

CHAPTER 6 RESULTS

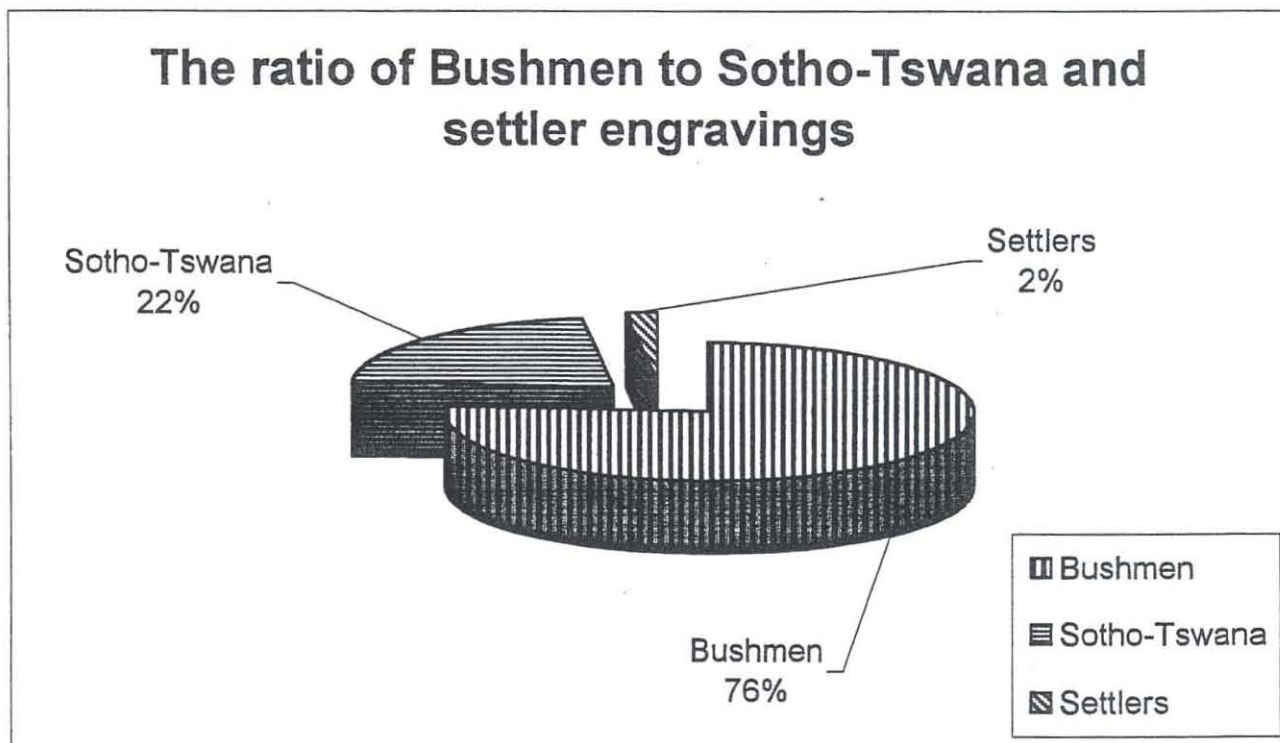
The results that follow pertain to those concluded from the individual engravings studied. Overwhelming evidence gained from the 16 sites on the Doornkloof farm confirms that the majority of the engravings are indeed of Bushmen origin. The remainder was produced by the Sotho Tswana and Settlers, (Figure 2). The engravings comprise of animal, pattern and linear work, human figures, cultural objects (These include food wessels and various weapons) and historical writings (Figure 3). Engraved animals comprise 53% of the artwork, and while pattern and linear work forms the second largest portion, human figures, cultural objects and historical writing only constitute 10% of the engravings located. Engraved animals receive the bulk of the focus as they have a direct correlation to the religious beliefs of the Bushmen as well as their daily life, (hunting).

There is a definite shift in the focus of the engravings studied on Doornkloof, from the paintings located in the Drakensberg. The Drakensberg painting are said to be of the oldest Bushmen recordings. The later paintings in this area depict a people comfortable with their environment, with a keen interest in expressing their culture. This concluded from their artwork, depicting mainly cultural activities, (hunting expeditions, trance and hallucination rituals and conflicts or wars).

The engravings of Doornkloof on the other hand focus on study. As mentioned animals formulate the bulk of the engraved work, with no cultural activities or self-portrates of Bushmen. The manner in which the animals are engraved corroborates this focus on study. Animals are depicted standing, walking, running, grazing, climbing up and down outcrops, laying down, interacting with their offspring, with the herd and being hunted by carnivores. The amount of detail, pertaining to unique characteristics of the individual animals, once again confirms, this culture of study.

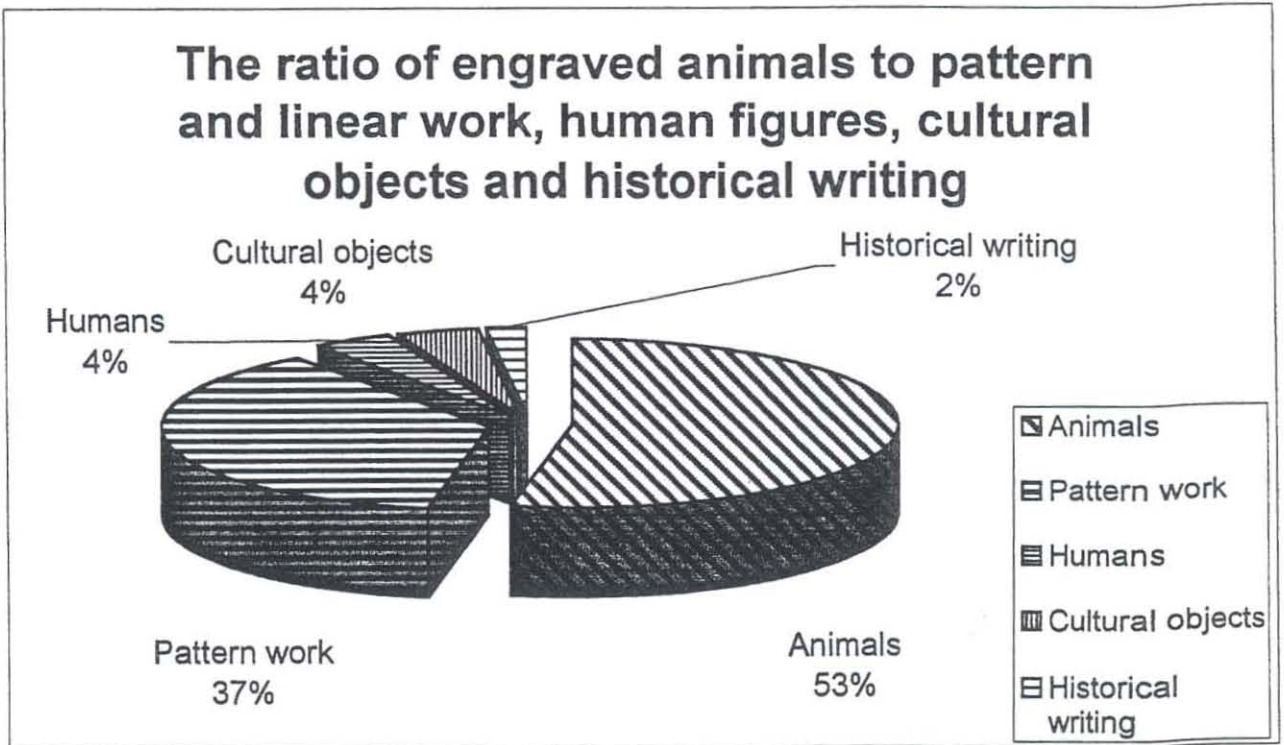
In keeping with this culture of study the human figures engraved were all of Caucasian people, (settlers). Theses human figures all wear dresses and have up side down triangular shaped faces. The use of a sharp, pointed face, to depict foreign persons appears to be inherent to all cultural groups, this was noted during psychological studies, (Hooper pers. Com 1999).

The focus on study in the Doornkloof area, is due to intricate relationship the Bushmen share with their environment. Bushmen require a in-depth knowledge of their surroundings, to insure their survival. They encountered the same animals in this area as in the Drakensberg, but due to the vast difference in environment, the animals behave differently, thus in order to get close enough to hunt the animals a in-depth study of their behavioural patterns, (daily activities and flight distance) was necessary. The settlers were also studied as the Bushmen realised, they had to attempt to co-operate with them as they stood no chance against them.



(Figure 2: The Ratio of Bushmen to Sotho-Tswana and Settler engravings)

The number of engravings recorded, differs from the number of engraved animals recorded as one engraved surface may yield more than one animal be it of the same or varying species (Table3).

