

THE ROLE OF ZOOLOGICAL GARDENS IN ENVIRONMENTAL EDUCATION

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This article attempts a broad survey of the environmental programmes offered at both the formal educational and informal recreational levels by zoos in Johannesburg, London, Whipsnade Park, Bristol and San Diego, California. It describes the part that zoos play in imparting knowledge of environmental conservation and an understanding of its importance.

INTRODUCTION

What makes a zoo successful? It's something like a fruit cake; there are basic ingredients which have to be combined in a correct balance. These component parts are recreation, conservation (frequently to the point of species preservation), research and education. Often it is difficult to distinguish the narrow divide separating these seemingly diverse fields.

Take, for example, the case of the scimitar-horned oryx, a native of the semi-arid region bordering the northern Sahara. This species had become extinct in Tunisia early in this century and most probably within the wild in the last five years. Man's negligence, and increasing desertification, resulted in the destruction of the natural habitat, thus causing zoos to become the only repository of this endangered antelope.

Successful breeding programmes in Edinburgh and Marwell zoos resulted in a surplus being available for re-introduction into natural habitats and so late in 1985 a group of ten young oryx began the journey back to their ancestral home, in fact to the Bou Hedma National Park in Tunisia. Here, a pilot scheme is underway to re-introduce indigenous mammals to a protected reserve area following habitat reclamation. Zoos around the world can claim many such

successful re-introduction programmes. Thus, apart from offering interest for the curious casual visitor to the zoo, the oryx posed a challenge to a conservationist research team since a breeding programme needed to be undertaken to prevent extinction and provide a stock from which animals would be re-introduced to the wild.

The pilot scheme at Bou Hedma supplies the material for a study of the behaviour of this particular species and problems relating to re-introduction of zoo stock generally to its natural habitat. Factors observed and lessons learned at this reserve can be applied to similar schemes elsewhere. Local tribespeople needed to be acquainted with the problems of soil erosion and the need for conservation and habitat rehabilitation, a process eased by the return of the native animals.

Finally, the success of this scheme provided Dr. Brian Bertram, Curator of Mammals at the London Zoo, with an interesting and meaty topic for a lunchtime talk, part of the zoo's lecture programme for autumn 1987. Informally educating the public of the good conservation work that zoos carry out internationally is an important function of their extension (information) service.

COUNTERING HOSTILE PRESSURE GROUPS

In the United Kingdom zoos face a barrage of criticism from pressure groups totally opposed to the concept of keeping animals in captivity. The polar bear controversy was one such issue. A performing polar bear had been rescued from a circus and installed in the polar bear enclosure in Bristol Zoo. To the great embarrassment of the zookeepers the antics of this badly scarred creature had

