

1989 (2)

Hornbill



BOMBAY NATURAL HISTORY SOCIETY



COVER PHOTO: Great Indian Onehorned Rhinoceros
(*Rhinoceros unicornis*), by Goutam Narayan

The Indian rhinoceros prefers swamps, grasslands or reedbeds in the alluvial plains, rarely entering woodlands or forests. Though solitary by disposition, several may occupy a patch at times. Their food consists chiefly of grass and tree leaves and they spend much of their time in wallows.

Till the fifteenth century they ranged from the Indus Valley in north Pakistan and Punjab, east through the Himalayan foothills and Indo-Gangetic plains in Nepal, Uttar Pradesh, Bihar, north Bengal, and northwest Bangladesh upto the Burmese border in Assam, where they were common in the Brahmaputra Valley. Now only about 1600 survive in nature. They are restricted to a few protected sanctuaries and national parks: Chitwan (estimated population 300) in Nepal, Jaldapura (30) and Gorumara (5) in West Bengal, Kaziranga (1100), Orang (70), Pabitora (60), Manas (80 ?) and Laokhowa-Burachapori (2 ?) in Assam. Recently a few have been introduced in Dudwa National Park in Uttar Pradesh, where they are breeding successfully.

The major reasons for the drastic decline in numbers are indiscriminate hunting and fast expanding human settlements and cultivation. The single most significant factor is the widespread superstition that the rhino's body parts, particularly the horn, have peculiar medicinal virtues. Although it has been repeatedly proven that there is no substance to this claim, persecution of the rhino continues unabated.

Hornbill

CONTENTS

Editorial 2

Have you seen the
Star of India? - *J. Frazier* 3

Where 8 Leaf Warblers
breed - *Trevor Price & Nitin Jamdar* 7

India - A wildlifer's apprehensions
- *M. Krishnan* 12

Seashore lore - *Beefsea* 15

News, Notes & Comments 18

In memoriam - *Shivraj Kumar Khachar*
- *Rishad Naoroji & Taej Mundkur* 22

Feed back 24

Manas - The land of the
Ulu Moira - *Lima Rosalind* 26

EDITORS

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DESIGN

Amar Shekdar

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 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.

Editorial

In this issue of *Hornbill* we publish an article on the Manas Sanctuary by one of our young scientists, who spent 18 months in the Sanctuary assisting her husband in the study of the Bengal Florican. What is happening in Manas is an example of an extreme situation which can, at any time, in some form or other, affect our National Parks and Sanctuaries, which are the last stronghold of endangered species and endangered ecosystems. Manas, a World Heritage site holding many endangered species, is now in the position of being without any protection. It is a victim of political disturbance and the consequent failure of law and order -- a situation similar to what happened in several sanctuaries in Africa during periods of political turmoil in that continent.

It is a tragedy that not enough attention is being paid to the problems arising from human impact on protected areas. This is a matter that requires immediate and sustained investigation. For instance, one of the main causes of degradation of existing ecosystems is cattle grazing. We have projects on feeding habits of wild ungulates, but we do not examine what the cattle are feeding on, what the effects are on different ecosystems, the favoured species of browse, the condition of cattle in different seasons, the vegetation cycle and regeneration capacity, and at what point competition is not sustainable. Unless the baseline data is available, alternative strategies cannot be planned.

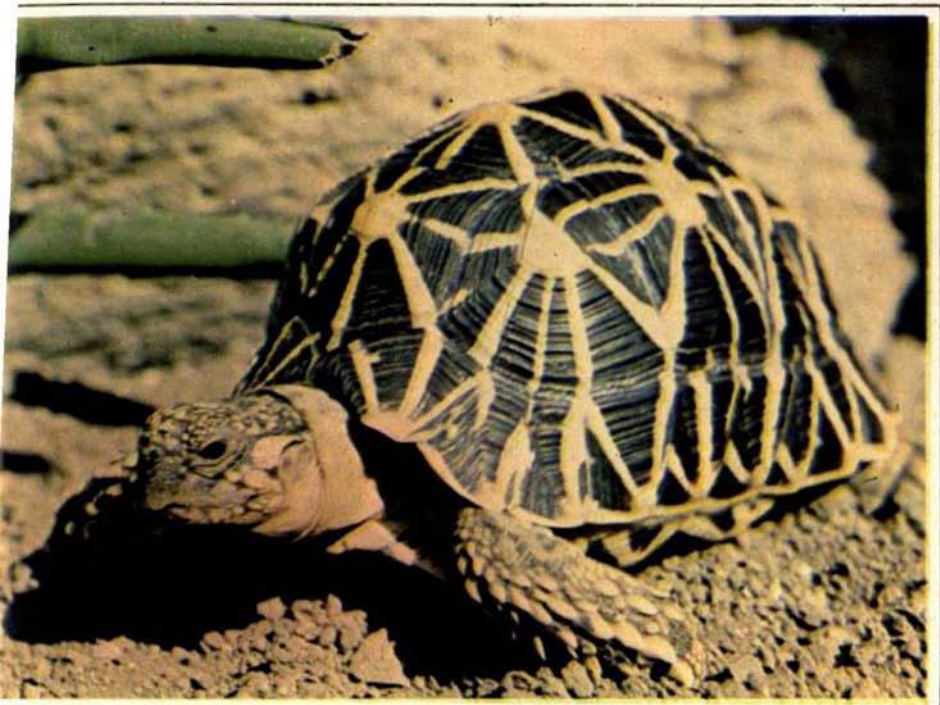
Cattle grazing in all cases is a disaster, but there could be the odd exception depending on the type of domestic stock. Take the example of the Bharatpur Bird Sanctuary. There was a clamour from conservationists, Indian and international, for the stopping of grazing. It was finally stopped, but the ham-handed manner in which it was done resulted in loss of human life, which is not the best recommendation for conservation.

There was one fatal flaw in the thinking of all concerned. The grazing of cattle on land at Bharatpur was definitely harmful, but the buffaloes were apparently beneficial in controlling the grass growth in the waterspread. When this control was removed the grass, particularly one species, overran all water areas. The resulting loss of habitat required bulldozing of certain sections of the waterspread. The vegetative succession changed, necessitating further control measures.

It is vital to study the ecology of human impact if the sanctuaries are to survive. This must be our main thrust in the nineties if we are to carry any of our heritage of natural wealth into the next century ■

HAVE YOU SEEN THE
STAR
OF INDIA?

ISAAC KEHIMKAR / BOOK OF INDIAN REPTILES



J. FRAZIER

Countless stars shine over India, but only one creeps and crawls. This is the Star Tortoise, known to science as *Geochelone elegans*, or "elegant land tortoise".

Its common names vary from place to place; in Gujarat it is frequently called *Dhal kachba* (Shield Tortoise), *Khad kachba* (Grass Tortoise), *Suraj kachba* (Sun tortoise), and *Patharia kachba* (Stone Tortoise); in Tamil Nadu it is known as a *Kaattu aamai* (Jungle Tortoise). All these names are appropriate: the tortoise eats grass, and is found among stones in the jungle. It has a shield, whose markings are elegant, resembling stars or the rays of the sun.

Of all the land tortoises in India, the Star Tortoise is the most common, found from Rajasthan, east to Orissa, west to Sind, and south to Sri Lanka. It is a harmless and totally distinctive animal; the shell is highly domed, like a hemisphere; the legs and shell are covered with thick, dry, horny scales; each large scale of the shell has a central yellow star set off by bold black blotches. It is a completely terrestrial animal, rarely, if ever, found in water. There are about 40 kinds of turtles and tortoises in India, but the only other species which is common and widespread is the Flap Shell, which has a soft shell, which is covered with skin, not scales. The Flap Shell is green in colour and is almost always found in still water.

Newly
hatched
Star
Tortoise

J. FRAZIER



The Star Tortoise is rarely more than a few kilogrammes in weight and 40 cm in total length. When fully grown, females are larger than males — sometimes nearly twice as large. Adult males are also distinguishable by their concave plastrons (bottom shells) and relatively long tails that can reach the hindleg. The newly hatched tortoises begin life only about 6 cm long [see article in *Hornbill* 1981(4) by Isaac Kehimkar], and appear to take about 7 years to reach maturity. For some reason, the Star Tortoise of western India grows to twice the size of the tortoise in the south.

Although the star markings are bold and distinctive, when a tortoise is on the ground it very quickly blends with the surroundings. Often - and normally during the midday heat - the tortoises take refuge under bushes, often thorn bushes, and then it is extremely difficult to find them. Some tortoises are very smooth and lack the conspicuous, concentric growth rings that are found on immature animals. In addition, they frequently lack the conspicuous star markings, but may have only a beige-coloured shell with black spots - virtually identical to the coloration of the leopard tortoise of Africa. The



J. FRAZIER

Star Tortoise
habitat
in Sendra,
Rajasthan.

darkest seem to be the immatures and young adults; south Indian Star Tortoises are also relatively darker than those in western India.

Despite its easily recognizable shape and coloration, and the widespread distribution and common occurrence, very little is known about the Star Tortoise. Even the most recent books about Indian turtles and tortoises give only sketchy information about its life history. Even the most basic question has still not been answered adequately with specific information: Where does the Star Tortoise occur?