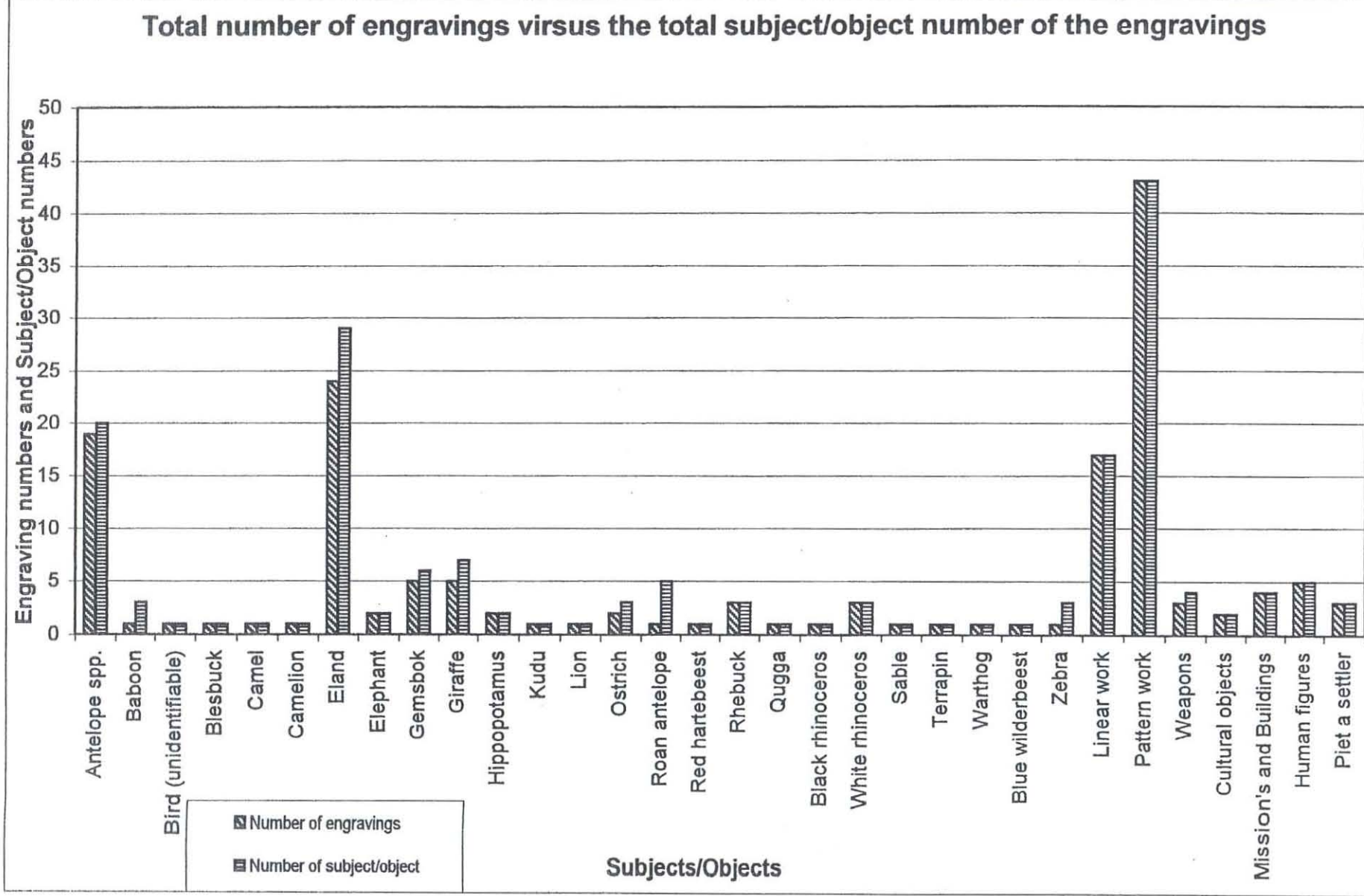


(Figure3: The ratio of engraved animals to pattern and linear work, human figures, cultural objects and historical writing)

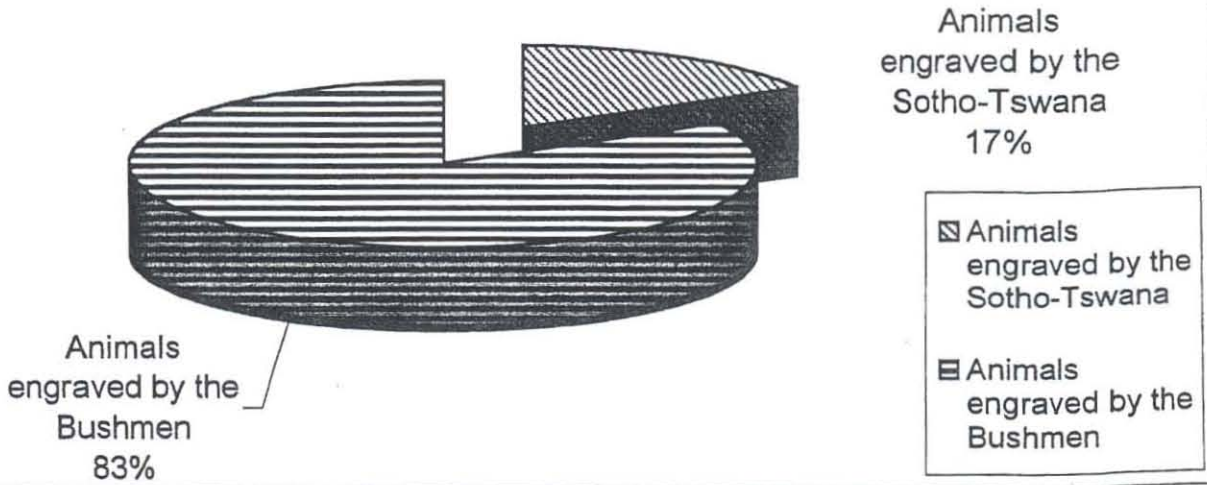
As stated before animals comprise the bulk of the engraved work and the majority were engraved by the Bushmen (Figure4). The bulk of the animals are isolated, with only a small margin paired (Figure 5). The paired animals are paired with other animals, be they of the same species or not, as well as various linear and pattern work and a small margin are paired with human figures, this pairing is however arbitrary (Figure 6). The overwhelming majority of the engraved animals are herbivores, with carnivores and omnivores comprising only 6% of the engraved work (Figure7). Similarly the majority of the animals are mammals, with birds and reptiles comprising only 7% of the engravings (Figure8). Antelope comprise the bulk of the engraved animal species, with the eland being the dominant choice (Figure9). The Bushmen engraved the unique distinguishing characteristics of the various species, with the eland this includes a coloration line running from the lower limb to the nuchal hump. Only a small percentage of the engraved eland located on the farm do not have this line, mainly due to the fact that the respective eland are stylised (Figure10).



(Table 3: Engravings versus the number of animals engraved)

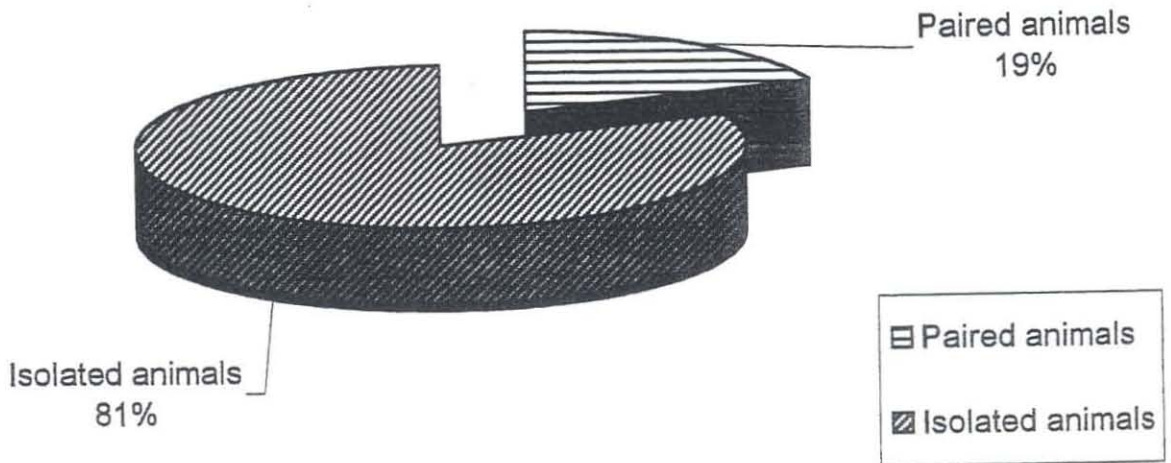


Animals engraved by the Sotho-Tswana compared to the percentage engraved by the Bushmen



(Figure4: Bushmen versus Sotho-Tswana engraving numbers)

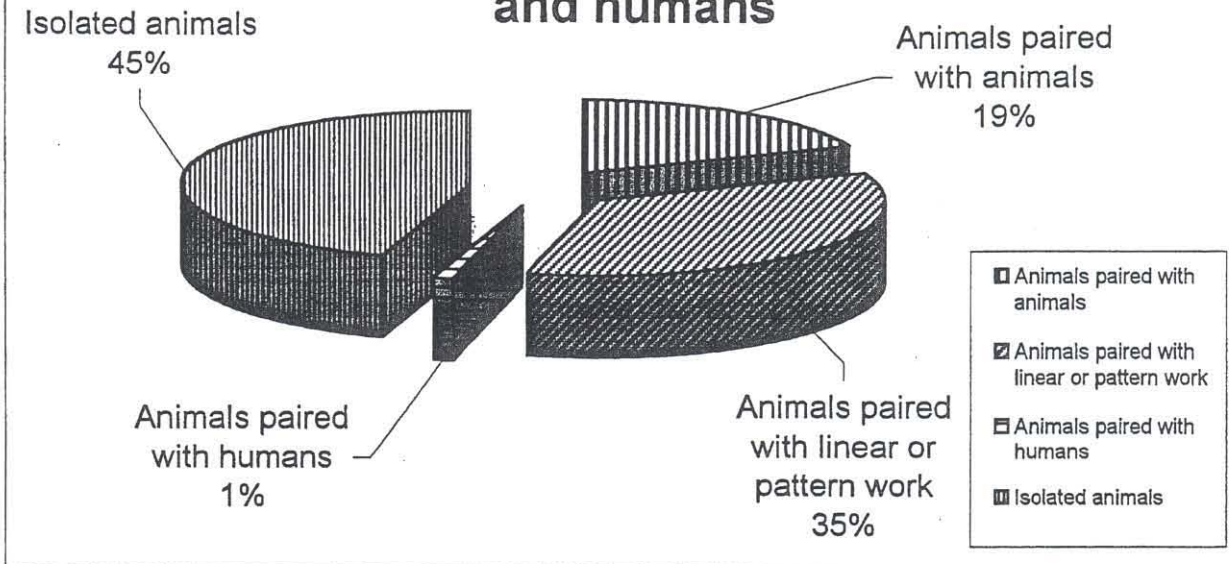
Paired animals in comparison to single animals



(Figure5: Paired versus single engraved animal figures)

