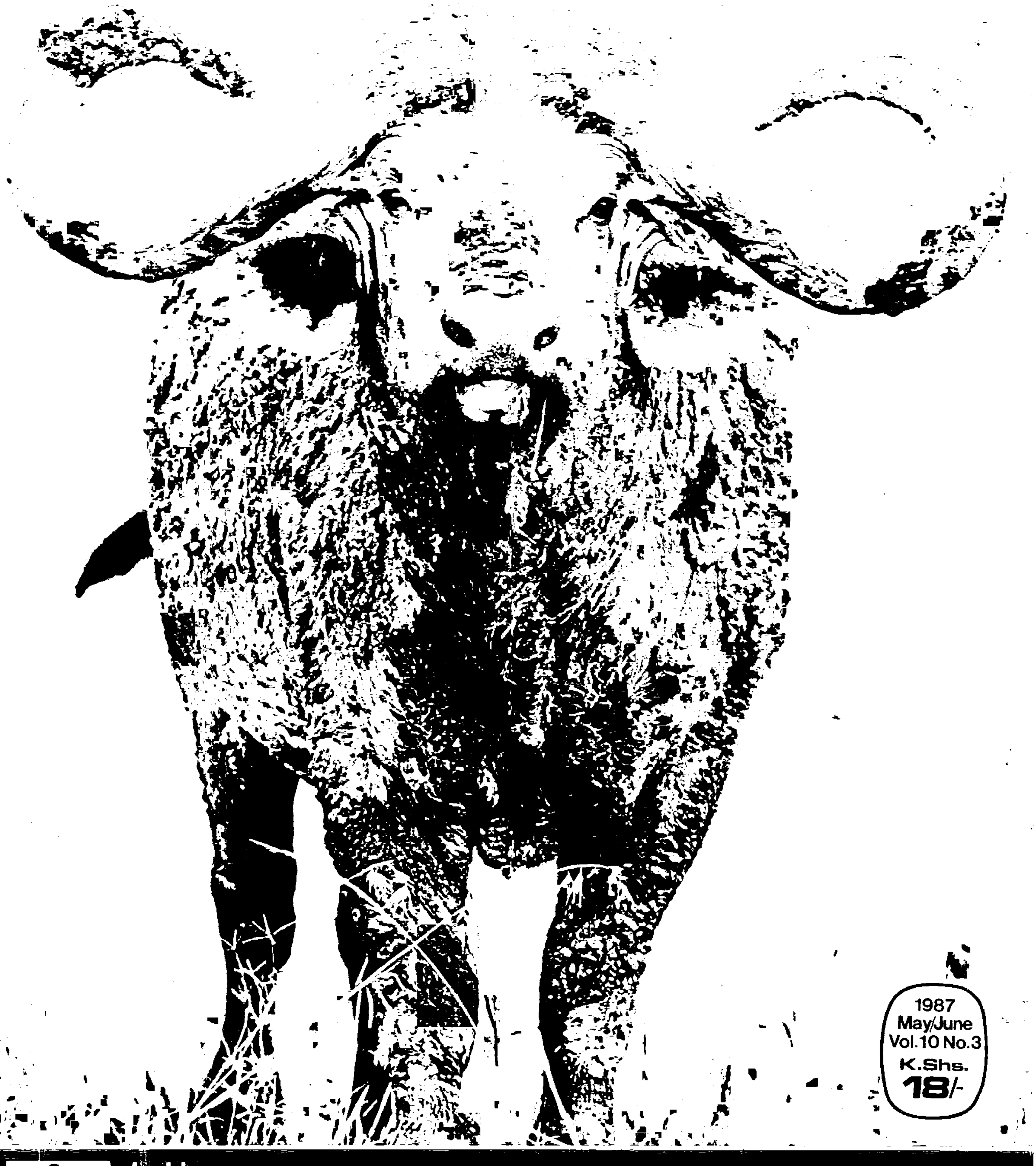
Swara



1987
May/June
Vol.10 No.3
K.Shhs.
18/-

Inside:

