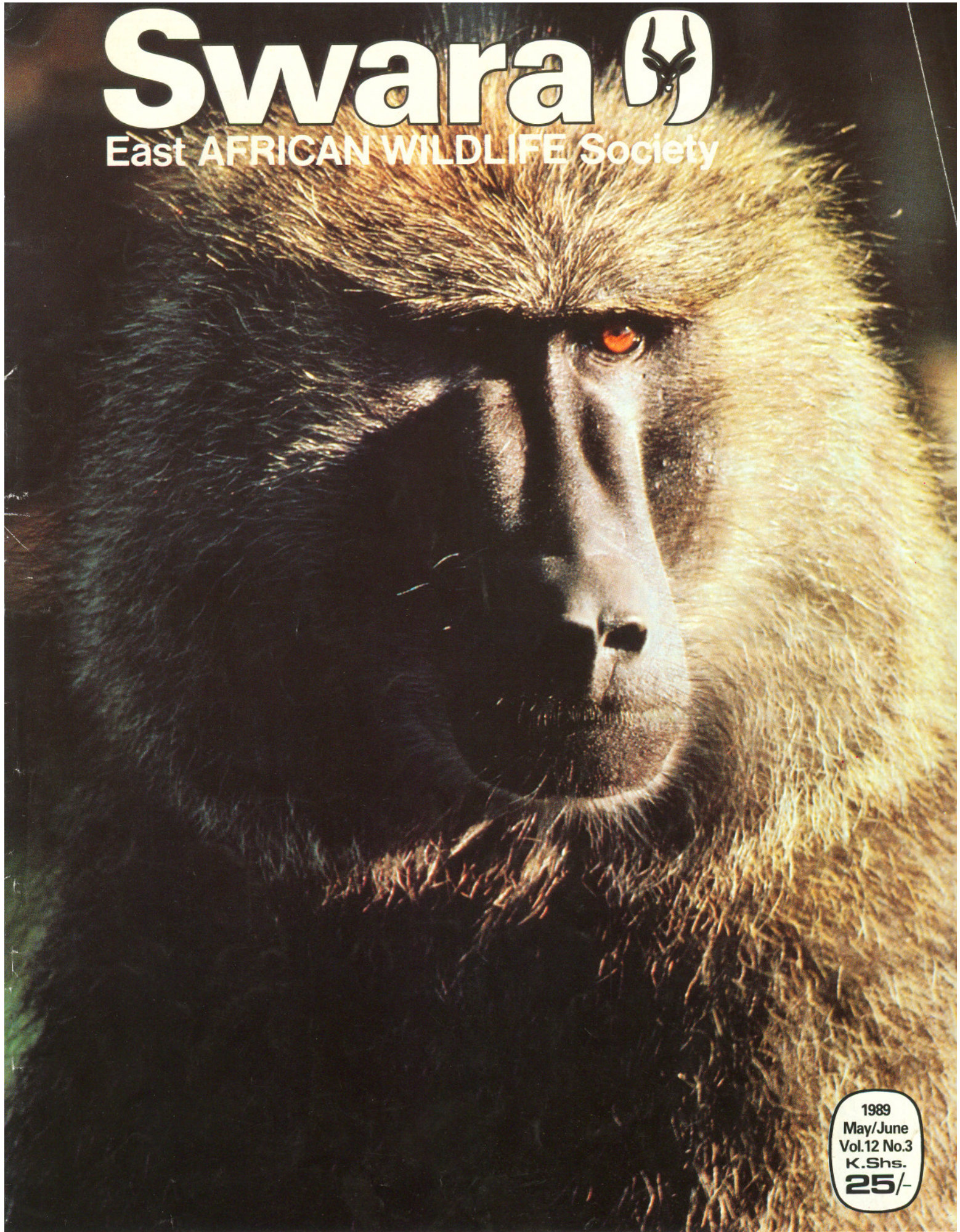


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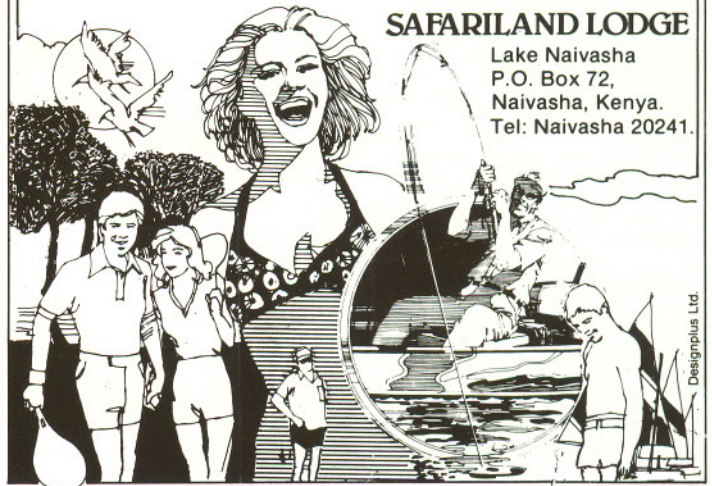
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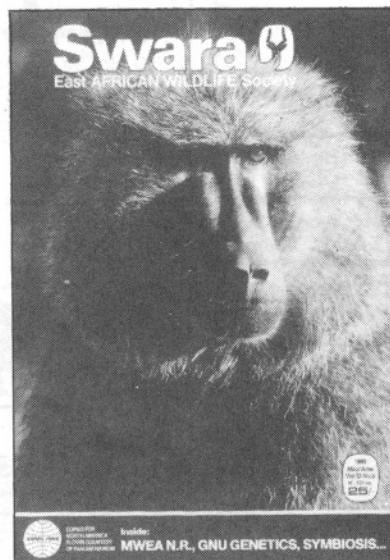
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Cover photo:
Olive baboon
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The impala antelope is the symbol of the East African Wild Life Society. Swara (sometimes pronounced Swala) is the Swahili word for antelope.



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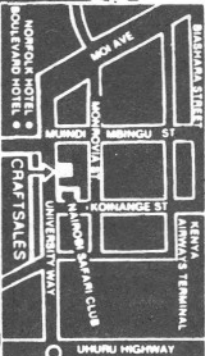
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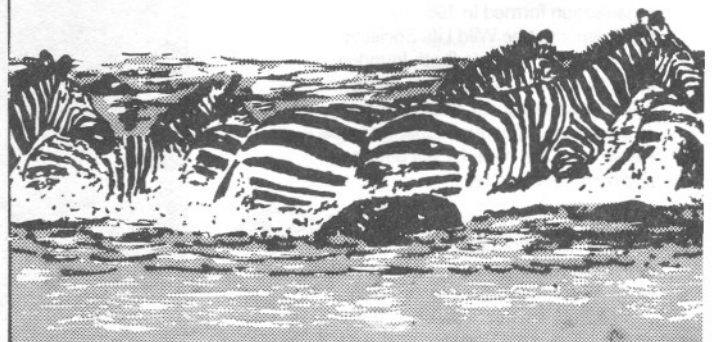
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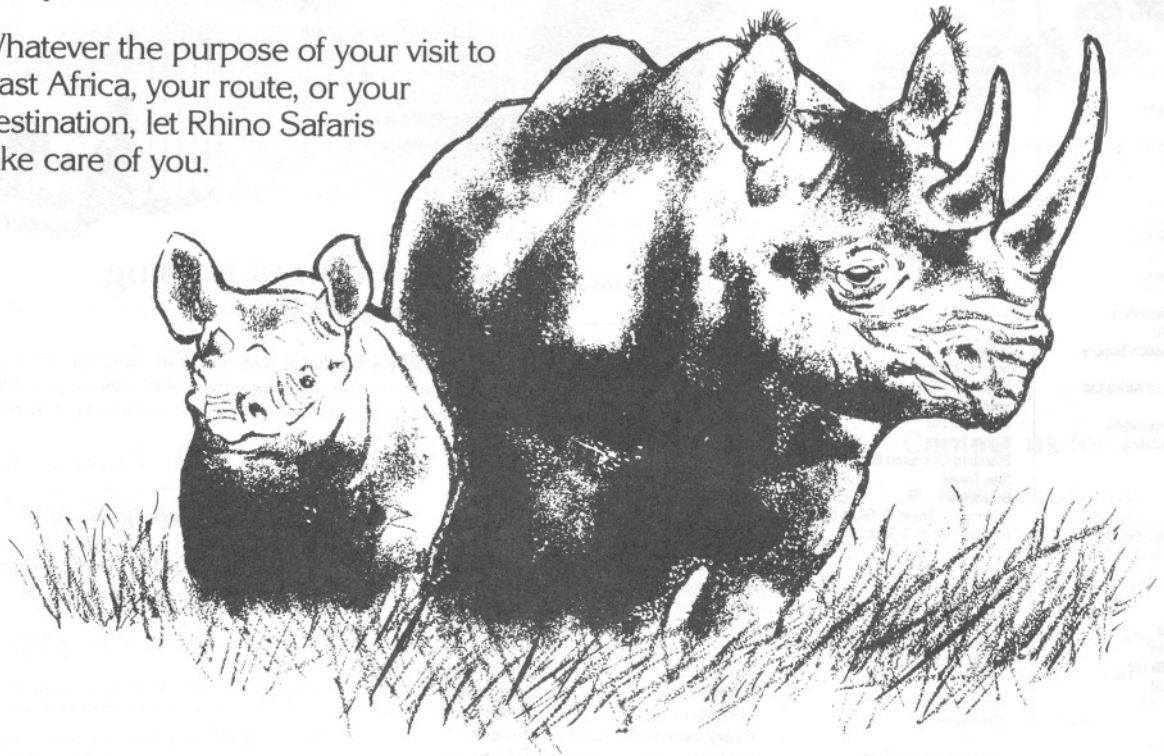


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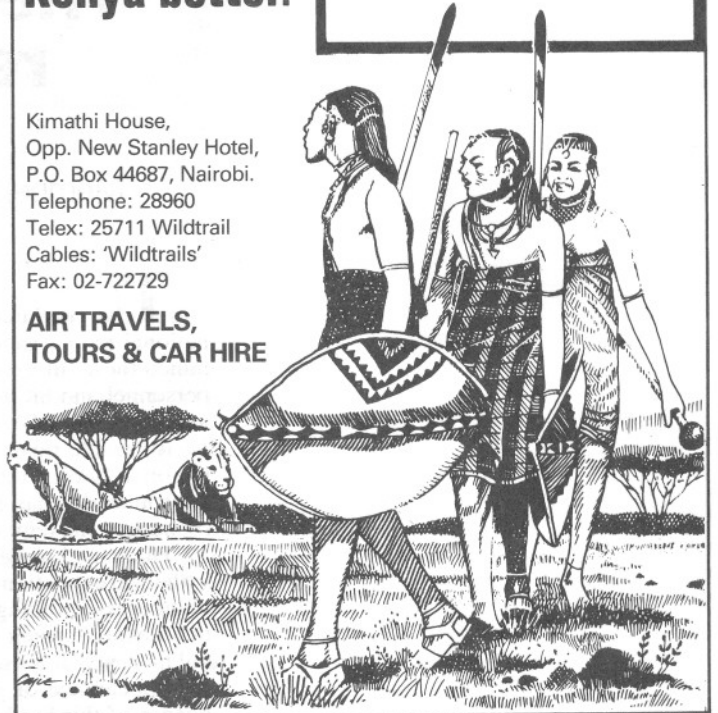
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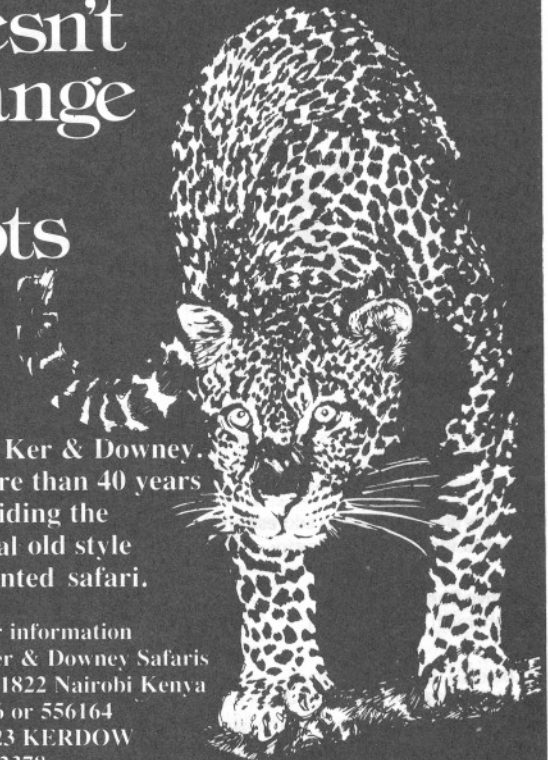
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The problems of the reticulated giraffe

by Dr Hussein Adan Isack
Member, EAWLS Scientific & Technical Committee

The continuing destruction by poachers of the wildlife in Kenya's national parks, game reserves and other protected areas shows how determined these ruthless killers are. They often evade detection by park security personnel and hit deep into the animal sanctuaries, killing elephants, rhinos and other animals.

But while much attention has been focused on the plight of wildlife in national parks, the fate of multitudes of species of animals living in unprotected areas has been ignored. The result is that herds of animals roaming in the remoter parts of the country are fully at the mercy of poachers.

The reticulated giraffe of northern Kenya is a mammal which is threatened with local extinction – because it is being over-exploited by man. The hunting of giraffes is nothing new. They have always been killed – with spears – for their meat, for their skin, which is used for making milk buckets, and for their tail hair, which is used for stitching and decoration. What is new, however, is the appearance of guns in the areas inhabited by the giraffes. The consequence of this has been a rapid increase in the rate at which the giraffes are being destroyed.



The East African Wild Life Society

The East African Wild Life Society was formed in 1961 by amalgamating the Wild Life Societies of Kenya and Tanzania (both founded in 1956).

The policy of the Society is to safe-guard wildlife and its habitat, in all its forms, as a national and international resource.

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Some pastoral nomads strongly believe that cattle *must* not be milked into any container other than one made of giraffe skin. Likewise, when lifting water out of deep wells for cattle, only a giraffe skin bucket can be used. In by-gone days, when villagers killed a giraffe – after the hard work of hunting it with a spear – they shared the skin, from which 12 containers can be made. A person in desperate need of a milk bucket paid up to one young bull for one.

Today, the picture has changed. Poachers armed with sophisticated weapons come (often on horseback) from a neighbouring country, massacre as many giraffes as they can – and with an AK47, it's not difficult – transport the skins back and exchange each small piece for a head of cattle. Each giraffe is therefore worth 12 head of cattle. In monetary terms, this makes the giraffe one of the most valuable animals in Kenya. Because herds of giraffe habitually browse in areas with specific terrain and vegetation, they tend to occur in herds. Fully aware of this, the poachers aim for these spots, where they mercilessly slaughter the helpless creatures.

These areas are vast in extent, roads are non-existent or in very poor condition, and there is an acute shortage of water. These factors make it very difficult to patrol the region. However, if moves are not made now, the chances are that the demand for, and the value of, the giraffe skins will continue to accelerate, posing an even greater threat to the animal.

The individuals engaged in the giraffe skin business should be hunted down and prosecuted. Perhaps more importantly, a public education programme should be launched, aimed at discouraging the use of giraffe skin buckets for milking or watering of cattle. A few hand pumps at some of the deeper wells could reduce the demand for giraffe skins. But convincing the pastoralists to begin milking their animals into wooden or metal containers will require a lot of persuasion. But it must be tried before it is too late.

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Mwea National Reserve

by Imre Loeffler

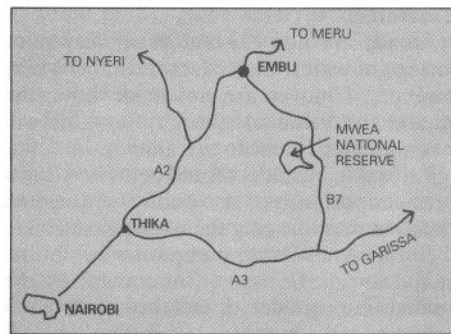
Surrounded by well populated and heavily eroded land, this small reserve could provide a fine example of how the initiative of local people can help preserve a quiet haven for people and wild animals alike.

Mwea Reserve is located on the north bank of Lake Kamburu (one of the man-made lakes on the Tana river), and between the Tana and Thiba rivers. The reserve covers about 120 square kilometres of thorn bush at altitudes between approximately 3,000 and 4,000 feet. The area is dissected by many seasonal river beds and as the soils vary from locality to locality, so does the vegetation.

Presently, the easiest access to the reserve is via the Thika-Garissa road, turning north on the B7 (the Kitui-Embu road) 71 kilometres east of Thika. This section of the B7 is hard surfaced. In dry weather, one can turn left at Kaewa (Kivaa), cross the Masinga dam and 25 kilometres further north enter the park through the only gate. In wet weather, cross the Kamburu dam and follow the signposts from there. When the Karaba-Gategi road is finished, the access will be even easier: from Thika via the A2 to Makutano, hence on the B6 (the Embu road) to the right, turning on to the Karaba road. The gate is 39 kilometres from this spot where there is a signpost.

The reserve belongs to the Embu County Council and is presently being developed in a joint effort by the council and the national parks. In a few months' time the airfield will be serviceable. Roads have been constructed, bridges and drifts are being built, there is a nice observation banda overlooking one of the bays of Lake Kamburu, there are signposts, two camping sites, a picnic site and, as we learnt from the friendly and hard working warden, Mr Njoroge, there are tentative plans to build a lodge.

We had the reserve to ourselves. As the receipt books had not been printed yet, we were not allowed to contribute towards the upkeep; not even entrance fees or camping fees were levied. We were in our sturdy Suzuki (a very hardy 4-wheel drive vehicle is a must) and had plenty of water with us. We shared the peace of the reserve with elephants – a part of the herd had just been driven back into the park from a raid on the granaries of a neighbouring village. There were vervet monkeys, baboon, rock hyrax, warthogs, bush duiker, Kirk's dik-dik, common waterbuck, impala, bushbuck, lesser kudu, buffalo, striped ground



squirrels and signs of porcupines, mongoose and small cats.

The warden reported the presence of leopards. In the water we saw hippos, many crocodiles, monitor lizards, and very large terrapins. Not trying very hard, we identified 82 species of birds, among these the Zanzibar sombre greenbul, the sulphur-breasted shrike, and a very handsome osprey. There were many darters and an astonishing number of grey herons. The sighting of a pair of martial eagle overhead caused the spectacular and cacophonous departure of some 1,000 birds from a mud-bank, among them 500 white-faced whistling duck.

