

# ANIMAL BEHAVIOUR AND INTERPRETATION IN SAN ROCK ART: A STUDY IN THE MAKGABENG PLATEAU AND LIMPOPO-SHASHI CONFLUENCE AREA, SOUTHERN AFRICA\*

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## ABSTRACT

Selected rock paintings of animals exhibiting specific behavioural traits are examined with special emphasis on kudu in the rock art of the Makgabeng Plateau and the Limpopo-Shashi Confluence Area (LSCA). Primary identification by morphological characteristics is essential for determining the taxonomic status of animals in rock art. Ethology, the study of animal behaviour, then becomes a second refining and defining procedure, and may help to identify otherwise unidentifiable animals in the art, sometimes enabling a match between ethnographically recorded San hunter-gatherer beliefs about animals. Although animal behaviour is implicit in many rock art studies, it is suggested that explicit critical awareness of ethology can provide for more in-depth interpretation of rock engravings and paintings of animals.

## INTRODUCTION

It is by now widely accepted that hunter-gatherers worldwide were keen observers of animal behaviour and often incorporated this behaviour in their cosmologies (see, for example, Mails 1972; Campbell 1976; Eliade 1989; Cowan 1989; York *et al.* 1993). The San were no different and many authors have commented on their acute observational skills, especially where animals that the San regularly hunted were concerned (*e.g.*, Marshall Thomas 1959; Vinnicombe 1976; Lewis-Williams & Biesele 1978; Shostak 1981; Biesele 1993). Nicholas Blurton Jones and Melvin Konner's landmark study showed, for example, that !Kung hunters had remarkable abilities in observing

animal behaviour, that these observations went beyond the immediate needs of hunting, and that information such as predator behaviour acquired during the hunt would be transmitted in an informal way through stories in the more relaxed social setting of the camp (1976:344). Moreover, the periodically precarious nature of survival, particularly in semi-arid environments, especially the pursuit of prey animals for protein, and, more importantly, fats (see for example, Speth 1990) - compelled hunters to use supernatural powers in order to transcend their human limitations (Biesele 1993:89, 195). Indeed, in the far northern parts of South Africa and in south-western Zimbabwe, hunter-gatherers used animals as cultural symbols as evidenced in the rock art (*e.g.*, Eastwood

1999; Eastwood & Cnoops 1999). Animals which were regularly hunted do not necessarily correspond to animal species which were chosen as subjects to paint (*e.g.*, Maggs 1967). The choice of animals for depiction in the art related closely to San hunter-gatherer social practices and religious beliefs (*e.g.*, Vinnicombe 1976). Apart from a rich store of recorded folktales where animals played a central role, the prolific and ubiquitous paintings and engravings of a restricted range of animal species all over southern Africa testify to the importance of these animals in San thought over time and space.

During the summer of 1974 David Lewis-Williams joined Megan Biesele at a camp near Maun in the Kalahari in order to interview !Kung informants on aspects of their beliefs which might have a bearing on specific aspects of Southern San rock paintings. In discussions with the !Kung it became clear that:

It is in the interpretation of animal species, sex, groupings and postures that contemporary San informants, can, I believe, be of greatest assistance in understanding the content of particular rock paintings; this is a field of study that still awaits extensive exploration (Lewis-Williams 1981:36).

In spite of Lewis-Williams' suggestion, very little specific work has been done on animal behaviour in southern African rock art, although assumptions about identification and behaviour have been implicit in most rock art research (see, for example, Fock 1972; Woodhouse 1984; Loubser *et al.* 1990). Some specific research on animal behaviour in rock art has been done elsewhere, notably the Upper Palaeolithic (Clottes *et al.* 1994). In southern Africa the work that has been done has shown that paintings and engravings of animal species often display a range of postures and behavioural characteristics suggesting movement or stasis (*e.g.*, Pager 1993:457, 1995:81), near-death states (Lewis-Williams 1981:92), mating and the care of young (*e.g.*, Pager 1975:39, 40; Lewis-Williams 1981:47; Lenssen-Erz 1994; Ouzman 1996; Eastwood & Cnoops 1999), or they are painted in groups indicating aggregation behaviour (Loubser & Brink 1992), territoriality and seasonal social structure (*e.g.*, Vinnicombe 1976:163; Mazel 1983; Lenssen-Erz 1994; Eastwood & Cnoops 1999). In some studies it was clear that an appreciation of basic ethological principles and an understanding of the San ethnographies is required in order to interpret the art (*e.g.*, Lewis-Williams 1981; Ouzman 1995a, 1995b, 1996, 1998; Eastwood & Cnoops 1999). Without some knowledge of animal behaviour the researcher may overlook nuances of specific classes of animal image that may shed light on interpretation. Indeed the rock art researcher, who is often someone not fully conversant with animal identification and behaviour, may not recognise certain postures displayed by an engraved or painted animal at all and simply ignore what may be a significant clue to the intentions of the artist.

Understanding animals in the wild depends, first, on their accurate identification, secondly, their ecology, and

thirdly, their behaviour. Behaviour is, perhaps, the most revealing part of an animal's natural history. Similarly, in rock art, initial interpretations of animal imagery depends on their identity, iconographic context and behaviour. More crucial, however, is understanding the way in which animals were incorporated into San beliefs (*cf.* Biesele 1993; Deacon 1994; Guenther 1994).

Comprehending aspects of animal behaviour is useful to rock art research because, in some cases it may help to identify animal species whose general body form and morphology are not sufficiently diagnostic for a positive, unambiguous identification, and it facilitates the interpretation of certain images in the art in at least two ways. First, behavioural nuances may elaborate on 'non-interesting' repetition of animal images, making them more intriguing, even if such connotations are not perfectly understood. Secondly, and far more forceful than the first, is the way in which identifying behavioural traits can help with interpretation, especially when it is combined with the ethnography.

In this paper we explore these possibilities and to illustrate our arguments we draw on the art of the far northern parts of South Africa and south-western Zimbabwe. Our study areas are the Makgabeng Plateau and the Limpopo-Shashi Confluence Area (Fig. 1). The Makgabeng plateau, situated to the south of the Blouberg massif, covers an area of some 300 square kilometres, consisting of broken, horizontal sandstone sediments of the Waterberg Group. The vegetation consists of Mixed Bushveld (Low & Rebelo 1996). The Limpopo-Shashi Confluence Area (LSCA) consists of roughly parallel series of Karoo Sandstone outcrops and typical Bushveld woodland interspersed with *Colophospermum mopane* scrub. In this study there are several reasons to justify the use of Kalahari ethnographies. First, these two rock art study areas fall within the eastern Kalahari-fringe area. Secondly, the environment and fauna are similar, and allow for similar responses to the environment by hunter-gatherers. Thirdly, and most significantly, there are many correspondences in the art of the study areas with most rock art regions in southern Africa (see Eastwood & Cnoops 1999).

## ETHOLOGY AND IDENTITY

### Identification by Primary Morphological Attributes

Given that San rock art is largely symbolic and non-literal (*e.g.*, Vinnicombe 1976; Lewis-Williams 1981), it is hardly surprising that some animal paintings are seldom depicted as accurate two-dimensional replicas of three-dimensional animals. Paintings of eland in the south-eastern mountains of South Africa, for example, are generally depicted with exaggeratedly long torsos, a convention which may have been intended to convey the extra-ordinary origins of these spirit-animals. Moreover, painted images may be a conflation of more than one animal species (see for example, Ouzman 1997 for the conflation of images of cattle, wildebeest and eland).

Indeed, many animals in the art appear to be of

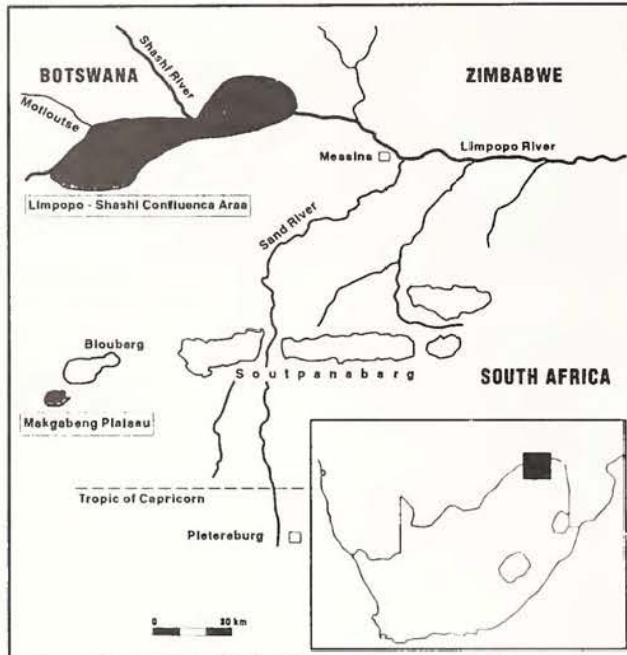


Fig. 1. Map of part of the Limpopo Basin of southern Africa with the study area shaded.

indeterminate species, especially in the largest category of all animal paintings: antelope. In the LSCA, for example, the most recent analysis of 119 sites shows that 'indeterminate' antelope make up 70% of the total number of painted antelope ( $n=475$ ; Eastwood & Cnoops 1999). It is often difficult for researchers to identify species-specific antelope from the vast repertoire of indeterminates. In recent surveys of the LSCA we have often had pointed out to us by professional hunters or trackers that some antelope we had identified as indeterminate were in fact identifiable by body silhouette and other features. An example of such misidentification was apparent when we recorded a site already documented by Pager (n.d.) in the 1970s. He had counted eleven species-specific antelope out of forty-one images of antelope, while we counted seventeen identifiable antelope (Eastwood & Cnoops 1998a:34). We therefore suspect that many of these 'indeterminate' antelope may have similarly been misidentified in other quantitative studies. Indeed, throughout southern Africa, quantitative studies almost always show that indeterminate antelope are the largest category of animal images (e.g., Maggs 1967; Pager 1971; Lewis-Williams 1972, 1974; Hollman 1993; Laue 1999; and see Erwee 1997 for discussion of these 'indeterminate' antelope).

