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Aus / From:
PAUL FAULSTICH (ed.)
Rock Art as Visual Ecology
IRAC Proceedings, Vol. 1
American Rock Art Research Association
Tucson, AZ. 1997: 43-54

METAPHORS OF INTACTNESS OF ENVIRONMENT IN NAMIBIAN ROCK PAINTINGS

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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 an 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 1950s (Breuil 1955, 1959). In a unique effort, the late Harald 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. Wendt excavated art mobilier in the "Apollo 11" Cave in southern Namibia, which was dated at about 27,000 B.P. (Wendt 1974, 1976). During another field project in the Brandberg, conducted by Breunig (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 characterized by various properties, can be summarized 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.

3. 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 (Breunig 1989, Kinahan 1991).

4. 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, Breunig 1990). The Brandberg hosts a much richer flora (Breunig 1988, 1990; Kinahan 1991), and endemic plant species (Wiss 1956/57) corroborate the view that this is an island in unfavorable surroundings. Yet it is not only the richness in species, but also the density of vegetation that makes the Brandberg a privileged region for hunting and gathering subsistence (Breunig 1988, 1989, 1990). The density of vegetation enabled pastoral nomads with their small stock 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 (Breunig 1990:13).

6. The main advantage of the Brandberg, which favors rich plant life, is the superior water storing capacity of the mountain. Vast stretches of the surface are sealed by solid rock, thus collecting hundreds of liters of water even after minimal rain (Pager 1980; Breunig 1990; Lenssen-Erz 1993a). Dozens of hectares of rock surface are so impermeable that no water can sink into the ground. Therefore, despite an annual precipitation of only around 100 mm (Breunig 1990:14), the Brandberg is far from being a desert environment.

The essence of all these facts is that ecologically the Brandberg, with its unmistakable 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. (Breunig 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. Scherz 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 technical traditions.

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 Butzer (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 faunal 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 (Butzer 1989).

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

1. In the rock art of the Brandberg we find 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 1991:234ff.). It has to be emphasized, however, that only large animals 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 klippspringer 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 amphibians to small and large mammals (Bleek and Lloyd 1911, Bleek 1924, Thomas 1950, Schmidt 1980, Guenther 1989, Biesele 1993).

2. The degree of naturalism in the paintings is indicative of the trustworthiness with which the painters clung to the natural model. This is evidenced, for example, by the morphological details that can be seen on the animals, such as the distinct stripe patterns of the mountain zebra (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 had 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. Lévi-Strauss 1966:135ff.). This point is also corroborated if we compare our ecological knowledge with that of southern African hunter-gatherers (Blurton Jones and Konner 1976, Heinz 1978, Snyman 1986, Liebenberg 1990, Köhler 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 1983:629, Apps 1992:153), and it appears that occasionally exactly this type of behavior was depicted (Figure 2). A terri-

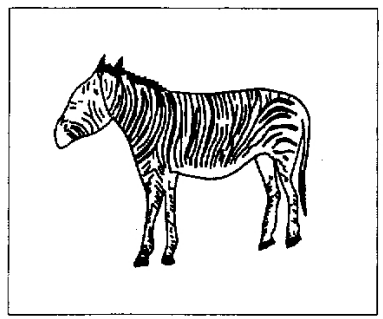

Figure 1. Depiction of a zebra from Brandberg site A 6 (Pager 1989). The stripe pattern (especially on the hindquarter) identifies it unmistakably as a mountain zebra (*Equus zebra hartmannae*).The original painting is red and about 12 cm high.

