

# HORNBILL

1982 (2)



BOMBAY NATURAL HISTORY SOCIETY



## ACKNOWLEDGEMENT

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It is regretted that due to oversight, an acknowledgement to the Trust was omitted in the 1982 (1) January—March issue.



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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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.

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

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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.

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EDITED BY

J. C. DANIEL  
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## EDITORIAL

The Emperor Jehangir who ruled India between 1605 and 1627 gives the following account of a hunt where his Queen, Nur Jehan killed four tigers in quick succession. '...the huntsmen marked down four tigers and I went out to hunt them with my ladies. When the tigers came in sight Nur Jehan Begum submitted that if I would order her she herself would kill the tigers with her gun. I said "Let it be so". She shot two tigers with one shot each and knocked over the two others with four shots. In the twinkling of an eye she deprived of life the bodies of these four tigers. Until now such shooting was never seen; that too from the top of an elephant and inside of a howdah, six shots should be made and not one miss, so that the four beasts found no opportunity to spring or move. As a reward for this good shooting I gave her a pair of bracelets of diamonds worth one hundred thousand rupees and scattered 1000 *ashrafis* (gold mohurs) over her.'

This is an extract from Sálím Ali's 'The Moghul Emperors of India as Naturalists and Sportsmen' published 55 years ago in the Society's *Journal*. Wealth permitting Emperors to shower their Emperesses with 1000 gold mohurs and an abundance of tigers enough for four to be shot in one hunt no

longer exist in India. The Society however has its own treasure chest of memories, the *Journal* which in its 96 years of existence records such diverse subjects as the natural history pursuits of the Moghul Emperors and of those of more plebian origin, whether it is yak shooting in Tibet, or shooting Marco Polo's sheep in the Russian Pamirs, or an ornithological pilgrimage to Manasarowar, or mahseer fishing in south India, or bird photography in India, or the habits of the Twohorned Asiatic rhinoceros, or the non-violent scientific study of birds, or the giant freshwater fishes of India, or the migration of butterflies in India, or the origin of the sandalwood tree.

These and many more, a pick of the best of the *Natural History* as opposed to the purely *scientific* articles published in the *Journal* are being offered to members in the Society's centenary publication A CENTURY OF NATURAL HISTORY. As soon as the costing has been worked out we shall be sending you a prepublication sampler and order form.

From this issue of the *Hornbill* there will be a Centenary section. In this issue, the Honorary Secretary writes on some of the programmes and plans. We look forward to your cooperation and participation.



## CENTENARY 1883-1983

Dear Member

You are probably aware that the Society will be celebrating its centenary on the 15th of September 1983. Various programmes and publications have been planned for the occasion. These will include:

1. An International Seminar on 'Conservation in Developing countries - Problems and Prospects'. The main emphasis, naturally, will be on India, but we hope to have some representative speakers from other developing countries. The Proceedings of the Seminar will be published and we hope it will become a standard work of reference on these problems.

Mrs Indira Gandhi, our Prime Minister, who is the Patron of the Society, has consented to inaugurate the Seminar.

2. A photographic exhibition of the 100 best nature photographs from the Indian subcontinent. We also hope to publish as a book, the selected 100 photographs, which will prove an excellent presentation item.

3. It is also proposed, during the centenary year, to hold an exhibition on the Society's activities and projects combined with a Snake show.

4. We will also release two centenary publications:

(a) THE ENCYCLOPEDIA OF  
INDIAN NATURAL HISTORY  
A comprehensive work  
which we hope will be of  
value to the student and

the field worker, and also a book of general information for the interested amateur.

### (b) A CENTURY OF NATURAL HISTORY

This will consist of extracts and reproductions of articles of lasting interest selected from the Society's journals of the past 100 years. The selections have been made with the general reader in mind (the specialist would already know them), and will serve as a fascinating introduction to the world of natural history.

5. Our most important enterprise for the centenary of the Society is the proposal to set up an Institute of Natural History. A brief description of the purpose and the funds needed is given below.

We hope all members will join these celebrations and make the centenary a success.

A. N. D. NANAVATI, M. D.

### The Institute of Natural History

The age of the wealthy amateur who could indulge his love of natural history passed away many years ago. For several years, we have been entirely dependent on project grants for carrying out any major research studies. This has meant that we were able to undertake only such studies



as were approved or requested by some financing agency, irrespective of our own priorities. Further, since all such projects are necessarily temporary, we must recruit and train afresh the field workers required for each project. This is very unsatisfactory. We cannot attract the best workers when we offer only temporary employment, and there is considerable training loss due to departure of trained workers for more permanent jobs elsewhere.

The proposal for an Institute of Natural History which will be financially independent, would eliminate both these problems. We can initiate and carry out research projects according to priorities envisaged; we would be able to retain a nucleus of trained workers to run such projects, and these projects would serve as in service training programmes for new workers, as well as for workers from other organizations requiring training in field research.

The University Grants Commission has already expressed an interest, with possibility of support, for such training programmes.

With the inflationary costs today, to set up an institute on even a modest scale will require an expenditure of Rs 75 lakhs a year (in field research, almost half the cost is on vehicles and transport). Buildings, library and laboratory facilities would cost about Rs 200 lakhs. We must also allow for further inflation in costs of building and equipment, as well as inflation of salaries as prices continue to rise. To cover all these, an income of Rs 100 lakhs a year, or a capital base of Rs 1000 lakhs is required. It will need a major drive to obtain funds on this scale, and we appeal to all our members to help us in this effort. We can expect some initial support from Government, possibly for the first five years. But subsequently we must be in a position to continue on our own.

*Pelican young picking its parent's pouch  
Be as generous as a pelican!*





## Forest wildlife threatened in the Himalayas

Thanks to the efforts of people like Dr George Schaller, the plight of species such as the Snow Leopard and the Markhor, both of which live above the treeline in the Himalayas, is now well known. Furthermore Dr Schaller's writings leave us in no doubt that man's improvidence is to blame for their near-extinction. It might be said, however, that the publicity given to these alpine species has distracted our attention from the equally desperate situation of Himalayan forest wildlife, and indeed of the forests themselves.

As a result of sponsorship by the U.S. Fish and Wildlife Service, and Overseas Development Administration and the World Pheasant Association, amongst others, a major series of forest wildlife surveys has recently been undertaken, mainly in the Kulu district of Himachal Pradesh in the Western Himalayas of India. The Himachal Wildlife Project's coorganizers, Drs. Tony Gaston, Peter Garson and Malcolm Hunter, Jnr., have just submitted a report to the Indian Government detailing their results and conclusions in the hope that at least one National Park will soon be set up to preserve the natural forests and diverse wildlife still left in this area of India.

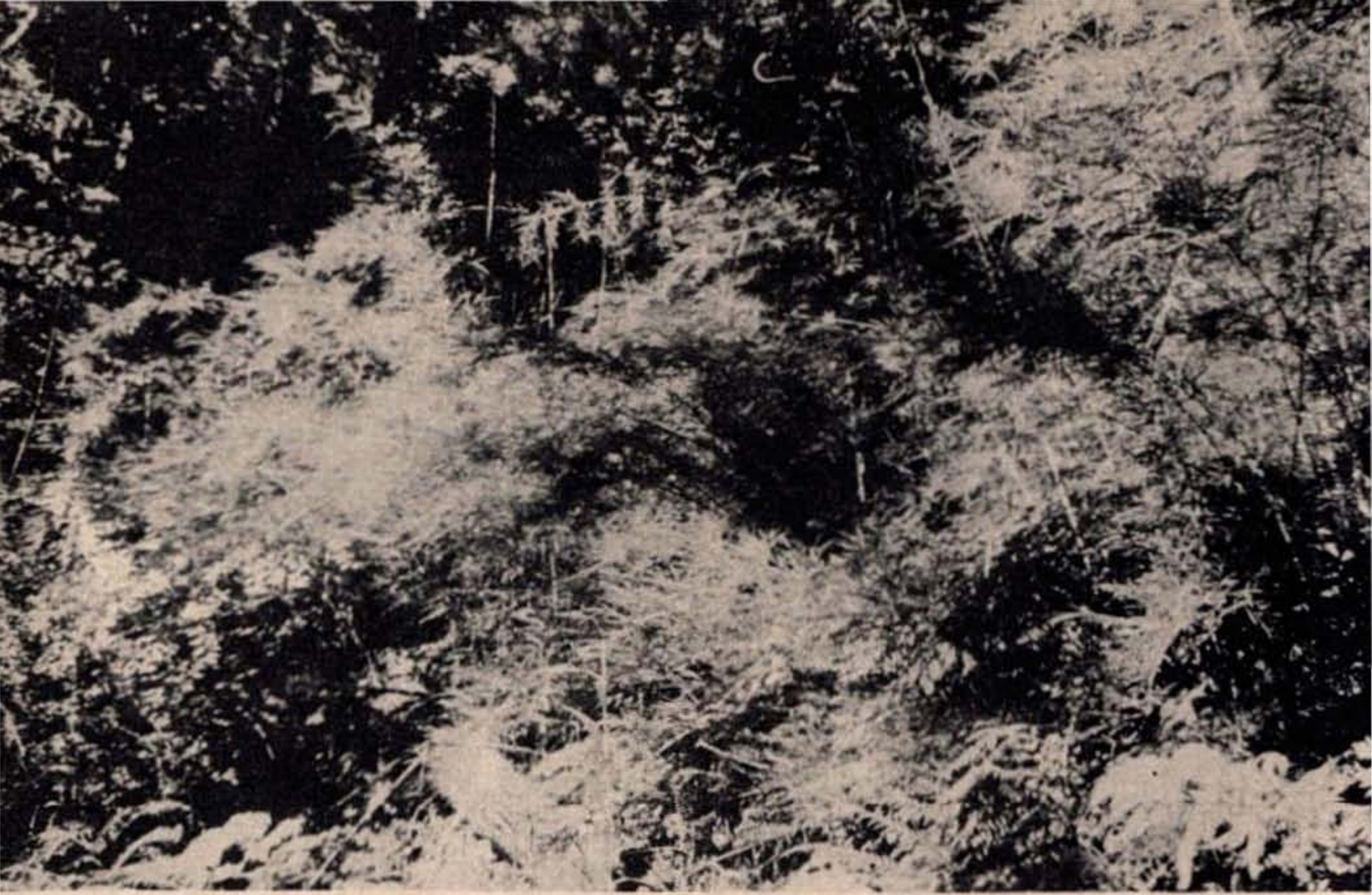
### EXOTIC FAUNA

Surveys during the Himachal Wildlife Project yielded records for 26 mammal species, ranging in size from Brown Bear to Grey Shrew, as