Examining the general form and structure of rock paintings of animals may give an idea of the taxonomic group to which the animal belongs, for example, family, tribe, genus or species, depending on the combinations of morphological characteristics which are portrayed. An example of this is the problem of identifying two members of the Tribe Alcelaphini of the Family Bovidae, the red hartebeest (*Alcelaphus buselaphus*) and the tsessebe (*Damaliscus lunatus*) in the study areas. The alcelaphines:

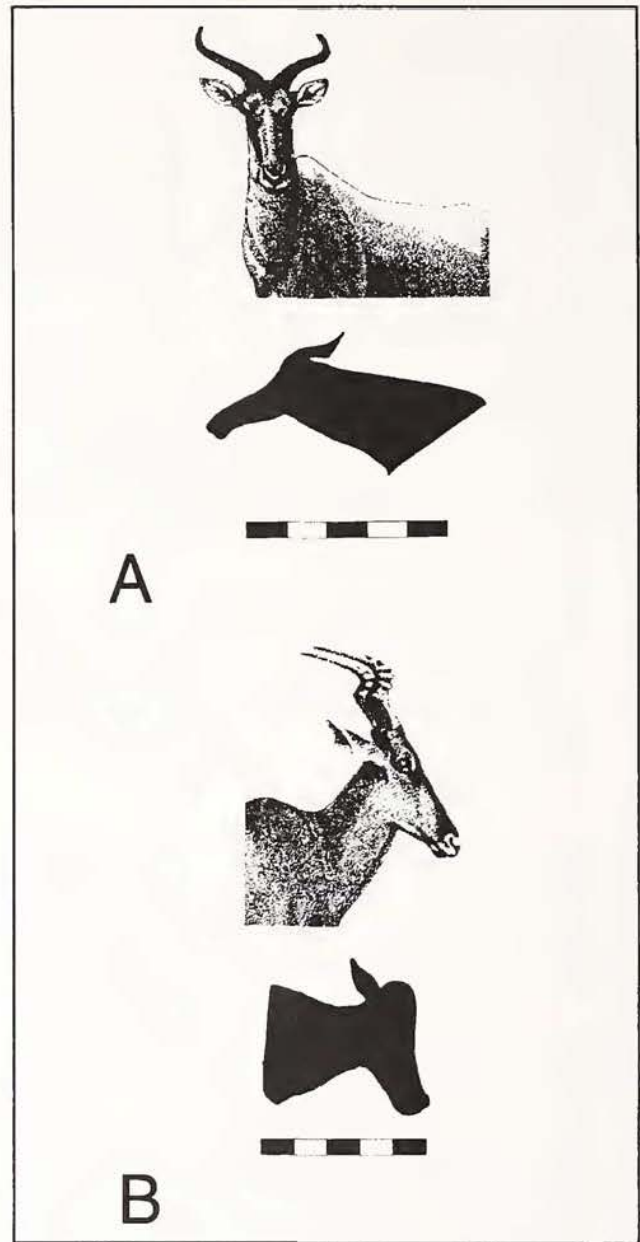


Fig. 2. Comparison between head shapes and horn structure of tsessebe (A) and red hartebeest (B). The topmost animals are realistic sketches (after Smithers 1983: plate 25). The two lower depictions are rock paintings from the Northern Province. Scales in intervals of 10 mm.

wildebeest, tsessebe and hartebeest are identifiable by shoulder-hindquarter orientation, body markings and horn shape. Differentiating between hartebeest and tsessebe, for example, where horns are borne by both sexes in reality, is often problematic in the paintings because horns are often absent. Perhaps these omissions are intentional, indicating a 'generic meaning' for these two alcelaphines, possibly indicating a set of concepts applied to these closely related genera. In the LSCA rare depictions of both red hartebeest and tsessebe are painted with horns and are therefore readily identifiable; real tsessebe characteristically have horns which curve uniformly backwards, outwards and then slightly upwards and inwards, while the hartebeest have horns that arise straight

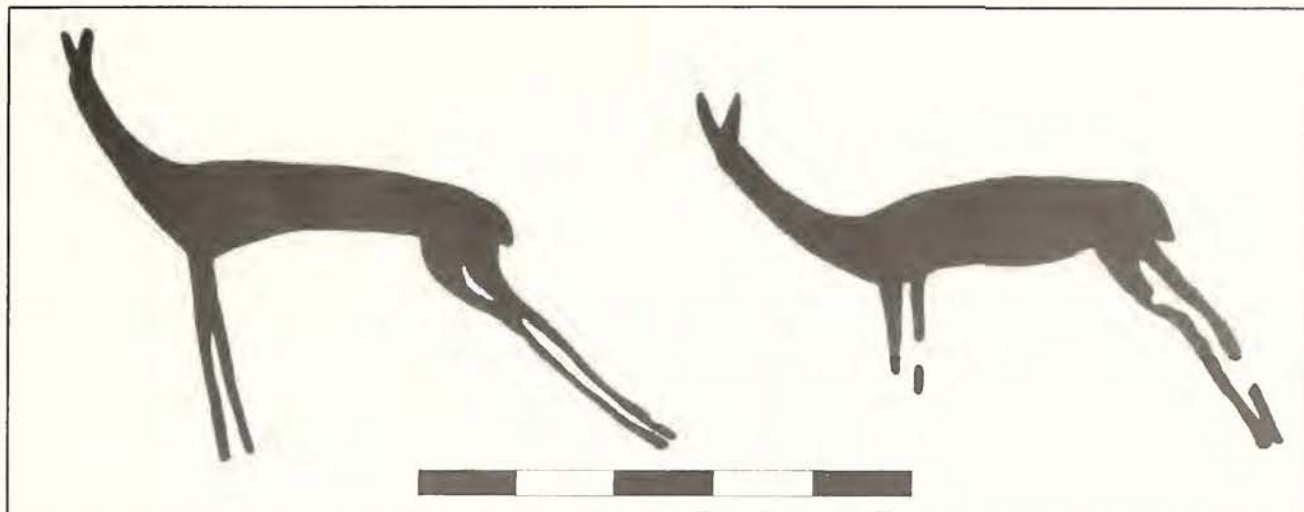


Fig. 3. Two small antelope from the Brandberg (after Pager 1993:116). These animals show territory-marking postures common to both impala and gazelle species. Black represents red. Scale in intervals of 10 mm.

up from a pronounced pedicle and curve forward and then backward. Because their body silhouettes are so similar, that is, the back slopes down from shoulder hump to hindquarters, paintings of these two genera are generally difficult to differentiate in the art. Nonetheless, some hornless depictions can be identified from the head shape where the pronounced pedicle on the hartebeests' heads are depicted, but is absent from depictions of tsessebe (Fig. 2). Generally, however, depictions of hartebeest are characteristic of the Makgabeng Plateau and tsessebe of the LSCA - which conforms to present distribution of these two animals (Smithers 1983:611, 618).

The identity of other painted antelope which are predominant in the study areas such as kudu and impala are much less problematic. Kudu (*Tragelaphus strepsiceros*), for example are recognisable by their shoulder humps, large ears, robust muzzles, relatively long necks, body stripes, horn structure (if male) or two or more combinations of these features. Paintings of impala (*Aepyceros melampus*) are also diagnostically unambiguous and relatively easy to identify because they are often bichrome with white underbellies, their limbs are relatively slender, their ears are large, they do not have pronounced shoulder humps and their backs do not slope to the rear.

Another category of animal paintings which is characterised by blurring of species-specific features are members of the Family Felidae. Paintings of large felids are generally identifiable by their heavy builds, robust legs, relatively long tails which dip down from the body and then upwards, a shoulder hump and slightly lowered head. Species-specific features such as the mane of the male lion (*Panthera leo*), or the spots of a leopard (*Panthera pardus*) or cheetah (*Acinonyx jubatus*) are rarely depicted. This blurring of species of felids may be understood when one looks at the Kalahari ethnography: *!homb* in the Ju/'hoan language means carnivores in general and is extended to refer to black and white people who may constitute a threat (Biesele 1993:111), and the

generalised forms of felids in LSCA art may also point to ideas about felids in general, rather than a particular species.