It was a delightful, quiet weekend, conducive to contemplating the cohabitation of man and game and the economic viability of a reserve of these particular characteristics, for it is surrounded by densely populated and heavily eroded land. The excursions of elephant and buffalo, of baboon and leopard, are surely intolerable, dangerous and costly, whereas there were no signs of incursions by man. Indeed, thanks to the obviously excellent co-operation between the wardens and the local chiefs, there are no cattle in the reserve, no goats, no tree poaching; in short, no trespassing at all. But almost every vista includes a powerline, the spot where the lodge is supposed to be built overlooks the generating plant of Kamburu dam and at all the camping places, one hears motor traffic throughout the night.

The excursions of the game will have to be curtailed by an elephant-proof fence. The terrain is such that the maintenance of

the roads and tracks will always remain costly. No tourist will come from overseas to gaze from the verandah of the lodge at the lights of the Kamburu plant, or to listen to the steady, heavy motor traffic crossing the dam. It will also be difficult to persuade him to give his money to the Mwea Reserve because the terrain and the vegetation make game sighting difficult. One would have to create salt licks and water-holes and bait the leopard. Only then could one promise the client a reasonable safari.

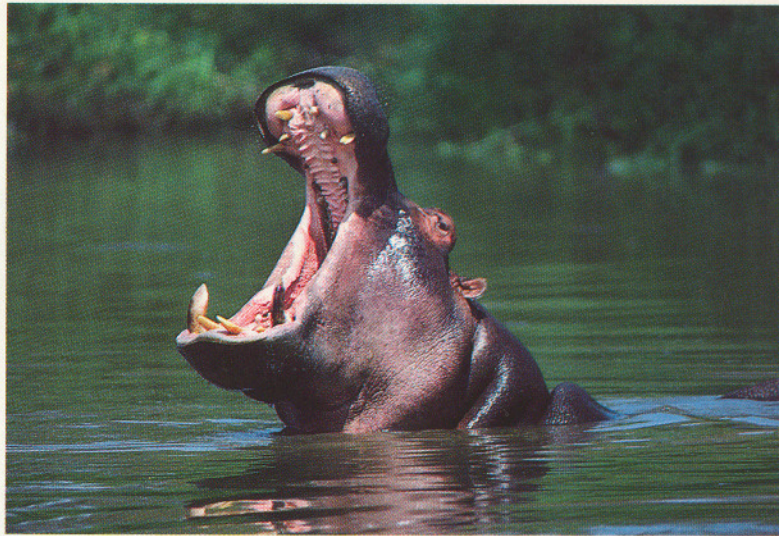
Except if the client is different from the mass tourist, if he is a specialist, say a bird-watcher or even better, a birdwatcher and a boating man. For the Mwea Reserve ought to be developed for birding and fishing from boats, rowing boats, that is, not motorboats. The lake and its many bays provide a very long littoral of great variety. Instead of a lodge, one could build several boating camps in sheltered locations where one would not see pylons, would not hear the traffic and spend the day on the water.

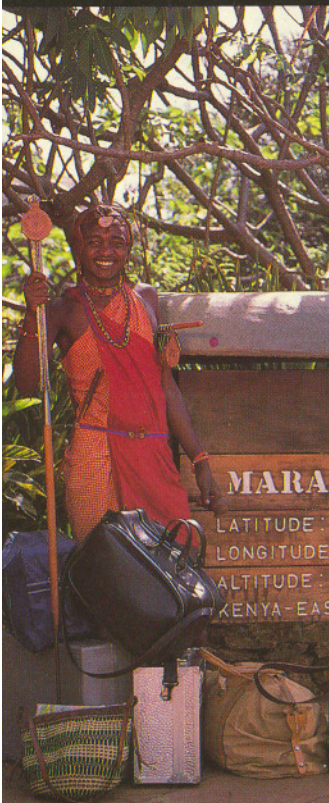
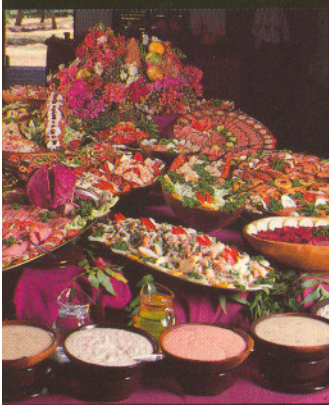
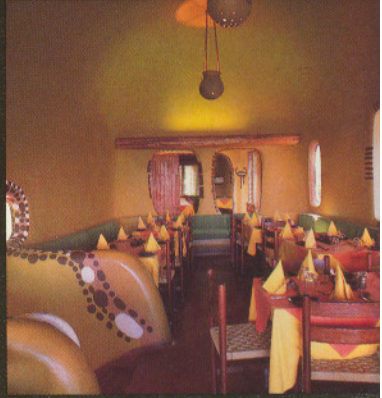
For such a scheme the quality of the water needs to be safeguarded, indeed, improved. Lake Kamburu stinks – in some lovely coves the prevailing wind has accumulated so much waste that there is no life in or around the water. There is an astonishing amount of rubbish drifting into the formerly beautiful beaches of the downwind bays. One assumes that most of the toxic substances come from the tea and coffee factories, and the other agricultural industries of the Nyeri-Muranga-Sagana area. But we found one little cove which contained a concentrated solution of, and also some crystallised, copper sulphate, at least a tonne of the stuff. There were no birds, no hippos, no crocodiles and no sign of life in the water for a long distance around this spot. Probably this poison was dumped into the lake as a molluscicide to eradicate the bolinus snail and thus render the lake bilharzia free. It will take a major effort to scoop up the blue-green mounds of this salt and to clean the beach.

The portents for the efforts of the Embu people are not very good unless there is a national effort to conserve the lake – that is the upper Tana river. For example, a new paper plant is being built on the south bank of Lake Masinga, so perhaps one should



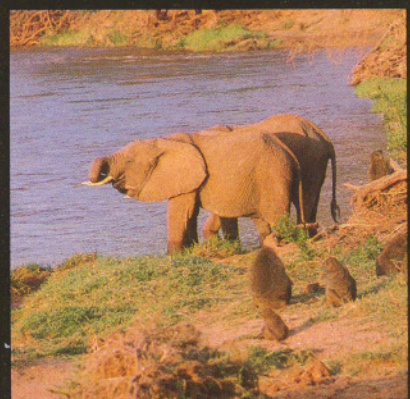
The best game viewing area on earth (clockwise from top right): fish eagle and catfish; hippo; the rainy season; lions; crocodile and zebra; and wildebeest crossing the Mara River.





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Songs of the Serengeti

By Pyke Johnson, Jr.

Wildebeest

The wildebeest are silly beasts.
They haven't any brains.
They run around in circles
On the Serengeti plains.
Their beards resemble spider webs
And hang below their manes,
A natural arrangement
Which possibly explains
Why they don't use their umbrellas
If they're caught out when it rains.

Hippo

There was a green and greasy pool
And at the bottom I
Saw settling for their daily snooze
Eleven hippopotami.

Grant's gazelle

I've come to like the Grant's gazelle.
When it sees you come, it runs like hell.
I think its piebald rump is swell
And quite admire its horns as well.
I hear it has a lovely smell,
But was never close enough to tell.

Warthog

The warthog's in a hurry for a most important date.
He isn't sure just where it is, but knows he can't be late.
His family follows after, the females and the males,
Horizontal are their snouts and vertical their tails.
They run and stop, run and stop, and then they look around.
Whatever they are seeking, you may be sure it won't be found.
And if you want to reach them, I suggest that you leave word
With the message-taking service of the Secretary Bird.

Thomson's Gazelle

Thomson's gazelle is brash and wild,
But yet a wise and prudent child.
When danger comes, the Tommy
Always rushes straight to Mommy.

Sign in the Mara River

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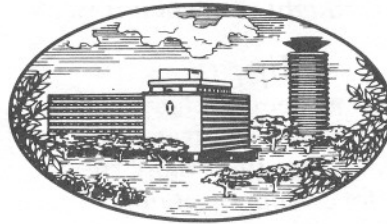
Flamingo

Go, flamingo, go
Go, flamingo, go.
You're getting bulgy
Eating algae.
Go, flamingo, go.

Lion

The painter sets his easel up.
He checks: the lighting's fine.
From past experience he knows
Just where to draw the lion.

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Counting elephants will not save them

by John Boshe

No one could reasonably deny that research has a key role to play in wildlife management and conservation, but has the time come to re-evaluate some of the financial support conservationists give to the work of scientists?

Of all of Africa's animals, the elephant is probably the species that has drawn the most attention from a world-wide community of research scientists. Hundreds of published articles, books, theses and dissertations, all dealing with different aspects of elephant ecology, are now available. And perhaps such a concentration of interest is justifiable given the economic value of the species.

It is clear from the literature that research interests in elephants have gone through a series of 'evolutionary' phases. The shifts in emphasis over the years have reflected both the fluctuations in elephant numbers, and scientists' and conservationists' perception of the threats facing the species.

Some years back, when elephants were abundant and in no way endangered, elephant trophy hunting in Africa offered one of the most thrilling experiences to European hunters, while at the same time bringing in reasonable revenues to African governments. During this period, scientific studies tended to concentrate on elephant behaviour and reproduction. This work not only provided new information for the scientific community, it also broadened hunters' knowledge of the species' behaviour and thus improved their hunting skills.

Over the last three decades or so, human population growth in Africa has resulted in an increased demand for land. This has inevitably meant a reduction in the land available for wild animals, to the point where protected areas have become 'islands' surrounded by human settlements. The confinement of animals like elephants to these ecological islands led to habitat over-utilisation and destruction, a situation that led some authorities to believe erroneously that the elephant population of Africa had increased. The attentions of researchers switched at this stage to studying elephants' interaction with their habitat and their food habits.



Arthur Christensen

... counting

In spite of these ecological changes, elephant hunting for ivory continued. In addition, illegal hunting also came on the scene as the price of ivory escalated, resulting in a continuous decline in the continent's elephant numbers. Once again, and inevitably, research interests switched to population enumeration to assess the impact of such hunting pressure on the species.

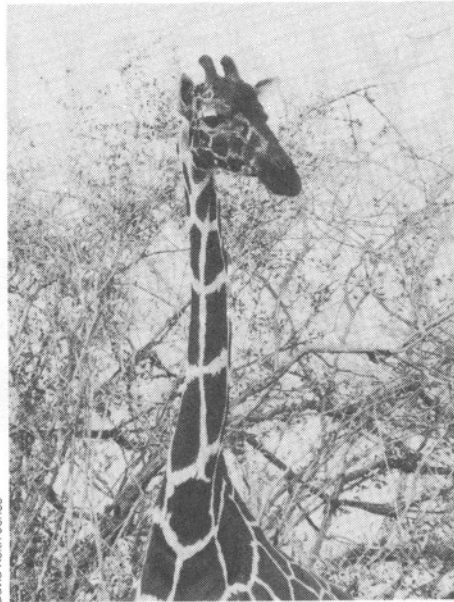
At present, some countries have restricted the authorised hunting of elephants while others have imposed a complete ban. However, the poaching of elephants and other wild animals has continued unabated so that elephant populations are now at an all time low. Against this background, the annual inventory of elephant populations in some African countries continues to receive high priority funding, and has now captured the major focus in conservation efforts within the continent.

It is evident that despite the considerable research efforts, funding and commitment that have been devoted to elephants, the species continues to decline at an alarming rate and its conservation to pose the greatest of problems and challenges. Some authorities now believe that the African elephant is on its way to extinction and that no efforts can save it. Such extreme thinking suggests that the most we can do is sit back and watch the species disappear from the face of the earth. To a conservationist, such a point of view is unnecessarily pessimistic when there is still hope and every reason to believe that the extinction of the African elephant can be prevented.

While accepting that the present status of the elephant is alarming, we should also acknowledge the efforts that have been directed across the continent towards the conservation of the species. Some governments have recently placed appreciable emphasis on elephant conservation by increasing conservation budgets, establishing and strengthening anti-poaching units, imposing more severe penalties on convicted poachers and organising special campaigns for particular species. These efforts have been augmented by assistance from rich foreign governments, some UN organisations and international conservation bodies.

Looking at all these efforts, one wonders why the species continues to become increasingly endangered.

The explanation is simple: poaching. Over the past 20 years, the number of elephants on the continent has dropped



David Keith Jones

Reticulated giraffe: another victim of poaching, now threatened with local extinction in northern Kenya.

from an estimated 1.5 million to fewer than 500,000 largely because of ivory poaching.

If this situation is to be arrested and then reversed, present conservation efforts must concentrate on anti-poaching operations. Large sums of money from both local governments and donor agencies are used each year to do research on elephants and, in particular, to count the species. At present, scientists insist on annual elephant counts in most game parks. Whenever the results of such counts are compiled, one thing is obvious with most populations: the numbers are lower than those of the previous years, and the next year's counts are expected to show a further decline. The most common explanation given for the trend is poaching. Then a list of recommendations – some of which are excellent – is made in the final report. However, when funds are next available, and in particular from a donor agency, more elephant counts are planned and conducted, and none of the previous recommendations are considered for implementation.

If annual counts of elephants are thought to be so desirable at this particular time, and continue to take the lion's share of conservation budgets, I am afraid it will not be long before we count this species to extinction.

In my opinion, the elephant can be saved if a large portion of the money now being used for research and counting were directed to anti-poaching activities. We are all aware of the limited operational capabilities of our rangers and the risks facing them out there in the bush due to their lack of adequate equipment. In addition, they are subjected to poor living conditions in a harsh environment. A large portion of both donations and the government budget for conservation should be used to provide the equipment needed for anti-poaching operations: reliable field vehicles, two-day radios, modern and automatic firearms, and uniforms. Comprehensive training and recruitment programmes for rangers and other field officers

must be given priority and funded. The social welfare of these people needs to be improved with the provision of good housing, clean water and health care. Remuneration packages should be worked out which will give them good prospects and provide an incentive to do the work well. I would strongly recommend that these uniformed and armed guardians of our wildlife, who need to be constantly on the alert for confrontations with armed gangs, should be treated just like any other part of the armed forces in terms of salaries, benefits and privileges.

I am in no way opposed to scientific research or regular surveys of wildlife populations. We need such information to demonstrate trends over a period of time and hence formulate appropriate conservation and management strategies. But given the present situation, continued annual surveys of elephant populations will deplete the limited resources that could otherwise have been used to save them. Conservation strategies for the African elephant must now focus on the single decimating factor – poaching – or else we will simply be compiling information that will be used to write a history of a once abundant but then extinct species.

Together with this appeal to spend more on anti-poaching and less on research and population surveys, there is also a need to look more deeply into the entire question of poaching. At the moment, poachers once arrested are prosecuted as individuals. In reality, poachers do not operate singly, and several other figures behind the scenes, who are often key members of the operation, from the initial planning stage to the final selling of the ivory, are neither investigated nor subjected to judicial proceedings. These people include reconnaissance scouts, who often come from within the local communities or among the game staff themselves, the actual poachers, the transporters of the ivory, the key middlemen who smuggle the ivory out of the country and the final overseas buyers.

If poaching is to be eradicated, then anti-poaching efforts must also aim to bring these people to book. Wardens and rangers alone cannot achieve this. Other government departments have to be involved, such as the general police force, the criminal investigations department, the judiciary, customs and excise, the intelligence services and the general public. If our anti-poaching efforts capture the 'artillerymen' of the enemy in this war, then their 'infantry' will be paralysed, and we will have won the battle.

The statements in this article are solely the responsibility of the author and do not necessarily reflect the opinions or policies of the WWF.

John I. Boshe did his first degree at the University of British Columbia, Canada and then an MSc in wildlife sciences at New Mexico State University, USA. From 1978 he lectured at the College of African Wildlife Management, Mweka, on wildlife management techniques and behavioural and evolutionary ecology. He was the deputy principal of the college during his last three years there, before joining the WWF Regional Office for Eastern Africa as a Programme Officer in August 1988.

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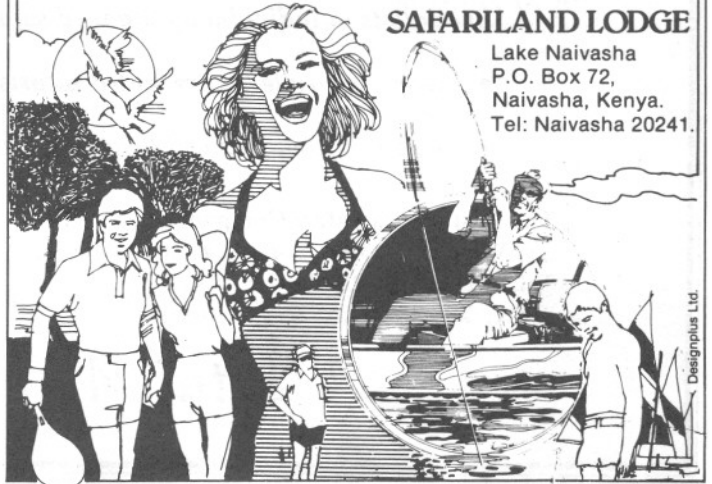
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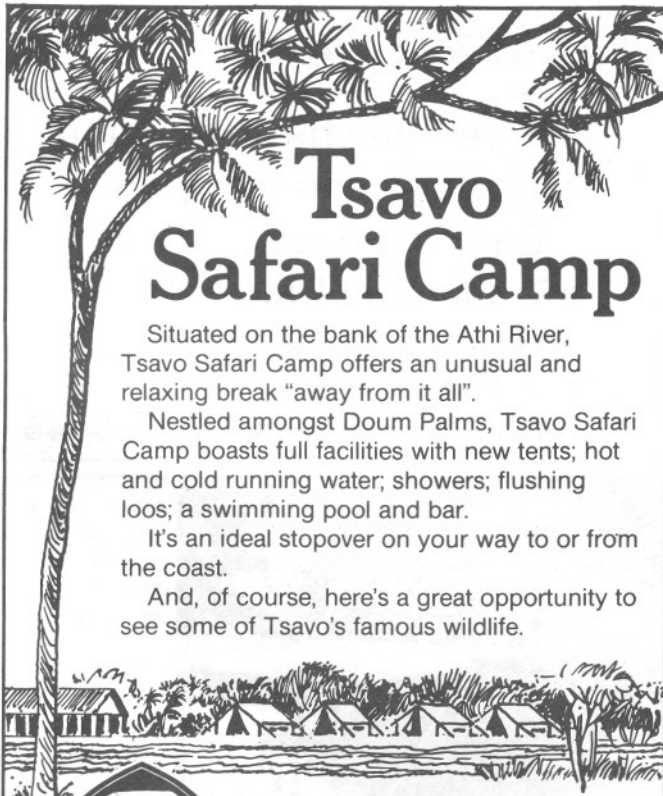
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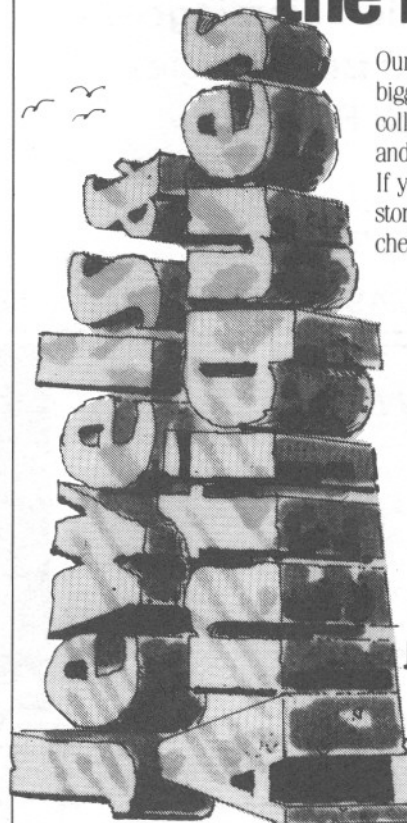
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KENYA

New director of wildlife

It was with considerable delight that the East African Wild Life Society received the news on the afternoon of 20 April that our Chairman, Dr Richard Leakey, had been appointed as the new Director of the government's Wildlife Conservation and Management Department (WCMD) by Kenya's President Daniel arap Moi.

