

# HORNBILL

1984 (2)



BOMBAY NATURAL HISTORY SOCIETY



## FUNDS FOR FIELD WORK

### **Salim Ali-Loke Wan Tho Ornithological Research Fund**

Project proposals are invited from Biologists, whether graduates or not, and interested amateur ornithologists, preferably between the age of 20 to 30 years, for promoting scientific ornithology and bird preservation in India.

### **Charles McCann Vertebrate Zoology Fund for Field Work**

Naturalists, amateur or professional may send project proposals for field studies including collection trips preferably of vertebrates.

### **Salim Ali Nature Conservation Fund**

Funds are available to assist schemes aimed at conserving nature in the Indian subcontinent. Schemes already in operation may also apply for additional assistance. Project proposals that are likely to promote conservation directly or indirectly like educating public through various mass media are also welcome.

*Monetary assistance under these funds does not normally exceed Rs. 5000/- per project.*

For more details write to :

The Honorary Secretary  
Bombay Natural History Society  
Hornbill House  
Bombay-400 023.

*Cover picture TOADSTOOLS, by Mr N. D. Mulla*

A flowerless plant, the toadstool is a fungus growing in areas of high humidity.



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 of the Society 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.

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The Secretary, Dept. of Science & Technology, Govt. of India

Members receive during a year three issues of the *Journal of the Bombay Natural History Society* now in its 79th volume, and four issues of *Hornbill*, the Society's popular publication.

#### *Journal Editors*

J. C. Daniel, P. V. Bole and A. N. D. Nanavati.

*Advertisements* for publication in *Hornbill* are welcome. Rates: Inside full-page Rs. 500/-; half page Rs. 250/-; back cover Rs. 1000/-.

#### *Annual and other membership subscriptions*

<i>Entrance Fees</i>	Rs	25.00
<i>Subscription</i>		
Ordinary individual membership	Rs	60.00
Ordinary corporate membership	Rs	125.00
Life membership	Rs	800.00
Copound corporate membership	Rs	2500.00

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The first annual subscription of members elected in October, November, or December will extend to the 31st December of the year following the election.

Write to:

The Honorary Secretary  
Bombay Natural History Society  
Hornbill House, opp. Lion Gate  
Shahid Bhagat Singh Road  
Bombay 400 023

EDITED BY

J. C. DANIEL

J. S. SERRAO

I. D. KEHIMKAR



## EDITORIAL

Members may recall that at the Centenary Celebrations on 15th September 1983, the Government of Maharashtra was pleased to make a land grant of 33 acres to the Society for enlarging its activities.

The Society has now submitted a proposal to the Government of India for inclusion in the 7th Five Year Plan to enlarge the Society's status as a Centre of Excellence.

The plan apart from enhancing existing facilities would establish a field research and education centre at the Society's estate of 33 acres of forested land adjoining the Sanjay Gandhi National Park at Goregaon in the suburbs of Bombay.

The primary objectives of this Centre would be:

1. To build upon, and develop the distinctive advantage that the BNHS has over other organisations and institutions committed to environmental conservation in terms of a growing membership of interested persons. It is proposed to do this by:

Progressively involving its members, staff and other interested persons in collecting information and data regarding the natural environment, continuously through the year.

A suitable system would be devised by which members and staff would be organised into an information grid and returns from these groups and individuals all over the country classified and stored at the BNHS and made available for research and for policy formulation.

Involving the members, staff and other interested persons in activities relating to the monitoring of our natural environment, thereby assisting the Dept. of Environment and other concerned agencies in this crucial, albeit difficult, task. Checklists will be developed and circulated to members and other interested persons, containing known indicators of specific environmental stress, degradation or turmoil. A system will be evolved whereby returns from these groups and individuals would be investigated and, if found significant, be communicated to Department of Environment and concerned agencies. Similarly, a more intensive system of monitoring would be evolved for areas which have been established to be ecologically sensitive or where activities with a significant potential threat to the environment are being undertaken.

Invoking the members and the general public to participate actively with efforts at conserving and rationally managing our environment.

Efforts will be made to disseminate information and data and to use the members and other interested persons to work with and inspire different segments of the society, for example the people living in and around national parks and sanctuaries, to not only themselves desist from being destructive to the natural environment but to prevent others from doing so also.

2. To carry out research into various aspects of the natural en-



vironment, which is:

field oriented, as at present, and attempts to understand natural processes as they really exist and through an empirical study in their natural habitat.

designed to tackle issues that could only be taken up with the help of the large membership that the Society has: a membership that could be involved in collecting data and information essential for research projects but impossible to gather by the usual small group of researchers who constitute a formal research team.

3. To design and implement environmental education and training programmes with the specific objectives of:

building up the capabilities of members, students and other interested persons for involvement in the earlier mentioned activities of collecting data and information, helping in monitoring the environment and invoking people's participation in environmental conservation and management.

Training new scientific staff and improving the capabilities of existing scientific staff, for undertaking field oriented research projects concerning the natural environment. This would also involve affiliating students, from various universities, to the BNHS for field oriented research in natural sciences leading to an M.Sc., M.Phil. or Ph.D. degree of these universities.

Organising training and educational programmes, courses and exhibitions to give members and the general public an opportunity to

develop their interest, awareness and knowledge of the natural environment. This may also be done through live exhibits.

4. To design and produce suitable books, pamphlets, charts and other printed materials, audio visual material and aids in English, in Hindi and in various regional languages, which could be both used by the Centre, and by other organisations, as aids for environmental education and training programme and which could be made available to the public as a part of the effort of bringing about environmental awareness and appreciation of our natural heritage.

Education regarding natural history and the need for conservation will also be imparted indirectly through the development of a range of educational products including games for children, household items etc. each of which would carry an appropriate educational message. This activity is expected to be self financing in the long run.

5. To develop an efficient environmental information system where data and information from published sources and as gathered by members, other interested persons and through the Centre's research studies could be systematically classified and made easily retrievable, for use by researchers and other interested persons and organisations.

6. To maintain and develop a collection of flora and fauna for use in research and education and as a record of the flora and fauna types of the country.



## A nature safari in Saurashtra

The jet swung sharply to the right and I looked out of the window. Broad expanse of a lake gleamed below. On the grassy banks I spotted some grey dots.

“These must be Demoiselle cranes”, I exclaimed. “Look, there must be close to a thousand of them on the farther bank”, said my companion, a Dutch scientist who had specially flown to India to see cranes. The end of January was approaching and the migrant birds that pour into Saurashtra every winter through Baluchistan and Sind should be in peak numbers, we thought.

The day we landed at Rajkot, we motored down to Gondal, formerly a well-known princely state of Saurashtra. Short of Gondal is a lake whose approach road is sure to make a jeep driver hold his breath. But once over the embankment, we and not the driver felt breathless and spell-bound. For, on that sheet of water now whipped by strong afternoon winds blowing in from the sea, floated hundreds of Shovellers, Wigeons, Pochards and Tufted ducks. A lovely pink ribbon of flamingoes adorned the faraway bank, and beyond on the meadows and in fallow fields stood Common cranes, to the delight of my friend. As we stood watching the spectacle, a piping skein of Black ibis alighted on the wash downstream. A flock of Little cormorants rose in unison and disturbed a covey of stone plovers

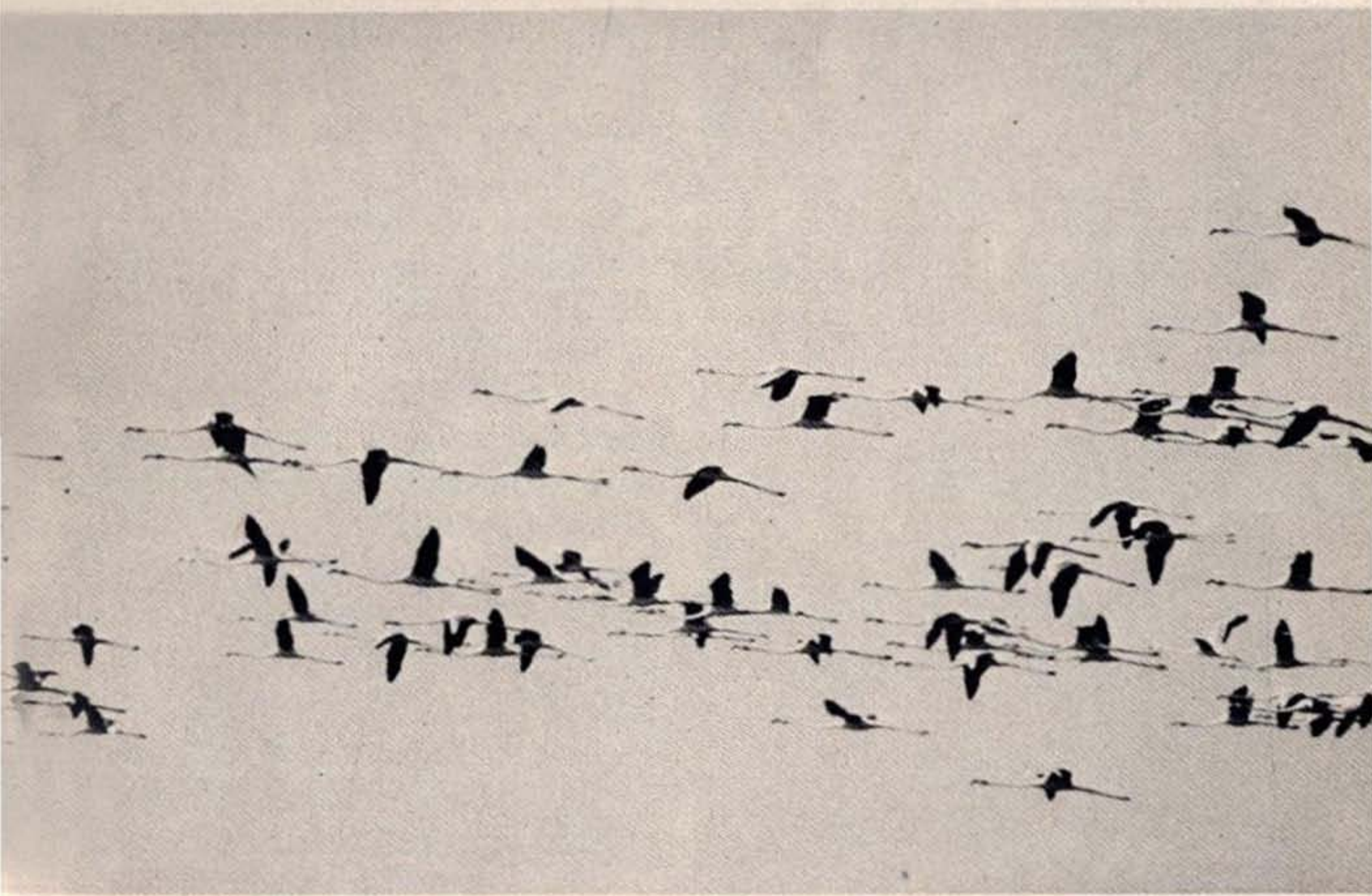
which were camouflaged on the stony upland beyond. My friend's camera, burdened with a heavy telephoto lens, rattled ceaselessly.

We must have stood there watching birds for a long time. For Lavkumar signalled, “Time to go back to Rajkot”. Lavkumar is one of the most knowledgeable ornithologists of Saurashtra. The peninsula is wellknown not only for its birdlife, but also for birdwatchers and ornithologists, many of whom were former princes who not only shot birds but also protected, studied and photographed them.

Lavkumar was going to show us the great assemblies of Demoiselle cranes that gather on reservoirs around Rajkot. The wintering cranes here follow a peculiar routine. Early in the morning the flocks fan out in different directions to feed in the fields on fallen grain and groundnut, to return to the banks of reservoirs around 11 in the morning. Here, they have a siesta and rest till evening, when they fly out again for another bout of feeding. They return to roost in the gathering dusk.

We raced back to Rajkot and went straight to lake Lal Pari. Above the lake there are remnants of a garden of the princely state vintage, on a promontory which commands a breath taking view of the lake. Nearer, our binoculars could spot nothing. But farther





*Demoiselles (above) and Flamingos (below) in Saurashtra*

*Photos: Author*



where the ground rose to meet a hill-slope, bunches of grey dots led us to a sea of birds---and they were all Demoiselle cranes. At least 3000 were there, was our estimate. "Last year when a famous Swedish photographer and his wife visited here, there were about 10,000 of them", remarked Lavkumar. Three lakes around Rajkot---Lal Pari, Nyari and Ramarda, hold between them more than 10,000 Demoiselle cranes in the winter.

Once in Saurashtra you do not feel shy on numbers. There they count birds in hundreds or still better in thousands. "Last year we only had 25,000 ducks, but this year their number is better", Lalsinghbhai said casually. Lalsinghbhai heads the birding community in Jamnagar and struggled to make people aware of their natural heritage. He was speaking of the lake right in the middle of Jamnagar, an industrial city with all the congestion, filth and squalor and typical of such cities in our country. But unmindful of the din and bustle, thousands of birds throng on the lake which forms the backyard of government offices and residential blocks and is surrounded by busy streets. Here, in one sweep of binoculars can be seen almost all the ducks that migrate to the subcontinent. Hundreds of Little cormorants perch on concrete pillars of an abandoned construction. The city fathers wanted the lake to be filled up and sell the plots to the builders. Thanks

to the resistance put up by nature lovers like Lalsinghbhai; the project has not materialised so far.

We had to jump over some drains to get closer to the birds. But the stench was nothing compared to the marvel spread before us. Along the grassy edges a number of waders---Bartailed godwits, Blackwinged stilts, sandpipers, Little stints, Ruff and reeve, Redshanks---were busily probing for food. Two skimmers with their ponderous red bills slit open, sat on an island while Caspian terns circled over. Innumerable ducks covered the surface of the lake. On one side a long line of Avocets busily searched for food, while a large flock of Greater flamingoes preferred to sleep soundly with their curving necks resting on their backs.