Despite the absence of diagnostic morphological features in many animal paintings, it is generally obvious to rock art researchers that accurate identification of animal families, tribes, genera or species in the art is a necessity for interpretation since many specific San beliefs and concepts are linked to particular animal taxa. We now turn to examine the possibilities of identification by behavioural features.

#### Identification and Behavioural Attributes

We suggest that, in some cases, observation of behaviour in the images may give some clue as to the identity of certain antelope. To illustrate this we use an example of two apparently indeterminate antelope from the Brandberg (Fig. 3). The way their legs are extended backward is a typical posture of male territory marking in both impala and springbok (*Antidorcas marsupialis*) (Smithers 1983:629; Estes 1991:163). Although the Brandberg falls outside the distribution area for impala (e.g., Stuart & Stuart 1988:210), it does not necessarily follow that this was the case in the past when the paintings were made (cf. Tyson & Lindsay 1992), nor does it take into account depictions made of animals from other places by transhumant people (see Ouzman 1995b). The behavioural attributes have thus narrowed down the options for identification of these two antelope, but further examination of specific morphological characteristics - in this case the relative size of the ears - allow the antelope to be identified; impala have very large ears relative to head size, whereas the antelope depicted have smaller ears and are therefore likely to represent springbok.

It is not only antelope, however, that can be identified by behavioural traits, but other animals as well. A panel recorded by Pager (1977) in the LSCA is a good example (Fig. 4). This panel of paintings portrays a group of eleven animals in a row of seven and a cluster of four oriented

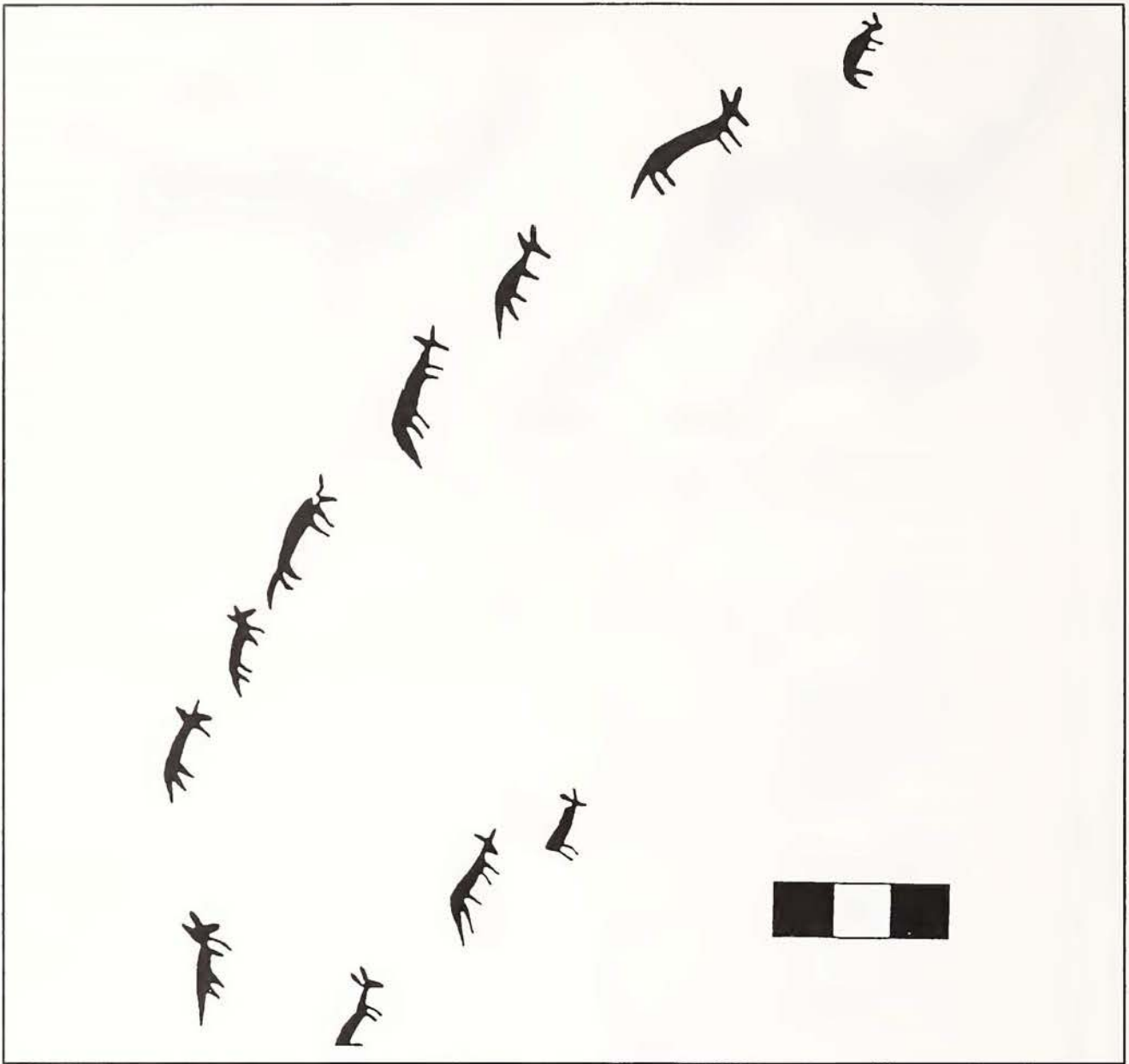


Fig. 4. These animals are identifiable as mongooses primarily by their alignment and not by silhouette (Redrawn from Pager 1997, fig. 3). Limpopo-Shashi confluence area, South Africa. Black represents red. Scale in intervals of 10 mm.

semi-vertically. The animals range in length from 15 to 27 mm in length and 4 to 7 mm at shoulder height. These animals generally have the silhouettes of carnivores. Their general outline suggests that they belong to the Family Canidae - either wild dogs (*Lycaon pictus*) or black-backed jackals (*Canis mesomelas*). Although they have a general canid appearance and are aligned in a way that suggests a hunting pack, their tails are too bushy and ears not rounded enough for wild dogs. The second, and better, possibility is their identification as jackals - consistent with their rather bushy tails and the angular form of ears and foxy muzzles (cf. Estes 1991:404). This choice, however, is also complicated by their alignment and gregarious arrangement - wild dogs hunt in packs, while jackals are solitary hunters. The average size of a wild dog pack is ten animals (Pienaar 1969), about the size of the group in the paintings, while jackals are

generally found in monogamous pairs (Estes 1991:398). This dilemma of identification is solved by a third possibility: that they belong to the Family Viverridae. Indeed, Pager (1977) identified these animals as mongooses, but without arguing why he chose this designation. We, however, agree with this identification for the following reasons: first, the long squat bodies (length to height ratios) of the paintings are similar to the appearance of a mongoose. Secondly, their body to tail-length ratios are more consistent with those of mongooses rather than canids. Thirdly, their small size when compared to other paintings of animals in the shelter (the mean length ratios of mongooses to other animal images are approximately 1:12. In another shelter in the area similar paintings have a 1:18 mean length ratio with animals in the same panel). Although this presupposes that San images are painted in proportion, these unusually

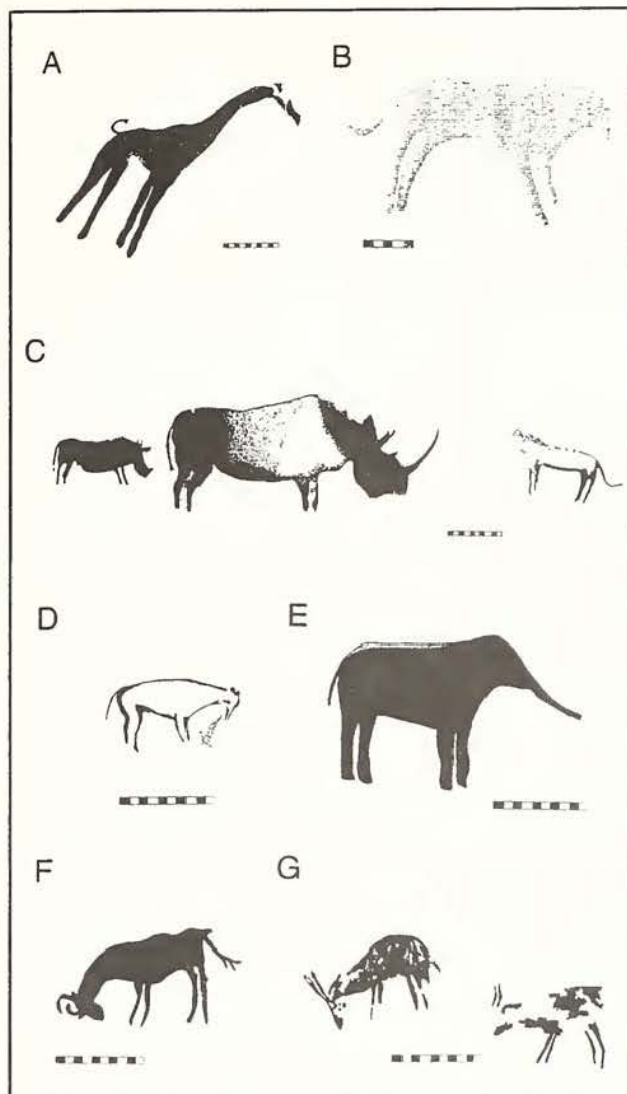


Fig. 5A. A giraffe exhibiting a gesture of alarm. Limpopo-Shashi confluence area, South Africa. Black represents red. Scale in intervals of 10 mm.