The northernmost record for the species seems to be from Sariska in Rajasthan. Does it occur farther to the north? Is it (or was it ever) found in Haryana or Delhi? We need answers to these questions. The central area of Rajasthan — the Aravali Hills — is one of the best places in the world to find the Star Tortoise. Yet, there are no detailed records from the districts of Barmer, Jaisalmer, western Jalor, Jodhpur, Churu, Ganganagar or Bikaner, or from eastern Rajasthan (Bharatpur, Daulpur, Swai- Madhopur, Tonk, Bundi or Jalwar districts). Our knowledge from other states is even more meagre. Uttar Pradesh, Haryana and Maharashtra: no records. Madhya Pradesh: only two records (from Indore and Burhanpur). Gujarat: records from Saurashtra and Ahmedabad, but none from Kutch, mainland Gujarat, or areas east or south of Ahmedabad. Orissa:

records from the extreme southeast, near Ganjam, but nowhere else. Andhra Pradesh: several records from eastern and southern districts, none from the north and west. Kerala: old reports from the extreme southeast.

Given the vastness of the area in which this animal is generally reported to exist, and the ease with which a specimen can be identified, the number of authenticated and detailed locality records is pathetically and frustratingly small. Clearly, if our knowledge of something as simple and fundamental as the distribution of the Star Tortoise is so poor, our understanding of the natural history of the animal is very incomplete. Specific records of feeding, breeding or other basic facets of the life history are extremely rare.

Any nature lover with specific knowledge of exact locations where Star Tortoises are found in the wild could help us tremendously by filling in the questionnaire below and sending it to the BNHS ■

STAR TORTOISE QUESTIONNAIRE

Please take a moment and answer a few questions about the Star Tortoise:

YOUR NAME

ADDRESS

- 1) Where have you seen Star Tortoises? (state, district, taluka, village — please be as detailed and complete as possible):
- 2) How would you characterize the habitat? e.g. agricultural land, grassland, thorn scrub, forest, etc. (Please give details.)
- 3) What was the date when seen (or the month or season if you cannot remember the exact date)?
- 4) What was the tortoise doing when you first saw it? What was the time of the day?
Additional information would also be very helpful:
- 5) That time of the year do these tortoises (a) mate? (b) lay eggs? (c) hatch from the nests?
- 6) Do you know anything about:
(a) tortoise food (b) tortoise habits (c) predators of tortoises?
- 7) Are tortoises more common, less common or as common as they were 10 or 20 years ago?
- 8) Please add any other comments, observations or suggestions which you think are relevant to the Star Tortoise.

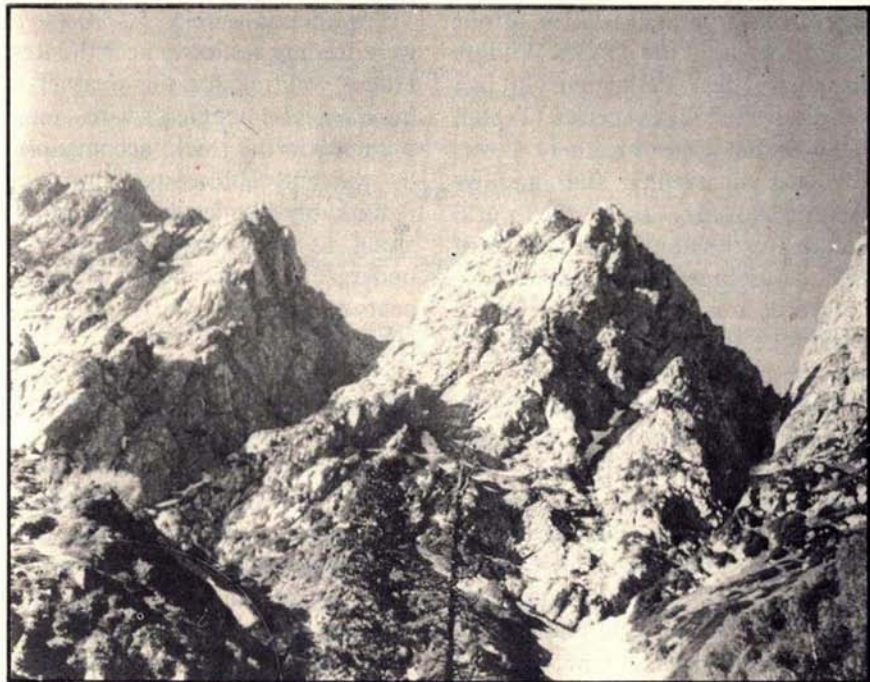
Please fill in and return to Star Tortoise Questionnaire, c/o BNHS. Thank you for your cooperation.

The Leaf warblers of the genus *Phylloscopus* are small brown or green birds. They breed in the Himalayas and throughout the Palearctic region and winter further to the south: 16 species have been recorded regularly wintering within Indian limits. They are all so similar, and so inconspicuous - the very name *Phylloscopus* comes from the Greek 'to look like a leaf' - that many ornithologists in India agree to ignore them. The Greenish warbler breeds across the whole of Russia, as well as in the Himalayas: it is probably the most abundant of all birds in India in winter, commoner than the myna or the sparrow.

WHERE **8**
Leaf
WARBLERS
BREED

TREVOR PRICE & NITIN JAMDAR

Study area at edge of treeline — prime habitat for leaf warblers. PRICE/JAMDAR



Leaf Warbler species are hard to tell apart: *P. inornatus* (left), *P. tyleri* (right),



PRICE/JAMDAR

In May 1985, we set out to study the leaf warblers at one locality where they breed in Kashmir. In the book, BREEDING BIRDS OF KASHMIR, Bates and Lowther record six species in the State. We had hoped there would be at least five at our study location, the Overa Wildlife Sanctuary near Pahalgam. In fact we discovered eight species (Table), all breeding close together. To us this was an exciting find and we believe we may have the world record for the number of species of one genus breeding in one 100 × 150 yards area. This is how we came across the species, and showed that they all breed near each other.

The Forest Rest House at Overa is at a fairly high altitude (7,400 feet), and is surrounded by fir forest. We began our expedition by camping nearby, and soon discovered the Crowned Leaf warbler *P. occipitalis* calling and singing incessantly everywhere. We caught and colour-ringed more than forty. Most stayed

in the area to breed in this and later years. One male, however, was spotted singing 2,000 feet further up the mountain when we moved there in June. But there was still snow up there in May, and flocks of the Yellowrumped warbler *P. proregulus* were feeding restlessly near the Rest House, waiting for the weather to improve. Sometimes, with more than 100 in the flock, accompanied by tits and goldcrests, they look remarkably like leaves being blown along as they pass through the undergrowth and canopy, which appears eerily deserted after they have passed by.

Near our tents a male Slenderbill-ed warbler *P. tyleri* established his territory, incessantly singing 'let's kiss him', a phrase coined by one of the early birdwatchers in the region, E. Osmaston, to describe the song. But some Slenderbilled warblers were also waiting out the weather, for we observed one we had colour-ringed singing right alongside that

colour-ringed Crowned leaf warbler 2,000 feet higher up in June. In our nets we also captured individual Yellowbrowed warblers *P. inornatus* (which have a white eyebrow in Kashmir!) and Greenish warblers *P. trochiloides*; then we spotted two Tickell's warblers, *P. affinis* along the roadside. On May 30th the river valleys began to fill with the Large-billed warbler, *P. magnirostris*. It has the most distinctive song of all Kashmir birds; a succession of five whistled notes descending in pitch.

As we set off to camp at 11,000 feet in early June we had already seen seven species (the Greenish warbler was the species not recorded by Bates and Lowther, and we were unsure if it bred, or indeed which

species bred in the sanctuary). Up at 11,000 feet we discovered that the Yellowbrowed warbler breeds abundantly, in fact at a density (4 pairs per hectare) about twice that recorded for any species of warbler elsewhere in the world. We decided to study it in detail, and set about finding as many nests as possible. It is not easy to find nests; the basic technique is to wander around and look for a bird with a stick in its beak, or calling anxiously. Then freeze, and hope it will go to a nest within sight. It is not unusual, after finding one nest, to have to search for six hours before finding another.

June 14th, 1985, was a good day

TABLE

THE EIGHT LEAF WARBLERS (GENUS *PHYLLOSCOPUS*) BREEDING IN KASHMIR.

SEE THE *HANDBOOK* FOR DESCRIPTIONS OF SONGS AND CALL NOTES WHICH ARE IN MANY WAYS THE MOST DISTINCTIVE FEATURES OF THESE BIRDS.