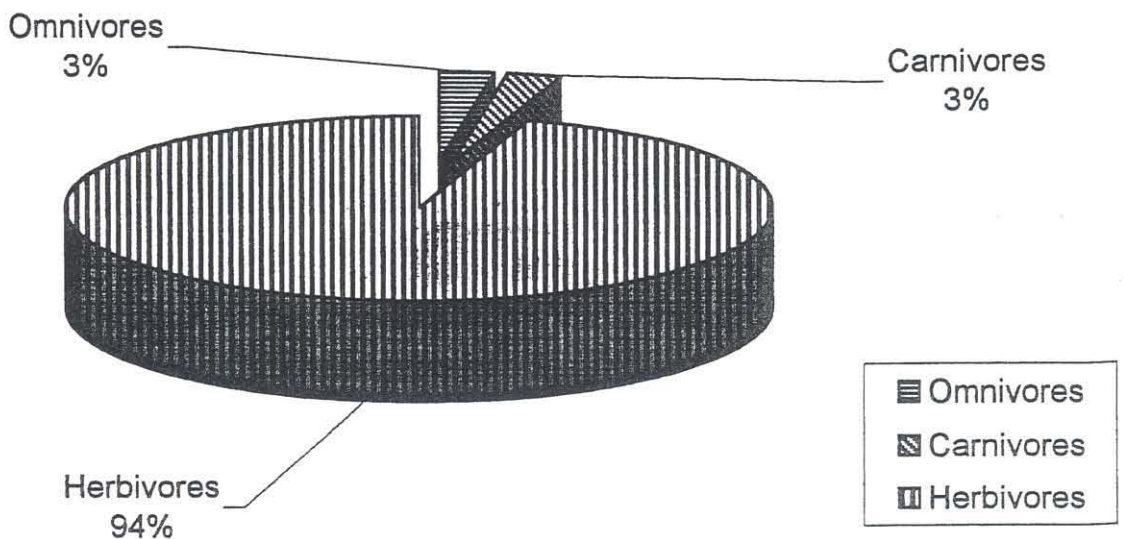


Isolated animals in comparison to animals paired with other animals, pattern work and humans



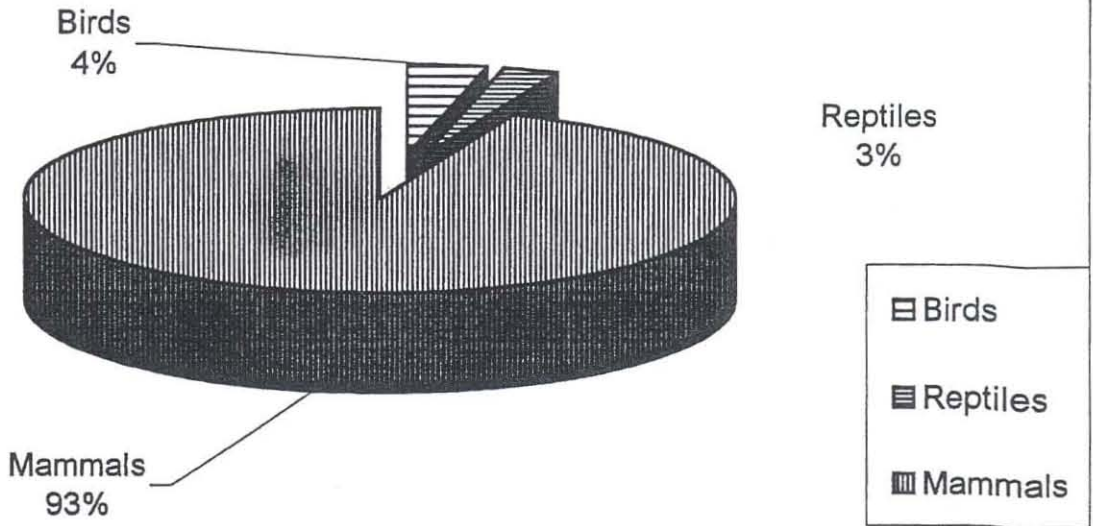
(Figure6: Animal pairings)

The percentage of herbivores in comparison to carnivores and omnivores



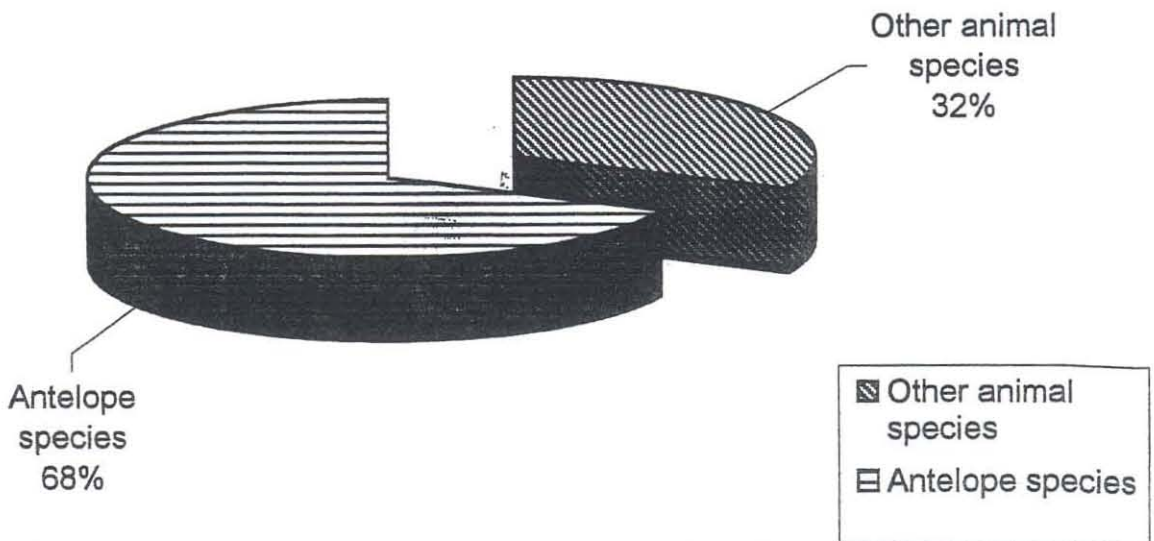
(Figure7: The number of herbivores versus the carnivores and omnivores)

The percentage of mammals versus that of birds and reptiles

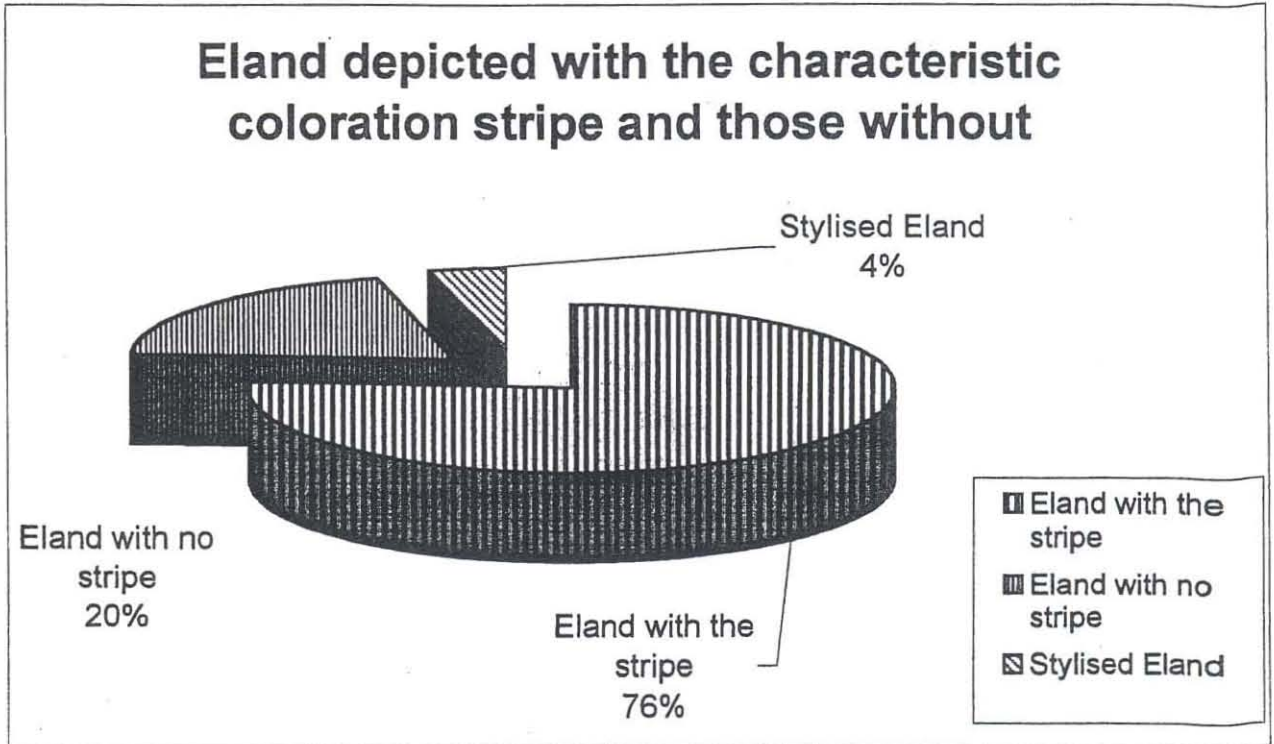


(Figure8: The number of mammals versus the birds and reptiles)

The percentage of antelope versus other animal species



(Figure9: The percentage of antelope versus other animal species)



(Figure10: The coloration stripe of the eland)

The geometric works, which incorporates linear and pattern work, constitutes the final component of engraved work. Pattern work which is more common (Figure11), is structured and a large portion of it can be classified as “entoptic phenomenon”, visions brought on by trances and hallucinations, (Figure12) or they could simply be doodles. According to Ockhams razor, “entities are not to be multiplied beyond necessity”, (Crystal, 1994), thus the latter is more plausible. As previously state, this “entoptic” work might share an engraved surface with other subjects, which in itself is rare, but they are not linked to these subjects in any manner, having been engraved at different time periods. In most cases they just make for an interesting background for the engraved work.