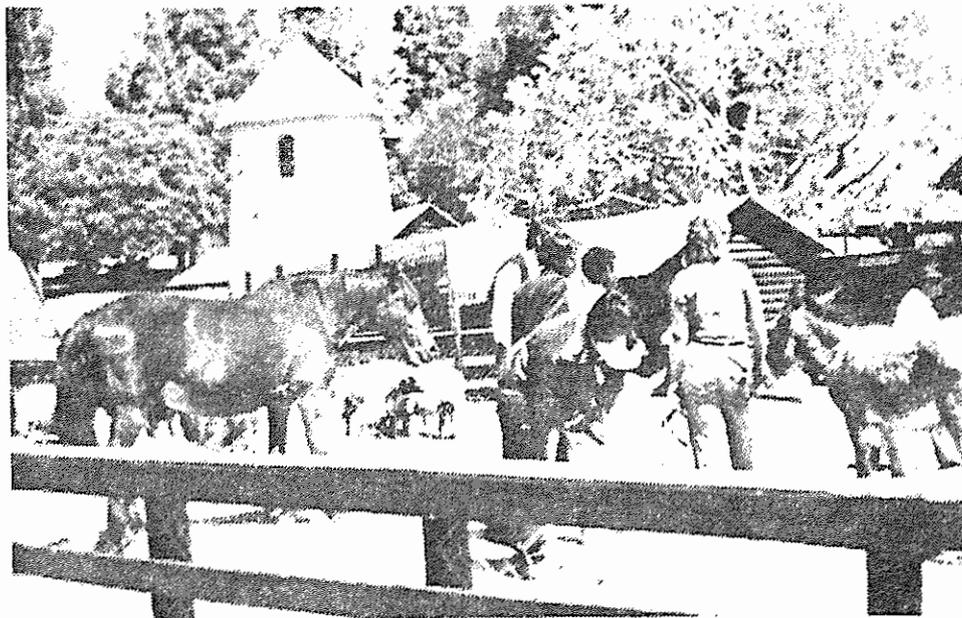


FIGURE 1
The farmyard is always a popular attraction

Photo: Johannesburg Zoo.

learned continued to be performed in its new home. The anti-zoo brigade seized on this fact and so an allegation of cruelty by the zoo was smeared over the front page of a tabloid Sunday newspaper. Irresponsible journalism such as this can do much harm to the zoo and when the inevitable apology was printed it occupied four lines in small type.

Bristol's chief zookeeper, Don Packham, has a regular feature on a local West of England radio station lunchtime magazine programme and effectively uses this medium to spread the message about the good and very necessary conservation work undertaken by zoos. He was able to use his media contacts and his 'News from Bristol Zoo' feature not only to counter the false allegations by stating the zoo's viewpoint, but also used the opportunity to put across information about polar bears, problems of their existence in the wild and successful rearing in captivity.

His popular feature spot deals with latest arrivals, births and deaths in the zoo, highlights programmes and fund-raising events, invites questions from the public and conducts quizz programmes. The programme also includes general information on conservation, animal ecology and behaviour. In this way Don Packham is doing much to enhance the general conservation awareness of the local public and puts over the case for the existence of zoos in an interesting and entertaining way. This is an excellent way to deal with the vocal minority of militant protesters.

FORMAL EDUCATION: A ROLE FOR ZOOS?

Until recently, the role that the zoo played in the formal educative process tended to be minimal, especially at the secondary level. Whether in South Africa or overseas, formal high school education has suffered from two basic faults: much of the subject content appears to the child to be irrelevant ('Why is it necessary to know that?') and also, despite the protestations of educational theorists that education should be child-centred, it is all too often teacher-centred. Many high school teachers and tertiary level educators are well aware that the South African core syllabuses lend themselves to a system where, in order to pass examinations and achieve the desired school leaving certificate, in some subjects a child merely reiterates numerous facts memorised by repeated learning. The thirst for knowledge, the development of an enquiring mind and the ability to reason somehow get lost and have to be found again at the tertiary level of education, or in an apprenticeship or job training scheme. I am not suggesting that all teachers are unenlightened, merely stating that syllabus structure and the format of matriculation questions does not make it easy for the inspired teacher to develop the desired qualities and aims of education.

The revised core syllabuses have gone some way to meeting the need for greater enquiry-based learning by incorporating practical work into high school geography and biology. These two subjects, ideally suited to the outdoor classroom, are not the only disciplines which can use environmental studies since, with a little imagination,

other subjects can also benefit from the outdoor experience.

Field work is desirable, but not compulsory, so the teacher often has to present a strong case to justify the need for that valued excursion. This often leads to compiling many worksheets and developing resource material and is generally followed by pupils preparing reports or making presentations of their experience. Overseas, teaching aids such as study kits, thought provoking worksheets and lectures linked with the syllabus, all form a part of the zoos' educative role, thus greatly assisting the busy teacher.