Species	Field Identification	Habitat
Yellowbrowed warbler, <i>P. inornatus</i>	Uniform large wing bar, with second fainter bar above	Mainly birch above 11,000 feet
Greenish warbler <i>P. trochiloides</i>	Green, with a single faint wing bar	Mainly birch above 11,000 feet
Crowned leaf warbler <i>P. occipitalis</i>	Wing bar and crown stripe	Villages, coniferous and birch woods
Largebilled leaf warbler <i>P. magnirostris</i>	Like the Greenish warbler; bill <i>pink</i> , not-yellow	Water courses below 11,000 feet
Orangebarred warbler <i>P. pulcher</i>	White outer tail feathers	Rhododendron above 11,000 feet
Yellowrumped warbler <i>P. proregulus</i>	Conspicuous yellow rump	Coniferous woods
Slenderbilled leaf warbler <i>P. tytleri</i>	No wing bars or crown or rump patches	Edges of woods from 7,000 to 11,000 feet
Tickell's warbler <i>P. affinis</i>	No wing bars, bright yellow underparts	Juniper above 11,000 feet

however, one of those days one dreams about. Everywhere we looked birds were going to nests, and in five hours we found nine nests of the Yellowbrowed warblers. Then, while walking towards the stream from which we usually collected water, we noticed a Crowned leaf warbler acting strangely. Sure enough under a piece of old wood on a ridge, we found its typical moss nest with a clutch of four eggs. Crossing the stream, just twenty yards away, a Greenish warbler came by calling 'pitchew' loudly, with a stick in its beak. Soon we'd found that nest too - like the nest of the Yellowbrowed warbler it is a ball of straw built on the ground —the first confirmed breeding record for the Greenish warbler in Kashmir! Things quietened off for a couple of days, and then, about 100 yards east of the stream, we noticed a male Slenderbilled warbler singing in a frenzy, and accompanying his female to a nest she was lining with feathers about 25 feet up a birch tree. A week later she was sitting on a clutch of four eggs (among *Phylloscopus* warblers, it is always the female who builds the nest and incubates the eggs).

The real excitement came when a warbler-like bird with white tail feathers zipped past our noses one day. This could only be the Orange-barred warbler *P. pulcher*, never before recorded this far west. Soon we were noticing them around many of the rhododendron bushes, giving their characteristic trill song. It was

in a rhododendron bush scarcely 50 yards above the Greenish warbler's nest that we found our first Orange-barred warbler's nest. This nest is a ball of birch bark, twigs and moss, lined with many feathers: sometimes there is a 'door' of feathers across the nest's side entrance hole. The nest contained four young, almost ready to fly. Now the challenge was really on: how close to the nests we had already found could we find the other three species breeding? The Yellowrumped warbler was easy. Turning around from the Orange-barred warbler's nest and looking downhill there was a solitary large fir surrounded by birch trees. Yellowrumped warblers breed only in coniferous trees: like the other warblers they build a domed nest, but at the end of thin branches, often high off the ground. Observing the fir for about 15 minutes, it became apparent that there was indeed a pair breeding in this tree, for they kept flying up to a particular branch with food in their beaks, although we never located the nest.

Two species to go, and we set off downhill a couple of days later to find the Largebilled warbler. Luckily we found a pair carrying food to a nest of three young, built on a ledge on a small cave. This was quite far away, however, about 150 yards below that of the Greenish warbler. Returning up the hill we heard another pair calling, and were able to seek out this pair's nest in a hollow in a fallen log, again with three young. This nest was just 50



Large-billed
Leaf Warbler.

PRICE/IAMDAR

yards below the Greenish warbler's: indeed, their territories seemed to abut.

One left. The Tickell's warbler breeds only in juniper bushes and is commonly found high above the tree-line, i.e. 11,000 feet and above. There was a stand of juniper just to the left of the Orangebarred warbler's nest, and sitting down to watch it a few days later we were rewarded with the characteristic Tickell's warbler alarm note *chick*. A pair was there and they had food in their beaks. In a sea of juniper a nest can get lost but eventually we narrowed it down to single bush. It was quite a shock to walk up to the nest, touch it, and see the whole thing move. We thought the strain or the altitude was making us see things. On closer inspection we realised the cause of the moving nest was its contents which was not a brood of small warblers, but a single very large Small Cuckoo, *Cuculus poliocephalus*. This cuckoo lays an egg in the nests of warblers and other small birds (although we have not found one in more than 300 nests of the Yellow-browed warbler). The young cuckoo, when it hatches, expels the chicks or eggs of the warbler, and receives all the food the parents bring. It needs

it, whereas a warbler grows to 8 grams or so in weight, a Small Cuckoo grows to up to 50 grams, and literally bursts out of its nest.

So there we are—eight species breeding close together in Kashmir (although no other species are known to breed in Kashmir proper, two other species, the Chiffchaff *P. collybita* and the Olivaceous warbler *P. griseolus* breed in Ladakh). We do not know if this is a world record for the number of birds of one genus breeding in one area, but it may be. In the state of Maine in the northeast of the U.S.A. 9 species of *Dendroica* (the New World warblers) breed, but there are no records of eight of them breeding so close together. In the Peruvian jungles there are many species of antbirds (*Grallaria*), but their breeding biology, geographic ranges and nests are poorly known. Not only are there many species of warblers breeding in Kashmir, but they are all common. Indeed we estimate that more than 40% of all the individual passerine birds at 11,000 feet in the sanctuary are warblers. Clearly this is an unusual situation, and the causes for it would repay further investigation ■

INDIA

A WILDLIFER'S APPREHENSIONS

M. KRISHNAN



Bos gaurus — a bull in his prime. With habitats being ravaged, how much longer will these magnificent animals roam free?

M. KRISHNAN

I have been receding from association with governmental wildlife conservation efforts because I am utterly disillusioned and dejected by the chasm of insincerity and futility between proclaimed policy and the invariable concessions to all popular depletive factors, however unjustified and illegal, that is its main feature actually.

However, I had a last go at the one major scheme I have been working on for years, the saving of the Anamalais (in my considered opinion the richest, most varied, and most closely integrated wildlife tract in India), by its upgradation as a national park.

I have failed. I am now told that a mere, discrete 118 sq. km of its natural 900 sq. km entity, already with enclaves and no longer susceptible of further fragmentation, will be so upgraded — which will only provide sanction for the continuation of infiltration and depletion of the Anamalais, that has been going on unsanctioned for years.

During this effort, I had occasion to send the Government of India the convictions of a lifetime on our country, for circulation among governmental wildlife conservation authorities. I append a copy of this note, with only a few words edited.

Diverse grounds have been set out for the need to save India's wildlife: 'wildlife' in the comprehensive and correct sense of the term, the country's bewilderingly rich and varied flora, fauna and wild settings. It is neither possible nor necessary even to list them all here, but the main claims may be mentioned to indicate their basis and bias.

Historical and Traditional. As is universally recognized, India is the country in which wildlife conservation originated, with Ashoka's edicts protecting some wild plants and animals. Moreover, many princes and potentates have also protected wildlife in preserves within their territories. Furthermore, there has been this feeling for protection even among the common people, as evidenced by rustic sentiment in many countryside zealously protecting nesting water-birds in the vicinity of hamlets.

Compassionate, Spiritual and Religious. This is the land of the Buddha and Mahavira, and of other saints who were also committed to *ahimsa* — even some communities, like the Bishnois, still protect wild animals from trappers and hunters

Statistical and Apprehensive. The rate at which our wildlife habitats are going (hill and plains forests, scrubland, wetlands, arid flats, each with its distinctive flora and fauna), and the staggering depletion of the forests and fauna by poachers and more potently by dispossession of habitats by our alarmingly increased humanity and the disjointed governmental efforts (planned with no thought for wildlife) to cater to its growing needs. Vide the Expert Committee Report of 1970.

Scientific and Biological. Faunally, India is one of the richest countries in the world, and no less an authority on our flora than J.S. Gamble opined, a century ago, that it was much the richest in its flowering plants (angiosperms). Protests against the depletion and probably the extinction of the genetic pools still left have been voiced by many.

Human Needs - Proprietary and Self-centred. The commercial (including tourism value) and daily-popular-needs aspects of our wildlife require its conservation — we should not kill the goose that lays the golden eggs.

Ethical. Many have pointed out that our wild animals are no less anciently native to India than ourselves; probably more anciently native, and that they, too, have the right to existence.

Human Needs - Recuperative and Recreational. In countries like the U.S.A., where poverty is less acute, the richest still find that the only therapy for blasé satiation with human life (with its many frustrations and dejections) is what is termed 'wildlife recreation', i.e. a vital and reviving interest in the rest of creation. The value of this to humanity, only hinted at here, is quite profound; and it is a cure for all human misery, whether of want or surfeit.

There are other grounds, but these will do. All are valid — and all are superficial. Superficial in that they all spring from a common root-stock which is still undisclosed, being deep buried. I shall attempt to uncover it in the fewest possible words — necessarily, this brevity requires that the reader should ponder deeply over what follows.

Men cannot live in a self-sufficient vacuum. They need moorings in life, a sense of identity, a sense of belonging. The largest common factor that can provide these moorings, and which has done so in every country from times immemorial, is a feeling for one's nationality — this is the very basis of nations identifying themselves apart from one another, even if amicably.

What is this India of which all of us are so proud? Is it the historic record of a hoary past and hopes for the future, with the present a vital link? Is it the vast cultural accretions of the centuries, our philosophy, religions, arts, literature, traditions, folklore and even our culinary cultures? Yes, to some extent it is both, but only to some extent in a rapidly changing world where communication has become instant.

