking, like animal tracks, prints and blood spoor, could be attributed to hunting. But could the subtle signs and elaborate hallucinatory images also be related to hunting in a metaphorical way? The question is: could some supernatural elements in rock art be interpreted through hunting practices? Was there an activity the HGs engaged in that might have even predated their ceremonial practices for trance dance? Did they practise something which, under the right circumstances, could have induced their minds into ASC?

## **PERSISTENCE HUNTING HYPOTHESIS**

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<sup>1</sup> Animal fat is necessary macronutrient for human survival, especially in the arid lands of the Kalahari

Evolutionary biologist David Carrier, biologist Dennis Bramble and paleoanthropologist Daniel E Lieberman have proposed a hypothesis based on the skeletal remains of *Homo erectus*. They suggested that our ancestors evolved to run down big game. According to their hypothesis, our ancestors living more than two million years ago (Mya) were adapted to run long distances for scavenging or for hunting by running them into exhaustion (eg Carrier 1984; Liebenberg 1990; Bramble & Lieberman 2004).

The persistence hunting (PH) hypothesis gives an attractive timespan for further investigation. Even mild endurance running (ER) is known to cause ASC (Dietrich 2003; Raichlen et al 2012). It is likely that already 2Mya the earliest members of the human genus had the capacity for ER. These features helped them to thrive in Africa, and also to reach out to other parts of the world. Their brains continued to expand gradually. This was caused by two factors: high quality foods and cognitive demand. Ancient HGs were able to obtain high-quality foods to enable the expanding bigger brain, but this could not have been possible without cognitive demand for a larger brain. Something they did was increasingly demanding for their cognitive capabilities, and there was a reward for that (Lieberman 2013:67–70).

Carrier (1984) claimed that early *Homo* were pre-adapted to ER, and the capacity for ER played a key part in our evolution. Humans are weak and slow compared to other animals. It was rarely thought that we were capable of hunting large game before the invention of lethal projectiles. However, there are signs that early *Homo* were habitually eating meat before they used projectiles. The adaptations that made their brains larger were older than the use of projectiles. This is shown in archaeological evidence, which reveals that early *Homo* was a habitual meat eater 2Mya.

Carrier (1984) proposed that we did not evolve to become fast, instead we evolved to endure. The game animals were faster over short distances, but humans have more endurance and therefore capable of exhausting them if the conditions are right. Humans could have been lethal animals due to their ER skills under hot sun, and exhausting larger and faster animals by forcing them to succumb to hyperthermia. This of course would have been easier in hot grasslands of Africa, but even in Ice Age Central Europe, where cold winters were followed by milder summers providing conditions for persistence hunters on foot and probably also on skis on snow.

Carrier noticed that little was known of the endurance performance of other mammals. The ER hypothesis was further studied by Bramble and Lieberman (2004) who took

Carrier's (1984) hypothesis further by providing additional data. They brought together the evidence to support the claim that humans are endurance runners that included an array of physiological features evident in human evolution. The reason why human running had been so poorly researched is because we are lousy sprinters. However, humans habitually engage in ER. This speed of ER c 2.4–6.5 m/s can be maintained for several kilometres using aerobic metabolism. ER is unique to humans among other primates and also very uncommon among quadrupedal mammals other than social carnivores (such as dogs and hyenas) and migratory ungulates (such as horses and wildebeest) (Bramble & Lieberman 2004:345).

Several morphological features are helpful in long-distance walking, but some adaptations can only be explained by evolution for ER. Humans have certain structural features making them better endurance runners than other primates, therefore walking could not have originated these features. The ER adaptations were visible in *H erectus* including longer legs, larger hindlimbs and vertebral joint surfaces, a narrower waist and shorter toes. Several features that enabled ER were not by-products from adaptations to long-distance walking (Bramble & Lieberman 2004). The spring mechanics of running require structural specifications for energy storage and stabilisation. Sustained running poses mechanical and thermoregulatory challenges beyond the requirements of walking. Expanded joint surfaces and mechanisms of heat dissipation are also useful for walking, but necessary for easing mechanical stress in running and dealing with endogenous heat (Bramble & Lieberman 2004).

## **Scavenging and endurance hunting**

Bramble and Lieberman (2004) suggested that early *Homo* was adapted to run long distances in hot environments. This could have been important for exploiting a protein rich diet starting c 2.6Mya. ER might have played a role in scavenging from carcasses killed by other predators. Early *Homo* already did some casual scavenging to supplement their plant foods. Scavenging is challenging as carcasses are rare. In Kruger National Park hyenas typically arrive at lion kill sites in less than 30 minutes. There would not have been much left for a diurnal scavenger and systematic methods were necessary (Lieberman et al 2009).

According to anthropologist Louis Liebenberg, it is possible that early *Homo* developed the skill of systematic scavenging. Instead of randomly stumbling upon a carcass, systematic scavengers read natural signs to find carcasses before others. Liebenberg has

recorded HGs in the Kalahari who followed circling vultures to determine if there were available carcasses (Liebenberg 2013:26). Many predators and scavengers can be intimidated into leaving their kills. The likely source for scavenging would have been lion kills, because lions do not consume the whole animal (Liebenberg 2013:27).

The cause for ER adaptations might have been endurance predation, the ability to run down big game by tracking it until the animal would stop or collapse. Big game animals cannot cool down their core temperatures as humans do. Their quadruped bodies are also more exposed to solar radiation and they have to sprint fast to find shade for panting, hoping the hunter would lose track and give up.

## **Ethnographic evidence**

Carrier (1984) noticed that there was a collection of stories of indigenous hunters who had claimed to run down their prey. The HGs of the Kalahari (collectively known as the San people) were recorded to run down duiker, steenbok and gemsbok during the rainy season and wildebeest and zebra during the hot dry season. Carrier also noted that the indigenous peoples in North America and in Australia were reported to hunt in similar manner.

The idea of PH was introduced by anthropologist Grover Krantz (1968), who noticed that early Homo obtained meat in some previously unexplained way. Their tools were not meant for hunting, but for butchering. The absence of projectiles and physiological adaptations made him suggest PH. Anthropologist Robert H Lowie (1924) wrote about the hunting methods of the Northern Paiute who practised something similar to PH. Krantz also noted the Kalahari San from the early 1900s and how they practised PH.