Certain of the pattern work pieces, closely resemble a form of art work excercise, practised to refine artistic style and fine motor skills, (Figures J8,J9 etc.). Less refined engravings are executed on badly weathered rock surfaces, corroborating this practice of the art form, to attain near perfection, (C24,H6 etc.).

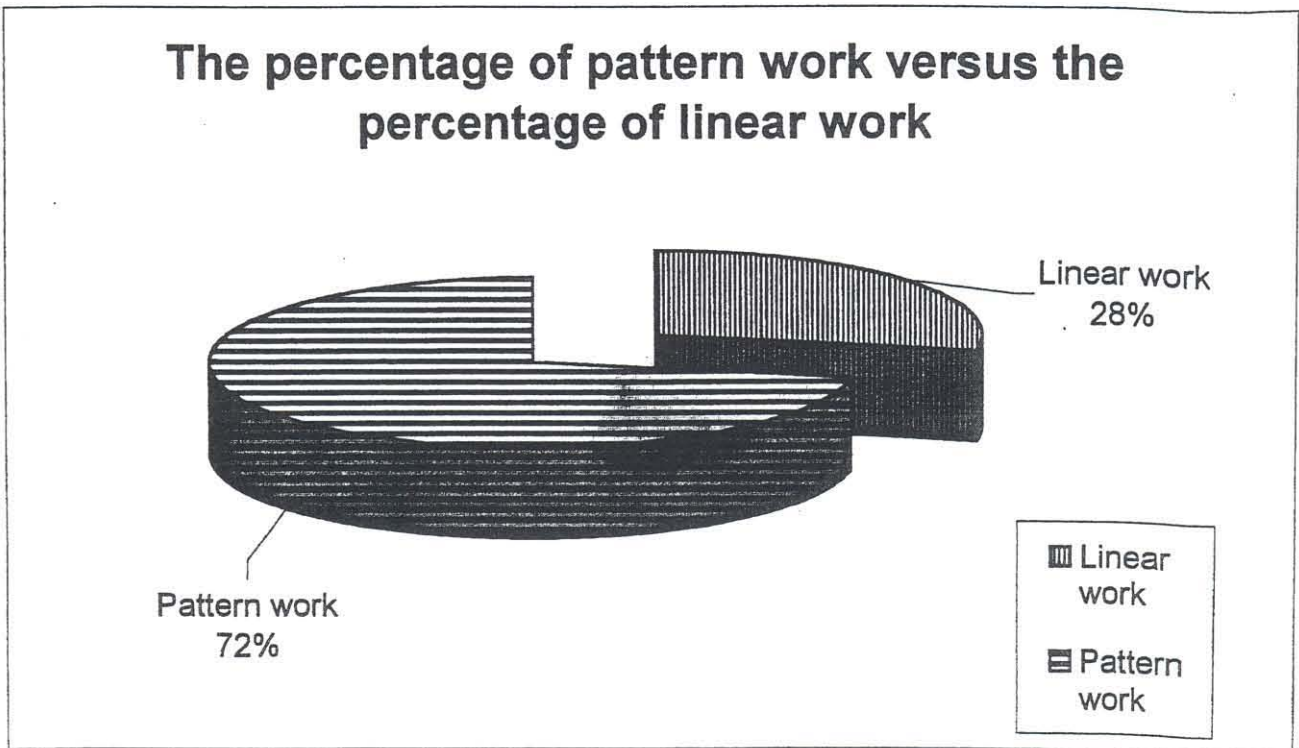
Three engraving techniques have been identified in the area, they are:

A fine line incision technique, utilised not only by the Bushmen, but also by the Sotho-Tswana and settlers.

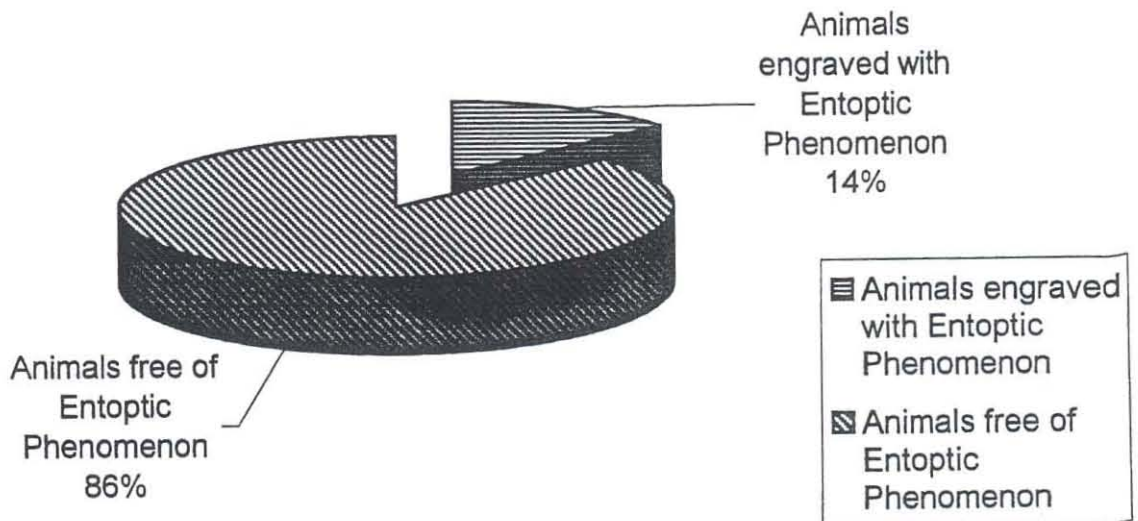
A broad line incision technique, utilised by the Bushmen engravers.

A rubbing technique utilised by the Sotho-Tswana to exposed the blue inner core of the rock, thereby colouring the engraving in.

The fine line technique is by far the most commonly used (Figure13). As will be discussed in the dating of rock art, (Chapter 10) it is agreed that the fine line technique is the oldest engraving technique. This however does not mean that all engravings incised making use of the fine line technique are older than there counter parts. In fact the fine line incisions produced by the settlers date to a mere 86 years, as the settlers date their work. Also the fine line incision work produced by the Sotho -Tswana, can only date back to around the 16 hundreds, when they first came to settle in the area. Although the fine line technique is the oldest engraving technique used, but it must be taken in context, when trying to date the work as it is a technique that continued through time.

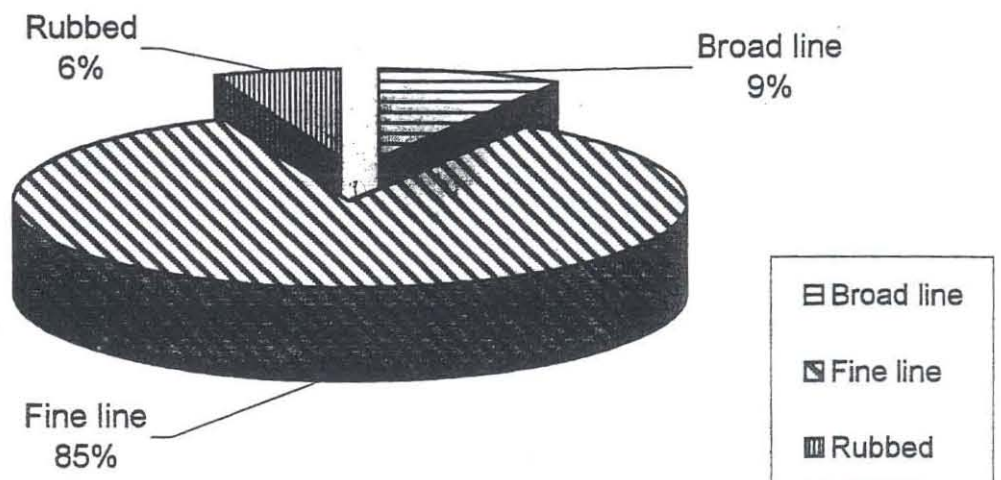


(Figure11: The number of pattern work versus the number of linear work)



(Figure12: Animals with Entoptic phenomenon versus animals without Entoptic phenomenon)

The comparison between the percentage of engravings depicting fine line, broad line and rubbed techniques



(Figure13: The comparison between the percentage of engravings depicting, Fine line, Broad line and Rubbed technique)



The problem of weathering is far from being solved and thus tourism and education of the public must be the main focus at present in the conservation of the engravings. The best way to educate the public is on a personal one to one basis, this is the only way to instil a real and lasting passion for the art work, which is necessary to create a mind set of preservation. The best way to do this is through personal interaction with the artwork in its natural environment. By taking on this approach , you not only create desperately needed jobs for qualified persons, but you also create a service for a growing tourism market. By generating much needed awareness for the art form, you aid in its preservation. To date people are very aware of rock paintings, but have no idea as to what rock engravings are and are always pleasantly surprised once they are introduced to it.

The protection offered by the legislation determined by the National Monuments council, looks good on paper, but the general public is unaware of its existence, thus it offers no deterrent to vandals and thieves. Also due to the fact that they have not studied the subject, the general public is unable to identify the ruins of archaeological sites and will inadvertently destroy them during the development of there land and the law can do nothing about this, as they have had no knowledge of the sites existence in the first place.

CHAPTER 7

THE CONSERVATION OF ROCK ENGRAVINGS

Due to the precarious location of the engravings and their age, they have numerous threats, from humans and nature. For the a-fore mentioned reasons it would seem logical that the engravings should be removed to places of safe keeping, but in this process they lose a lot of their value and use. Thus all efforts should be made to conserve the engravings in their natural surroundings.

The geographical distribution of rock art differs broadly and is determined largely by geological distribution of rock types suitable for the various engraving techniques, (Avery, 1974). The distribution of engravings conforms for the most part to the distribution of dolomites and dolerite, which occur interspersed among the exposed sedimentary rocks on the Highveld, mainly as outcrops on low hills, (Avery, 1974). Elsewhere erosion has exposed the surface of ancient rocks, mainly diabase, also used to engrave upon, (Avery, 1974). The engravings occur on unprotected boulders or rock surfaces and are thus constantly exposed to the effects of vandalism; natural weathering and when they are located close to industries, the effects of pollution, (Avery, 1974).