5B. A large felid in typical standing or walking posture. Limpopo-Shashi confluence area, South Africa. Grey represents yellow. Scale in intervals of 10mm.

5C. A white rhinoceros with calf facing a lion. Limpopo-Shashi confluence area, South Africa. Black represents dark red, stipple represents faded red. Scale in intervals of 10mm.

5D. Antelope with head lowered, bleeding from the nose. Limpopo-Shashi confluence area, Zimbabwe. Black represents dark red, stipple represents light red. Scale in intervals of 10mm.

5E. An elephant exhibiting 'greeting-intention' behaviour. Limpopo-Shashi confluence area, Zimbabwe. Black represents black, outlined stipple represents red. Scale in intervals of 10mm.

5F. A wildebeest cavorting - either territorial or mating behaviour. Limpopo-Shashi confluence area, South Africa. Black represents red. Scale in intervals of 10 mm.

5G. Two bushbuck in defensive and offensive postures. Limpopo-Shashi confluence area, South Africa. Black represents red. Scale in intervals of 10 mm.

small painted animals (mean length 19 mm) suggests that they represent small animals; generally, in the LSCA where kudu and impala and/or tsessebe/hartebeest, and, indeed, other animal species, are depicted together in the same panel and in the same episode it has been noted that they are more or less in proportion. Fourthly, and most important, the arrangement of the animals in processions depicted at two sites signifies a gregarious species. The only gregarious animals with long tails and squat, slender bodies are either the dwarf mongoose (*Helogale parvula*), or the banded mongoose (*Mungos mungo*). Both species are a relatively common sight in the region. When packs are encountered they flee, uttering a strident, chittering alarm signal and often run in single files, much like those port-rayed in the paintings. In the case of these mongoose paintings, the animals are more readily identifiable from their linear alignment, than from their body form. Thus, behavioural attributes, we argue, may contribute toward identification.

When once the identity of an animal painting is established by examining combinations of morphological features, ethology then becomes a second refining and defining step. Although an aid to identifying paintings, ethology is useful to rock art researchers in the more important realm of interpretation.

#### ETHOLOGY AND INTERPRETATION

Ethology, the scientific study of animal behaviour, is a useful tool in interpretation of rock art images in at least two ways. First, it points to the unusual nature of some paintings of particular species that, at first glance, may seem merely repetitious images. In other words, a slight change in the posture of a particular animal painting that is frequently painted in a static demeanour may represent a crucial variation and may help with interpretation. Secondly, ethology combines powerfully with ethnography to illuminate the extra-ordinary meanings of certain paintings. We now examine images of identifiable animals in various postures which exhibit a range of behavioural characteristics.

#### Identifying Animal Behaviour in the Art

In our examination we draw on the work of Reay Smithers (1983) and, in particular, the work of Richard Estes (1991). Estes points out that the problem of categorising animal behaviour is that most behaviour patterns overlap. For example, 'Social Organisation' would include 'Territoriality' and 'Mating Systems', which reappear under 'Reproduction' and 'Parent/Offspring Behaviours' and so forth (1991:xxi). Despite the apparent overlaps, in the following framework we have simplified and adapted Estes' system and include most of his designations. An additional category, 'Behaviour in Death', has been included because San hunters often portrayed dying animals in certain parts of South Africa (e.g., Lewis-Williams 1981:92; Lewis-Williams & Dowson 1989:50-52). Our framework takes

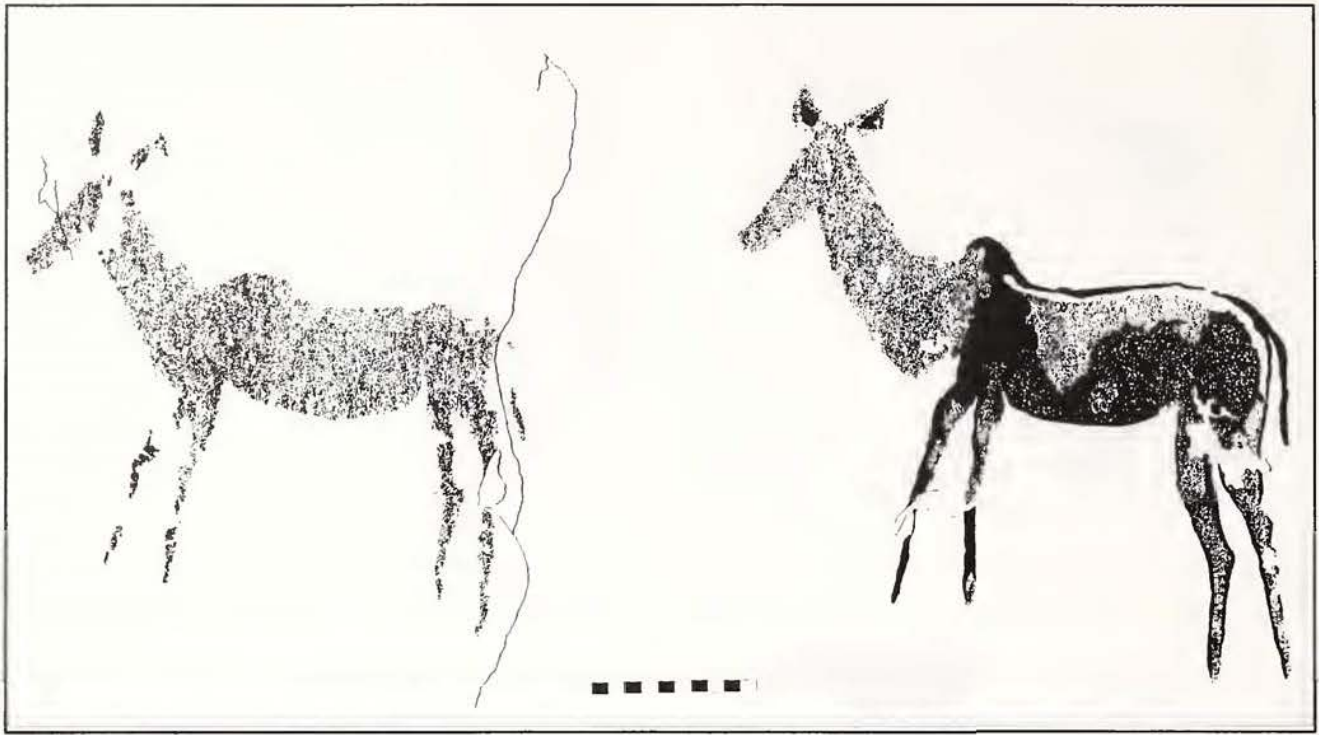


Fig. 6. Two kudu cows exhibiting postures of inquisitiveness or subtle agonistic behaviour of caution. Limpopo-Shashi confluence area, Zimbabwe. Black represents dark red, heavy stipple represents light red, light stipple represents yellow. Scale in intervals of 10 mm.

into account the various animal behaviours which are consistent with images found in the art. In the following section we discuss five categories with reference to specific images found in rock paintings. These categories include 'Postures and Locomotion', 'Predation and Anti-predator Behaviour', 'Behaviour in Death', 'Social Behaviour' and 'Reproductive Behaviour'.

#### *Postures and Locomotion*

This refers to attitudes assumed while seated, sleeping, standing, feeding, or any locomotory behaviour. Of all the potential postures and locomotory positions - only a few are depicted in the art. In other words, the San were selecting a restricted range of postures, as they did with human figures. The examples given below (Figs 5A-G) illustrate the nuances of posture that may be shown in paintings of animals. Most animals portrayed in the art appear to be 'simply standing there' but there are many examples of animals that lie down, walk or run. For example, an unusual depiction of a giraffe (*Giraffa camelopardalis*; Fig. 5A) from the LSCA is tilted slightly forward giving the impression of movement - perhaps cantering. Indeed, the swept-back tail suggests this. When one approaches a giraffe it usually runs off, apparently in slow motion, the tail held curled up on the rump and switched at regular intervals (*cf.* Estes 1991:204). One of the authors (Bristow) has observed this behavioural trait during courtship, when the female is in oestrus. Like many other paintings of animals this idiosyncratic image is difficult to interpret either from the point of view of its

context, or indeed, the ethnography. However, if the intention of the artist were concerned with the mating and consequent parental behaviour of specific animals it would make more sense because, as we later explain, such behaviours in animals resonated with San hunter-gatherer socio-cultural concepts.