One early account of PH was written by the Finnish explorer Henrik Jacob Wikar who spent four years exploring southern Africa. His journals (Wikar 1935) from 1778 to 1779 contain the earliest firsthand report of PH:

On the plains of the Great River at this time of the year [January-March] you can catch even a steenbuck with your hand [...] for when it jumps up you just let it go its way. [...] you take the spoor of the steenbuck and follow it; after you have driven it up again you sit down. [...] The third or fourth time you do this you can catch it with the hand as it jumps up – then its feet are burnt through. This is the regular custom of the Bushmen of the plain (Wikar 1935:175)

## **Contemporary evidence**

After Bramble and Lieberman published their article of 2004, anthropologist Louis Liebenberg contacted them. Liebenberg had published a book (1990) of his experiences

with the hunting practices of the San people and later (2006) reported a PH in the central Kalahari in Botswana recorded in 1985, detailed to him by !Xo hunters !Nam!kabe, !Nate, Kayate and Boro//xao. The first time he witnessed PH on foot was a kudu chase in 1990. PH took place during the hottest time of the day when the temperature was around 40°C. The hunts were performed by three to four hunters, of which some were too old, but still skillful trackers. Two successful hunts in 2001 by Karoha were recorded with GPS. The first one took 3h 50m covering 25.1 km, with an average pace of 6.3 km/h. The second one took 4h 57m covering 33 km with a pace of 6.6 km/h. Early Homo did not need complex projectiles for hunting. All they needed was their adaptations for ER.

PH hypothesis also faced criticism, the most notable being written by Travis Rayne Pickering and Henry T Bunn (2007). Their criticism centres on two issues: first, that early Homo lacked the tracking abilities for successful PH, and second, that recent evidence suggests that modern HGs rarely use ER for either hunt or scavenge. However, the responses (Lieberman et al 2007; Liebenberg 2008) to this criticism point out how the modern ethnographic record reveals only a questionable reflection of past behaviour. Although tracking is difficult, there is little evidence to suggest early Homo lacked the capacity for tracking as we should take into account that various forms of tracking are practised by mammals using a combination of olfactory, auditory and visual evidence.

## **Conditions and efficiency**

PH requires a healthy population of the preferred animals and the hottest weather possible. The animal will escape the hunters and flee at a gallop to cool down in the shade. The hunters run to chase the animal away from the shade before it has cooled its core temperature. 'A team of hunters can track much faster than one individual on his own. In the beginning the fittest runner may adopt an easy pace while the other hunters do most of the work tracking and running. [...] When the others drop out, the fittest runner must pace himself to run down the animal on his own' (Liebenberg 2006:1017–1018). When the animal collapses the hunters can safely dispatch it from close range.

Although some animals are better suited targets for PH, and seasonal changes can also affect the hunt, PH has been an effective way for catching a variety of animals in various seasons. Although some seasons are easier for persistence hunters, PH was possible all year round (Liebenberg 2013:44). PH was an efficient method with a high success rate and meat yield. The data suggests that PH produces a higher meat yield (kg/day) than hunting

with more complex technology. Only hunting with dogs produces a significantly higher yield (Liebenberg 2006).

## **Bigger brains**

Tracking must have been a crucial skill even to the early hunters. The brain of *H erectus* was probably already large enough to enable cognitive abilities necessary for simple interpretations of animal tracks (Lieberman et al 2009). PH and tracking might have spurred the evolution of bigger brains. Large brains appear only after the evolution of this slender endurance runner's body has appeared 2Mya. The importance of ER did not lose its significance when projectiles were invented. The Kalahari HGs still practised PH in early 2000s and they still run after some game animals after using poisoned arrows. If the hunter is fast enough, it will get to the wounded animal faster than other predators.

The physical and cognitive demands of tracking combined with stable access to high-quality foods might have stimulated brain growth even further. PH also happens at very low costs. ER speeds require only 30–40% more energy than walking and this energy loss is independent of speed. The cost of moving at a speed of 3 m/s is the same as moving at 6 m/s (Lieberman et al 2009).

## **Tracking**

Recent HGs of the Kalahari are skilled readers of animal signs, which is a pivotal skill in PH. These signs can be clear hoof prints, faeces or urine, trampled grass or broken branches, disguised prints under leaves, drops of blood, or just a swish of a springhare tail, or a bird giving a warning call of an approaching predator. These skills have a long evolution and they did not acquire these skills all at once. Liebenberg (1990) has distinguished three levels of different types of tracking to reconstruct the viable evolution of tracking. Simple tracking refers to the following of animal footprints in ideal conditions. Systematic tracking is based on gathering information from natural signs to develop an image of what the animal was doing and where it is going. Speculative tracking demands the creation of a working hypothesis on the basis of a variety of signs. It requires a specific knowledge of animal behaviour and surrounding environment. When the hunter has developed a mental reconstruction of the animal's activities, they search for signs where they expect to find them.

The ability to identify spoor goes beyond recognising prey animal prints. A team of San trackers can identify the spoor of individual animals, with a 93.8% success rate of the 569



cases (Stander et al 1997). The hunters can also identify prints of ants, beetles, scorpions, millipedes, legless skinks and lizards. Women are often better identifiers than men. Trackers look for all signs of animal presence, not just hoof prints. They try to find scent, feeding signs, urine, faeces, saliva, pellets, territorial signs, paths, shelters and auditory signs. They also pay attention to signs left by non-living elements, such as leaves and twigs rolling in the wind, long grass sweeping the ground and dislodged stones (Liebenberg 2013).

Hunters can visualise how the animal is moving and place themselves in its position. They can save time with educated guesses about the animal's next moves. They can often read the animal's sex, size, the age of the spoor, where the animal came from, how fast it is moving and where it is going. Reading the signs, the group can form a complete image of the animal they are pursuing (Liebenberg 2013).

In speculative tracking, trackers can create a mental reconstruction of the events, and they can look for signs where they expect to find them. The signs are sought only to confirm or refute their expectations. The initial hypothesis can be reinforced if the signs are found. If they fail to find any signs to prove their hypothesis, they can abandon the initial one and investigate alternatives (Liebenberg 2013).