Speaking to *Swara* in his new office a few days after his appointment, Dr Leakey said, 'I intend to get the management of our national parks on to a proper, well-organised and successful basis. This will include dealing with poaching and, equally importantly, with the abuse of national parks by thoughtless tour drivers and members of the public. I am also concerned that the body responsible for wildlife should establish itself as a useful, constructive and positive element in the development strategy of Kenya.' In a special message to the members of the East African Wild Life Society he added, 'Kenya needs your help more than ever before.'

Dr Leakey's appointment was also welcomed by the *Kenya Times*, the newspaper of the governing party, the Kenya African National Union. 'The great news is that President Moi, whose concern for our animals – for their tourism as well as ecological value – must have been growing very rapidly of late, has this week appointed the chief critic of the Game Department (WCMD) to be its chief custodian.'

In the same editorial they recognised, however, the size of the task before Dr Leakey. 'What can one man – however committed he is – achieve in the face of a bureaucratic machine which has been in place for a protracted period of time? . . . Dr Leakey may, therefore, find himself in an embarrassing situation. Unless the more committed members of the entire Ministry (of Tourism and Wildlife) – and, indeed, of the Cabinet and the President's Office itself – make a conscious daily effort to help him overhaul the Department by getting rid of bad elements, appointing more patriotic cadres and revamping the entire system, he may yet come a cropper. At least, however, Dr Leakey has the dedication necessary for a serious start on making an assault on those who would deprive us of our national bequest from nature. . . .'

New reptile award

On the occasion of the 20th anniversary of the Wildlife Clubs of Kenya, the Gallmann Memorial Foundation announced a new award, the Emanuele Pirri-Gallmann Memorial Award for Reptile Awareness. The award will go each year to the best

artistic work on the theme of reptiles produced by a junior member of a wildlife club. The trophy will be kept by the club and the winner will receive a personal award.

The award will be presented at the same ceremony as the Emanuele Pirri-Gallmann Memorial Shield for Herpetology. This latter award was established by Michael Werikhe in 1984 to commemorate his late friend, whose interest in snakes he shared. It is awarded to the best essay on herpetology produced by a wildlife club.

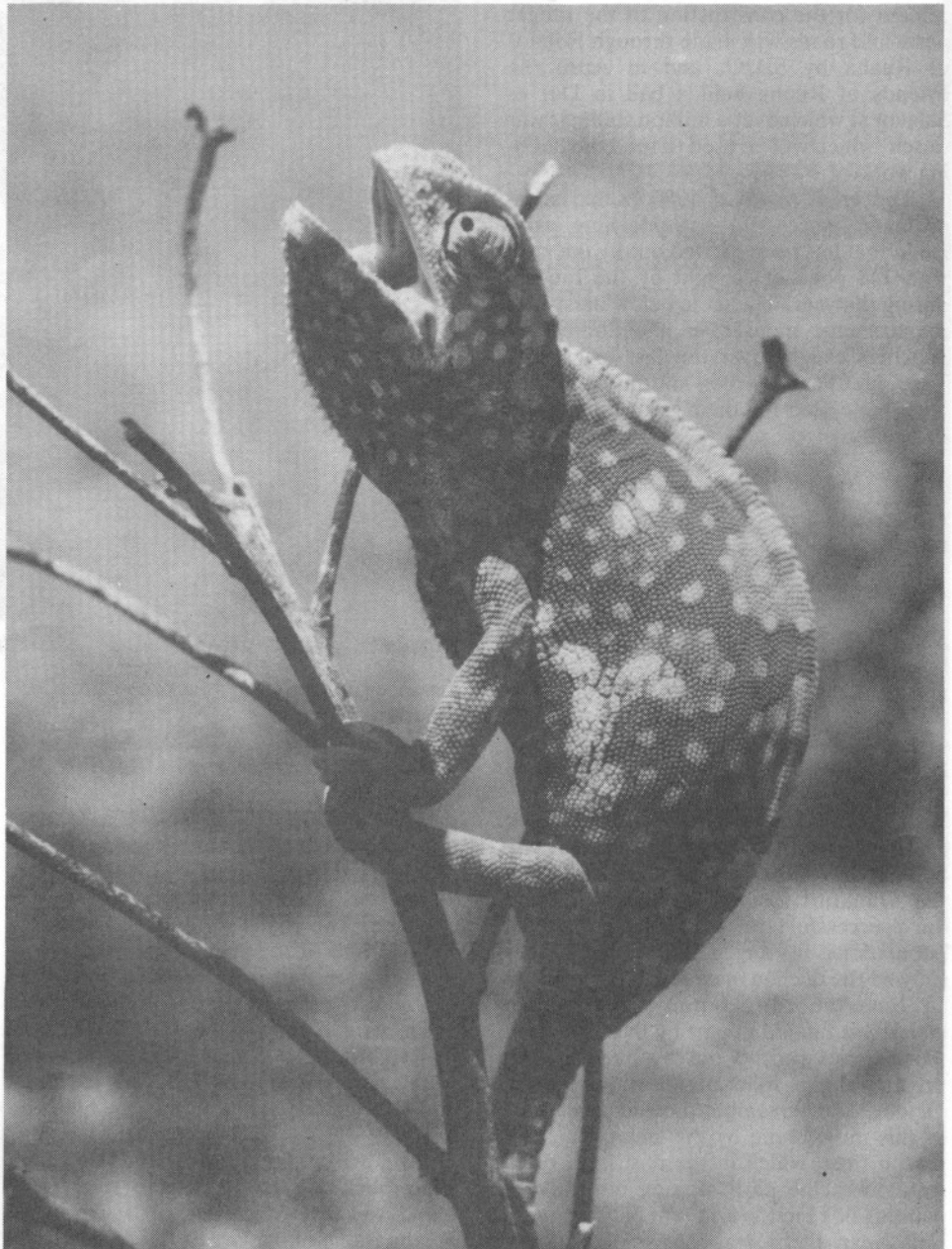
Emanuele Pirri-Gallmann was born in Italy in 1966. Interested in zoology from an early age, he was able fully to develop his passion when he moved to Kenya in 1972. Soon, he began to concentrate on snakes, which he collected and studied with total dedication. He became a familiar figure in

the Department of Herpetology at the National Museum, and although very young, was recognised as an expert in this field.

On 12 April 1983, three years after the death in an accident of his step-father Paolo, Emanuele was bitten at Ol Ari Nyiro Ranch by a puff adder, whose venom he was extracting. He died, at the age of 17.

The Gallmann Memorial Foundation is a tribute to the memory of these two men. It aims to create out of Ol Ari Nyiro a model of how the conservation of wildlife and the environment can and should be harmonised with the balanced development of natural resources within an operating and productive ranch and farm. It also promotes and sponsors environmental education and wildlife management.

Chameleon: a source of wonder to many children.



Arthur Christiansen

TANZANIA

1988 in Ruaha

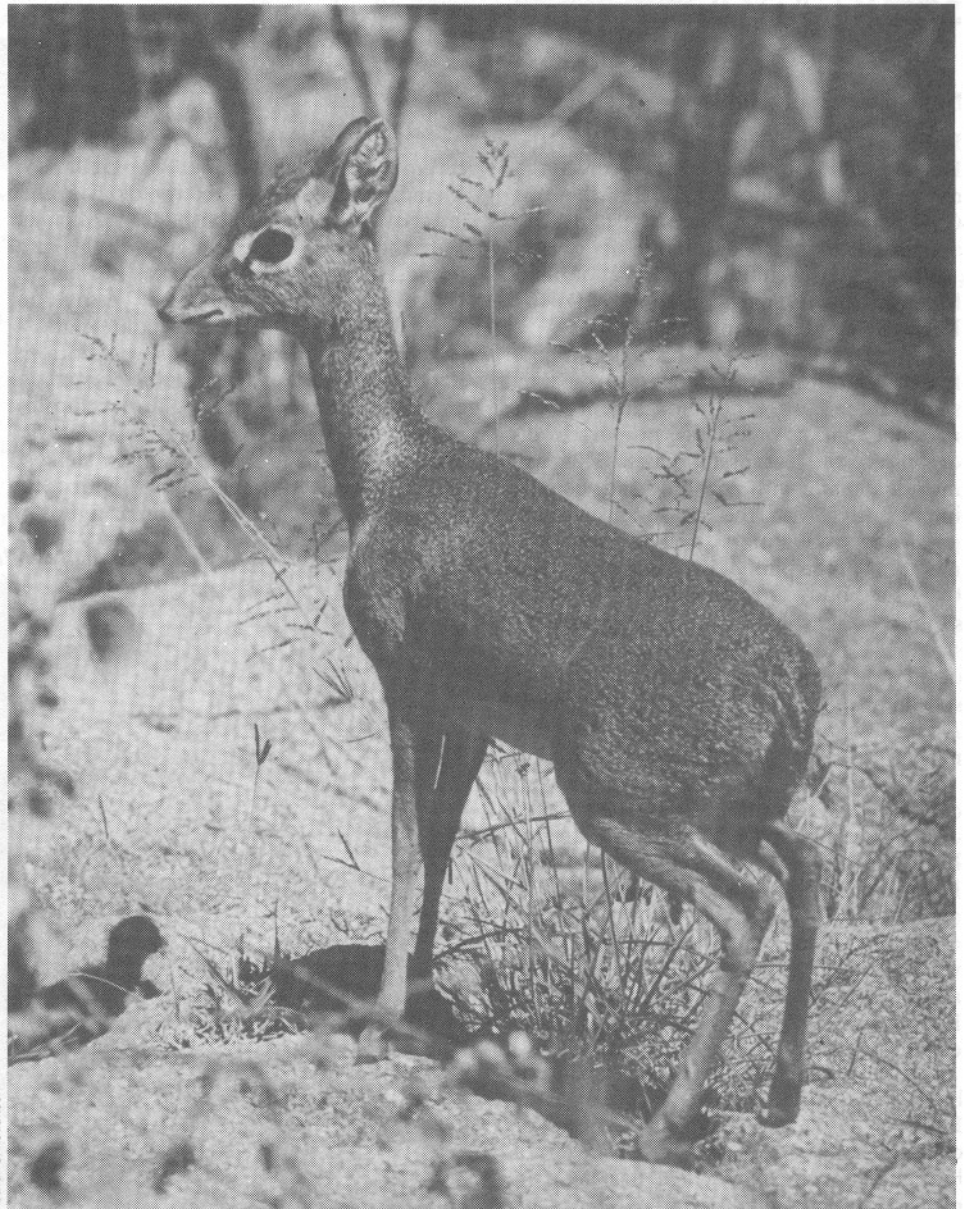
Perhaps the most predictable aspect of East African weather is its unpredictability. In 1987 it proved impossible to cross the Great Ruaha river for several months, whereas in 1988 the ferry stopped operation on 11 April and was back at work by 29. 1988 also saw the completion in November of the six pillars which will eventually support the much needed bridge across the river. Construction work was also started on the access roads to the new ranger posts at Mpululu and Lunda, with nearly 80 kilometres of road completed by the end of the year. Rocks have been collected ready for building the posts themselves and they are planned to be finished before the end of 1989. In March a donation of 600 bags of cement for the construction of the ranger posts and roads was made through Friends of Ruaha by SIDO, and in April the Friends of Ruaha held a ball in Dar es Salaam at which over a million shillings was raised, which will be used to fund the building work.

The great news of 1988 is the extraordinarily successful anti-poaching campaign that has been carried out by the park with 148 poachers caught by the rangers during the year. The table below illustrates the dramatic increase in the number of poachers caught over the last few years. The Chief Park Warden and his staff must be commended for their great efforts and dedication.

Year	1985	1986	1987	1988
Poachers caught	28	75	81	148
Poachers escaped	24	110	112	74
Fire-arms confiscated	11	32	20	133

The campaign against poaching was greatly assisted by the generous donation to the park of three Land-Rovers from the government of the United Kingdom, and a further Land-Rover from WWF to compliment the one given in 1987. Friends of Serengeti, Switzerland, also encouraged the park rangers by giving funds under their Ranger Incentive Scheme.

In May officers from TANAPA, the Serengeti Wildlife Research Institute, and the Frankfurt Zoological Society carried out a successful week-long survey of animal populations in the park, which further showed the decline in elephant population. In June the early burning programme, which was funded in part by the Friends of Ruaha, was carried out by burning fire-breaks along roads and watercourses. October and November showed the success of this programme by the lack of late dry season fires, which in the past have often resulted in the park looking like a Nash painting of a First World War battleground. This year there was no smoke in the



Arthur Christiansen

Ruaha: lucky glimpses of the usually timid dik-dik.

distance and no great blackened areas on the tourist circuits.

Tourism peaked in the dry season with 1,484 visitors during the months of July and August, and was steady through the rest of the year at about 300 a month. That is one tourist for each 43 square kilometres of the park's total area of 13,000 square kilometres, so it cannot be said to be crowded. The roads suffered a bit during the first half of the year as the grader was out of action, but it was back in operation by August so that by the end of the year the roads were in good shape.

1988 was a good year for game viewing. Many people saw lion, leopard, cheetah, and hunting dog in addition to the herds of buffalo, zebra, elephant, and impala. Giraffe are common, as are the shy kudu. Waterbuck are found by the river, and eland towards Mbagusi or Jungomero. Ruaha is one of the largest, most beautiful,

and least visited parks in East Africa. Come and see it, not only during the middle of the dry season, but also when everything is green in January, or when the grasses fruit in May, or when lightning lights up the evening sky in October and November.

Friends of Ruaha

January in Ruaha

The river was down to a trickle until the New Year, and it is only in the last few weeks that the park has become suddenly green. The animals, which have been in the hills, have now returned to near the river and are grazing in an apparent Arcadia of lush grass in a parkland of trees. Kudu stand by the road, not at all shy, and the timid dik-dik does not disappear quite as fast as usual. There are baby buffalo, baby elephant, baby zebra, baby impala, and hyena calls in the evening. Swallows dart

across the river and at night cluster together under the eaves of the bandas' at Ruaha River Camp.

With the coming of the rains all sorts of strange shaped beetles and creatures emerge to forage on the damp ground. Fresh young leaves sprouting from baobabs on the kopjes have been eaten by hyraxes, and fish are swirling in the milky stream coming off Kilimatonge. Most of the flowers are discrete, swamped by green, though the red gladiolus and white lilies add a touch of colour, and at Mwayangi the rare shrub *Peterodendron ovatum* is flowering.

The river flooded once, but is still low and there are no problems with operating the ferry, which will soon be renovated with new drums. A sudden storm and strong wind has knocked over many trees at Msembe, one of which hit the dispensary at Park Headquarters and damaged the roof. Most of the road junctions now have green and white sign posts and the main roads are in good repair. The evenings are cool, and it is surprising that there are so few visitors at this time of year when the park goes through its annual genesis.

Friends of Ruaha

UGANDA

International symposium

The Uganda Institute of Ecology is hosting its third international symposium, the theme of which will be 'Human influences on endangered wildlife species in Africa'. It will be held at the Kampala International Conference Centre from 3 to 6 December 1990, and all interested people from Africa and around the world are being encouraged to attend. For further information contact Dr Eric Edroma, P O Box 3530, Kampala, Uganda; Telegrammes: SIMBA KAMPALA; Telex: 61255 UNDP UGA; Fax: 256 41 245580.