RHINO GENES, KILLER APES, CAMELS ...

and news from World Wide Fund for Nature

Swara

The Magazine of the East African Wild Life Society

Editor:
Shereen Karmali

Acting Editor:
Genevieve Cameron

Advertising/Editorial Assistant:
Juliah K. Murage

Typesetting:
Typotronic Typesetters Ltd

Art:
Designplus Ltd

Printing:
Majestic Printing Works Ltd

Colour Separations:
Kul Graphics

Advertising Sales:
Advertising Department,
Swara Magazine,
P.O. Box 20110, Nairobi, Kenya.
Tel: 27047/331888

Swara & Society Offices:
Mezzanine Floor,
Nairobi Hilton Building.

CONTENTS

May/June 1987 Volume 10 Number 3

3 **Society services**

6 **Comment**
The East African Wild Life Society

9 **Rescue the rhino genes**
Nick Georgiadis
Rhino survival depends on captive management. Should rhino genes be managed as well?

12 **Society Highlights**

13 **The secretary bird — aristocrat of the savannah**
Marie Read
What lies ahead for the secretary bird as an increasing human population invades its habitat through agriculture?

15 **Through the bush by camel**
Daniel Stiles
The camel is gaining popularity with pastoralists for its hardiness during drought, and with conservationists for preserving wildlife habitats.

20 **The secrets of the Selous**
Bob Pateman
The Selous Game Reserve in Tanzania offers many attractions, yet relatively few people visit it or know of the potential threats to wildlife there.

23 **Horizons**

26 **News from World Wide Fund for Nature**

29 **Quest for the killer apes**
Michael Ghiglieri
Chimpanzee warfare is described as self-interested male co-operation to obtain females and territory.

34 **Book reviews**

36 **Letters**

Cover photo:
Buffalo
Jonathan Scott

Swara Magazine,
P.O. Box 20110, Nairobi, Kenya.

Swara is a bi-monthly magazine owned and published six times a year by the East African Wild Life Society. The Society is a non-profit making organisation formed in 1961 by amalgamating the Wild Life Societies of Kenya and Tanzania (both founded in 1956). It is Society policy to conserve wildlife and its habitat, in all its forms, as a national and international resource. Please see page three for full details and membership rates.

The impala antelope is the symbol of the East African Wild Life Society. Swara (sometimes pronounced Swala) is the Swahili word for antelope.

Karen Blixen and handicapped children

Two Danes are organising a slide show in the United States about Karen Blixen and Denys Finch Hatton to finance their dream of creating safari camps for physically handicapped children in Kenya and ultimately East Africa. Wildlife photographer, Ole Neesgaard, and his journalist-wife, Winna, hope that 'Handycamp' can teach the children about wildlife and the conservation of it.

The slide show, which is prefaced by a lecture on the EAWLS, contains several black and white historical pictures which have never been published before. There are also colour slides which follow a few of Finch Hatton's safari routes among the wildlife, ending with his journey to the pygmies in the Ituri Forest. Called the 'The True Story of *Out of Africa*', the show runs 45 minutes on three projectors, giving an impression of a slow-moving film.

The Neesgaard's have already used the money from the sale of Ole's wildlife photographs to buy 300 wheelchairs and 500 crutches for the disabled in Kenya and elsewhere in Africa.

Any inquiries or offers of help can be directed to Ole and Winna Neesgaard, Box 56728, Nairobi, Kenya.

Ole Neesgaard

'Handycamp' plans to teach handicapped children about wildlife and conservation.

Werikhe plans European walk in 1988 for rhino conservation

A new chapter in the history of wildlife conservation in Africa will be written in May next year, when Michael Werikhe walks across Europe to raise funds to save the rhino. For the first time, an African volunteer will take an appeal for conservation directly to another continent.

Werikhe, a security supervisor at Associated Vehicle Assemblers in Mombasa on the Kenya coast, and an active member of the East African Wild Life Society, previously walked across East Africa for rhinoceros conservation. In 1982-83, he launched his efforts with a walk from Mombasa to Nairobi, and raised more than a quarter-million shillings for the rhino after sponsors sent pledges to the Society for each kilometre of his trek.