ZOOS STUDIED: THEIR PROFILES AND PROGRAMMES

Bristol

The zoo was founded in 1835 on 12 acres of farmland as an educational and scientific charity, the Bristol, Clifton and West of England Zoological Society which, to this day, receives no public funding. It is the fifth oldest zoo in the world and the second oldest in Britain and has 400 species of mammals. The zoo is visited annually by 500 000 people, of whom 40 000 are school children.

The aim of the zoo, according to one of its founding members, Henry Riley (1835), was "to promote the diffusion of useful knowledge ... as well as affording rational amusement and recreation".

Bristol Zoo does not have as large a catchment area as that of the older London Zoo and only recently appointed a full-time Education and Scientific Officer. Visits by schools are encouraged during the autumn and winter terms; since the academic year ends in mid-summer preceded in June by the end-of-year examinations. The spring term is in any event less favoured for extracurricular activities.

For both primary and secondary levels there are films, tape/slide shows with discussions, question and answer sessions, lectures, workbooks and worksheets on a variety of topics. 'Hands on' group studies where live animals are used as educational props are very popular and other resource material (skins, fur, bones etc.) can be studied and passed around during the session.

A well-organised resource centre and lecture theatre accommodating 110 pupils and study sessions for up to 40 students has been built at the zoo; the vagaries of the British climate make this a necessity. The broad theme of 'Zoos and General Conservation' forms an integral part of the programme. The range of topics offered is more limited than in either of the London zoos because the zoo has a smaller educational staff and caters for fewer children.

London Zoo and Whipsnade Park

The Zoological Society of London was founded in 1826 and the following year the zoological gardens were opened to society members on a two hectare (five acres) site on the north side of Regents Park. Royal charters granted in 1829 and 1963 laid down

the society's aims as "The advancement of zoology and animal physiology". The public were admitted to the zoo in 1848 and today the gardens cover 14,4 hectare (36 acres). Two million people per year passed through the zoo gates in the post-war heyday; now one and a half million visitors go to London Zoo and its offshoot, Whipsnade Park, each year. The educational department of London Zoo is used by 60 000 students annually, not including informal visits. London Zoo cares for 8 000 animals representing more than 900 species.

Whipsnade Park, the first open-air zoo, was opened by the society in 1931 to complement the Regents Park gardens. The 200 hectare (500 acres) site is home to nearly 2 000 animals of 200 species. Many animals roam freely in the park.

Whipsnade claims to have done more than any other zoo to promote the breeding of rare and endangered species such as the white rhino, Przewalski's horse, cheetahs and Pere David's deer. (This claim is hotly contested by San Diego Zoo). For every animal taken from the wild more than 50 have been born at Whipsnade and it has bred almost 90% of the animals that it keeps.

When devising programmes the zoo's educational staff worked hand-in-hand with the Inner London Education Authority's Teacher Centre. They organise visits and send out comprehensive literature on courses which can be accommodated, stating the levels to which the lectures and worksheets are geared. The lectures, and the level of pupils' suitability, are linked closely to the syllabus requirements. Special needs can be met if the organising teacher visits the zoo beforehand; with the advice of the resident staff teachers are invited to prepare their own worksheets.

The various worksheets (printed in black on coloured A4 size paper) are well illustrated with imaginative questions taxing the appropriate level of intelligence. The junior worksheets - over 20 in number - include topics such as primates, reptiles, fish, various aspects of animal behaviour, camouflage and geo-biological divisions. There are general questions on the functioning of the zoo and the animals, using sight, sound and smell.

The range of worksheets for high school pupils (11 to 18 years) varies greatly in the depth of knowledge and understanding required to answer the questions posed. Also, these sheets are accompanied by resource material and students' notes, the most advanced being equivalent to first-year university standard in South Africa. Some worksheets are simplistic in concept and aimed at less academic pupils. These programmes and those designed for the physically handicapped use many specimens relying heavily on sense perception to explain form and function.