WIDER HORIZONS

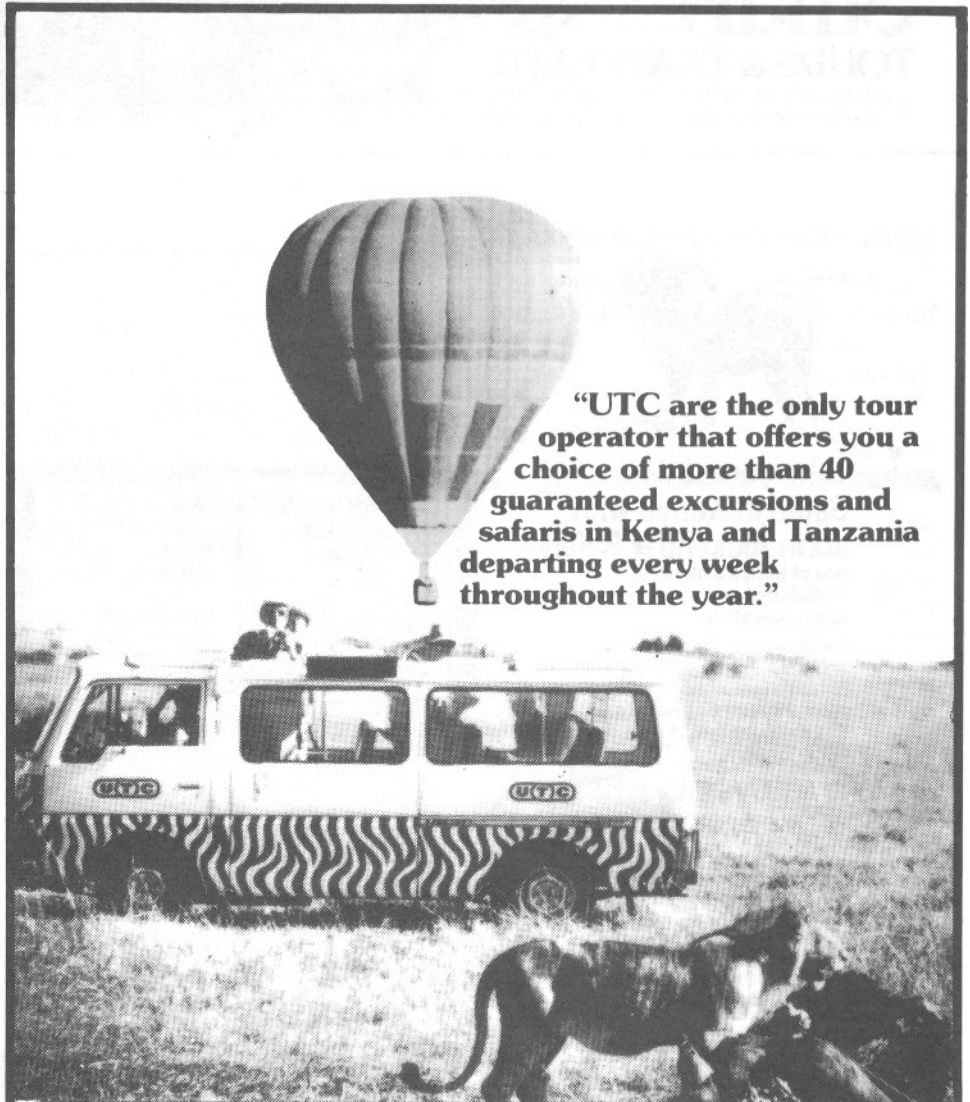
Wildlife diseases

The growing economic and cultural importance of wildlife in recent years has not been overlooked by the veterinary profession. This was why the Office Internationale des Epizooties devoted a technical item of its 56th General Session in May 1988 to the study of diseases of wildlife transmissible to domestic animals. It has now published a special issue of its journal *Scientific and Technical Review* on wildlife diseases.

The subject is extremely complex. Interaction between wild and domestic animals can take many forms. Wild species

are themselves diverse and situations vary greatly from one country to another. Furthermore, the transmission of diseases does not occur in only one direction. If the health of domestic animals in contact with wild species quite rightly gives cause for concern, so should the impact of domestic animals on wildlife. The recent decimation of seal populations by canine distemper along European coastlines offers a timely reminder of the dangers.

Without purporting to be exhaustive, this issue of the *Scientific and Technical Review* attempts to shed new light on the economic potential and utilisation of wildlife, the interaction between wild and domestic animals, and the different aspects of disease control. It is available from OIE, 12 Rue de Prony, 75017 Paris, France. ♣



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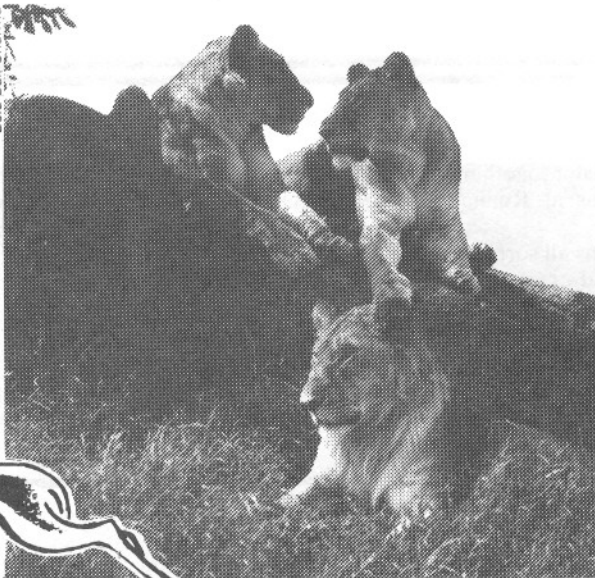
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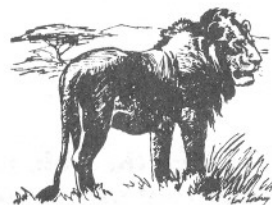
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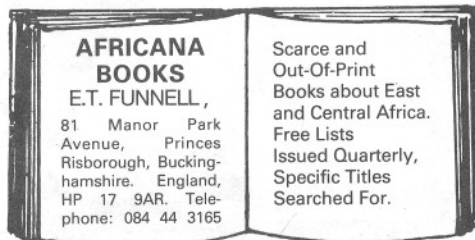
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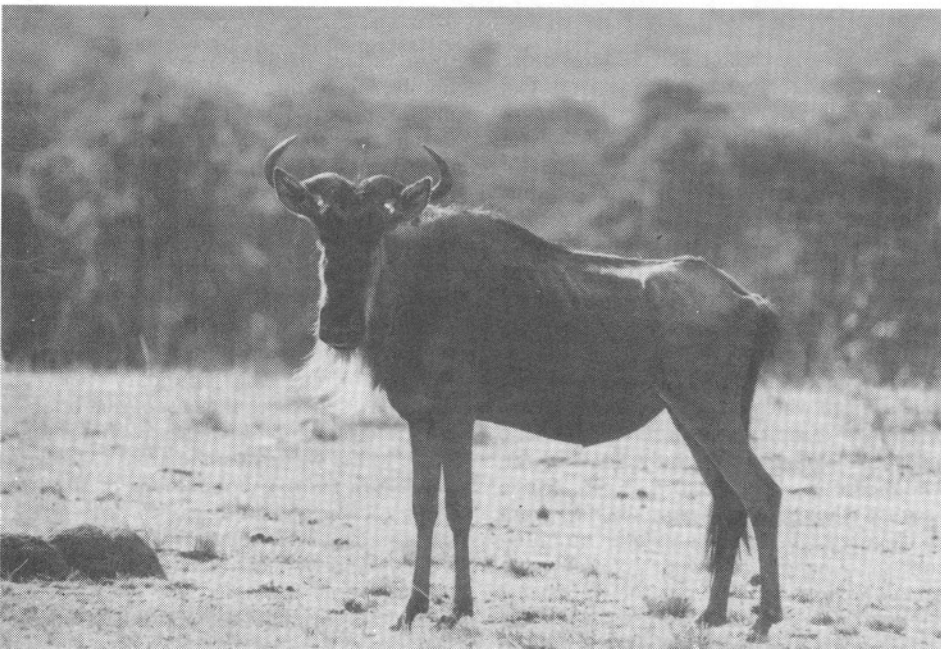
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Gnu races across the Rift Valley

by Nicholas Georgiadis and Pieter Kat



John Karmali



Johan W. Elzenga

The authors argue that successful conservation will ultimately depend not just on minimising human impact on the environment, but on knowing how to manage biological communities.

Practical conservation aims to minimise the destructive influence of humans on our environment, but there is little consensus about how this should be achieved. Many conservationists believe that humans should be the focus of conservation efforts because human activities pose the biggest threat to the environment. They stress that wilderness should be left alone and that we should trust in its capacity to manage itself. Here, we argue that this policy will not be sufficient to minimise species extinctions in the long term. Rather, extinctions will be minimised by expanding our knowledge about ecological communities, and then actively applying such knowledge through management. This will require a much more detailed understanding than we have at present, and East African reserves can contribute substantially to this learning process.

The unstable wilderness

Everyone agrees that, if left alone, wilderness can look after itself – it has been doing so for millions of years. However, wilderness is only a relative term. If defined as ‘expansive landscapes that have remained unchanged by man’, little if any real wilder-

Examples of the two races of wildebeest. Those from the area west of the Rift Valley (bottom) are smaller and darker than wildebeest east of the Rift (top). Also, western wildebeest differ in the horn shape and length of the face, and usually exhibit a distinct chevron above the eyes. Genetically, they are as distinct as species of deer.

ness remains on earth. Given that man has already changed wilderness, it follows that man has also altered its capability to manage itself, in many cases to the point of considerable instability. This is especially true of those reserves that have become islands in a sea of human development. *Even if humans are excluded from these islands*, copious evidence shows that species are invariably lost over time. Among the first to go are those, like large mobile predators, that require more space than is available. Once such keystone species are lost, the system becomes unstable.

Interventive ecological management has not yet been necessary in the larger parks and reserves in eastern Africa. In the industrial world, however, an environmental free-for-all has resulted in an environment so modified that conservation more often entails *reclaiming* wilderness and *reconstructing* ecosystems, for example from the ravages of strip mining and acid rain. Reconstruction demands not only vast sums of money, but also a knowledge of how ecosystems work. Conservationists are thus increasingly challenged by a need, as opposed to a wish, to know how ecosystems function – the important difference being that it matters increasingly when wrong decisions are made.

Ideally, conservation biologists must learn how to manage remnant ecosystems so that they function almost as if they are intact. This is a tall order, but a great deal can be learned by comparing the dynamic properties of intact ecosystems with those of remnant ecosystems. East Africa can contribute much to the learning process because relatively intact ecosystems still persist there (e.g. the Mara-Serengeti and Tsavo), as well as remnants of ecosystems that have now become man-made islands (e.g. Nakuru and the Usambaras), and yet others that are in the transition between those extremes (e.g. Tarangire and Nairobi). Studying intact ecosystems as well as the process of their transition to island ecosystems will provide crucial information for managing parks in the future.

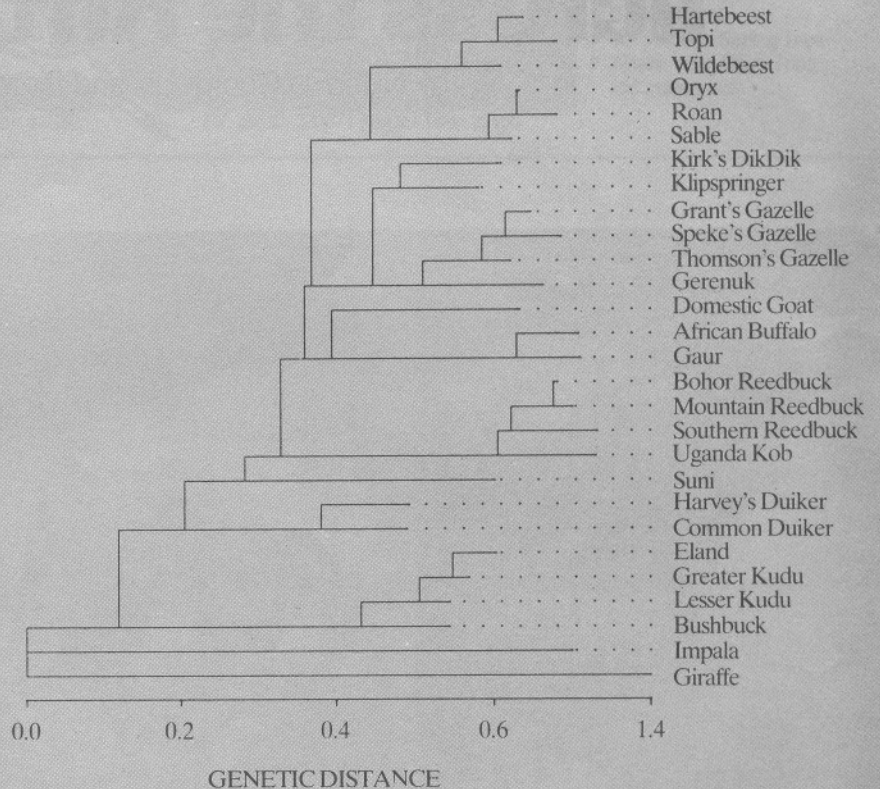
How can conservation biology contribute?

A laboratory at the National Museums of Kenya, recently established by one of us, will focus on research and training in conservation biology. One project, which we are conducting with the help of two students in the lab, Hellen Oketch and Musombi Kibberenge, is prompted by a general question: Do island ecosystems occur naturally? Before man established the parks and reserves, were those areas joined into one big ecosystem, or were they already islands, centred perhaps on sources of permanent water, or isolated by geographical barriers? One way to answer this question is to estimate the extent to which animals and plants (as seeds) migrated between those areas in the past.

An evolutionary tree of the family Bovidae

Genetic studies require small samples of blood or tissue from individual animals. In the course of our work on antelope populations, we have collected samples from 27 species in the family Bovidae, which includes all the antelopes and gazelles, as well as cattle, sheep, and goats. Using the same techniques as we used in the population genetic studies, we quantified degrees of genetic distinction between these species. An evolutionary tree generated from the data suggests how the species are related to each other in an evolutionary sense.

The genetic distance between any pair of species is roughly proportional to the sum of the *horizontal* branches that connect them by the shortest route. For example, Bohor and mountain reedbuck are the closest relatives in the tree. The most distantly related species are topi and impala. Interestingly, the impala, which is the symbol of the East African Wild Life Society, is genetically the most unique of all.



Because genetic change accumulates more slowly than ecological change, we can estimate migration rates by comparing the genetic makeup of individuals of a given species in different areas. If no genetic distinctions exist, we can infer that migration has occurred in the past, resulting in genetic mixing or 'gene flow' between populations. If genetic distinctions are marked, we conclude that migration has not occurred, and that the areas can be seen as natural islands.

The technique can be applied to any species from which we can obtain the blood or tissue samples required for genetic analyses. We have initially focused on wildebeest populations in East Africa because they are widespread, far from endangered, and easily sampled. Our initial analyses have revealed considerable genetic divergence between the wildebeest populations on either side of the Rift Valley. These distinctions are equivalent to

those found *between species* in the deer family, suggesting that there has been no migration between those wildebeest populations for thousands of generations. If there continues to be no migration, the two races will become different species.

Given the extent of the migration in the Serengeti-Mara, we know that wildebeest are physically capable of moving vast distances. So what limits their movements? The Serengeti and Kitengela populations represent two distinct races, with the Rift Valley forming the boundary between them. Wildebeest to the east of that boundary are larger and of paler gray colour than those to the west. In some areas (Manyara and Ngorongoro), populations of the two races occur as little as 45 km apart, separated by the western wall of the Rift Valley, and by cultivated areas (formerly forest) not suitable for wildebeest. Although we have not yet compared the genetics of those populations it is clear that

distance separating wildebeest populations is not a good measure of the amount of migration between them.

However, the fact that the Rift is much older than wildebeest as a species, and that wildebeest are found on both sides, tells us that some time in the distant past they did move across the Rift barrier; probably when climate and vegetation were totally different to what they are now. Dramatic changes in vegetation occurred throughout Africa, for example, during the ice ages. Since wildebeest have no aversion to climbing steep hills, migration between populations is not so much limited by geographic features as by their associated vegetation.

Of course, what is true of wildebeest may not be true of other species. In another project, evidence suggests that wild canid species like jackals and wild dogs exhibit little genetic differentiation over vast areas, implying that there are few barriers to their dispersal and gene flow. In contrast, social factors, such as the preference of many animals to breed within their natal population, can prevent migration in the absence of barriers.

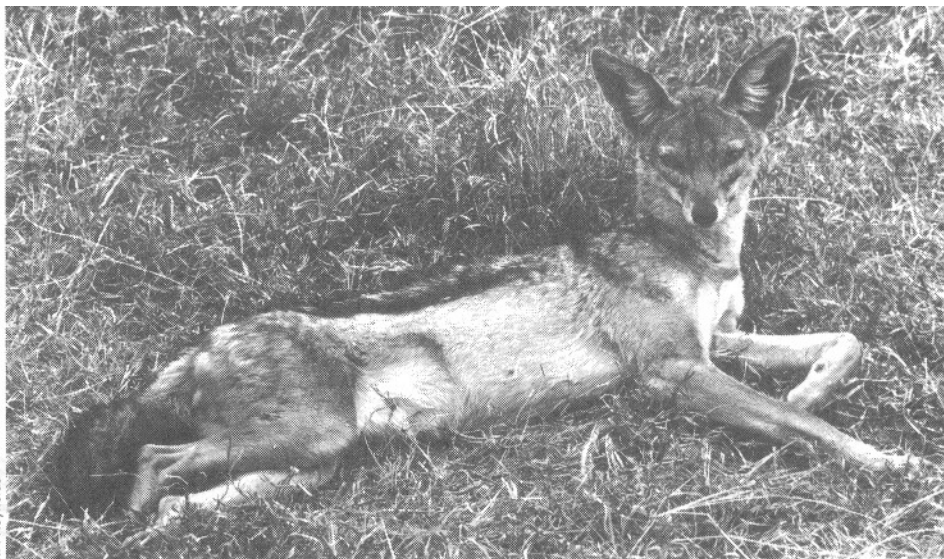
Is genetic variation necessary?

The process of studying genetic distinctions *between* populations of a given species also reveals the amount of genetic variation that exists *within* populations. Such variation, caused by subtle differences between individuals in their genetic makeup, is vital because it is precisely the raw material on which natural selection acts. Put another way, if all individuals are genetically identical, how can natural selection choose the more fit from the less fit?

Island populations are well known to lose genetic variation at increasing rates as population sizes shrink. Lack of variation limits a population's ability to adapt to changing conditions, makes it more susceptible to disease, and lowers its reproductive capacity. Future managers of island populations will need to maximise genetic variation for future survival. Just how much variation this entails is a hotly debated issue, but the current feeling is that it is not so much the amount of genetic variation, rather the rate of loss of that variation that poses the greatest threat to island populations.

An obvious first step to solving this problem is to find out how much genetic variation exists in wildlife populations that are relatively pristine. This information is critically lacking because few large mammal populations exist in a pristine state outside eastern Africa, and because there has been no regional facility until now to work on this problem. Yet large mammals are at greatest risk because they require the most space. Our results show that natural populations of wildebeest, topi, and hartebeest harbour low levels of genetic variability, while Thomson's gazelles contain moderate amounts compared to the mammalian norm.

By studying the genetics of individuals, populations, and species, we hope to learn



J.F. Reynolds



David Keith Jones

Studies of jackals (above) and wild dogs show little genetic variation over vast areas, suggesting that there have been few barriers to these animals' dispersal.

more about how large mammal species evolved, how their natural communities work, and how they can be conserved. An accumulation of this type of information will help determine which species have populations that naturally receive little gene flow, and thus would be better suited than others to living in island communities. It will also estimate the extent to which the island reserves of the future were island communities in the past, and where migration corridors should be maintained to permit continued exchange between communities that were originally linked.