1. The Problem of Weathering

Rock engravings are susceptible to the same environmental forces as the natural rock surface, (Rosenfeld, 1988). Weathering enlarges the existing pores of the rock, so that the moisture intake and movement are increased, (Meiklejohn, 1997). The more dynamic the moisture regime becomes, the more the rock weathering process increases and an accelerated rate of breakdown of the rock occurs, (Meiklejohn, 1997). According to Meiklejohn, (1997) and Rosenfeld, (1988) the major processes of weathering include:

- Disintegration
- Chemical alteration of minerals
- Crystallisation, pressure from precipitating salts and the hydration and dehydration of rock minerals
- Precipitates
- Scaling or flaking

The susceptibility of the particular rock to weathering depends on the characteristics of the rock type and the nature of the environment to which the rock is exposed, (Rosenfeld, 1988). In the Magaliesburg area where the majority of the rocks engraved upon are hornfels, which attract lightning, the likelihood of fissuration increases, which in turn increases the rock permeability and the chances of mineral alteration, (Rosenfeld, 1988). Fortunately the hornfels rocks contain quartz, which is a resistant mineral and thus has a slower weathering rate, still this doesn't render the rock resistant to weathering, (Avery, 1974).

To date little has been done to determine the process of deterioration and the development of techniques for preservation, (Meiklejohn, 1997). The reason being that there is a lack of understanding concerning the specific mechanisms pertaining to rock weathering in South

Africa, (Loubser, 1991). The majority of the research on rock weathering to date is purely speculative and is therefore inadequate and few investigations into specific weathering processes have been undertaken, (Meiklejohn, 1997). There is a definite need for in-depth research into the process of the decay of rock art, (Meiklejohn, 1997).

Rock breakdown occurs due to an interdependent complex of mechanisms, which include mechanical, chemical and biological mechanisms, (Meiklejohn, 1997). Each of these mechanisms must be studied independently and collectively, (Meiklejohn, 1997). Research done to date reveals that temperature and rock moisture is the most important environmental controls on weathering, (Meiklejohn, 1997). Also chemical analysis, rock property determination, rock strength and simulation experiments are valuable components of data collection, (Meiklejohn, 1997).

According to Dragovich, in Australia, Blackwelder (1933) and later Griggs investigated the effects of temperature variation on rocks. They experimented by heating and cooling granite specimens in a dry air oven at a temperature range of 110° C. They chose to use an artificial environment over field observations as they could then intensify the weathering environment and thereby hastening the weathering process. In this manor they could also establish which factors play a roll in the breakdown. They exposed the rock to the dry oven for enough cycles to cover a period of 244 years (each cycle is one day). They concluded that there was no change to the rock surface. They then subjected the granite to cooling by water instead of air. After they completed cycles equivalent to 2 and a half years, cracking and flaking were apparent. Therefore they concluded that temperature change in the absence of moisture had little effect on the rock surface, but a temperature and moisture variation favoured rapid weathering (Dragovich).

French workers to, who conducted numerous experiments on different rock types under different conditions, - constant temperature and constant moisture, see the role of moisture as very important

- Constant temperature and wet / dry cycles
- Temperature change and constant moisture
- Temperature change in the presence of wet / dry cycles

They to concluded that a temperature and moisture variation produces the greatest amount of weathering (Dragovich).

A temperature variation assists in producing minute cracks in the rock surface, which is then more readily penetrated by moisture, (Dragovich). The moisture causes a chemical alteration of the rock, which forms silicate clay minerals, (Dragovich). These alteration products, occur only along the cracks where moisture has penetrated for the time being, but assist in further rock breakdown because there presence reduces rock cohesion and also some clays have lattices that expand in the presence of moisture, which exert pressure on the adjacent mineral surfaces, (Dragovich).

In saline environments, salt crystals are precipitated during evaporation, (Dragovich). The crystals occupy a lesser volume than the initial saline solution, (Dragovich). Pressures are



however exerted in the process of salt crystallisation as crystals will continue to grow against confining pressures and the salt crystals therefore do not simply fill cracks in the rock, (Dragovich). They're potential for disrupting permeable rock is great, (Dragovich). The presence of moisture is unavoidable and weathering will proceed even more rapidly if salts are present in the water (Dragovich).

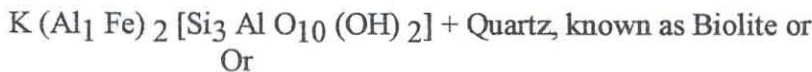
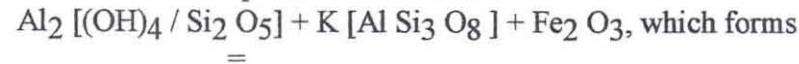
If we look at weathering where rock engravings are concerned, they have a better chance of survival in the field than paintings, because rocks are etched to some slight depth, (Dragovich). For this reason a thin layer of material could be weathered off without destroying the engravings, (Dragovich). In many cases weathering will proceed not only on the rock surface but also on the walls of the engravings themselves, thus tending to preserve them, (Dragovich). The weathering surface of the engraved rocks could therefore become "stable" with respect to conserving rock art, (Dragovich).

Hornfel rocks were the preferred medium of the Bushmen engravers in the Magaliesberg. Samples of hornfel rocks from the area of study were taken to the geological department of the university of Pretoria so that the mineral content could be established as well as the weathering rate of the rock. The hornfel rocks were originally shale rocks that due to extreme temperature changes, in excess of 400°C, like the volcanic action at Pilansberg, changed due to metamorphic processes, (Snyman pers. Com 1999). They are dark and fine-grained and found at the interface with dykes of igneous rock, which caused the metamorphism at the time of intrusion, (Curuthers, 1990). Hornfel rock does not retain the stratification of the original shale rock, (Curuthers, 1990). Shale rock consists of the following minerals - Quartz (Si O₂)

- Kaolinite Al₂ [(OH)₄ / Si₂ O₅] = clay
- Hematite Fe₂ O₃
- K- feldspar K [Al Si₃ O₈]

These peaty clay minerals are arranged parallel to each other laying horizontally, when they come in contact with heat in excess of 400° C, which was experienced during the volcanic action at Pilansberg. During this metamorphic process the shale rocks chemical make-up was altered to formulate a rock type called hornfel, (Snyman pers. Com 1999).

The chemical composition of hornfel is -



Or
(Mg₁ Fe)₃ Al₂ [Si₅ Al O₁₈], known as Cordierite, which is purplish in colour, (Snyman pers. Com 1999).

The above symbols represent the following elements:

- Al = Aluminum
- OH = hydroxide ion
- Si = Silicon
- O = Oxygen
- K = Potassium
- Fe = Iron

Mg = Magnesium, (Zak, 1990).

As far as the weathering rate of the rocks is concerned, it is exceptionally good, (Snyman pers. Com 1999). A sample of the core profile of the rock was taken and when studied showed that the rocks weather very slowly and evenly, (Snyman pers. Com 1999). The outside of the rock is a golden brown in colour, caused by weathering (essentially a rusting of the rock), while the inside of the rock is a purple- blue colour (The true colour of the rock), (Snyman pers. Com 1999). This brown layer of “rust” is no more than one centimetre deep all over the rock surface and when you take into consideration that the rocks are over a million years old, the weathering rate is slow and even.

2. Other Natural causes for Deterioration

Other natural causes that can cause damage to the engravings are indirectly related to man, they are, (Steel).

- Bush encroachment, this bush causes shade and damp, which encourages the growth of moss and lichen, which cover the engraving, (Steel). Also these lichen, fungi and algae derive their nutrients directly from the mineral rock and the atmosphere, (Rosenfeld, 1988).
- Termite heaps and small burrowing animals, which occur in over grassed areas. The actions of these animals cover the engravings, (Steel).
- Cattle dung and bird guano. These faeces stain and discolour the rocks and their high acid content also causes damage, (Steel).
- Veld fires, blacken from the soot and smoke and fine cracks and laminae occur at high temperatures, (Steel). Firebreaks can help control this, (Bachelor, 1990).
- Lightning, which they attract, due to their iron content, cracks metallic based rocks, (Steel). This is applicable in the research area, due to the mineral content of the hornfels rock.
- Floodwaters cause damage due to debris, stones and sand floating by.
- A silica layer, builds up from water splashing on the rock surface from rain or a waterfall, this causes the rock to form a whitish shine.

3. Damage by Humans and Domestic Animals

Man unfortunately is responsible for defacing many engravings by scratching their names, or graffiti over the engraved work, (Steel). There are also instances where people have taken it upon themselves to engrave over the original lines, deepening or broadening them and even adding features. Theft is also a big part of the deification of a collection. People do this to add to their own private collections or displays, (Steel). Unfortunately rock art has a price and for this reason, people remove them from the veld and sell them to the collectors. The wetting of engravings to enhance photographs and the making of casts for collections, both damage the engraving, (Steel).

Overgrazing forces cattle to enter the boulder clusters for food, this is however indirectly the fault once again of man, (Steel). Most engravings are found among boulder clusters, which provide protection for the environment from veld fires, producing palatable grasses. These palatable grasses attract cattle, sheep and donkeys, when overgrazing of the rest of the veld occurs, (Steel). However palatable the grass amongst the boulders is, it is sparse, thus cattle will



only venture into these area, if grassing on the open areas is depleted. The hooves of the animals produce broad scratch marks on the figures, (Steel). Fortunately the farmers in the Doornkloof area work together as far as grassing is concerned. They allow their cattle to graze together on one portion of land allowing the rest to rejuvenate and then rotate the land, thus the cattle have no need to enter the boulders.

Agriculture also plays a small part in the destruction of engravings, (Steel). Farmers need large amounts of arable land to farm on and thus clears vast areas for ploughing. The land on which people plough however needs to be as flat as possible and farmers tend to avoid areas with big boulders as their removal is both costly and difficult. As the majority of the engravings are located on the hill slopes and outcrops, land farmers will consider as a last resort.