A little thought will show that all these, and similar factors, are all man-made and ar-

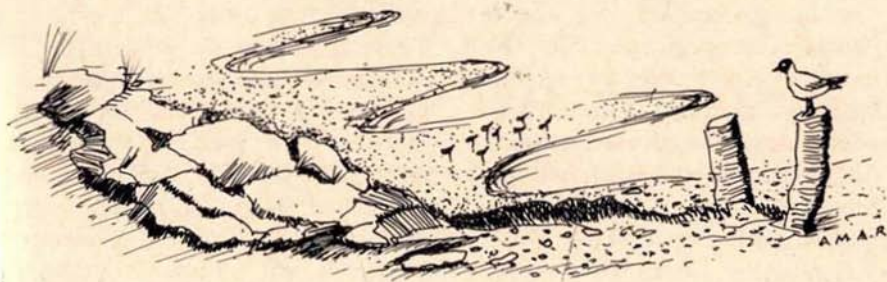
tificial, mutable, susceptible to obsolescence and destruction, many even only ephemeral. The history of any cult or religion, literature, music or arts, however Indian its ethos, if scrutinized dispassionately over a mere century or two will prove irresistibly that this is so.

The only natural heritage that we have, which is not of our own creation (though we have the vandalistic power to destroy or mutilate it), is the wholly natural physical character and entity of the land, its native flora, fauna and geomorphology. It is only this that has an authentic and truly Indian quiddity, only this that can provide a stable basis for the continuity of the entity of India. Unless we have the somewhat belated wisdom and self-restraint to safeguard this now, in our country where there is so little civic consciousness and popular self-restraint and even less feeling today in our national culture for nature, we are doomed. We should safeguard this natural identity of our country at least in representative, revivable or still unspoiled bits of it, for future generations to have any sense of national identity or continuity with the past — at least in, say, 10% of the total land area. If we cannot meet the needs of our peoples with 90% of the land, then there is something seriously wrong with our administrative efficiency.

A country can be lost otherwise than by invasion and conquest, by the dissipation and defacement of its entity from within. The enormous effort and expense incurred each year on safeguarding our frontiers from aggression and encroachment is necessary. Surely it is no less essential to protect India from internal depletive factors. So much is said and written these days about our need to prepare to enter the 21st century. At the end of that century and in spite of floods and droughts, famines and family planning, our teeming millions will still be there, but will a cognizable image of India survive to endow the millions with their national identity? ■

SEASHORE LORE

II: Stingers on the Shore



BEEFSEA

The seashells that people so avidly collect for the beauty of their colour and shape are the empty "houses" in which dwelt soft animals. These snails, like the proverbial tortoise, move very slowly, and are either vegetarians or scavengers, feeding on carrion. One group of snails, however, has adapted to killing and eating faster prey. These are the cone shells, and they have evolved a style more reminiscent of the scorpion or the cobra. And some of them can kill human beings.

Cones have been known for ages to be dangerous to man. As early as 1705, the Dutch naturalist G.E. Rumphius reported the death of a woman on the island of Banda, in Indonesia. She picked up a live cone shell and held it clenched in her fist. She felt a tickling in her palm, which sensation crept slowly through her body. Within minutes she was dead. The cone shells most

often responsible for human deaths are *Conus geographus* and *Conus textile*, but several other varieties can be equally deadly — for example, *Conus aulicus*, *C. omaria*, *C. marmoreus*, *C. gloriamaris*, *C. striatus* and *C. tulipa*.

There are more than 400 kinds of cone shells. They abound in the tropics, mainly in the Indian and Pacific Oceans, from shallow water down to a depth of several hundred feet. Some cones grow to 23 cm. They are appropriately named, having heavy shells shaped like a truncated cone. The spire, unlike in other shells, is quite flat. Many cone shells, because of their great beauty of colour and design, are collectors' items. Some of them can be quite expensive. One of the rarest is *Conus gloriamaris*. As late as 20 years ago, only 70 specimens of this Glory-of-the-seas were known, and fetched a price of over

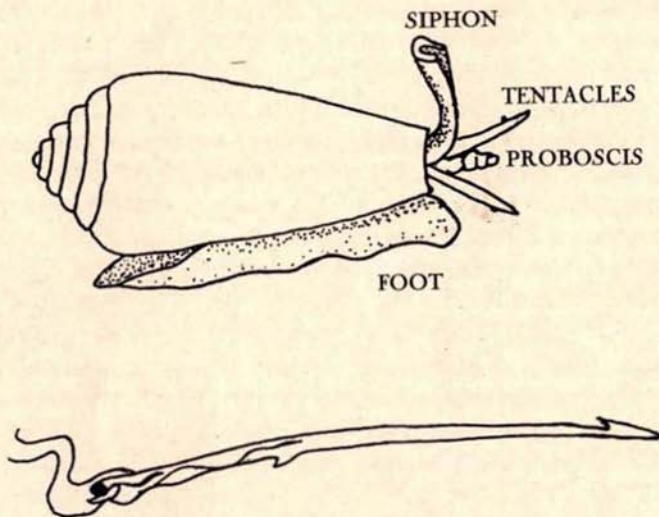
Rs. 18,000 each.

Cone shells feed on three types of prey — other molluscs (snails, clams and octopi), worms or fishes. The prey is killed by a potent venom injected into it, and the poison is so specialized that it will have an effect only on prey animals of its particular group. Thus a snail-eater, like *Conus textile* or *Conus marmoreus*, will kill snails but not fish. The venom of fish-eaters, such as *Conus geographus*, will not kill worms or snails, and that of worm-eaters will not kill fish. The poison may be still more specialized. Of two kinds of worm-eating cone shells inhabiting the same beach, one could kill only nereid worms and the other only eunicid worms. Out of seven kinds of worm-eating cone shells, only

three could kill a common marine worm, *Phyllodoce*. One cone shell, *Conus marmoreus*, feeds only on other species of cone shells.

The venom is contained in tiny darts, 9 to 10 millimetre long. These darts are derived from the radula or tongue. In most snails, the radula is a flat ribbon on which there are minute teeth like the rasps on a carpenter's file, and the radula is brushed to and fro to scrape off pieces of food. In the cone shells, however, the radular teeth are shaped into elaborately barbed harpoons. These teeth are manufactured in an L-shaped bag called the radular sac. When fully formed, they shift from the long arm of the radular sac to the short arm, which opens into the pharynx or throat of the snail. By the time

A cone shell.



Dart and delivery system.

the darts reach here, their interior is filled with venom.

A single tooth is enough to kill a worm, but as many as six may be shot into a snail. The dart remains inside the prey and passes through the cone shell's gut without harming it. While devouring a snail, the cone presses its mouth against the victim's shell aperture. After holding it for fifteen minutes to an hour, the empty prey shell is dropped. Each radular tooth is used only once. If it fails to hit its target, the tooth is ejected from the mouth, and a new one moves into position from the radular sheath.

Most cone shells hunt at night. In the daytime they are buried in the sand, or under stones or coral. They can probably smell their prey by means of a "nose", called the osphradium. This nose lies in the path of the water current that is constantly being pumped through the cone shell by its siphon, a tube lying between and above the two tentacles.

Fish-eating cone shells do not respond to dead fish. The presence of a live fish, however, makes them active. The snail's proboscis (snout) points in the direction of the fish and stretches till it is almost half as long as the cone shell. The fish swims closer; the proboscis is kept pointed towards it. When the proboscis tip touches the fish, a dart is shot in with force. At the same

time, a muscular ring tightens around a bulb at the near end of the dart, preventing the fish from jerking itself free. By now, the fish has been weakened by the venom. The proboscis shortens, and the fish is "reeled in", as it were. The cone's mouth now widens enormously (to 2 cm), like the gape of a snake devouring a rat, and it engulfs its meal. If the fish manages to escape, the dart can be used only once. In this manner, a cone shell 11 cm long can consume a 9 cm long fish, albeit taking several hours.

Some cone shells are timid and sluggish, and withdraw quickly into their shells when disturbed. Others are quite active and, when picked up, may extend their proboscis to investigate their surroundings (*Conus textile* is particularly aggressive). A cone shell can sting only when its head is outside the shell. When collecting cone shells, always pick up the snail by the large hind end of the shell. If you see the snail extending its snout from the pointed front end, drop it immediately. Most stings occur when the shell collector tries to scrape encrusted matter from the cone shell. The scraping action probably stimulates the cone to sting. *Never* hold a live cone shell in the hand longer than necessary, because the snail, even if it has withdrawn into its shell, will soon relax and extend its snout ■

List of cone shells recorded from Indian seas :

<i>Conus ceylonensis</i>	<i>C. geographus</i>	<i>C. mutabilis</i>	<i>C. litteratus</i>
<i>C. ebraeus</i>	<i>C. insculptus</i>	<i>C. piperatus</i>	<i>C. monachus</i> var. <i>achatinus</i>
<i>C. figulinus</i>	<i>C. lentiginosus</i>	<i>C. textile</i>	

News, notes & comments

ICBP Conferences

Two major conferences of the International Council for Bird Preservation (ICBP) were held in recent months. The Asian section of the ICBP met in April in Bangkok, Thailand, and the European section in May in Adana, Turkey. The four-day Bangkok conference had 120 participants from twenty countries. India was represented by Mr S A Hussain and Dr A R Rahmani, both from the BNHS. Among the topics discussed: status of population and habitats of threatened bird species in Asia (of which there are 328); bird migration and bird ringing. Mr Hussain was elected one of the two vice-chairmen of the Asian section of ICBP.