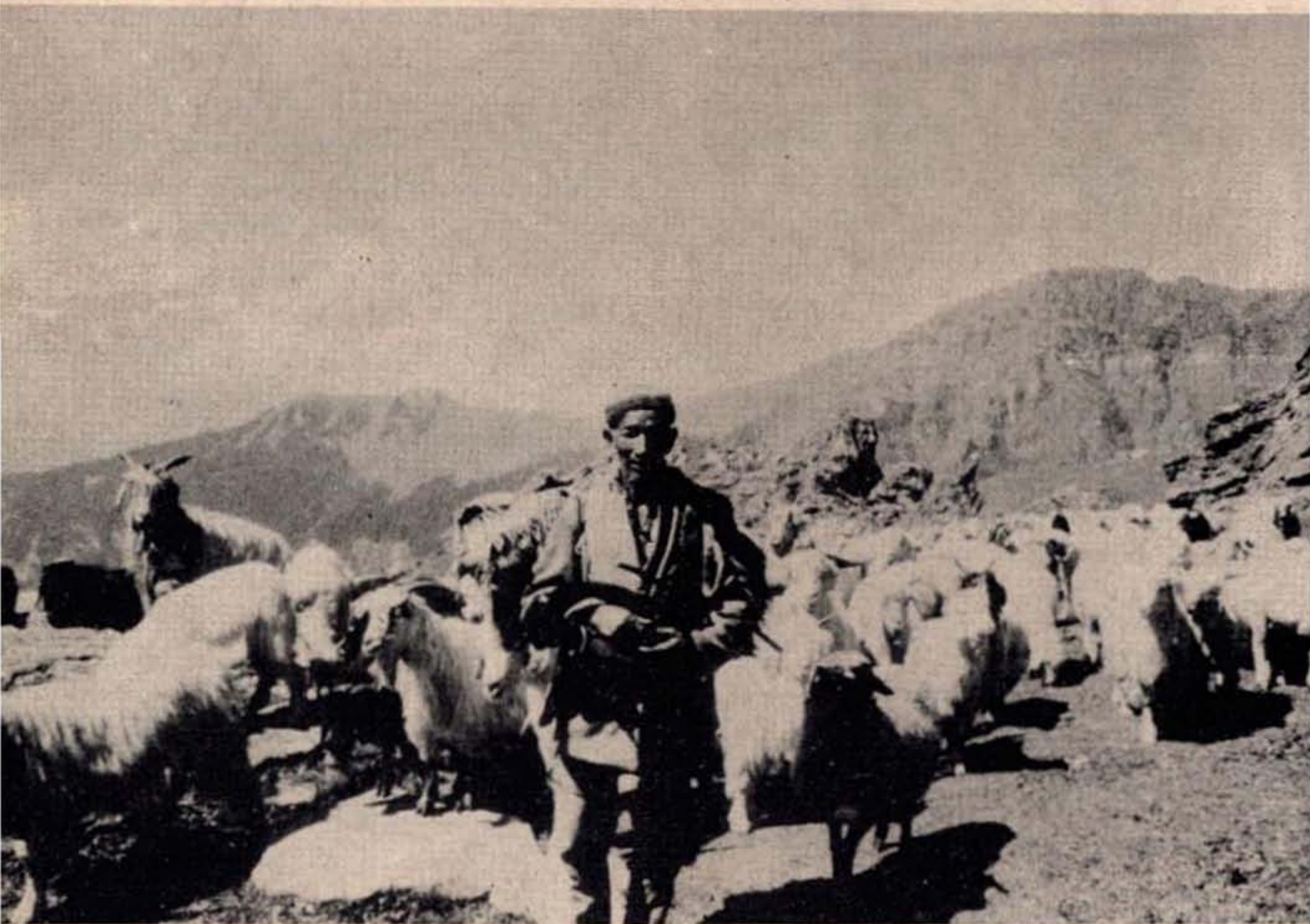
well as for 268 species of birds, including 25 raptors and 11 gamebirds. Amongst the latter are five pheasant species including the exotic Monal (Nepal's national bird) and Western Tragopan, which is "severely endangered" according to IUCN's *Red Data Book*. On the evidence now available it seems likely that the upper Beas river Valley in the north of Kulu is this Tragopan's major world stronghold. It also contains a relatively healthy population of the Cheer Pheasant, another threatened species. The large mammal fauna of the area includes no less than five secretive and little-known ungulates—Himalayan Tahr, Serow, Goral, Musk Deer and Barking deer (Muntjac) and as well as Langur and Rhesus monkeys, Himalayan Black Bear and Leopard. There are also Himalayan Ibex and Brown Bear above treeline.

During winter in Kulu all ground above 2,500 m is blanketed with snow for two to five months, depending on altitude, slope and aspect. With a few exceptions such as Musk Deer and Black Bear, the resident birds and mammals descend towards the valleys after the first snowfalls of November and December, and follow the snow-line up again between March and May. Perhaps the most spectacular altitudinal migrant is the Monal; in Kulu it can be found below 2,200 m in winter, whilst it is commonest just below the treeline, at around 3,300 m, from April to October.





*Ringal Bamboo forest— Western Tragopan habitat*



*Migratory flocks of sheep and goats; wildlife's most serious problem*

*(Photos: Author)*



These recent surveys also revealed, not surprisingly, that the apparent habitat preferences of the various pheasants and mammals were often very different. For instance Koklas pheasants and Western Tragopans live in dense forest understorey whereas Cheers, and to a lesser extent Monals are found in more open places, such as steep, scrubby and sparsely forested slopes. Whilst the Goral shares the latter habitat with these pheasants, the Tahr is never found far from crags and ravines in the forest. By contrast the Musk deer and Muntjac are seldom far from dense undergrowth.

#### MAN'S IMPACT

Himachal Pradesh, like the rest of India, has an increasing human population, and villages are common place in Kulu to an altitude of 2,600 m. Villagers use wood for cooking and heating as well as for building houses and bridges. Survey parties often saw them climbing through snow for several kilometres and up to 1,000 m above their settlements in search of both animal fodder from evergreen oaks and wood for burning. Overgrazing of the forest understorey by small but resident flocks of goats and sheep near villages often removes most of the ground cover so vital to all wildlife, but especially to the large mammals and pheasants.

Poaching is also widespread, particularly in the winter and spring when wildlife is often to be found close to human settlements. Of course the most sought-after species

is the Musk Deer; the sale of a few of the musk-pods carried by males could cover all the expenses of an Indian hill family for the year. In addition the Male Monal's green crest of feathers is much in demand as a hat ornament in Kulu. It is worth twice or three times as much as the bird itself is as a source of much needed protein in the diet. Other pheasants such as the Western Tragopan are almost certainly shot incidentally as a result of this trade in Monal crests.

Large areas of forest, even those well away from villages in most of the valleys surveyed, had very little understorey vegetation. In most places this appears to be the result of overgrazing by domestic stock, especially goats. Here the finger of suspicion points particularly at the migratory graziers who move through these areas in both spring and autumn en route to and from their high alpine grazing grounds in Spiti, Lahaul and Ladakh to the north. No systematic records of the state of the forests in Kulu were made prior to the Himachal Wildlife Project, so it is difficult to assess whether the overgrazing problem is becoming more acute as time goes by. However, areas surveyed in 1980 that are not on the traditional routes used by these graziers supported a luxuriant understorey and a marvellous abundance of wildlife encountered nowhere else. It is therefore confusing that statistics on the only well-researched ethnic group of graziers, the Gaddis of Kangra, suggest, if anything, that their stock have decreased in



number over the past 30 years. And yet, according to both local people and Forest Department personnel, this is a period over which much wildlife has apparently disappeared from the forests. Either the statistics are inaccurate or the fault lies with graziers other than the Gaddis.

#### FOREST CONSERVATION

At present the Himachal Pradesh Forest Department cannot prevent poaching or regulate grazing and tree cutting properly for at least two reasons. First, the organization is hopelessly underequipped and understaffed for the effective policing of a rugged piece of country with few roads. Second, Forest and Wildlife Guards are not well paid and receive no incentive payments for reporting or apprehending offenders. In any case, being unarmed and often single handed, they would be foolish to challenge a determined gang of Musk Deer hunters. The working conditions of these men must be improved and many more Guards must be employed if the general level of protection for forests and their wildlife is to be raised.

It is also clear that any effective sanctuary for this whole threatened wildlife community has to be large,

as well as diverse in its habitats to cater for the variety of life styles exhibited by all the different animals one hopes would be present. For instance, it should contain both moist, heavily forested and moderate north-facing slopes and drier, scrub-covered and steeper south-facing ones. If possible it should have some tracts of forests that are continuous from riverbanks below 2,000 m right up to the alpine meadows at 3,600 m.

During the 1980 surveys one such area was found around Sainj and Tirthan river valleys in the south-east of Kulu. These valleys are neither heavily populated nor on any migratory grazer's route; the habitat is lush and the wildlife abundant. The creation of a Wildlife Sanctuary or National Park in this area might preserve it from the axe, at a time when India's demand for wood is increasing out of all proportion to her stocks and her forests are disappearing fast. One set of recent statistics imply that there will be no trees left in India in 20 years time. We must hope that government officials will now act promptly for the sake of the forests, the wildlife and the people of northern India.

P. J. GARSON



# NOTES, NEWS AND COMMENTS

## National Zoological Collections-An Appeal

The Zoological Survey of India was established by the Government of India in 1916 for obtaining fullest possible information about Systematic Zoology in the Subcontinent. It inherited the entire zoological collections of the Asiatic Society of Bengal and the Indian Museum. While its collections have steadily grown during the last 65 years, complete representation of the fauna of the Subcontinent is yet to be achieved. To fill in this gap the Zoological Survey of India appeals to the universities, research institutions, scientific groups and individuals who have built up collections to send representative *type specimens* and also *named collections* for permanent preservation, care and maintenance.