Lastly man made structures are a culprit, in that engraved boulders were used to strengthen earth walls erected during dam building, (Steel). Other man made structures include roads, cable laying, irrigation (pipe trenches), fence erection, electrical and telephone pole erection and industrial pollution, (Steel). During the study of the engravings of this area electrical poles were erected, but this process was carefully monitored and no damage was caused to the engravings. This however was not easy, even though Eskom has a strict policy on environmental conservation. This policy does not filter down to the contractors who do the actual erection work. These contractors are uneducated were conservation is concerned and also do not care about archaeological terrain's and engravings as they don't realise there worth and importance. Thus they have to be monitored constantly, as these contractors will take short cuts were ever possible.

According to a report submitted by the, (National building research institute, 1983:12), " In the absence of a fully reliable method of permanently preserving rock paintings (engravings) in situ"....." paintings (engravings) of exceptional value that should be protected and preserved at all costs, if feasible, be removed from their settings to museums". Chapter 9 deals with the problems facing removal.



CHAPTER 8 THE LAW AND ROCK ART

Chapter 7 dealt with the problems facing rock engravings, from both natural and human intervention. This chapter focuses on the law and legal implications, of human intervention and destruction of the engravings. The value of the legislation is questionable as their implementation is difficult.

The law pertaining to the protection of rock art extends as far back as 1911, known as the Bushmen Relics Protection Act (Act No. 22 of 1911), (Deacon). The main purpose of the Act was to control the export of original rock paintings and engravings, (Hoffman, 1971). Twelve years later the Natural, Historical and Monuments Act (Act No. 6 of 1923) made provision for the appointment of a Commission for the preservation of Natural and historical Monuments, (Hoffman, 1971). This act made provision for a wider range of sites than those of the Bushmen, (Deacon). An even greater diversity was catered for in the subsequent commission for the Preservation of Natural and Historical Monuments, Relics and Antiques Act (Act No. 4 of 1934), this act made it possible to declare particular sites national monuments, (Deacon). Amendments to this Act were made in 1937 and 1967, (Hoffman, 1971). This Act was replaced in turn by the National Monuments Act (Act No.28 of 1969), (Deacon). This Act was amended in 1986, (Deacon).

In legal terms at the present time, rock art is protected in two ways by the National Monuments Act:

- 1) By making it illegal to damage or export the art without a permit.
- 2) By declaring the site a national monument, (Deacon).

It is also protected in more general ways by the Environment Conservation Act of 1989,(Deacon). The following are three aspects of this Act.

“ The permit system

1. *The permit system*

No person may "destroy, damage, excavate, alter, remove from its original site or export from the Republic" any rock art without a permit from the National Monuments Council. Rock art is defined as "any drawing or painting on stone or a petroglyph known or commonly believed to have been executed by Bushmen; . . . or by any other people who inhabited or visited the Republic before the settlement of the Europeans at the Cape." Anyone convicted of an offence in terms of this section of the Act may be liable to a fine of up to R10 000 or two years' imprisonment, or both.

Legally, then, the rock art is protected from any form of damage, whether as a result of deliberate or accidental action.



The problems with the permit system include that it leaves all rock art done after 1652 legally unprotected, (Deacon). It is also re-active rather than pro-active, meaning that it can only be enforced after someone has damaged a painting or engraving and due to there remote settings means that the crimes are not observed and the results of this are only noticed over a considerable period of time, (Deacon). Lastly there is no statutory commitment on the part of the council to conserve rock art sites other than those that have been declared national monuments, (Deacon).

“Declaration of national monuments

2. *Declaration of national monuments*

Additional protection may be given to selected sites by declaring them national monuments. Declaration does not change ownership of the property: it may be sold and transferred in the private sector, but it makes the National Monuments Council doubly responsible for the upkeep and maintenance of a rock art site. Because the property owner retains all rights, he or she is not bound to open the site to the general public and may decide without consultation with the National Monuments Council whether to do so or not. The owner is, however, bound to apply for a permit to alter the area declared a national monument, or indeed to alter the roads or landscape in the vicinity if this alteration is likely to affect the national monument.

“The environment Conservation Act

3. *The Environment Conservation Act*

Another player in the conservation of cultural resources is the Department of Environment Affairs. The Environment Conservation Act of 1989 enables the Minister of Environment Affairs to call for a report on the impact a particular development programme may have on the environment. Instead of making it illegal for a developer to embark on a project without an impact study, the Act puts the onus on the developer to do an environmental impact assessment at the earliest possible stage in the development process. Such an assessment would identify the presence of rock art sites and make recommendations regarding their safety and protection. This has worked very well in cases where the developer has been sensitive to rock art and cultural conservation generally.

Although regulations have not yet been promulgated and developers are not yet legally bound to do assessments, several have been done as the result of National Monuments Council vigilance and the interest of landowners.



The National Monuments Act, 1969 (Act No. 28 of 1969) has once again been amended, the transitional provisions and consequential amendments for 1999 follow, (Republic of South Africa Government Gazette, Vol406, No. 19974).

Transitional provisions and consequential amendments

58. (1) For the purposes of this section, "the previous Act" means the National Monuments Act, 1969 (Act No. 28 of 1969). 10

(2) The National Monuments Council established by section 2 of the previous Act is hereby abolished and all its assets, rights, liabilities and obligations shall devolve upon SAHRA without formal transfer and without payment of any duties, taxes, fees or other charges. The officer in charge of registration of deeds registry must, on submission of the title deed and on application by the authority concerned, endorse such a title deed with regard to such development. 15

(3) Any person who was in the employment of the Council referred to in subsection (2), is regarded to have been appointed under this Act.

(4) The remuneration and other conditions of service of an employee contemplated in subsection (3) may not be less favourable than the remuneration and other conditions of service to which that employee was entitled to before. 20

(5) If a person appointed under subsection (3) or a person regarded to be so appointed, is dismissed, that person may within 14 days after the date of notification of the dismissal, appeal in writing against the dismissal to the Minister, who may confirm, vary or set aside the dismissal. 25

(6) The National Monuments Council library shall become part of the national heritage resources library established under section 13(2)(b).

(7) The committees established by section 3A of the previous Act are hereby abolished and all their assets, rights, liabilities and obligations shall devolve upon SAHRA without formal transfer and without payment of any duties, taxes, fees or other charges. 30

(8) Unless it would in any particular case obviously be inappropriate, any reference in any law, document or register, to the National Monuments Council must be construed as a reference to SAHRA and any such reference to an officer or employee of the National Monuments Council must be construed as a reference to an employee of SAHRA performing functions or exercising powers similar to those of the first-mentioned officer or employee. 35

(9) All trust funds for which the National Monuments Council acted as trustee, including the War Graves Trust Fund referred to in section 9A of the previous Act, shall on the date of commencement of this Act become vested in SAHRA as part of the National Heritage Resources Fund referred to in section 40, and SAHRA must act as trustee on the same terms and conditions as existed prior to the commencement of this Act. 40

(10) On the establishment of a provincial heritage resources authority, arrangements must be made for the transfer of such assets, rights, liabilities and obligations of SAHRA in that province to the provincial heritage resources authority as the Minister and the MEC deem fit. 45

(11) Sites and objects which prior to the commencement of this Act were protected by notices in the *Gazette* in terms of the previous Act, shall, subject to the provisions of any provincial legislation for heritage resources conservation and any agreement in that regard, and without the need for the publication of notices in the *Gazette*, continue to be protected in terms of the following provisions of this Act: 50

(a) Immovable national monuments in terms of section 10 of the previous Act shall be provincial heritage resources sites: Provided that within five years of the commencement of this Act, the provincial heritage resources authorities in consultation with SAHRA, must assess the significance of such sites in accordance with the heritage assessment criteria set out in section 3(3) and prescribed under section 7(1) and SAHRA must declare any place which fulfils the criteria for Grade I status a national heritage site; 55 60



- (b) immovable property in terms of section 5(1) of the previous Act registered in the register for the province in which they are situated and in the inventory of the national estate;
 - (c) conservation areas in terms of section 5(9) of the previous Act shall be heritage areas: Provided that where no provision has been made for the protection of such areas in by-laws under the previous Act or in a town or regional planning scheme—
 - (i) sections 31(7)(a), (b) and (c) of this Act automatically apply to such heritage areas; and
 - (ii) the local or other planning authority concerned must provide for the protection of such area in accordance with the provisions of section 31 within three years of the commencement of this Act;
 - (d) provisionally declared immovable properties in terms of section 5(1)(c) of the previous Act are provisionally protected for such remaining period as specified in the notice of provisional declaration;
 - (e) national gardens of remembrance in terms of section 9C of the previous Act are provincial heritage sites;
 - (f) cultural treasures in terms of section 5(c) and movable national monuments in terms of section 10 of the previous Act are heritage objects.
- (12) A notice under section 10(3)(a) or 5(5)(b) of the previous Act which was served within six months prior to the commencement of this Act shall be deemed to be a notice served by a provincial heritage resources authority in terms of section 27(8) or section 29(1) and (2) of this Act, as the case may be.
- (13) A permit issued under the previous Act shall be deemed to be a permit issued by the responsible heritage authority under the relevant section of this Act.

Regulations

59. The Minister may, by notice in the *Gazette* make regulations regarding—
- (a) any matter which may or shall be prescribed in terms of this Act;
 - (b) any other matter which may be necessary or expedient in order to achieve the objects of this Act.

Repeal

60. The National Monuments Act, 1969 (Act No. 28 of 1969), and section 41(2) of the Environment Conservation Act, 1989 (Act No. 73 of 1989), are hereby repealed.

Short title and commencement

61. This Act shall be called the National Heritage Resources Act, 1999, and shall come into operation on a date to be fixed by the President by proclamation in the *Gazette*.

PENALTIES FOR NATIONAL HERITAGE ACT

(Section 51)

1. A fine or imprisonment for a period not exceeding five years or to both such fine and imprisonment.
2. A fine or imprisonment for a period not exceeding three years or to both such fine and imprisonment.
3. A fine or imprisonment for a period not exceeding two years or to both such fine and imprisonment.
4. A fine or imprisonment for a period not exceeding one year or to both such fine and imprisonment.
5. A fine or imprisonment for a period not exceeding six months or to both such fine and imprisonment.
6. A fine or imprisonment for a period not exceeding three months or to both such fine and imprisonment.