Normally a zoo visit begins with an audio-visual programme. For primary schools (5-11 years) there are 25, classified into age group suitability and 22 for high schools. For the 4 to 5 year olds there are animal stories with a high educational content. A question and answer session follows and after that there are tours using the

worksheets provided or those designed by the organising teacher. Depending on the programme between 30 and 80 children can be catered for but the ratio of staff member (or responsible person) to children must always be one to ten.

Teachers can purchase a teaching aid, 'Using the Zoo', which gives practical help and advice on planning the educational visit plus numerous fact and information sheets about animal behaviour both in the zoo and in the wild.

Both London and Whipsnade zoos have well-equipped lecture theatres and resource rooms for teaching. Visual aids include illustrated charts and skulls, bones, skins and hides, hooves, stuffed animals and display material to demonstrate aspects of animal ecology and to illustrate the talks.

Whipsnade has recently created an enclosed Discovery Centre where one is required to use one's senses of touch, smell, vision, hearing and physical strength as keys to unravelling facts about animal characteristics and behaviour patterns. There are excellent live exhibits of creatures of the British seashore, a simulated hot and steamy rain forest with its typical flora and small fauna, and a moonlit desert with its wildlife.

One could not fail to appreciate the level of professionalism of the staff in the educational section of these British zoos; the degree to which their programmes are tailored to assist the teacher in coping with aspects of the school biology syllabus and, in the case of London Zoo, the amount of co-operation received from the local education authority.

The British educational system is in a state of flux with the change-over from the more formalised examination-decides-all approach of the old system to the new GCSE system under which class work, especially project work and critical understanding, accounts for a good percentage of the year mark. The zoos' educational staff believe that this is a positive step forward and that it will enhance their conservation education programmes.

San Diego Zoo and associated wild animal park

The Zoological Society of San Diego is a private, non-profit corporation, incorporated in 1915, and today has a worldwide membership of 12 500. 3 200 animals of 800 species occupy a 100 acre tropical garden. According to Chip Kamber, former P.R.O. at San Diego, 98% of the animals on display are endangered and of these 20 species no longer occur in the wild. Like Whipsnade, it has successfully bred white rhino, Arabian oryx, Przewalski's horse, gorillas and okapis.

A second campus, the San Diego Wild Animal Park in the San Pasquel Valley, is a sprawling 1 800 acre sanctuary where rare and endangered species roam freely in surroundings as similar as possible to their natural habitat. The park contains 2 200 animals representing 225 species of birds and mammals. The dedicatory plaque (9 May

1972) reads:

"Join us here to contemplate the wild animals of the world and nature's wilderness, to strengthen a commitment to wildlife conservation throughout the world and to strive toward man's own survival through the preservation of nature."

The zoo's education department serves a very positive function from the kindergarten level up to tertiary education, including zoo orientation programmes for teachers. Tens of thousands of children are catered for both in informal programmes with their teachers and formal programmes involving both teachers and the educational staff. Every child in second grade (8 years old) is exposed to a guided tour with lessons on ecology. A 72-seater bus transports 25 000 of these youngsters every year as part of their formal education. During the long summer vacation, the zoo's education staff offers classes from third grade up to twelfth grade. More recently adult classes have been offered too.

In some cases the programmes include a 'hands on' approach using bones and skulls, furs and skins, tortoise shells and reptile skins and even live creatures such as reptiles, ferrets, foxes, dassies and mongooses. These animals are donated pets or injured animals which for some reason cannot be re-introduced to the wild or used in breeding programmes. These tame display animals are often taken out of the zoo as part of the formal education programme when lectures and talks are given to groups outside of the zoo's campus.

Johannesburg Zoo

In 1903 an 80 hectare piece of land was donated to the city fathers by Messrs. Wernher, Beit & Co., to be known as the Hermann Eckstein Park. The collection of animals donated at this time was transferred to the park the following year. The first aviary was erected in 1906 and by 1920 open enclosures were being developed for lion and mountain sheep. In 1963 new moated

enclosures were built for elephant and large cats. Twenty years later the Polar Bear Trust was launched to help to modernise the zoo's facilities, starting with a new polar bear enclosure.