Threatened bird species

Over one thousand of the roughly 9000 known species of birds throughout the World — 69 of them from India — are threatened with global extinction. The ICBP has published a checklist of these species (*Birds To Watch: ICBP world checklist of Threatened Birds*, Tech. Publication No. 8). Their conclusions are as logical as they are pessimistic. Not just the birds, but a great many other species are also at risk. To quote: "Since the destruction, modification and fragmentation of habitats are by far the most common type of threat, there

is no reason to assume that other life-forms — plants, insects and animals — that share the habitat of these threatened birds are any better off. The birds are in fact just the tip of the iceberg, concealing thousands of other species we know little or nothing about, many of them still undiscovered by science, and facing the same fate..“ And these thousand-odd are only the ones visibly in danger; tomorrow, it could be the turn of other species. "The potentially threatened species could outnumber these by a factor of three or four."

Workshop in Vertebrate Ecology

The BNHS is organising a workshop in vertebrate ecology at the Mudumalai Wildlife Sanctuary from 6th November to 6th December 1989. The aim of the workshop is to develop a pool of field biologists who will be able to independently design and conduct surveys and other research projects in wildlife and habitat conservation. A variety of topics will be covered, and lectures supplemented with field training. Participation is invited from researchers, Forest Department officials and others who have worked in wildlife biology. Please contact the BNHS for details.



New Blackbuck Sanctuary

The Sunderpura Blackbuck preserve on the outskirts of Baroda (Gujarat) occupies 290 acres and supports a population of approximately 300 blackbuck. Privately managed, the preserve will now be awarded sanctuary status. Classification as a sanctuary gives it exemption from the Gujarat Land Ceiling Act; otherwise it would have had to be trimmed to a mere 12 acres in extent.

There is proposal to convert it into an antelope park, with the introduction of nilgai, chowsingha and chinkara. How successful this step will be remains to be seen; the area will suit the nilgai, but not the chinkara, and certainly not the chowsingha.

Zoo policy

Almost all the 44 recognised zoos in the country have severe financial problems. Things may improve with the new zoo policy, which is now being formulated by the Ministry of Environment & Forests. The projected requirement for zoo development in the 8th 5 year plan is Rs. 5 crores. Rather than set up new zoos, grants to existing zoos will be increased, subject to the zoos adhering strictly to government policy, especially in the manner in which they acquire exhibits (some have been known to flout the Wildlife Protection Act). The concept of 'model zoos' will be introduced (although the criteria have not yet been laid down), and special funds

provided for improvements in conservation methods.

Snakeskin trade to be allowed?

Trading in snakeskins, which is now banned under the Wildlife Protection Act, may be allowed in the near future, if the Tamil Nadu Forest Minister has his way. At the conference of state forest ministers in Delhi in May, Mr K P Kandaswamy asked that the ban be lifted, or at least that an expert committee be appointed to study the issue.

He has the vocal support of tannery owners, leather exporters and the Irula Munnetra Sangham, an organisation representing the Irula tribe, who traditionally hunt snakes and rats. The Sangham has submitted a memorandum to the state government, seeking that the ban be lifted because it causes them severe financial hardship. Their argument is as follows: female snakes devour most of their young after they hatch; killing female snakes therefore actually helps in snake conservation. This theory has few takers; and even the secretary of the Sangham has said he would prefer an alternative scheme, under which tribal cooperatives would be established, where snakes would be bred, and then skinned for sale.

White Tiger Safari

The Orissa government has announced the establishment of a White Tiger safari at the Nandan Kanan National Park, opening on Independence Day. Built for approximately Rs 27 lakhs, the safari will



White Tiger — big crowd-puller.

house 10 tigers in an area of 30 acres. National Parks need money, and at least a part of their funds must come from entrance fees paid by visitors. Many visitors would like to see exotic animals, and there are few more exotic than the White Tiger. But whether the 27 lakhs would have been better spent on other conservation programmes is a question that ought to have been asked (we are presuming it has not already been) when the safari was being planned. Another point is the area available to the animals — 3 acres per tiger, and even less when you consider the area set aside for roads within the safari — far less than tigers in the wild require.

Reprints of papers

Reprints of papers that have appeared in earlier issues of the *Journal* of the BNHS are available to members at cost. There are 133 papers on mammal studies, dealing with a large number of species.

Please contact the Society for details.

Conservation Expedition Competition

Are you planning an expedition abroad? Are you a university student? Do your interests lie in the field of wildlife conservation? Are you planning to involve local people in your work?

If the answers to these questions are positive, then you could be

eligible to enter the conservation expedition competition organized jointly by the International Council for Bird Preservation (ICBP) and the Fauna & Flora Preservation Society (FFPS). There will be four prizes in two categories — birds (£ 1,000 and £ 800), and all other wild animals and plants (£ 1,000 and £ 800).

The competition was established to stimulate expedition groups to adopt a conservation objective for their work. Expeditions are often in a position to collect useful up-to-date information on many aspects of wildlife conservation in parts of the world rarely visited by wildlife professionals. In selecting the prize-winning projects, attention will be paid to conservation content and likely impacts, feasibility and relationship to the ICBP/FFPS conservation priorities. Write to either of the addresses below for details of the competition, and for advice on organizing an expedition, lists of addresses, publications etc.

International Council for Bird Preservation, 32 Cambridge Road, Girton, Cambridge CB3 0PJ, England. Tel: 0223 277318.

Fauna and Flora Preservation Society, 79 - 83 North Street, Brighton, East Sussex BN1 1ZA. Tel: 0273 820445.

BNHS Calendar 1990

In order to finance its various activities, the Society brings out a pictorial calendar each year, and many of you have been regular

buyers in the past. For 1990, you have a choice of two calendars — a desk calendar of size 8 1/2" x 6 1/2", with 12 photographs, and (for the first time) a full-size wall calendar, 14" x 19", with 6 photographs, each one blown up to a size of 10" x 14".

Cost: Rs 15 for the desk calendar, Rs 25 for the wall calendar

Discounts of upto 10% are available for bulk orders.

If you haven't received a copy of the prospectus, write to us, and we'll send you one immediately. If you have, please send us your order as early as possible.

RESULTS OF REFERENDUM DATED 4TH MAY 1989

A referendum was held among those members of BNHS whose annual membership subscription had been received on or before 4th May 1989. The last date for receiving ballot papers was 15th June 1989. The scrutiny of votes was done on 16th June 1989. A total of 750 valid voting papers were received. The result was as follows:

Rule 28 (1): Executive Committee members to be elected from within a radius of 250 km from Bombay
298 members voted in favour of retaining the 250 km limit. 448 members voted against.

Rule 28 (2): Appointment of Curator as an ex-officio member of the Executive Committee

387 members voted in favour.

358 members voted against.

Rule 29: Preparation by the outgoing Executive Committee of a panel of candidates whom they recommend for election to the next Executive Committee.

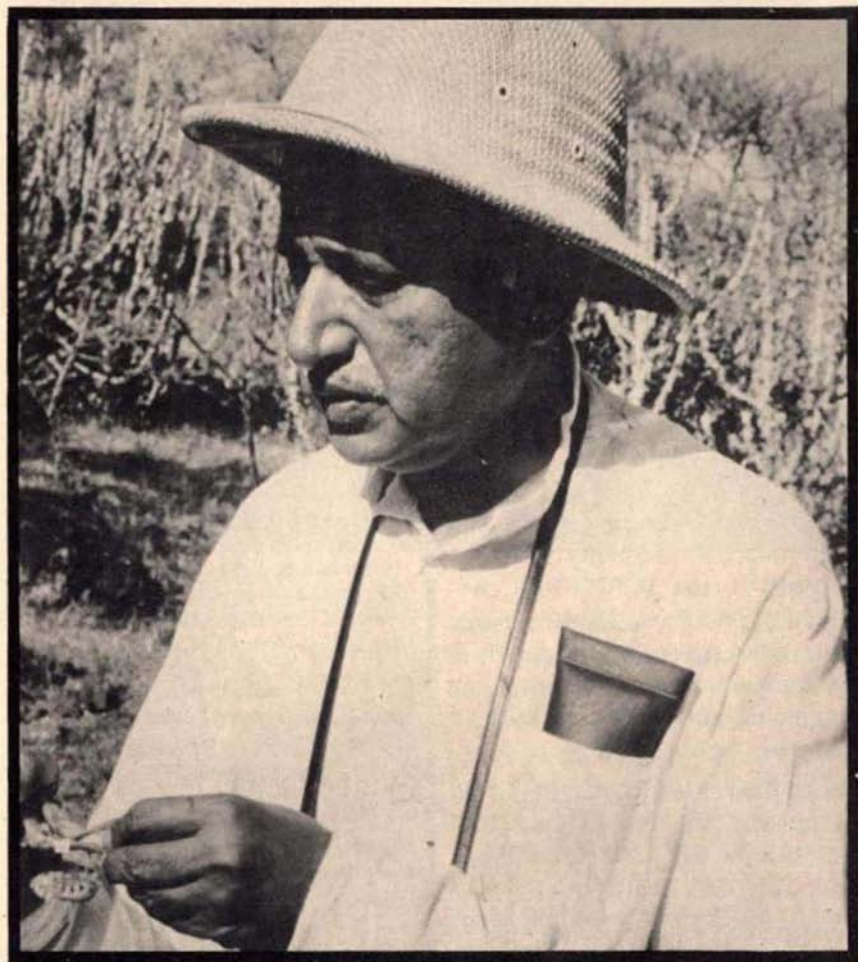
273 members voted in favour of having a panel. 465 voted against.