Hunters might anticipate the animal's movements and after conceiving a mental model of the animal's behaviour they follow an imaginary route the animal might have taken. This is akin to the psychological idea of a theory of mind, but applied to other animals. Hunters visualise the animal moving and ask themselves what they would do in its position. Most trackers begin as systematic trackers. Through experience they can begin to trust their knowledge enough to advance into speculative tracking. Systematic and speculative tracking are so different that many trackers fail to make this transition. In open terrain systematic tracking can be efficient, but if the tracks lead to woodlands or rocky hills, speculative methods are necessary (Liebenberg 2013:75–76).

## **Persistence hunting and altered states of consciousness**

Persistence hunters have to measure their own condition against their prey. Liebenberg writes how eventually their prey began to show signs of hyperthermia. The kudu was kicking up sand and its stride was getting shorter, but Liebenberg was also getting dehydrated. He was so focused trying to project his mind into the mind of the kudu, and to run down the kudu, he almost ran himself down:

Concentrating on the spoor I was so caught up in the event that I was completely unaware of my own state of exhaustion. As if in an almost trance-like state I could not only see how the kudu was leaping from one set of tracks to the next, but in my body I could actually feel how the kudu was moving. In a sense it felt as if I myself actually became the kudu, as if I myself was leaping from one set of tracks to the next. [...] the kudu seemed to be so exhausted that I insisted that we should carry on. At one point a cold shiver went through my whole body and for the first time I realised that I was dragging my feet in the sand. (Liebenberg 2013:19)

Hunters try to think like the animal to predict its movement. They project their mind into the animal's mind, trying to feel like the animal. This process can be so intense that they experience transformation into the animal. Liebenberg describes how he had merged into the animal's mind and how he ultimately felt like he had transformed into the kudu. Karoha, one of Liebenberg's hunting partners, explained 'What you will see is that you are now controlling its mind. You are getting its mind. [...] You have taken the kudu into your own mind' (Liebenberg 2013:37–38).

The anticipation, mental focusing, physical exhaustion and nutritional depletion all drive the hunter forward and occasionally plunge the hunter into an ASC. There appears to be several reasons for hunters' transformative experience: 1) concentration into the animal's condition; 2) imagining what the animal will do next and where it is going and for what reason; 3) dehydration; 4) physical exhaustion; 5) hyperthermia; 6) monotony of the activity; and 7) rhythmic body movements (including dance) are also known to induce ASC (Kennedy 2011:76).

Young Ju/'hoan hunter Kxao in the Nyae Nyae Conservancy in Namibia related the connections of hunting and ceremonial practices: 'When I see an animal spoor, I become the animal' (Kxao, pers com, 5 December 2014). Kxao's transformation experience was not based on mental transference nor was it a metaphor. Instead, it was an experience that happened to him when he encountered a spoor.

Skiing hunters of the Altai Mountains in China also go through similar experiences while pursuing their prey in deep snow. These hunters exhaust their prey on snowy mountains and use lariats to lasso their prey. According to documentarist Nils Larsen, the trackers identify, follow and build up a detailed image of the tracked animal (N Larsen, pers com, 12 May 2015). As with the Kalahari hunters, they also experience transformation into the animal's mind. The urge to deduce what their prey is sensing, combined with the physical stress of constant pursuit and tracking on skis cause similar mental transformations.

## **Runner's high**

From the description above we saw how PH can also produce forms of ASC. Early awareness of ASC while running down game and insights of these experiences could have affected the cultural shift into deliberately induced trance states among early HG societies. This is why we need to examine how endurance exercise affects our mind.

Running developed our body, but also our mind. The phenomenon referred to as runner's high (Pargman & Baker 1980) occurs during prolonged aerobic activity. Running makes you feel good and there might be an evolutionary purpose for it. For millions of years running was a way to obtain food, move around and escape. This is an activity we socially depended upon and it also produces pleasure. Rather than a selfish activity, running has always been collective and it has been connected to obtaining food as a group. It is conceivable that running makes us happy as it is connected to social interaction and social rewarding.

Humans have a biological system of receiving neurobiological rewards from prolonged aerobic activity. This exercise reward is referred to as runner's high. The physical experience of losing one's self in the activity in a moment of bliss and unitary beauty is often referred to as flow (Csikszentmihalyi 1990). The physical sensation of the runner's high is well acknowledged, but the biological process underlying it remains speculative. Several theories have suggested on how runner's high is produced. Physiologist Phillip B Sparling (Sparling et al 2003) suggested that runner's high might be a product of endogenous neurotransmitters known as the endocannabinoids (Sparling et al 2003; Raichlen et al 2012). Endocannabinoids are endogenously produced cannabinoids similar to tetrahydrocannabinol (THC), the main psychoactive component in cannabis (Cecchini & LoPresti 2007).

## **Running and ASC**

According to neuropsychologist Arne Dietrich, all ASC experiences are not necessarily caused only by neurotransmitters, rather by temporally reducing metabolism in the prefrontal cortex (PFC), what he refers to as transient hypofrontality (TH). This can be triggered by drugs or through various activities such as exercise. This idea was based on studies on patients with depression and anxiety disorders. He noticed that exercise induces a state of TH, which could have beneficial effects on mental health (Dietrich 2003).

The expansion of PFC has been generally assumed to have played a role in the evolution of the human mind. This was one of the physiological adaptations, which enabled imitation of imaginative social behaviour. The development of the PFC enabled mimetic behaviour

and refined motor control in early Homo. The upgraded PFC gave rise to a stronger sense of self, self-control and meta control. The new skills enabled differentiated working memory and the ability for introspection and reflection of their own cognitive processes (Donald 2009:15–16).

The evolution of PFC also enabled psychological separation of self from collective surroundings. Dietrich (2003) claims that certain compounds and activities can reduce the activity in the PFC, alleviating the sense of separation. The experiences of ASC are not necessarily caused by neurotransmitters as this idea is inconsistent with psychedelic experiences related to prolonged fasting, sleep deprivation, sensory deprivation, audio driving (eg intense music), visual driving (eg flashing lights), pain, suffocation or hyperventilation or other activities such as running and dancing.

TH means that for a moment the thinking part of our brain gets a rest. This allows other functions to become more dominant. TH can be used to explain dreaming, ER, meditation, daydreaming, hypnosis and certain ASC by psychedelic drugs. Runner's high refers to sensations during aerobic exercise. The sensations include happiness, elation, feelings of unity, peacefulness, timelessness, harmony, stamina and reduced pain (Dietrich 2003). During exercise, a large part of the brain is occupied by perception and motor output resulting in activations across the brain. Physical activity demands a sacrifice of the resources including our brain, forcing it to redistribute its resources. The activations that occur while running are demanding for mental resources. When limited resources are needed elsewhere enabling physical stress, these centres slow down causing ASC (Dietrich 2003).

