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METAPHORS OF INTEGRITY OF ENVIRONMENT IN NAMIBIAN ROCK PAINTINGS

The Brandberg in Namibia is an isolated, prominent mountain area of 570 square km. It is located on the eastern margin of the Central Namib Desert, where the land changes into a semi-desert and bush savannah. Despite its antiquity and extreme aridity, the Namib Desert has not been an unsurpassable barrier that screened the Brandberg from the Atlantic Ocean, which lies 80 km distance beyond the desert. The mobility patterns of hunter-gatherers in this area encompassed all vegetation zones from the coast to the far inland savannahs and also the Brandberg (Richter 1990).

Besides this prominence, the Brandberg is also outstanding in its enormous wealth of rock art, which first gained popularity in the 1930s (Breuil 1935, 1959). In a unique effort, the late Harold Pager started, in 1977, to record all rock paintings of this mountain, thus carrying on a project that actually began in 1963 with E. R. Scherz, who produced a country-wide documentation of rock paintings and engravings (Scherz 1970, 1975, 1986). Part of this project of the University of Cologne was the attempt to date rock art by archaeological means. This resulted in only a few, but nonetheless outstanding, dates on African art tradition. W. Wendl excavated art mobiler in the "Apollo 11" Cave in southern Namibia, which was dated at about 27,000 B.P. (Wendl 1974, 1976). During another field project in the Brandberg, conducted by Breuning (1989), exfoliated pieces of rock paintings were excavated in a layer dated at 2,700 B.P.

About ninety percent of the rock paintings of the Brandberg were recorded, amounting to 43,000 figures from 879 sites. About one third of these were published (Pager 1989, 1993, 1995), and further volumes are forthcoming. The published paintings are accessible in a computer file (Lenssen-Erz 1989, 1994a) and form the basis for the data presented in this paper.

In compressed form, the conspicuousness of the Brandberg as a landmark characterised by various properties, can be summarised as follows:

1. As an inselberg, it can be seen from a distance of 100 km from all directions.
2. It is the major rock art region in southwestern Africa and among the most important archaeological areas in all Africa, comprising roughly 50,000 rock paintings in some 1,000 rock art sites, all within the reach of a two-day walk.
The Brandberg has been the vanishing point for the activities of hunter-gatherers, and more recently of pastoral nomads. In central Namibia over many millennia, they left behind hundreds of prehistoric habitation sites, many with rock art (Breen 1989, Kinahan 1991). As compared to the Namib Desert and the savannah areas around it, the Brandberg offers advantageous living conditions while life in the other parts of the region has become problematic due to seasonal droughts or ecological crises (Pager 1980, Breen 1989). The Brandberg hosts a much richer flora (Breen 1988, 1990, Kinahan 1991), and endemic plant species (Smith 1976, 1986) corroborate the view that this is an island in unfavorable surroundings. Yet it is not only the rich flora in species, but also the density of vegetation that makes the Brandberg a privileged region for hunting and gathering subsistence (Breen 1988, 1989, 1990). The density of vegetation enabled pastoral nomads with their small herds to occupy the Upper Brandberg in a transhumant cycle during at least the last five centuries (Kinahan 1991).

5. The temperatures in the Brandberg rockshelters have a lower amplitude due to the heat storing capacity of the granite, retaining a temperature of 3 to 4°C higher than in an open field in cool nights (Breen 1990:13). The main advantage of the Brandberg, which favors rich plant life, is the superior water storing capacity of the mountain. Water stretches of the area are sealed by solid rock, thus collecting hundreds of liters of water even after minimal rain (Pager 1980, Breen 1990, Lennert-Era 1993a). Dozens of hectares of rock surface are impermeable that no water can sink into the ground. Therefore, despite an annual precipitation of only around 100 mm (Breen 1990:14), the Brandberg is far from being a desert environment. The essence of all these facts is that ecologically, the Brandberg, with its unmanmade outline, is clearly distinct from the land around it. It is quite probable that for prehistoric people living in the region it was also viewed cognitively as a discrete entity.

The rock paintings in the Brandberg were probably painted from 3,500 to 2,000 B.P. (Breen 1989; Richter 1991). Even though the data presented here come from a restricted part of the mountain (Pager 1989, 1993), the rock art in central and northern Namibia is well comparable (cf. Schep 1986). It has to be emphasized, however, that this study does not include rock engravings, which can also be found in central Namibia. There are too many differences between the two traditional techniques.