All the collections received will be duly acknowledged and names of the donors with details of collections sent by them will be enclosed in the Annual Report. This will help tremendously in building up the complete collections of Indian Faunal Wealth.

### Wildlife Protection in Nagaland

The Wildlife (Protection) Act 1972 has been extended to be operative in the State of Nagaland from 16th December 1981, and is issued in term of section/(3) of the Act. The Government of Nagaland is now required to frame the necessary rules in accordance with the Act.

### Tamil Nadu Forest Department and Irula Snakecatchers Coop.

The Irula Snakecatchers Co-operative, Madras, informs us that it is about to receive the go ahead to start producing venom to help supply India's antivenom needs. They have initial permission to catch 5000 snakes per year of the four medically important species: Cobra, Krait, Russell's Viper and the Sawscaled Viper. Venom will be extracted 2 to 4 times from each snake which will then be released. The snakes will be caught from a wide area totalling several thousand square kilometres to allay any fear of ecological impact.

### Jean Delacour/IFCB Symposium on Breeding Birds in Captivity

The International Foundation for the Conservation of Birds is to present the Jean Delacour/IFCB Symposium on Breeding Birds in captivity, between February 24th to 27th, 1983, at Sheraton Universal Hotel in Universal City (Hollywood), California. Over 50 prestigious speakers from around the world join in honouring Dr Jean Delacour, one of the hosts for this event and an active member of the International Foundation for the Conservation of Birds. The programme will emphasize natural history as it applies to the future of captive birds, their husbandry and management. As the interest in this



Symposium is worldwide and enrollment capacity being limited, reservations will be accepted on first come, first served basis. The organizers therefore advise prompt response.

Further information and registration form could be had from

DELACOUR/IFCB SYMPOSIUM

C/O GARY SCHULMAN

11300 WEDDINGTON STREET

NORTH HOLLYWOOD

CALIFORNIA 91601, U S A.

### Snake Specialist Group

The inaugural meeting of the Snake Specialist Group of the Species Survival Commission of the International Union for the Conservation of Nature will be held on 8th-12th November 1982.

The meeting is open to all herpetologists. Anyone wishing to attend must inform us by 31st July 1982 mentioning which hotel accommodation is desired. Trips to

see South Indian herps will also be arranged as mentioned below.

### Accommodation Charges per day

Golden Beach	US\$ 7	Single
	US\$ 10	Double

Fisherman's Cove	US\$ 28	Single
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Silversands	US\$ 11	Single
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	US\$ 14	Double
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★ Temple Bay	US\$ 14	Single
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	US\$ 20	Double
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★ We recommend this one.

*Food:* about US\$ 5 per day

*Field trips:* (1) Local herp places \$10 (one day trip with food); (2) Western Ghats \$100 (5 day trip with food).

Please contact:

ROMULUS WHITAKER

CHAIRMAN, SNAKE SPECIALIST GROUP

MADRAS SNAKE PARK, GUINDY DEER PARK

MADRAS 600 022, SOUTH INDIA

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## Wildlife and Nagaland

The State of Nagaland is situated on the northern end of the Indo-Burmese mountain system, which continues southward through the State of Manipur and the Burmese Chin Hills into the Arakan Yoma belt of Burma and to the north as the Patkoi range in the Tirap district of Arunachal Pradesh. The Indo-Burmese range separates the Assam valley on its west and the central Burma lowland basin on the east. The major part of the terrain was once a big chunk of tropical rain forest. The Assam valley has nearly been cleared and a few of its reserved forests have also been very much degraded and encroached by habitation. Substantial part of Nagaland is considered forest land, meaning land capable of bearing forest, but now under various degrees of degradation and under *jhum* cultivation (shifting cultivation of slash and burn type).

The protected forests, located in inaccessible areas of hill tops and hilly areas close to the Indo-Burmese border, account for 3.13% of the total area of the State and 18.01% of the total forest area. The Village Forests, owned by villagers or village communities, contain 11.3% of the total area of the State and 72% of the total forest area. These have neither been surveyed nor clearly defined on ground, sometimes not even on maps. No regular management system exists for the village forests and the customary *jhuming* practice is the main cause of habitat destruction.

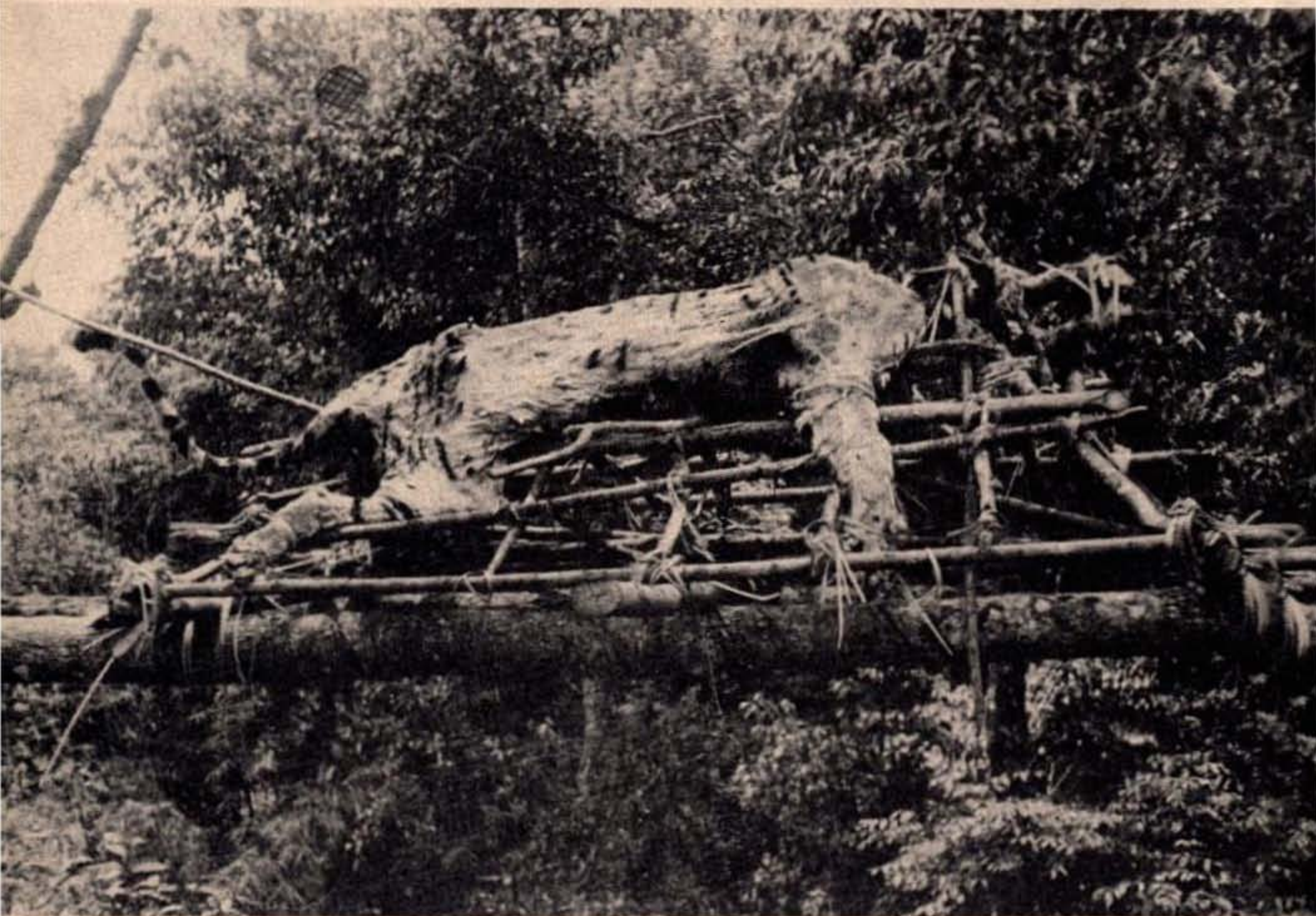
A very important and complex problem is how to conserve nature that can ensure sustainable utilization, despite growing land hunger. The population pressure is still very low in the State (47 per sq. km 1981 census figure) but growth rate is very high (49.73%) and at the same time 80% of the population solely depends on agriculture and 85% living in the villages do cultivation of various crops. *Jhum* still remains as the main form of cultivation. The present *jhum* cycle is reported to be around 6 to 10 years. But after the second or third cycle, the soil is exhausted and areas are usually transformed to shrub and grassy lands. Condition further varies from place to place. Bald hill slopes made up of ultrabasic rocks are conspicuous in eastern Nagaland with patches and pockets of remnant thick temperate evergreen type forest. The *Pinus insularis*, locally *kesiya*, forests of eastern Nagaland are also believed to be caused by *jhum* cultivation with regeneration of only the pines in the fallow land.

The tribes of Nagaland also have a craving for bush-meat. As a consequence of habitat destruction and over exploited game killings, the wildlife of the State faces acute threat of total extermination. Several State forest divisions still continue to regularly notify for sale of bones and skins of dead animals. To most people, wildlife is an inexhaustible resource and thus there is no understanding at all of the gravity of the situation and the need to





*—Out on a tiger hunt*



*The result 'adorns' the village entrance*

*Photos: Author*



take immediate conservation measures to protect the wildlife and preserve their natural habitat. Nagaland is the only State which has not yet adopted the Wildlife (Protection) Act of 1972. However, as per unconfirmed news this was adopted by the State Assembly in mid September, 1981 but no notification has yet appeared in the gazette (See p. 9).