The PFC is the structure in our brain enabling segregation and differentiation. Dietrich claims that the experiences of losing the sense of self or merging with the environment result as our neural networks begin to save resources and cease to calculate the difference between self and other. Therefore, self becomes one with others. The calm of this experience results from the relief that you no longer have to differentiate yourself from the other. Dietrich believes that exercise momentarily impairs frontal-dependent cognition, generating a state of vigilance and awareness.

The hypothesis of TH was also studied by Robin Carhart-Harris's team (2012). They mapped brain blood supply and changes in blood oxygen levels before and after administering psilocybin. He found that hallucinations were caused by decreased blood flow in the brain's hub regions, such as thalamus and cingulate cortex but also in the

anterior cingulate cortex (ACC) and medial prefrontal cortex (mPFC) (Carhart-Harris et al 2012).

## **Origins of shamanism**

Physical exercise involves caloric expenditure and can expose people to injury risk. It also reduces stress and induces a sense of elation causing various kinds of health benefits (Lieberman 2020). This rewarding feedback could have posed a selective advantage for ER adaptations. However, excessively prolonged stress might also lead to ASC. Ultrarunners occasionally experience sensations of merging together with the environment and losing their sense of self. All humans have the ability to experience ASC and according to sporadic accounts by ultrarunners, it appears these experiences might be more common than supposed, although proper studies have not yet been conducted.

If there was a way to acquire meat through ER, there is a chance that experiences of ASC would have been a part of everyday lives of early Homo. The conscious awareness of ASC might have been an early step towards shamanic practices which gave the context for purposefully induced ASC. PH could have played a role in the evolution of shamanic practices. Perhaps the ASC experiences were understood before anyone established specific ceremonies to induce them deliberately. These experiences should be evaluated in the context of selective pressures and advantages. PH provided such an advantage and it could have been practised by early Homo. Natural selection would have favoured ER adaptations if they ensured high quality foods. ASC experienced during PH could have led to elaborate means of ceremonial practices.

## **VISUAL EVIDENCE TO SUPPORT PH AND TRACKING APPROACH**

Eastern philosophy acknowledges the experiences of nonduality (Loy 1988). This experience is seen as the other side of our perceived reality, which is free from our personal attachments, in which there are no dualities such as good and evil. The experience of nonduality is often described as indescribable through language because it is built on non-linguistic categories and concepts. This notion of complex indescribable experience applies to all ASC experiences. This complexity is pivotal for this study. When there is a pressure to describe something that escapes our words, we might seek for alternative means, such as images.

## **Earliest examples of figurative art**

Lewis-Williams and his colleagues used a concept of a *neurological bridge* between contemporary humans and prehistoric humans to build a contextual bridge to explain some of the imagery of prehistoric and recent rock art. He emphasised that prehistoric image-makers shared a shamanic worldview. He appears to neglect the idea that they were first of all HGs and only then shamans. Experiences related to hunting and gathering might therefore be a source for making images, but also as origins for shamanism.

Modern humans appeared in Europe between 45–35 ka. The earliest dated examples of figurative art date to this same period. The evidence from Australia suggests that in the Northern Territory pigment art on rock walls was made by 50 ka (David et al 2013; Roberts et al 1990). Recent dating of cave paintings (Figure 3) from Indonesia and from Borneo (Aubert et al 2014; Aubert et al 2018) suggest that ancestors of these people most likely carried this tradition when they left Africa.

Archaeologist Claus-Joachim Kind and his colleagues (Kind et al 2014) have claimed that the Lion Man from the Hohlenstein-Stadel cave dates back to 39–41 ka. It depicts a therianthrope figure with a lion's head and human body carved from mammoth tusk. The earliest dated examples of cave paintings in Europe comes from the Chauvet Cave, France (Chauvet et al 1996; Pike et al 2012) and from the Fumane Shelter, Italy (Balter 2000), with both dating back to 35–40 ka (Pike et al 2012). All of these examples of figurative art represent therianthropes (half-animal and half-human).

The oldest found and dated evidence (27.5 ka) of African figurative rock art was excavated from the Apollo 11 Cave in the Huns Mountains, Namibia (Wendt 1976). The painting depicts a therianthrope, with feline features but with human legs and oryx horns (Figure 4).

In the following paragraphs I present examples of visual categories to support the suggested hypothesis for PH and tracking approach to rock art. They are categorised in the following manner:

1. hunting without weapons
2. hoof prints
3. blood trails
4. vulva imagery
5. therianthropes (half-animals and half-humans)
6. nasal bleeds
7. general adoration of wild animals

8. map-like depictions.

## **Hunting without weapons**

According to archaeologist Tilman Lenssen-Erz (2007) only 0.6% of the images depicted in Namibian Dâureb/Brandberg mountain can be interpreted as having human–animal relationships. These have not been interpreted as hunting scenes, due to their lack of weapons (Figure 5). Archaeologist Pieter Jolly (2002) describes a weaponless hunter reaching out to their prey: ‘Some [hunters] are shown relating to elands in unusual ways, reaching out to or touching these animals’ (Jolly 2002:88–89) (Figure 6).

This raises a question: could these weaponless hunters, often half-animals, be attributed to describe a metaphorical persistence hunt? During the hunt, the hunter might experience transforming into an animal, explaining the therianthropes reaching out or touching the animals. Similar description of tail grabbing at the end of PH was described by Elizabeth Marshall Thomas (2006:32).

The inexplicable hallucinatory hunting experience of transformation into an animal might have served as an origin for purposefully set up trance ceremonies, the kinds still practised among the HGs of the Kalahari. This connection could explain why some supernatural elements in rock art might not describe shamanic practices. Some elements in rock art can still depict hunting in practical levels just as Guthrie (2005) has suggested. However, some images could carry an allegorical level of supernatural qualities that might be depictions of something that could be described as fragments of the hunt.

Liebenberg’s (2013:19) experience of transforming into a bull kudu while he was running it down appears to explain some of the questions. One of the main questions that remains: could therianthropic figures, that penetrate the vast periods of time and distances in rock art, be linked to hunting experiences? Although we might connect some of these therianthropes to PH, others might have shamanic origins. But what if shamanic practices also originate from experiences that happened to prehistoric persistence hunters?