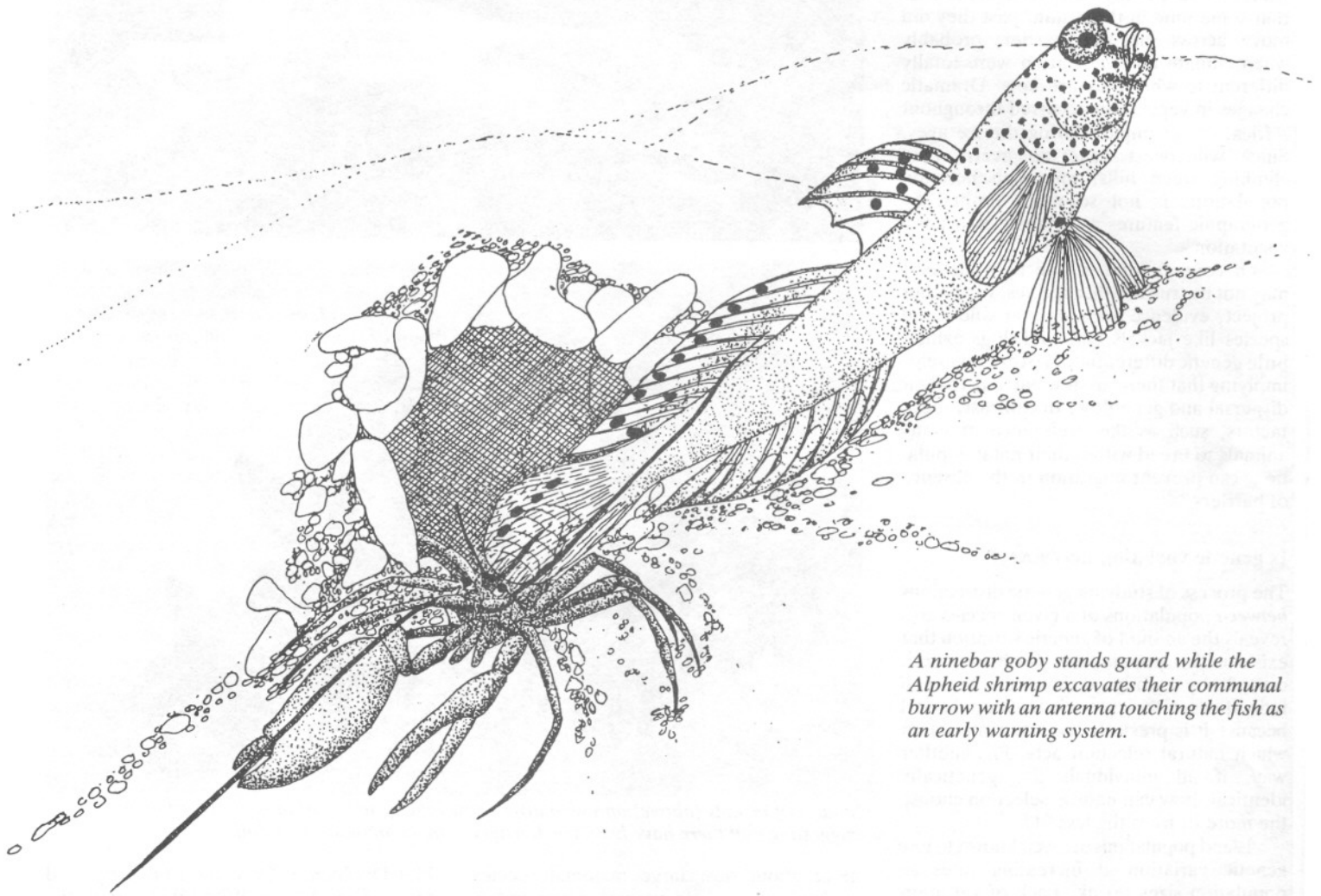
Until now, the principal management policy in East Africa's reserves has been to 'let nature take its course'. Few disagree, however, that many of the parks will have to be intensively managed in the future if they are to maintain their spectacular biological diversity. Interventive management will no doubt be accompanied by controversies and mistakes. These will be minimised by a greater understanding of how ecological communities function. Ultimately, successful conservation will depend as much on knowing how to manage biological communities as on knowing how to minimise human impact.

Acknowledgements: NG was supported by grants to Professors Sam McNaughton and

Phil Dunham at Syracuse University, and by the East African Wild Life Society. We would like to thank Kareem Hirji, David Hopcraft, John Richardson, Robin Hurt, the Tanzania Wildlife Corporation, the warden and anti-poaching unit of the Serengeti National Park, and many others for bovid samples.

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.

Dr Pieter Kat was born in Singapore and spent most of his early years in south-east Asia. He received his university education in the United States, culminating in a PhD in evolution and ecology from Johns Hopkins University in 1983. He arrived in Kenya in 1984 to establish the Malacology Section of the National Museum, and was funded by the US National Science Foundation to study the evolutionary relationships among mollusc faunas of the African great lakes. He established the Genetics Section in 1986. Current research projects include genetics and diseases of jackals and wild dogs, evolutionary relationships and population genetics of African bovids, genetics of vectors of trypanosomiasis and bilharzia, and evolution of the endemic snail fauna of Lake Tanganyika.



A ninebar goby stands guard while the Alpheid shrimp excavates their communal burrow with an antenna touching the fish as an early warning system.

Living together

Story, drawings and photographs by Brian Maudsley

In the rich and varied world of a coral reef, living together can give two very different creatures the extra benefit that enables each of them to survive.

'Nature, red in tooth and claw'; the struggle for survival; survival of the fittest. Such phrases conjure up a picture of strife and death, each organism fighting for its own little patch of living space. The tranquility of a reef is deceptive; there is no leeway for the slightest mistake. An injured fish transmitting its distress through erratic vibrations, is rapidly torn apart by predators; a nocturnal brittle star, revealed by over-turning a pebble, is devoured in seconds. Yet there are also many organisms which live together in mutual harmony, often totally dependant on each other and united against all-comers. These close relationships are collectively known as symbioses, with the most intimate being mutualistic.

Coral reefs have more organisms on, in and above every square metre than any other habitat in the world, the only other

contender for such richness and variety being tropical rain forests. This is easy to believe when visiting the seaward edge of any Kenyan reef. Off Diani, should the Indian Ocean rollers allow a safe entry, it is nearly impossible to find any unoccupied space, and even apparently bare rock will be covered by microscopic diatoms and bacteria. This dense cover stretches down as far as the eye can see into the deep blue depths, so it is not surprising that there should be a correspondingly high number of symbiotic relationships. Any advantage that can be gained, however small, may be of crucial importance for survival, and living together can be mutually beneficial to both partners.

Hard corals, which are basically animals, could not survive and grow to such a large size if it were not for the microscopic green algae which inhabit every polyp cell.

Under the microscope hundreds of the single celled algae can be clearly seen. These zooxanthellae carry out photosynthesis, using sunlight for energy and carbon dioxide from the sea and from coral respiration. The food they produce can be passed on to the coral as sugars and amino acids. The value of this nourishment is demonstrated by the fact that if reef building corals are shaded, they will die. The polyps do bear stinging cells, which are capable of killing small animals which are then eaten, but the importance of this method of feeding varies, depending on the species.

In return, the algae obtain shelter and minerals and a generally congenial environment in which to grow and reproduce. Fish shelter in the corals at night, especially branched ones such as the stag horn coral, *Acropora*. It has been shown that the polyps are able to take up nitrogenous substances from the fish's urine and pass them to the zooxanthellae.

The algae have another vital part to play in coral life; they are essential for the production of the calcium carbonate skeleton surrounding the delicate animals. The simplest model of how they do this suggests that as the algae take up carbon dioxide this causes the acidity of the tissues to drop. Under these alkaline conditions calcium carbonate dissolved in the sea becomes less soluble and precipitates out as tiny crystals which grow and coalesce to form the skeleton.

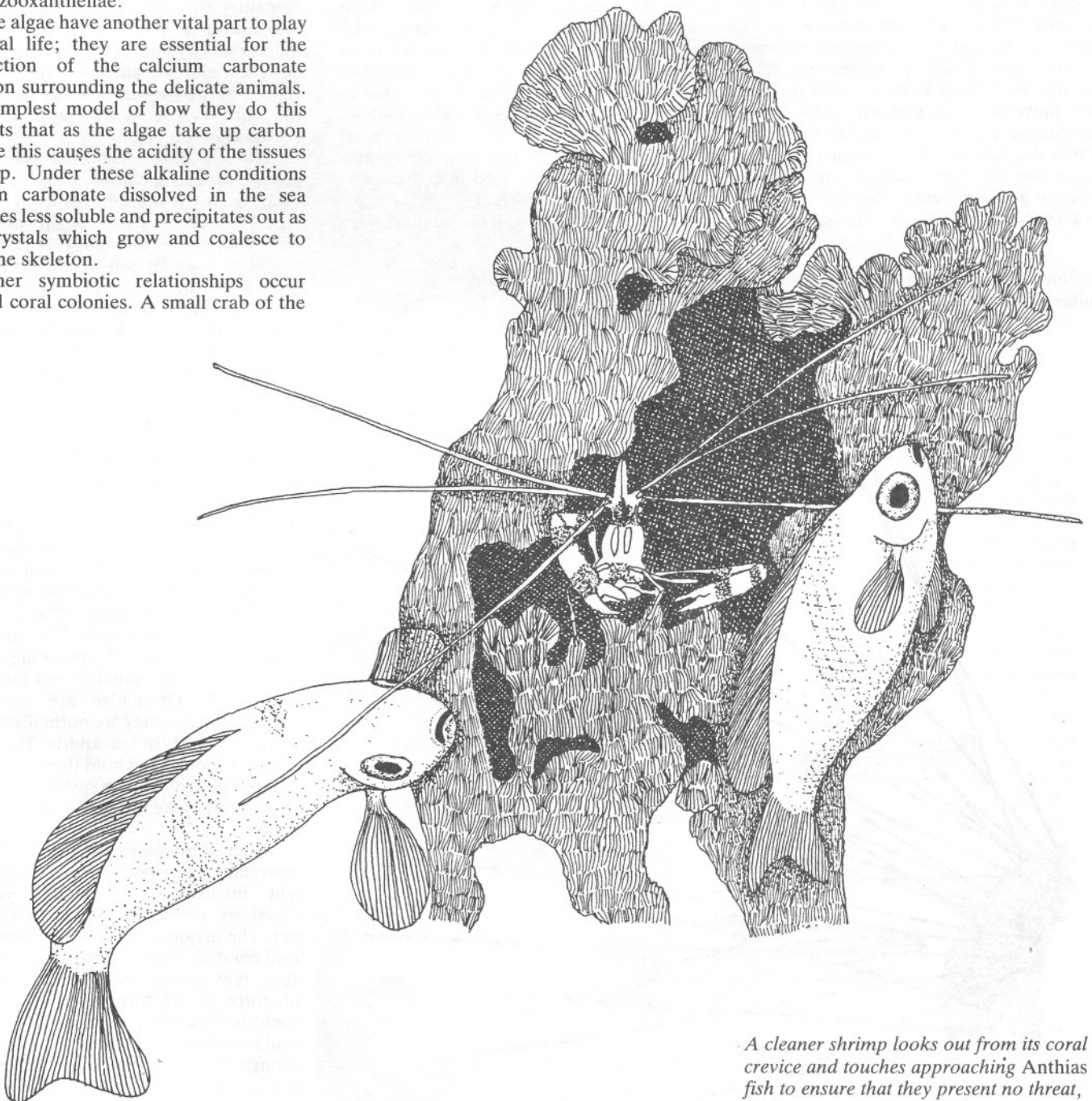
Other symbiotic relationships occur around coral colonies. A small crab of the

Trapezium species sets up its territory among the branches of *Acropora* colonies. It will protect it against all-comers, and has even been reported fighting off that devastator of Australian corals, the crown of thorns starfish, which also exists in Kenya. This illustrates the general theme of symbiosis. The crab is not being altruistic, but taking care of its own survival: it is in its interest to maintain the coral colony in a good condition as otherwise it will lose its home. Thus both organisms gain and the relationship is strengthened.

While the corals stand out and dominate the snorkeller's view, there is another less obvious animal which also relies on intracellular algae to provide it with nutrients. When walking over any reef crest at low tide, you will soon become aware of the giant clams of the *Tridacna* species. On Tiwi reef they can be seen about every 20 metres or so. Although the Kenyan species

do not reach a vast size, some on the Great Barrier reef have been reported as reaching 1.5 metres in length. Apparently, the stories about divers' legs being trapped in them are not true, as the clam would not be able to close fast enough; but the tremendous force of the muscles which hold the shells together would not tempt one to try it. They grow to a far greater size than any other shelled mollusc (some squid, which are also molluscs, are much larger). Their normal method of feeding is by filtering microscopic organisms out of the sea water but as they are competing with many other filter feeders on the reef, this does not provide enough food to allow for growth on the scale of the clam.

Their supplementary food source is indicated by their colouring, often brown, blue or green, sometimes brilliantly so, and by their habit of remaining open in the sunlight. Their cells contain large numbers of



A cleaner shrimp looks out from its coral crevice and touches approaching Anthias fish to ensure that they present no threat, before emerging to clean them.

... togetherness

algae which have a safe haven in which to grow, well provided with carbon dioxide from the clam's respiration. There is one difference between clams and corals in that clams seem to farm the algae; they digest the excess growth. This is analagous to the cellulose digesting bacteria in a cow's rumen which will eventually end up as the cow's food; or, indeed, to the cows themselves, lovingly cared for by the farmer before being slaughtered for beef.

Two reef inhabitants have set themselves up as cleaners. These are the cleaner wrasse, *Labroides dimidiatus*, and the cleaner shrimp, *Stenopus hispidus*. Both of these can be found in the lagoons (between the beach and the reef) and on the seaward side of the reef, the wrasses circling above rocky outcrops and the shrimps in crevices with only their red and white tentacles protruding. They have both evolved behaviour patterns which cause fish to come up to them and present themselves for cleaning without any kind of aggression. The shrimps wave their tentacles with distinctive movements and gently tickle their customers, a sort of crustacean massage. When the fish is suitably passive and no aggression has been noticed, the shrimp emerges and commences cleaning. Cleaner wrasses have been seen entering mouths

and gill cavities of even the fiercely carnivorous groupers, the gill covers being obligingly lifted to make the job easier.

Wrasses set up 'cleaning stations', which are often many years old. Above the station the wrasse has a particular jerky zig-zag dance to advertise its service. It will do this to an approaching human and, with care, can even be induced to start cleaning. This mainly consists of attempting to remove the leg hairs which are mistaken for a bad attack of worm-like parasites!

There is another little fish, the scale-eating blenny *Plagiotremus tapeinosoma*, that uses an underhand way of getting near its prey. It closely mimics the cleaner wrasse in appearance and behaviour and so can approach a fish, which expects to have its skin parasites removed. Instead the blenny darts in at the last moment and bites off a scale or piece of fin. The closeness of the mimicry indicates that cleaner wrasses must have been around for a very long time to make copying them worthwhile. There must also be a limit to the number of scale-eating blennies that can be tolerated in an area; if there were too many then fish would begin avoiding the cleaner wrasses and the blenny's strategy would be useless. These blennies can be a bit of a pest, nipping at unsuspecting snorkellers who were previously engrossed in contemplating the beauties of the reef.

In one experiment all the cleaners were

removed from part of a reef. Within a short time parasite damage was visible on many fish and not long afterwards most fish left the area only to return, weeks later, when cleaners again set up their stations. Thus they are essential to a healthy fish population and in return have their food brought to them.

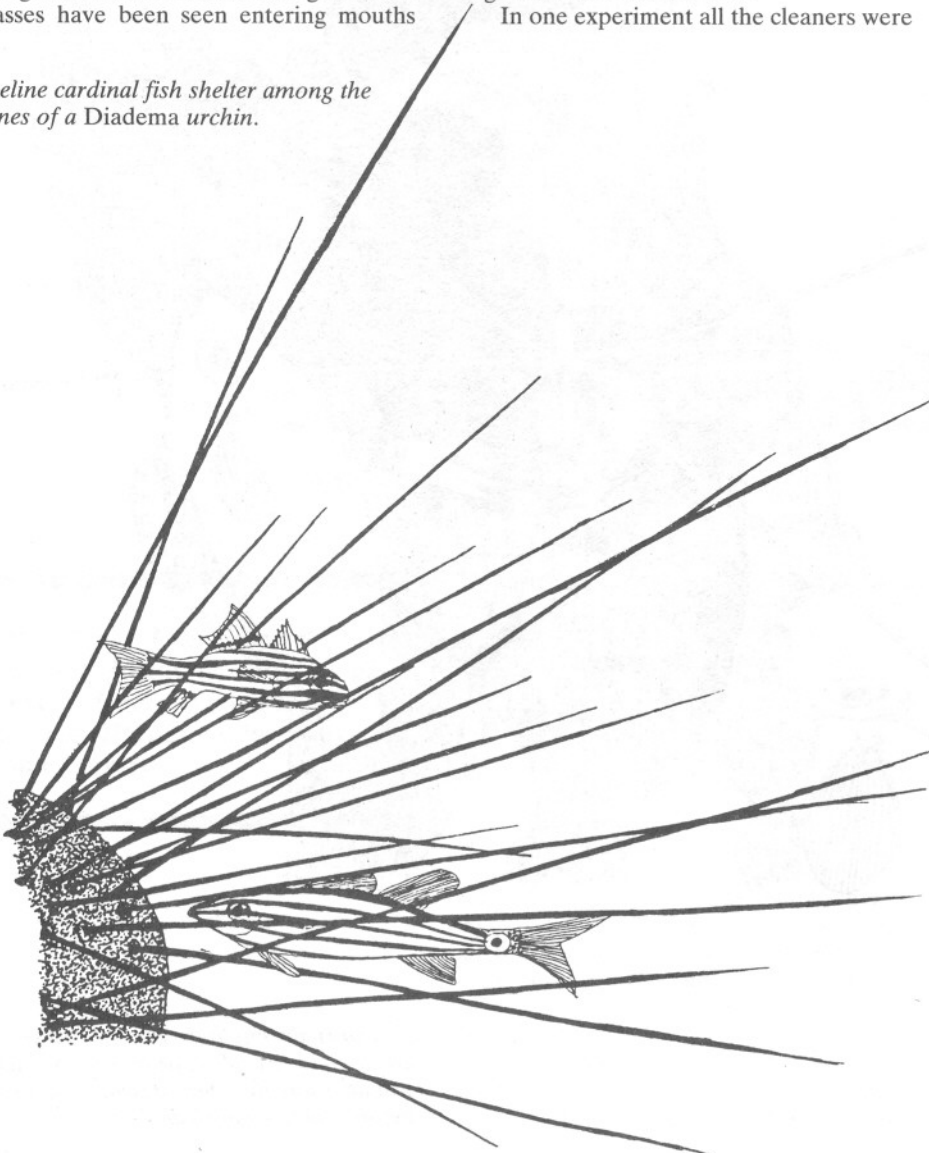
Another highly visible and very common relationship is that between the giant anemones, for example from the *Radianthus* species, and the clown fish, mainly of the *Amphiprion* species. The anemones are frequently shared by small black and white juvenile domino fish, *Dascyllus trimaculatus*, and almost transparent shrimps of the *Periclimenes* species. On any hour-long snorkel from any Kenyan beach, two or three of these associations will almost certainly be seen in the lagoon areas. Normally, sea anemones are lethal to fish. As soon as they brush against the tentacles, microscopic barbs, known as nematocysts, are fired which inject venom into the flesh. If the dose is high, death follows shortly afterwards and the fish will be taken into the anemone and digested. Clown fish, however, actually live among the tentacles and lay their eggs under the anemone on the rock.