We thought that this miracle of a place was sure to have turned every Jamnagar citizen into a birdlover. But alas, very few are even aware of it. Are we blind to natural beauty? Or more likely, in a region endowed with such bountiful natural heritage, is all this taken for granted and just ignored?

I was even more fascinated by the other place near Jamnagar that we visited. This is the Khijadiya bird reserve. Here greater variety of habitat attract correspondingly greater variety of birds. This vast wetland borders the sea. Its seaward side is saline and brackish with scattered mangroves on which, of all the animals, the camel also feeds.



These saline mudflats attract Curlews, Avocets, Reef herons, Spoonbills not to say Large egrets and Pied kingfishers.

The sweetwater expanse of the wetland is separated from the saline mudflats by an embankment on which you can drive through a screen of *Prosopis juliflora*. As you drive ahead, Coots, Moorhens, Purple herons and Spotbill duck race for the shallow pools. Lesser and Greater flamingoes walk away with long strides and a flock of White pelicans lifts up, beating the water with their massive wings until these heavy weights are airborne. The pelicans and flamingoes can exploit the saline as well as the freshwater habitat.

The shallow freshwater pools also attract White ibis, Painted stork, and a variety of ducks. A vast sea of reeds in the background conceals more than it reveals. Only when an eagle coasts over its contours do the birds rise and can be spotted.

“A wonderful place to be put under the Ramsar Convention”, I remarked and my friend agreed. The Ramsar Convention which was ratified by India in October 1981, calls on member countries to protect certain large and strategic wetlands frequented by migrant birds that fly through several countries. Keoladeo Ghana near Bharatpur and Chilka Lake in Orissa have already been included under the Convention. The extensive wetlands near Khijadiya could very well be the next entry.

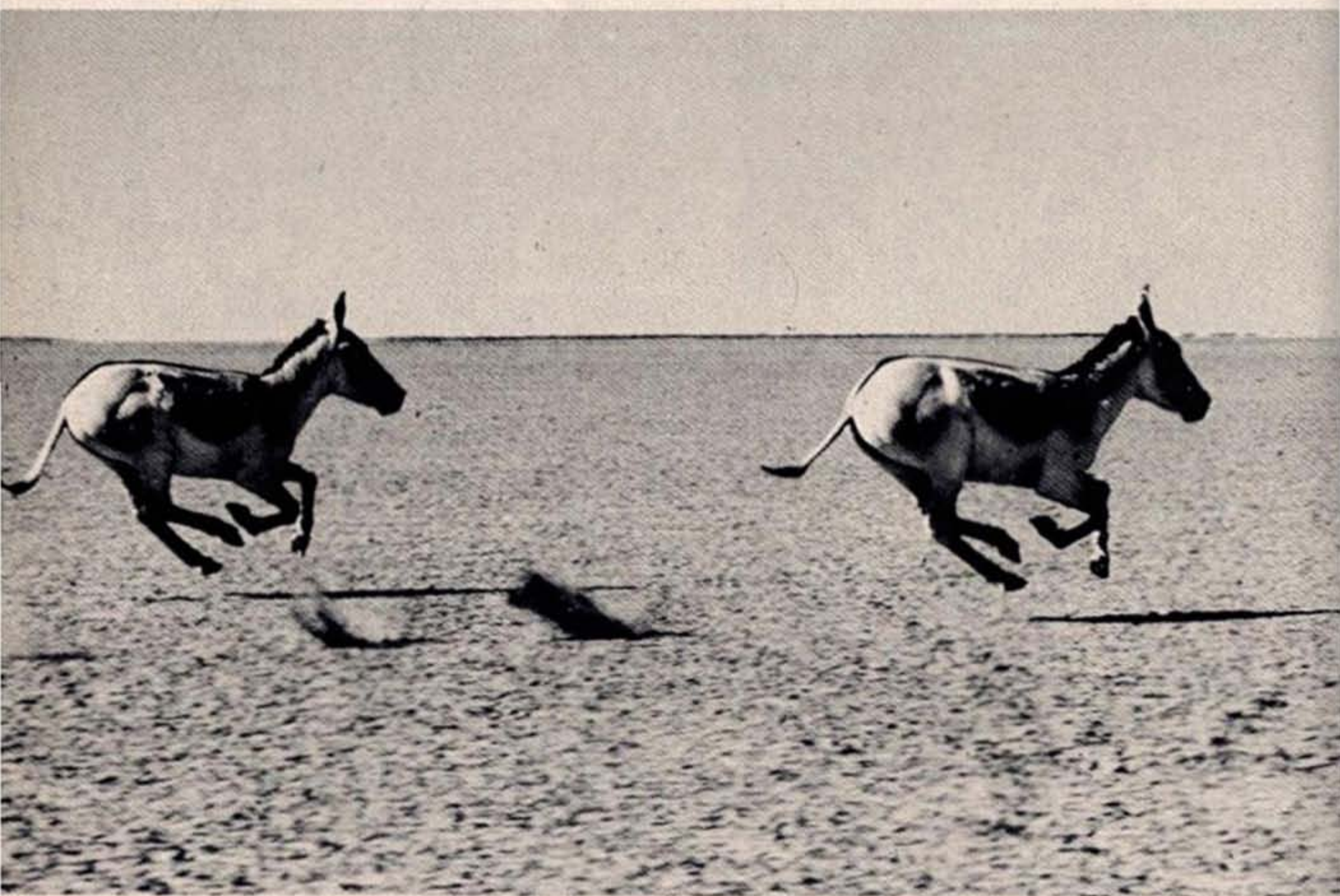
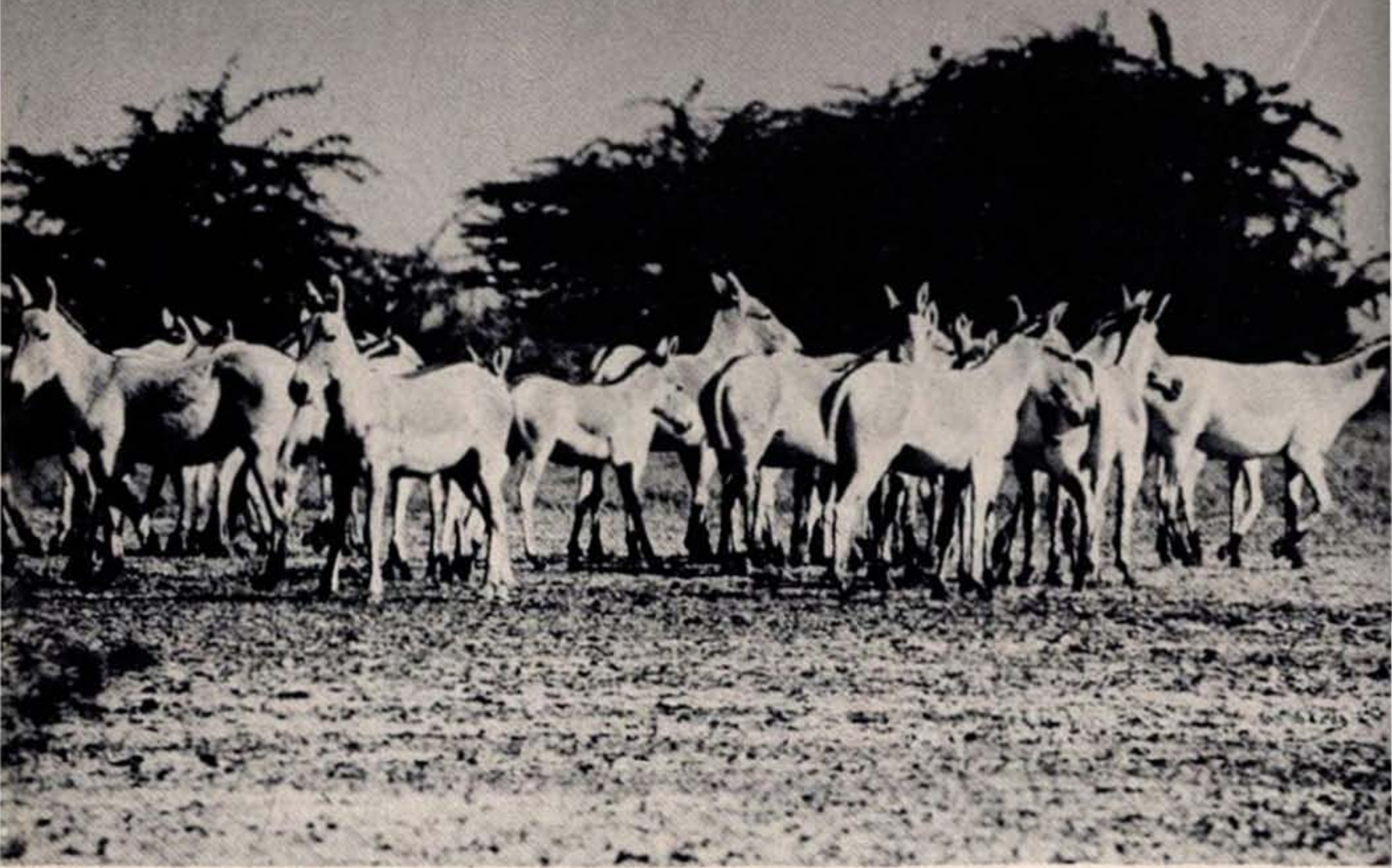
We had to leave Jamnagar the next day, for our hosts were promising even greener pastures ahead. Reluctantly we left the city, but not before obtaining pictures of a pair of Brahminy kite that chose to nest on a *neem* tree beside a thoroughfare, dusty and noisy with heavy vehicular traffic.

Our next destination was the Little Rann that straddles the area between Saurashtra and Kutch. It is a vast, dusty, waterless plain that overlooks the Gulf of Kutch and where mirage can play havoc with your vision. Saline lakes fill up depressions, suggesting that the area once held an arm of the sea. Now *Prosopis juliflora* is trying to take over the dry plain and preventing the dust being blown further inland.

This inhospitable region is the kingdom of the Wild Ass, that remarkably tough animal which makes a speciality of surviving in the most desolate regions of the world---the Rann, Ladakh and deserts of Central Asia.

From Dhrangdhra we started very early, even before daybreak. We were going to face the Wild Ass on his home ground but not well versed in the art of survival without food and water, thought it better to return by noon to the shade of a tree for a bite. The Forest officer accompanying us was quite optimistic. He would not only show us the Wild Ass but would also give us the pleasure of chasing a herd in his jeep. My Dutch-friend was quite





*Wild asses in Saurashtra*

*Photo: Hanumantha Rao*



pessimistic. Not used to big wild animals in his own country and having been told that all of India's large animals are nocturnal, he thought our chances of meeting any animals were one in a hundred. "We may perhaps see some specks on the distant horizon", he lamented.

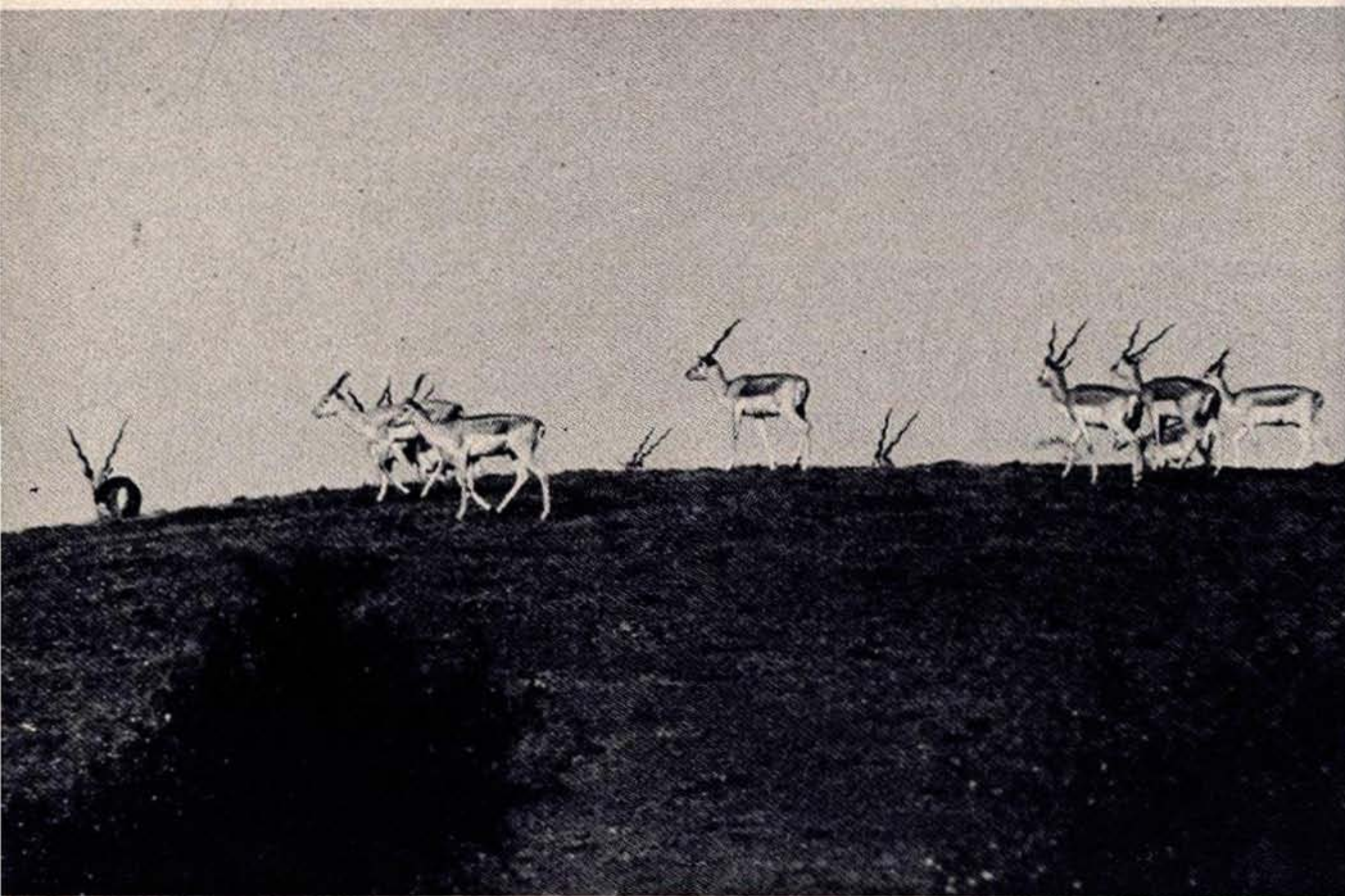
The road was level and very well kept. Bordered by cotton fields, it ran in a straight line until we came to a bridge under construction. A broken road ran through the depression and our vehicle had to climb the other bank to join the road once again. But no sooner did we reach the road, than we shouted to the driver to stop. For, in a green field beside the road we saw a troop of Wild Ass as the sun was just breaking over the horizon. Wild Asses in a totally different setting, miles away from their parched homes, their sanctuary, merrily munching the tender leaves of young jowar. My friend could not believe his own eyes. For half an hour we stood entranced and then my friend thought of getting out of the vehicle for better pictures. Cautiously we got out. Then we crept ahead; still the animals fed nonchalantly. Only when we were fifty metres of them, they began showing uneasiness. But there was not need to go further; we just kept watching them. Then came a shout from the other side. The cultivator had seen the asses. What was feast to our eyes, was a bane to him. He barged in and the animals bolted,

trotting away in a neat file.