The suggested fragments of the hunt might also be subtle. Instead of depicting hunter tracking and running after an animal (Figure 7), these fragments might be small hints just like the hoof prints on the animals in Lascaux (Figure 8), or engraved or painted tracks (Figure 9). If the ancient hunters who painted these images were persistence hunters, it

would be obvious that in some cases weapons might not have been depicted (Figure 10). Running down an antelope does not require any complex weapons. PH is a physical skill leaving no other archaeological evidence besides skeletons.

The absence of hunting scenes and hunting equipment could be explained with the PH and tracking hypothesis. During the hunt, the hunters might experience transforming into an animal, explaining therianthropes reaching out or touching the animals. There are also interesting hunting scenes in the Dâureb/Brandberg mountain, depicting hunters tracking and running. One scene (Figure 6) depicts the hunters partly transformed into animals following tracks.

## **Hoof prints**

Some of the aurochs in the Lascaux are depicted with a hoof print instead of hoofs (Figure 8). This would enable the painter to apply information of the animal's spoor inside the image. Only a tracker would do this. Palaeolithic painters were trackers. Showing the print instead of the hoof implies that this print was special. For his part, Guthrie reminds us that a similar way of depiction is also evident in some of the animal images in Australian rock paintings (Guthrie 2005:268).

According to Paul Bahn (1998) depictions of animal and human tracks in rock art span across time and location. The majority of explanations of these tracks seem to accept that they are symbols filled with mythological and supernatural significance (eg Forssman & Gutteridge 2012; Eastwood & Eastwood 2006; Lewis-Williams & Biesele 1978). However, some depictions, such as the tracks at the site of Sturts Meadows in Australia might depict actual prints. The engravings show scaled reproductions of the spoor of kangaroo species. They reveal individual speeds, weight and gait. Some larger tracks are attributed to extinct megafauna (Bahn 1998:192–193).

The majority of rock engravings in Namibia's site /Ui-//aes (Twyfelfontein) depict animals and their spoor (Figure 9). The rock engravings have a collection of realistically engraved depictions of animal spoor. They were clearly important for the people who made these images. It would have been nearly impossible for early Homo to stalk and wound an animal before they could track them down. The majority of animals hunted by the recent HGs are not killed upon initial contact. Rather, they are tracked, stalked and wounded, stunned or immobilised followed by a prolonged pursuit. When the animal is out of sight it has to be tracked to be dispatched.



Although the European Palaeolithic HGs already possessed advanced hunting strategies and technologies, they still depended on tracking skills and endurance. The ability to read natural signs was pivotal for their existence. A tracker may know the animals better from their spoor than from their other characteristics. The spoor is a living document of animal activity. The animal spoor is painted and engraved on rock surfaces everywhere where people have been making rock art. Although they might have had ritual reasons for painting tracks, they were still tied to the practicalities of tracking.

## **Blood trails**

Guthrie (2005) has described how the red dots in Upper Paleolithic caves, such as the Chauvet (Figures 1 & 2), could depict blood tracks. Blood trailing is practised by hunters everywhere. A droplet of blood is an indicator that the hunter is still following its prey (Guthrie 2005:270–271). Blood trailing is also practised by the Kalahari San. The hunters retrieve their poisoned arrows after shooting and if one of the arrows is missing, there is a chance the animal was hit. If only the reed arrow shaft is recovered next to the animal spoor, the poisoned point might have penetrated the skin.

The blood spoor depicted in Upper Paleolithic art is an important example of tracking depicted by the ancient HGs (selection of these images presented in Guthrie 2005:272–273). The hunter has to be in close proximity (about 25 metres) of the animal to cause haemorrhaging with a projectile such as an atlatl. Occasionally the droplets are the only sign of the animal's whereabouts, its condition and where it is trying to escape.

This red dot is an important symbol of the animal and a sign of its wounded condition, and the success of the hunt is now up to the tracking skills and endurance of the hunter. Although European cave painters had complex technology like atlatls and darts with razor-sharp bone tips, the wounded animal would still be alive and it could run for a considerable distance, meaning a long pursuit and plenty of tracking. The faster the hunters could catch it, the better was their chance against other predators and scavengers.

## **Vulva imagery**

Prehistorian André Leroi-Gourhan introduced the division of the animals into representations of sex. He also categorised abstract symbols into male and female signs. He speculated that male-symbolism was represented as a horse, ibex, stag, reindeer and hind, and the female was depicted as images of aurochs and bison. These animals were often depicted with corresponding signs or symbols. According to Leroi-Gourhan

(1968:144–146), rectangles, lattice-shapes, tectiforms, ovals, claviforms and braces were female signs reminiscent of vulva. The signs depicting barbed shapes, short strokes and dots were male-signs (Leroi-Gourhan 1968:146–147).

The many signs classified as vulvas might depict something different. The interpretation into female genitalia in Palaeolithic art was ignited by Abbé Breuil in 1911 as he interpreted an engraving in Abri Blanchard as the designs as ‘Pudendum muliebre’ (female genitalia). Breuil was convinced that gender symbols trace their origin back to prehistoric engravings (Hosking 2013:195).

According to Bahn (1998), exact representations of female genitalia are extremely hard to find in Palaeolithic art. Only a few examples are attached to their bodies. Vulvas are mostly motifs without any context. Bahn notices that these motifs often look like hoof prints or bird footprints, and he suggests that these image-makers could possibly have been working on several symbolic meanings simultaneously.

Liebenberg (2013; 1990) claims he has identified one cave painting depicting bell-shaped figures in El Castillo cave, Spain (Figures 13 & 14). Leroi-Gourhan (1968) claimed they belonged to the female sign category and that these particular shapes were typical representations of vulvas (Leroi-Gourhan 1968:144–145; 334). However, as a tracker, Liebenberg recognises that these figures resemble ungulate hoof prints on soft substrate. Liebenberg describes that this group of prints might belong to a jumping animal and how this gait is exhausting for a large animal and it is rarely used on solid ground. Liebenberg suggests that this animal moved on soft substrate, probably on mud or snow. Liebenberg (2013) writes:

The points at the back of the footprints reproduce the impression created by the dew claws when the animal’s feet sink into soft mud or snow. The forefeet are usually larger than the hind feet, and in soft substrate the forefeet appear also more splayed than the hind. The lines down the middle of the middle and lower right footprints may indicate that they are more splayed than the other two. If this is so, the middle footprint would represent that of the left forefoot, and the lower right footprint that of the right forefoot. The extreme left footprint would then represent that of the left hind foot, and the uppermost footprint that of the right hind foot. Taken as a whole this track group closely resembles that of a jumping animal (Liebenberg 2013:191–192).