The antiquity of the paintings implies that the painters were hunters and gatherers. This assumption allows some very probable basic inferences about their social structure, group size, mobility, lack of leadership, division of labor, and social strategies such as sharing. Due to the lack of any motif of European origin in the paintings and only a handful of depictions of domesticated animals, it appears that painting ceased some centuries ago.

In an attempt to reveal at least part of the meaning of an art whose cultural tradition vanished with the extinction of the artists, I have recently started to work with a concept of "ecological credibility." This term was introduced into studies of hunter-gatherer rock art by Karl Buser in (1989:151) in studies on South African rock engravings. He used it to describe the reliability of depictions of animals in comparison with the actual fauna that could be found in that area. This is not to say, however, that rock art provides a 1:1 scale catalogue of the fauna inventory but, instead, animals which are rare in the area may figure prominently in the art due to the high symbolic value accorded to them by the painters. Likewise animals being dominant in nature may be neglected in the art (Buser 1989).

In my understanding, the concept of ecological credibility applies to the rock paintings of the Brandberg in the following ways:

1. The rock art of the Brandberg is an authentic catalogue of the large fauna of the area. This means we see animals that actually do live there and did live there for many millennia as documented by archaeological excavations (Richter 1991:234E). It has to be emphasized, however, that only a few species that cannot get up into the upper regions of the Brandberg were painted, while the typical smaller fauna of the mountain (rock dassies, hares, rats, or the small klipspringer antelopes) were not depicted. It is one of the conspicuous features of rock art that this "catalogue" exclusively contains large fauna, whereas in the myths and folklore of many peoples in southern Africa all kinds of animals appear, from insects and amphibia to small and large mammals (Bleek and Lloyd 1911, Bleek 1924, Thomas 1930, Schmidt 1980, Goonther 1989, Biese 1993).

2. The degree of naturalism in the paintings is indicative of the truthworthiness with which the painters cling to the natural model. This is evidenced, for example, by the morphological details that can be seen on the animals, such as distinct stripe patterns of the mountain zebras (Figure 1). There is a minuteness in such depictions that goes far beyond any necessity if one simply wanted to denote a zebra, which could be achieved easily with a few stripes. It appears, therefore, that for the painters, there existed a compulsion to be very exact in depicting animals and that they probably held cognitive categories that resembled our concept of species. Thus, they were perceiving at least part of their ecological setting in a way that we can comprehend today (cf. Lejo 1961:135f). This point is also corroborated if we compare our ecological knowledge with that of southern African hunter-gatherers (Blinman Jones and Rousier 1976, Heinz 1978, Sayman 1986, Liebenberg 1990, Kohler 1991).

3. In line with this credibility of physical features stands the reliable representation of behavioral features that are found, for example, in springbok depictions. Springbok mark their territory in a very specific manner (Smithers 1983:69, Apps 1992:153), and it appears that occasionally exactly this type of behavior was depicted (Figure 2). A territo-
social male "mates with his hindlegs stretched backwards and apart and his body low to the ground, then he brings his legs forward into a humped posture and defecates on top of the urine" (Apps 1992:153).

4. For myself, the most surprising finding regarding the ethnological credibility of rock art is the relative frequency of animals in the art, which corresponds astonishingly to that in the natural habitat (Figure 3). The data of the central Namibian area covering various vegetation zones are the result of a census carried out by the Namibian Nature Conservation in 1989, while the rock art data are derived from a body of about 12,000 figures from two areas in the Brandberg (Pacher 1989, 1993). This does not imply that rock art is but a catalogue of the fauna, replete with all species, but conspicuous data correlations like those in Figure 3 are worth some tentative interpretations. What catches the eye immediately in this graph is the equal ratio of most of the painted animal species compared to their presence in the actual bipedel. Springbok, gemsbok, zebra, and eland do not deviate drastically from their ratio in rock art from their natural frequency. The discrepancy in springbok may diminish if one considers that a high number of not clearly identifiable "buck" in rock art may depict springbok. This may be understood as corroboration for the ethnological credibility of rock art. It is evident that rock art, neither in its morals nor in its preferences, renders an anti-ethnographic or realistic picture of the ecological setting. Figures of clearly non-realistic origin—any kind of anthropomorphs or zoomorphic imaginary beings—attain a frequency of 0.3% among all paintings.