Extreme deterioration of the biotic environment of the present region is reflected by the pocketing of the few surviving apex animals like elephant, tiger etc. The elephants are further concentrated and made resident in a fragmented belt along the Nagaland foothills due to extensive degradation and encroachment of rain forest of the adjacent State of Assam. For their mere survival and close proximity to human habitation they are compelled to come into conflict with man. But there is as yet no indication of habitat destruction by the elephants. On the other hand there is unplanned capturing; killing under proclamation and under plea of self defence and unabated poaching of the surviving elephant population. Eight elephants were reported to have been poached in Rengma foothills (west of Dimapur) during February-March this year. Some more have been poached even later. This information is well known but unofficially! On 13th August 1980 I

witnessed a mass tiger hunting procession of the Sangratsu village. The melee included month old children tied to the back of their mothers or relations, or to octogenarians. They carried spears, *daos* (50 cm or longer straight bladed axe), cane shields, fire arms, sticks, umbrella, food and drinks. The tiger had killed some of the village cattle possibly since its natural prey was extremely scarce. The tiger escaped death that day but one wonders for how long! In Mongmetang village, a tiger was killed in a similar hunt on 4th March 1981. I saw the putrefied carcass of this ill-fated tiger propped up at the village entrance. (Human graves are also customarily located at the village entrance.) A tiger cub was reported to have been captured during March 1981 at the time of burning of the felled *jhum* land in Longpha village.

It is earnestly hoped that the existence of these animals would not be sacrificed by the people of this region for their short term betterment of life and for the pleasure of killing. The threats to the existence of the elephant and the tiger, both apex species and therefore indicators of the health of the biotic environment are also warning signals from the deteriorating ecosystem, which if allowed to go unabated would also ultimately threaten the existence of man.

S.K. ACHARYYA



## The Man-eating tiger of 'Bangajhala'

Adjoining the Corbett Tiger Reserve and National Park is another wildlife area known as Sitabani noted for its natural splendour, and abundance of wildlife. The spillover of tigers from Corbett has resulted in increased tiger population in this area also. To reach Sitabani one has to proceed from Ramnagar, headquarters of Project Tiger, to Garjia, cross over the Kosi river and pass through an area known as 'Bangajhala' which is an ideal tiger habitat, with plenty of water, cover and prey animals chiefly sambar, chital and wild boar. Three small villages, Leti, Bhalon and Chopra, are situated in the northeastern part of this area and are accessible by footpaths and game tracks which the villagers normally use.

On 21st March 1979, two villagers, Sher Singh and Dev Ram, after loading their weekly ration on a pack-horse were returning from Garjia to their village Chopra along a footpath with the horse in the lead. The route passed through dense lantana cover where a tiger which probably had not had a proper meal for the last 5-6 days heard their voices and the occasional neighing of the horse. As the party approached the bush they heard a rustling sound and before they could do anything the tiger pounced on the horse which reared and bolted. The tiger missed the horse but unfortunately Sher Singh received the tiger's fatal blow. His companion Dev Ram and the horse ran

leaving him prostrate on the ground. The tiger having never killed a man before hesitated a short while but hunger got the better of it and dragging the dead body of Sher Singh into a bush ate heartily of it. Thus, the tiger whose diet had so far included wild game like sambar, chital, wild boar and occasional cattle only, accidentally became a man-eater.

This incident created panic in the area. The local wildlife warden immediately visited the site and made tracings of the pugmarks of the tiger near the human kill. The tracings indicated that the culprit was a big male tiger. The people gradually forgot about the tiger as there was no further incidence during the next 21 months.

In January 1981 Sher Ram, a stump marker of the Forest Department employed to check the stumps in a felling area sold to a contractor was on his way from his village, Chopra, in the early hours of the morning to his place of duty. The tiger after his night's prowl, had returned to his favourite place of midday rest and was basking in the sun hidden by a bush along the path taken by Sher Ram. Sher Ram became his-second victim. The place being close to Project Tiger area, I, along with the local wildlife warden and field staff, visited the site and found the remains of Sher Ram, his slippers, lathi etc. scattered around and also the tiger's pugmarks nearby, which were those of a big male tiger. Comparison with the pug trac-



ing of the tiger at the site of the first human kill of March 1979, confirmed that the culprit was the same tiger. A study of this incident revealed that this was a chance killing.

There was a lull of six months. People relaxed and again forgot about the man-eater. The tiger struck again claiming his third victim on 25th June 1981, only about 50 m away from the site of the second kill. On that fatal day, a boy and an aged companion, Buddha, had ventured into the Bangajhala forest for collecting honey. The boy had climbed up a tree laden with numerous honey combs asking Buddha to withdraw some distance away to avoid being stung by the bees. After he had completed collection, he shouted for his companion to come back but there was no response. He called and called again from the tree-top and when Buddha did not turn up, the boy got down from the tree cautiously remembering that it was the same spot where the tiger had killed the forest employee six months ago, and fearing that his companion might have met the same fate he ran repeatedly calling the name of his companion, which was heard by the graziers in a nearby nala. When they went in search of Buddha, they found his slippers and a blood trail which immediately confirmed that the dreaded man-eater had struck again.

After the third human kill there was great panic among villagers who started blaming Project Tiger for the loss of human life by the tiger simply because the word 'tiger' was connected with the Project, though

all three human kills had taken place quite far (some 6 or 7 km) away from the boundary of Corbett National Park to which alone the activities of Project Tiger are confined. Yet, the fact remained that as a result of sustained rigid protection and habitat improvement of the park, wildlife population including that of the tiger had (and still has) been steadily increasing and there was spill-over from the park to the adjoining areas. The Project Tiger authorities therefore, apart from human reasons, could not but take an active interest in stopping these killings.

A study of the circumstances and the sites of human kills, and a thorough survey of the area of operation of this tiger was therefore, immediately undertaken. During the course of this extensive survey, it was revealed that there was only one large dominant male and a tigress with cub in the area and the hideout of dense lantana cover near the site of the last two human kills, was frequented and almost always occupied only by the dominant male while the tigress with cub always kept away from this area. All the previous and subsequent pug tracings near and around the site of the human kills, very clearly confirmed the presence of only the big male tiger. To be certain that only the real culprit was removed it was decided to tie baits at exactly the same spot where the last two human kills had been made and then once the bait was killed, to compare pug tracings of the bait killer with those of the man-eater



and if they tallied, attempts were to be made to localise him by further regular baiting at the same site for future action.

Accordingly, regular baiting was started from 27th June. The bait was killed on 28th/29th night. The Deputy Director and Research Officer of the Project Tiger and the local Wildlife Warden visited the site on 29th morning and followed on elephants the drag-mark of the kill which led into lantana thickets only about 25 metres from a baiting site, and a tiger's loud roar came from these thickets. The elephants trumpeted and refused to go forward. Suddenly a navy blue pyjama, the one worn by Buddha was spotted and picked up by an elephant. Everyone shouted and clapped but the tiger instead of running away kept growling and snarling from inside the bushes. The noise of tearing skin and the cracking of bones was intermittently heard. Two shots were fired in the air to scare the tiger away but without effect. After continued shouting and firing of a third shot, the tiger was ultimately seen moving away. The partly eaten kill was located and only 5 m away a maggot-ridden human skull (apparently of Buddha). As Forest Guard Taslim, got down to retrieve the skull the tiger was seen moving off about 10 m away.

The area where both the human kills had been eaten was heavily littered with a variety of sun-bleached and fresh bones both of domestic as well as wild animals, presenting a gruesome picture of a vast open graveyard and an ideal 'dining

room' of the tiger. The pugmarks of this bait killer and the man-eater tallied.

A regular baiting at the same place every third/fourth day was commenced to localise the man-eater. The monsoon broke on 30th June with full vigour lashing the area with torrential rains, flooding the nalas and the Kosi, thereby disrupting all communication rendering Bangajhala totally inaccessible. This created an immense problem in the transport of baits to the baiting site across the flooded Kosi because now the baits had, of necessity, to be transported on elephant back right up to the site. Also, as there would always be a gap of 3 to 4 days before the tiger's next kill and as bringing back the unkill-ed bait daily could be a cumbersome exercise, it was a big problem as to how to keep it supplied with sufficient fodder and water lest it should die of starvation and thirst. For this, the guards and elephants had to ford the Kosi river twice daily in the mornings and evenings, carrying sufficient fodder and taking the bait to the nearby stream to enable it to quench its thirst, and tie it back for the night.

The tiger would kill almost every third or fourth day and take it to the same old hideout and pugmarks of no other tiger, but the man-eater were found in this area which showed that he was getting localised. A formal permit was then obtained from the Chief Wildlife Warden, Uttar Pradesh, for catching the tiger alive by tranquilising and/or by trapping.



Formalities completed, an operation camp to capture the man-eating tiger was established on 5th July at Garjia Forest Rest House, the only camping site near to Bangajhala. Sri A. N. Singh, Research Officer of project Tiger who had the requisite training in tranquilising and telemetry joined the camp a few days later.

The biggest problem was of transporting the tiger across the flooded Kosi after his capture. For this, a strongly built iron box trap was procured and with great difficulty transported in a tractor-trolley and placed about 6 m away from the baiting site so that the tiger during his daily rounds would get used to it. Regular baiting was continued and up to 13th July the tiger killed two more baits inspite of the proximity of the cage.

Many wildlife enthusiasts and friends who had come to know about the proposed capture of the man-eater wished to join the operation but were discouraged, except Kunwar Brijendra Singh of Delhi, who is a very keen wildlife enthusiast and photographer regularly spending nearly 7 to 10 days almost every month in the Park. He had also some experience in the capture of the Dogadda man-eating leopard and I therefore felt that his presence during the operation would be useful rather than a handicap and he would also be able to get a photographic record of this operation particularly in the form of a cine-film.

On the 25th morning, the operational party while going to Banga-

jhala (this had become a daily routine) saw the pugmarks of the tiger in the nala going towards the baiting site which raised their hopes that probably the bait may have been killed. From a distance, they saw that the bait was missing and clear drag-marks led into the lantana thickets. Following the drag-mark, the elephants entered the lantana thicket and soon after the partly eaten bait hidden in a bush was located but no trace of the tiger inspite of intensive search for 3 to 4 hours. Apparently as was proved by the alarm call of sambar and chattering of rhesus some 200 m away the tiger had moved away. It started raining heavily compelling the party to return to camp. Rain continued and a second visit to the area in the evening was given up. A visit on the 26th morning indicated that the kill was dragged to the baiting site where a *machan* had already been put up on a jamun tree. I and the Research Officer sat up with our tranquilizing guns in the remote hope that the tiger might return. But it soon started getting dark with dense clouds and so we had to abandon any further hope of tranquilising the tiger that day. There were no kills on 27th, 28th and 29th. On the 30th morning, Brijendra Singh and the Research Officer along with two guards and 3 elephants left for Bangajhala very early. Two hours later, I along with my orderly went to Bangajhala carrying pack lunch for all as we had decided to spend the whole day in Bangajhala area in search of the tiger. It rained heavily and we all got completely drenched.