The Forest officer kept his promise. We had the dubious pleasure of chasing the asses at close to 60 km per hour on the Rann. This perhaps is the game which every visitor to the Rann is obliged to play and the animals know this. As soon as a vehicle is spotted, the asses begin to wheel and trot. A vehicle outside the Sanctuary perhaps does not elicit the same reaction. Is it not wonderful that we met the Wild Ass outside his home, where he appeared more placid, more unafraid.

We returned to the road bordered by cotton fields. In some of the fields where cotton had already been harvested, I could detect yellow patches. On closer examination, the patches turned out to be blooms of a plant, actually the root parasite *Cistanche*. I had seen it growing on the roots of *Capparis decidua* in the Thar desert. But here in the Rann, the colour of the bloom was more vibrant, the growth more prolific. But otherwise the vegetation of Saurashtra somewhat disappointed us. Even the few characteristic species of the arid zone like *Capparis decidua*, *Salvadora*, and Bishnoi's wonder tree in Rajasthan, the Khejdi (*Prosopis cineraria*), were few and far between. Everywhere *P. juliflora* appeared to dominate the landscape. It was brought in to resist the march of the desert. But if it is the only choice, it is both unfortunate and costly. It is





*Above. Pintail ducks in flight. Below. Blackbuck near Botad*

*Photos: Author*



no friend of wild fauna, nor is it accepted by the cattle. Indigenous species like *Salvadora* and *P. cineraria* will be far more beneficial and should be planted with vigour.

Our last stop was Hingolghadh, a fairy palace atop a hill surrounded by beautiful dry-deciduous forest. It was the monsoon home of the royal family of Jasdan. The present heir, a keen naturalist and ornithologist, has marked this place for educating the children in the mysteries of nature. The surrounding forest is dedicated to the children of India. This forest is a sanctuary, maintained by the royal family. In the evening you sit on the promenade outside the palace to watch the glorious sunset and observe chinkara and nilgai quietly browsing the trees below. Above in the canopy of the balcony a female Lagger falcon sits on her eggs, while a distant hoot of the owl marks the arrival of night.

Blackbuck or the Indian antelope, once common, now exists in isolated pockets in Saurashtra. The antelope finds a sanctuary in a group of hills 60 km from Hingolghadh. The remarkable thing about this place is that the sanctuary is looked after by the town of Botad. Over 300 antelopes roam the scrub forest in perfect security. Besides a few dominant males with their harems, there are bachelor groups of young bucks. What a wonderful place to study the life of this endangered antelope! In spite of so many animals, the

vegetation appeared to be healthy and thriving. If human interference is absent, animals and plants tend to live in harmony. On the other hills there are neither any wild animals nor trees, nor bushes.

The munificent citizens of Botad look after not only antelope but also old and sick cattle, goats and sheep. Owners of animals bring their useless cattle here, and these are fed, given medical aid, etc. and are not allowed to starve. Many of them die of old age. This sort of compassion towards animals is probably unique today in our country.

This was a fitting climax to our safari. It was a revelation to understand what a dedicated and determined body of citizens can do to conserve nature. All the maxims the high pontiffs of conservation preach, were translated into action here.

We left Hingolghadh on a happy note. We had seen one of the richest avifaunal regions in the country. We had seen what efforts are needed to protect this natural heritage; and we have come across the ideal solution ---local population dedicated to conserving the surrounding plants and animals.

As we neared Rajkot, the factory chimneys belching grey smoke came into view. But by the side of the road was a blue lake and in its midst was a pink ribbon of Lesser flamingoes---soundly asleep. Was it not typical Saurashtra?

PRAKASH GOLE



# NOTES, NEWS AND COMMENTS

## World Forestry Day

As part of the World Forestry Day Celebrations last year a painting competition was arranged under the Society's Nature Education scheme on 19th February 1983, when more than 300 students from various schools around Bombay participated. The prize distribution was held on 15th September 1983 at Hornbill House when Mrs Indira Gandhi, the Prime Minister of India, gave away the prizes to the first prize winners of each age group. The second prize winners and runners-up of each age group received prizes from Dr Salim Ali.

This year in view of the oncoming final examinations of schools and colleges, an on the spot essay competition was held in advance on 18th February 1984 as part

of the World Forestry Day, when 321 students participated. The topics given: to the first group of Standards 5th to 7th *Why we need forests?*, the second group of Standards 8th to 10th had *Forests and Man*, and the third group of Standards 11th and 12th had *Forestry and development*.

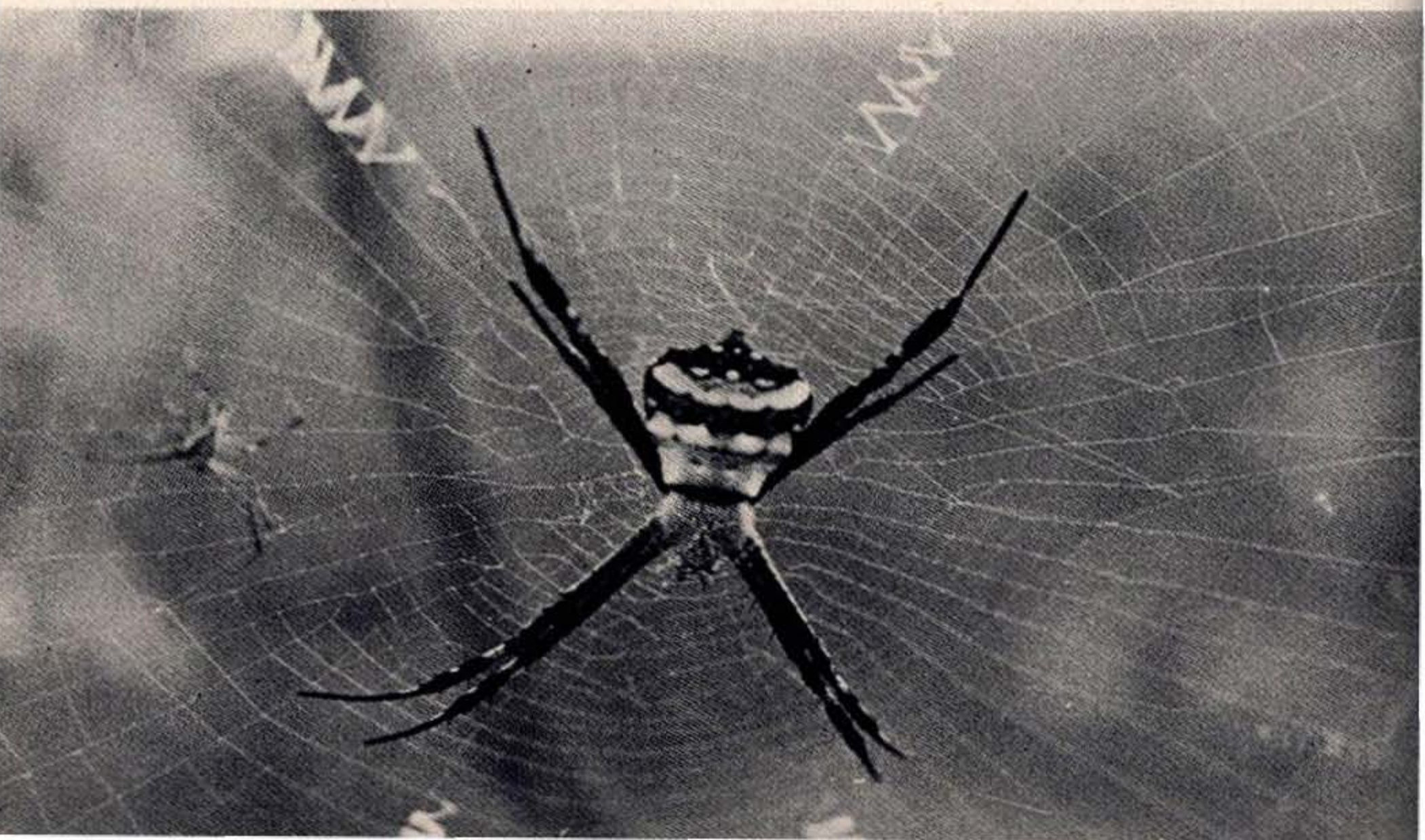
Prizes to the winners were given away by the Hon'ble Minister of Forests, Shri Surupsingh Naik on 21st March at Hornbill House.

## Spiders

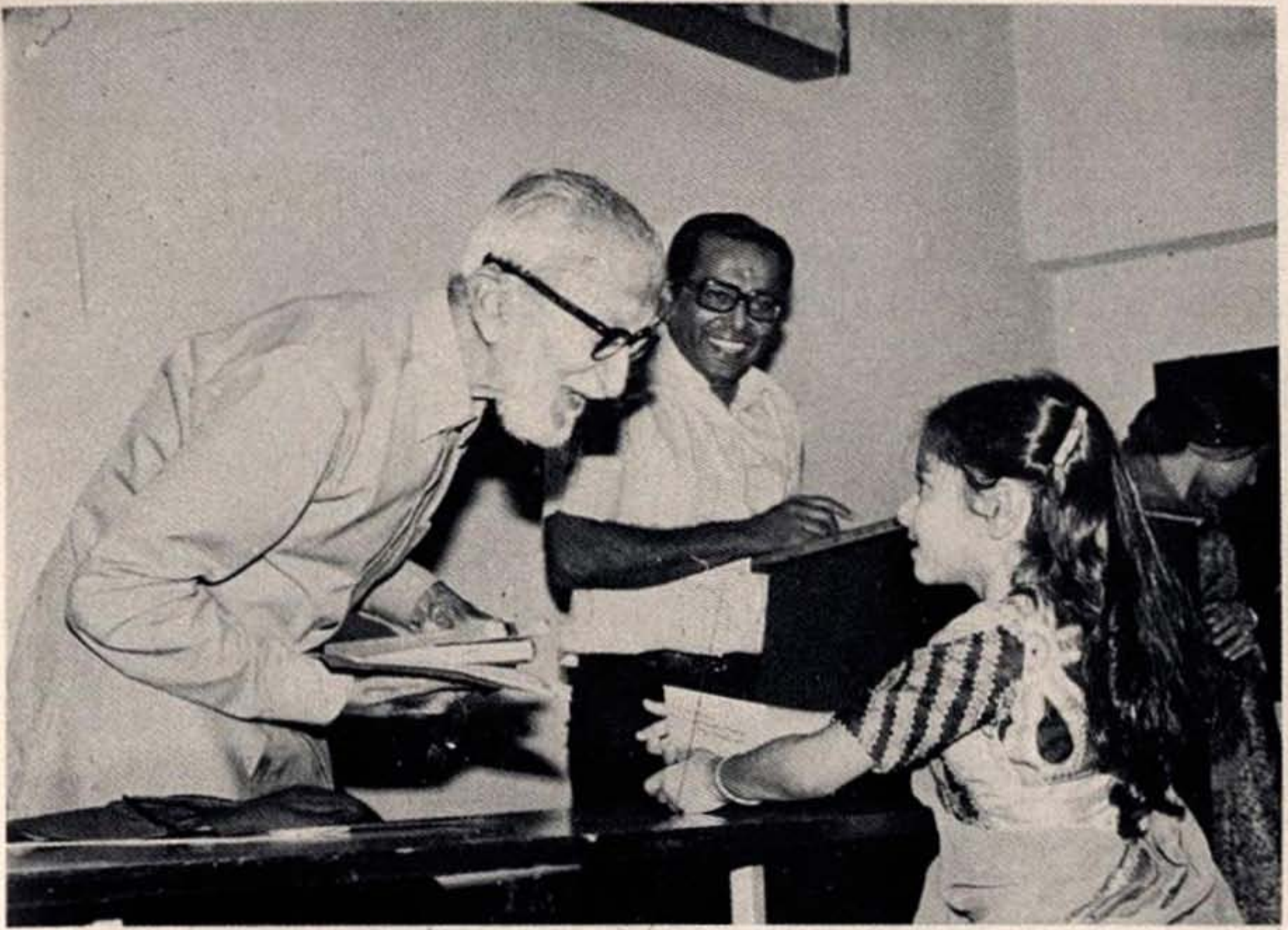
There is a notable increase in the study of spiders, which is reflected in the formation of the British and American Arachnological Society since 1950. With the growth of information about the order Araneae there followed a large-scale reclassification of, and additions to,

*An Argiope spider on its web*

*Photo: A.R. Rahmani*







*Photo: Robert B. Grubh*



*Photo: Goutam Narayan*

*Above. Dr Salim Ali and a young prize winner of the art competition. Below. The Forest Minister and a prize winner in the essay competition.*



the previously known species. A major hinderance, however, to the taxonomists, arachnologists and ecologists is the unavailability of a satisfactory catalogue of the Aranea. The two existing catalogues preceding the current publication do not include the thousands of species described or reclassified in the last 25 to 40 years.