The Society used the funds to support rhino research and management. Frederick Waweru undertook a study of black rhinos in Nairobi National Park. The Society provided government anti-poaching forces and the Laikipia Ranch rhino sanctuary with additional radio and support equipment.

Michael Werikhe set off again in 1985, this time across East Africa from Kampala, Uganda to Dar es Salaam in Tanzania and back to Mombasa. The highlights of the 20,000-km trek were described by Gavin Bennett (*Swara*, July/August 1985). When all the pledges were in, Werikhe's walk had raised more than a half-million shillings. Even more important, it had brought the issue of wildlife conservation to the people of East Africa through the dramatic concern and courage of one man.

At about the same time, the Kenya government launched an ambitious programme to save the rhino. In addition to anti-poaching efforts, the government set up special rhino sanctuaries at Lake Nakuru and Tsavo East National Parks and on private ranches. Government resources in a developing country, however, are stretched to the limit.

The Society is using the money raised by Werikhe's walk to support this programme. It has paid for revamping the entire water system of the Lake Nakuru rhino sanctuary, building holding pens for the rhinos, and preparing the foundations for the Tsavo East sanctuary fence. It also funded a joint vegetation and hydrologic survey of the Nakuru sanctuary to ensure optimal use of the area by the relocated rhinos.

Much more money is needed to equip and service the sanctuaries and relocate endangered rhinos to safety. So Michael Werikhe has decided to walk again, this time in western Europe, from May to August 1988. In this nuclear age, there are no national boundaries to the environment – the rhino will live or die because of us.

Volunteers are needed to help with Werikhe's walk. If you can help, please contact the East African Wild Life Society, Box 20110, Nairobi, Kenya.

Fleur Ng'weno

Nakuru rhino study

The Society sponsored a research project, by F.K. Waweru of Moi University, on the feeding strategies and habits of black rhino in Lake Nakuru National Park at a cost of Ksh 22,000.

Aid to Meru National Park

Meru National Park received Ksh 19,353 in emergency aid from the Society to purchase spare parts for the warden's vehicle.

The EAWLS staff goes to Tsavo

Thirteen staff members of the EAWLS went on a three-day trip to Tsavo National Park in February to learn about park management and the reasons for creating the park.

The trip allows the staff to familiarise themselves with the wildlife, parks and reserves, and enables them to give first-hand information to people visiting the Society offices.

Donations

The Society would like to gratefully acknowledge receipt of Ksh 35,025 in donations over the last two months. Those who donated more than Ksh 1,000 were: William F. Nelson, Richard W. Wiebke, John P. McBride, N.C. Draper, and Eleanor Horner.

Leather Cheetah

A framed leather picture of a cheetah is available at the Society shop for Ksh 1050, after being kindly donated by member Himatlal D. Shah of Tanzania.

Of three races thought to have existed in Kenya, only one is said to survive. However, the extent to which the original races have been mixed in captive populations is not known.

Crossing individuals from different races can also cause problems due to 'outbreeding depression'. While inbreeding depression results when mates are too closely related, outbreeding depression results when mates are too distantly related. An absurdly extreme example of outbreeding depression results from reproduction between different, but related species, like horses and donkeys. The product is a mule which is sterile – a genetic 'dead-end' in the evolutionary sense. More subtle symptoms of outbreeding depression have been documented from matings between different races of the *same* species, but the cause is not well known.

Genetic differences between populations can result from different responses to natural selection. Thus, rhinos in the Aberdares may be better adapted to cold, high, wet and leafy environments, while those in Tsavo to low, dry, hot and thorny environments. Mixing populations from habitats with extreme climatic differences, like Tsavo and the Aberdares, might result in a population that is less well adapted to either climatic extreme. Conversely, mixing populations that are inbred can be beneficial because genetic variation is increased, thus compensating for the deleterious effects of inbreeding depression. The potential costs and benefits of mixing populations can only be evaluated by genetic management.