*The author on his way to the man-eater's hideout*

*Crossing the flooded rivers was a hard daily task*





When I was still about half a kilometre away from the baiting site, I saw the entire party waiting for me in the open nala rather than being near the baiting site which was a clear indication that something had happened. I was told that the bait had been killed and lest it should disturb the tiger, they had returned to wait for me before planning the next move.

In the drenching rain we approached the baiting site very cautiously. We could not find any drag-mark which apparently must have been obliterated by the heavy rains and the normal presumption was that the tiger must have taken the bait to its usual hideout of lantana thickets towards Katalia as had been his routine; except only once when he had dragged the kill in the opposite direction. Because of the pouring rain, the tiger was more likely to seek open high ground rather than take the kill into his usual favourite dark, dank thickets. I therefore decided that I must check up the opposite area for any likely drag-marks lest we should go on wild goose chase into the usual thickets. I accordingly took my favourite elephant, Rambha, leaving everyone else behind to recce the high ground (opposite the thickets). At about 50 m from the baiting site, I saw something which looked like a drag mark. The mahawat, Nazir, who is really good at tracking stated quite emphatically that it was really a drag-mark. To make sure, we proceeded further when we found the clear drag-marks of the kill inspite of lashing rains. It was good that we

had not routinely gone to the opposite thickets losing precious time. All the elephants then joined me following the drag-mark. Hardly had we proceeded 200 m when we saw the kill behind a lantana bush, rather in the open which clearly indicated that the tiger did not have much time to hide the kill and had just moved away. The bait was almost entirely intact with only a small chunk of flesh having been eaten from the rump confirming the tiger's hurried departure and also that he had made the kill only a short while ago. The tiger was clearly hiding very very close by. The elephants were fidgeting confirming the proximity of the tiger.

A whispered discussion followed as what to do next. The idea of trying to search for the tiger in the lantana for tranquilising was considered inadvisable as it was more likely to prove abortive. It was therefore decided that the kill should not be moved at all and someone should sit up close by. A jamun tree was selected for sitting up with the tranquilising gun and leaving the Research Officer with his riding elephant near the selected tree, the other two elephants moved out into the lantana thickets ahead, where the tiger was in all probability hiding. While this was going on, the Research Officer quickly climbed the tree and took his perch between the two forking branches while the armed guard, Harak Singh, sat on another tree near by. While moving around, I heard a rustling sound in a bush some 3m. away and saw a flash of patch of yellow and black. I



could not see the tiger clearly but as we advanced further, we saw the clear very fresh pug marks of the man-eater in shallow sandy depression which he had just crossed. Without disturbing the tiger any further, we quickly retreated talking quite loudly, first towards the baiting site and thence to a nala bed a kilometre away. The retreating sounds of the elephants and the human voices should have made the tiger to return and retrieve his kill. I had given instructions to the armed guard that if the tiger returned to the kill and was darted, they should keep completely quiet for another 8 to 10 minutes to allow the drug to take effect before firing a shot for us to return and search for the darted tiger.

It was nearly 11.00 am. when we left the two men on the trees and waited expecting all the time for the gun shot signal but none came till 2.30 pm. I then returned to the kill and relieved the Research Officer with instructions to return by 5 p.m. if nothing was heard earlier.

There was no sign of the tiger or any movement in the lantana till 5 p.m., when Brijendra Singh and party came back as directed. Apparently the tiger had moved away a bit and was unlikely to return before sunset. There was, therefore, no use sitting up on the tree or machan till sunset for tranquilising the man-eater for even if we did succeed in darting him, it would have been a colossal job to search out the tranquilised tiger in the darkness or even if we did succeed in locating the tiger, to make arrangements for its

transport during the night.

We therefore, took the next best step and dragged the kill back to the baiting site where the box-trap was already there and put the bait inside at the farthest end of the cage activating the trap device. It was considered immaterial whether the tiger is first tranquilized and then trapped or first trapped and then tranquilised (to avoid major injuries to the tiger in his struggle to free himself from the confines of the cage). The trap cage was then very well camouflaged on all sides keeping the trap door open. It was quite likely that the tiger would not be able to detect the kill inside, at the far end of the cage because of its poor sense of smell. This had been proved on an earlier occasion when his half eaten kill was dragged for hardly 25 m and was properly hidden in a lantana bush but the tiger was not able to detect it even though he had searched for it all round as was apparent from his footprints the next day. In order, therefore, to entice the tiger to approach the trap door from where he would certainly see the bait inside, the two legs of the bait were hacked, keeping one leg near the baiting site and the other just in front of the trap door. As the floor of the cage was a rusty iron sheet with pools of water inside, we kept a thick layer of grass on it, primarily for eliminating any rattling sound which might possibly scare the tiger from entering the cage. While this was going on, we heard the clear persistent alarm call of a barking deer about a kilometre away coming from the same direction in which the



tiger had gone in the morning indicating that the tiger was on his way back to the kill. We returned to the camp hoping for the best.

The mahawats and guards especially those who had been camping for over a month in the dilapidated, leaking outhouses of Garjia Rest House and sleeping on wet floors, had almost reached a breaking point and pleaded that we should now really wind up the operation for the time being, at least and take it up again after the monsoon when the weather would be more congenial for such an operation and communications would have been restored. Also, we were becoming objects of ridicule to the villagers who considered the operation as a farce and started saying that the Project Officers were feeding the tiger only to make him stronger so that he could kill more humans in the future, and also that the Officers were having a nice outing at Government cost rather than making any real efforts to kill or catch the man-eater. We, therefore, decided to wind up the operation and break camp next day.

Next morning, i.e. on 1st August 1981, when the camp was in the process of being wound up, we decided to make a last check of our trapping device and if nothing had happened, the trap door at least must be closed lest some other innocent animal was trapped and died of hunger and thirst. Accordingly two guards and two elephants were sent early in the morning to Bangajhala with a man-pack wireless set.

Having finished our breakfast and loaded our packages into the car, I contacted through the wireless receiver the guards who had gone to Bangjhalala when to our immense joy they reported that the tiger was trapped in the cage. We could not believe our ears but the wireless kept on crackling, repeating over and over again in an excited voice that the tiger was trapped. What luck! we had really achieved success at long last against all odds and expectations, and after many failures. Everyone in the camp excitedly got ready to leave at once for Bangajhala to see the man-eater. I immediately sent instructions to my Ranger at Ramnagar through the wireless and forest telephone system to arrange two tractors, one trolley with steel and nylon ropes and a crane and sufficient man-power to leave for Bangajhala at once.

Having made all these advance preparations for transporting the caged tiger across the Kosi to Ramnagar and having issued instructions to all concerned to stand by for further orders, we got on to our elephants and proceeded at a fast pace crossing the flooded Kosi river, where the advance party of elephants and guards who had radioed back the happy news were waiting. They informed me that in the morning when they had approached within a sighting distance (about 150 m) of the cage, they had seen that the trap door was down. This had made them curious as to what had caused this closing of the trap door. Could it be the tiger? Or could it be some other innocent



animal? Or could it be just the ferocity of the wind or rain which had caused the snapping of the trip wire, dropping the trap door? Every thing had been absolutely quiet and eerie silence had prevailed; no twittering of birds or chirping of crickets which are so common in the forest. Something was definitely amiss. The guards had approached very cautiously on the elephants trying to look through the cage camouflage, but still no movement, no sound. They had hidden the elephants behind a lantana bush and tried to look into the cage very carefully. Something yellowish was visible through the camouflage. Could it be the tiger? As they were debating in whispers there had come a loud roar from the tiger in the cage. The tiger struck at the trap door and before they could grasp the reality of the situation, the elephants had panicked. The mahawats had great difficulty in controlling the elephants even though our Corbett elephants are so used to facing the tiger every day. However, once the elephants had calmed down, the guards and mahawats had an immense feeling of elation and achievement and had communicated the happy news on wireless. I had already dispatched one elephant for the assistance of the tractors and the remaining four elephants, the mahawats, the two guards, a few *chara* cutters, the Research Officer, Sri A. N. Singh, Kanwar Brijendra Singh and myself reached the spot rather at a fast pace and as we approached the cage the tiger gave a loud roar and out of



*The trapped Man-eater* (Photo: Author)

sheer anger, frustration and helplessness gave a mighty blow on the cage door which reverberated. This time our mahawats, however, were alert and in spite of the tiger's loud roar the elephants stood their ground. The elephants approached slowly and stood in front of the cage some 5 m away with the tiger still roaring and snarling from inside the cage. The tiger's attention was now on the elephants.

We found that the tiger had already injured himself quite a bit on his lips and face and some blood could be seen oozing out of it. Lest he should injure himself further in his struggle for freedom, it was



decided to tranquilize him at once. We, on the elephants kept on talking and shouting loudly facing the tiger to divert his attention, while A. N. Singh and a guard took one elephant away got down quietly and approached stealthily towards the tiger's cage from the rear. The tiger's attention, thus remained concentrated on the facing elephants, so much so that Singh and the guard could approach within a metre of his rump without the tiger sensing their close proximity. Singh fired the pistol at 11.30 a.m. injecting the drug (1000 mg Ketaset) through the projectile syringe. Even the pistol sound followed by darting which must have been just a pinprick to the tiger caused only a twitch and the tiger never, for one moment, looked behind; so high was his concentration on the elephants.

Within 7 to 8 minutes the drug effect was quite visible, yet it was apparently not of the desired level as the tiger was still vocalising and trying to gnaw at the bars of the cage. A second dose of 500 mg Ketaset was then administered after 40 minutes. Gradually, the drug effect

was observed as progressive ataxia, head weaving (due to which the tiger was pushing its head against the bars of the cage), increased salivation as also the licking movement of the tongue, occasional excitement (like swiping at the bars with its forepaws) and a glazed expression of the eyes.