#### *Predation and Anti-predator Behaviour*

These two categories are set in opposition: predatory behaviour is characteristic of carnivores (killers and eaters of living animal prey), while anti-predator behaviour refers to certain agonistic behaviour of prey species. Agonistic behaviour is defined as "associated with aggression, including offensive, defensive, submissive, and fearful behavior" (Estes 1991: 559). Carnivores such as mongooses (Family Viverridae), hyenas (Family Hyaenidae), and jackals (Family Canidae) are all infrequently depicted in the art of the LSCA (*e.g.*, Eastwood *et al.* 1994; Eastwood & Cnoops 1998b; Eastwood & Blundell 1999). Felids, on the other hand, are a persistent and ubiquitous image in southern African rock art (*e.g.*, Lewis-Williams & Dowson 1989; Garlake 1995; Pager 1995) including the Northern Province of South Africa (Eastwood & Cnoops 1998b). In the Northern Province art none of the felids (lions and leopards), for example, show any significant or obvious behavioural characteristics, besides walking (*e.g.*, Fig. 5B). Despite this lack of painted or engraved variation, felines are significant in San cosmology. Lions, for example, were highly respected by Kalahari San and were

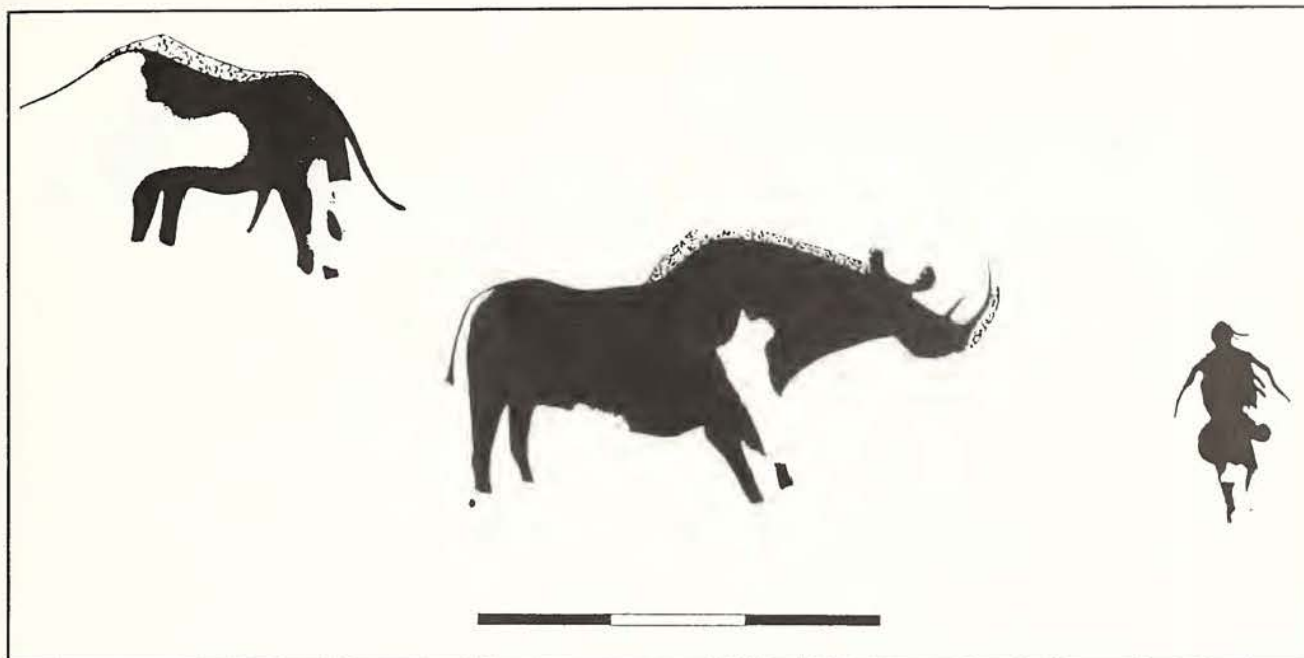


Fig. 7. An elephant bull in must, a black rhinoceros and an obese woman. Limpopo-Shashi confluence area, Zimbabwe. Black represents black, outlined stipple represents red. Black represents black, outlined stipple represents red. Scale in intervals of 100 mm.

believed to possess the same powers as shamans. Lions could, by all accounts, transform themselves into hartebeest, and when hunters appeared they could then revert to their lion form. It was believed that shamans were 'Lions of God' who could change into lion form and move around the country in out-of-body travel (Lewis-Williams & Dowson 1989:132-133).

Felines, like shamans, were believed to possess supernatural knowledge (Bleck & Lloyd 1911:187). The !Kung word for out-of-body travel, one of the shaman's activities, is *jum*, also the word for 'pawed' creatures (Lewis-Williams 1981:97, 1985:55). A common appellation for shaman is 'beast of prey'; felines are obvious candidates for the visual representation of a shaman and their potentially dangerous qualities (Ouzman & Wadley 1997).

Predatory behaviour in animals and its analogues in San thought suggests that antidotal ritual behaviours such as shamanic trance (*cf.* Guenther 1975/6) has important implications for understanding anti-predatory behavior in expressive culture. Biesele, for example, has noted that the three main concepts of supernatural potency (*n/om*), altered states of consciousness (*!aia*), and the weather-changing capacities inherent in the interaction of certain animals and people (*n!ao*), and the related concepts of the powers that are found at the back of the neck (*n!ao* spot - from where sickness is expelled by shamans during the medicine dance, and where felines bite to kill), and *!kui g!oq* - danger from carnivores - are five concepts inherent in folklore. These five concepts she says "... help us understand Ju/'hoan ritual attitudes toward the problem

areas of sickness, initiation, hunting, childbirth, weather, and attack by carnivores" (1993:88).

The anti-predator behaviour of animals includes gestures of alarm or alerting signals common in vocal displays among many mammals and birds. A panel of paintings from the LSCA (Fig. 5C) portrays a white rhinoceros and calf (*Ceratotherium simum*). This identification of the adult is based on five features: the pronounced shoulder hump, the very long anterior horn, the very short posterior horn, the exaggerated 'square' lip, and the elongated head which is carried much lower than the shoulder hump. The calf also displays the typical head-lowered posture of this species, and the posterior horn has not yet developed. Usually calves precede their mothers when moving or in flight (Estes 1991:229), but in this panel the adult rhinoceros is painted in front of the calf facing a male lion, identifiable by its feline shape and mane (*cf.* Smithers 1983, fig 14). The unambiguous identification of the animal as a white rhinoceros, and the uncharacteristic position of the calf behind the mother is consonant with the white rhinoceros' anti-predator behaviour - the mother is confronting the lion and protecting its calf. The identification of the adult rhinoceros as female is clear from behavioural studies: the mother and calf separate from the dominant bull, the father, after the birth of the calf (P. Straughan pers. comm.) and it is mothers who zealously protect their young against attacks. Estes (1991:234) points out that young rhinoceroses are vulnerable to attacks by lions. These depictions clearly illustrate the anti-predator behaviour of the rhinoceros in the face of a potential threat by a predator. It should be noted that in this case parent/offspring behaviour is also exhibited. More



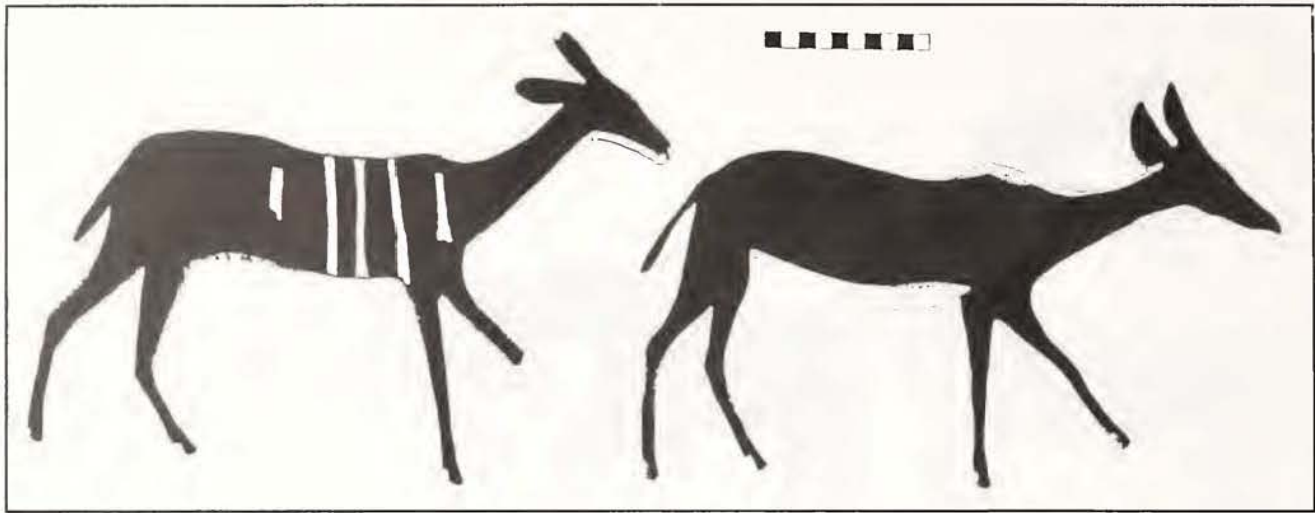


Fig. 8. Two kudu cows exhibiting typical pre-mating postures. Makgabeng plateau, South Africa. Black represents pink, white represents white. Scale in intervals of 10 mm.

importantly, given that felines embodied anti-social or threatening forces in San thought, it is possible then that this painting is commenting on the protective role of shamans towards their society (cf. Ouzman 1996), and it may make important statements about the role of feminine potency in San society. Later, we return to the very important issue of feminine potency in San rock art.

