

1990 (3)

Hornbill



BOMBAY NATURAL HISTORY SOCIETY



COVER PICTURE

Arabian oryx (*Oryx leucoryx*), by Asad R. Rahmani

This stately desert antelope is the most endangered of the world's five species of oryx. Once found throughout much of the Arabian peninsula, it was hunted to extinction in the wild. The species is now recovering, thanks to a landmark reintroduction project in Oman and Saudi Arabia.

Highly specialised thermo-regulatory mechanisms allow the oryx to survive the combination of heat and aridity that is characteristic of its desert habitat. Normally, when high air temperatures cause an increase in body temperature, an animal cools down by an increased rate of evaporation of sweat. This would entail loss of water—which would be undesirable in such an environment. Depending on the availability of water, oryx can either sweat, or (if water is scarce) permit the body temperature to rise, even above the temperature of the surrounding air.

The brain, which is easily damaged by overheating, is protected by an unusual heat exchange mechanism. The carotid artery in the neck, which carries blood to the brain, branches into a network of vessels that pass very close to veins bearing cooler blood from the nose. The blood in the arterial vessels loses heat to that in the veins, so that blood flowing into the brain is not hot enough to cause damage.

ACKNOWLEDGEMENT

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Hornbill

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The Society was founded in 1883 for the purpose of exchanging notes and observations on zoology and exhibiting interesting specimens of animal life. Its funds are devoted to the advancement of the study of zoology and botany in the Oriental region. The Society also promotes measures for conservation of nature.

Membership is open to persons of either sex and of any nationality, proposed and recommended by one or more members of the Society; and also to persons in their official capacity, scientific societies, institutions, clubs, etc. in corporate capacity.

Members receive during a year four issues of *Hornbill*, the Society's popular publication. Life members receive, in addition, three issues of the *Journal of the Bombay Natural History Society*, now in its 87th volume.

Membership fees and subscriptions

Entrance Fees Rs 50

Subscriptions

Ordinary individual membership Rs 75

Ordinary corporate membership Rs 250

Life membership Rs 2000

Ordinary members may subscribe to the *Journal*; annual subscription Rs. 80 for members resident in India.

For membership forms and information on the Society's activities, write to:

The Honorary Secretary, Bombay Natural History Society, Shaheed Bhagat Singh Road, Bombay 400 023. Tel.: 243869, 244085

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EDITORIAL

Headlong towards disaster

Recently, a core committee of the Ministry of Environment and Forests, under the chairmanship of Dr M.S. Swaminathan, made an assessment of the appalling state of the nation. Some excerpts from the 'National Strategy for Conservation and Sustainable Development' report are given below.

Towards the end of this decade, we will have a human population of about 980 million, nearly 70 per cent of whom will be below the age of 35. This has enormous implications for the demands of infrastructure and natural resources. For example, in the next 20 years, we will have to build as many schools as were built during the entire history of India.

A growth in domesticated animal population, to nearly 500 million, has been accompanied by a loss of area under grasslands and pastures. Hardly 3.5 per cent of our geographical area is under grasslands.

At the present level of consumption of forest produce and the current productivity of forests, the country needs a minimum of 0.47 hectares of forest land for every individual. The existing forest area would, on this basis, be adequate only for a population of 150 million. The task of improving the productivity of forests and mobilizing alternative energy sources is thus urgent.

The exact extent of our land area which is degraded and needs restoration is not known, but the estimates of our wastelands vary between 55 million and 146 million hectares. We are losing 47,500 hectares of forest cover, and an estimated six million tonnes of top soil each year. A third of the country is drought-prone, and floods affect an area of around nine million hectares every year; the total area susceptible to floods has been estimated at 40 million hectares. The cost to the nation is immense.

By the year 2000, the per capita availability of arable land is likely to decline to 0.15 hectares. Much of this land is degraded, over-grazed, over-cultivated, water-logged or saline. The result of faulty land and water management practices is devastating; it threatens economic security, ecological stability and productivity.

The quality of ground water is being affected due to chemical pollution, and in coastal areas due to the ingress of sea water. The absence of a sustainable and enforceable land and water use policy for the country is taking a heavy toll on these basic natural assets.

All our major river systems and other surface water sources are severely polluted by industrial effluents, chemicals and sewage. Unsafe drinking water is one of the leading causes of diarrhoea, growth retardation and even death, especially of infants and young children. Our cities and industrial townships are shrouded in smoke, dust and harmful gases which contribute to the high incidence of respiratory and skin ailments in India.

By the next century, India will have a population of one billion, and one out of three persons will be a city-dweller. Our total annual population growth, our child population and our urban population are the largest in the world. Civic services, especially in the small and medium towns and cities, which are growing the fastest, are already under severe stress.

Our development strategies, and legal and educational systems, have not succeeded in addressing the root problems. Since independence a plethora of laws have been enacted and rules promulgated, but despite this serious problems remain.

Ecological security is too serious a matter to be left to Government alone. It is the duty and privilege of every citizen to work for a clean environment for current and future generations.

SEASHORE LORE

VII: Hitch-hikers of the Sea



BEEFSEA

*When suddenly there clave unto her keel
A little fish that men call Remora
Which stopped her course and held her by the heel
That wind nor tide could move her thence away.*

In Spenser's 'World's Vanity'

Sharks may be the monarchs of the sea, but there is one fish that makes a sucker of them—the remora or sucker fish. Go out in a boat in the harbour, and chances are that you will see one or more of them swimming near the hull. Observe one closely, and the thing that immediately impresses you is the oblong suction disc on top of the flat head. This is made up of two parallel series of transverse plates, set in a long oval frame. These plates move like the slats of a venetian blind and, when raised, create a partial vacuum. Numerous tiny spines slope backward

The illustration above shows native fishermen in the Antilles (but in European dress) using a remora to capture a manatee. From a 16th century woodcut by Conrad Gesner, based on reports of this method of fishing.

from the ridges and provide additional friction.

There are several types of sucker fishes, and the largest grow to over a metre long. They attach themselves to a variety of fish, including sharks, barracuda and sting rays, turtles, whales, floating driftwood and even boats. The remora has a black band with white borders running along its body. When it clings upside down on the back of a fish, as it often does, the usual colouration (dark on the back, white on the belly) is reversed. Its ability to thus change its colouration, coupled with the fact that it often clings upside down onto the back of a shark, gives it its sixteenth century Spanish name "Reverso" (upside down fish).

The suckers are merely energy saving mechanisms, allowing the remora to hitch a ride, somewhat like a lazy cyclist clinging to a slow moving lorry. Once attached, it can relax its muscles. The faster the shark swims, the greater the suction force. And the power of suction is tremendous. A 60 cm long sucker fish was allowed to attach to the inside of a bucket filled with water, weighing 9 kg in all. When the remora was picked up by its tail, the bucket came up along with it. (Do not carry out this experiment; it is cruel to the fish and may damage the sucking disc or even break its backbone.) However hard you may pull it backwards, you will not be able to dislodge it. Even a dead sucker fish is hard to remove from a smooth object, as long as the pull is from the rear. To remove it, push the head forward (this lowers the flanges of the sucking disc), or pinch the disc from both sides, which permits water or air to enter and equalise the pressure.