As the tiger was still showing restlessness, intramuscular Diazepam was given with a hypodermic syringe. A total of 60 mg Diazepam was thus administered. At 2.05 p.m. 200 mg Ketaset was again administered because the tiger was showing signs of recovery. This additional dose of Ketaset was given to prolong the drug effect because the tractor trolley in which the tiger was to be transported was bogged down on its way to the capture site (owing to heavy downpour while negotiating a marshy stretch of land). A slight hyperthermia developed by the tiger was controlled by pouring cold water on it, which a little later, was not necessary as it started raining heavily again. At 2.30 p.m. the respiration was apneustic and was at

*A bleak future from an unfortunate choice of food*





the rate of 13/minute. The animal was closely watched at this time for signs of hyponoia. An analeptic was kept in readiness for any eventuality but this was not required as the respiration was always thoracic and never dropped below the rate of 13/minute.

At 3.00 p.m. the rate of respiration increased to 16/minute. During this entire operation, no tonic convulsions or bloating was observed. Salivation was profuse but owing to the presence of normal pharyngeal-laryngeal reflex there was no cause for concern.

Having achieved immobilization successfully thereby immunising the tiger from causing further injury to itself, we got down to making a device for handling the cage with the tiger and loading it on to the tractor trolley, of which there was still no trace.

Many names were suggested for this *badmash* (bad character). It suddenly struck me why not call him 'Banga' (in our local dialect, it means the 'naughty' or the 'wicked') which also rhymed with the area of his operation, Bangajhala. So we finally christened him 'Banga'.

As we started from Garjia to Ramnagar at 6.00 p.m., we saw huge crowds gathered at several places for a glimpse of the man-eater because the villagers had naturally assumed that the man-eater will be brought back from Bangajhala via Garjia. They were greatly disappointed when we informed them that the tiger was going to Ramnagar via Terha along

the *kucha* road on the other side of the Kosi river. At Ramnagar, the news of the capture of the man-eater had spread like wild fire and several thousands had been waiting right from the morning to have a glimpse of Banga, the man-eater. Even at 6.30 p.m. there were huge crowds gathered in the forest compound.

After a long wait at 9.30 p.m., I saw with great relief the approaching headlights of the tractors across the Kosi. Even at 9.30 p.m. there was still a huge crowd waiting for the man-eater and they all got so excited on learning the news of the tiger's arrival, that it became an impossible task to control them with everyone hustling and jostling to reach the tiger's cage to have a glimpse of the man-eater. I had no option but to take the tractor trolley (with Banga) about 5 to 6 km away from Ramnagar and hide it in a dense forest, hoping that people would not dare venture into the forest to see the tiger so late at night. At 1.30 a.m. we took a truck to the forest, where the caged Banga was hidden and got the cage unloaded from the trolley and reloaded on to the truck which was, at long last, directed to proceed straight to Lucknow without stopping at Ramnagar or anywhere else. I decided to accompany the tiger to Lucknow in my vehicle and supervise the unloading and loading of the cage from the tractor to the truck. At 2.00 a.m. on 2nd August 1981 we finally left for Lucknow and to the zoo where Banga now resides.

C. B. SINGH  
Field Director, Corbett Tiger Reserve



## BIRDWATCHER

### Nawabganj Priyadarshani Sanctuary

After the tropical rain forests, wetlands are perhaps the most endangered terrestrial habitats in the world. Among the freshwater ecosystems, marshes and swamps are very productive. Hundreds of species of plants, invertebrates, fishes, amphibians, birds and mammals vie with one another to find a niche in the aquatic habitat. Due to enhanced productivity of jheels, they were the first to come under the plough of Man. When drained, jheels could be converted into fertile crop fields. Every year, thousands of acres of jheels and swamps are drained. Pyagpur in Uttar Pradesh, Najafgarh near Delhi and Naowjheel in Mathura district are few examples. The Nawabganj jheel in Unnao district of U.P., 41 km from Lucknow, is one such jheel which was in danger of destruction so the U.P. Government in 1974 took conservation measures and declared it as a bird sanctuary.

The Nawabganj jheel is on the main Kanpur-Lucknow route and due to its proximity to the Nawabganj town it was being polluted. Moreover, hundreds of ducks and waders were shot or netted every year from the jheel: Lucknow and Kanpur being the lucrative markets. After the enactment of the Wildlife (Protection) Act 1972, the bird market first went underground and then slowly died down. Side by side, conversion of the area into Nawabganj Priyadarshani Sanctuary resulted in greater

protection of the jheel which greatly helped in increasing the population of the birds. Since 1974 I have visited this sanctuary, once or twice annually, and every year I have found some species new to my list. From 1980, egrets, spoonbills, little cormorants, night herons and white ibises have started breeding on the *Prosopis* trees planted on the mounds. Purple moorhen, coot, dabchick and jacanas regularly breed on the vegetation-filled swamp.

Aquatic flora and fauna is luxuriant in Nawabganj. While small fishes like *Colisa fasciatus*, *Esomus dendricus*, *Puntius sophore* and *Mystus vittatus* dexteriously avoid the piscivorous birds, colourful dragon and damsel flies of various hues and shades dance in the aerial world above the jheel. The water surface is crisscrossed by the water measurers (Hydrometridae), water treaders (Mesoveliidae) and pond skaters (Gerridae) and the giant water bug sulks between the submerged vegetation.

Waders and ducks are quite common in Nawabganj. Green and Wood sandpipers dot the margin of the swamp and the Blackwinged Stilt rests in comparatively deeper water, thanks to its long legs. Almost all the local and migratory ducks are present: pintail, shoveler, gadwall, garganey teal, cotton teal, common pochard, redcrested pochard, etc. A surprise bonanza for me in 1977 was a small flock of



the Great Crested Grebe. In that year, I also saw a flock of 530 comb ducks resting on innumerable islands. In March 1981, spotbill was most commonly seen.

In absence of dead trees, cormorant and darter dry their wings on *Ipomoea carnea* which has covered a small patch of the swamp. This plant can grow anywhere with a small amount of water (and sometimes in dry areas) and it easily over-runs its habitat. Another menace is the ubiquitous water hyacinth. Though every year, water hyacinth is being removed, this pernicious weed stubbornly refuses to be eradicated. Except for the purple moorhen and few egrets, most aquatic birds avoid hyacinth area.

Every year, Nawabganj sanctuary attracts more and more birds of prey—a very healthy sign indeed. The marsh harrier is fairly common—as common as a raptor could

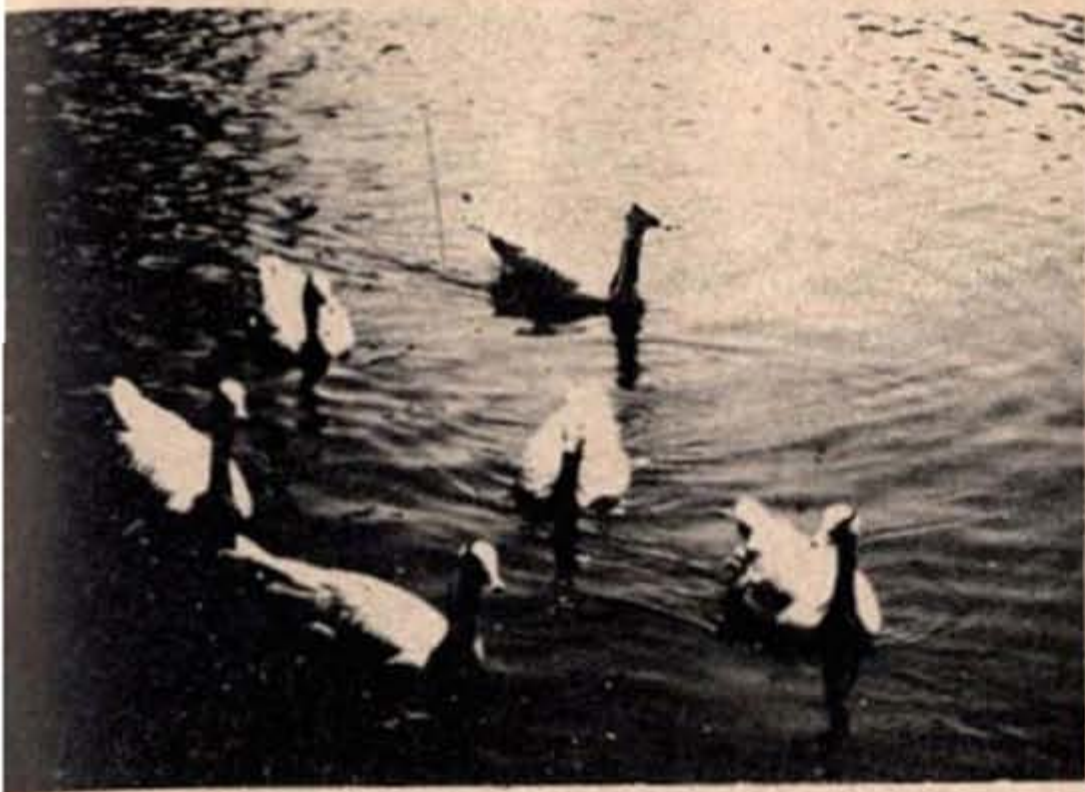
be in a five-square kilometre area of marshland. It could be seen circling over the marsh in search of a coot or a jacana. Healthy and alert coots avoid it by skittering on the surface and forming a compact flock but a weakling is easily caught. A coot is a heavy bird for a harrier to carry so the harrier kills it by sitting on the struggling bird and drowning it. The greater spotted eagle frequently usurps a marsh harrier's prey to enjoy a hefty meal. Pallas's Fishing Eagle is another bird which gives a feeling of wilderness to the area. Their raucous screams cannot be missed by any keen birdwatcher. Due to the absence of any big trees, fishing eagles have not yet started breeding in Nawabganj sanctuary.