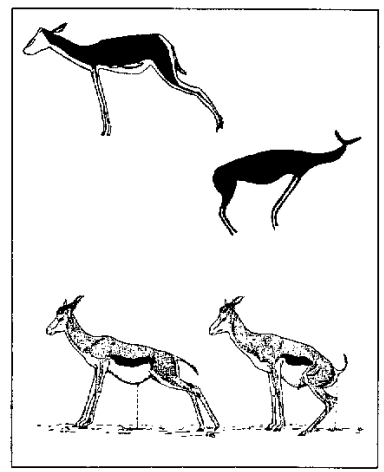

Figure 2. Territorial behavior of male springbok (*Antidorcas marsupialis*) is displayed by a specific way of urinating and defecating. The lower illustration is from a book on animal behavior (Apps 1992); the upper two figures are rock paintings (from sites H 43 and H 121, Pager 1993; red and white, both 10 cm high).

torial male "urinates with his hindlegs stretched backwards and apart and his body low to the ground, then he brings his legs forward into a hunched posture and defecates on top of the urine" (Apps 1992:153).

4. For myself, the most surprising finding regarding the ecological credibility of rock art is the relative frequency of animals in the art, which corresponds conspicuously 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 gorges in the Brandberg (Pager 1989, 1993). This does not imply that rock art is but a catalogue of the faunal repertoire of an area, 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 the most often painted animal species compared to their presence in the actual biotope. Springbok, gemsbok, zebra, and eland do not deviate drastically in 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 ecological credibility of rock art. It is evident that rock art, neither in its motifs nor in its preferences, renders an non-enigmatic or realistic picture of the ecological setting. Figures of clearly

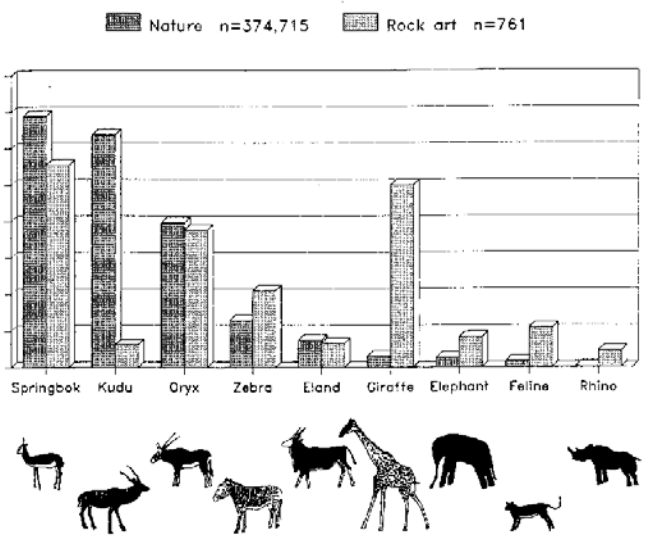

Figure 3. Frequency of certain animal species in the natural central Namibian habitat as compared to rock art. Census data from the Namibian Nature Conservation (1989) and from Brandberg rock paintings (Pager 1989, 1993). The small animal illustrations are taken from rock paintings with only few modifications on some of them.

non-realistic origin—any kind therianthropes or zoomorphic imaginary beings—attain a frequency of 0.5% among all paintings.

At two points in Figure 3, however, there are very conspicuous discordances 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 in the rock art of Zimbabwe kudu clearly outnumber any other species (Garlake 1987:56), and these might be the westernmost specimens of this possibly totemic sign.

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 ranks 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—if 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 metamorphosis from giraffe to the eared serpent, the only frequent and clearly mythical animal in the paintings. The eared serpent is rather likely to fit into the universal pattern of serpent symbolism that associates it with water. It is depicted in many variations with features of giraffes comprising the characteristic mandible, the ears, 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 (zebra, gemsbok or oryx, and springbok) seems to lie in an ecological framework.

But before demonstrating this, some reservations have to be addressed, because there are aspects of the data that forbid more than preliminary hypotheses. First, the census data from the Nature Conservation concern a very limited time span (i.e., 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 made, 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 areas of the Namib and the south, can one observe either an increase of the large ungulates (in the north) or an increase of the small ungulates (in the south) (Thackeray 1982/83:7). 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 as 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. Lenssen-Erz 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 morphology 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 (Halthenorth 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, that which characterizes 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 (Halthenorth and Diller 1977:103, Smithers 1983:630, Apps 1992:156).