## Therianthropes

Therianthropy refers to the fantastical, or mythological, ability of some humans to change into non-human animals. Therianthropic figures are one of the striking features in southern African rock art. The tradition of depicting therianthropes appears to be a widespread phenomenon. They also appear in the Upper Palaeolithic cave paintings and engravings in Europe. Recent studies have shown that early rock art in Australia also features therianthropes (May et al 2018). The therianthropes reflect the connection between something that humans did from very early on was connected to the experience of transforming into an animal.

According to Mathias Guenther (1999a; 2020a; 2020b), the HG societies and shamanic societies usually have two temporal orders of existence. The early one, which is the mythological past, similar to the Australian Dreamtime, and the second one, which is the present. The Kalahari San refers to the 'First Order of Existence'. The Nharo people in Botswana, believed that early people 'had no customs and the animals' flesh tasted foul'. According to the Nharo and the /Xam of South Africa, the first people were either therianthropes, or beings which were internally merged, but appeared like humans or animals. The current species of our contemporary existence came into being through transformation from original human-like entities marking the end of the First Order. This ending also stands for the end of immortality of all beings, which forever became mortal (Guenther 1999a).

According to Guenther (1999b), the San believe that humans transformed into animals, and animals turned into people. The human elements were eliminated and their animal elements were brought to the forefront. This ambiguity of the transformation is evident in San cultures. The shamans still experience transformations into animals in trance and present a linear time convergence with the mythic past (Guenther 1999b:69–70).

Leroi-Gourhan (1968:132) described therianthropes in European cave art depicting 'figures of men wearing horns or antlers'. These figures included the man/bison found at Les Trois Frères (Figure 15), and the man/bison at Le Gabillou. Other similar figures have emerged since such as in the Chauvet Cave, the most famous being the painted half-bison and half-human figure, also referred to as *Venus* or as the *Sorcerer* (Figure 16). This therianthrope is located at the last chamber inside the cave. It is painted on the back side of a hanging triangular limestone cone, protruding from the ceiling, known as 'Le Pendant de la Vénus'.

This outcrop is painted with four lions, one horse, two mammoths, one musk ox and with a therianthrope figure. The lowest tip of this formation has a painting of a woman's lower body with tapering legs. Her pubic triangle is drawn with black colour. The leg on the right also forms the legs of the bison, whose head looms over the pubic triangle. This composition also seems to blend with a lion, which continues from this image up to the left.

Therianthropes are present but rare in European cave art, but they do appear to be a common feature in all shamanic traditions and common subjects around the world. Lewis-Williams and Clottes (1998:19) claim they present evidence of the relationship between the shaman and the spirit-animal. The shamanic approach does seem to explain some therianthropes, but most likely not all of them. The practice of making such figures seems to reach into the past, and spread where humans have gone. The therianthropes and other depictions of transformations are one of the connections between rock art in Africa and elsewhere. These depictions are also present in European cave art and portable art. Some of the therianthrope figures could be seen as depictions of a persistence hunter's transformation experience into the pursued animal.

## **Nasal bleeds**

Guthrie (2005:240) refers to Leroi-Gourhan citing that only 15% of the depicted animals in European cave art are shown speared or bleeding. These images occur in engravings and paintings, and on tools, stone tablets and bone scraps. These images penetrate the visual culture created by the Europeans of the Pleistocene. These hunters used projectiles, which penetrated into the animal's thorax, killing by haemorrhaging, not by impact trauma. The thoracic region of a large animal is highly vascularised. When a projectile slices through these tissues, blood vessels and organs, it causes bleeding, making the animal lethally weak. The animals that are portrayed with lethal hits are also shown with nose bleeds and shown urinating and defecating, which also is a response to a lethal hit.

Lewis-Williams has attributed nasal bleeds to shamanic trance dances as healers experience bleeding noses when falling into trance. The ceremonial practices were at least somewhat similar among the Maluti San, who had still made rock paintings in the mid-nineteenth century. According to the testimony of the last HG Maluti named Qing, the men were depicted with their noses bleeding and partly transformed into animals because they had fallen into a deep trance state (Orpen 1874:10). In many ways, the Maluti healing ceremonies appear to be similar to the ones practised by the Kalahari San. Bleeding noses

were also a feature of shamans entering the trance state among the recent San in Dobe, Botswana, but not recorded in the Nyae Nyae, Namibia (Marshall 1999:87). According to Lewis-Williams (2002; Lewis-Williams & Challis 2011), this feature is depicted in southern African rock art and therefore could be evidence to support claims about the connections between ceremonial dances and rock art.

However, we cannot attribute all nasal bleeds into shamanic practices. They could simply depict animals with lung hits from projectiles. Animals can show excessive running noses and foaming mouths, but even nasal haemorrhages as they are chased to death. This is an especially convincing idea in European rock art, where hunters did not use poisoned arrows, like the Southern African San. Another explanation could refer to possible use of snuffed psychedelics. There is evidence of psychedelic snuff used at Chavín de Huántar in Peru. According to Richard L Burger there are stone visages showing figures with mucus flowing from their nostrils. In some cases this nasal discharge is substantial, running over their mouth and chin (Burger 2011).

## **General adoration of wild animals and map-like depictions**

I have suggested eight categories of visual evidence, or *fragments*, to support the hypothesis for PH and tracking approach to rock art. I will briefly mention the last two of them. The first one is titled ‘general adoration of wild animals’. The image-making hunters would have adored the wild animals that provided them food, clothing, tools and other resources. The animist societies did not make an effort to elevate their own kind over others in the animal world. Humans were just another species, and transformational experiences in ASC might only have enhanced this view. Therefore, some depictions of non-human animals might have been done from an adoring aesthetic perspective.