To remedy this situation, the Manchester University Press, New Hampshire, U.S.A., has published Paolo Brignoli's A CATALOGUE OF THE ARANEA DESCRIBED BETWEEN 1940-1981 under the sponsorship of the British Arachnological Society. The CATALOGUE is now a major work of reference not only for the professional arachnologists but also to the beginner. One will be able to know from it the names of the entire spider families and all valid genera. It will also get oneself referred to literature published over the last 40 years.

The price of the CATALOGUE is U.S.\$90, which includes handling and shipping charges to any destination the world over.

Orders for the CATALOGUE should be placed with:

MANCHESTER UNIVERSITY PRESS  
51, WASHINGTON STREET  
DOVER, NEW HAMPSHIRE 03820  
U.S.A.

### **Aquaria**

B. F. Chhapgar's HOW TO KEEP FISH AT HOME brought out by the Taraporevala Aquarium of Bombay

is certainly an invaluable guide for beginners who wish to keep aquaria at home.

The most notable feature of this informative booklet is its relevance to Indian conditions and to fish of Indian origin. Such guides on fish keeping so far available being authored by foreign authors often exclude fish of Indian origin in their scope. The present guide therefore fills a long-felt need.

Almost all important aspects of successful fish-keeping are dealt with in an informal and fluently written text, and is adequately illustrated with excellent line drawings to facilitate identification. Information on insect enemies and maladies of aquarium fish, treatment of freshwater-and brackishwater fish, as also the tips contained in the book on aquatic plants for decorating the fish tanks help in the aquarium maintenance operations.

The price of Rs 4/- per copy brings the book within reach of everyone interested in keeping aquarium fish. Copies could be had from

THE DIRECTOR  
DEPT OF FISHERIES  
TARAPOREVALA AQUARIUM  
NETAJI SUBHAS ROAD  
BOMBAY 400 002

### **Conservation training**

The Jersey Wildlife Preservation Trust, established in 1963 under the auspices of Gerald Durrell, provides



a centre for the breeding of Endangered Species as a means of ensuring against their complete extinction. Besides conducting field surveys to assess the status of such species, emphasis is now being given to development of projects for reintroduction of captive bred stocks into natural habitats to restore original wild populations.

The Trust has on earlier occasions held four successful Summer Schools. The two held in 1980 and 1981 had 'Biology and Conservation of the Primates' as their topic. In 1982 and 1983 the topic was 'Breeding and Conservation of Endangered Species'. The Summer School to be held from 11th August to 1st September 1984 has the same topic as in 1982 and 1983.

The aim of the three-week course is to provide a basic introduction to practical management aspects and to supply detailed information relevant to captive breeding and conservation. The course is intended for zoo staff or for students who wish to further their interests in the studies of behaviour and the role of captive breeding programmes as an aid to Conservation.

The fee per person attending the course is £450/- (c. US\$675), which includes food and accommodation. Admission for the course would be limited to 20 and would involve selection on merit. Further details could be had from

THE SUMMER SCHOOL CO-  
ORDINATOR  
JWPT TRINITY

## JERSEY, CHANNEL ISLANDS BRITISH ISLES

### **A book on Bird Conservation**

The International Council for Bird Preservation is preparing a 380-page illustrated book on bird conservation to be published simultaneously in several worldwide languages in the spring of 1985. The book will contain a series of introductory chapters explaining the functioning of ecosystem, the role of birds within them, and the relationship with and benefits to man. Following these chapters there will be individual chapters on 13 major ecosystem types. In each of these a concise introduction will be followed by accounts of a number of threatened species from different parts of the world, highlighting the problems they face and the action taken to save them. The species accounted will be fully illustrated with colour photographs, explanatory diagrams and in some cases with colour paintings.

The ICBP seeks help from the Society's members for securing photographs mainly of birds on the Asian scene. Besides the list given below, suitable material on any other special subject may also be sent. Clear, sharp photographs preferably taken without flash are desired. In case of bird pictures they should show an adult bird in its natural habitat, preferably depicting interesting though normal behaviour such as feeding, displaying, etc. Nest photographs are to be avoided.



All photographs will be treated with utmost care and those not selected will be returned promptly by Registered Post. Selected material will be returned similarly. Payment has been budgeted on realistic reproduction fees but if one wishes to waive the fees or accept a modest token fee, may please inform them accordingly for it could hardly be in a more worthwhile cause.

#### LIST

FALCON *Falco* in flight (stooping on prey)

VULTURE (Family Cathartidae or Accipitridae) soaring overhead

SPARROW HAWK *Accipiter nisus* flying through trees

JACANA (LILY-TROTTER) (Family Jacanidae) walking over water-lilies

SPOONBILL *Platalea* sp. feeding

PEACOCK *Pavo* sp. in full display

OWL (Family Strigidae or Tytonidae) catching prey

FLORICAN *Sypheotides indica* in long grass

Cattle grazing on short grass in India

FALCONER and FALCON *Falco* sp. in desert

CATTLE, CATTLE EGRETS *Bubulcus ibis* and HERDSMAN

Alternatives: SIBERIAN WHITE CRANES *Grus leucogeranus* on winter-grounds (Bharatpur India); Crane-hunters

RINGNECKED PARAKEET *Psittacula krameri*

BLYTH'S TRAGOPAN *Tragopan blythii*

Bare trees in snow; ice on branches

BENGAL FLORICAN *Eupodotis bengalensis* in display

Long grass habitat

GREAT INDIAN BUSTARD *Ardeotis nigriceps*

Dust-storm in sand desert

SANDGROUSE *Pterocles* or *Syrhaptes* spp. fighting to/from water-hole

HOUBARA BUSTARD *Chlamydotis undulata* — desert wintering grounds

Arab hunters with guns and vehicles; bustard being chased by Falcons

Habitat of JERDON'S COURSER *Cursorius bitorquatus*

CATTLE EGRET *Bubulcus ibis* with cattle; nest colony

PIGEON *Columba livia* fed in city square by children

HOUSE SPARROW *Passer domesticus*

WHITETHROAT *Sylvia communis*

WRYNECK *Jynx torquilla*

Tea/coffee plantation in the tropics

Bodies of poisoned birds

LITTLE TERN *Sterna albifrons* against background of beach develop-Asia-tropical rainforest Asia-ricefields.

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## Bats — an urgent need for their conservation

Bats, which constitute nearly a fourth of the extant mammalian fauna in number of genera and species form the second largest Order among mammals and have developed numerous morphological, anatomical and physiological modifications suited for an active aerial life and an inverted resting posture. These make them unique among mammals. While all bats look alike to a layman there are over 800 recognized species incorporated in 18 families. They range in their body size from the size of a large moth (*Pipistrellus mimus mimus* from India has an adult body weight of 3.5 to 4 g) to the giant fruit bats with a wing-span of over five feet and a body weight of nearly a kilogramme. They have a wide variety of dietary and feeding habits on the basis of which they can be classified into frugivorous (herbivorous), insectivorous, carnivorous, piscivorous, nectarivorous and sanguivorous bats. The dietary habit is almost specific to a given species. Using an ultrasonic sonar mechanism they are not only able to navigate themselves during the night and avoid obstacles but are also able to catch insects in flight. The bats inhabit almost all kinds of ecological situations on land and are distributed all over the world except in the permanently frozen Arctic and Antarctic regions and very high altitudes like the ice-covered higher ranges of the Himalayas. In addition to their

anatomical modifications they have developed several highly specialized physiological characters. They are notoriously poor in fecundity and most species have a single rigidly defined annual breeding cycle and bring forth a single young one each year. In spite of their poor fecundity they have been able to maintain their populations except for a few species which are fast dwindling in their numbers and are on the verge of extinction unless active measures are taken to preserve them. A few of the Indian species which are endangered are mentioned later in this paper. By extraordinary ecophysiological mechanisms, such as by increasing their longevity (some species live for 25 years) and by artificially increasing the potential reproductive population by preferential mortality of males during their prepubertal life these animals have been able to maintain their population.

### IMPORTANCE OF BATS IN THE ECOSYSTEM BALANCE

Except a few exclusively vegetarian bats, which feed on fruits and tender leaves and shoots, nearly 98% of the bats feed on insects which they catch while in flight utilizing their special echo location faculty. The importance of this becomes clear if we realize that a single bat consumes about 2500 to 3000 insects each night. An example of the importance of this in maintaining the ecological balance will



bring out the significance of their voracious habit. The Robbers' cave near Mahabaleshwar has, perhaps, the largest colony of *Miniopterus schreibersii* in the world. An approximate estimate of the number of specimens in this cave was made by the authors a few years ago and the number of specimens within the cave was estimated to be about 400,000 + 25,000. The rich vegetation in and around Mahabaleshwar is maintained to a very great measure by the presence of these bats. Smaller colonies of this species are present at several places in the Western Ghats of Maharashtra, and all these help in maintaining the ecological balance and the lush vegetation because the insect pests on the plants and the trees are eliminated to a large extent by these bats. Similarly, the presence of large colonies of bats has ensured good agricultural yield in several parts of India due to the consumption of thousands of insect pests by the bats. One can predict with almost certainty a crop failure in a given area if the bats in the area are destroyed. It is painful to mention that the archaeological department, in their enthusiasm to keep the monuments clean, have destroyed by fumigation hundreds of thousands of bats inhabiting the old monuments. The thoughtless destruction some time in 1962 of several thousands of bats, which inhabited the caves at Ellora and Ajanta, was an added factor for the failure of the jowar crop in the adjacent regions during 1963 and 1964.

The timely action taken by the then Commissioner of Marathwada, Major R.G. Salvi, by issuing instructions to the archaeological authorities in Aurangabad not to fumigate the caves any further saved an agricultural catastrophe in Marathwada. The bats in the caves near Osmanabad were spared from fumigation. Except for a few places, the bats are driven out of their roosts or killed by fumigation in most of the archaeological monuments, and, unless the Government gives clear cut instructions to prevent this practice, we may irreparably disturb natural biological balance which controls the population of insect pests which affect various kinds of agricultural crops and horticultural products.

In some parts of Bastar area and Western Ghats the bats are eaten by the adivasis (and bat meat, specially of the giant bats like *Pteropus*, more than matches chicken and mutton in taste and consistency!). Some governmental measures should be taken to prevent the wanton killing of these bats since they form the major natural agents for the dispersal of seeds — specially in forest areas. It is painful to note that the two groups of man-made caves near Nasik in Maharashtra — Pandav Leni and Chamar Leni — which were full of bats about 25 years ago do not have a single bat now. They have all been destroyed or driven out of these caves by the archaeological department and other human agencies.



Nectarivorous bats are the natural and exclusive pollinators of certain economically important plants. Throughout East Asia the flowers of the Durian trees are exclusively pollinated by the bats and the annual income from Durian fruits alone is of the order of Rs 10 crores only for Malaysia. How many such exclusive pollinators of important fruit trees are present in India is yet to be determined.

#### BATS FOR RESEARCH

Apart from the sonar echo location system, which the bats possess, the maintenance of their population density in spite of their poor fecundity has been a baffling question which has evaded answer so far. A considerable amount of research work on the physiology of reproduction of these animals has been carried out all over the world with a view to understand this phenomenon. The protracted survival of inseminated sperms for several months in the female genital tract of bats has been known to occur in many bats inhabiting cold and temperate regions, and this was thought to be an adaptation to meet the severe cold during winter in these regions. Bats inhabiting these regions hibernate during winter. Recent work has shown that many tropical bats also exhibit this phenomenon, and that too at the body temperature! If the physiological mechanism responsible for the protracted storage of the spermatozoa in bats is properly understood, it would give us a very important clue not only for human population control, but also help in veterinary practice specially in regard to semen preservation for long periods and thereby increase

the right type of livestock both for milk and for meat.