Genetic management

This oversimplified account has attempted to highlight the difference between managing the reproductive health of a captive population, and managing its genes as well. In the former approach, individuals are collected from different wild populations and mated together without regard to their underlying genetic differences. If genes are ignored, the longer populations are kept in captivity, the more they will suffer from inbreeding or outbreeding depression, and the lower their chances of survival.

How can this be prevented? First, the population size of captive rhinos should be maximised. Effective numbers can be increased without physically merging isolated populations, simply by swapping a few individuals between them. Provided those individuals reproduce, they create a genetic bridge between isolated populations that is sufficient to maintain complete genetic mixing in the long term. Choice of appropriate candidates for exchange should ideally be based on knowledge of the genetic identity of as many individuals as possible in donor and recipient populations. From a management viewpoint, the number of individuals that are moved between populations should be as low as possible, but only genetic analysis can reveal when and where to translocate rhinos.

Second, populations should contain an equal number of males and females, and all should contribute equally to reproduction. The inverted argument clarifies this point: if an individual does *not* contribute to reproduction, its unique combination of genes will be extinguished when it dies. In the evolutionary sense it might as well have never existed. But equal reproduction is more difficult to achieve because dominant males tend to monopolise reproduction, and if that does not happen, managers cannot tell which males are contributing to reproduction, and which are not. Paternity can be established, provided that the genetic identity of all possible fathers is known. Males that dominate reproduction are obvious candidates for translocation to other populations, but we have much to learn about introducing rhinos into established populations without social perturbations. Dominant males are quite capable of killing each other.

All this sounds like a lot, but genetic management is simplified by the fact that all the necessary genetic information can be obtained using biochemical analysis of proteins and DNA. Requiring only a blood sample from each individual, this technique can reveal the overall genetic differences within and between populations, the genetic identity of each individual, and the identity of the parents of offspring bred in captivity. Applied to human populations, such techniques has been known to be *too* effective: a study in 'Smallville', USA not only revealed that a shocking proportion of children were illegitimate, but identified the guilty dads as well!

Deleterious effects of inbreeding will not become apparent in captive populations *until* siblings start mating with each other. However, genetic variation can quickly be lost if a few dominant males monopolise reproduction, so genetic management should begin as soon as possible. Since blood is difficult to get from wild animals, it is essential that blood samples be obtained while rhinos are immobilised for translocation, and stored at low temperature. Analytical facilities may soon be available in Kenya.

Systematic genetic management would not only benefit Kenya's rhinos, the experience would also aid the conservation of other endangered species. When rhinos are reintroduced to parts of their former African range, genetically diverse individuals will be a far more valuable commodity than inbred individuals. They would symbolise a very conspicuous feather in Kenya's conservation cap.

... rhino genes

superbly adapted to its ecological niche, but which may in fact be in an evolutionary dead end. The message is clear: the greater the genetic diversity in a population, the better its chances of survival. This applies not just to disease resistance, but to *any* natural selective force that affects a population of any species, in captivity or in the wild. Without genetic variation, species cannot weather evolutionary challenges.

Genetic variation arises largely by mutation, and results in several different versions of a given gene existing in a population at one time. This variation is manifested in such familiar ways as differences between individuals in eye colour or blood type. The implications of losing genetic variation are important for conservation. For example, we now know that wild cheetah populations are vulnerable to extinction. We also know that the 'Noah's Ark' approach to conserving endangered species, by keeping one male and one female in captivity, is totally inadequate because only a fraction of the total genetic variation is preserved, and extinction more likely. Consider a more subtle implication. Individuals of many species rely on scent markings to define their territories, and may even identify each other by smell. If an individual's unique scent had a genetic basis, and the population lost its genetic variation, all would smell the same, and be unable to tell each other apart! This could play havoc with the social system. While this might not apply to rhinos, the challenge for rhino conservationists is to establish that captive populations are genetically variable, and to maintain that variability. Genetic variation is difficult to aquire and easily lost.