At two points in Figure 3, however, there are very noticeable discrepancies in the ratio of rock art to the natural habitat. The clear underrepresentation of kudu (Tragelaphus strepsiceros) in rock art might either point to a low status in symbolism or perhaps some kind of taboo concerning this animal. This may be a wide territorial marker because the rock art of Zimbabwe kudu closely matches those of other species (Garfinkle 1987:56), and these might be the westernmost specimens of this possibly tonic entity.

On the other hand, the markedly high frequency of giraffes in rock art as opposed to their natural demographic ratio is no surprise. The giraffe undoubtedly is an animal that could be very high, if not highest, as a symbol in the ideology of the painters. This is suggested by the uncommonly broad spectrum of stylistic variability that is used to depict giraffes, from very naturalistic paintings with realistic hide patterns to strongly stylized depictions where the hide pattern—or any—is but a geometric grid. Besides this, giraffes are often painted extraordinarily large, requiring careful planning and preparation of the painting event by preparing a large quantity for pigment. Furthermore, giraffes can be found in very different contexts. Sometimes they are shown with other giraffes and occasionally there are scenes of giraffes with humans, which sets them clearly apart from other animals.

Finally, and perhaps most significantly, one can find various steps of metamorphosing from giraffe to the sacred serpent, the only frequent and clearly mythical animal in the paintings. The sacred serpent is rather likely to fit into the universal pattern of serpent symbolism that accompanies it with water. It is depicted in many variations with features of giraffes comprising the characteristic mandible, the eyes, the short horns, and, of course, the hide pattern. Thus, the serpent is the most tangible mythical being, but since it attains only a frequency of about 0.2% in the paintings, much of its potential symbolic meaning may be conveyed by depictions of giraffes.

Because of these characteristics, giraffes would seem to be a particularly complex symbol with a significance that lies beyond a concept of ecological credibility. By contrast, the metaphoric significance of the other animals frequently depicted in the art (kudu, gemsbok or oryx, and springbok) seems to lie in an ethnographic framework.

But before demonstrating that, some reservations have to be addressed, because they are aspects of the data that forbid more than preliminary hypothesis. First, the census data from the Nature Conservation concern a very limited time span (0–2, the year 1989) in an area covering several vegetation zones. By contrast, the rock art comes from a relatively limited area, but the data are presented in their final state after centuries of painting activity. When the earlier paintings were executed, there may have been quite different ratios of animals. Nevertheless, one finds a fairly uniform mixture of species throughout the different vegetation zones for the ungulates of central Namibia on a regional basis. Only if venturing far into the woodlands of the north or the arid east of the Namib and the south, can one observe either an increase of small herbivores (in the north) or an increase of the large ungulates (in the south) (Thackeray 1982:247). Therefore, even considering moderate climatic changes in the past, the structure of the species depicted in Central Namibian rock art would have been comparable to today at the vegetation zones did not move over drastic distances.

Figure 3 illustrates only animals that appear in both the Namibian Nature Conservation and the rock art data. If all animals counted in either data pool, but not present in both, were taken into consideration the ratios would change.

To demonstrate the broadness of the concept of ecological credibility in a concrete case, I want to focus on springbok, the animal most frequently found in the art as well as in nature (cf. Lensen-Rza 1994b).
Depictions of springbok are invariably realistic, and in many cases they are painted with almost photographic realism. This realism applies not only to the morphologies of the animal, but also to the depiction of what one might call “scenes from the real life of a springbok.” Such a perception of the art is dismissed by other researchers (e.g., Lewis-Williams 1986:97), but the following features have to be fitted into a consistent, explanatory framework with a relevance for the presumed painters.

1. There are big herds at rest with many animals calmly lying down (Figure 4). The aggregation of big springbok herds is, of course, dependent on the availability of sufficient green grass (Haltenorth and Diller 1977:103). Paintings of such big herds at rest show the animals relaxed, not as if being pursued by a predator. Generally 75% of all springbok in the paintings are static (for comparison, roughly 75% of humans are moving). Conspicuously, there is which characterises springbok so distinctly (and gives it its name), its peculiar way of jumping, is never painted, perhaps because this movement is an unmistakable sign of stress displayed only when the animal feels threatened by a predator (Haltenorth and Diller 1977:103, Smithers 1983:630, Appes 1992:136).