Sucker fish are not immune to being eaten by sharks. They take care not to tempt the shark by hovering near its mouth, but live sucker fish have been found inside sharks' mouths; they probably got there by going through the

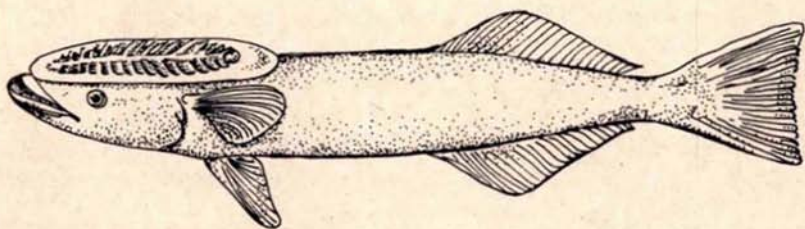
gill slits. At aquaria, a new sucker fish is introduced only after the sharks have had a meal.

The ancient Greeks and Romans were greatly impressed by the sucking power of the remora, and believed that it could slow down or even stop a moving ship. The Latin name 'Remora' means 'holding back', and the scientific name for sucker fish—*Echeneis*—comes from two Greek words meaning 'to hold back'.

Emperor Caligula's death was attributed to a sucker fish fastening onto his ship and holding it back—against the exertions of 400 oarsmen—allowing enemy ships to overtake it. When the hull was examined, there was found attached to it a remora—indisputable proof (to the sailors) that this small fish had held the galley back.

You may not believe it, but sucker fishes have been used by fishermen from India, Zanzibar, Malaya, Australia, Japan, South America and the south Pacific for catching turtles. Accounts of these 'hunting fishes', when they were first published in Europe in 1504, were not merely disbelieved, but widely ridiculed.

The method is simple. When the



Sucker fish *Echeneis naucrates*



Chinese illustration of cormorant fishing

fishermen sight a turtle, the sucking disc of a captive remora is vigorously scrubbed with dry sand to remove slime. A ring of rattan is fastened around its tail, just tight enough to prevent it from slipping off, and to this is tied a length of thin but strong cord. Weary of having been tethered in the boat, the sucker fish, as soon as it is liberated, dashes off towards the turtle, and attaches itself to its shell. The fishermen then reel in their catch—fish, line and turtle.

While on the subject of animals used for fishing, otters have been trained in the Sunderbans of Bengal to herd fish into a net. And cormorants are trained in China and Japan to catch fish. A ring made of string is tied around the lower part of the bird's neck. The cormorant can now swallow small fish, but not large ones. Up to a dozen cormorants, tied individually to leashes, are taken on a boat to the fishing ground, and then

released into the water. When a cormorant returns with a fish and gives up the catch to its owner, it is promptly rewarded with a piece of fish.

Another unique method of fishing is used by fishermen of Kanjrode and Kallada villages near the Ashtamudi 'lake' of the Quilon backwaters in Kerala. It once accompanied a group of them, rowing in a dugout canoe to a secluded spot sheltered from the wind. It is well known that many fishes produce sound; that is why the Sciaenid family of fishes are known as drummers and croakers. The target perch squeaks, the silver belly makes a grating noise, and triggerfishes and porcupine fish produce a gnashing noise with their teeth.

The man at the bow, who was the most experienced, enjoined us to complete silence, got into the water and holding on to the gunwale, immersed his head. He was 'listening in' for the sound produced by the fish. After locating the shoal, we rowed to the spot and spread our gill net in a circle. After encircling the shoal, the fishermen tapped the sides of the canoe, gradually tightening the circle. And lo! There was a shoal of fish inside, jumping nervously about. I was told that experts could tell from the sound whether a shoal was at rest, feeding or moving; and even roughly determine its size. The Malays on the east coast carry on their payang fishing in a similar manner. Talk of Asdic or Sonar!

It is a pity that these quaint but romantic methods of fishing are slowly being given up, and replaced by high but dull technology.

Information Wanted

BIRDS OF KERALA

Dr Salim Ali's *Birds of Kerala* was published in 1969. Since then, birdwatchers in Kerala have recorded various additions to the avifauna of the state, as well as new breeding records. Much of this additional information has not been published.

A group of ornithologists is collecting information on Kerala's birds gathered after 1969, and plan to publish it as a supplement to *Birds of Kerala*. They need the following information:

Species name(s); place where it was seen and distance from the nearest town; dates of sightings; number of individuals seen; whether sightings have been reported/published (with details); notes on behaviour and habitat; location, description and condition of nests; and names of birdwatchers who support the identification. Please send photographs where available. All new information will be credited to the person(s) who provide it.

Information, as well as suggestions regarding this project, should be sent to C. Sashikumar, 9, Subhash Nagar, Cannanore, Kerala 670 002.

ORCHIDS

The Smithsonian Environmental Research Centre, U.S.A., intends to review the reproductive biology of the



Spoonbills — first recorded from Kerala in 1988

LOKE WAN THO

Orchidaceae. They need unpublished or soon-to-be published data sets on breeding systems in orchids. The information will be used to make phylogenetic, biogeographic, and growth habit comparisons among species. They are particularly interested in natural levels of fruit set (% of flowers producing fruits) and, where available, results of hand pollinations; as well as data on seed set (% of seeds bearing embryos). Data should preferably be broken down by site and year where appropriate, to show natural variation. If the information is already in manuscript form, authors may send manuscripts, indicating to which journal the article has been or will be submitted. All information will be acknowledged. Write to:

Jess K. Zimmerman, Smithsonian Environmental Research Centre, P.O. Box 28, Edgewater, MD 21037, U.S.A.

NEWS NOTES COMMENTS

Windfall for conservation

The Species Survival Commission of the World Conservation Union (formerly IUCN) has announced the receipt of a gift of over U.S. \$ 1 million from the Peter Scott Memorial Appeal for Conservation. The Appeal was launched last September to raise money for conservation projects including environmental education and work on endangered species. It is run by the Wildfowl and Wetland Trust and the World Wide Fund for Nature, two organizations founded by Sir Peter.

The gift was made possible largely by a substantial donation from the government of Oman, which, in the past few years, has earned the reputation of being one of the most environmentally concerned in the world. The Omanis have initiated numerous conservation projects in the Middle East, and contributed funds to programmes elsewhere. Among these are the re-introduction of the Arabian oryx into the wild, and conservation programmes for Arabian tahr and sea turtles.

The money will be used by the Species Survival Commission to specify conservation action for high-priority animal groups such as marine turtles, bears, antelopes and such valued plants as palms.

INSA awards

The Indian National Science Academy awards are given each year to

young scientists for work done in India. The award carries a cash prize of Rs. 10,000, and, in suitable cases, research grants and travel grants for attending international conferences. Those born on or after 1st January 1959 are eligible for the 1991 award. Nominations may be made by Fellows of the Academy, or by established scientific societies of all-India character, university departments, or research institutions.

To obtain the nomination proforma, write to the Indian National Science Academy, Bahadur Shah Zafar Marg, New Delhi 110 002, enclosing a self-addressed envelope of size 28 cm x 12 cm.

Biosphere reserves

The Proceedings of the Symposium on Biosphere Reserves, which was held at the World Wilderness Congress in September 1987, are now available. The papers provide an overview of the various roles of biosphere reserves in maintaining biological diversity, understanding ecosystems and demonstrating sustainable uses. For a copy of the proceedings, write to U.S. Man and Biosphere Secretariat, Department of State, OES/ENR (MAB), Washington DC 20520, U.S.A.

Mushrooms

The Kerala Agricultural University, in collaboration with the Mycological Society of India, is organising a National Symposium on Mushrooms at Thiruvananthapuram, Kerala from

22nd to 24th January 1991. For details, contact, Dr M.C. Nair, Professor of Plant Pathology College of Agriculture, Vellayani, Kerala 695 522.