When a clown fish first comes into contact with an anemone, it lightly brushes itself against it then moves away. This is repeated over and over again, more and more frequently. Gradually, the anemone ceases to respond and finally the fish can dive into the mass of tentacles with impunity. The fish appears to develop a layer of mucous during the touching process, which protects it. If this is wiped off artificially, the fish dives straight back into its previously safe haven and is instantly killed. The clown fish gains considerable protection. In return, it does appear to keep rubbish off the anemone's surface and there are reports of the fish actually bringing food to the anemone, although they are not above nipping off an occasional tentacle.

Hermit crabs can also be associated with anemones. *Dardanus tinctor* is in the habit of carrying *Calliactis* anemones on its shell. It will carefully lift them off and transfer them when changing shells. The anemones provide protection and camouflage, while the crab provides mobility and food. The crab family Dromiidae are known as 'sponge crabs' as they are normally covered by living sponges or sea-squirts. They select pieces of sponge and hold them in position because sponges contain spicules of silica or calcium carbonate which make them almost inedible.

Other symbioses are not so easy to appreciate. One that has recently come to light involves rather more mundane organisms, yet may be crucial to a healthy reef. The majority of reefs are mainly built from coralline algae. Without the coralline algae, reefs would quickly erode away; the full force of the waves would be free to reach the beaches and the entire coastline would resemble the large bay at Malindi (though here the corals and other reef-building organisms are killed off by the silt and fresh water of the Sabaki river). These

Fiveline cardinal fish shelter among the spines of a Diadema urchin.





David Buitron



David Buitron



David Buitron

Rhino photographed during a foot safari in Chizarira (top); a view of the Chizarira escarpment as you approach from the Zambezi (above left); and greater kudu (above right).

country near Victoria Falls.

With the exception of the two incidents in Chete, the 5,000 square kilometre protected area encompassed by Chizarira and the Chete and Chirisa Safari Areas has not yet been touched by rhino poaching. With a probable population of three or four hundred rhinos, it may in turn become truly the last stronghold of the rhino. The results of the monitoring project in the lower Zambezi will soon tell.

Conservationists concerned with the plight of the rhino are bravely trying to work out strategies that one day might allow black rhino numbers to be built up again to about 8,000 in four separate populations. But when incidents occur like the

recent butchering of the five white rhinos being guarded in the very heart of Kenya's Meru National Park, I'm willing only to hope that Zimbabwe will be able to hold its own against the corruption and greed that is allowing this kind of killing to take place. I have nothing but praise for Zimbabwe's efforts, and I wish its successes might lead to a reversal in the fortune of the black rhino, as well as other endangered wildlife, on the African continent. I still have some consolation in knowing that in Chizarira, at least, a place still exists in Africa where rhinos, as yet uninterfered with by man, continue to thrive the way they once did all over Africa. But it really is their last Garden of Eden.

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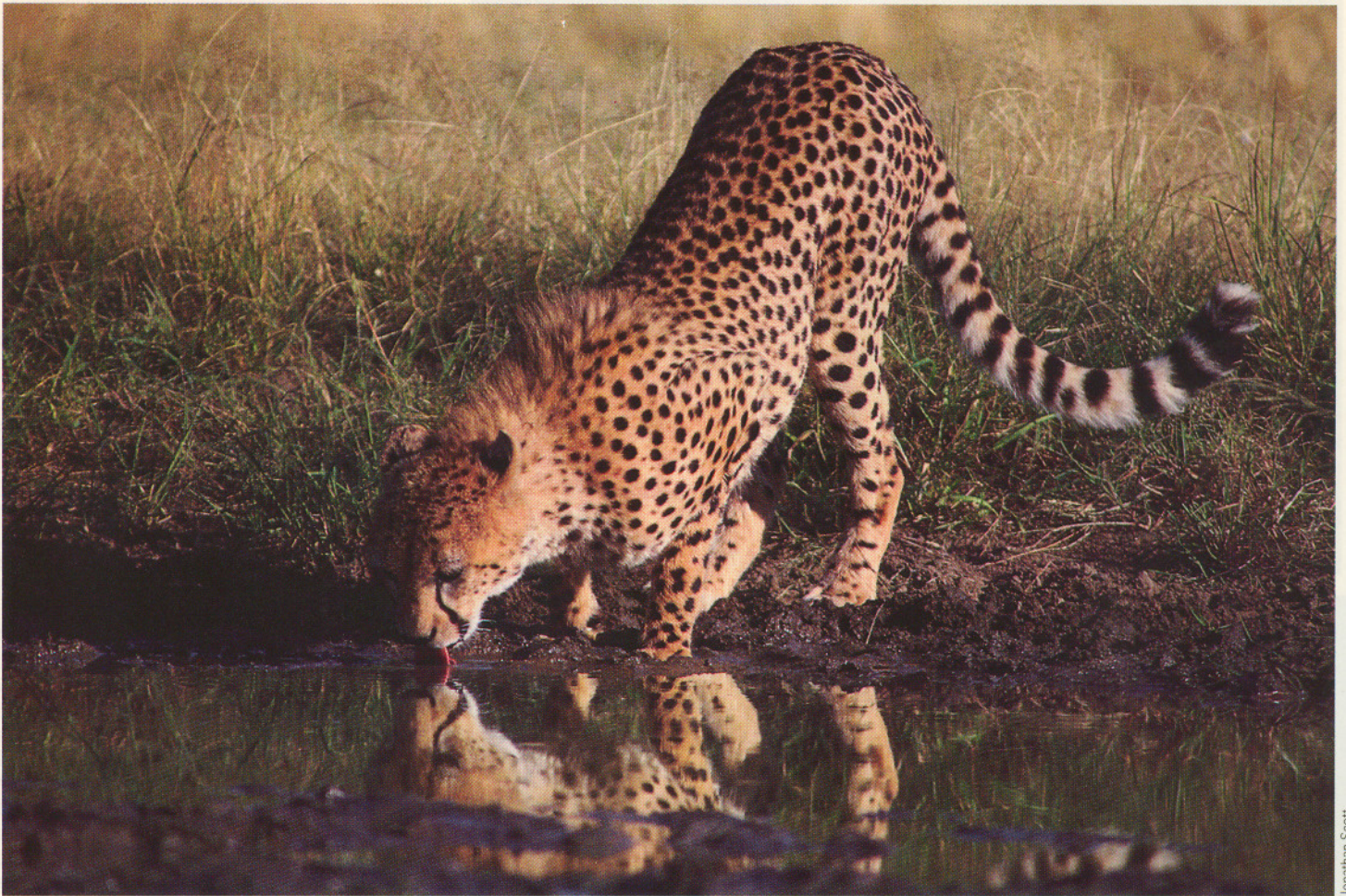
New York Times
16 Dec. 1984

Collectors items in wood by Akamba and Makonde artists, and fine batiks.



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Jonathan Scott

Cheetahs are recognised by the unique pattern of spots on their face and chest.

The Serengeti Cheetah Project

by Tim Caro and Karen Laurenson

The chances of surviving to maturity are stacked against cheetah cubs.

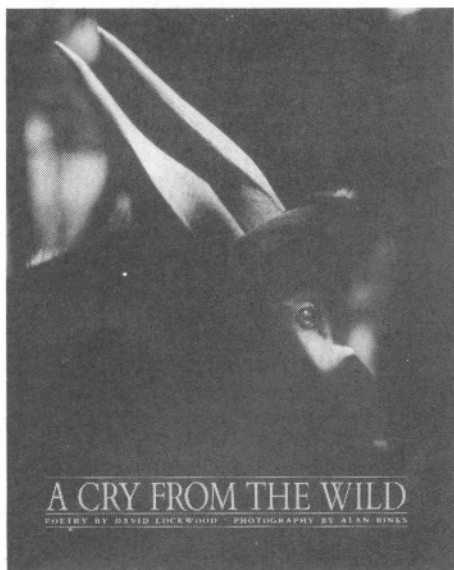


Jonathan Scott

Victims of a grass fire.



BOOK REVIEWS



A Cry from the Wild

David Lockwood and Alan Binks
Kenway Publications, Nairobi, 1989,
Ksh 395

Cosmic worlds, beware!
Man is in the air,
And will kill your kingdom
'Because it is there'.

This is the message of this unusual book – the world is in a mess because of man, the thread of life becomes ever more slender as habitats and ecosystems are destroyed and species teeter on the brink of extinction. *A Cry from the Wild* is an impassioned plea in poetic form, sensitively written by David Lockwood. Poetry may not be to everyone's taste, but environmentalists, conservationists and naturalists cannot fail to sympathise with David's words. This is an appealingly different sort of book, unique in its approach. The 'cry' has been heard many times, but not with such depth or poignant clarity. The rhino pleads: 'Give me a world where the tracks go on for ever, as on and on I circle in my span. Give me a world where I can charge for ever, and never ever see another man.'

If for any reason readers are unmoved by David's pulsating message, the photographs by Alan Binks will more than compensate. A superb portfolio this, covering all aspects of the African scene, from butterfly to beach, mountain to man, desert to decaying ruin. We see the sheer beauty of nature and the indignity of death, as the battle for survival in this shrinking world becomes more desperate. The photographs are individual gems, which marry perfectly with the accompanying verse. An appendix at the back describes each one.

Entirely produced in Kenya, the book is of a high standard, particularly the colour separations and the printing. It is a pity that the binding is so poor – my copy fell apart before I got it home. It is still beautiful though, a unique and refreshing new look

A Cry from the Wild: some of Alan Binks' photographs.

at Africa. And a wonderful, sensitive book with a powerful message. Buy it.

Jean Hartley

Kenway Publications is offering copies of *A Cry from the Wild* to EAWLS members at the special price of Ksh 375. For each copy sold, Kenway will make a donation to the Society's Conservation Fund. Copies can be bought at the Society shop or ordered by post from the Shop Manager at P O Box 20110, Nairobi. For those ordering by post, the costs (including postage and packing) are as follows:

Asia, Australia, Canada, USA & Far East – Airmail US \$61, Surface US \$28;
Europe – Airmail £30, Surface £18;
Within Kenya – Ksh 395;
Rest of Africa – Airmail only US \$45 or £27.

Key Forests for Threatened Birds in Africa

N.J. Collar and S.N. Stuart
International Council for Bird
Preservation Monograph No. 3,
Cambridge, 1988

In 1985, Nigel Collar and Simon Stuart produced the standard reference work, *Threatened Birds of Africa and Related Islands: The ICBP/IUCN Red Data Book*. This mammoth compilation recognised a total of 101 Afrotropical and Malagasy birds which, either inhabiting forest or being closely associated with it in some way, face some real risk of extinction. The authors made a point of mentioning the forests that hold more than one of these endangered species.

In this present book, Collar and Stuart have taken this analysis a step further, by identifying the forests in this region that either (a) support or are thought to support more than one endangered species, or (b) are the sole or most important strongholds of very localised species, or (c) hold one endangered and one or more near-threatened species.

This procedure leads to a list of 75 forest units which are crucial to the conservation of birds in this region – but the point is speedily made that these are not the *only* important forests at risk, rather the 'Top 75' in a list of hundreds.

This in itself would have been an interesting and useful analysis, but the authors have gone on to address a further question. Within these 75 crucial areas, which have the higher priorities for conservation and which has the highest? Where, in a world perpetually short of conservation funds, can resources best be applied in an attempt to save the greatest numbers of unique forest birds?

This problem is tackled using a priority scoring system that awards each forest a points total based on the Red Data Book categories of the threatened species that it contains. Thus a bird considered

'Endangered' earns five points, while a 'Vulnerable' one earns four, etc. The score for a species that is endemic to a single forest (e.g. Clarke's weaver in Kenya's Sokoke Forest) is doubled.

This system gives first place, the highest priority for conservation action, to the Macchabé/Bel Ombre Nature Reserve, on Mauritius. Its 64 points reflect the fact that these 36 sq km hold representatives of every threatened and/or endemic species on the island, while being actively encroached upon and degraded by such factors as cyclone damage, grubbing by feral pigs, browsing by introduced deer and invasion by introduced plants. At the other end of the scale, five forests appear least threatened, with only four points apiece.

This scoring system is inevitably subjective, and prey to all sorts of hidden biases, but it does give a very usable basic pointer to where the more serious problems lie.

Kenya's Sokoke Forest rates sixth in the list overall and second on the African mainland, with its 34 points largely reflecting the endemic Sokoke scops owl and Clarke's weaver, and other important species like the Sokoke pipit, east coast akalat, spotted ground thrush and amani sunbird. Tanzania's Usambara Mountains (30 points) and Uzungwa Mountains (29) achieve high placing (eighth and joint ninth, respectively) for similar reasons.

Three localities in southern Kenya attract distinctly fewer points: these are the lower Tana riverine forests (10, joint 37th), and the Taita Hills and south-eastern coastal forest (both 9, joint 44th). This stems from the fact that they contain but one endangered forest species, the Taita olive thrush.

The Kakamega-Nandi Forests of western Kenya, so relevant and exciting to any Kenyan conservationist or birdwatcher, achieve a mere six points and joint 56th position. This is due to the facts that they are not the special refuge of any threatened bird species and that, although important to us here in Kenya, they are merely the easternmost outposts of much larger areas of similar forest in central Africa.

The information in each forest's account is presented, true to ICBP tradition, in a very organised and easily comprehended way. The title line gives the forest's name and geographical coordinates. Then follow three standard paragraphs, the first of which deals with such fundamentals as location, topography, geology, altitude, climate, broad vegetation types, surface area and official (legal) status.

The second paragraph lists the threatened birds found in the forest, each species being followed by a letter indicating its conservation status in Collar & Stuart's Red Data Book, e.g. E for endangered, R for rare, etc. That this paragraph goes on to list other threatened or noteworthy fauna and flora in the forest – butterflies, mam-

... books

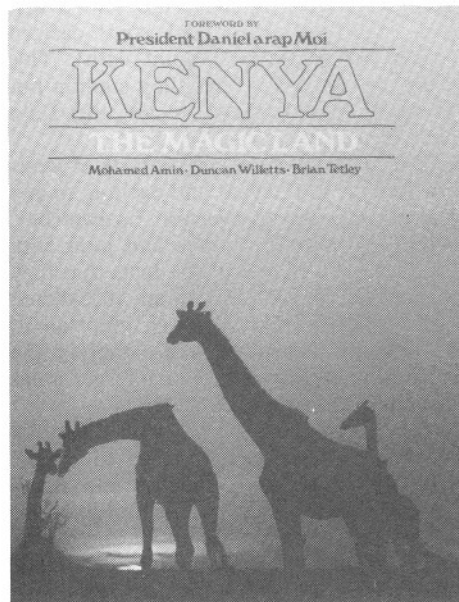
mals, snakes, frogs, wasps, snails, etc, and a host of plants – makes this excellent book doubly valuable.

The final paragraph in each account describes any factors that threaten the forest in question, together with the conservation strategies that are being implemented in the area, or which ought to be.

These accounts are crammed with precise, relevant, fully referenced data. The Kenyan sites are covered accurately and comprehensively, and it would be surprising if those from other countries are not too. The book is completed by a full bibliography. The price is not given but, judging from the costs of its two predecessors, it may be around £5-10 sterling – very good value.

Having read it through, two general impressions remain. On the one hand, here is yet another excellently produced and eminently useful book from ICBP. But on the other hand, its message is grimly clear. A continent's forests, essential both as water catchments and as the receptacles of vast biological diversity, are at risk. The threatening factors range from increasing population pressure, with its appetites for firewood, grazing land and cultivation, to such large-scale commercial interests as cash crop plantations, the quest for timber and minerals, and development for the tourist industry. The third paragraph in these accounts often makes depressing reading.

Adrian D. Lewis



Kenya: The Magic Land

Mohamed Amin, Duncan Willetts and Brian Tetley

Westlands Sundries, Nairobi, 1988, £22.50

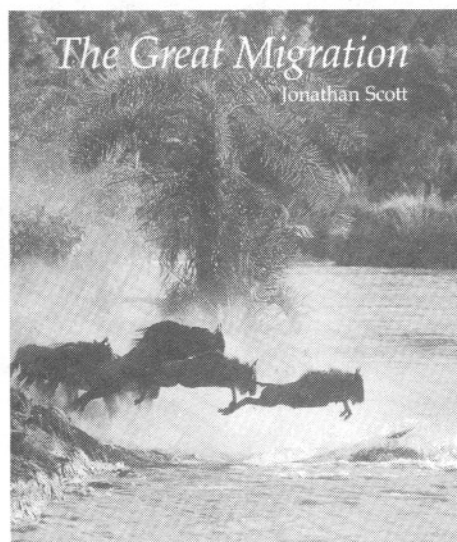
Another coffee table glossy from the Camerapix team: I had worried that this would be a repeat of *Journey through Kenya*, containing nothing new. One of my criticisms of these prolific producers of books in the past has been that they tend to try and squeeze too much extra mileage

from their photographs. Beautiful as they are, it should not be necessary to reproduce them over and over again. However, for the most part, *Kenya: The Magic Land* contains photographs not previously seen in other publications. Here we have a superb new selection of searing desert scenes, wildlife, people in ceremonial finery, dramatic aeriels and majestic buildings, which certainly do justice to the country's beauty. These photographs have been on exhibition in London to mark the country's 25 anniversary of independence, and will be returning to Kenya in April, for local exhibition.