2. There are realistic depictions of mother and young (Figure 5), indicated by portrayals such as a suckling young, a difference in size and proportions, or the lighter yellowish-brown color of the young (cf. Haltenorth and Diller 1977). These pictures suggest peaceful scenes rather than animals under stress.

3. There are realistic depictions of springbok nuzzling their flanks (Figure 6), expressed by one novelist as follows: “Springbok grooming themselves frequently rubbing parts of their bodies with the sides of the muzzle, nuzzling with the incisor teeth and rubbing with the horns... All of these actions contribute to a neat, clean appearance” (Smithers 1983:630). This is also characteristic behavior of relaxed animals that are not under stress or in an altered condition.

4. Realistic behavior was also depicted, showing springbok in poses that we also can observe today. These pictures are clearly different from the images of animals in the myths of the San, where a distinction of human and animal behavior is blurred (e.g., Bleek and Lloyd 1911, Bleek 1924, Thomas 1950, Schapiz 1960, Guenther 1989, Biesele 1993). This is to say that animals in rock art always behave as we would expect them to do if we accept that they are superficial reproductions of the biological organisms that we know.

These characteristics of springbok are important features of the art with high impacts on its meaning—an issue that certainly can be transferred to other animals too. If we accept that rock art is more than art for art’s sake, then there is a meaning behind every detail in the art, and it makes sense in a specific context. At this point, I disagree with Lewis-Williams who dismisses morphological details as superficial differences (Lewis-Williams 1986:114). Rather, I think the
naturalistic and realistic details in depictions of springbok were used as metaphors for circumstances and processes in the ecological setting that were vital to the lives of hunter-gatherers. The symbolism of springbok is more difficult to detect, because a symbol by its nature is arbitrary, whereas in a metaphor putative natural phenomena are chosen with reference to other analogous concepts of meaning.

Courtship behavior is an example of a feature in the springbok paintings that can be clearly contextualized ecologically. The depiction of a courting male (Figure 7) has to be understood in the context of the mating season of springbok, because the mating season for springbok depends on when rainfall brings on a flush of new grass growth (Appoll 1972:154) or, in the words of another author, "the mating season was largely dependent on the physiological status of the female which was governed by their level of nutrition" (Simonds 1963:630). From such evidence one can infer that the depiction of a courting male is not necessarily a direct and straightforward expression of a concept of fertility associated with reproduction, such as it is popularly generalized for depictions of corruption or pregnancy (which are absent in Namibian rock art). Rather, the courting male conveys a derived sense the high nutritional value of an animal that is vital to hunter-gatherers, namely the healthy condition of their ecosystem.

Because the above conclusions were deduced from the art itself without resorting to other culturally related sources, it may be helpful to have a short look at the ethnography to get a more complete view of how certain animals might have been perceived. The comprehensive ethnography of the Nama, a southern San group who used to live in the inland regions of the Cape in South Africa, is a useful source, because "hunter-gatherers with similar social forms and productive processes who live in similar environments where the same animals are present may have comparable, though by no means necessarily identical, animal (and other) metaphor and, sometimes in addition, artistic expressions of those metaphors" (Lewis-Williams 1986:113). Although this approach can only be implemented with many concepts, an understanding of the metaphorical meaning of springbok similar to that elaborated above, can be drawn from the Nama folklore as documented by Wilhelm Bierk and Lucy Lloyd in the last century (Bierk and Lloyd 1911; Bierk 1924, 1925, 1933, 1935, 1936). In the published parts of the Nama folklore, the springbok does not play a prominent role, and it has an interesting character, although this character is unambiguous (Lemon-Ere 1994a). Springbok seem to stand for the frankness and well-being of the environment. For example, it is associated with the gentle (female) role that makes the new grass sprout. With the new grass comes the springbok (an ethnological explanation for this perception is that springbok start to feed when the grass is green after the rain (Appoll 1972:154)). In many quotations from the folklore, one can easily point out that the springbok are not seen as the bringers of rain, but they indicate the greenness of nature by their own coming (cf. Lemon-Ere 1994b). Thus, they are metaphorized of this state of nature because their presence is a result of it, whereas if symbolic, springbok could just as well be contextualized in a forecasting sense.