Saving the Sahel

Over the past few years the idea of reintroducing two endangered antelopes into parts of their former range in Africa has gained ground. The scimitar-horned oryx (*Oryx dammah*), once widespread in the western Sahel in Africa, is on the brink of extinction in the wild owing to uncontrolled hunting and competition with livestock. Today, there is thought to be one viable population remaining—a few hundred animals in Chad—although this has yet to be confirmed. Recently a single pair was reported in Burkina Faso.

The related species *Addax nasomaculatus* has suffered a similar decline in range and numbers. This gregarious, desert-dwelling bovid was once found throughout the Sahara. Today only a few hundred remain in isolated groups in Chad, Mali, Mauritania and Niger.

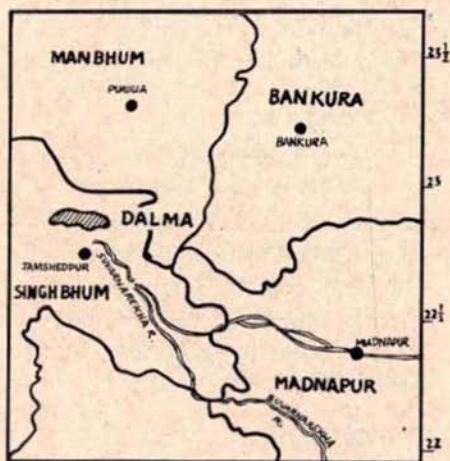
A small reintroduction of the two species is currently being tried in a fenced area in Tunisia under the sponsorship of the Zoological Society of London. Similar operations are being thought of for Niger, though they are still very much in the planning stage.

Elephants

The 193 sq. km Dalma Sanctuary (where the BNHS has a field station) is situated on the Chhota Nagpur Plateau in south Bihar, close to Jamshedpur. The

approximately 65 elephants in the sanctuary have gained considerable notoriety over the past few years because of their rampages through villages and fields around the sanctuary.

Man-elephant conflicts, which are a direct result of degradation of elephant habitat caused by human interference, often result in loss of lives (men and elephants) and colossal damage to property. Such conflicts are not restricted to Bihar, but it is there that the number of deaths is highest, and the public uproar the loudest. The elephants of Dalma cut a wide swathe. Over two thirds of the population spends nearly six months of the year outside the sanctuary, moving in a body to the plains of West Bengal, 60-70 km away from the sanctuary, and frequently more. They return to Dalma in summer, because the core area is appreciably cooler than the surrounding plains (where summer temperatures soar beyond 45°C).



Location of Dalma Sanctuary

During the past two years these peripatetic raiders have extended their range to the eastern part of Midnapur district. The West Bengal government has made efforts to control the elephant menace. Electric fencing has been erected along the Bengal-Bihar border, kumky elephants and men have attempted to drive them back to Bihar. But nothing seems to work. The elephants normally begin their journey by end September, and villagers in their path are already highly apprehensive.

New-letters

The various specialist groups of the IUCN publish newsletters dealing mainly with their specialities. Two more newsletters have been launched, raising the total to 33—*CBSG News* by the Captive Breeding Specialist Group, and *Fish* by the Freshwater Fish Specialist Group.

Their addresses: CBSG News, 12101 Johnny Cake Ridge Road, Apple Valley, MN 55124, U.S.A. Freshwater Fish Specialist Group, c/o London Zoo, Regents Park, London NW1 4RY, U.K.

SSC directory

The membership directory of the Species Survival Commission is now available. It lists 1500 members in 100-odd countries, representing each of the SSC's 98 specialist groups. Write to The Chicago Zoological Society, Brookfield Zoo, Golf Road, Brookfield, Illinois 60513, U.S.A.

Rolex awards

The Rolex Awards for Enterprise are

presented each year to projects of unusual merit (no particular field is specified) that symbolise the spirit of enterprise. Three of the five awards for 1990 went to wildlife and environmental conservation oriented projects.

Suryo Wardhoyo Prawiroatmodjo, an Indonesian veterinary surgeon, has been involved with environmental education through the Green Indonesian Foundation. He now proposes to establish Indonesia's first centre for environmental education. Les Stocker, a writer and photographer from the United Kingdom, has for over a decade been caring for injured wild animals at his Wildlife Hospital Trust. He plans to establish a teaching hospital, the first in Europe, where both professional vets and laymen can acquire wildlife treatment skills not taught in conventional veterinary training.

Anita Studer, a Swiss ornithologist, has been working on the protection of the forests and fauna of northeastern Brazil. She has now developed the Arco-Iris (Rainbow) environmental education project to gain governmental and popular support for a long-term plan of reforestation by instituting tree planting campaigns and stimulating general-ecological awareness.

Greeting cards, calendars

The BNHS raises funds for its various activities by selling greeting cards and calendars each year. Have you booked your orders yet? If not, please do so immediately. An order form is enclosed. Fill it up **now**—and remind your friends to do the same.

LETTERS

Sir,

I have a packet, handed over by my grandfather, labelled 'Shark Chaser' and issued by the U.S. Navy during World War II. What is it, and how can it chase a shark?

SANGEETA VERMA

F-16A, D.D.A. (S.F.S.) Flats, Saket, New Delhi 110 017.

Beefsea replies:

What you have was issued by the U.S. Navy during the second world war and was meant to save torpedoed sailors and downed airmen from shark attacks. It looks like a bar of soap and contains copper acetate and nigrosine dye, mixed in a wax binder.

When scientists found that sharks do not eat decayed shark flesh (which contains organic acids caused by putrefaction), they tried copper acetate (which is an organic acid) to deter sharks.

The nigrosine dye forms a dense black cloud in the water, and is meant for the concealment of the man. However, it serves more as a morale booster for the man to believe he is hidden from sharks.

It was found that, during a feeding frenzy, sharks completely ignored the Shark Chaser, even biting the packet. Inclusion of the Shark Chaser in sailors' emergency kits was later discontinued.

A recent innovation results from the chance discovery that sharks will not eat the Moses sole—a small fish from the Red Sea. The sole's skin pores secrete a

toxic chemical called pardaxin which has the properties of a surfactant—a constituent of the detergent soaps used for washing clothes. Scientists have successfully tested another surfactant, sodium dodecyl sulphate (SDS), and it works well, repelling sharks which receive a blast of SDS from a detergent gun in their face.