CHAPTER 9 THE MANAGEMENT OF ROCK ENGRAVINGS

Legislation comprises an integral role in the management of engravings, but on its own is not an effective means of conservation and protection. The implementation of this legislation is its downfall. Therefore adequate management systems are needed, as they form a basis from which the law can be enforced.

Rock Art is considered to be an important ethnographic record of earlier groups of people and is therefore used as a cultural record, (Rudner, 1989). Given that rock art is a valuable national and international heritage, it needs to be managed as a cultural resource, (Meiklejohn, 1995). An effective management policy provides the potential for future research and a foundation for rock art preservation, (Meiklejohn, 1995). According to Mazel, (1983) and Loubser, (1994), much of the motivation behind the management of rock art for its protection to date is purely from an academic perspective.

The first step is for national and provincial government and landowners to recognise its importance, not only as our cultural heritage, but as a tourist attraction and revenue earner, (Meiklejohn, 1995). Legislation protects rock art but doesn't provide for its future preservation, (Meiklejohn, 1995). The following management options are available to respective authorities:

- 1- to conserve the rock engravings.
- 2- to educate and inform the public.
- 3- to remove rock art to places of safekeeping.
- 4- to preserve rock art in situ.
- 5- to promote rock art for tourism, (Meiklejohn, 1995).

To preserve rock art, weathering processes need to be stopped or minimised, but due to inadequate research in this field, conservation, public education, removals and tourism have become the priorities, (Meiklejohn, 1995).

1. The Removal of Rock Art for safe keeping

In the past engravings were removed for one of two reasons:

- 1- To remove them from the threat of humans and nature and
- 2- For the convenience of studying them in a museum, (Loubser, 1994).

Fortunately this view changed due to a change in museum policy, financial logistics, conservation problems (curation and storage space shortages) and problems encountered during removals, (Loubser, 1994).

Removal is not only a difficult process, due to the sheer size of the majority of the art surfaces, but it is also costly, requiring large equipment and the persons recruited to perform the tasks are often incompetent and negligent, (Loubser, 1994). More often than not, the artwork is damaged in the process, because weathered rock becomes brittle and flakes, (Loubser, 1994). Removal must be warranted, due to the fact that the engraved work loses its importance once it is taken out of context, and then only has aesthetic value, (Loubser, 1994). Dating and the analysis of

work that is not in situ is made difficult, (Loubser, 1994). Removal of engraved work to museums, normally ends in the engraving being stored in a store room, as they are difficult to display due to their sheer size, thus they are lost to the public, (Deacon, 1992). Thus a viable alternative could be to create on site museums at selective sites, where tourists have access to the sites, and will still gain value from the removed pieces, (Deacon, 1992). By adopting this management strategy, we will be able to protect the artwork and educate the public.

According to Deacon, (1992. b), the minimum standards for an archaeological on site museum and sites open to the public include:

- The approach to the site - site times and adequate sign posts
- Site should be kept locked
- If the site is open on appointment only, a guide must be available
- There must be maintained off road parking
- The parking must not encroach on the site
- There must be a barrier between the parking and the site
- There must be a litter bin, and it must regularly be emptied
- Ablution blocks must be present and serviced
- Souvenir shop should be maintained
- The protection of the site - have a notice board explaining site protection by law
- Have a visitors book
- Put pamphlets and brochures in a protective case
- Have a physical barrier between the art and the public
- Remove all graffiti from the site
- Regular maintenance of the site is to be undertaken
- Regularly maintain the vegetation around the site
- Have a good record and filling system
- Record the sites on map
- Prevent people from camping on site, touching the painted surface and putting water on the surface to enhance a picture.

2. Tourism as an Option for Conservation

Tourism is one option whereby resources and people can be managed in a sustainable manner, especially via nature based, rural and farms tourism, (Meiklejohn, 1995). Many of the principles utilised in Ecotourism can be applied to the tourism of rock art, in that it could benefit the conservation of this rock form, (Meiklejohn, 1995). Ecotourism is a type of tourism whose main objective is to make money, in a responsible manner, and then to utilise this money for the conservation of the resources and improve the quality of life for the local inhabitants, (Hattingsh, 1994). Ecotourism can generate increased revenue for further research into the conservation of the engravings. By creating a market, you create employment opportunities for people living near the sites as well as an opportunity to educate more people on the importance of the engravings, which in turn will aid in conservation.

Tourism is recognised, as the fastest growing industry in the world, with South Africa increasing in popularity as a tourism destination, the potential for utilising rock engravings as a draw card, is a distinct possibility, (Meiklejohn, 1995). Both Australia and France, have done exactly this and with great success, (Meiklejohn, 1995). The only problem preventing South Africa from reach the same success is our underdeveloped tourist infrastructure, (Meiklejohn, 1995). We also need to change the view we as South Africans have of our rock engravings to that of a national heritage and not as the heritage of an almost extinct culture, (Meiklejohn, 1995).

We need to market our rock art, as part of a package deal for would be tourists, (Hattingh, 1994). According to Meiklejohn, (1995), rock art would ideally have to be part of the nature based tourism industry, or on route a popular tourism route, as is the case with the Doornkloof engravings which are on the Magalies meander. Rock art must be considered a part of the natural environment as it utilises natural features and it enhances the environment, (National Monuments Council, 1990). The package needs to include natural and cultural resources, infrastructure, and such elements as service, quality of product and safety and security, (Satour, 1995). To successfully attract the foreign tourist we need to, first attract the South African tourist, (Satour, 1995). If we have pride in our own land, then others will have pride in our country, word of mouth and self image are critical for tourism development. A successful tourism industry starts at home, (Satour, 1995). By creating a financially viable and sustainable industry, we aid in the conservation of our cultural resources, (Meiklejohn, 1995).

To develop an interest in the field of rock art we need to expose the public to the art form in its natural habitat. We also need appropriately educated personal to conduct tours of the sites, (Satour, 1995). The guide should always know more than the tourist, (Satour, 1995). People can not related to the work via a taped recording, like those utilised in the Drakensberg sites, they want to be able to ask questions, and demand proper answers, (Mazel, 1982). It does not help to merely inform people about interesting facts surrounding the art form and telling them to conserve it, you need to ignite a passion for the art in them and a tape recording, pamphlets and books can't do that. Until you ignite this passion, you are doing little to conserve the art.

While tourism may be a feasible route to conserve our art, it is a service industry, and needs to be developed as such, in order to meet the demands of the public, (Meiklejohn, 1995). Thus land managers have to be employed on site to see to the protection of the cultural and natural resources, further more human and physical infrastructure are needed, (Meiklejohn, 1995).

According to Meiklejohn, (1995) rock art conservation and tourism form a symbiosis in that;

- The long-term protection of the resources is essential for sustainable tourism.
- Tourism can be a powerful tool for resource conservation is executed correctly, but could also has serious negative impacts if not managed properly.
- Tourism is a role player in the conservation of these resources, but by no means should be seen as the only resort.
- Tourism and Ecotourism have complex infrastructure needs that must be met in order to be sustainable.
- Landowner and local support are also crucial to resource conservation.
- The tourism must have a strong cultural and people element.

- There has to be co-operation between key groups, this being one of South Africa's major problem areas.
- A tourism policy must be formulated on both a regional and national scale.
- If the standard of service is not up to scratch, the tourist won't come no matter how good the product is.

3. Education and Management

In the words of Leeuwenburg, (1971), "Try to develop in the minds of as many people as possible an interest in the protection and preservation of these sites", referring to rock art sites. The education of Rock art should be approached on a national and local level, (Mazel, 1982). On a national level knowledge of the art form should be brought to the public's attention through the media, public lectures and information brochures, (Mazel, 1982). Also a greater archaeological and cultural perspective should be incorporated into the school curriculum, (Mazel, 1982). At veld schools, rock art can be incorporated in the curriculum as an outdoor activity, for example the children can make their own art work (paintings, engravings, bead work and jewellery, clay figurines, hand prints), utilising the same resources in nature that the original artists did, (Natural History Museum, 1985).

On a local level the public should be informed and encouraged to appreciate and protect our heritage, in the form of displays, brochures, lectures and guided visitations to sites, (Mazel, 1982). The public is very aware and has been extensively exposed to rock paintings in South Africa. Experience has proven however that they are uneducated as far as rock engravings are concerned, being unaware of what they look like. Thus the conservation of engravings has a long way to go and is in its infancy as far as exposure and its placement in the tourism industry is concerned. Once the public has however been exposed to its beauty, complexity and simplicity, they gain a deep appreciation for it, and three-hour tours turn into five, with sheer amazement and intrigue for the subject. Thus the tourist markets as far as this resource is concerned exists; it just has to be tapped in the right manor to ensure the maximum enjoyment for the tourist and conservation of the resource.

In a short period of time the Doornkloof collection has built up a local market for the resource, as well as an international one, with tourists ranging from England, Scotland, Hong Kong, America, Israel, Botswana, Russia, Ugoslavia and Namibia. The entire international market was gained through the word of mouth marketing by the South African tourist, who have already visited the site. Thus if the product is presented in the correct manor, which includes personalised service, you don't need a large expenditure to market the product, which in turn generates funds for the conservation of the resource and creates jobs.

General solutions to conservation problems can be a danger, and to overt this danger each case must be dealt with in accordance with the circumstances encountered on the site.

CHAPTER 10 DATING OF ROCK ENGRAVINGS

An aspect of rock engravings that inevitably comes to the fore during any investigation is the question of the age of the piece. Speculation constitutes the basis for dating rock engravings. Radio carbon dating a technique utilised in the dating of rock paintings, can not be utilised were engravings are concerned as you would be dating the actual rock, which inevitably is much older than the engraved work. Distribution patterns and engraved techniques used, can render clues to the relative age of the pieces. If the engraving depicts an event, of which the date is known a specific date can be attached to the engraving.