As another association of springbok with the good condition of the environment, one may understand the role of springbok as the prey for excellence in 35% of the occurrences of springbok in the Blikk and Lloyd recordings, they are contextualized with hunting, and are always the victim (Lemon-Ere 1994b). The general availability of springbok as abundant and unproblematic prey can be understood in a context of a non-aggressive hunting situation. This desirable ecological state, in turn, contributes to the social harmony of the group, because only successful hunting allows sharing, an important cultural value.

A further ecological contextualization can be evidenced in the motifs of mother and young in the folklore (as in the paintings); the young springbok are not born at a fixed time of the year, but when there is ample grass and following the main rainy season (Simonds 1963:630). All the above examples show that the features of springbok depicted in the rock art as well as in the folklore can be explained within an ecological context.

In a recent study on Ju'hoan folklore, a San group living in northeastern Namibia, Megan Bierschke wrote:

Both the Bleek and Lloyd tales collected in the last century from Bushmen prisoners in South Africa and the ones which I taped during the last decade show a hunting-gathering subsistence. They deal with problem points in living which must always have characterized the hunting-gathering adaptation, such as recurrent hostile weather, difficulty in procuring game, danger from carnivore attacks, and correct relations with the ancestors. These sorts of concepts, expressed and explored in the artistic verbal forms, have been part of hunter-gatherer living arrangements throughout much of environmental change (1995:13).

1 think this statement fully applies to rock art, too, although it certainly is not the entire explanation for it. But one class of objects (i.e., springbok in all their variety, and probably certain other animals) also indicates that the hunting-gathering subsistence deals with ecological issues.

CONCLUSION

In this paper, I attempted to demonstrate that a concept of rock art that sees an interpretation of the rock art opens access to certain aspects of the meaning of the art without necessarily having to resort to an etiological background. Rather, such a background can be combined in a second step to test the plausibility of the cognitive categories that were previously set up. Without postulating a holistic ecological imperative (cf. Wilmsen 1995:13), I assume that a good part of the thinking and the social management of the prehistoric hunter-gatherer is occupied with the good condition of the ecosystem. Various cultural provisions, including painting, must through all times have served to bring the mental condition to a good state, even if the natural and the social environments were in crisis.

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WAYFINDING IN THE DESERT:
EVALUATING THE ROLE OF ROCK ART THROUGH GIS

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The history of prehistoric rock art research is, like much of archaeology, aimed at recognizing the "intentional behavior" of individuals or groups. The quest for understanding "meaning" or "function" is, with few exceptions, the focus of most rock art research (Schaafsma 1987, Dunell 1992, Salmos 1995). With some misgiving this paper does not claim to be different. However, in this discussion we try to delineate a set of conditions—economic, social, and environmental—that determine why we see rock art at some places and not at others.

The distribution of rock art sites on the landscape has generated the interest of archaeologists throughout the world (e.g., Snyder 1966, Weaver and Rosenberg 1978, Mand 1978, Ferg 1979, Wallace 1983, Marchette et al. 1983, Hamann and Hedges 1986, Marynce 1986, Sears 1986, Hood 1988, David and Cole 1990, Gould 1990, Johnston 1991). But it was Conkey (1984) who first emphasized the social impact of marking places with rock art. And it was Layton (1985), emphasizing the complementary functions of rock art and myths in Australian Aboriginal cultures, who argued that "outside observers" we need to pay particular attention to

the geographic location of rock art sites. Modifying places in the natural environment with petroglyphs or petroglyphs helped enhance the assigned functional meaning of a place in the sociocultural system.

This paper is concerned with the role of prehistoric rock art in the land-use strategies employed by aboriginal groups in the highly dissected canyon country of southeastern Utah. We are interested in several characteristics of rock art sites in this area, namely their toponomastic situation, the assemblage content of the rock art itself, and the relationships of these sites to the remains of other activities.

We approach this research with two fundamental assumptions: First, the abilities to use symbols and icons and to make judgments based on analogical reasoning evolved because they serve some adaptive function in social living. Secondly, rock art functions as one means of conveying information among individuals or groups that enhanced their abilities to manipulate social situations and to acquire resources in the environment of southeastern Utah.

Two behavioral issues conditioned by the physiographic and climatologic characteris-