Another fragment might be the ‘map-like depictions’, especially the ones in New Zalavruga 4 in northwestern Russia. The panel (Figure 17) shows a group of hunters on skis following the spoor of three elk. The hunters decided to climb uphill with the hope of surprising the elk while sliding down and sending the animals galloping into deep snow. This hunt ended with the group of animals trying to separate from each other. The fastest skier cuts off one of the elk and shoots the calf with three arrows. The hunters dispatched all of the elk by shooting them with arrows and throwing spears from close distance (Gjerde 2010:314–317; Janik et al 2007).

## **REINTERPRETATION OF ROCK ART**

There is reason to suppose the groups of ancient HGs who left Africa c 60 ka, already had shamanic beliefs and practices. This view is supported by the practices among the recent HG societies all over the world. Some early groups invoked ASC with music and dance, and others with psychedelics extracted from local plants and fungi. Therefore, the first remaining images could partly be results or important elements of ritual practices. We can still find visual evidence of these rituals in caves in France, Indonesia, Borneo, Spain, Italy, Germany, Australia and elsewhere.

I am not proposing the Game Pass Shelter panel (Figures 11 & 12) depicts a naturalistic hunting scene. The panel made famous by David Lewis-Williams is also referred to as the Rosetta Panel. However, if we take into consideration the ASC experiences reported by the persistence hunters, the transformative experiences reported by the Ju/'hoan hunters of the Kalahari and Altai trackers in China and the ASC caused by prolonged pursuit, we notice that the figures in the Rosetta panel might be seen as persistence hunters. Therefore, the zoomorphic qualities of these figures could be explained through hunting instead of shamanic ceremony. The figures could be representations of the zoomorphic experiences of the tracking persistence hunters. The eland appears to be exhausted and dying. The figures have clearly appropriated animal features and they also appear to be exhausted. Thomas (2006:32) notes how the hunter did not necessarily need weapons. The hunter could lie on an eland's neck and clamp his palms over its nose and mouth, suffocating it.

I propose that we should also try to find alternative explanations to complement previous shamanic interpretation models to rock art. This approach would be linked to the everyday practices of the HGs. However, we cannot be certain how long our ancestors have harboured shamanic traditions, but they might have been persistence hunters even 2Mya. We should not discard the possibility that the HGs could have experienced ASC while running after their prey.

The likely reason why PH approach to rock art research has been overlooked prior to my doctoral dissertation (Ijäs 2017) could be because the scholars lacked the evidence supporting it. The crucial evidence lies in the studies conducted by Bramble and Lieberman (2004) and Liebenberg (1990; 2013). To the best of my knowledge, the connections between PH and the subjects depicted in rock art has not been properly studied besides a few remarks by Liebenberg (1990; 2013).

Several features in rock art often attributed to the shamanic approach could also be depictions of psychedelic experiences related to PH. I am suggesting that PH along with tracking, combined with the experience of therianthropic

transformation might have been powerful experiences for prehistoric hunters. Some hallucinations might not just be related to hunting, but ER in general, as it has been practised for other reasons too such as communication, transportation, travel, warfare or vision quests (Nabokov 1981). The advantage of this hypothesis is its connections to the practicalities of tracking and running. This hypothesis is not based on a cultural add-on without evident connections to life's necessities. It is at the very core of the existence of HGs. The transformation into an animal's mind and other ASC experiences encountered while pursuing game might have spurred the cultural behaviour that led to ceremonies with an intention to evoke ASC.

## ACKNOWLEDGEMENTS

I am very grateful for the Ju/'hoan people who were welcoming and helpful for me and my wife on our research trips to the Nyae Nyae Conservancy area in Namibia. I am also thankful for Mikael Fortelius, Andries Fourie, Mika Karhu, Louis Liebenberg, Daniel E Lieberman, Nicky Marais, Pentti Määttänen, and Miikka Tallavaara for their continuous support and feedback. This article would not exist without commitment and opinions of Louis Forline and anonymous reviewers. I'm also grateful for the Finnish Cultural Foundation for their continuous support.

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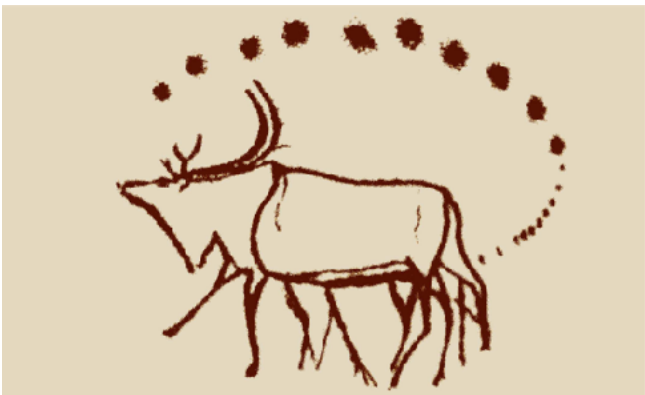
## FIGURES



**Figure 1**

Reindeer with blood spoor, also known as the Dancing Reindeer (Le renne dansant). Salle du fond, La Grotte Chauvet-Pont d'Arc, Ardèche, France

Photograph by Jean Clottes



**Figure 2**

Drawing of the reindeer with blood spoor. Salle du fond, La Grotte Chauvet-Pont d'Arc, Ardèche, France

Drawing by R Dale Guthrie (from Guthrie 2005:272)

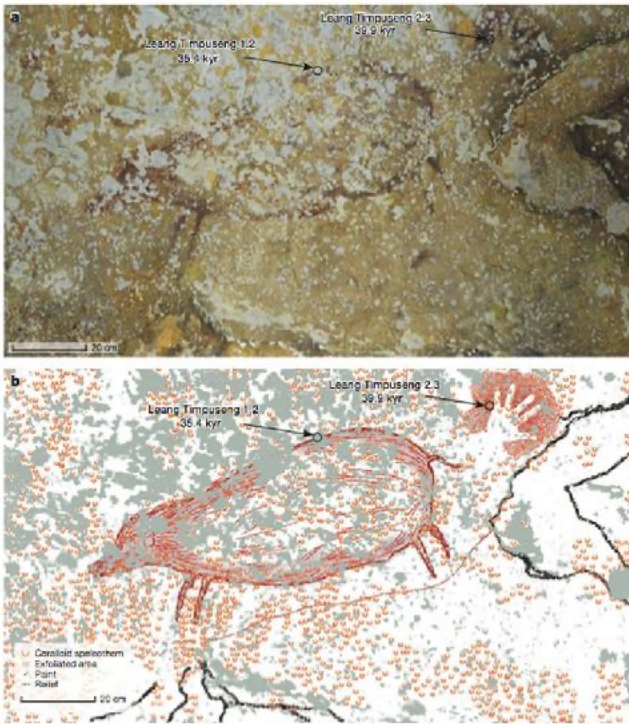


Figure 3

35,400-year-old painting of a Babirusa and a 39,900-year-old hand stencil.