Sir,

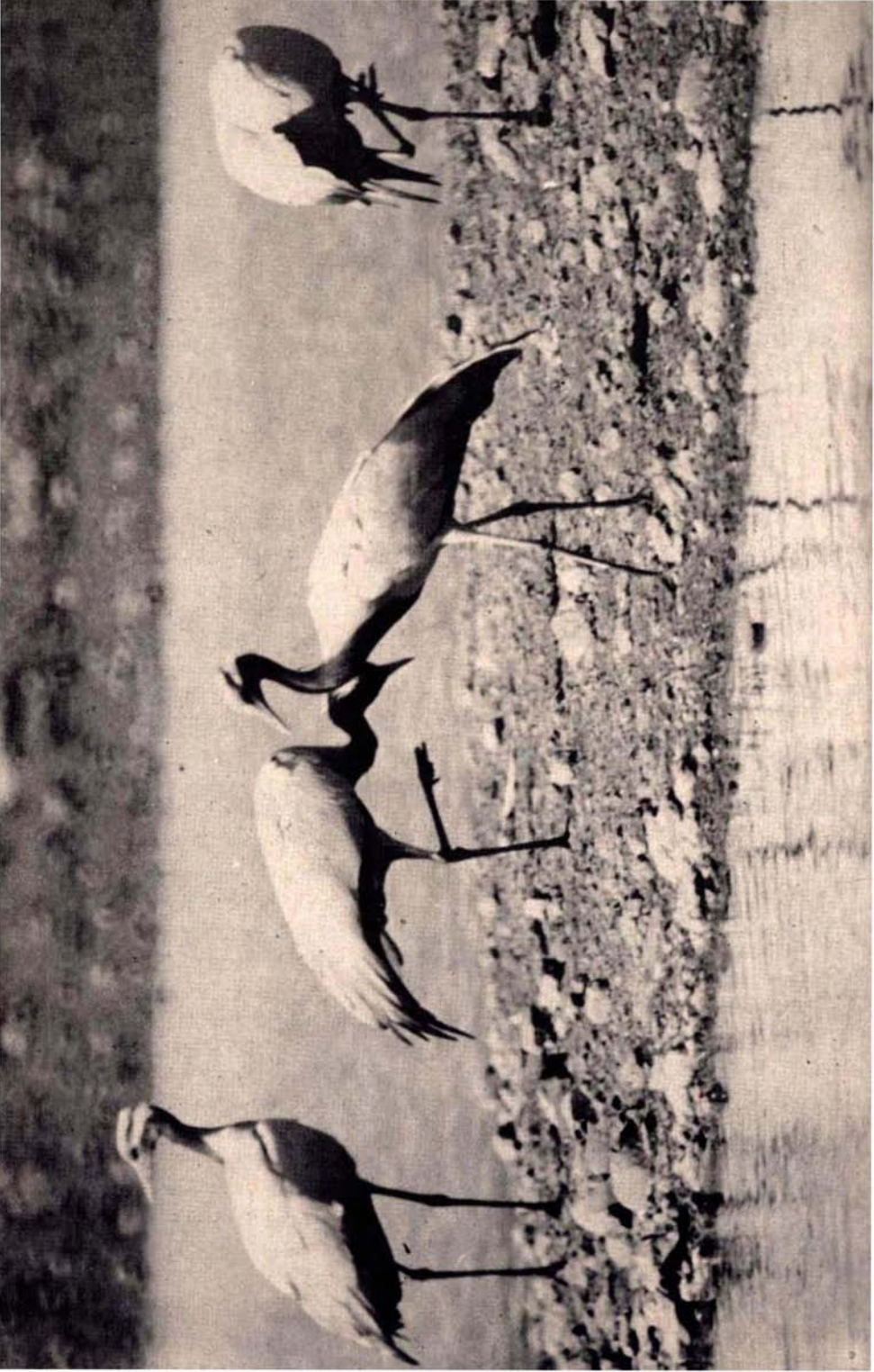
An unusual method of killing chital and other smaller deer has come to my notice.

A strong wire three to four metres long is taken, and steel nuts of assorted sizes are tied to it at regular intervals, about 15 cm apart. The heaviest weight is at the end. When the hunters spot a deer, they first daze it by focusing a bright light on it. A person familiar with the operation of this contraption gets down from the vehicle and crawls carefully towards the animal. When he gets close enough, he hurls the wire, weights and all, at the deer's legs.

The wire gets wrapped around one or more legs; in some cases the impact of the steel weights even breaks the legs. In any case, the deer is immobilized, and promptly slaughtered. The success of the operation depends on how close the shikari can get to the victim without alerting it.

A.M.K. BHAROS

M-532, Padmanabhpur, Durg,
Madhya Pradesh



The Cranes of Kheechan

NARENDRA SINGH

The Aravalli mountain range runs roughly southwards across Rajasthan, dividing the state into two regions with strikingly different climates and vegetation. Eastern Rajasthan is fairly fertile, with some areas (the Sariska and Ranthambore National Parks are located in this region) under good deciduous forest. Western Rajasthan, in contrast, has a harsh desert climate; most of Rajasthan west of the Aravallis is part of the Thar desert, which extends into Sind (Pakistan).

It is perhaps the very harshness of the environment that has made the local people very conscious about wildlife conservation and maintenance of the area's ecological balance. About five hundred years ago in this area, was born a great preacher and saint named Jambhoji (1451-1536), whose thoughts and teachings even today govern the lives of his followers, the Bishnoi sect. He preached the protection of all living beings and prohibited cutting of green trees. Thanks to his teachings the Bishnois, who inhabit this area, have never allowed anyone to kill any living being or to fell or cut green trees. So successful have their efforts at conservation been that the sandy tract is covered with trees like ber (*Zizyphus nummularia*), ker (*Capparis decidua*), khejri

(*Prosopis cineraria*), rohida (*Tecomella undulata*), jal (*Salvadora oleoides*) etc., and bushes like aak (*Citrullus colocynthis*), making it the world's greenest desert. Even the normally shy and wary chinkaras roam fearlessly in the area.

The village of Kheechan (rhymes with kitchen) lies in Bishnoi territory, about 140 km from Jodhpur. What makes this small, remote village unique are its guests—every winter, Kheechan plays host to a group of about 2,000 demoiselle cranes (*Anthropoides virgo*).

There are small rain-dependent tanks in the village, which fulfill the cranes' water requirements in winter. The birds stay near these tanks when they are not feeding. The villagers provide not just protection but food as well. The village has an enclosure called *Chugga Ghar* (feeding ground), which is fenced in with barbed wire and has a gate at the entrance. Within the enclosure is a small locked store room in which is stored jowar for feeding the cranes.

A heart-warming scene is played out at about seven o'clock every morning: two men, Ratanlal Malu and Khet Singh, start scattering jowar grain on the ground in the *Chugga Ghar*. At about the same time the demoiselle cranes, after a night's rest near the village tanks,

Facing page: a family of demoiselle cranes. These winter migrants are invariably seen in large flocks.

S.A. HUSSAIN



Demoiselles feeding, peafowl and a pigeon in the foreground.

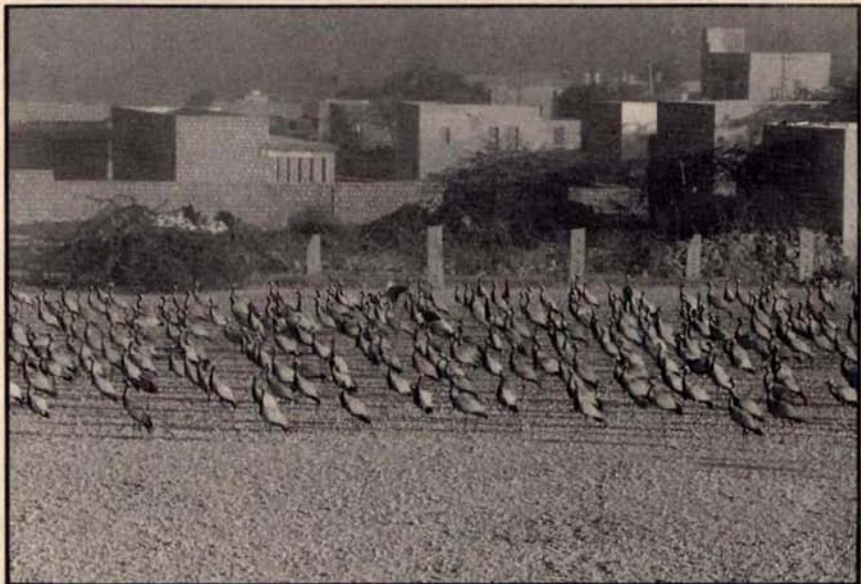
GORDHAN NAGAR

start arriving in groups and land in the open space outside the *Chugga Ghar*. They wait for some time, make a few reconnaissance flights over the enclosure, then start landing inside it. The scattering of grain continues and as the cranes have become familiar with the two men, they continue picking grains unmindful of their presence. They even do not mind villagers moving around the enclosure. The scattering of grain takes about 45 minutes, during which time two bags weighing one quintal each are emptied. After finishing their morning feed the cranes fly back to the village tanks. A second feed is given at 4 o'clock in the afternoon. After a heavy breakfast it's a light lunch: only one quintal of jowar is provided for the afternoon feed.