#### THREATS TO BAT SURVIVAL

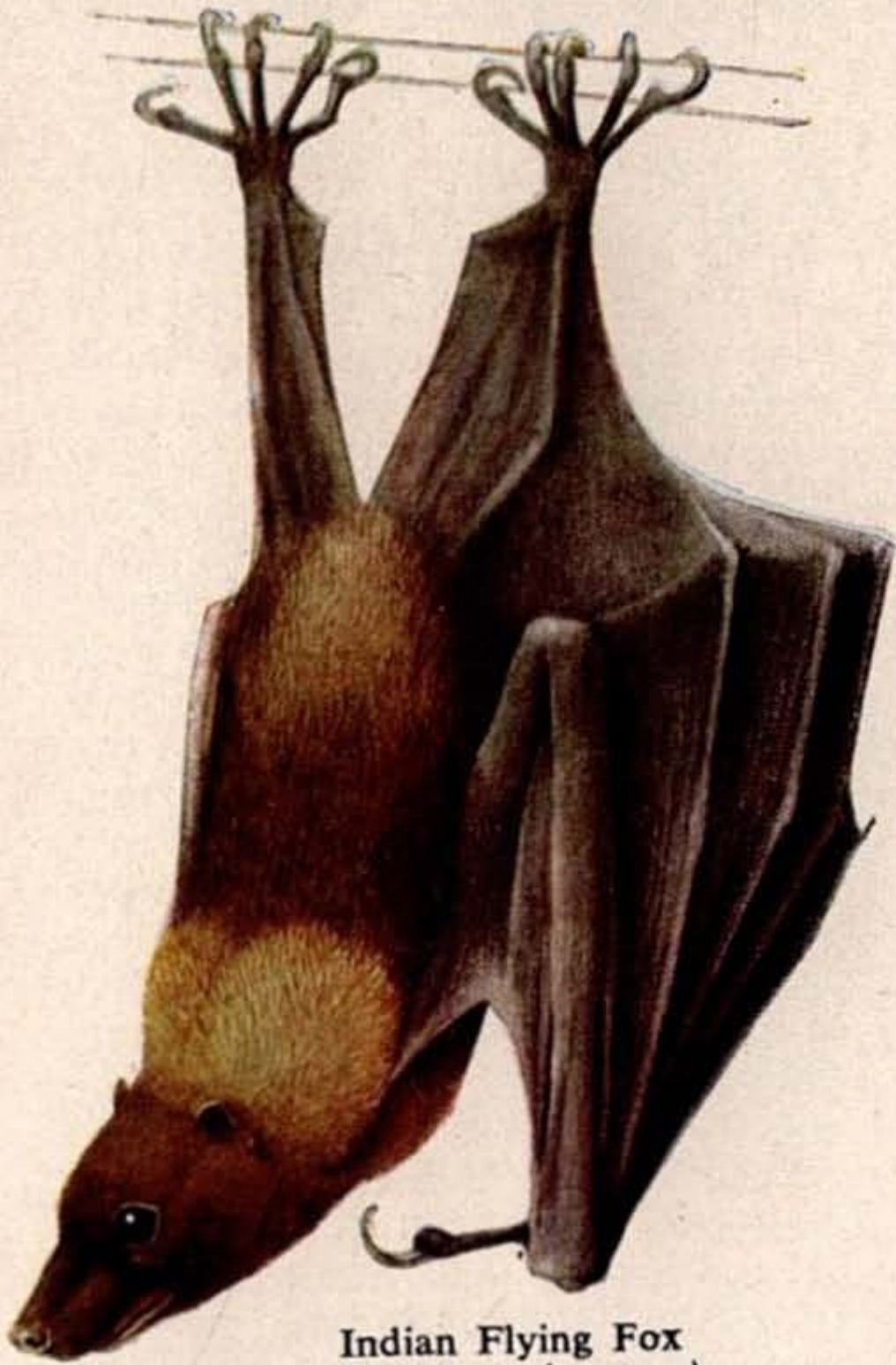
The bats have been misunderstood for ages in all human cultures as bad omens and as harbingers of bad luck. Hence, apart from the so called 'aesthetic' considerations of the archaeological department, bats are relentlessly destroyed by people. The importance of bat conservation has been recognised by governments of most of the advanced countries, and in many of these countries laws have been enacted to impose a heavy penalty for killing bats. In the United Kingdom a law has been recently introduced (as per newspaper reports) that even disturbing a bat roost would entail imprisonment for one year and a fine of £ 1,000. Similar laws have been enacted or are in the process of being enacted in many advanced countries in Europe, U.S.A., Japan and Australia. The "Bat Conservation International" has been recently established to advise the governments of the various countries on the methods to be adopted for the conservation of the bats. The Government of India should also take immediate measures to prevent wanton destruction of bats and their roosts.

#### BAT ROOSTS

Bats inhabit a variety of ecological systems. The most common places are the natural and man-made caves, old temples, hollows of trees, dungeons in old forts, underground passages in old palaces and old buildings, among closely hanging fronds of palm trees, under the eaves, between the tiles of houses, inside crevices in the walls of old wells, between rafters of bridges, between the wall and the wooden



0 5 10 cm.  
0 2 4 ins.



Indian Flying Fox  
(*Pteropus giganteus*)

0 5 10 cm.  
0 2 4 ins.



Fulvous Fruit Bat  
(*Rousettus leschenaulti*)



Shortnosed Fruit Bat  
(*Cynopterus sphinx*)

Great Eastern Horseshoe Bat  
(*Rhinolophus luctus*)



Great Himalayan Leafnosed Bat  
(*Hipposideros armiger*)

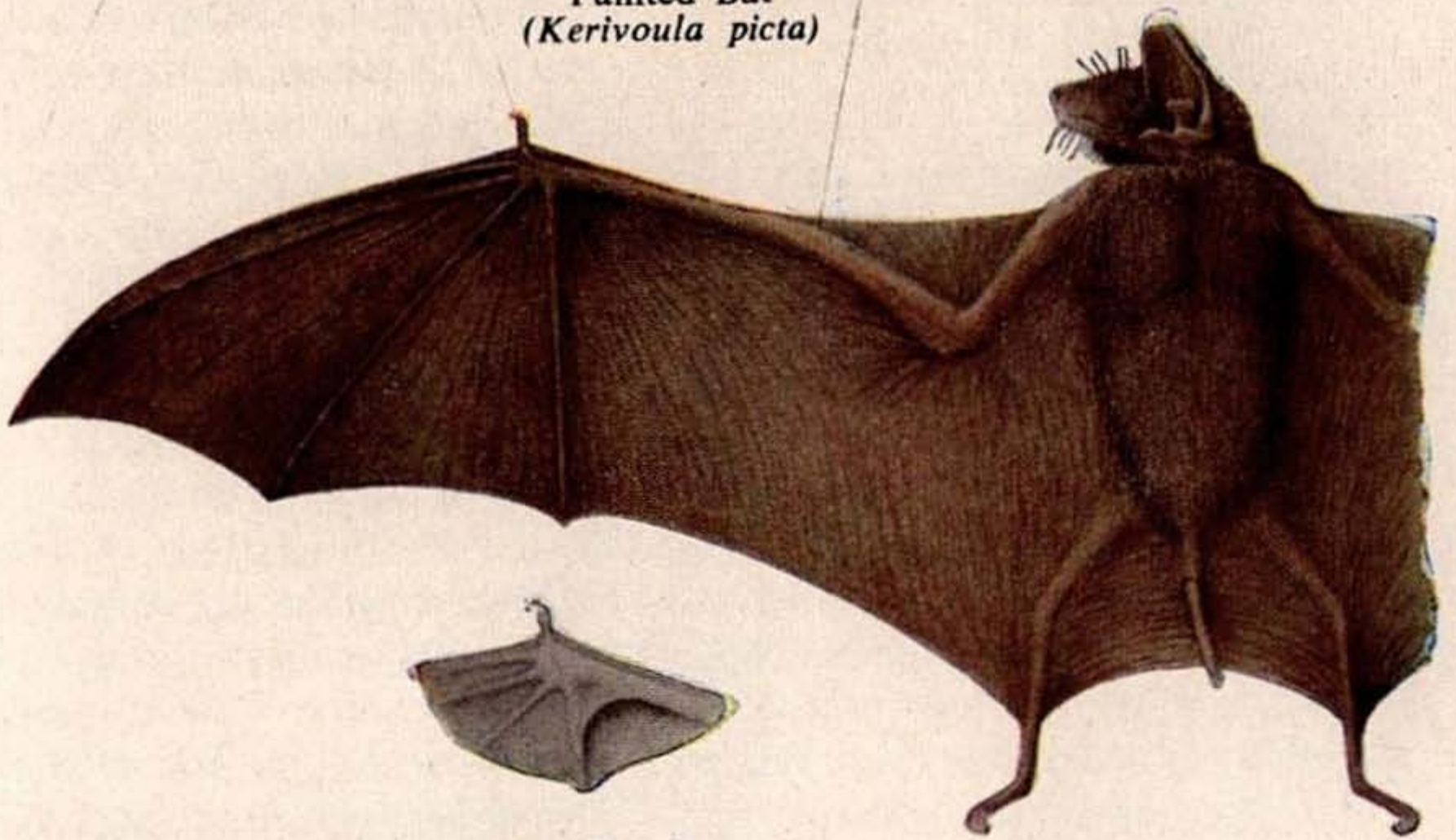


Indian False Vampire  
(*Megaderma lyra*)





Painted Bat  
(*Kerivoula picta*)



Bearded Sheath-tailed Bat  
(*Taphozous melanopogon*)



Serotine  
(*Eptesicus serotinus*)



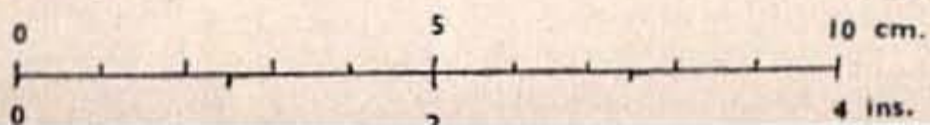
Indian Pipistrelle  
(*Pipistrellus coromandra*)



Tickell's Bat  
(*Hesperoptenus tickelli*)



Common Yellow Bat  
(*Scotophilus heathi*)





boards of electric switches and such other structures, inside the rolled young leaves of banana plants, inside the cracks among rocks and so on. Except for a small number of species which live in deep forests and in small groups of two or three specimens in each group most bats are anthropophilic and live in colonies. Cow sheds and grain godowns invariably have some bats living in them. The entire colony or the members of one sex in the colony may sometimes live in separate colonies during the non-breeding seasons. But in most cases males and females live together throughout the year. They have highly specific migratory habits.

#### ENDANGERED BAT SPECIES IN INDIA

Many species of bats are endangered because of human intervention. The extensive use of insecticides, which accumulate ultimately in the body of the bats since they occupy the apex of the food chain, is a great danger to the lives of these animals. Some scheme to eliminate the danger from this source should have to be taken up by the government. The residual pesticides are extremely harmful to the bats whose tolerance to these chemicals is very low. Secondly, it is necessary to develop insecticides other than the ones used at present and which do not accumulate in the body of the bats nor harm these animals.

Bats are of considerable economic importance because their guano is one of the richest naturally available manures — and this is available in plenty in India. For example, from the Robbers' cave alone it should be

possible to get over 100,000 tons of guano — accumulated during the past several centuries — and every year at least 50 to 60 tons of guano can become available from this one place. There are so many other places from where the guano can be collected every year, and used as manure since it is very rich in nitrogen content. There are nearly 2000 natural and man-made caves all over India so far explored and the guano can be collected annually from all these places. In fact, there is an urgency for carrying out extensive survey of the country for the bat roosts so that these animals are preserved not only for the biological control of insect pests but also for collection of their guano.

Two critically endangered Indian species are the Eastern Horseshoe Bat *Rhinolophus luctus beddomei* and the Painted Bat *Kerivoula picta* both of which are of high economic importance. There are also many other species which are in danger of becoming lost from India unless prompt action to preserve them is taken immediately.

There is an urgent need to augment ecological and other researches on bats in India as is being done in the advanced countries like the United States of America, Japan and Australia. The government should give all facilities for such researches on a top priority basis specially from the point of view of methods of conservation and for understanding the



mechanism by which they have a natural population control and for understanding the physiological mechanisms by which it has become possible for the spermatozoa of bats to remain viable for long periods at body temperatures as in some

tropical bats. These animals offer challenging problems both for purely academic research and for the application of the findings for human benefit.

A. GOPALAKRISHNA  
SATWANT SANDHU

### **The elephant in classical literature**

The classical literature of Greece and Rome contains many references to elephants. The most well known are probably the accounts of the use of war elephants by the Carthaginian general Hannibal. However there are many other descriptions of the habits and appearance of elephants to be found. The following short account is drawn from the works of Aristotle (384-322 B.C.), Aelian (3rd century A.D.), Pliny the Elder (23-79 A.D.), Strabo (c.63 B.C.-after 21 A.D.), Diodorus Siculus (1st century B.C.) and Solinus (3rd century A.D.). These authors are indicated by the first two letters of their names in the text.

Of all the animals only one exceeds man in longevity and that animal is the elephant. They live to 200 to 300 years and their adult life begins at 60 (Pl and St) but they are very prone to diseases (St) and dislike the cold (Pl). Owing to their large size elephants have a long period of gestation, 16 to 18 months (St and Di) or 18 months to 3 years (Ar). The female elephant has only two teats, which are located near to the forelegs, and usually has only

one young at a time. The young are born mainly in the spring (St). They suckle with their mouths and not with their trunks (Ar). The young are cared for six years (St and Di). Fully grown elephants are the largest of land animals (Pl). Indian elephants are nine cubits tall and five cubits in width (a cubit is about 20 inches) (Ae). The elephants of the island of Taprobane (Sri Lanka) are very numerous and larger than those of mainland India. The elephant has a unique nose which it uses like a hand to convey food to its mouth and to tear up trees. It also uses its nose to enable it to breathe while standing in deep water (Ar). Elephants do not have hooves either cloven or solid (Ar) but have five toes on each foot (Ae). The front legs will not bend and the elephant is unable to settle down on all of its legs at once but has to recline onto one side or the other (Ar). They have short tongues (Ae). Only the tusks are composed of ivory, the skeleton being only ordinary bone (Pl). The tusks are used for digging up roots. Male elephants sometimes discharge a sort of greasy stuff from the holes in their temples (St). Elephant flesh is inedible except for



the trunk and lips (Ae). Elephants eat tree trunks (Pl). In captivity they eat nine medimni (about twelve gallons) of barely and drink fourteen metretae (about 8½ gallons) of water in the morning and a further eight metretae in the afternoon (Ae and Ar). The creature which elephants despise most is the mouse. If a mouse even touches the fodder of an elephant the elephant will refuse to eat the tainted meal. Their hide is very hard but the belly is soft. The skin is creased and they crush flies in the creases (Pl). Elephants can cure their wounds by eating olive flowers (Ae). Elephants are closest to man in intelligence, understand language and obey orders. One elephant is reported by Mucianus to have learnt the Greek alphabet (Pl). They are frightened by rams and by the squealing of pigs, but are attracted to beautiful women and enjoy the smell of perfumes (Ae). They like rivers but cannot swim owing to their size (Pl). When elephants come to a river, the smallest cross first so as not to wear away the bottom so quickly (Pl). If a group of elephants come to a ditch which they cannot easily cross, the largest one jumps in to bridge the gap. The others then walk over his

back to the other side. Then one elephant allows the one in the ditch to clasp his leg with its trunk while the others throw material into the ditch to allow him to climb out (Ae). Elephants are particularly moral animals and will punish adulterers by impaling them on their tusks (Ae). Elephants salute the rising sun by lifting their trunks to it. When the Sun is particularly hot they cover each other with viscous mud as a protection against the heat (Ae). Elephants worship the Moon (Pl). At the onset of New Moon they collect branches from trees in the forest and, holding them in their trunks, wave them back and forth while gazing at the moon. Full-sized elephants are difficult to capture, so they are captured young and trained as they grow. They are able to climb up and down ropes (Pl). If elephant fat is rubbed onto the body it makes one invulnerable (Ae). An enemy of elephants is a snake called the drakon. It hides in a tree and when an elephant comes to feed from the tree, the snake gouges out its eyes and strangles it. Old elephants go to live in a region of luxuriant green at the base of Mount Atlas. Here they live out their lives peacefully.