Leang timpuseng, Sulawesi, Indonesia. tracing by Leslie Refine 'Graph & Co' (France).

Nature (from Aubert et al 2014:224)



Figure 4

The 27,500-year-old Apollo 11 Cave therianthrope. the Huns Mountains, Southwestern Namibia

Courtesy of the State Museum of Namibia

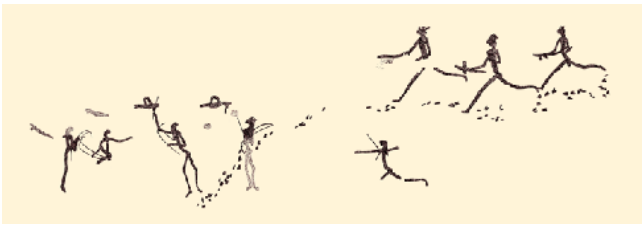


Figure 5

A possible persistence hunting scene. Hungorob gorge, Dâureb/Brandberg, Namibia tracing by Harold Pager (from Pager 1992: site 96)

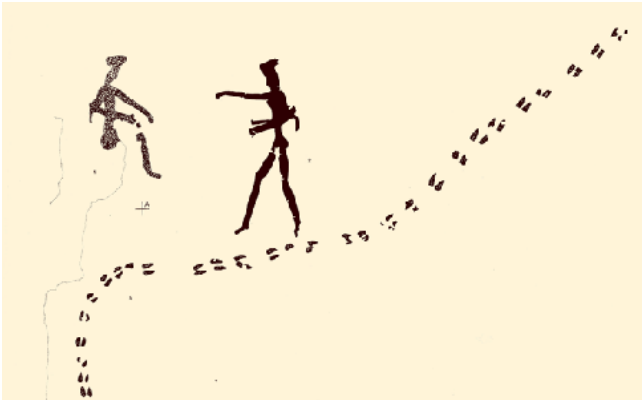


Figure 6

Trackers. Naib gorge, Dâureb/Brandberg, Namibia tracing by Harold Pager (from Pager 2006, site 109)



Figure 7

A possible persistence hunter. Hungorob gorge, Dâureb/ Brandberg, Namibia  
Tracing by Harold Pager (Pager 1992:75)



Figure 8

The Great Black Bull. Notice the hoof print. the Axial Gallery, Lascaux Cave, Dordogne, France (from Aujoulat 2005:107)



Figure 9

Engraved animals and their tracks. /Ui-//aes, twyfelfontein, Damaraland, Namibia.

December 2014

Photograph by Mikko R Ijäs



Figure 10

Running hunter. tsisab gorge, Dâureb/Brandberg, Namibia. December 2014

Photograph by Mikko R Ijäs



Figure 11

The Rosetta panel of the Game Pass Shelter. Site: Game Pass I 7240, Mooi River district, KwaZulu-Natal, South Africa

Photograph by Benjamin Smith. Copyright Rock Art Research Institute, University of the Witwatersrand, South Africa



Figure 12

Tracing of the Rosetta panel of the Game Pass Shelter. Site: Game Pass I 7240, Mooi

River district, KwaZulu-Natal, South Africa

Copyright Rock Art Research Institute, University of the Witwatersrand, South Africa

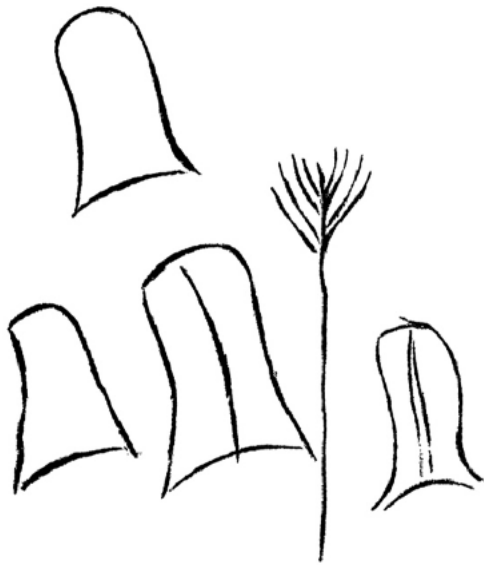


Figure 13

Copies of the bell-shaped figures. el Castillo Cave, Spain  
(from Liebenberg 2013:192)

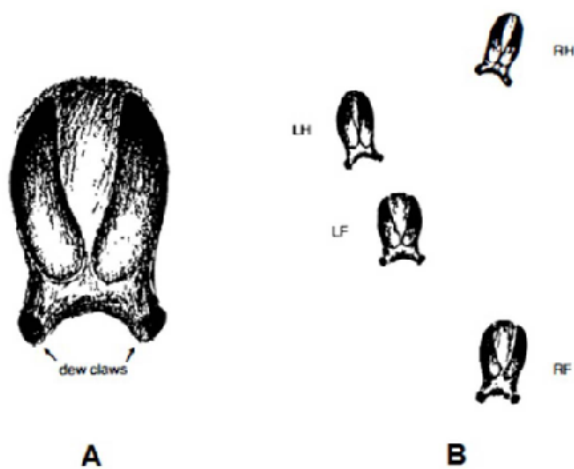


Figure 14

Louis Liebenberg's depiction of (A) Hoof print in soft substrate (B) Jumping gait (from Liebenberg 2013:193)





Figure 15

The shaman of Les trois frères. Volp caves, Les trois frères, Ariège, France

Copy by Abbé Henri Breuil (from Bégouën & Breuil 1958: plate XX)



Figure 16

Half-bison and half-human figure in the Chauvet Cave. Le Pendant de la Vénus, Salle du fond, La Grotte Chauvet-Pont d'Arc, Ardèche, France

Photograph by Yanik Le Guillou



Figure 17

Elk hunting scene depicting three hunters on skis pursuing three elk. New Zalavruga 4, Vyg, Russia

Photograph by Ismo Luukkonen