I talked to Ratanlal Malu, who told

me that the funds for feeding the birds are provided by the Malu Charitable Trust. According to him the cranes arrive at Kheechean during the month of Bhadrapad (September) and depart in Phalgun (March). They have been regular visitors for as long as he can remember, and the feeding is apparently a tradition that goes back several generations. But in the past there was no enclosure, due to which donkeys and cattle used to eat the grain meant for the birds, who were also harassed by dogs. To prevent this, about five or six years ago the *Chugga Ghar* was fenced with barbed wire.

According to Malu the total quantity of jowar consumed during the winter period is about 550 quintals at the rate of 3 quintals per day, and the total amount involved is about Rs 1,25,000.



Full house at the Chugga Ghar; village houses in the background

GORDHAN NAGAR

The grain is shared by other birds too, the largest number being of rock pigeons (*Columba livia*), which number more than two thousand, and a small number of other birds—half a dozen peafowl (*Pavo cristatus*), and about the same number of ring doves (*Streptopelia decaocto*) and house sparrows (*Passer domesticus*). After the cranes depart, in the remaining six months of the year the other birds continue to be fed, though the quantity of grain used is obviously much smaller.

Ancient Sanskrit poet Kalidas has used clouds as messengers in his epic Meghdoot. In a popular Rajasthani folk song, the messenger is the demoiselle crane (known locally as *Kuraj*). Maru misses her lover Dhola, who is far away.

When she feels the pangs of separation she goes and says, "Oh Kuraj, you are my sister. Take my message, take my love letter to Dhola."

Kuraj replies, "We are not human beings and cannot speak. But write down your message on my wings. I will go (to your lover) and show it to him." Then the crane flies one thousand *kos* (2500 km) and takes Maru's message to Dhola written on its wings.

The popularity of this song in Rajasthan is perhaps due to the fact that people from this region have been going to far away places for employment or business (or war), leaving their wives behind. And who could be a better messenger for an epistle of love than the graceful, delicate demoiselle crane?

The Return of the Native

Text and photographs by ASAD R. RAHMANI



THE ARABIAN ORYX is to the Arabs what the tiger is to Indians. Both species have similar stories: both were admired, and even held in awe—but still slaughtered mercilessly till they were nearly extinct. And finally, both were saved from extinction by drastic conservation measures. Now, both the tiger and the oryx have become symbols of conservation in their respective countries, providing hope that with proper wildlife management, many other beleaguered species can be saved.

The Arabian oryx *Oryx leucoryx* belongs to the family of horse-like antelopes, found in Africa and the Middle East. There are five species of oryx in the world, all living in arid areas: the beisa oryx is found in east Africa, the gemsbok in the Kalahari desert in southwest Africa, the fringe-eared oryx in Kenya, the scimitar-horned oryx in the Sahara desert and the Arabian oryx, the most striking of the five, in the Arabian peninsula.

The Arabian or white oryx, as the name implies, is white, with strongly contrasting dark brown markings on the head, neck, tail and legs. It is a medium size antelope about 100 cm tall at the shoulders, and weighs from 60 to 80 kg. Sexes are quite similar (though adult males are a little heavier), with slim but extremely powerful, pointed horns up to 70 cm long.

The young ones are sandy brown, apparently for camouflage. A baby oryx sitting in a depression, with grey or brown sand all around, merges perfectly with its surroundings. As it grows older, the brown changes to white. Although adults are white, in the shimmering glare of the desert they are surprisingly difficult to see when they are hiding or resting among trees. Brown markings on the body also help to break up the outline of a sitting oryx, making it difficult to locate.

The oryx lives in small herds of twelve to fifteen individuals, with a dominant male and a dominant female. Herds generally consist of family members, with two or three males and a similar number of females, and youngsters of different ages. When the herd becomes too large, it splits into two or three sub-groups to avoid intraspecific competition for the sparse natural forage in the desert.

Like most antelopes, the Arabian oryx is a prolific breeder. Females are ready to breed at the age of two years and the gestation period is eight and a half months. Calves are weaned when they are six to ten months old, but live with the mother till the next calf is born. In years when the rainfall is good, females can produce calves once a year on the average. With an expected life-span in the wild of 15 to 20 years, theoretically a female oryx is capable of producing 15 calves in her lifetime. This has in fact been achieved in captivity—which is why the Arabian oryx has multiplied from a mere twelve individuals to about 1,000 at present.

The Arabian oryx lives in one of the most arid regions of the world, where the average annual rainfall is as low as 50 mm, with many consecutive rainless years. In order to get sufficient food it has to roam over a very wide area in search of grasses, herbs and bushes. The oryx has many behavioural and physiological adaptations to survive the ordeal of heat and aridity. During summer it generally feeds in the late evening and at night, spending most of the day in the shade of trees. In winter, it feeds during the day, when the sun is up and takes shelter at the night from cold winds in depressions made strategically behind large bushes.

A remarkable physiological adaptation in the oryx (though the camel is more



Baby oryx sheltering from the heat. The brown coat provides perfect camouflage.

famous on this account) is its ability to go without water for many months. The longest recorded time without drinking is 11 months. Without this adaptation, it is unlikely the oryx could have survived in the hyper-arid areas of the Saudi Arabian peninsula, where the nearest source of surface water may be hundreds of kilometres away. When water is available, the oryx drinks copiously, sometimes taking as much as 15 percent of its body weight.

Because food is available at low density in the desert, the oryx has to be constantly on the move. Nature has provided it strong legs to walk, sometimes continuously for 10 to 15 hours. An oryx can walk 40 km overnight for a drink, and be back at the starting point by morning. A pair was seen to walk 70 km in 12 hours. Unlike most antelopes, the Arabian oryx has splayed hooves, which enable it to walk on the sand by spreading the body weight over a bigger area. Camels, which live in similar habitat, also have splayed hooves. Like many desert dwellers, oryx also have an uncanny ability to find areas where localized rain has fallen. This ability to respond to wind-borne information about rain is the key to survival in the desert.

A species can adapt to Nature's rigours, but not to those imposed by man. The discovery of oil triggered off a human onslaught on this fragile ecosystem, which took a devastating toll. Arabs had hunted oryx for food for hundreds of years, but their primitive hunting methods, on camel or horse-back, did not



Successful captive rearing — the key to the reintroduction programme.

seriously threaten the species. The arrival of four-wheel drive vehicles permanently tilted the balance in favour of man. Within no time entire populations were decimated. The last six wild Arabian oryx were killed or captured in Oman on 18th October 1972 by a group of foreign visitors. Since then, there has been no confirmed sighting of the original wild stock.