The zoo houses 2 000 animals of 300 species, 50 of these being endangered. Internationally speaking the zoo is highly rated and has a good animal breeding record, including the first white lion born in captivity and the endangered Pere David deer. Attempts are being made to breed the endangered Egyptian Vulture with the eventual hope of re-introducing it to the wild.

The administration of the zoo falls under the Parks and Recreation Department of the Johannesburg Municipality, and hence the educational programme that it conducts, largely through the Polar Bear Trust, is not really described as 'formal education'. The National Zoo in Pretoria has both the staff and the facilities to cope with this. School visits to the zoo are definitely encouraged and either one of the two members of the information staff or one of the technical staff would act as guide to explain general animal ecology and behaviour and answer questions. Basic worksheets are available, but the approach is considered to be more informal than formal: if the child's interest is stimulated then that child would return and a conservation ethic could be subtly inculcated. In any event learning should be fun and our South African climate is ideally suited to the outdoor experience.

This does not mean that the zoo lacks the expertise to organise, for example, a special lecture for a specific interest group on the social behaviour of primates; rather let it be said that individuals are both willing and able to undertake such tasks when the occasion arises.

Zoos internationally often contain a farmyard section and Johannesburg Zoo is no exception to this. Domestic animals normally found on farms such as sheep,



FIGURE 2
Roy Wilkinson tells a campfire story:
The evening visits to the Johannesburg
Zoo are a great attraction
Photo: Johannesburg Zoo.

goats, cattle, poultry, waterfowl, pigs, horses, donkeys, rabbits and pigeons are present. Many of these creatures are very tame and as they can be handled, a direct 'hands on' approach is adopted which proves very popular with pre-school and primary school children and also with the disabled.

At various times of the year (especially occasions like the 'Zoo Extravaganza' - see below) demonstrations of sheep-shearing, milking of cows, horse grooming and incubation and hatching of eggs take place. The popularity of the farmyard section is testimony to the need for close contact that city-bred children like to have with animals.

Informal Education Programmes

"Zoos are an Educational tool in a Recreational setting" (National Federation of Zoological Gardens of Great Britain and Ireland).

Often the difference between formal and informal education programmes - and even recreation - is blurred. The zoo forms an excellent outdoor classroom and man has a natural curiosity and interest about the creatures with which he shares this planet. In the wild or in a game sanctuary, the amateur observer with the untrained eye often sees very little of the animal life which is close at hand and very aware of his presence. Again, unless one is both willing and able to travel to far-flung parts of this planet the diversity of life which is exhibited in zoos will never be seen (other than in illustration or on film).

Zoos are thus a microcosm of the wild and animals on display for recreational purposes to satisfy this human fascination with other life forms. This basic interest can develop into understanding, sympathy and active concern for wildlife conservation.

Informal education entails the marketing of zoos in the leisure and hobby or interest market. In one sense the wheel has turned full circle since the original mid-nineteenth century or Victorian concept of zoos was that they were places where amusement and recreational facilities were provided in an attractive setting. In the early days of Bristol Zoo, to cover costs of maintenance, regular fetes took place with fireworks and fairground rides, also skating, tennis, archery and there was even a bandstand. However, by the 1920's, zoo director, Dr. Richard Clarke, believing that such activities were not in keeping with the original objectives of the zoo's founders, phased out fetes and carnivals (they have since been re-introduced for fundraising purposes). He began a link-up with the University of Bristol and established the endowment of scholarships for research and the principle of general informal education of the public.

Dr. Clarke's time saw the rebuilding of the sea lion pool, the construction of aquaria, a reptile house and monkey temple, and a nocturnal house was also added. These exhibits were internationally declared to be ahead of their time. He set a standard of excellence which is to this day jealously guarded by the staff in the fields of conservation, research and public education in a beautiful garden setting.