#### *Behaviour in Death*

This category of behaviour is not mentioned in standard reference works, but may be oblique in references to predators killing their prey. In the rock paintings of the south-eastern mountains of southern Africa, for example, images of eland are shown with their heads lowered, nasal bleeding, collapsing cross-legged, legs extended or defecating (e.g., Lewis-Williams 1981; Lewis-Williams & Dowson 1989). Such postures are typical of animals dying from the effects of slow-acting toxins when shot with poison-tipped arrows and are not as a result of natural predation. Nasal bleeding and death postures in antelope are also metaphors for 'death' in trance (e.g., Katz 1982:115-116; Lewis-Williams & Dowson 1989:50-52). There are only three such examples in the Northern Province art as far as we can ascertain. One such example from the LSCA is illustrated in Figure 5D, where an indeterminate antelope has its head lowered and appears to bleed from the nose. In another example, to be discussed later, an antelope with its head lowered is interpreted as being in a near-death state as suggested by its contextual associations.

#### *Social Behaviour*

This is broadly defined as the social interaction of conspecifics, including communication - by visual, olfactory and vocal signals, territorial behaviour concerned with maintaining and advertising territory, and agonistic behaviour which is generally associated with aggression, fear and submission (Estes 1991:xxi). Agonistic behaviour overlaps with territoriality and mating behaviour.

There are several notable examples of animals exhibiting social behaviour in the LSCA San rock art. With their highly mobile and visibly prominent trunks, elephants (*Loxodonta africana*) use them in a range of revealing emotions and signals. For example, the trunk is an indicator of the animal's intentions in warning, threatening or charging a potentially threatening intruder (e.g., Smithers 1983:538-539; Estes 1991:262-267). This expressive member is used in communicating, for example, benign signals such as the 'greeting-intention movement' by extending its trunk out toward an approaching elephant (Estes 1991:262). This feature is evident in an image from the LSCA (Fig. 5E) and may have been intended to represent a greeting display.

An aspect of both territorial and agonistic behaviour is 'cavorting' in the blue wildebeest (*Connochaetes taurinus*). This behaviour combines many actions, such as leaping, bucking, spinning, jinking, head movements and tail lashing (Estes 1991:136). Such actions may have been intended in the painting of a wildebeest in Figure 5F, from the LSCA. This animal is clearly identifiable by its characteristically curved horns. When a wildebeest cavorts its head is sometimes lowered and its tail swishes outward.

Figure 5G illustrates two antelope from the LSCA. The antelope on the left which is difficult to identify from its horns, but appears to be a tragelaphine (Family Bovidae, Tribe Tragelaphini), such as a bushbuck (*Tragelaphus scriptus*), judging by the rounded form of the back. This identification is reinforced by the animal to its right which has the distal part of the horns canted slightly forward, which suggests that it represents a bushbuck. The animal on the left demonstrates the 'head-low posture' - with the chin drawn in more or less depending on the direction of expected attack, and horns pointing upward - a nearly universal bovid characteristic of defensive threat. Alternatively, the right-hand animal displays the 'medial-horn presentation', with the neck at about shoulder level with horns pointing upward, a feature of actions associated with offensive threat (Estes 1991:21). The two bushbuck may, alternatively be displaying anti-predator

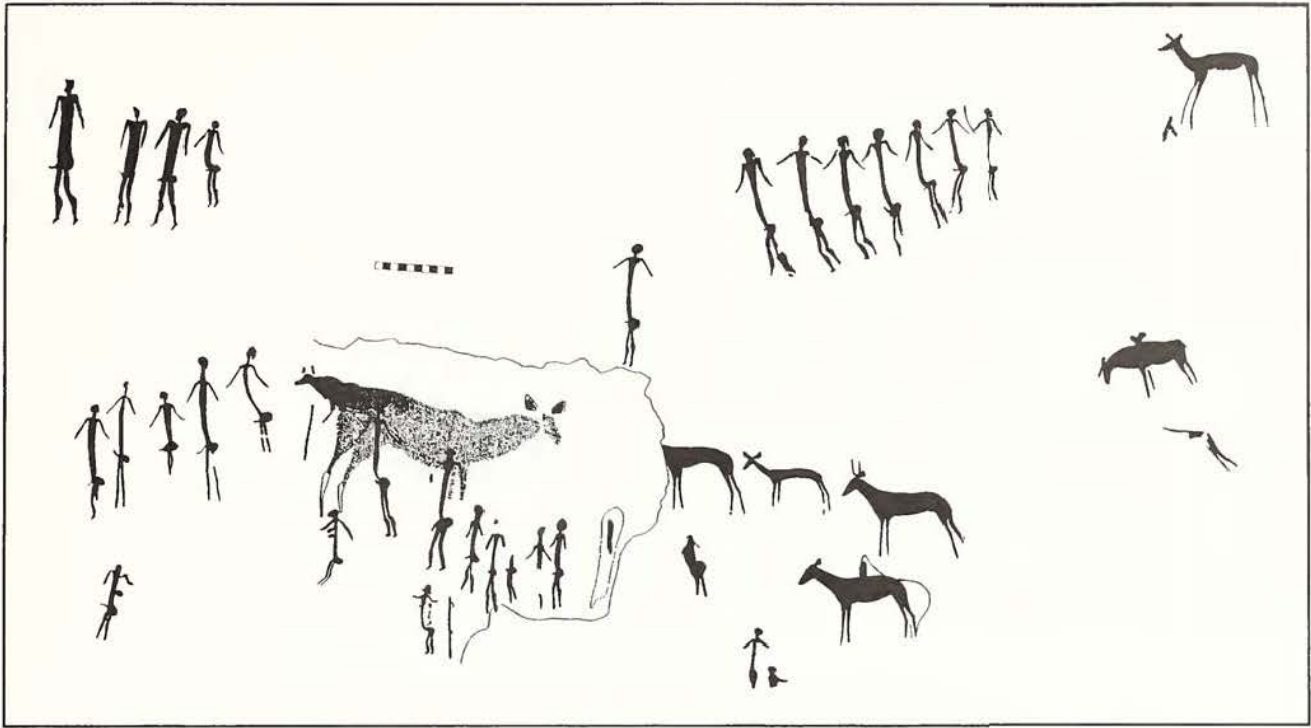


Fig. 9. A complex panel with kudu cow, impalas and humans. Limpopo-Shashi confluence area, South Africa. Black represents red, stipple represents yellow. Scale in intervals of 10 mm.

behaviour, although the context does not suggest this. Indeed, a bushbuck may face a domestic dog in this manner should flight prove difficult.

A subtle form of agonistic behaviour is displayed by kudu in certain situations and this posture is clearly depicted in the art. Kudu are a shy and retiring species, and when moving across open ground or approaching water they are hesitant and nervous, fleeing instantly if they sense danger. However, in woodland cover, they are less nervous and will stand still to observe the cause of disturbance. "Under these circumstances the large rounded ears, especially of the females, are a conspicuous feature, which when cocked toward the observer, appear to dwarf their heads" (Smithers 1983:668). This behavioural feature is especially notable when approaching kudu by vehicle, which may not necessarily pose an immediate threat. This attitude is displayed by the kudu cows in Figure 6 from the LSCA. These animals are identifiable as kudus by their shoulder humps, long necks and large ears. This painting is significant, because it is one of the few examples of polychrome kudu cows in this posture - usually cows are depicted with their heads lowered - a feature which we discuss below in more detail.

It is interesting that so many paintings in the study area exhibit behaviour associated with aggression, fear and submission. Indeed, returning to ethnographic analogues, Ouzman & Wadley have pointed out the distinction between latent and manifest threat particularly during San aggregation phases where 'maverick' shamans may possess antisocial powers: "the danger from antisocial agents may remain latent if social norms are respected" (1997:394-395). Different animals showing attributes of

anti-predator behaviour may therefore be a metaphor for protective deterrents against such forces.