*Harrow, England* J. P. LEAVER



## A case of mistaken identity

The dense teak forest of Singrampur, Damoh district, M. P. is relatively free from human interference. The region has been famous for its rich wildlife even up to the first quarter of this century. Like other parts of the country, this region has also witnessed an unprecedented decline in wildlife but the strict enforcement of the Wildlife Act has shown a definite rise in the numbers of animals. Small herds of nilgai, chital and chinkara move freely in the core area of the forest. Langur troops are found in the peripheral areas. Occasionally wild boar, sloth bear and leopard are also seen. The tiger is difficult to see, but indirect evidence such as pugmarks and the reports of villagers suggest that there are at least six tigers present in this forest—an old male lame on one foot, a younger male, a female and three subadults.

In this part of the district, villagers go early in the morning to the forest to collect mahua flowers (*Madhuca indica*). There had been incidents when mahua flower gatherers have encountered sloth bear, but they normally take the risk for the mahua flower, which is eaten and used for distilling a potent liquor.

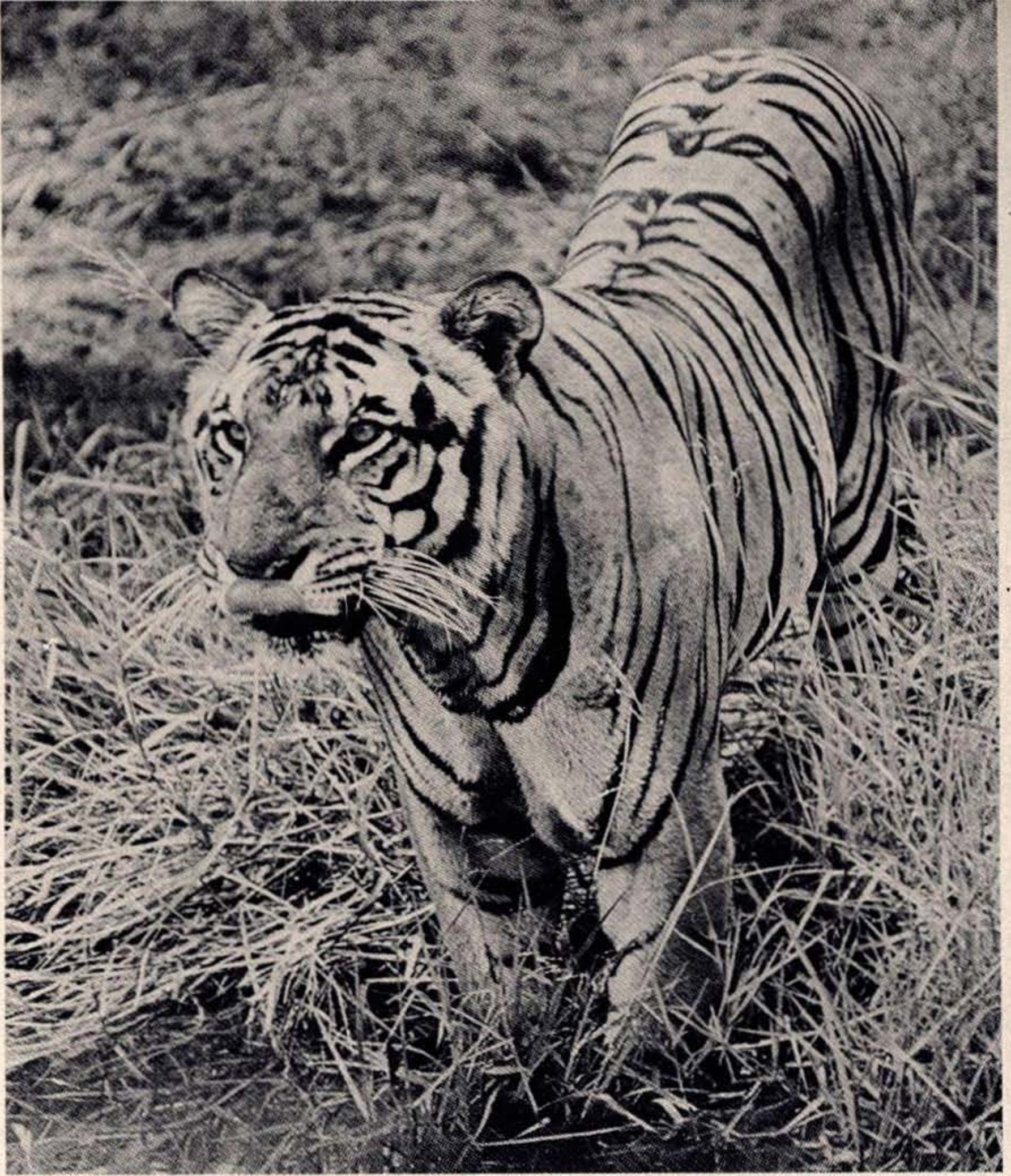
It was well before dawn on 25th of April 1982, when two tribal youths went deep into the forest in their usual search for mahua flower. They found a mahua tree which had

shed a large number of its fragrant flowers and while one stood guard, watching the branches of the tree, apparently in fear of the sloth bear, the other busily picked the flowers scattered all over the ground beneath the tree. Before they could sense the danger, the tribal who was bent over picking flowers felt a smashing grip on his right arm. Any other villager, but the healthy tribal would have become unconscious as the large canines of the tiger pierced deep into the muscles of his arm, but the victim cried loudly and his companion though struck with fear at the sight of the big cat threw stones and shouted loudly. All this happened in a fraction of a second. The tiger surprised and disconcerted immediately released the man and disappeared into the forest.

The bleeding from the wound was severe, but the two tribals though in a state of shock managed to reach the village. The injured person was given first aid at the village and immediately sent to the Medical College Hospital at Jabalpur 50 km away, where he was soon declared to be out of danger.

The attack, which was by the old male, is intriguing. The tiger is not a man eater, there is no report of this tiger or any other attacking a human being, and the tiger has been often seen near jungle villages. Although it is old it is not a cattle lifter, and therefore respected by the local villagers as the 'Tiger of





*"The tiger is difficult to see ....."*

*Photo: Hanumantha Rao*

Devimatha', the local goddess.

This incident leads us to believe that the poor tribal was the victim of mistaken identity. The tiger with its poor smelling powers mistook the man who was bent over picking flowers for a wild animal and attacked. However, as soon as the man screamed and stood up erect and also when it saw another man

standing near by, it realized its mistake and ran away leaving the injured victim.

It is fortunate both for the tiger and the villagers that the tiger realised its mistake in time; otherwise there is always the likelihood that the tiger may have become a man-eater.

SHIVKUMAR TIWARI



## Unusual nesting sites of the Redvented Bulbul

Perhaps the lack of a suitable bush made a pair of Redvented Bulbuls choose a disused tubelight for a nesting site in my class room on the second floor, in an unfrequented building. The tubelight was fixed just above a window with broken glass panes. The day after they started, the nest seemed to be slipping through, so I strung it up hammock style, as can be seen in the first photograph.

In four days the nest was complete, two days later Sept. 11, 1983 a pair of eggs filled the nest. On the 23rd both chicks were being fed by both parents. They allowed close approach and continued bringing food during our lectures much to our interest. On the second day, they brought food 13 times in a span of 140 minutes while on the fourth day, they had doubled it to 16 times in 70 minutes. Moths and dragonflies were among the morsels of food brought. A few days later, college closed down and so we did not know what happened to the chicks.

It so happened that on Sept. 10, 1983 another pair of bulbuls decided to nest on a curtain pelmet in my house, above a door leading into an open terrace on the first floor. The pelmet naturally being unsuitable for nesting on, allowed all the twigs to fall onto the floor beneath. So anxious that the birds did not abandon the nest, I helped out by tying down a few of their fallen twigs as a

base and they took over immediately.

Sept. 14, saw the first egg, which I promptly marked with a black marker. On the 16th there were three marked eggs. During the day we kept the door open at all times. But at night we shut the door after one parent sat on the nest, incubating the eggs. One night, I marked the incubating bird with a patch of white liquid paper under its tail; clearly seen in the second photograph. Now we were able to identify it immediately. It was this bird that sat on the nest every night and took active part in feeding the chicks so I guess she was the female.

Standing under the nest at night in the dark did not provoke any response from the incubating bird, but the moment the light was switched on she first ducked lower in the nest and then if we moved away she sat put. But instead, if we made some noise or movement she craned her neck suspiciously, and then if scared, flew off to the light and sat there till we were gone and or we put off the light.

Sept. 27, two chicks were seen, while egg no. 3 remained unhatched. On Sept. 30, the egg disappeared without any trace. I presume the parents had removed it; as it was perhaps addled.

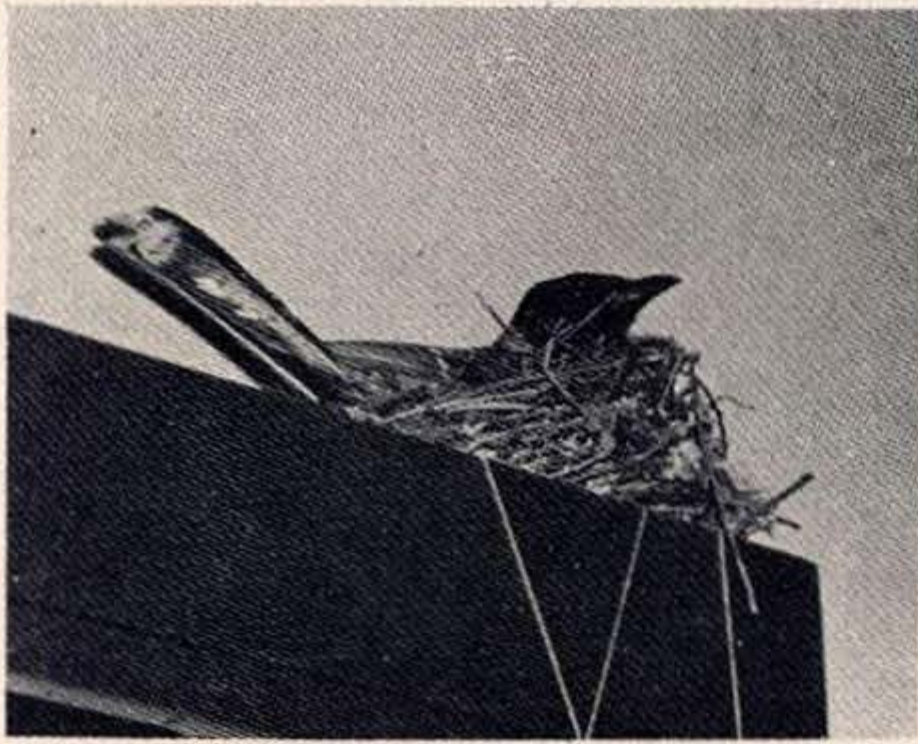
The two chicks grew fast but one was decidedly smaller than the other. Oct. 2, at 6.00 a.m., the



female entered our bedroom and we put on the light to find that she had dropped something on the ground. It was a dead chick, with three holes on it's side. A large hole between the neck and the left wing, the ribs were broken through. The second one, smaller, was further back between the wing and rump, while the third was in the flesh of the still unfeathered rump.

Thinking back, I remember seeing one parent jabbing into the nest the previous day, but this I had never suspected.

The lone survivor grew fast and soon came out of the nest to be fed. Some of the food identified, included grasshoppers, moths and a green caterpillar.



*Bulbul on its nest*

*Photo: Author*

Early in the morning of the fourth, my mother woke me up as the whole nest was covered with red ants, possibly attracted by the remains of the dead chick. The female was visibly agitated and chattered around, wildly pecking at every ant she could get at. Lifting the chick out (it had no ants on it), I killed all the ants I could see and replaced the chick. The mother flew around my head during this performance. After that she killed a few remaining ants.

On the night of the seventh I had to kill a few more ants.

The chick did not return to the nest on the ninth evening, but took up temporary residence in the trees outside.

During the whole breeding period the bulbuls showed an intense dislike to koels and chased them off from the vicinity of a large chikkoo tree immediately beyond the terrace. They did not bother any other garden bird and surprisingly even the crows were not touched.

After the birds left I removed the nest. We all hope that another pair of bulbuls will build a nest as we have grown quite fond of them.

TAEJ MUNDKUR



## Association between animals

*Reproduced below are notes which appeared in the Society's Journal in 1936 on the subject of curious association between animals in the wild. The purpose of this reproduction is to draw members' attention to the types of notes which once appeared in the Journal making it popular among the amateur naturalists and serious scientific workers, and to stimulate our present members to send in their experiences, however trivial they may appear, for consideration for publication.—EDS*

### BETWEEN A LEOPARD AND A TIGRESS

'I had a good fortune of witnessing a very strange association between a large leopard and a full-grown tigress. An instance of animal companionship which is surely given to very few sportsmen to see.

'I was invited by my maternal uncle, His Highness the Nawab Sahib of Tonk, to a tiger shoot in one of his very large detached territories in Central India known as Sernoj. The Vindhya Range runs through the heart of this pargana, and the scene of occurrence lay in one of its very lovely reserved forests called Samalkheri. The story related by the shikaris was that in these forests there was a large leopard which always killed the bait, and that a tigress waited and took part in eating the kill. The story sounded improbable. To discover the truth there was in it I obtained permission

from His Highness to try and bag both the tigress and her supposed mate the leopard.