Since 1974, the forest department has planted more than a lakh trees on the periphery of the five-square kilometre sanctuary. Due to the absence of undershrub, bush birds are generally absent save for a few

A 'Pond Heron among the reeds (Photo: Author)





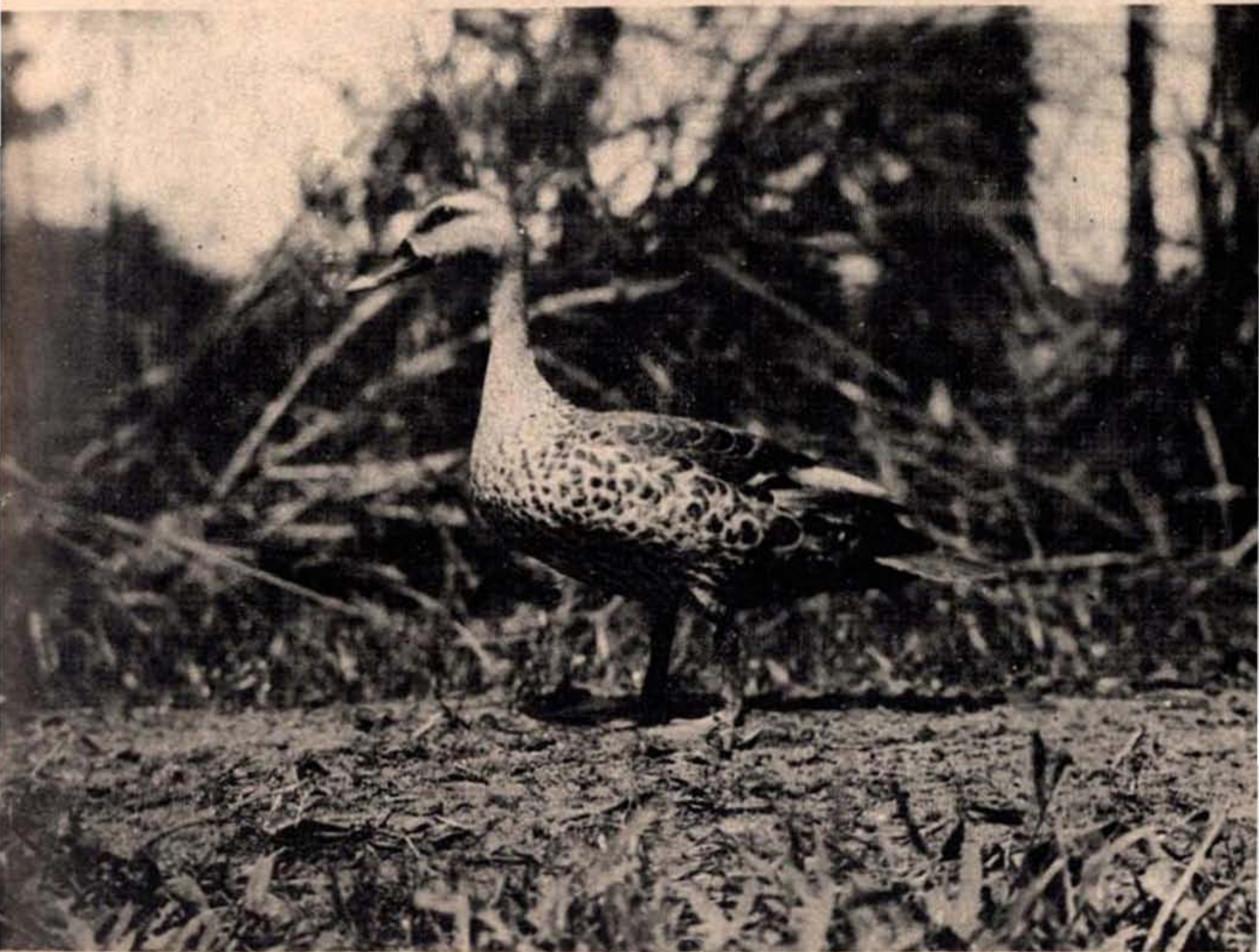


*Barheaded Geese*



*Migrant ducks*

*(Photos: Author)*



*A Spotbill Duck: a resident breeding species*

*(Photo: Author)*



tailor birds, wren warblers, purple sunbird, bulbuls and the robin. Thick grass clearly indicates that grazing, or better say over-grazing, is restricted.

Recently, a twelve room Priyadarshani Motel of the U.P. Tourism Department was inaugurated. There are four air conditioned and eight ordinary rooms. This 35-lakh motel is built in such a way that all rooms open towards the jheel. A panoramic view of the sanctuary could be had from the terrace. A big conference room with all the basic facilities is present and a library of books on wildlife is being developed. However, with Lucknow and Kanpur, two big cities of U.P. near by, it is very doubtful if many tourists will stay overnight in the motel especially due to the fact that the district is notorious for dacoits.

This small sanctuary has extensive lawns but the Forest Department has spoiled the scenery by painting the stems of the trees. First of all, eucalyptus trees should not be there, secondly these trees look hideous

with alternate red-and-white colour on their stems. Such type of anachronism gives the appearance of a municipal park instead of a sanctuary. Moreover by building a watch tower between the trees in the central mound, the Forest Department has inadvertently disturbed the best mixed breeding colony of egrets, darters, night herons and spoonbills. It is doubtful whether these birds will nest in the next breeding season in that area with a large number of excited tourists moving beneath the trees.

Within a span of eight years, Nawabganj Priyadarshani Sanctuary has become an important place for the migratory birds. However, the pace of development and unimaginative planning clearly indicate that this small sanctuary could be easily destroyed. The U.P. Government should see that 'Priyadarshani', which in Hindi means "pleasing to the eyes", should remain attractive both to the birds and to the tourists.

ASAD RAFI RAHMANI

### CENTENARY PHOTOGRAPHIC EXHIBITION

Centenary celebrations of the Society in 1983 will, among other activities, hold an exhibition of wildlife photographs of the Indian subregion (i.e. Pakistan, India, Bangladesh, Sri Lanka, Burma and the adjacent areas). Entries depicting wildlife (flora and fauna) in their natural state are invited for the exhibition. The exhibition is open to all; substantial prizes will be offered for the best photographs in different categories; and it is proposed to publish a souvenir art book comprising the 100 best nature photographs selected for the exhibition. Please write to

THE HONORARY SECRETARY  
BOMBAY NATURAL HISTORY SOCIETY



## Goa

Goa, 'A Perola de Oriente' (the pearl of the Orient), is of course famous for its golden beaches backed by hundreds of undulant, feathery palm trees and beautiful temples and churches snuggled amidst verdant palm-groves or rising on the slopes and summits of rugged hillocks. But very few people know about the natural treasure in the mountain ranges of the Sahyadris (Western Ghats) along the eastern boundary of Goa.

Our visit to these forested regions from 18th May 1981 to 24th May 1981 was an experience to remember. The nature trail started from Castlerock situated at an altitude of about 800 m on top of the Sahyadri range. This village amongst thick, virgin, evergreen forest is in Karnataka just on the border and from here the mountain ranges start sloping down to the west towards Goa. The whole region is very rich in flora and fauna. It is evident from the flowing water in the Kali river, Dudhsagar waterfall and various streams even during the peak of summer months that water availability in this region is very high and naturally the forest is full of huge evergreen trees with climbers, orchids and undergrowth of bamboos, canes, ferns and various shrubs. The beauty of the lush evergreen forest was enhanced by our visit coinciding with the flowering and fruiting season, and the most eye-catching were *Anthocephalus cadamba*, *Hopea wightiana*, *Rauwolfia densiflora*, *Gar-*

*cinia indica*, *Vangueria spinosa*, and *Aerides maculosum*, an orchid with pink-violet fragrant flowers which was in bloom at many places, while a beautiful 'bee orchid' in flower was seen only at one place.

The birdlife in this whole region is so rich that even many of the rare species were seen in abundance. Yellowbrowed bulbuls and Blackheaded Yellow bulbuls were more common than the Redvented and the Redwhiskered bulbuls. A trek from Castlerock to Dudhsagar waterfall along the rail track took us through a real bird paradise. Throughout the trek there was the lovely background music of the calls of the Malabar Whistling Thrush, the Shama, Black Bulbul, Racket-tailed Drongo, Magpie Robin, flycatchers, etc. Blackheaded Orioles, Scarlet Minivets, flycat-

*The Dudh Sagar Falls*







*A view of the evergreen forest covered hills on the  
Goa frontier*

*(photos: Author)*

chers, sunbirds, Chloropsis, Green pigeons were abundant, but a real feast to the eyes awaited us near Ghotgewadi station where in a small valley we could see flocks of Fairy Bluebirds fluttering here and there in pairs and the interesting aerobatics of lorikeets. Never I had seen Fairy Bluebirds in such abundance at one place.

The trek from Castlerock to Anmod village was through similar evergreen forest. *Jambul*, mango and *kokam* trees were in fruit with langurs and Bonnet monkeys feeding on them. Giant squirrels were also common.

Butterflies were also active along the streams, particularly tigers, crows, blues, blue bottles and tree nymphs. It was interesting to watch a family of Goldenbacked woodpeckers moving along, and the magnificent flight of the Great Indian Hornbills. Grey Junglefowls, Spurfowls and Barred Jungle Owlets along with a Small Green Barbet were continuously keeping the forest awake.