On the question of setting up the Salim Ali Institute of Ornithology and Natural History, 698 voted in favour and 46 voted against.

Bombay-23
01-08-1989

(P V Bole)
President, BNHS

IN MEMORIAM – *Shivrajkumar Khachar*



TAEJ MUNDKUR

RISHAD NAOROJI & TAEJ MUNDKUR

The conservation movement has suffered a grievous loss with the untimely death of Shivrajkumar Khachar, on 10th May 1989, at the age of 58. His pioneering work in Gujarat has set an example for a generation of naturalists to follow.

He was responsible, in the early sixties, for setting up the BNHS bird ringing station at Hingolghadh, and for persuading the WWF-India to undertake studies of the Hingolghadh Sanctuary (where he held the first nature education camps in the country) and the Gulf of Kutch Marine National Park. It was at his insistence that a lake inside Porbandar City was declared a sanctuary. He donated his ancestral property in Hingolghadh to the government, to preserve as a sanctuary and education centre. He later became chairman of the Saurashtra division of the WWF.

In 1974, along with Dr Salim Ali, he discovered that the Lesser Flamingo breeds in India. When Dr Ali suggested that he publish the findings himself (since he had seen the colony first), Mr Khachar declined, insisting that Dr Ali was the better qualified. This was just one example among the many instances where he shunned the limelight, preferring to work behind the scenes for a cause for which he felt passionately.

He was a keen photographer as well; he filmed the various bird species that nest near Hingolghadh. He won the Lok Wan Tho prize at the BNHS centenary photographic competition, and his pictures have been published in the standard reference book on ornithology, *FUNDAMENTALS OF ORNITHOLOGY* by Van Tyne and Berger.

Mr Khachar was also a member of the Gujarat legislative assembly.

His main interest, apart from wildlife, was social work in rural areas. As scion of the former ruling family of Jasdan state, he felt responsible for the welfare of his constituents. They in turn, sure of his sincerity and commitment, flocked to him with their problems, and he freely gave time and money to projects that helped the people help themselves. Because he was highly respected, he was successful in encouraging proper land use for soil conservation.

His warmth, sincerity, generosity and his unbridled sense of humour (he enjoyed a joke at his own expense, and was always ready with an answering quip).. his unsurpassed knowledge of the natural history of the Jasdan region, and his willingness to share this knowledge with others (he helped several budding naturalists establish themselves).. the breadth of his interests (he had a vast library, and could quote chapter and verse from most of his books) .. these, and other, qualities set Mr Khachar apart.

He practised the conservation he preached: he had instructed that he be buried, not cremated, so that his beloved trees would not be burnt. This was a major deviation from normal religious practice, which local people would not have understood. Therefore, as a sorrowful Jasdan looked on, his funeral pyre was fuelled with cattle dung. His innumerable friends, colleagues, and the people, to whom he was always "Darbar Saheb", will remember him with love and respect. ■

Feedback



Hornbills for sale. SUDARSHAN IYER

Sir,

I was in Dhanbad on an official trip. Throughout the month, just outside the Divisional Railway Manager's building complex, I saw something that would drive any conservationist mad, with indignation. A self-styled medicine-man was busy selling bones of Hornbills. He had about 10 dead birds, each wrapped in a cloth so that only the head and the beak were visible. Each one was liberally sprinkled with turmeric powder (*haldi*). In order to attract crowds he had a live hornbill whose flight feathers had been plucked. The poor bird was perched on a stand, unable to flee, overlooking its dead kin. These hornbills (*Dhanush-pakhee*, as they are called in this region) are caught from the forests in Bihar and Uttar Pradesh.

People have superstitious beliefs about the medicinal powers of the bird, and these are exploited by the poachers. Casual questioning revealed that these people function in Calcutta also. An acquaintance who used these bones testified to their effectiveness on rheumatism, though it seemed more of faith-healing. The bones are also used to make talismans to ward off the evil-eye. This is ironical, as these hornbills themselves are plagued by the evil-eye of the poachers.

For the people who sell these bones, this seems to be the only way to make a living; for the Hornbills this is the death-knell. Unless effective steps are taken to curb poaching of the Indian Pied Hornbill, it would only be a matter of time before this species vanishes from the eastern side of India.

(SUDARSHAN IYER)

3, Dev Smruti, Jogeshwari (E), Bombay.

Sir,

We refer to the article 'Close Encounters of the Bird Kind' published in *Hornbill* 1989(1). The article is well-written and the International Airport Authority of India compliments Mr S M Satheesan, the author, and the BNHS for having taken interest in the field of bird nuisance to civil aviation. We hope such articles are published more often, reaching more and more readers so that awareness of bird hazards to aviation and air safety reaches all cross-sections of society.

(K V ANAND)

Airport Director, Bombay Airport International Airports Authority of India

Sir,

This is in response to the notice in Hornbill 1989(1) regarding the Red Alert Maps. I wanted to suggest Bandhavgarh National Park in Madhya Pradesh, both because it is a fine park as also the fact that it is indirectly under threat. It is situated in Shahdol district ($23^{\circ} 30'$ to $23^{\circ} 46' N$ and $80^{\circ} 46' 45''$ to $81^{\circ} 11' 36'' E$). It is 32 km from Umaria and is the entrance for tourists. Part of the erstwhile Rewa state, it was declared a National Park in 1968 with an area of 105 sq. km, later extended to 448 sq. km in 1984. A number of villages are located in the extension zone which are now in the process of being relocated. Reluctance on the part of villagers, government apathy and lack of financial support are causing delays.

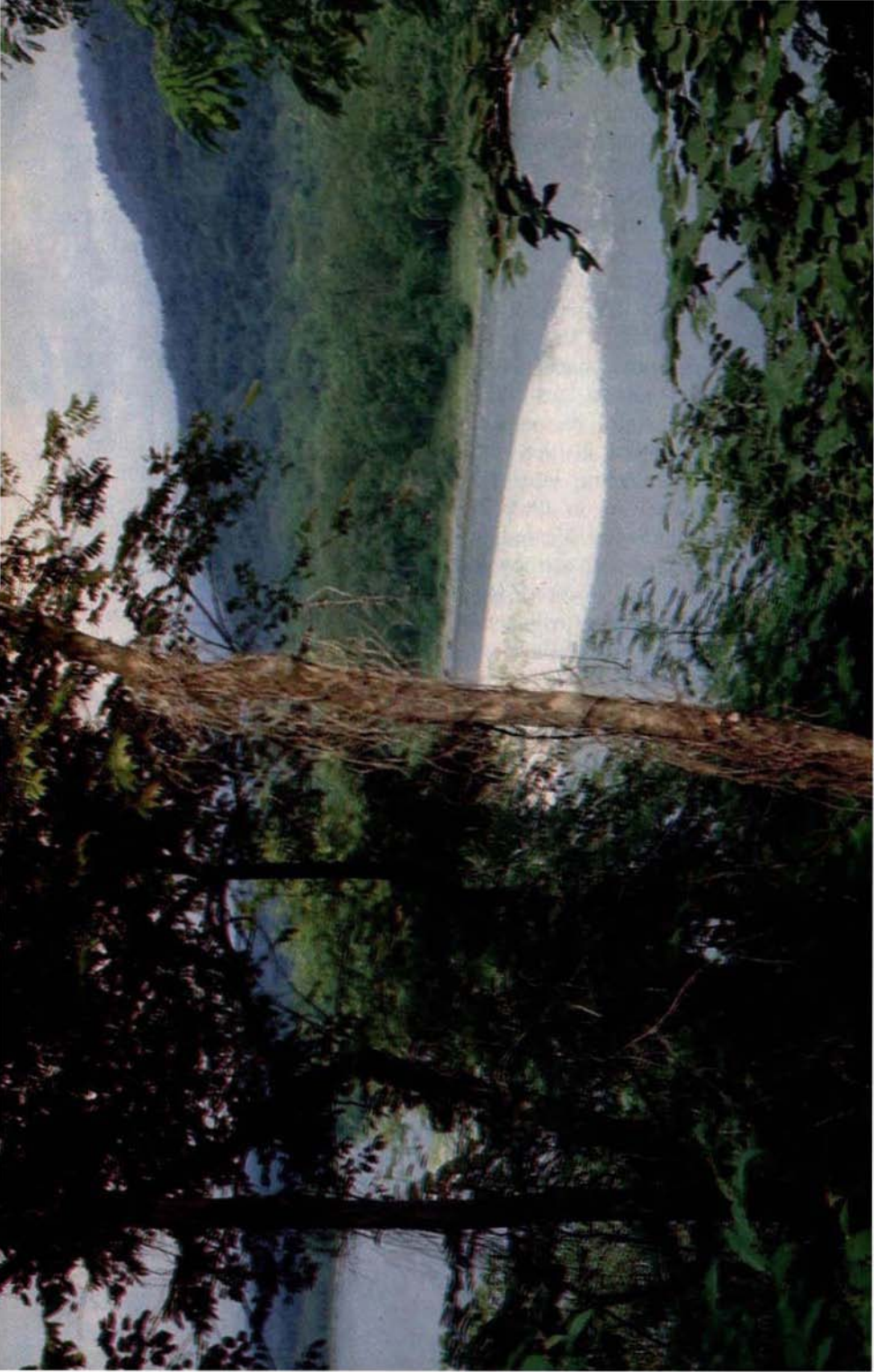
Along with Kanha, it is one of the finest examples of the sal, bamboo and dense mixed forests interspersed with meadows that characterise the moist forests of the eastern part of Central India. It is well known for its large numbers of tiger, although they are almost certainly less than the official number of 56 (1987 census). Apart from tiger it harbours a wealth of fauna which, in the main, remains unstudied. 240 species of birds have also been recorded in the park.