Johannesburg Zoo however, under the guidance of Curator Roy Wilkinson, has moved positively towards the leisure market. Anticipating adverse comments that the entertainment programme which formed part of the 'Zoo Extravaganza' (such as puppet shows, drum majorettes, bands, tombola and lucky dips) was not really in keeping with the true spirit of the zoo's purpose, Wilkinson (1986) made a justifiable case for a realistic approach toward tapping the entertainment market and the leisure industry.

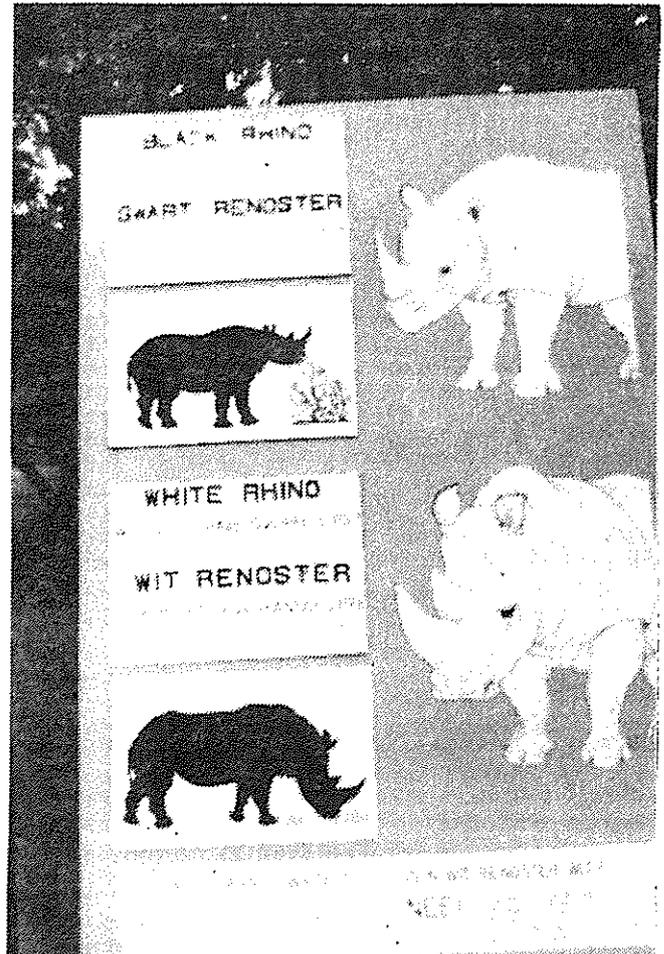


FIGURE 3 Informal education without a teacher. Information boards serve a very useful purpose.

Photo: Johannesburg Zoo.

Preaching to the converted is all very well, but the conservation message needs to go to the unenlightened. Education needs to be fun. Subtly putting across the message of conservation to a captive audience who come to the zoo for the entertainment offered, works far better than holding serious lectures, debates, filmshows on poaching, pesticides or primates. This way the marketing is 'soft-sell' and the interest or curiosity aroused among the public is a spin-off from a fund-raising function which helps the zoo to finance the daily running costs or capital expenditure.

To assist with large capital expenditure projects, the voluntary arm of the zoo - the

Polar Bear Trust - was set up in 1983 with the objective of fund-raising to improve the zoo's services and facilities. Within three years the Trust had successfully raised funds to rebuild the polar bear complex and the current interest is in modernising and replacing the Victorian-style cages of the baboon enclosure.

On-going activities of the Polar Bear Trust are the provision of a gift shop, tours by members of 'Friends of the Zoo' and the provision of a transport system - the tractor and open trailer - to take the non-walking public, the disabled or the senior citizens around the zoo. Volunteers are also becoming more active in terms of informal education. An Information Centre was opened in April 1988 and the first course to train the volunteer staff, who man the bureau, took place in March. Zoo staff gave lectures on general conservation, mammals, reptiles, birds etc..