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. Halthenorth and Diller 1977). These pictures suggest peaceful scenes rather than animals under stress.

3. There are realistic depictions of springbok nibbling their flanks (Figure 6), expressed by one zoologist as follows: "Springbok groom themselves frequently, rubbing parts of their bodies with the sides of the muzzle, nibbling 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 alerted condition.

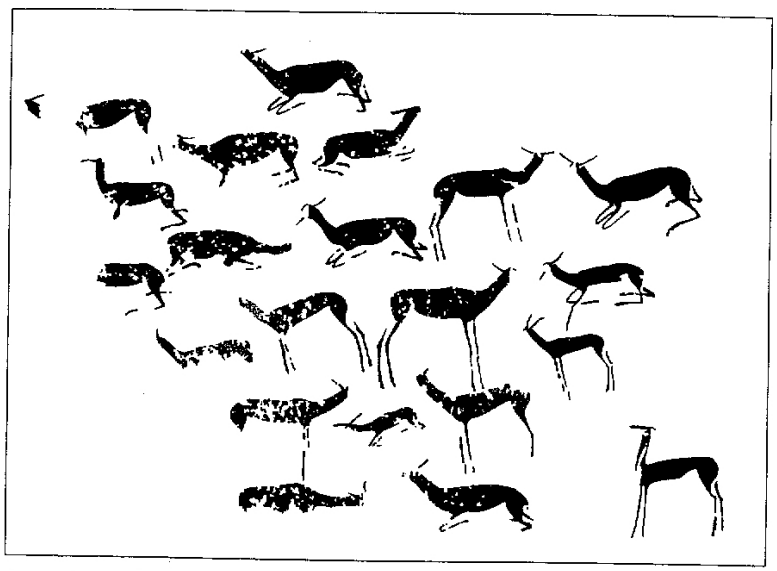

Figure 4. A scene of a springbok herd at rest (Brandberg site A 35, Pager 1989) with many animals lying down in apparent calmness. Paintings in red, the standing figures are about 12 cm high.

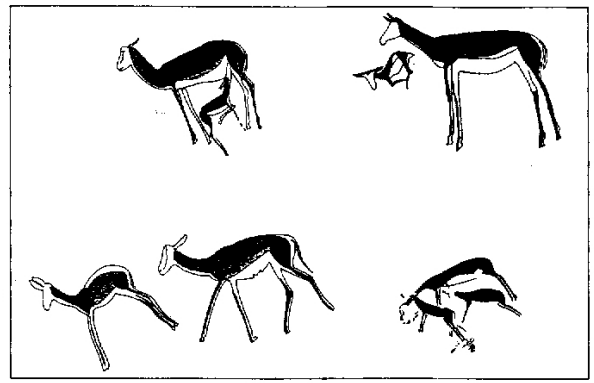

Figure 5. Depictions of mother and young springbok from Brandberg site A 10 (Pager 1989) using various means to indicate the young one. The depictions (mostly red, around 10 cm high) were isolated from a complex panel but not from larger scenes.

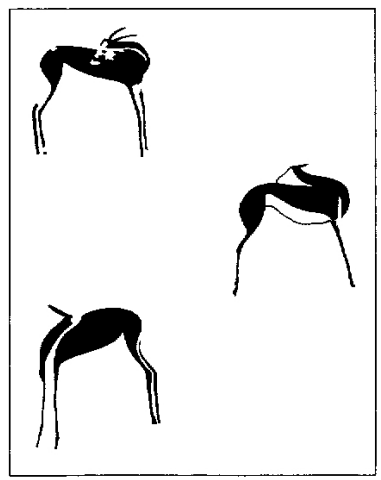

Figure 6. Three springbok nibbling their flanks in apparent leisure. From sites A 35 (upper left), A 10 (middle) and A 38 (Pager 1989). Figures in red and some white, all about 12 cm high.