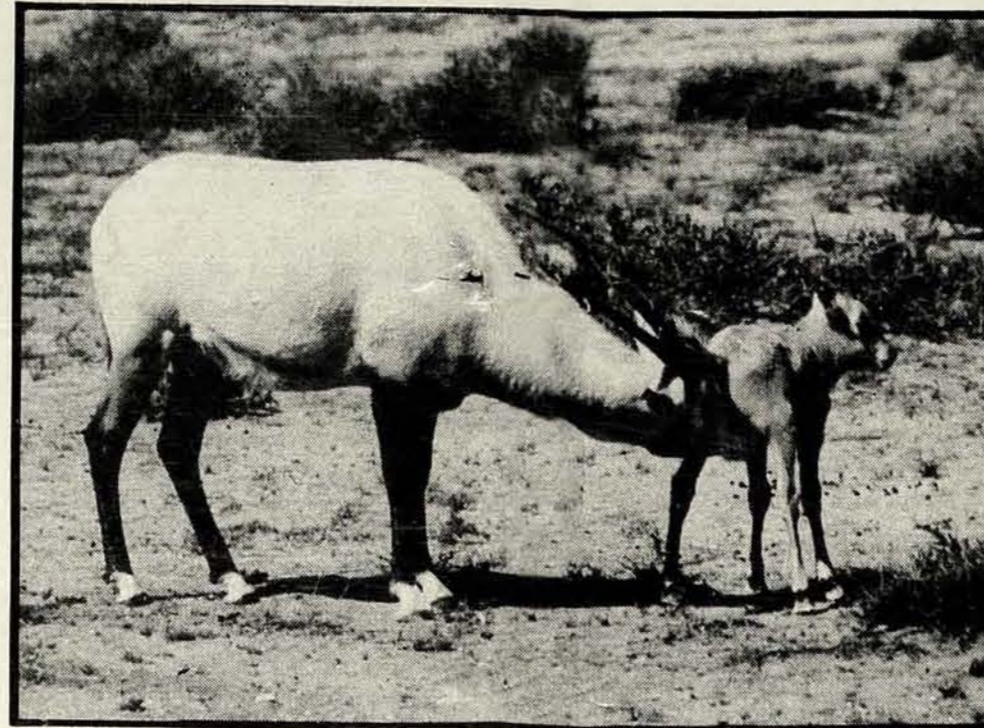
Fortunately, in 1962, the Flora and Fauna Preservation Society of the United Kingdom, in cooperation with the World Conservation Union (formerly IUCN) had captured three oryx for captive breeding. After quarantining them in Kenya to avoid transmitting diseases, the animals were shipped to the Phoenix Zoological Garden in Arizona, U.S.A., where the climatic conditions were similar to their native habitat. These three were joined by 6 others—one presented by the Zoological Society of London and five by the rulers of Kuwait and Saudi Arabia. This nucleus of 9 animals formed a group known as 'World Herd', to which three more animals were added later.

The Arabian oryx is a hardy species and thrives in captivity. Although extinct in the wild, it did well in

zoos and breeding centres and by the 1970s there were enough oryx in captivity to return some to their native land. Several rulers in the Middle East had their own private herds, but were reluctant to give away their pets. Jordan was the first country to reintroduce this species. In 1978-79, four pairs from San Diego Wild Animal Park were shipped to the Shaumari Reserve in Jordan. To improve the genetic diversity of this herd, three animals were added from Qatar. The oryx settled down without any trouble into their new home. In 1983 the herd, now numbering 31, was released into a fenced area of 22 square kilometres. By 1986, it had increased to 70, and now the population in Shaumari Reserve is nearly 100, excluding the animals distributed to other areas.

The Jordanian programme, because it involved sequestering a herd within an artificial enclosure, was not strictly a reintroduction. The first true reintroduction took place in Oman in 1982, when a herd was released in the Jiddat al-Harasis area, about 450 km from Muscat—the same area where a decade earlier, the oryx had become extinct in the wild.

Jiddat al-Harasis (a *jiddah* is a stony plain) is an extremely arid, desolate area occupied by a nomadic tribe called Harasis. For hundreds of years these hardy people shared the habitat with oryx and other wildlife (gazelles, wolves, caracals, foxes and over 150 bird species, 22 of them breeding residents). The graceful white antelope played an important part in their folklore. It was compared to a pretty woman for its beauty and elegance; its hardiness and ability to survive the aridity and heat were ideals to which young men strove.



Toilet training—the baby oryx needs to be physically stimulated before it will defecate or urinate. In the wild, the mother does the job (left). At right, a biologist lends a helping hand.

A large part of the credit for the success of the oryx programme must go to the Harasis. Their knowledge of local wildlife and conditions, accumulated over generations, and their phenomenal tracking abilities made them ideal wildlife rangers. Following a lone oryx across the stony tracks of the Jiddah (and this had to be done frequently) was a trial of patience and skill. It often meant deciphering single prints, incomplete and partly filled in by drifting sand—and spaced 200 metres or more apart. Even so, the trackers rarely failed to locate the oryx.

Many Harasis tribesmen were trained, particularly in radio tracking methods, and the responsibility for protecting the animals was entrusted to the tribe. They took a fierce pride in their work (which obviously suited their sentiments and their temperament—oil companies in the area found them most unsatisfactory employees). They promised in fact, to protect the oryx with their lives; and their performance has matched their promises. So effective has been their patrolling that to date, with nearly a hundred oryx roaming over an area of several hundred square kilometres, not a single animal has been poached.

When the oryx camp was under construction, the Harasis agreed to give up the use of one of their most valuable resources—a stretch of woodland and perennial grassland around the enclosure—so that the oryx release area would remain undisturbed. From time to time, areas which provided temporary grazing after local rainfall were kept free of settlement and grazing by goats, till such time as the growth died away.

In Oman the Arabian oryx is now a symbol of conservation and a shining example of cooperation between wildlife authorities and local people. The role of Sultan Qaboos, the ruler of Oman, is also commendable. He is one of the few leaders in the world who has taken a very active interest in conservation. Hunting of all animals is totally banned in Oman. Species such as the Arabian gazelles, the Nubian ibex and the houbara bustard, which have become extremely rare in other countries of the peninsula, are thriving in Oman. For instance, there are now 5,000 Arabian gazelles in Jiddat al-Harasis, and their population is increasing.

Although the largest and the most influential country in the Middle East, Saudi Arabia woke up rather late to the need for wildlife protection. The Meteorological and Environmental Protection Agency (MEPA) had dabbled in conservation for many years, but the real impetus came only in 1987, when the National Commission for Wildlife Conservation and Development (NCWCD) was established. Within the short span of three years, the NCWCD developed seven protected areas and banned hunting of most animals. More parks and nature reserves are being planned. One species which needs urgent protection is the Arabian bustard, which is closely related to our great Indian bustard.

One of the biggest achievements of the NCWCD was the release of 17 oryx in a reserve known as Mahazat as-Said. It is an enclosed area of 2,190 square

kilometres, perhaps the largest such reserve in the world. Since the release on 1 March 1990, the oryx have moved about 100 km and have located natural grazing grounds. Although high quality forage and water is being provided near the release site, the animals have started roaming over a large area and generally do not come back to the release site. Their movement and behaviour is constantly being monitored by Saudi and French biologists. Another batch of oryx will be released soon.

The NCWCD plans to bring back all the species earlier found in the area. When I was there in February 1990 (as part of a team working on the conservation of the Arabian bustard), the first batch of Arabian sand gazelles had arrived. Presently, they are being kept in small enclosures for acclimatization to local conditions. The other two species, the Saudi Dorcas gazelle and the mountain gazelle, will be released later.