A in-depth study into the possible dating of the Doornkloof pieces was not undertaken, due to the complexity of the undertaking, which demands the attention of a complete study of its own. A general overview into the work already undertaken in this field, does however follow, as it is valuable to the study for future reference.

Rock art is widespread and of vital importance to the recording of prehistoric South African culture, (Humphreys, 1971). It is the only representation of the culture and achievements of the early inhabitants, (Humphreys, 1971). It's a unique look into the development of the prehistoric culture through the dimensions of time and space, (Humphreys, 1971). Rock engravings provide a contemporary view of some of the most essential elements of prehistoric environment and culture, yet rock art, as with all other art has an innate subjectivity that makes interpretation difficult, (Butzer, 1979). Age and overall context of semiarid engravings remain unknown, (Renfrew, 1994). Our knowledge of the lives of prehistoric societies in Southern Africa would be greatly enriched if we could date the art, and so relate its content to that of conventional archaeological cultures, (Inskeep, 1971).

There is extreme controversy as far as dating engravings is concerned, Willcox (1963) considers that "about 1000 years is the maximum possible time" for "rocks to degrade to the original depth of a petroglyph", (Humphreys, 1971). Mason (1962) on the other hand has suggested that "the earliest possible date of the engravings at Bosworth is the earlier part of the Later Stone Age approximately ten thousand years ago, (Humphreys, 1971). From these statements it is obvious that there is no agreement as far as the age of the engravings or the length of time that the engraving can survive, (Humphreys, 1971). There is, however, nothing to disclaim that the oldest existing engravings are of an equivalent age to the oldest existing paintings or vice versa, (Humphreys, 1971).

According to Butzer *et al.*, (1979), the traditional dating methods utilised where engravings are concerned include:

1- Stylistic typologies - this is based on the paradigm of art evolution, which states that art evolved from primitive, to sophisticated and ultimately to degenerate work.

The different styles of engraving offer clues for stylistic sequence that may have temporal implications. In the past the art was divided according to different "styles" and "classes", but subsequent classification looked at a mix of content, style, technique and chronology. Still later

an objective typology, based primarily on technique was designed. This typology classifies engravings in the following categories -

- a) scraped engravings (multiple closely spaced lines)
- b) Polished engravings (rubbing and grinding down the rock surface
To create shallow forms)
- c) Incised engravings (pressure grooving)
- d) Pecked engravings (controlled uniform, vertical or inclined impact points that form dots or dashes)
- e) Hacked engravings (uncontrolled, irregular blows, vertical or inclined, creating large holes)
- f) Classical technique (animal engravings, pecked in silhouette to give a three dimensional effect)

This technological approach is used to systematically recognise a spatial variation, not only within a site, or between site clusters, but also between different regions. It also makes stratigraphic studies possible (Butzer et al., 1979).

According to Butzer et al., (1979), conclusions drawn from this type of studies show that:

- The oldest engraved work has very fine lines, less than 1mm in diameter and in cases where superimposing is present, they are found at the bottom of all the other engraved work.
- Pecked engravings, engraved in a classical style are intermediate in age, being younger than the outlined engravings, but older than outlined animals that are simplistic, over generalised or poorly proportioned.
- Classical are limited in number, but are linked in style and technology to more common representations that lack the unmistakable three dimensional effect.

2 - The sequence brought about by the art of superimposing, (Butzer et al., 1979). This sequencing aids in relative dating.

3 - Visual differences in the preservation and weathering of engravings, for example rock disintegration caused by - Exfoliation

- The reduction of line depth by granular rock face deterioration.
- A direct abrasion by geomorphic or animal agencies, (Butzer et al., 1979).

4 - Archaeological association - This include rock art that is found in a sealed and datable contexts, or by linking composite typologies based on style, super-impositioning and physical state, (Butzer et al., 1979).

5 - Thematic variation - South African engravings are divided into:

- Animals
- Human figures
- A mixed class of geometric forms and inanimate objects

These distributions imply that different sites had different functions, were used at different times, were used by different groups and cultures and to a certain degree there is correspondence between site location or size and demographic patterning, (Butzer *et al.*, 1979).

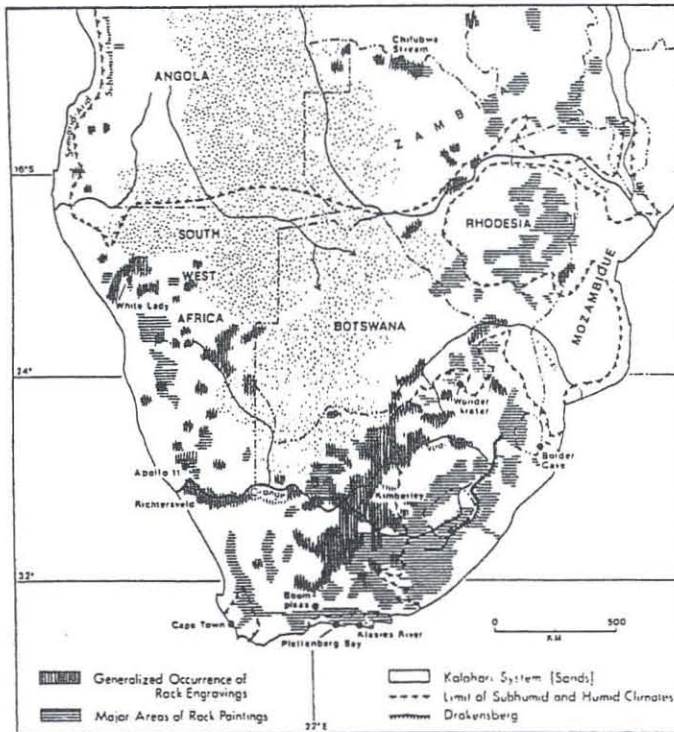


Fig. 1. Distribution of rock engravings and paintings in southern Africa. The semi-arid-subhumid moisture boundary follows the Thornthwaite classification (1/8).

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(Map 37, Rock engraving distribution, (Butzer *et al.*, 1979))

The map indicates that engravings are typical of semiarid regions, while paintings are largely confined to the sub-humid and humid environment, (Butzer *et al.*, 1979)

There is also consensus that all but a very few of the rock art clusters were done by “Bushmen”—few by Bantu, early travellers and farmers, (Butzer *et al.*, 1979).

In an effort to date the engravings some attempts have been made to associate engraving sites with the cultural material found near them, even so this method is only suggestive, (Humphreys, 1971). No matter what technique for dating you may use the results are always relative, as all the



techniques are speculation. The only absolute dating possible is on the basis of subject matter and eyewitness accounts, which is only possible, in the case of the youngest paintings, which depict settler influence and wars. The older engravings seem in all probability to relate to some Late Stone Age culture.

The engravings recorded at Doornkloof comprise of very old incised fine line animals, younger incised broad line animals, superimposed work, a few younger scraped engravings and on or two pecked engravings. The work is comprised of animals, humans, geometric shapes and historical information. The artists who worked in the area came from various cultures which include the Bushmen, the Sotho-Tswana and European Settlers. The engravings in this area date anywhere from approximately 10 000 years to 86 years.

CHAPTER 11 SOUND AND ROCK ART

Neither the location nor subject matter of prehistoric rock art has yet to be satisfactorily explained, (Waller, 1993). Location and rock type play a part in the information supplied by the engraving, into the past of the Bushmen. Theories into the choice of location and rock type should be considered. Studies in France provide possible explanations for the location and subject matter of the art, (Waller, 1993). Both open-air and deep cave sites give reflected sound levels significantly above the ambient, (Waller, 1993). This suggests an acoustic influence on both the placement and content of the art, (Waller, 1993).

According to Waller, (1993), statistical results of studies done in Europe conclude that 90% of ungulates are found in sound reflecting environments. It is known that some ancient cultures considered echoing a supernatural phenomenon. Experiments with the sound reflection at rock art sites revealed that percussion noises (from clapping or producing stone tools) can yield echoes that sound similar to the galloping of a horse and that reverberation of percussion noises can sound like the thundering of a buffalo stampede.

This phenomenon of "hoofbeat" like echoes thus relates to the ungulate images as well as to the sound reflecting canyons and caves where the art is typically located, (Waller, 1993). Observations suggest that Palaeolithic ungulate art was produced in response to percussive sound reflections perceived as "hoofbeats", (Waller, 1993). The production of "hoofbeats" via sound reflection could have been part of a ritual intended to summon up game, (Waller, 1993).

The a-fore mentioned theory makes for interesting reading but would be prove with difficulty on the sites on Doornkloof, as the hornfel rocks on which the engraved work was executed, have a iron base. Therefore they all produce a metallic sound when tapped together, so you could not conclusively say that the ungulates were engraved on them for there sound representation or for ritual purposes. The good sound the rocks produced does however tell one that the rocks weather evenly and slowly, (Snyman pers. Com 1999).

CHAPTER 12 CONCLUSION

Rock engravings span over many centuries and that they have managed to last for all these years is a feat all its own. It is safe to assume however that many have been lost over the years due to development, weathering, theft, vandalism and other threats facing the art form. Many have been lost before they ever had a chance of being recorded and there are still many out there that has yet to be discovered and recorded. This recording is not only of importance because of the beauty of the art, but it is of great value to the scientific community, in that it offers an insight into the life style of a almost extinct culture and also information on distribution patterns and habits of animals found today and extinct species.

The problem of weathering is serious, but a feasible solution has yet to be found. The removal of engravings to museums is unrealistic for many reasons, not to mention they can't facilitate the large number of engraved pieces. Also the removal of engravings is a very costly process and the engravings loose a lot of there meaning in the process as there surroundings play a large role in the history they have to tell. Thus the only solution is to undertake a thorough on site recording of the engraved work, which has its own set of problem as there is a shortage of manpower, which in turn is due to a shortage in funding for such big and time consuming project.

The only foreseeable short term and long term solution to this problem is education through tourism, as this will not only educate the public but generate much needed funds and jobs. Making sites known to the public through tourism, has its own set of problems and for this reason your education plan must be effective so as to deter possible vandals. To do this you need educated professionals to act as guides on walks and restricted access to the sites.