'On the night of the 25th of March, 1936, I sat up to watch. A young buffalo was tied out as a bait. The sun had hardly set when I heard the "sawing" of the leopard and long drawn moan of the tigress. It seemed as if both were in the same place. A little later a sambhur belled and Langoors began to swear as the felines passed beneath them. All was quiet again, and not till the sun had set and it was fairly dark did I hear the bait jump up and try to break loose. The next instant from the thick bushes like a streak of lightning the leopard sprang upon the bait and a struggle ensued. The leopard being a very large one was capable of mastering and killing the buffalo. All the time the tigress sat in the open watching her mate kill the bait. When all was over both sat side by side and devoured the kill. I was terribly excited at this sight; and with the greatest difficulty refrained from firing. I made up my mind to see whether this extraordinary performance would be repeated and to give myself another opportunity of watching it. The next day another bait was tied out but no kill took place. The following morning it was observed that the leopard and the tigress had both passed close to that bait but did not kill. I was afraid that both had left the locality, and that I had also missed the chance of





Above. *Wild Boars are formidable opponents.* Below. *A leopard at ease* Photos: Hanumantha Rao



shooting the couple of such animals. The subsequent evening I sat up again, and exactly the same thing occurred. The leopard killed and the tigress, who took no part in the killing, shared the meal. Again I did not shoot. They killed every second night, and, in preparation for the next kill, I had a larger bait tied out to see as to whether the leopard would attack it or leave it to the tigress to kill. The leopard hesitated a bit this time but launched the attack as usual. The bait drove off the leopard. The attack was repeated with renewed vigour and this time the leopard got home, but the buffalo in floundering and jumping managed to fling off its assailant. Seeing her mate incapable of mastering it, the tigress attacked and killed the bait. Both again on the friendliest of terms devoured the kill. I left them in peace and returned home after they had left the kill. I sought an explanation of this strange association as to why this particular leopard and tigress lived in such intimacy. The only feasible thing that I could think of was that the leopard was a hybrid. The theory proved to be wrong as the leopard after being shot proved to be nothing more than a leopard of exceptional size. The next day I made up my mind to have a beat, and His Highness very kindly let me have the best machan. The beat began and very soon the tigress appeared. She tried to escape by a side nullah, but was turned by a stop. She came within sixty yards of my

machan when I fired hitting her just behind the shoulder. She gave a bound but fell dead to a bullet from my .375 Holland and Holland magnum rifle. A few minutes later the leopard appeared and when quite close was shot by my brother-in-law, His Highness the Nawab of Baoni. The tigress measured 8 ft 3½ in. and the leopard 7ft 10½ in. between pegs.

‘Thus ended a very extraordinary and strange friendship between a tigress and a leopard. Both animals were in the soundest condition and no signs of any kind of previous crippling wounds were found’ either of them.

IFTIKHAR ALI KHAN

*Heir Apparent of Malerkotla State*

PUNJAB

*July 3, 1936*

It is difficult to explain the curious association between this leopard and tigress — except to suggest that it may be an instance of mating between the two animals. When the two species occupy the same territory, normally, there is acute rivalry between panthers and tigers on the question of food and there are numerous instances of panthers being killed by tigers in dispute over a kill. In the present instance a complete understanding apparently existed between the two animals, not only in the matter of killing prey, but equally in the division of the spoils. The natural disposition to rivalry between the two animals



could have been overcome only by the sexual urge which draws animals of the same species into association — temporary or permanent — and which in the present instance may have drawn together two different though allied species. Under conditions of captivity the great cats, lions, tigers, leopards and jaguar have frequently interbred. We have instances of lions and tigers interbreeding — the most recent being the 'Liger' a cross between a lion and a tiger which the Society was instrumental in sending some years ago to the London Zoo. In 1912, we sent a skin of a hybrid lion-leopard to the British Museum — the result of the mating of a large male leopard and lioness in the Kholapur Zoo. A male lion is also recorded as having bred in Chicago with a female, which itself was a cross between a jaguar and a leopard. Opportunities for such interbreeding under natural conditions must be rare but the note under discussion suggests their possibility.

—EDITORS

*J. Bombay nat. Hist. Soc.* 39: 153-6

BETWEEN A PANTHER AND  
WILD BOAR

"I wonder whether you or any member is interested in or can explain the following incidents, which happened near the Gir jungle in Junagadh. The facts are given to me

by a very knowledgeable local expert in panthers, Mr Sequeira.

"He had a *khobar* of a panther, and went after it. The first day a male panther, a female and a half-grown cub were marked down in a nullah. He saw them lying under a banyan tree, and three boars were lying with them, about 8 or 10 ft away. The panthers did not come to the kill, so they had a beat. The male panther got out, from the side of the nullah; the female and cub and *the three boars* passed the guns.

"Next day the panthers, male and female, were again found in a bush, and the three boars again were lying near them. The cub was not seen. In the beat, the male panther was shot; the female and the three boars again ran, past the guns — up the nullah.

"On the third day, the female and cub were lying at the mouth of a cave, with the three boars lying round them. As the female was big with young, she was not shot; but one of the boars was shot instead.

"To me it would be interesting to know whether any other cases of such companionship are known."

J. MONTEATH, I.C.S. (Retd)  
C/O LLOYD'S BANK  
6 PALL MALL, LONDON, SW. 1  
April 12, 1936

*J. Bombay nat. Hist. Soc.* 39: 157-8



## The last days of a natural sanctuary

*The author has based this article on some recollections of an English lady, Louise Kalbera, in Bhimtal, one of Corbett's homes, in the days over 50 years ago, when it was still a sanctuary for wildlife. It provides a first hand insight into those last days when man and animal lived together, before official sanctuaries had to be the creations of government, and the last hope of wildlife.—EDS*

These days environmentalists press governments to make official sanctuaries for the protection of nature, and of wildlife in particular. The law and power of the state—such as it is—is sought to be brought into the losing battle to preserve the residual wilderness. This is an account from the first-hand recollections of an English lady over 90 years old, Louise Kalbera, of a part of Corbett country in Bhimtal, district Nainital, UP, when man and animal lived together in the last days of natural sanctuary. Reluctantly she wrote almost telegraphic notes at my request. Louise, a lover of Bhimtal and of nature, is now losing her eyesight, but the happy memories of her childhood and youth over half a century ago has come through the window of her aging mind with simplicity, brevity and charm. These rare glimpses of first-hand testimony to a better time, before man overwhelmed his ancestors' environments.

So let Louise hold memory's door at 90. Gone are the big beasts; only a few wild boar, *kakar* and marten remain. The forests and the natural habitat have been destroyed, forests in which Louise once walked

and roads, "where the silence was so impressive and we were so alone, it felt like a living presence about us". When a local hillman, Chintamani Joshi was asked how long the hills had been so bare; he replied: "When I was a boy and we went into these forests, we beat drums to keep wild animals at bay". Since then man has beaten the life out of those forests. Louise begins: "As I sit alone looking out of my window many an incident of bygone days returns to be relived and chuckled over, or be sobered by them". She rambles over terrestrial and aquatic life, with the little things of human interest of those days.

The introduction to the first tiger of this little English lady was painful. "It had been shot somewhere in the vicinity of Talli Tal. Badly wounded in the spine, the poor beast had dragged itself over rocks and thorns down to the street at Khairolla. Its belly was torn, scratched and bleeding. Much affected, I tried to write a poem in its defence". Another tiger shot in Sat-Tal was "a huge beast with a wonderful coat, for it had spent the winter in the hills. W.J. sat over the



kill of Mr. Evan's pony. Watched bear and tiger fight over the carcass. Tiger killed bear and ate it before it was shot. Tiger's fat an expensive item as a pain remover; clavicle bone for luck; and the whiskers (leopards also) reduced to powder to be used in food to remove enemies".

Then there was an unusual tiger with a chain round its neck. "Unafraid yet instilling fear, he would walk into a village or herd of grazing cattle. *Gwalas*—usually children—terrorised, fled at his approach, and left him to make the choice of the animal he wished for his meal. Uncertain what happened to him. Probably shot for his daring depredations".

One night she "was wakened to see a leopard just outside the window, lying full length, switching his tail because he was unable to get at the dogs". Here is a charming and unbelievable story of another leopard. "10 a.m. one morning watched leopard stalking a pony in Arno plain. Rolled over on his back, he played like a cat with a butterfly. Then crouched ready to spring. Shot fired saved the pony". Imagine a leopard playing with a butterfly before the kill, like a child between play and food in the innocence of nature's world. One night Jacko, her pet monkey was killed and eaten by leopard. "I forgave Jacko for giving me a nasty bite earlier and snatching away my cake". Then there was the "distressed leopard

which followed its shot mate all the way to the bungalow, calling softly to it as it crept below the road". One can feel Louise's empathy for the distressed leopard as the animal itself felt for its shot mate.

Bears mauled women grass-cutters, some of whom were hospitalised. A bear at the bungalow "killed Aunt D's Aylesbury ducks"! When a bear was shot on a hill above the bungalow, "the poor thing had staunched its bleeding wound with oak leaves before it died". One morning they saw three bears swimming the Bhim Tal lake. "Poor beasts all shot by Anwar Khan. Gall bladder much coveted for its healing properties. Gall bladder dried and rubbed on stone, with water, formed linament for various wounds".

Then there were miscellaneous recollections of wild dogs, *kakar*, and snakes. "Pat was chased by wild dogs after a picnic at Sat-Tal. We watched and shouted and jumped and shrieked. He was very nearly caught". Bell, "a *kakar* 'butcha' reared on bottle by mother. Much distressed as she was killed first time she was allowed to go free and graze.

Two large king cobras were "shot on a pine tree while they were disputing their prey. Handsome reptiles with wide gold bands". Once she watched a rat and a snake "tussling". The rat got away, but both contestants received bites. There were snake "guests" in the



roof of the bungalows of Mr Aitkin and Mrs Lal. "They were served saucer of milk every morning as wages for keeping their houses free of rats".

Once they climbed to the top of Nagbiji, now called Karkatok. It is a mountain sacred to snakes. There is an old temple to a "Nag" deity at the top. "A snake festival is held there yearly and lots of milk and sweets are offered". Each summer, when the hillsides are hot and dry, snakes come down to the Bhimtal and Sat-Tal waters to drink. None are killed, unlike *kakar* and bear. Hindu mythology has a built-in conservation niche for the snake.

Then memories shift to less wild things, and to glimpses of the Raj in remote Bhimtal. Horses were such a delight and interest.... Bay (name of a horse), a gift from Bertram would come to the sitting room at tea time, drink tea from a cup, and eat any dainty offered to him. He would open the tap with his lips, and give himself a drink of water. A big horse but a most gentle creature".

After the snow on Chowpuria, many dead birds were picked up with childish exclamation of sorrow. Even frozen baby langurs found".

This is India's lake district, once a famous fishing resort for masheer. It attracted anglers from Burma, Kashmir and South India. Mr Westmacott of the Calcutta High Court came regularly twice a year

for many years. In summer and autumn it attracted Army and ICS folk. "Mr Percy, Capt. Copper, and Major Roberts were with their fox-hounds on their way to Mukteswar to spend the summer". The arrival of the Maharaja of Jind and his retinue meant the Goanese band every evening, parties at the palace, tennis, badminton, billiards etc. to which all and sundry in Bhimtal were invited, plus VIP's from Nainital". British and Gurkha troops passing through Bhimtal always entertained them with the band.

The annual camps of the Bhootias too were a source of entertainment. They camped in the Arno or below Kilmore house with yaks, ponies, sheep and goats. "We would hear the musical tinkle of their bells long before they came into sight. They brought skins, colourful rags, wool, asafoetida, and medicinal plants. Obedient to a melodious call it was interesting to see the animals return to their camp, and instinctively take their places for the night. Sheep and goats in the centre. Horses and yaks outside, and baggage, Bhootiyas and fires around".

Such was the old world of Louise Kalbera, when, despite hunting and shikaris — "especially Lal Singh, called Red Horn, a typical man of the jungles who could call up animals, pheasants and junglefowls" — it was possible for people and wildlife to live in a natural sanctuary, with people who

(Concluded on p. 40)



## Tal Chapper Blackbuck Sanctuary

Among the many blackbuck sanctuaries distributed in our country, Tal Chapper Blackbuck Sanctuary in Churu district of Rajasthan, is perhaps one of the best place to see these graceful antelopes at a close range. I counted 48 black males from the window of the rest house. All were fearless and appeared to be tame—thanks to supplementary feed provided by the Forest Department, and lack of poaching. From a central place in the sanctuary, we saw between 700 to 800 blackbucks.

Tal Chapper, notified as a sanctuary in 1962, is a vast expanse of treeless depression which during good rainfall years comes underwater and acts as a haven for the innumerable waterbirds. However, as the district falls under the arid zone, rainfall is generally insufficient to inundate the sanctuary. Therefore, for most of the year, the depression or *tal* remains dry.

After the monsoon showers, a grass locally called as *moothia* comes up and within a few weeks reaches up to one metre. The grass is relished by the blackbuck, while the tubers are said to be eaten by the demoiselle cranes which used to come in the thousands in the olden days. Actually Tal Chapper is a former shooting preserve of the Maharajah of Bikaner who used to arrange regular crane shooting in the tal. About 500 demoiselle still come to the sanctuary. We saw 158 in one flock.