Cattle-lifting by tigers in Shahdol district is a politically sensitive issue, since over 600 cases were compensated last year. This,

together with destruction of crops by wild animals and resentment over extension of protected area and resettlement, have created a reservoir of ill-will towards the park which local politicians have sought to exploit. It is strongly suspected that the major fire of late April-early May 1989 was caused by villagers instigated by politicians. The aim seems to be to pressurise the government to revoke the extension, which will jeopardise the future, not only of the park but of the whole area. Eco-development is an urgent requirement here. Some Directors of the park have considered this, but lack of funds and political support make this an unattainable ambition at present. Within the park also, a policy decision has been made to disallow all burning of the grasslands on the grounds that the long-term consequences of a fire regime are not well understood. However, no experiments are being conducted anywhere in the state to resolve this issue and to create a satisfactory model to prevent coarse high grasses from colonising the meadows of short grasses, with a consequent decrease in food value. The desired balance between the two kinds of grasses is being upset at an increasing rate.

PS: I very much enjoyed the article 'Birdwatching at 60 kmph' in *Hornbill* 1989(1).

(HASHIM TYABJI)
624/1, Road No. 10, Banjara Hills
Hyderabad - 500 034



MANAS-

The land of the *Ulu Moira*

LIMA ROSALIND

A cold breeze sweeping across the vast expanse of green, the bright orange sun faintly visible through the mist, the calling of the peacocks ... the upright ears and tails of the Hog deer giving notice that the king of the jungle was on the prowl...For this is tiger country -- the delightfully Kiplingesque Manas Wildlife Sanctuary, one of India's premier wildlife reserves.

The sanctuary, locked into the foothills of the Eastern Himalayas on the Bhutan border, has a spectrum of forest types, from the sub-Himalayan moist-mixed deciduous and wet-evergreen forests that blanket the foothills, to the eastern wet alluvial grasslands and low alluvial savannah woodlands in the plains. This diversified and highly dynamic habitat harbours the largest number of animal species in the country, including 42 of the endangered species listed in Schedule I of the Wildlife Act.

Manas, it was once remarked, is what the earth looked like before the arrival of Man -- a jewel embedded on land, reflecting nature's varied and brilliant hues. The Manas river flowing across the reserve is one of its dominant physical features. From its source in the remote reaches of the Bhutan Himalayas, it roars over gorges and fiery rapids, down a rugged valley, meeting the plains at the Manas Sanctuary. Frequently, it changes course, and boulders and giant scoops of silt are strewn over the area once covered by the river. It disgorges vast quantities of water into the sanctuary through rivulets, streams and *nalas*. The *beels* or seasonal wetlands formed during this shifting of course are frequented by the swamp deer (*Cervus duvauceli*). The *nalas* also form permanent waterholes for the animals of the sanctuary.

The sanctuary was made a Project Tiger area in 1973, and the success of the programme is evident. Today, Manas is believed to support the second largest population of tigers (after the Sunderbans) in the country. But tigers are more often heard than seen here, and Manas is no place to anticipate a guaranteed sighting of this magnificent cat. On the other hand, the elephants more than compensate for this lack. Although both tuskers and *makhnas* often raid crops and destroy huts, the locals revere them as 'Ganesh Baba'. They are driven away by nonviolent means -- shouts, drumbeats and crackers.

We, too, have had our run-ins with the elephants. Our hides and *machans*, situated in the tall grass or atop trees, were frequently destroyed by

elephants returning from their nightly forays. Once, a dawn photography session from a basket hide was interrupted by a visit from a big tusker. We set off crackers (we always carry some along) to stop his advance for a few moments, bounded into our jeep and sped off. Later, the ranger, S K Sarma, remarked that the encounter could have been disastrous: the tusker was a known rogue, and in musth besides.

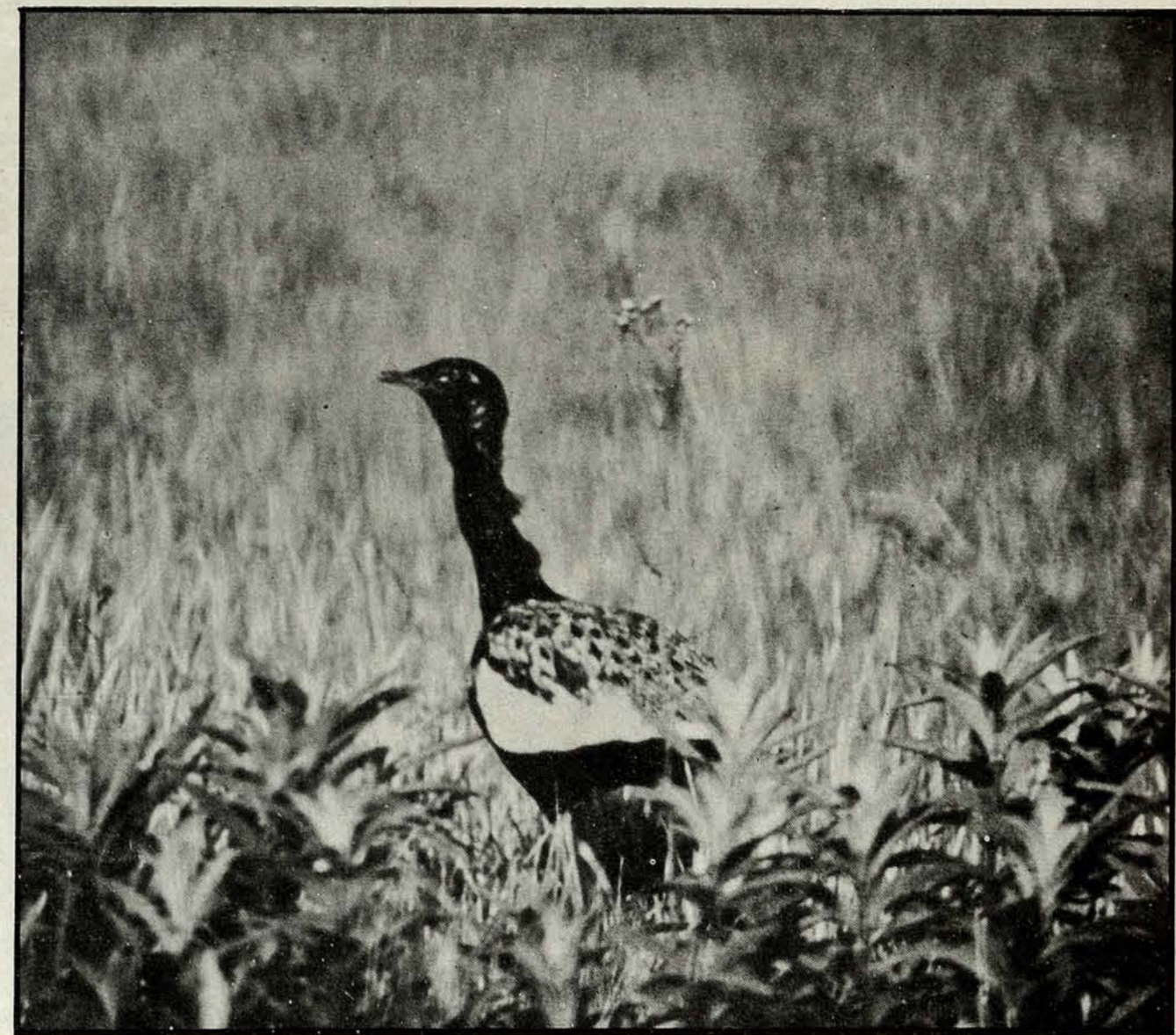
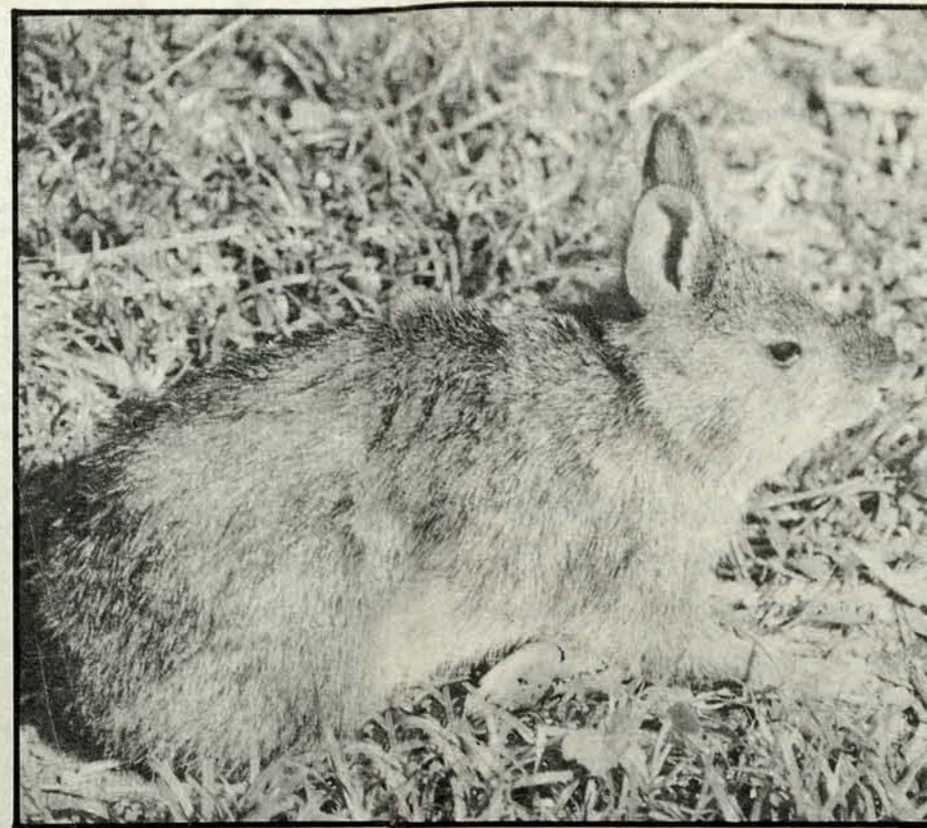
Tigers rarely cause problems, preferring concealment to confrontation. Very rarely, they attack lone human beings on foot. In January '87 a tiger badly mauled a mahout who had gone into the jungle to collect his elephant. A similar incident, involving another tiger, was repeated in September that year: this time a grass-cutter was injured. Tigers often stray into the nearby tea-gardens and lift cattle from the villages. The tiger in the first instance was trapped, and it was found that it had a deep wound in its forepaws and was hence unable to catch its natural prey. In the second case the animal was a healthy four year old male, which had earlier chased our field assistant up a tree. Its territory was very close to the boundary of the sanctuary, and it had therefore lost the fear of man.