#### *Reproductive Behaviour*

For the purposes of our study reproductive behaviour includes seasonality, sexual behaviour - which incorporates courtship and mating, and parental roles. Images of animal mothers and offspring are a widespread theme in the art of southern Africa (e.g. Pager 1975, 1993; Lewis-Williams & Dowson 1989; Lenssen-Erz 1994; Garlake 1995; Ouzman 1996). In the LSCA it is especially the giraffe which is depicted with young. Throughout southern Africa, San artists have persistently portrayed images and scenes which explicitly and implicitly depict the reproductive behaviour of animals. These images, of course, have a bearing on the way San people perceive things, and it appears that concepts such as analogues with social structure (e.g. Vinnicombe 1976), territoriality and long-distance travel (Ouzman 1995b), the health of the environment and social health (Lenssen-Erz 1994) and sexual behaviour are intended in the art. An example of such intention is an idiosyncratic depiction of an elephant from the LSCA (Fig. 7), which is associated with a black rhinoceros (*Diceros bicornis*) and a particularly obese female figure. The identification of the rhinoceros is based on three features: first, the head is held erect up near the shoulders and is relatively short (in contrast to the white rhinoceros); secondly, the lip is rounded - not square as is the case in white rhinoceroses; thirdly, the animal has a generally slighter build than that of the white rhinoceros (Smithers 1983:558-563; Estes 1993:228-234; P. Straughan pers. comm.; cf. Fig. 5C). The male elephant has a large penis indicating the condition of must. In real

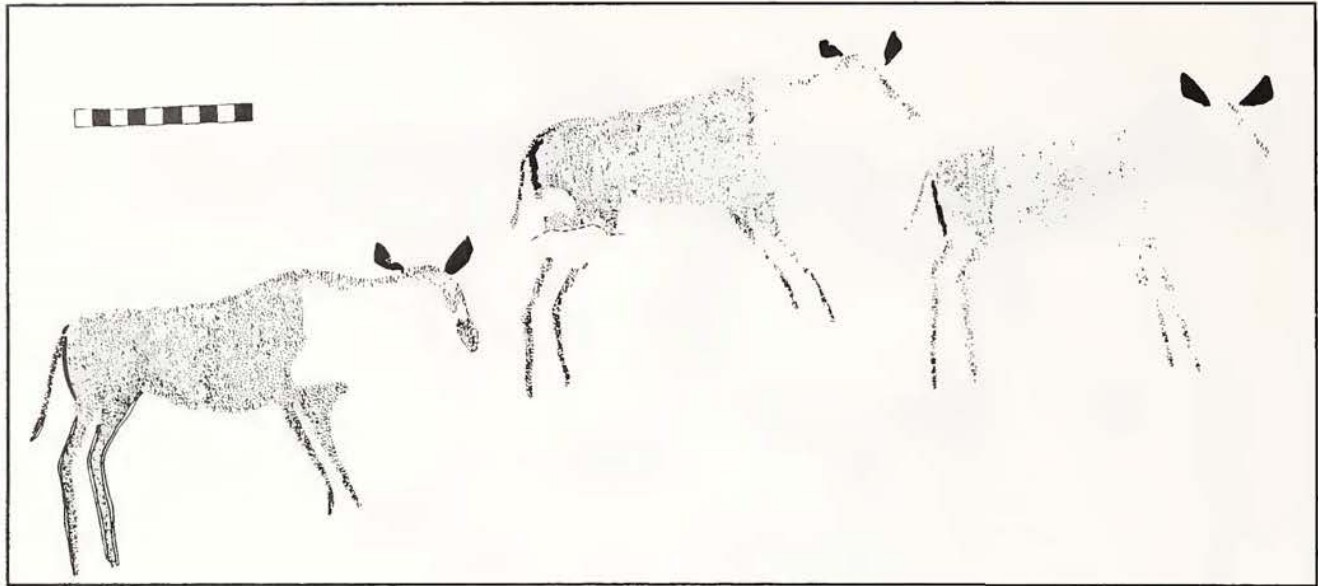


Fig. 10. Three kudu cows in pre-mating postures with their genital area emphasised. Limpopo-Shashi confluence area, South Africa. Black represents red, stipple represents yellow. The hind legs of the left-hand animal are outlined in white. Scale in intervals of 10 mm.

elephants this condition is associated with heightened aggression. These paintings have been interpreted by Eastwood (1999) as representing three powerful shamans. The red dorsal stripe on the elephant and rhinoceros represent rising potency and the obese woman is filled with potency. The tension between the sexual aggression of the male elephant and the woman are mediated by the sexually ambivalent rhinoceros standing for a shaman-healer by virtue of the emphasis on its *n/ao* spot - the area between the shoulders from where sickness is expelled by shamans. The rhinoceros' horn also has a thick red anterior stripe. Nuanced horns in rhinoceros engravings are suggested by Ouzman (1996:50) to metaphorically represent elements of both masculine and feminine gender ideologies-consonant with the confusing and inversive nature of altered states of consciousness where gender may be blurred. The red dorsal line and the anterior horn stripe appear to draw attention to areas of potency.

More subtle exhibitions of sexual behaviour are also depicted in the art. Take, for example, a set of paintings from the Makgabeng Plateau in the Northern Province, which depict two kudu cows (Fig. 8). These animals are identifiable as kudus because of their large ears, long necks, shoulder humps and white body stripes in the hindmost animal. They are females because they do not bear horns. Associated paintings consist of several indeterminate antelope and a warthog. Superficially, these images are simply two more female kudus, a widespread theme in the regional repertoire of painted animal subjects. Despite the aesthetic elegance of the paintings and the minute attention to detail in the execution of the paintings, this cluster of images apparently has little to suggest about the cosmology and beliefs of the painters - beside the fact that kudu are potent *n/om* and *n/ao* animals (cf. Marshall 1957; Lewis-Williams & Bieseke 1978) -

unless one takes into account the behavioural postures of the two animals. It will become clear as we proceed how the traits exhibited by these two kudu led us to look more closely at a this class of image, which in turn contributed to understanding the role of kudu, animals that lay at the heart of San cognitive thought in the Northern Province of South Africa and Zimbabwe in the past (Eastwood & Cnoops 1999).

Sexual and reproductive behaviour is not only evident in specific postures exhibited by certain animals in the art, but may also be apparent in portrayals of seasonal and territorial aggregation. In contrast to the two kudu cows mentioned above (Fig. 6), who have their heads held high and ears cocked, the two kudu cows in Figure 8 have their heads and necks extended forward in the 'head low/chin out' posture, which may express submission in some bovids (agonistic behaviour), but in tragelaphine females it is a posture adopted by animals ready to mate (Estes 1991:171). One of the authors (Bristow), on identifying this typical pre-mating posture pointed out that the slightly raised tails and the significantly flattened ears of both animals are also features of female kudu in oestrus, and their willingness to be mounted by a male.

The examples that we have discussed so far point to the deeper, subtle and nuanced associations of images that may appear to be simply straightforward. Of course, this is not a new point and has been made by other researchers (e.g. Lewis-Williams 1981, 1985). Nevertheless, ethology, combined with ethnography can produce insights into the art that it would be difficult to achieve with ethnography alone. We now turn our attention to a panel of paintings that illustrates this point.

#### Ethology and Ethnography

We now examine a large panel from the LSCA in South Africa (Fig. 9). This group of paintings depict four

groups of men, three of which are in processional rows. In the centre of the panel there is a large bichrome kudu cow with a single figure of a woman juxtaposed below its hind legs. Again, this animal is identified as a kudu because of its shoulder hump and large ears where the inner ear is emphasised in red pigment - a characteristic of polychrome depictions in the LSCA. This kudu cow, like the Makgabeng examples, has its head down and neck extended, again suggesting the typical mating posture of tragelaphines. To the right of the kudu are a group of four impala - the right hand top animal being a ram. At the top right of the panel is another impala ewe. These identifications of impala are based on the following: first, these antelope have a relatively slender build, especially the animal between the 'ram' and the headless animal and the antelope at top right of panel. Secondly, all these animals have long, slender legs (*cf.* Smithers 1983:647). Thirdly, they all have relatively large ears, and, fourthly, their backs are straight, rather than humped or rounded. Furthermore, way in which the two slender ewes were painted suggest that their lower bellies were once outlined in white pigment, a frequent feature of impala depictions in the LSCA. The horns of the ram are not accurate representations of impala horns, and appear to resemble those of a bushbuck. However, a bushbuck has a distinctly rounded back (*cf.* Fig. 5G). Furthermore, the frequent depiction of identifiable impala rams with groups of ewes in the LSCA reinforce this identification. The impala ram appears to be displaying the 'proud posture' advertising territorial status (Estes 1991:158). Impala are seasonally territorial and during the rut a dominant male will herd a group of females, keeping competitors away by displays of dominance (*ibid.* 1991:159-161). The group of impala in the paintings are thus suggested as representing a breeding herd of females with a single alpha male.

Further to the right, a rather heavily-built antelope stands with its head lowered and a bifurcated object protruding from its back. Below it are the remains of a painting depicting a human figure in a bending-forward posture. This is identifiable as human because its knee reticulations are consonant with a human being's - not an animal's. The animal in the head-down posture suggests that it may be drinking, grazing or, alternately, may be in a near-death state. As we proceed with our discussion in the next section we identify its posture by examining the context of the whole panel.

We have now established that the central group of animals: a kudu cow, three impala ewes and an impala ram portray a specific posture associated with mating and seasonal breeding aggregation respectively. Interpretation of these behavioural attributes now depend, first, on understanding the meanings in the clusters of paintings surrounding the central group of animals, and secondly, linking the images to the ethnography.