Another successful scheme is the 'Young Volunteer' corps composed of teenagers who are concerned for animals and their conservation. They undertake a holiday training course and, after passing a test, work at weekends and during school holidays in the farmyard and other sections of the zoo. If the interest is maintained then these youths eventually join the 'Friends of the Zoo'.

WHAT OF THE FUTURE?

"Good zoos are a pleasure and a joy. What zoos offer, which nothing else can, is the simple pleasure of contact" - Jeremy Cherfas.

Ever aware of the role that zoos need to play in the total conservation movement over and above the education/research and captive breeding functions, David Jones, Director of the Zoological Society of London wrote in the Summer 1987 edition of *Zoo News*:

"What we have to remember is that, increasingly, the principal message we are trying to put over about the variety and fascination of animal life is the interdependence of it all and of man's reliance ultimately on his ability to manage this planet rationally. The common theme which runs through the whole conservation movement is to promote the concept that resources must be used on a sustainable basis if life for all organisms, including man, is going to exist in the long term. Our Society must be running in the forefront of this movement with like-minded organisations and we must use every opportunity presented to us to ensure that our role in this direction remains one of our highest priorities."

Zoos throughout the world are actively seeking to promote a wider awareness of their role, and in particular their value to the conservation cause. They aim to counter the criticism of well-meaning but usually poorly informed people concerned about animal welfare, who believe that zoos represent a form of legalised cruelty. In a variety of ways many zoos are seeking to reduce their dependence on national or local government funding: businesses are also

encouraged to become involved with zoos which could, for example, cater for conferences and annual meetings. Johannesburg Zoo has a highly successful 'Animal Adoption' scheme and a couple of years ago introduced the very popular night tours of the zoo; both have been very well supported by the public and institutions. Working from a sounder and more independent financial base, zoos' efforts in the fields of conservation, education and research can be pursued with greater confidence and vigour when looking positively towards the twentyfirst century.

CONCLUSION

"In the end, we will conserve only what we love. We will love only what we understand. We will understand only what we are taught" - Baba Dioum (Senegalese Conservationist).

Zoos do leave a lasting impression. One of my earliest childhood recollections is of being taken to Bristol Zoo and gasping in horror and disbelief as Alfred the gorilla performed 'King Kong'-like antics and shook the bars of his cage. (An ethologist would probably recoil in horror at a naive description of a display of dominance). However, my next encounter with this ungentle giant was years later after his carcass had been worked on by a taxidermist and he stood in splendour in the natural history section of the museum. Fear gave way to curiosity and admiration and a fascination which lasts to this day.

When walking around Johannesburg and Pretoria zoos I am always impressed by the enthusiastic response of the young visitors, many from Soweto and other townships, to the creatures placed by God or natural accident under man's stewardship on this planet. Watching them, one cannot unfortunately help likening the zoo to a circus since the animals which are the best natural performers attract the biggest audiences. Even so, the thirst for knowledge and understanding of the world around us, much of which is outside the realm of our everyday life, needs to be awakened and nurtured by experiences such as these.

The process of urbanisation is gaining momentum. The population of South Africa stood at 33 million in 1985 and by the end of this century - less than 11 years away - is expected to be 53 million. 75 - 80% of Southern Africa's population will be urbanised by the year 2000 and many will be migrants from rural areas or first generation urbanites. For many people the wild, rural areas will be largely inaccessible and thus seemingly unimportant in terms of their urban daily lives. One realistic way to link man's urban existence with that of animals in the wild would be through environmental education programmes conducted at zoos where animals can be seen live and not only on the small or large screen or in a picture book.

For conservation of our environment, and of the creatures with which we share this environment to be meaningful, humankind must see wild animals and wild places as being relevant and necessary to their everyday lives. If the bulk of a country's population are city dwellers, then what