Dr Nick Georgiadis was born in Kenya and educated in England from the age of 13. After graduating from London University with a degree in biology, he studied savannah grassland responses to grazing for a PhD degree from Syracuse University in New York. He is currently a post-doctoral associate at New York's University of Rochester, studying population genetics of large mammals, and its role in the conservation of endangered species.

Inbreeding

Theory has long predicted that the most effective way of losing genetic variation is to isolate small populations — the exact conditions that prevail in captivity. Indeed, this has been the experience of most captive breeding programmes in zoos, and is causing severe problems, largely due to 'inbreeding depression'. Inbreeding is simply mating between individuals that are closely related, for example siblings. Depression refers to its effect on reproductive rate.

Increased offspring mortality is one indication of inbreeding depression, but the mechanism is quite subtle. Not all of the versions of a gene need function properly, but because an individual inherits a complete set of genes from *each* of its parents, at least one functioning copy of every gene is normally present. Malfunctional versions, known as recessive lethals, are very rare and manifest themselves only when they are paired with another recessive lethal. Normally, that does not happen because the chance is remote that unrelated parents harbour the same recessive lethals. However, closely related individuals, like siblings, are (by definition) more likely to have the same recessive lethals which will pair-up in their offspring. The result is that neither copy of the gene functions properly causing loss of vigour, or death. Clearly, inbreeding in captive populations should be avoided if possible.

Outbreeding

Not only are individuals in most wild populations genetically unique, but isolated populations are often genetically distinct from each other. If populations are isolated for long periods (millenia) genetic differences between populations accumulate, resulting in the formation of races or 'sub-species'. Morphological evidence suggests that there were seven races of black rhinos in Africa, but nothing is known of their genetic differences.

Rescue the rhino genes

by Nicholas Georgiadis

Rhino survival depends on captive management. Should rhino genes be managed as well?

The earless trait that made Pixie famous in Amboseli National Park may be an effect of inbreeding.

Rhinos and dinosaurs have three things in common: large size, a prehistoric character and a precipitous decline in numbers leading to extinction, or near extinction. That is no coincidence because large animals have long generations and slow reproduction – traits that retard their ability to evolve in response to changing environments. But that is where their similarities end. While there is no doubt why rhinos are in trouble, paleontologists still argue about what extinguished the dinosaurs. One amusing possibility suggests that, like many reptiles, dinosaur sex was determined by the incubation temperature of the eggs. A nest in the sun might have produced all females, or all males originated from a nest in the shade. When the earth's climate suddenly warmed (or cooled), all embryos developed into the same sex, and reproduction ceased.

Whatever the cause, the decline of the dinosaurs was precipitous only by evolutionary standards – it took thousands of years. By contrast, rhino devastation took only a few decades. This difference underscores our tendency to forget that species' lifetimes are measured in millions of years, during which time survival depends on subtle changes in their genetic constitution by the process we dimly know as evolution. The acute decline in rhino numbers on a continental scale must radically affect their genetic constitution in ways that can hardly qualify as natural. While confinement in sanctuaries may be the only short-term strategy to save rhinos, the experience of managing small populations in zoos has shown that long-term conservation of captive animals entails more than protecting populations and maximising their reproductive rates. It also entails managing their genes. This article attempts to show why those two goals can oppose each other, and how they can be reconciled.

Genetic variation

In 1983, 18 cheetahs in an Oregon zoo died of a virus infection. Subsequent research on wild and captive cheetah revealed that, genetically speaking, individuals are almost identical. By contrast, in human and most wild animal populations, all individuals except identical twins are genetically unique. The cheetah results suggested that, as a consequence of genetic uniformity, there is little variation between individuals in their ability to resist disease. Results also showed that captive populations are especially vulnerable to extinction because, once established, contagious diseases spread rapidly. A genetically diverse population would include individuals that differ in their capacity to resist disease, and is therefore buffered against extinction. The cheetah results dramatically drew attention to a species that we think of as