Summers in Manas are hot and humid. The browning of the grass and the falling leaves herald the arrival of autumn. The *Simul* or Silk Cotton (*Bombax cieba*) breaks into a riot of blood-red flowers. In the grassland, the shrub *Sonchus arvensis* begins to bloom, its bright lemon-yellow flowers providing a perfect complement to the green of the grass. The thatch grass is cut or burnt by the Forest Department at this time, to allow fresh grass to come up. The new growth brings the hog deer, the buffalo and the elephant frequently to the open grassland. Some grass is cut and stored, to be used later as compensation for crop or huts damaged by animals.

Winters are cold, with the mist spreading its translucent blanket over the landscape. Night falls quickly, with sunsets as early as 4.30 p.m. With the first showers of rain in early February, the sanctuary comes to life again. This is the beginning of the breeding season for most of the birds in the area. Soon, untidy structures appear on tree branches: Finn's Baya, one of the weaver birds of the area, are hard at work decorating their nests. Males of the highly endangered Bengal Florican (*Houbaropsis bengalensis*) perform their spectacular aerial displays to woo females hidden in the grass.

Top left: Hispid Hare — among the rarest of Manas's mammals, and probably the most difficult to photograph. Top right: Hog deer stag.

GOUTAM NARAYAN



Bengal Florican — Manas is home to nearly one fifth of the world population of 400-odd.

GOUTAM NARAYAN

The Bengal Florican is known locally as 'Ulu moira', or Peacock of the Thatch Grass (*Ulu* = thatch grass; *moira* = peacock in Assamese). It is considerably less active than the related Lesser Florican, frequently spending long periods -- sometimes more than an hour -- scratching around at the same spot, from time to time looking around with neck stretched (possibly another kind of display). These periods of seeming lethargy are interrupted, without warning, by sudden bursts of activity. When we began studying and photographing these elusive birds in '87 our work was a trial of patience. But after two years of practice, we have fine-tuned our reflexes to match the birds' pattern of activity.

The florican is almost extinct in Bengal, and a few now exist outside Assam; not surprisingly, some Assamese suggest a change of name to Assam Florican! Manas supports a sizeable population, but persistent cattle grazing within the sanctuary remains a problem. A limited amount of grazing either by cattle or wild animals is essential to arrest the growth of the grass and thereby make the area more conducive to the floricans, but the movement of cattle during the birds' breeding period needs to be severely restricted.

The grasslands in the floodplains of the Manas river are the favoured habitat of the wild buffalo (*Bubalus bubalis*), and it is here that these are found in their genetically purest form. They are formidable creatures, dirty grey-black coats gleaming wet, horns thrown back in a great sweeping arc. Cows are generally more even-tempered than bulls. The latter are usually

GOUTAM NARAYAN

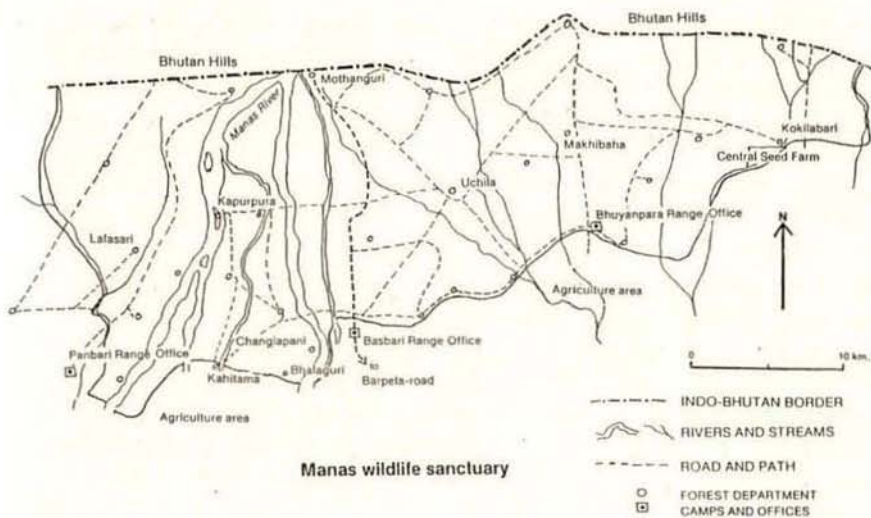
Herd of buffalo cows; bulls usually live separately.



obstinate, standing erect and ready to charge, refusing to let human intruders pass, and eventually forcing a retreat -- when the opponent is a bull, discretion is best.

December and January is the picnic season. Every holiday, thousands of people invade the sanctuary, completely shattering its tranquility. The Forest Department has recently begun to restrict entry to 40 buses per day. But upto 200 buses queue up at the entrance, and any refusal to permit them to enter the sanctuary threatens to develop into a riot. These picnickers are not even remotely interested in wild animals. They come, with cassette players blaring, with the sole intention of having a feast on the banks of the Manas river. The sight of any animal brings out the animal in them, and they exhibit this behaviour throughout the 20 kilometer drive to the river. Finally they return at sundown, leaving the place littered and filthy. The restriction on picnickers should be strictly enforced if the pristine habitat of Manas is to be maintained.

There are other maladies as well, especially cutting of wood and thatch by villagers along the sanctuary's periphery. They are driven to it, in the face of heavy odds, by poverty. The Forest Department compensates those whose houses have been damaged by elephants with a limited amount of money and thatch. But no compensation is awarded for cattle lifted by tigers, or crops destroyed by foraging elephants and deer. This neglect could cost dearly in the long run; without the cooperation of the villagers, the Manas sanctuary may go the way of many others in the country.





First Laokhowa, now Manas — yet another victim of rhino poachers. GOUTAM NARAYAN

The Bodo agitation, which began in mid-February, is now probably the single most serious threat to Manas. To the big-time poachers and timber smugglers it is a golden opportunity. The jungles in the sanctuary provide refuge to extremists, who are often armed, and turn easily to violence. Consequently, the sanctuary has now been deserted by the protection staff; the flood-gates are now open.

In February, the extremists attacked and burnt the Panbari Range Office and staff quarters, and a little later the forest camp at Lafasari. A mahout was killed, and a game watcher seriously injured. In April the forest camp at Makhibaha was burnt, and another game watcher killed. Thirteen truckloads of timber were confiscated by the Forest Department in June at Barpeta Road. In July, 600 logs were found buried under the soil in a paddy field on the outskirts of the sanctuary. We have not been spared either. While returning to camp one evening, we were stoned by a mob, and the windscreen of our jeep smashed — probably to persuade us to leave the sanctuary.

The history of conservation has its ups and downs, but Assam's tale is unique. During the AASU agitation in 1983, over 30 rhinos were slaughtered, within a period of 3 months, in the Laokhowa Sanctuary in Nagaon district. Now it seems to be the turn of Manas. Let not Manas go the Laokhowa way. The State and Central Governments need to take immediate action to flush out the extremists from the sanctuary. Nature should not become a victim of their petty politics. Unless the authorities move quickly, we will be writing not poems, but requiems for the Manas Wildlife Sanctuary ■

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