Survivors in the desert

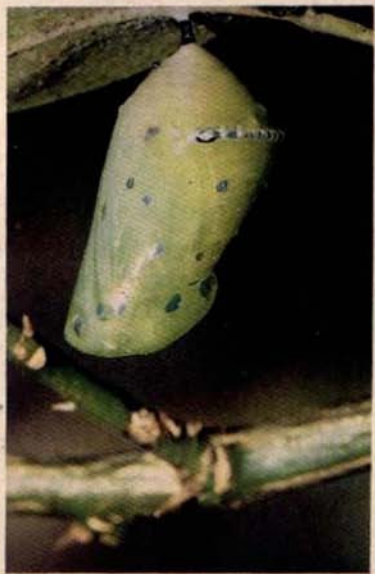
Even by the standards of the nomadic pastoral tribes in the deserts of Arabia, the Harasis lifestyle is specialised. Before development, government subsidies and job opportunities began altering (usually improving) their lives, they followed rain and grazing over vast areas of central Oman, rarely staying more than two days at one patch of vegetation before moving on. Skillful livestock management of their camels and goats, supplemented by hunting and occasional barter or trade, allowed them to survive in an extraordinarily harsh environment.

The rocky limestone soil does not retain rainwater, and what little surface water is available is barely potable. Temperatures soar to 48°C on summer days and drop below 7°C on some winter nights. The daily variation in temperatures may be as much as 20°C. Fog moisture is an important part of the water economy. The Harasis collect drops of condensed moisture from the canopies of *Acacia tortilis* trees by spreading a blanket under the tree trapping the branches, and then wringing the collected moisture out of the blanket.

Successful exploitation of sparse, unevenly distributed natural resources requires that conservation be built into local custom. When Harasis hunted gazelles or oryx, how many animals (usually only one) were taken depended strictly on the size of the herd. The dead animal was fully utilized—even the rumen juices of the oryx were carefully drained and drunk. Only deadwood was used for fuel. If trees had to be cut, only the lower branches were, so that the tree's shade was not reduced. One fodder-providing tree species was used only for sick livestock, never on a regular basis.

When local rainfall triggered new grass growth in an area, depending on its size, it was frequently declared a grazing reserve. Goats and human settlement were banned in the reserve, leaving it for wildlife and camels. (Competition with camels for food resources affects the oryx only slightly, and the other herbivores not at all.)

The first three decades after the discovery of oil in the Middle East saw a terrible massacre of wildlife, thanks to the power of recently acquired wealth. In the 1980s people began to realise that wild animals do have a right to share this world with us. Once a species is gone, no one can bring it back. The sad story of the extinction of the Arabian oryx in the wild played an important role in changing people's attitude towards wildlife in the Arabian peninsula. Much more has to be done to protect nature, but a beginning has been made. The return of the 'native' to the land from where it was once exterminated is proof of this awakening.



BUTTERFLIES

Early stages in the life cycle.

BY NARESH CHATURVEDI & ISAAC KEHIMKAR

MILKWEED BUTTERFLIES (Continued from *Hornbill* 1990 (2))

Because predators find them distasteful—and recognize them by their striking colour patterns—milkweed butterflies are usually left alone. On this reputation survive several other look-alike butterflies which have no such in-built chemical defence. The mimics not only resemble the milkweeds but also have the same slow, sailing flight to advertise their (false) warning colours. The glassy and blue tigers are mimicked by two swallowtails, the common and the lesser mime. The female danaid eggfly, a nymphalid, resembles the plain tiger, and another female nymphalid, the great eggfly, is a perfect copy of the common crow. Such mimicry is known as Batesian mimicry. Even milkweeds themselves practice such deceit: several species of crows resemble each other, thus reinforcing their reputation for distastefulness. These are Mullerian mimics.

BLUE TIGER *Tirumala limniace*

Egg White, barrel-shaped, flattened at the base and dome-shaped at the top. Longitudinal ribs run from the base to just short of the apex, and are connected with transverse ridges. Eggs are laid singly on the underside of the leaves of the foodplant.

Larval foodplants Chiti (*Marsdenia tenacissima*), aak or rui (*Calotropis* sp.), wax plant (*Hoya* sp.), *Wattaakaka volubilis*, blood flower (*Asclepias curassvica*) and *Heterostemma cuspidatum*.

Larva During its first two instars the caterpillar is pale grey-blue with black rings, and keeps to the underside of the leaves, where it feeds. As it grows and its warning colours become bolder it is often seen feeding openly on tender leaves. The fully grown caterpillar is cylindrical and smooth, with 2 pairs of fleshy, white, black-tipped tubercles on the second and eleventh segments. The pair on the second segment is the larger of the two.

Pupa Usually jade green to bluish green in colour with brilliant golden markings. Wing colours begin to show through the pupal skin two nights before emergence.

Clockwise from top left: full grown caterpillar; pupa; common mime in near-perfect disguise; newly emerged blue tiger.

PHOTOS BY ISAAC KEHIMKAR

Wildlife Photography

T.N.A. Perumal

WHICH IS THE IDEAL MEDIUM, B & W OR COLOUR? THE QUESTION HAS LONG vexed photographers, since both have their advantages and disadvantages. I feel that colour is the natural choice: since the natural world is colourful, so must the photograph be. The distinctive features (and colours) of an animal or bird show up more clearly in a colour photograph. A B & W photograph will represent it in shades of grey and black and white, making it drab, and sometimes unidentifiable. For example, when photographs of a colourful bird like the kingfisher in B & W and colour are viewed side by side the difference is obvious.

Monochrome is an abstract rendition of the subject in shades of grey and black and white, making it only a graphic picture. One 'advantage', of using monochrome, however, is that the human eye cannot identify or reject the different shades of grey in a B & W photograph as correct or incorrect representations of the colours of the subject. In colour, the eye quickly notices errors in reproduction.

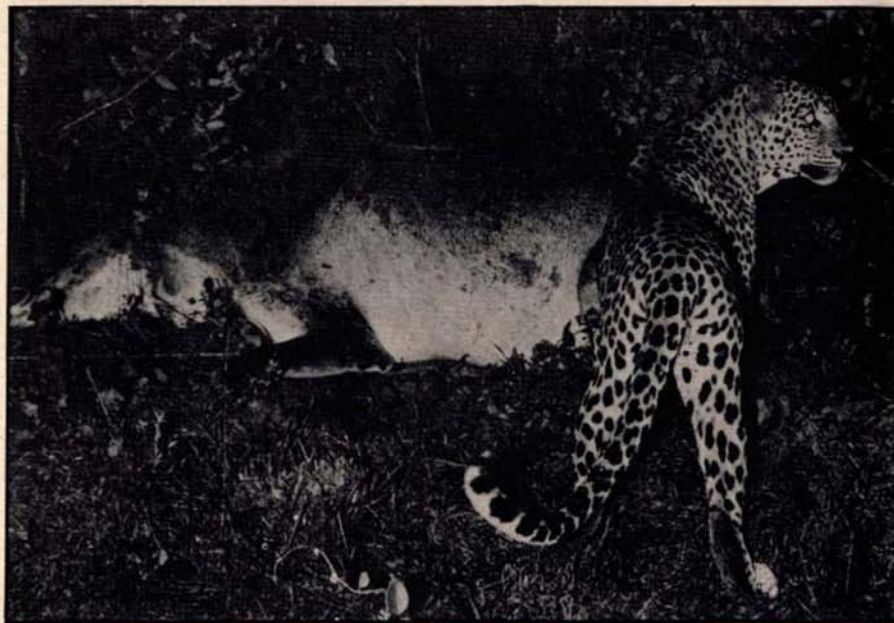
Another point is that manipulations in processing and printing are possible in monochrome, which can produce photographs of special charm and appeal. It is also true that a B & W photograph is more permanent than one in colour. Even so, in recent years technology has advanced so much that the advantage of permanency may not hold good much longer; CIBACHROME and KODACHROME already claim as much permanency as B & W.