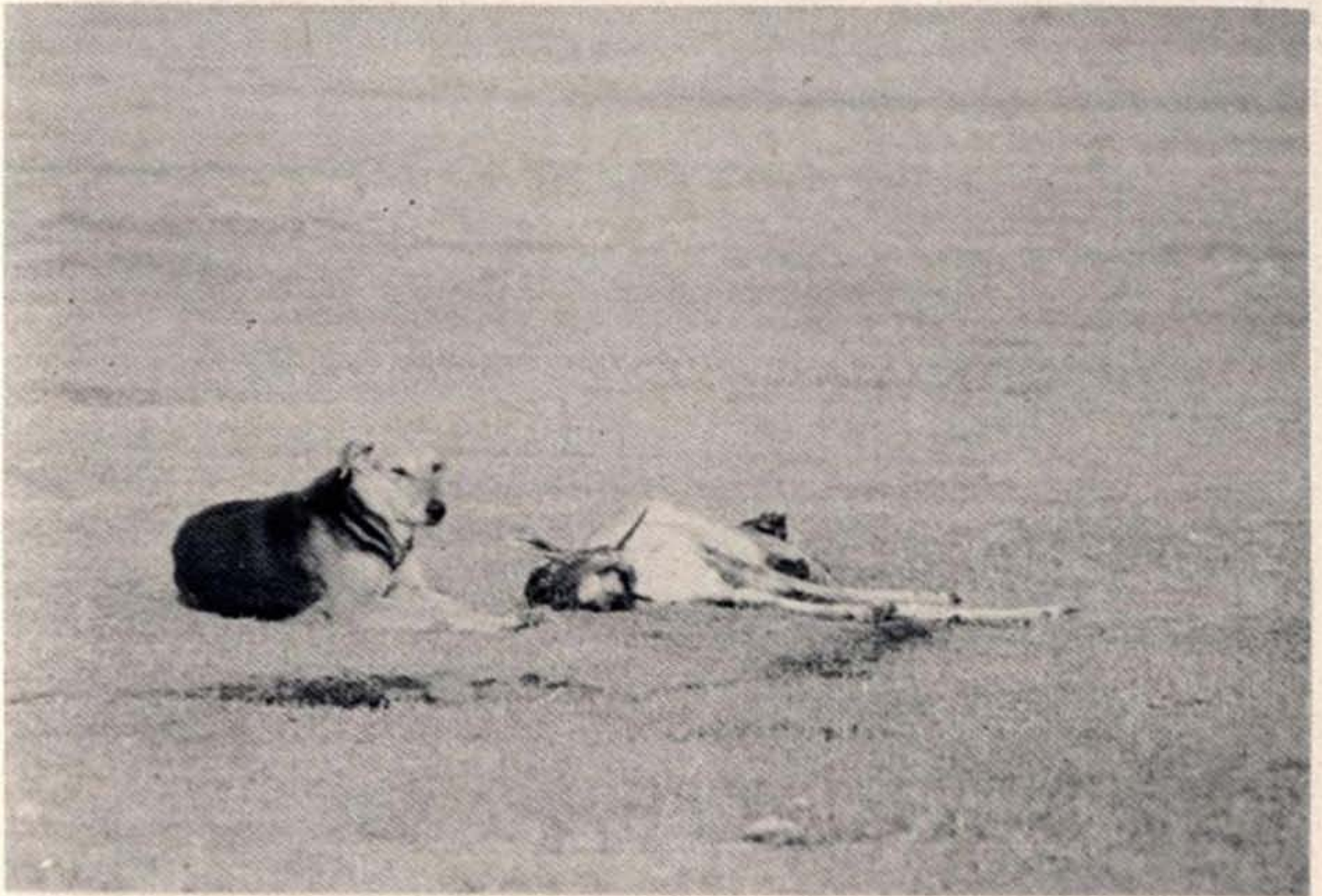
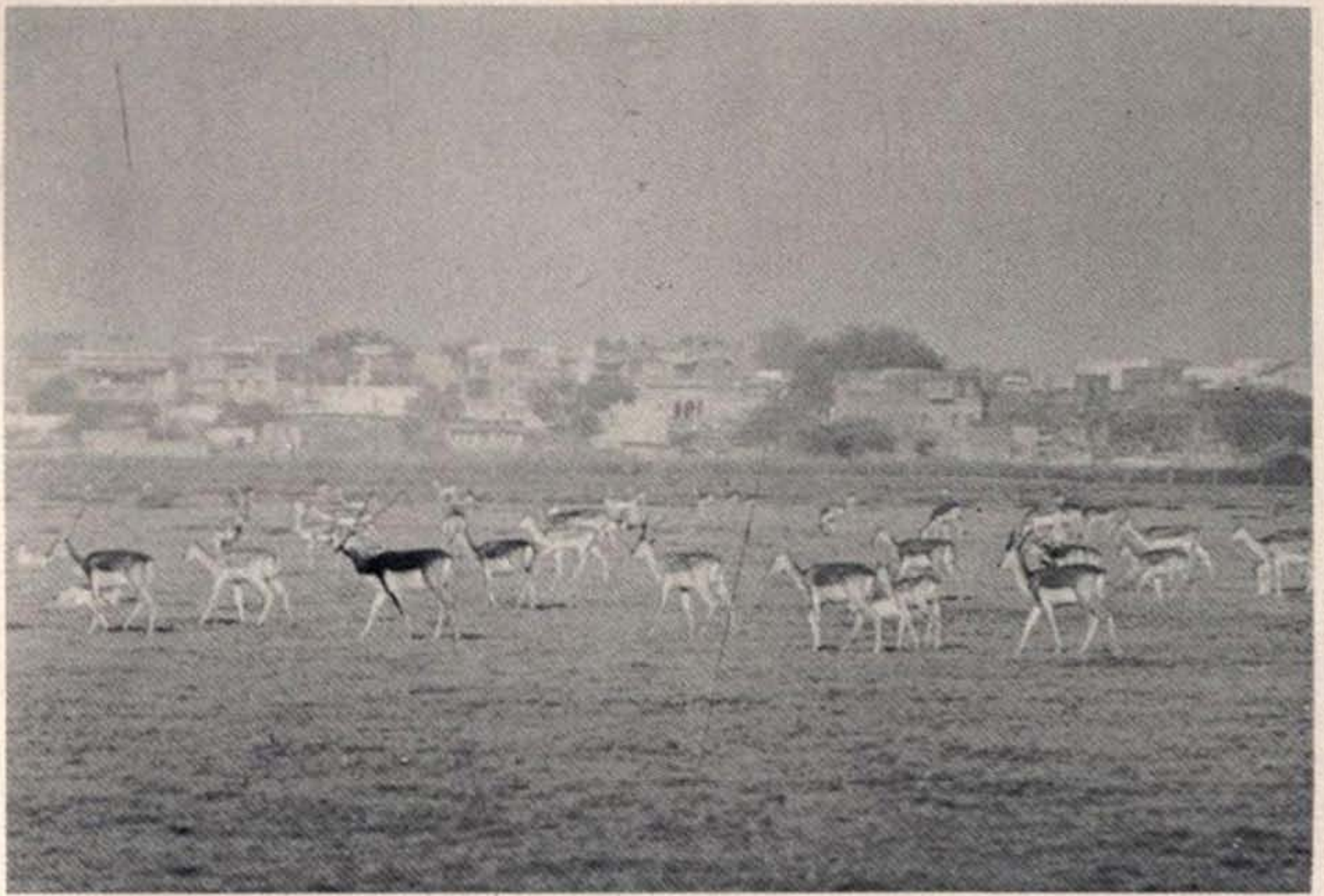
Nearly 1400 blackbuck are present in this five kilometre sanctuary. The trend is definitely towards overcrowding. Many weak and cadaverous antelope indicate that something should be done to increase the food supply or to decrease the number of heads. Moreover, the ubiquitous cow competes with the blackbuck for the sparse vegetation and the supplementary food. Twenty-six cows were counted in an hour's drive on 5th March 1983. We saw also many cows pushing the blackbuck off to appropriate the green fodder spread by the Forest Department.

As there is no natural enemy of the blackbuck in the sanctuary, pie dogs play the predatory role. During our visit, we saw two blackbuck carcasses attended by dogs and vultures. A wizened shikari with a decrepit muzzle-loader gun was trying to shoot the dogs which trotted away when the pellets (stones) came out from the gun with a loud bang. A forest guard told me that in two months, they have killed 160 dogs but the menace is still present. Villages surrounding the sanctuary supply an endless number of dogs.

Rock salt extraction is another disturbance at the border of the sanctuary. A continuous stream of trucks and bullock carts coming and going creates a din to which the blackbuck have become accustomed. However, it creates a bad impression of the sanctuary.

—ASAD RAFI RAHMANI





*Above. A Blackbuck herd in Tal Chapper Sanctuary. Below. A pie-dog eating a Blackbuck in Tal Chapper Sanctuary*

*Photos: Asad Rafi Rahmani*



# CONSERVATION ACTION

## Wildlife preservation in India

India has now 44 National Parks and 207 Sanctuaries covering 87,735 sq.km as compared to 1981 when there were only 19 National Parks and 202 Sanctuaries. These now constitute 11.7 percent of the total forest area in the country and 2.7 percent of the total geographical area of the country. Having been set up within the framework of the Wildlife (Protection) Act of 1972 these areas receive full legal protection and under the New National Action Plan for wildlife, it is proposed to critically review the existing protected areas to ensure proper coverage of every habitat type and to identify whether any particular bio-geographic area has been left out. This implies expansion of the protected area within the next few years.

In recent years the initiative taken by the Government for wildlife conservation is laudable. The Central Act called the Wildlife (Protection) Act of 1972 is now applicable throughout the country. In 1980 the Forest (Conservation) Act was enacted under which no forest area can be diverted for non-forestry use without the prior approval of the Central Government. The financial outlays for Central Sector and Centrally sponsored schemes for wildlife conservation which stood at Rs. 66,400,000 in the Fifth Plan (1974-79) have been stepped up to Rs. 121,000,000 during the Sixth

Plan (1980-85).

Four new reserves have been added to the existing eleven tiger reserves under Project Tiger. Status surveys of endangered species have been undertaken to recommend conservation measures and emphasis is also given to captive breeding of these species. A national level institute for wildlife management has been set up at Dehra Dun and a Crocodile Research Centre under this institute is located at Hyderabad.

State Governments, have been directed to give special attention at the highest level from time to time regarding the proper enforcement of the Wildlife (Protection) Act of 1972, strengthening the Wildlife Wing and enlisting public support through mass media and by organising Wildlife Week every October.

On the International scene India is party to the following important conventions.

1. Convention on International Trade in Endangered Species of Wild Flora & Fauna (CITES).
2. Convention on Wetlands of international importance specially as waterfowl habitat.
3. Convention on conservation of Migratory Species of wild animals.
4. International convention for the Regulation of Whaling.

Also, very soon India will be entering into a convention with the USSR for protection of migratory



birds between the two countries.

India was elected Chairman of the Standing Committee of the CITES in the third conference of the Parties to this Convention in 1981 and once again India has been re-elected as Chairman of the Standing Committee in the recently held fourth Conference at Botswana.

The Indian Board for Wild Life is fortunate to have the Prime Minister, Smt. Indira Gandhi as its Chair-person who is keenly interested to conserve India's rich natural heritage for posterity.

### **The Snow Leopard**

In western Himalayas (Nepal) a project has been launched for an in-depth study of the snow leopard and its habitat, and for the first time a snow leopard in the wild was radio collared by Rodney Jackson of the California Institute of Environmental Studies. Jackson and Co-investigator K. Shah of the Natural History Museum of Nepal were able to determine that snow leopard is mainly nocturnal, but may move during daytime especially on cloudy or cold days. It begins its prowl about four in the afternoon and will stop at about eight in the morning.

Snow leopards are largely concentrated in the region where blue sheep occur but they are also known to hunt rodents, thar, musk deer and yak. They do not generally attack livestock. The snow leopard appears to be a cousin of the Common leopard. The fur is thick and woolly which grows about two inches long

on the back and twice the length on the underparts. Its pale or grey-brown colour may sometimes have a yellow tinge but the underparts are pure white. The large irregular black rosettes form a black streak down the middle of the back. It ranges from the Himalayas into the Hindu Kush and across Tibet as far as the northeast of Tsinghai and the west of Szechwan provinces in China and the Altai mountains. In Nepal, the greatest concentration of snow leopards is found in the Dolpo and Muga districts. Though protected by the government, reports indicate that the animals are widely hunted for their fur in Namlung and Dolpo districts with over thirty hunters operating daily through the range. Poison spears are kept along rocky passes and riversides for this purpose. Snow leopard is hunted throughout its range in China, Mongolia and in northern India in spite of the government protection, since enforcement is very difficult as the areas in which it occurs are so remote.

The Nepalese government is planning to include the snow leopard study area in the new Shey Phoksundo National Park which is set up specially to protect Tibetan wildlife. The enlarged area of the park including the study site will cover about 800 square miles and will extend up to the Tibetan border.

*IUCN News Features*, July 1983.



### Alligators and their sex-dependence

Mark Ferguson of the Queen's University of Belfast and Ted Joannen of Louisiana Wildlife & Fisheries Commission conducted a series of laboratory experiments and field observations to determine the co-relation between the variable incubation temperatures and the sex ratio among hatchling American alligators, since it is well known that sex-ratio of reptilian hatchlings depends on the prevailing incubation temperature.

In the wild, temperature probes were placed in alligator nests constructed in three different habitats: wet marsh, dry marsh and levee (elevated firm ground). Levee nests were hot (34°C) and hatched approximately 100% males whereas the wet marsh nests were cool (30°C) and hatched approximately 100% females. Dry marsh nest had an intermediate temperature profile; the hottest location was the top centre of the nest. Males developed from eggs in these locations and females from the cooler (30°C) peripheries and base of the nest.

With these observations coupled with the laboratory experiments, the two biologists concluded that temperature of 34°C and above produced male hatchlings whereas 30°C and below produced females.

In wild, the natural ratio at hatching was found to be five females for every one male and when weighed, the female hatchlings were heavier than their male counterparts since females hatched at lower temperature absorbed more abdominal yolk. With these extra energy reserves the females grow faster during the first years of life to become sexually mature much ahead of the males or lighter females. This early maturity of females in the reproductive life style of American alligator is biologically advantageous as the result of the evolution of temperature-dependant sex determination in alligators. This fact is now being applied in captive propagation for farming and conservation.

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*Continued from p. 35*

had a love and empathy for that wildlife and the simple pleasures of living in the remote hills of Kumaon. Louise's random recollec-

tions supplement and bring alive the days of Jim Corbett in Corbett country itself. She is the last live witness to that time.

A.D. MODDIE







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