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, Schmidt 1980, 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 organism 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 life of hunter-gatherers. The *symbolism* of springbok is more difficult to detect, because a symbol by its nature is arbitrary, whereas in a metaphor per se 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 plant growth" (Apps 1992:154) or, in the words of another author, "the mating season was largely dependent on the physiological status of the females which was governed by their level of nutrition" (Smithers 1983:630). 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 is popularly proclaimed for depictions of copulation or pregnancy (which are absent in Namibian rock art). Rather, the courting male encodes in a derived sense the high estimation of a value that is vital to hunter-gatherers, namely the healthy condition of their ecosystem.

Figure 7. The courtship behavior of springbok comprises a peculiar way of putting one foreleg between the hindlegs of the ewe. The lower illustration is extracted from Apps 1992:155, while the upper is a rock painting from site A 10 (Pager 1989; painting originally 24 cm long). Note that the ostrich superimposed over the buck is identifiable as a male by the red foreparts of its legs.

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 now extinct /Xam, 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) metaphors and, sometimes in addition, artistic expressions of those metaphors" (Lewis-Williams 1986:115). Although this approach can only be implemented with many caveats, an understanding of the metaphorical meaning of springbok similar to that elaborated above, can be drawn from the /Xam folklore as documented by Wilhelm Bleek and Lucy Lloyd in the last century (Bleek and Lloyd 1911; Bleek 1924, 1932, 1933, 1935, 1936). In the published parts of /Xam folklore, the springbok does not play a prominent role, and it has an inconspicuous character, although this character is unambiguous (Lenssen-Erz 1994b). Springbok seem to stand for the intactness and well-being of the environment. For example, it is associated with the gentle (female) rain that makes the new grass sprout. With the new grass come the springbok (an ethological explanation for this perception is that springbok start to herd when the grass is green after the rain [Apps 1992:154ff.]). In many quotations from the folklore, one can clearly point out that the springbok are not seen as the bringers of rain, but that they indicate the greenness of nature by their coming (cf. Lenssen-Erz 1994b). Thus, they are *metaphorical* of this state of nature because their presence is a result of it, whereas if *symbolic*, springbok could just as well be functionalized 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 par excellence. In 53% of the occurrences of springbok in the Bleek and Lloyd recordings, they are contextualized with hunting and are always the victim (Lenssen-Erz 1994b). The general availability of springbok as abundant and unproblematic prey can be understood as a carefree ecological constellation. 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 green grass following the main rainy season (Smithers 1983:630).

All the above examples show that the features of springbok depicted in the rock art as well as in the folklore can be explicated within an ecological context.

In her seminal study on Ju/'hoan folklore, a San group living in northeastern Namibia, Megan Biesele wrote:

> Both the Bleek and Lloyd tales collected in the last century from Bushman prisoners in South Africa and the ones which I taped during the last decade show a hunting-gathering substrate. They deal with problem points in living which must always have characterized the hunting-gathering adaptation, such as uncontrollable weather, difficulty in procuring game, danger from carnivore attacks, and correct relations with in-laws. These sorts of concerns, expressed and explored in artistic verbal forms, have been part of hunter-gatherer living arrangements through many sorts of environmental change [1993:13].

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

Conclusion

In this paper, I attempted to demonstrate that a concept of ecological credibility in the interpretation of rock art opens access to certain aspects of the meaning of the art without necessarily having to resort to an ethnological background. Rather, such a background can be consulted 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 1983:15), I assume that a good part of the thinking and the social management of the prehistoric hunter-gatherer painters was occupied with the good condition of the ecosystem. Various ritual 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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After all, patterns are only abstractions because, in reality, time never stops; it is a continuous ongoing process. There are no patterns; there are only processes [Taylor 1977:134].

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 1985, Dunnell 1992, Salmon 1993). 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, Mandt 1978, Ferg 1979, Wallace 1983, Manhire et al. 1983, Hamann and Hedges 1986, Martynec 1986, Ives 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 as "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 pictographs 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 topographical 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 functioned 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-