Of course, monochrome is definitely not going to fade away. For instance, there are occasions when there is no colour at all in the scene (an elephant in dry forest in summer) when it may be profitable to shoot in B & W, as a monochromatic subject will come out best in monochrome. It has its own charm and special uses; colour and monochrome are to be really considered as two disciplines. It is up to the photographer to use the right medium for the right subject. It should be appreciated that proficiency in B & W photography lays a solid foundation for technical competence, visualisation and the development of an aesthetic sense in photography.

*Egret landing (f 5-6 at
1/250th of a second)*

Photo : T.N.A. Perumal





As for the choice of equipment, 'the bigger the better' is a sound policy. A large format (2B size or bigger) negative or transparency is definitely superior and yields sharper enlargements and reproductions. But unfortunately even the modern large format equipment is bulky, slow and impractical under normal field conditions. And pictures of animals in action or in flight are almost impossible with this equipment.

A medium format (6 x 7 cm, 6 x 6 cm, 6 x 4.5 cm) may be a more manageable proposition, and for this format prism finders, TTL meters, motor drives, telelenses and zoom lenses are also available. But here again, the factors of weight, compactness, portability, cost and availability should be carefully considered.

The main governing factors in choosing equipment will be what one wants to do, how far one wants to progress in this hobby and how one chooses to present his work—whether as slides or prints, and the intended size of blow-ups of pictures.

A modern 35 mm single lens reflex (SLR) camera is light and handy, and has all the modern technological innovations in optics and electronics incorporated into it. It is an eye level camera with an interchangeable system of lenses and screens, sophisticated TTL meter-

*Left: Leopard at
kill (f-8 at 1/ 250th
of a second)*

Photo: O.C. Edwards

Right: Common langur

Photo: T.N.A. Perumal



ing, a fast, smooth, silent, quartz controlled shutter, special features like auto-exposure, TTL flash, aperture priority, shutter priority, programmeability, auto focus etc. Fast telephoto lenses, quality zoom lenses, motor drives and remote controls are also available. The high quality images produced by such equipment will meet the requirements of the most discerning. All in all, a modern 35 mm SLR camera is a good choice. Any modern 35 mm SLR fitted with a motor drive that is not too noisy and a quality medium-range zoom lens, say 80/200 mm or, better still a 50/300 mm, is adequate for photographing most of the wildlife in our jungles. Of course, a quality 2X converter or prime telephoto lens of 300/400 mm will be useful.

Now some do's and don'ts: Become thoroughly familiar with your equipment, and with the area of work. Observe which animal is found where and when, make mental notes of lighting and weather, and the general reaction of wildlife to the presence of a photographer in the area. Wear comfortable clothes, in sober camouflage colours like khaki or brown. Avoid sudden movements and unnecessary noise, and do not carry objects which will reflect light.

Refrain from taking pictures from moving vehicles (car, boat or elephant)—even using a fast shutter speed will not prevent camera



shake. Avoid clicking when the engine of your vehicle is running, even if the vehicle is not moving; wait till the engine is switched off. Consciously avoid clicking when there is movement caused by co-passengers shifting positions in the vehicle.

The use of a motor-drive helps a great deal, and makes clicking at the crucial moment easy and sure. With the automatic film advance, you are ready for the next shot without having to move your head or hand. One can never miss a shot if a motor drive is used intelligently.

Keep the lens pre-focussed between 100' and infinity. This makes it quicker to refocus when an animal presents itself. Always focus on the animal's eye or head. Use and trust the TTL meter in your camera. Of course, your TTL meter and camera should be checked for calibration, and adjustments made if necessary. Use the fastest shutter speed possible to avoid fuzziness in the picture due to camera shake or movement of the subject. Also, use the smallest aperture possible to ensure a good depth of field, so that the entire animal is in focus. Use the smallest possible focal length lens in a given situation.

Protect cameras, lenses and film from heat, dust and moisture. Plastic bags of different sizes to cover equipment in the field will help. Brushing and cleaning of cameras, lenses, motor-drives and other accessories every day is essential during a field trip. Check the whole system for proper functioning before setting out. Always carry extra cells, batteries and sufficient film, and an extra camera body and a hand exposure meter, which will come in handy if the TTL metering of the camera or the camera itself lets you down. The camera settings should be made for the correct ASA rating to match with the film used, the required aperture and shutter speed. Mode of operation of cameras and motor drives should be periodically checked for any involuntary shifts while handling equipment. It is important to check that the camera is loaded with the type of film you want to use.

Another suggestion: whenever you find that there are only a few frames left in the camera, rewind and load a fresh roll. At the next opportunity you will have an entire roll to shoot and thereby not lose a chance because of crucial time lost in reloading the camera.

Always keep exposed film rolls separately and safely, unless you wish to risk losing them. And never make the mistake of reloading already exposed film once again into the camera. This can be prevented by following the simple rule of rewinding exposed film completely into the cassette without leaving the tongue of the film sticking out of the cassette.

Small blue kingfisher.

Photo: Loke Wan Tho

Battling Boars

*A wild boar (that is to say an angry one) is a formidable creature. And when two of them take issue with one another, most spectators run for cover. Others, however, take notes
An extract from an account by Vicomte Edmond De Poncins, published in the Society's Journal in 1913.*

A large boar backed out from a thicket into a clearing, then suddenly stopped and charged full speed into the thicket. There were loud grunting noises, followed by dead silence. A boar walked out into the clearing just in front of me and stood motionless, head low and hair standing on end on the back. Almost directly another one came out trotting, and the first charged at him as straight as a cannon ball. Both were grand chaps, fully two hundred and fifty pounds in weight. They kept fighting by turns for certainly a quarter of an hour, sometimes quite near my hiding place and sometimes in the jungle.

Evidently, when boars fight (they often do if two of them of about the same size are discussing family questions), they go at each other full tilt, heads rather high, and they nearly always both rear up like horses on their hind legs when coming into contact, both chins touching and trying to get at the other for a broadside swing. Then they stop and stand silent and motionless a few yards apart for a rest. The grunting takes place only when they touch each other.

As long as both heads are held high enough and neither fighter gets a broadside or flank chance at the other, very little damage will occur. Once, one of them got his snout under the chest of the other and lifted it with incredible speed.

The other cut him repeatedly on the top of the shoulder and made him back off a little, then had a chance at the side and went at him with all his power. Both very nearly rolled over, but after a short contest—difficult to see in the dust—both brutes were looking at each other about a yard apart, munching rapidly but none the worse.

They never tried a direct vertical toss, but always slanting upwards broadside cuts. I carefully observe the cuts on boars when I kill any, and the scars are always the same: some at the end of the lower jaw near the neck, much oftener on the shoulders and ribs. I never saw one further back than the flanks.

If anybody intrudes during a bout, it is very likely that both would make straight for him. But an intruder over 50 yards away would hardly be noticed. If he shows himself and shouts, the boars will stand motionless for a while and then, as soon as one of them moves away, the other will charge at him.

I have no reliable evidence of wild boars killing each other in a fight. I wonder if it is possible, given the length of the tusks and the thickness of skin, flesh and muscles on the exposed parts. No doubt they can rip open a pony, but what is the skin of a horse compared to that of a boar?

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