Likewise, the text is new. Brian Tetley's supreme talent has brought us a totally different view of Kenya with no repetition, despite his several other books on the subject. The central spine of the text is the railway, with little branch lines breaking away like ribs to enter all corners of the country. With just the right amount of lyricism, the text flows through the country with the same gentle grace as the old steam trains, taking in 25 years of progress and achievement since independence as well as colourful history. Little gems appear now and then, such as the rollicking ballad about the 150 km stretch of railway from Kajiado to Magadi, and some possibly apocryphal anecdotes of some of the early settler 'characters'. Areas not actually served by rail are of course included: the far north, birthplace of man, where the bar-room atmosphere may be 'warmer than the decor'; the depths of Maasailand; the distant hills of the populous far west.

From the icy chill of the highlands to the breathless heat of the rift floor, Kenya is indeed a magic land – and this book could not portray it better.

Jean Hartley



The Great Migration

Jonathan Scott

Elm Tree Books, London, 1988

The awesome spectacle of the immense migrating herds of wildebeest, trekking across the Serengeti-Mara ecosystem every year is a subject that was crying out to be recorded in a book. Joan and Alan Root's film *The Year of the Wildebeest* was a fitting monument to this incredible event,

but a book is more easily at hand to browse through, study, enjoy and admire.

Jonathan Scott's latest book is certainly one that people will turn to again and again, not only for its quite exceptional pictures but also for the wealth of information contained in it.

The author traces the geological history of the Serengeti plains with its rocky islands jutting out of a sea of grass, the famous 'kopjes'. He also recounts the history of the Serengeti National Park from the mid-fifties when Myles Turner took up his job as warden, through the historic survey of the Grzimeks, which for the first time provided some basic information about the migration and the number of animals in the Serengeti.

In the following chapters he traces the movements and activities of the migratory nomadic wildebeest, but does much more besides. We learn about a host of other inhabitants of the plains and woodlands and about the general ecology – information interspersed with the account of the migration. We read, for instance, how the sheer number of the grazing wildebeest, by close-cropping the sward, prevents the grassland from turning into bush; how the herbivores' clipping the grass actually stimulates regrowth, partly through the grazer's saliva. He recounts the sequence of events leading to the degradation of the environment through too many tourist vehicles penetrating into bush and thicket. We learn about the extraordinary hooves and coat of the klipspringer and how the anatomy of the herbivores is linked with the type of food they consume.

In the chapter 'Life on the Plains' the author concentrates on the life of wild dogs, those pariahs that are just beginning to be acknowledged as an integral and legitimate part of the ecology. Hopefully, it is not yet too late for this much persecuted and by now heavily endangered predator.

I found the quotations at the beginning of each chapter added a lot to the quality of the book. I especially liked the eloquence of Henry Beston saying that animals are '... other nations caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth.' The author too can choose his words well. Who could resist the charm of such phrases as 'But soon the land sparkles in a new coat of glittering green' or '... owners of that rank predatory odour'?

The pen and ink drawings, done with an unusual stippled technique, are quite outstanding. My favourite is the banded mongoose family, with each animal showing a different expression and personality.

Now for the highlight of the book, the photographs. Their luminosity, clarity and wonderful light effects couldn't be bettered. Some have tremendous depth of focus, others focus sharply on the subject such as the kingfisher, floating in a sea of out-of-focus muted greens, throwing the bird into sharp relief. Although this technique is employed by many photographers, few use it with more success.

Some pictures give the impression of a painting by an old master: the scene of a moving herd of wildebeest in a golden haze

(pages 80-1) is one of them. Two other pictures I found very impressive: the flying vulture taken head-on, probably from the air. The unusual angle and the incredible sharpness of detail combine to make it unique. The other which I found unusually attractive was the picture of two klipspringers, with soft yet clear colour and crisp detail on the animals and rock. It shows very clearly the animals's unusual stance: standing on tiptoe. And lastly; even if you thought you saw every sunset picture you ever want to see, the one on pages 148-9 will still be stunning.

My criticisms? I would have welcomed a map of the original Serengeti National Park in order to follow the changing boundaries. A map of the Mara would also have been helpful for finding the many local references mentioned. Possibly the author didn't want to facilitate the locating of some of the hiding places of leopard and wild dog denning sites. Still on the subject of maps: I found the three outlines of the Serengeti (page 34) showing the direction of migration confusing. The largest one has no date but shows practically the reverse of the other two dated '1960-69' and '1969-present'. Yet it is unclear if the large one shows events before 1960 or what.

Occasionally, I wasn't quite sure what the author wanted to say. Even after re-reading such paragraphs several times I still remained in doubt. One such was on page 63, referring to the wildebeest rut, the other on page 150, mentioning Tanzania's policy on tourism.

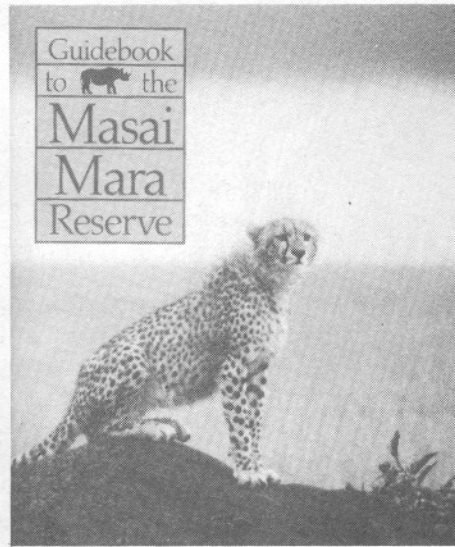
Even though I commented favourably on the author's habit of weaving ecological information into the narrative, sometimes it caused this reader to lose the thread of the story. Occasionally the continuity is too disrupted, and I had to go back several pages to see where he'd left off.

One last comment, this one of omission rather than commission. In the 'Epilogue' Jonathan Scott emphasises that local inhabitants must benefit from the parks and wildlife, but, by implication, refers only to the financial benefits from tourism. However, in the long run, as Africans become more urbanised it will be they themselves who will need and want the restorative and recreational facilities that the parks and other wild places offer; just as Western man

needs them now.

However, all these criticisms are really just minor points and do by no means detract from the general high value of this magnificent book.

Judith Rudnai



Guidebook to the Masai Mara Reserve
Alison Wilson
Friends of Conservation – Friends of Masai Mara, 1989, Ksh 120

The title of this book is rather misleading. It should really be called 'A brief ecological survey of the Masai Mara Reserve'.

It is a nicely designed book with plenty of concise, well presented information about 'the grassland community', 'the bushland community', 'the woodland community', etc. There are also excellent notes on the behaviour of some of the mammals and birds. In fact, to a great extent this book is a reflection of the author's background in biology and zoology. An innovative and attractive feature is the separate bird check-list, which fits neatly into a pocket on the inside of the back cover. Furthermore, the book is handsomely illustrated by Jonathan Scott's beautiful drawings.

A passenger riding in a tour bus should find many chapters informative and instructive. Their explanation of some of the natural processes which will be

observed will surely enhance any person's enjoyment of his trip. The grave weakness of this 'guidebook' lies in its lack of practical advice for a visitor who is travelling independently. Such a person might be disconcerted to find considerable information about an organisation called 'Friends of the Masai Mara' but none whatsoever on how, when and where to look for lions! He will probably be disappointed by the map on pages 24 and 25, which at 10 km to the inch is simply on too small a scale. (Could not a larger one have been supplied and slipped into that neat back cover pocket?) If he does try to follow the small-scale map, the incorrect siting of some public campsites may lead him into difficulties.

When the traveller turns to page 36, headed 'Notes for visitors' (one page only), will he find those notes rather superficial and lacking in the kind of detail which one would expect to find in a 'guidebook'? If he is a person accustomed to metric conversions he will already have noticed an error on page 10 where 120 mm of rainfall is said to equal 53 inches when actually it equals 47. On that same page, there are indeed some useful passages about rainfall patterns and the best season in which to see the wildebeest migration. Unfortunately, important items of that kind tend to be hidden amongst other extraneous data which may be of relatively little interest to some visitors.

I first travelled through the Mara region in 1962 and have been a regular visitor ever since. Having witnessed its almost incredible transformation from a pristine wilderness to a major tourist destination, it is surprising to me that no mention of this change is made in either the historical background or the changing landscape sections. In the historical section, there is one other extraordinary omission. No mention is made of Major Temple-Boreham, the man who more than any other individual was responsible for the establishment of the reserve, a man who was respected and trusted by the Maasai people of Narok district to the point where they accepted his advice and his vision of the future, and set aside an area for the conservation of wildlife.

Joe Cheffings 📍



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SOCIETY HIGHLIGHTS

Conservation Fund

During the last two months, the East African Wild Life Society has received donations of over Ksh 265,000 to its Conservation Fund. We are extremely grateful to everyone and in particular to Evelyn Bateman, G.G. Bonar, N.W. Bowie, Miss Stephanie Clark, Sherry Corbett, Wolfgang Doring, Egerton University Wildlife Club, Betty J. Eves, the Fauna and Flora Preservation Society – Trustees of St Kathreen's Fund, Eugene F. Ford, Ms C.D. Gabel, Peder Gronhagen, N. Hekimian, P.J. Hime, Hallam J. Koons, Michael P. Sweeney, Mrs Carol C. Waller, and Sam and Judy Yaker for their generous donations of Ksh 1,000 and over. At the request of some of the donors, certain of these donations will be channelled to specific projects.

Save the Rhino Fund

Donations worth nearly Ksh 5,000 have come into the Save the Rhino Fund over the past two months. The Society would like to thank all donors for their generosity and in particular Jeanne Higgins, who gave over Ksh 1,000.

The African Ele-Fund

The Society has received over Ksh 19,000 in support of this fund during the last two months. We would like to thank all donors, but in particular the Metropolitan Toronto Zoological Society for their handsome donation of Ksh 18,000.

Mama Safari

We have received a donation of Ksh 1,275 in memory of the late Nanette Benson, who was popularly known as Mama Safari. She worked very hard for conservation and had a particular love for Africa. Our sincere gratitude goes to Betty Eves, who made the donation to help further the works and ideals of her late friend.

International Association of Agricultural Students

The association will be holding its third congress in Kenya during July this year, with delegates expected from all round the world. The Society has given the congress Ksh 30,000 towards its expenses. When the Society's Executive Director presented the cheque to the conference organisers, he pointed out that the conflicts between agriculture and wildlife were much exaggerated. In fact, conservationists and agriculturalists had many problems in common, such as deforestation, desertification, pollution and soil erosion. He hoped that the money from the Society would be put to good use, supporting sessions where the students would make recommendations as to how these common problems could be overcome.



Michael Werikhe receiving a donation of Kshs 5,500 raised by the Egerton University Wildlife Club.

Michael Werikhe wins award

It was with great pleasure that the Society received the news from the Executive Director of the United Nations Environment Programme that Michael Werikhe, Kenya's Rhino Man, is to be named to the Global 500 roll of honour. The ceremony will take place in Brussels on 5 June, World Environment Day 1989, on an occasion where the world community will pay official tribute to Michael's outstanding environmental work.

The greater honeyguide

The Society has agreed to fund Dr Hussein Adan Isack, head of the Department of Ornithology in the National Museums of Kenya, to do further research on the greater honeyguide. The Ksh 54,740 will be used to fund a one-year study in three different parts of Kenya which will examine how honeyguides have had to modify their behaviour because of increased human habituation and resultant environmental changes. As many readers will know, the greater honeyguide, alone among the 18 subspecies of honeyguides, has for centuries guided honey hunters to bee colonies.

Medicinal plants

The Society has given a grant to Catherine Githinji to support research she is doing

into the plant family Labiatae, as part of the requirements for an MSc degree at the University of Nairobi. Several plants in this family have long been used in traditional medicine and others produce essential oils which are much in demand overseas, where it has become fashionable to use cosmetics with vegetable bases. The economic potential of this family is thus substantial, but in some areas these plants have been over-harvested and in others they are being threatened by the clearing of land for housing and agriculture.

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Operation Cheetah

by David Drummond

The five cubs were thought to have been born in early July 1987. Their birthplace was a well concealed outcrop of rock situated on a short lugga to the west of Rhino Ridge, overlooking the Paradise Plains.

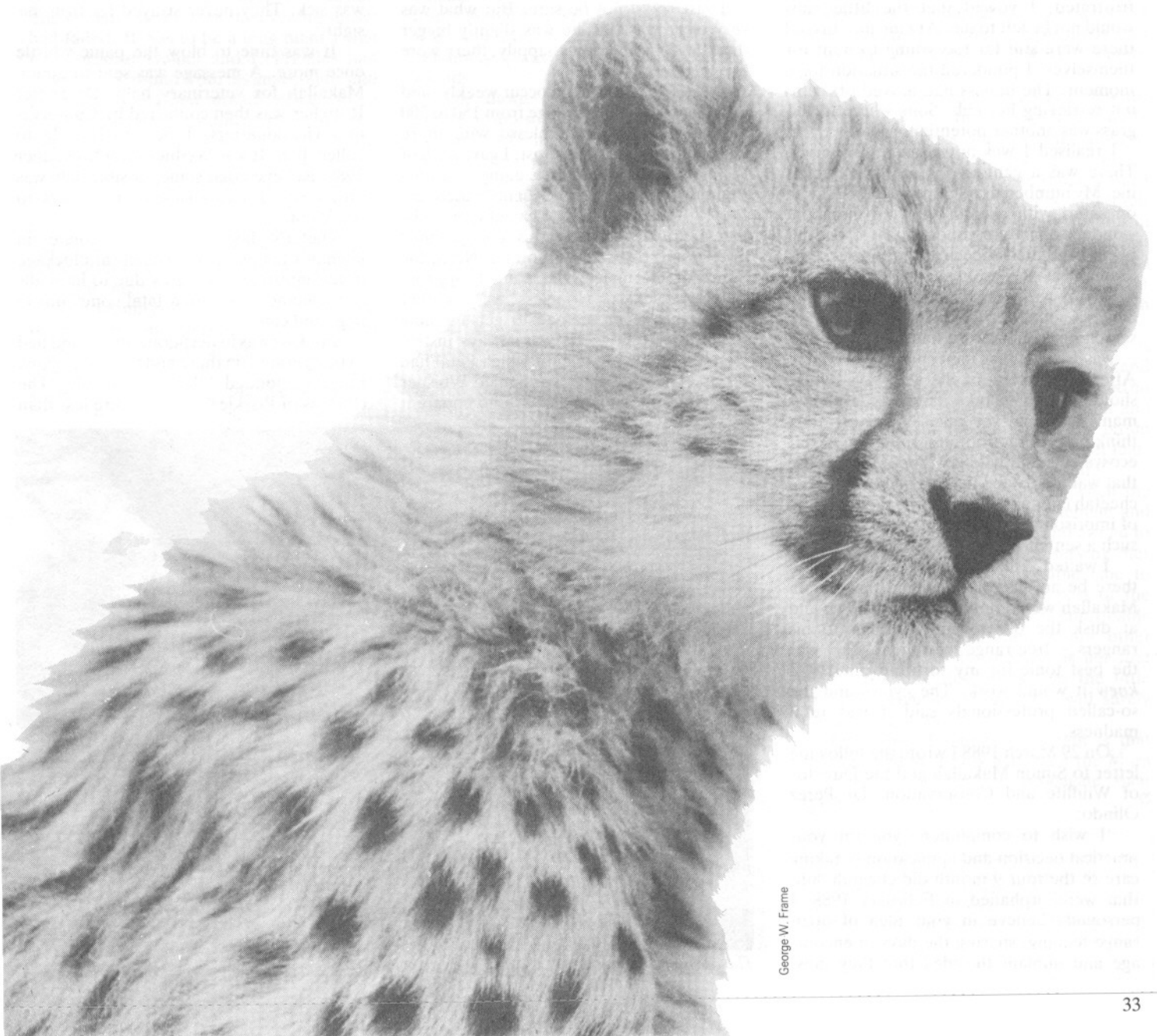
As the days and nights passed, so the mother and cubs thrived. Their lair was impenetrable and each time the mother went off far and wide to hunt, the little ones were shuttled into their hideaway, safe and secure, until she came home.

One may ask where their father was all this time. Well, like all good cheetah males, he and his brother were away pollinating other flowers in the vast territorial area

Countless visitors to the northern part of Kenya's Masai Mara National Reserve will have photographed on their game drives a family of five adult cheetah, but few will know of the drama and tragedy that lie behind their survival.

that seems to stretch from the northern Serengeti through and into every corner of the north Mara.

When the five cubs were four and a half months old, they and their mother left their home to seek out and explore the greener pastures of their 'estate'. The cubs became more adventurous, bolder and stronger as the weeks went by. The pressure of tourists did not really seem to bother them. It all looked just too good, for few cheetah mothers can boast a 100 per cent success rate when bringing up their offspring. Then the tragedy struck. At first light, in the rising mists of a dawn after a night when the



George W. Frame

... cheetah

heavens had opened, her cubs stumbled into a crouched and waiting lioness. The lioness, too, had a litter of four cubs, just a week old, and was in the process of transferring the last one to drier ground.

The mother cheetah, in her frenzy to save her cubs from certain death, leaped in front of the lioness to draw its attention away from her fleeing babes. For that momentary second her life or death plan worked, but attempting to leap away from the big cat, she slipped in the treacherous black cotton soil. It was too late by a hair's breadth: claws from the outstretched paw of the lioness sank deep into her flank, and it was all over.

I watched horror struck for I could do nothing. The stream ahead of me, and the rock-strewn bank, were impassable by Landcruiser.

There was no sign of movement from the slain cheetah mother and there was no doubt in my mind that she was dead: the lioness had bitten deep into her back and neck. As I watched, distressed and frustrated, I vowed that the little cubs would not be left to die. At nine months old there were still far too young to hunt for themselves. I pondered the situation for a moment. The lioness had moved off without retrieving her cub. Somewhere in the grass was another potential orphan.

I realised I was not alone in my grief. There was a gentle sobbing from behind me. My numbed mind remembered – I was on safari with clients, showing them the wonders of nature! Suddenly, we had all been catapulted speechless into a scene as dramatic as one could ever observe.

Word was despatched urgently to the Senior Game Warden, Simon Makallah, to search his soul. Nature had played its part – was it right that man should intervene? After all, the law of the wild says nature should be left to take its course – that is man's teaching, yet much of our off-track thinking is at the root and ruination of our ecosystems and wildlife. There were those that wanted to step in, dart and capture the cheetah cubs and then confine them to a life of imprisonment. Who are we to decide on such a sentence?