We now examine a third component of this panel - the antelope at the right with a figure below it. This antelope has a protuberance painted on or out of its back. We suggest that this protuberance was painted to emphasise the *n//ao* spot, the point at which sickness is expelled by

beings that have entered the 'half-death' of trance (Katz 1982:115-116; Lewis-Williams & Dowson 1989:50-51). This, together with the head-lowered posture would suggest that this antelope is in a near-death posture and state. The human component of the panel, processional rows of men who appear to be acting in unison, clearly suggests ritual activity (*cf.* Parkington 1996:286; Eastwood 1999). None of the figures have bows in their hands, excluding the possibility of this being an economic activity like hunting. Secondly, in the topmost group at the right, the last man in the row carries a stick, or perhaps an arrow. Such a feature has been suggested by Eastwood (1999) to denote the control of potency in similar depictions of groups of men who are usually portrayed as carrying single, or sheaves of arrows, or batons in their hands. In this light the three processions of men can therefore be explained as representations of a medicine dance. Alternately, the rows of 'men' may be explained as being a part of boys' initiation rituals. According to Schapera (1930:122-126) boys who have shown their hunting expertise are taken by 'magicians' to secluded places in the bush where they learn endurance and the mens' /gi dance (*cf.* Silberbauer 1965:89 for description of G/wi initiation; Bleek 1928:23-25 for description of Nharon boys' initiation; and see Parkington *et al.* 1996 for interpretation of processional rows of men in the rock art of the Western Cape Province). In the !Kung tradition (Lewis-Williams 1981:60), after a boy has shot his first eland, he "is brought to the eland" where a ritual fire is kindled near the forelock of the dead animal. The new hunter's bow is placed at right angles to the 'female fire stick' and the ash from this medicine fire is rubbed onto the bow in order to ensure future hunting success. A second fire is lit for cooking part of the liver and other parts, and then:

... the regular eland medicine dance is then danced.  
... A medicine man who has eland *n/um* [*n/om*] goes into trance and 'cures'. This dance is performed only by the hunters; no women are present. This is the only occasion on which men themselves do both dancing and clapping (Lewis-Williams 1981:60).

Unlike the two kudu illustrated in Figure 8, where the context does not *appear* to be relevant, the paintings in Figure 9 can only be understood if all the surviving components are taken into account. We argue that each cluster of associated images in this composition contributes toward understanding its meaning(s). Each cluster of images is inter-related, each reinforcing and supplementing the other, giving it a 'semantic range'. This panel has been explained at length by Eastwood and Cnoops (1999) who interpret it in terms of *n/om* and *n//ao*. However, taking a slightly different approach, we now consider this panel in the light of the behavioural traits of the animals in the panel. First, the central, lone kudu cow has been indicated exhibiting a willingness to mate.

Secondly, the group of impala ewes are suggested as

being in pre- or post-oestrus states, and are therefore ready to mate, or, indeed, have completed mating. Below the hind legs of the kudu cow is a woman and 12 identifiable men. Already, we can begin by saying that this particular group of images is not a natural or literal 'scene'. To begin with, a single kudu cow in oestrus would not be consorting with a breeding herd of impala, and it would be even more unlikely that these animals would be surrounded by humans. However, such a literal 'reading' does not bear closer scrutiny; the group of men and the single woman were painted in a later episode than the impala within the rock spall which had decapitated one of the impala, and the kudu was painted *over* two of the male figures and the indeterminate antelope - thus suggesting three possible painting episodes. However, despite the 'cross-temporal' nature of this panel, the different components are linked - the spatial proximity of the kudu, impala and humans suggest conceptual proximity.

To elucidate this we now return to the ethnography. The larger antelope, in particular the kudu, is considered by the Kalahari San to be a particularly potent animal, a *n/om* animal whose potency may be harnessed by shamans to enter trance (Lewis-Williams & Bieseke 1978). In addition this animal is believed to be a bearer of *n!ao*, a concept concerned with its weather-changing capacity (Marshall 1957). Nick Walker (1996:68) has also reported that kudu were used in the marriage rituals of Eastern Khoe San, the probable artists of the LSCA paintings. Eastwood & Cnoops (1999) have argued that the kudu was a central symbol in this region, and that women's initiation rituals centred on the kudu - a bearer of *n!ao*. The impala have been suggested as *n!ao* animals because they are also plains animals such as hartebeest and wildebeest and therefore suggest similar roles to those of the alcelaphine antelope in the *n!ao* beliefs (cf. Marshall 1957). Impala are not only grazers, but browsers as well, and are more resilient to drought than other plains animals. In Figure 9 the arrangement of impala as a group of females attended by a male suggest the mating of antelope prior to the expected rainy season, signifying the rejuvenation of the environment and the bearing of young.

If these rows of 'men' represent boys' initiation ritual dances, the connection with the kudu, impala and girls' initiation and feminine potency makes even more sense. However, whether such rows of men are interpreted as the dual-gender medicine dance or male initiation dances, supernatural potency would have been generated in both cases - as the paintings suggest. The link between boys' and girls' initiation and the medicine dances are explained by Bieseke as follows:

Two other rituals involving dance and celebrating 'production' and 'reproduction', the boys' hunting initiation and the Eland Bull Dance for a girl at her first menstruation, have close connections to these main themes in the folklore and are also linked through them to the great curing dance (1993:81).

The paintings in Figure 9 are therefore suggested as making a gendered statement, where the kudu and impala stand for the women's concerns of initiation, readiness for marriage and childbearing (*n!ao*), and the men representing the male concern with initiation and the medicine dance. Thus the images of kudu cow and impala ewes represent women, who are conceptually interchangeable with prey animals (cf. Bieseke 1993:89, 197). The men in this case are suggested as harnessing feminine potency.

In polychrome images of female kudu in the study area, most of them have their heads lowered and can be interpreted as representing women and the post-liminal stage of marriageability and readiness for childbearing. This explanation is reinforced by paintings of kudu cows in this posture where their genital areas are emphasised in red paint. This is not a literal characteristic of kudu - the feature however, is exaggerated and can only point to the use of animal metaphor in the paintings. During oestrus the vulva becomes slightly swollen and does have a reddish tinge (C. Guillaume pers. comm.). In the paintings and the red pigment frequently extends over a larger area (Fig. 10). Recognition of animal behaviour, we suggest, may thus alter the whole tenor of meanings that can be attributed to certain groups of paintings.

## CONCLUSION

Although this paper has drawn on data from the Makgabeng plateau and the LSCA, the implications of the argument are wide-reaching, for throughout southern Africa there are animals painted in various postures and groupings. It is highly likely that the quantitative studies that have so far been conducted have overemphasised the category of indeterminate antelope; future studies of this kind could, perhaps, benefit from a more active, critically aware understanding of ethology. Primary identification by morphological attributes is essential in determining the taxonomic status of animals in rock art - and the ethnography may then offer clues as to whether San beliefs about animal 'groupings' such as carnivores or alcelaphines and so forth correspond to more generalised paintings where species-specific features are blurred. If morphological identification fails, then ethology may give intimations of the taxonomic status of certain animals. Careful examination of animal images may thus reveal behavioural attributes that in turn could lead to deeper interpretation.

The identification of the pre-mating postures of the two female kudu from the Makgabeng Plateau, for example, did not immediately seem to impart any profound insights into the imagery. It was only after noting this posture in many paintings in the LSCA, that we began to recognise that this was an important theme, and that the context and associations of these animals opened up many possibilities for interpretation. Because a great deal of overarching theoretical work on southern African rock art has been done in the recent past intensive regional studies, with its differences in emphases, can provide a more detailed and

fine-grained quality of explanation. Images of kudu in a variety of contexts in the Makgabeng Plateau and LSCA substantiate the mating behaviour hypothesis - not only are their heads extended but in some cases their genital areas are emphasised in red pigment. This feature points to the importance of making a statement about the readiness to mate, a metaphor for a young woman's post-liminal status and her marriageability. This interpretation is corroborated by the association of a single kudu cow in the pre-mating posture with a seasonal breeding herd of impala, and with men performing a medicine or an initiation dance. These components point to the interlinked concepts of supernatural potency, the sexual potency of women and concepts concerned with metaphors linking women and prey animals.

Although rock art researchers do use ethology implicitly, it is only by explicit critical awareness that we can advance techniques like this. Indeed, just as ethnography has become an integral part of any interpretative approach to the art, so too should ethology. Certainly, if our aim is to get, as it were, as deep into the minds of the San artists as possible, then ethology is indispensable, for the San were, and still are, the ultimate ethologists. As Blurton Jones & Konner observed:

...!Kung have an advanced ability to observe and assemble facts about behavior and to discriminate facts from hearsay and interpretation. In this ability they surpass lay observers and many professionals in western society (1976:344).

In the absence of San people, however, rock art researchers could, perhaps, benefit from the observations of trained ethologists, zoologists, professional hunters and trackers - people who have close contact with wild animals on a daily basis. Developing our ability to understand animal behaviour can only make for a more productive interpretation of the art.

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