I waited. The hours dragged by. Would there be an answer? I prayed that Simon Makallah would not let the cubs down and at dusk the order came through to his rangers – free range feed them. That was the best tonic for my tortured mind – I *knew* it would work. The cynics and the so-called professionals said it was total madness.

On 29 March 1988 I wrote the following letter to Simon Makallah and the Director of Wildlife and Conservation, Dr Perez Olindo:

'I wish to compliment you on your practical decision and application in taking care of the four 9-month-old cheetah cubs that were orphaned in February 1988. I personally believe in your idea of open range feeding, spacing the days to encourage and implant the idea that they must

think about hunting for themselves, etc. My observations and encouragement are purely in support of your programme and I believe your efforts will be rewarded by a satisfactory conclusion, barring determined predator intervention. Keep up the good work.'

And so, did the cubs live happily ever after? No! What happened to No.5? One day he just disappeared. What happened to the remaining lion cub? His was the same fate: they had just vanished.

I pondered for a few months on their fates. The remaining four cheetah cubs, three males and a female, became inured to the pressures of tourist game viewing – they even explored the exterior (and sometimes, mischievously, the interior) of occupied tourist vehicles, much to the dismay and fear of the occupants. Then two months after the fateful day, cheetah No.5 joined the party! I was mystified – no cheetah could have survived two months alone in the bush at nine months of age.

I checked my video film of the original five cubs – was it *really* No. 5? The tail markings were similar but not clear enough from the video; the face, the chest markings – I just could not be sure. But what was very clear was that he was slightly bigger than the four and now, happily, there were five again.

My visits to the Mara occur weekly, and total days spent there range from 150 to 200 days a year, so I am blessed with more 'observation time' than most. I gave each of the now adult cheetahs a name – something that my mind could identify them by. Petal fitted the female. I called one of the males Prickles because his coat seemed prickly and often stood on end. No.5, the larger of the males, was named, appropriately, Hackles. Hopeless was another male, who never seemed to get anything right, poor fellow; he was always instrumental in 'blowing' a hunt which Petal had set up. The final male was named Whisper for he mouthed his calls, with no apparent

sound, although the other cheetahs could hear his call. A trip to my audiogram specialist confirmed my hearing was still above standard. It was found that Whispers was calling outside and above my human audio range.

And so the tourists had their money's worth, and the cheetahs behaved amiably and amicably. Their range began to expand to an area 40 km by 10 km. Their hunting skills improved. Petal continued as their leader and think machine. At 17 months, the boys found their puberty exciting, much to the annoyance of Petal. She must surely soon be due for her first oestrus and may well leave the 'family' any day.

But to reflect for a short while on a miracle that really did happen. I noticed Prickles was getting thin and listless. Each day he became weaker and weaker – there was something drastically wrong. I watched; I followed. We were in an area east of the Olorok Ridge, away from the normal intense daily tourist activity. The cheetahs' diet was, in the main, African hare. Prickles was not participating or eating. He was dying slowly and painfully. The four fit cheetahs realised too that Prickles was sick. They never strayed far from his sight.

It was time to blow the panic whistle once more. A message was sent to Simon Makallah for veterinary help. Dr Dieter Rottcher was then contacted by Conservation Headquarters. I flew to Nairobi to collect him. It was Wednesday 9 November 1988. Relieved that some possible help was on its way. I accompanied Dieter back to the Mara.

Dieter's diagnosis was immediate: in layman's language 'a mechanical blockage in the intestines' probably due to hairballs – a common and often fatal complaint in dogs and cats.

Prickles was in desperate straits and had to be operated on there and then. The game rangers nodded their approval. The chances of Prickles' survival were less than



The open-air operation.

50:50; infection, peritonitis and half a dozen other secondary ailments could still take his life away. Dieter set to work. The rangers and I watched fascinated: his expertise was obvious.

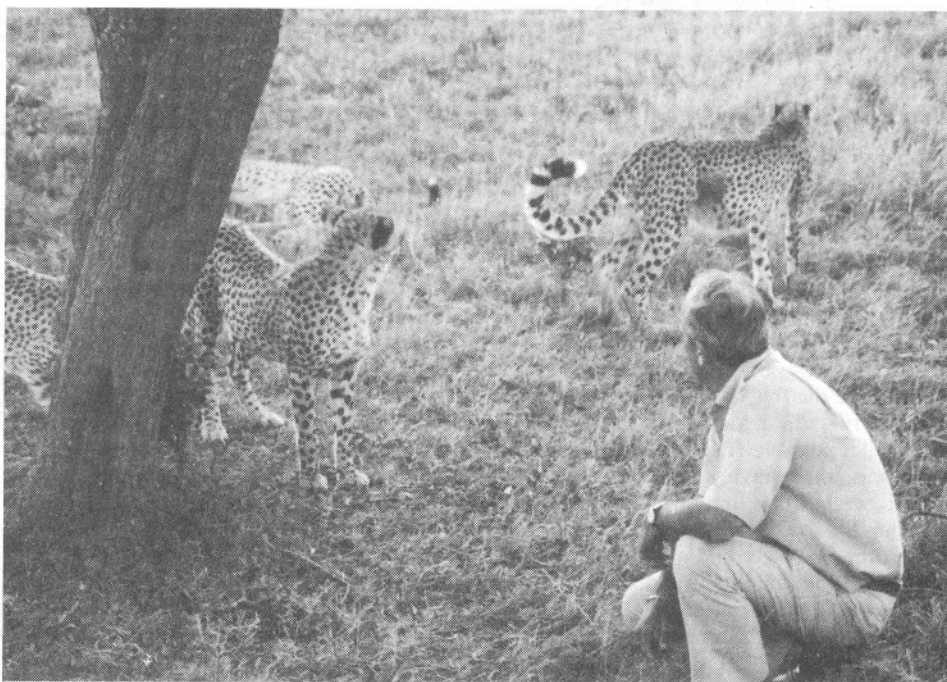
If Prickles was to survive, his post-operative care in the wilds could run into weeks. I remembered my vow; and was fully prepared to keep to it. The rangers, too, were fired with enthusiasm, so we planned the next three days and nights on a roster system.

Dieter was deep in concentration. I noticed he had hardly said a word. I checked my watch, it was two and a half hours since the first incision had been made. Storm clouds were gathering in the east. We prepared a makeshift shelter and, shortly after, the first drops heralded the approaching storm. Dieter was now stitching up and tying the final knots. Ten rock-hard hair-balls, larger than golf balls, lay beside Prickles. Dieter stood up, staggered and wiped the perspiration from his forehead – the strain of the last three hours had sapped his energy.

The storm was upon us. Dieter had to catch a 6.00 p.m. flight back to Nairobi. The golden shades from the evening sunset had faded. It was to be a long night's vigil for Corporal Daniel and I. Prickles had slowly come round from his anaesthetic and in preparation I had already placed some sacks around his body and a light rain proof canvas over him to keep in the warmth. Prickles slept fitfully and when awake occasionally called softly into the night. I sensed his companions were not too far away, and were probably camped down for the night close by. Throughout the night, a pride of lions and a hyena pack passed by on their nightly prowls. Prickles sensed their proximity but was comforted and relaxed by our presence. Our patient occasionally lapped water proffered to him from a *karai*. He was fighting for his life and I felt a sure bond developing between us. I had been totally accepted and for this I was grateful.

The dawn seemed a long way off. It was 4.00 a.m. and bitterly cold. Prickles, I sensed, was listening intently. He could hear something that I could not. I strained my ears – no, I could distinguish nothing out of the ordinary, but I knew instinctively we were not alone. Corporal Daniel was cat-napping in the Landcruiser parked some 10 feet away. Prickles, with head up, was peering groggily into the dark a few feet from me. I shone my torch for a second and here, almost within touching distance, was Whispers. Prickles attempted to stand. I helped steady him. There was no doubt in my mind that Whispers had been sent to collect his brother. I was overjoyed.

The first fingers of the dawn were clawing up into the sky, and its rays provided just sufficient light for me to make out forms in the fading darkness. I tapped a signal quietly on the vehicle body and both the ranger and I peered astonished at the two outlines disappearing into the dawn light. To me it was a miracle. We followed at a distance, using night vision binoculars and there, some 50 yards away from where



Fifteen days later, Prickle's scar was still clearly visible .

Prickles had lain for his operation, were the four waiting cheetahs. Prickles was checked over and over by them, and he seemed genuinely pleased to be back with his friends.

The dawn came and went, and the family group sought refuge from the burning sun in a clump of bushes. Prickles spent most of the day sleeping off the effects of his anaesthetic and drank copious amounts of water from the *karai*. He allowed his companions to share his bowl. The heat of the day passed uneventfully, apart from a busload of noisy visitors who were ignorant of recent happenings.

The group of cheetah appeared content to settle down for the night. Meantime, a caring manager from Buffalo Camp realised our plight and brought us hot coffee, biscuits and buns – a very welcome gesture to two starving conservationists!

Everything seemed set for a quiet vigil and a night's cat-napping for me. It was Corporal Daniel's turn to keep wide awake. At midnight a pack of ten hyenas came to investigate our Landcruiser and I found my trusty fire extinguisher very handy. The hyenas took off in one direction and . . . the cheetahs in another! Prickles had steadied up remarkably and seemed capable of walking purposefully. The next hour, again with the aid of night vision binoculars, we were able to follow the group at a distance of some 50 yards without too much trouble. We covered about three kilometres to a wooded copse, and here the cheetahs stayed for the next four days, never straying too far from Prickles, whose recovery was extraordinary. The game rangers took turns to range feed the group every second day and I was relieved when Prickles took his first small meal after three days. His strength returned and their wanderings became more purposeful. The group began to hunt again, Prickles gently flexing his muscles, but not partaking in any chases; he preferred to stroll up and join the mêlée at his own pace. Fifteen days passed and the

wound appeared almost closed. The twenty or so stitches were beginning to fray and I had visions of the incision coming apart and depositing the whole of Prickles' 'plumbing' on the ground!

Dieter answered our call and flew in. He removed the stitches, applied a hefty dose of antibiotics via a syringe douche into the drain hole, and pronounced Prickles over the worst. The rangers and I were overjoyed. Tour drivers and their clients appeared from nowhere to join in our happy celebrations. I realised then just how many people who valued wildlife had been holding their fingers crossed for Prickles; it was a memorable moment, with much hand-shaking and back-slapping.

Today, as I write, Christmas 1988 is approaching, and the little family is fit and well. Prickles and Whispers have formed an inseparable friendship with each other and my reward is the recognition by the group of total trust and acceptance, without fear, of either Corporal Daniel or myself.

I sense the days are closing when the group will split up. Petal, the female and 'chief cook', will soon depart and attend to her natural instincts of preserving her species. Here will lie a possible clue to No.5, Hackles. Was he ever part of the original 'family'? If he was, it is improbable that Petal will choose him, or any other male members of the family, as her first mate. The next few weeks, as the little group approaches 18 months, will surely tell another story.

One thing I know for certain is that Prickles and Whispers will roam the Mara together as brothers to propagate their species.

Captain David Drummond was born in Kenya, the son of a cattle rancher. He is an active and outspoken conservationist who has perfected an uncanny affinity with wild animals. He gives much of his personal time and money to conservation and wildlife projects in Kenya, in particular to the David Sheldrick Wildlife Appeal.

LETTERS

From J.F. Chapman, Beckenham, UK

I have been meaning to write ever since I read the article in the September/October 1988 issue of *Swara* about a game drive in the Masai Mara. It was interesting to contrast the frenetic pace of the writer's drive with my own experiences in 1988. Granted that I had visited Kenya before — as I expect have many other visitors to the Mara — and so perhaps there was less pressure to see the 'big five', although clearly I, and the rest of my party, still wanted to see them all if possible. The main advantage we had was that having planned our own safari, we had the luxury of time to spend looking for the 'big five', but not having so little time that we could not appreciate and follow up the delights that chance and our own group's eyes spotted.

Most package tours seem to spend only two nights in the Mara, so at most they would get four, and more likely only three, game drives. The same rule also generally applies to Samburu and Meru. In my view this puts the driver under unnecessary pressure to find the 'five' in very little time. One solution might be to increase the minimum stay for package tours in such reserves as the Mara, Samburu and Meru to three nights, giving either five or six game drives and reducing the pressure on the drivers. In this way more responsible attitudes could be engendered.

It would also help if all visitors were issued with a copy of the park rules on arrival. Responsible tourists could then insist on their driver following the rules if any irresponsible attitude was noticed, and a responsible driver could point to the rules when pressured by irresponsible clients.

From A.M. Bataamba and A. B. Otim, Makerere University, Kampala, Uganda

On behalf of the Impenetrable Forest Conservation Project, we wish to correct the wrong information contained in the article 'Journey around Lake Victoria: A Traveler's Guide' by Daniel Stiles, in *Swara* November/December 1988. The WWF project operating in the Impenetrable (Bwindi) Forest is *not* involved in habituating gorillas and chimpanzees, or any other primates, for tourism. We therefore wish you to correct the wrong information and inform your readers.

From Dr Jon Lovett, Ngwazi, Tanzania

I read with interest the debate in *Swara* on elephants (see 'Letters', July/August 1988, November/December 1988, January/February 1989). I know very little about elephants, and my only claim to intimate experiences are being rather frightened of them whilst conducting vegetation surveys. However, this is not so much of a problem now, as there are a lot fewer elephants. If even I am noticing a change, then something must be happening. I have read that the elephant population of



Michael Gore/Nature Photographers

Unstriped ground squirrel: freedom to follow up the delights that chance provided.

Tanzania has declined from around 180,000 in 1977 to less than 90,000 in 1987. At say 8.5 kg a tusk, or 17 kg per elephant, then the 90,000 elephants lost would produce 1,530,000 kg of ivory. At say \$150/kilo this ivory is worth \$229,000,000 or rather over twenty two million dollars a year in the ten-year period. Thus there seems to be quite an economic incentive to exterminate elephants. This is not meat hunting by local people, or damping down of an excessive elephant population during a cyclical swing. This is big business, and I am told much of it is illegal.

That this sort of hunting will have changed the elephant population age and social structure must be beyond question. Moreover, it must have an enormous effect on the ability of any future surviving elephants to produce tusks at all as those with the best tusks will have been removed from the gene pool. This mitigates against managing elephants for legal commercial production of ivory in years to come. How long will it take for the age structure to recover? Will there need to be a breeding programme to breed tusks back into elephants?

The poaching does not appear to have stopped despite considerable attention. In Tanzania at least, arresting poachers does not seem to be a practical way of preventing elephants from being killed. Presumably, the profits are sufficiently high for poachers to chance the risk of arrest. If Tanzanian elephants are to be managed for profit or pleasure then something needs to be done fairly quickly. Perhaps the best way is by stopping or at least restricting the ivory trade (I assume it will be impossible to stop completely, unless it is by the extinction of the elephant), and the easiest way of doing this is to put the elephant on the CITES Appendix 1 at the CITES meeting in October of this year. The Wildlife Conser-

vation Society of Tanzania is calling for just such a proposal. Anyone seriously opposing such a move must have a stake in the ivory trade. As so much of the trade is illegal, then it will be interesting to see who they are.

From Dr Keith P. Martin, Victoria, BC, Canada

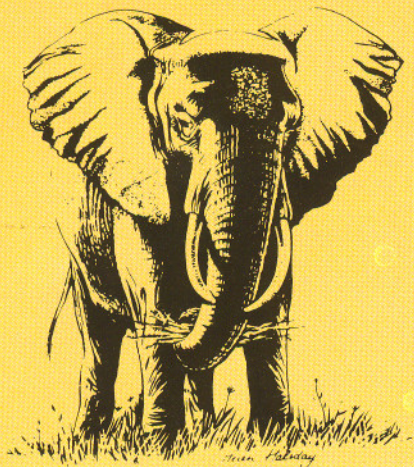
It is with great sadness that I have observed the decimation of the elephant and rhino within the borders of your beautiful country. On successive trips to Kenya in the last few years, I have noticed this first hand.

In order to curb this loss of your heritage, bold and aggressive measures will have to be taken. First, as has been suggested before by other conservationists, we must force the international community to impose a world-wide ban on the import and trafficking of products related to rhino and elephant. This can be done by marshalling the help of some of the large economic powers like the USA, EEC. They in turn can wield their social and economic levers (e.g. foreign aid) to coerce certain countries to stop dealing in these products.

Second, more money will be required to step up anti-poaching measures and for research. Also, rangers' salaries could be improved, and as an incentive this may be tied to increases in the populations of certain endangered species within their park borders. Happily, this is within the realm of the Kenya government. I propose to impose a one to two per cent tax on businesses that derive their income from tourism such as hotel chains, travel agents, etc. Perhaps this could be levied on a graded scale so as not to hurt the smaller companies. This could amount to a very large sum of money. For example, in 1987 this tax would have earned 60 to 120 million shillings. This tax, I believe, is justified considering the use that these companies get out of the resources of this country. Also, some of the money derived from this tax could be used for social/economic improvements, for the people who live around the parks. This would demonstrate to these people in a very concrete way that they too can benefit from the preservation of the parks.

Lastly, perhaps, certain areas could be designated for controlled hunting overseen by the parks department. The hunting of non-endangered species could provide significant sums of money. This, in turn, could be used for the aforementioned purposes.

I certainly hope that the government of Kenya and organisations like the EAWLS can combine efforts to preserve the wondrous gifts of nature that you have. These are a heritage not only of the Kenyan people, but of all mankind. ♣



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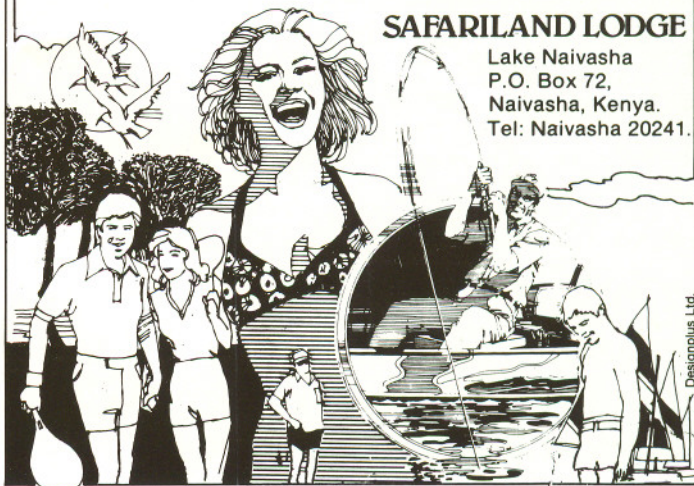
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