Climbing down the Anmod Ghat brought us to Bhagwan Mahavir Sanctuary at Molem in Goa. Ac-

commodation in the forest rest house was not available but we had our first experience of Goan hospitality when a forest guard on duty, Mr Naik, kindly accommodated us in his house. This forest is just an extension of the same forest, but due to change in altitude and climate we could clearly see the evergreen forest turning into a deciduous one. The forest is thick, undisturbed and full of birds and animals. When we started our trek from Molem to Colem along the path going through the thick forest, the first creature to attract our attention was the flying Lizard *Draco dussumieri*. It was interesting to watch these lizards courting, flicking and exhibiting the bright yellow pouch under the chin. Courtship fights between males were more impressive because of their glides of as long as 50 feet from one tree to the other. The beautiful bright orange-yellow colour of the flying membrane was clearly visible during their glide against the afternoon sun. The glide was so smooth that many a times we saw them taking even upward turns during the glide. The birds became more active towards

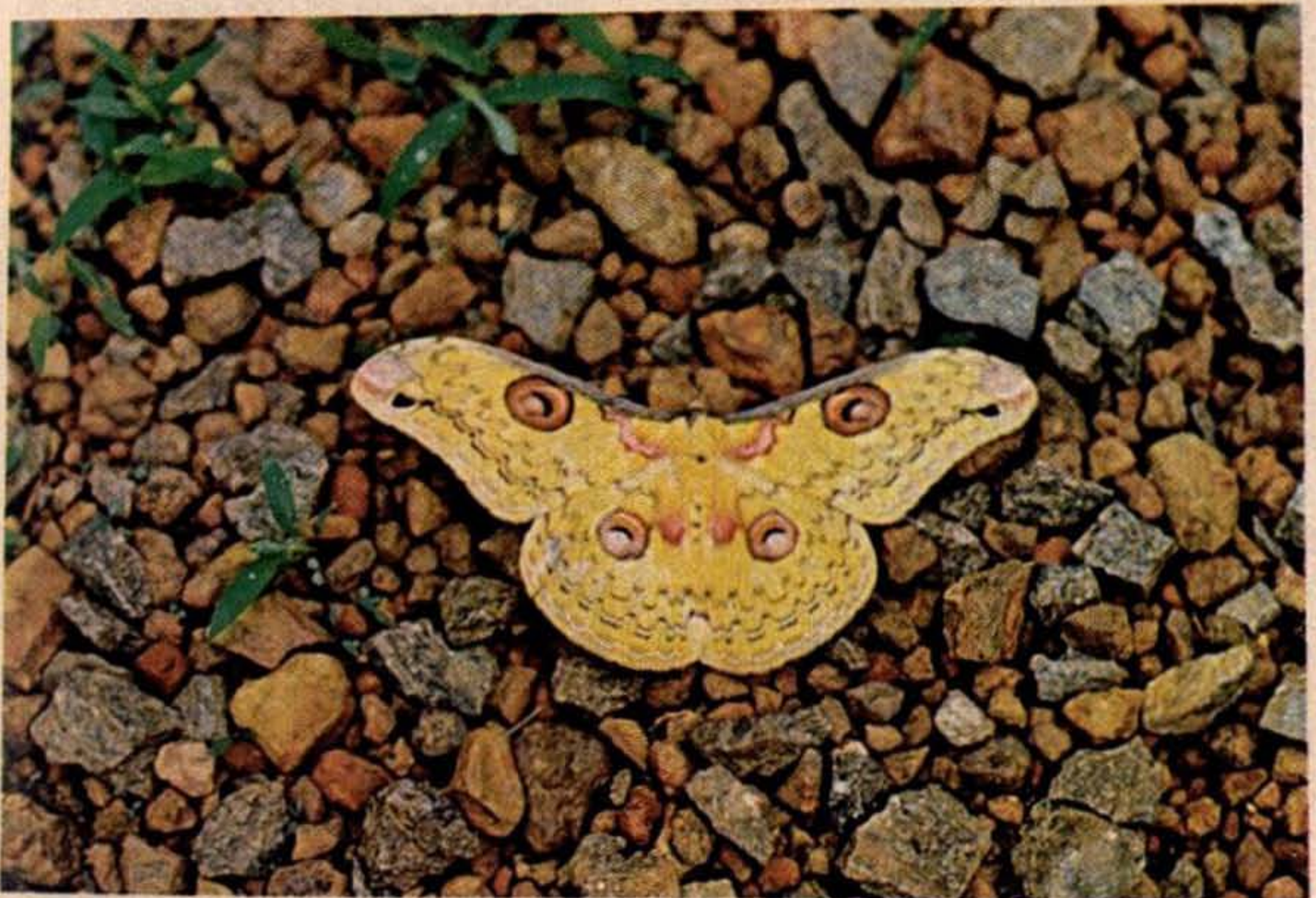




*Rhynchosstylis retusa* – commonly known as Foxtail Orchid. It grows in the Himalayas, the Deccan, and the Western Ghats down to Malabar.



*Pancratium* sp. – a bulbous lily with fragrant flowers found throughout India.



*Loepa katinka* – a wild silk moth common in the Western Himalayas and the Western Ghats.

(Photos: Author)



the evening, prominent being the woodpeckers, drongos, cuckoo shrikes, orioles, barbets etc. A pair of Chestnutbellied nuthatches was seen creeping along and hunting on the insects in the rough bark of a *Terminalia tomentosa* tree. As we were walking towards the Dudhsagar river at Colem, the sun had just set. The atmosphere of the forest changed suddenly, and bird activity slowly came to a standstill. It was quiet and peaceful. Suddenly we heard a distant call of an animal. While moving ahead slowly and quietly, we heard footsteps near by and then again a peculiar call and we were thrilled to see a pair of Striped Hyaena in front of us. They stopped for a moment and being disturbed ran away in different directions into the dark forest. On our way back we heard calls of Barking deer and jackals. Our sighting of hyaenas was matched by other members of our group who had an equally exciting experience of seeing ten Malabar Pied Hornbills at a time on a tree.

On 21st May, from Usgaon Tiska we trekked a stretch of 7 km through dense deciduous forest to enter the so called Bondla Wildlife Sanctuary. In actuality it was a zoo with caged animals. The beautiful forested region is being developed into an exotic tourist resort which involved destruction of about 5 sq. km of thick forest for the sake of a zoo, deer safari park, garden with exotic plants, fruit orchards, lily pond, swimming pool etc. as a tourist attraction. Except the well-designed tourist complex, harmonis-

ing and blending completely with the surroundings, there is nothing to say 'well done'. Anyway the birds seem to have ignored this as lots of flycatchers, orioles, sunbirds, chloropsis, lorikeets, cuckoos, and barbets were busy with their activities. Nest building activity of the Blacknaped Blue Flycatcher was in full swing. It was fascinating to watch them giving the finishing touches to the cup-shaped nest in the fork of a small *Xylia xylocarpa* tree. The male was busy working and singing, just to prove that he really enjoyed the work! The female continued her strict supervision from long distance though she obliged him by giving musical entertainment. A Giant Squirrel and a group of langurs were the only real wild animals seen. But to top the list, the colourful Indian Pitta wished us farewell with its *wheet-tew* call, which wonderfully synchronised with its head movement.

The following birds seen are an addition to the list of the 'Birds of Goa' published by Robert B. Grubb and Sálím Ali in *J. Bombay nat. Hist. Soc.* 73 (1): 42-53: Sparrow-Hawk, Peacock, Common Green Pigeon, Ring Dove, Spotted Dove, Jerdon's or Southern Maroonbacked Imperial Pigeon, Roseringed Parakeet, Brainfever, Plaintive Cuckoo, Drongo Cuckoo, Maratha Woodpecker, Indian Pitta, Ashy Swallow Shrike, Hill Myna, Blackheaded Yellow Bulbul, Lesser Whitethroat, Chestnutbellied Nuthatch, Loten's Sunbird, and the White-eye.

ULHAS RANE



## CONSERVATION ACTION

### 'Extinct' Oryx return to the wild In Oman

The last wild Arabian oryx was reportedly killed in Central Oman in 1972. However, conservationists had rescued a number of animals as early as 1962 and shipped them to the United States where they formed a protected 'World Herd' which currently numbers over 150. The project which was initiated by the International Union for Conservation of Nature and Natural Resources in 1956 and supported by the World Wildlife Fund for the last 20 years has managed a breakthrough. According to the World Wildlife news release, a group of 10 oryx were set free in Central Oman in February.

The Sultan of Oman has entrusted the protection of the animals to a small tribe of nomads - the Harasis, who will also lead the oryx to good pastures in the 200 km wide stony plateau which constitutes oryx territory.

The Arabian or white oryx is a rare desert antelope which once roamed the deserts of Arabia and the Middle East. It can go for years without drinking, living on the moisture it can gather from vegetation and morning dew. It can detect rainfall over great distances and this stimulates a migration to areas of fresh plant growth. Many of the oryx have been radio collared to enable scientists to monitor their movements.

### Mysterious death of Javan Rhinos

Of the 60 remaining Javan Rhinos

in the isolated Ujung Kulong National Park, Indonesia, five have been found dead. Investigators have ruled out poaching as the cause of death as the valuable horns were untouched. Disease is suspected. According to Dr Arne Schiotz, World Wildlife Fund Director of Conservation "This could be a critical situation for the species". The disease could lead to the extinction of the species which is not found elsewhere. This shows the importance of maintaining a species in more than one area as single populations are far too vulnerable.

The rare Javan Rhino has been hunted to extinction everywhere for its horn which is an important constituent of Chinese medicine. The few remaining representatives of the species are now only to be found in the dense jungles of Ujung Kulong.

### Cats and Birds

Introduction of a species into an ecosystem can lead to drastic changes in the balance of the system. The Seychelles Magpie Robin *Copsychus sechellarum* is confined to Fregate Island in the Seychelles group, where 4 years ago a population of 40 birds could exist. Last year scientists of the International Council for Bird Preservation found that the population had fallen to 24 birds and that strong circumstantial evidence pointed to increased predation on young birds by the increasing feral cat population. The ICBP drew up an emergency proposal and a team of scientists conducted a study on the basis of





*Panda—the symbol of the international conservation effort*  
*(Photo: Courtesy WWF)*



which 51 cats were killed between July and December. With the large number of cats killed, the number of fledged young is showing the first upward trend in three years.

### **Reintroduction of the Asiatic Wild Asses in Turkmenia, U.S.S.R**

A successful two phase reintroduction of the Asiatic Wild Ass *Equus hemionus* was completed in the Soviet Union last year. Between 1978 and 1980, 22 animals were transported from the Badkhyshy Nature Reserve in the Turkmen S.S.R for reintroduction on two sites near the foothills of the Kopetdag mountains. These are among the first experiments of this nature ever undertaken by the Soviet scientists.

In April 1978, 3 male and 8 female asses were taken from the Badkhyshy Nature Reserve to a round enclosure 5 m. in diameter in Meana Chaachinsk where they were kept for a year. After their release a herd of 8 females and 1 male was formed. By 1981 the herd had increased to 21 heads. Dr. A. Bannikov states that the new herd preserved features of the population structure and social behaviour characteristics of the species. In December 1980 phase two of the reintroduction process began and it has met with similar success.

### **Wild baby Panda dies - Offspring of radio-collared mother**

The first baby giant panda born in the wild to a radio-collared mother has died.

The unnamed panda cub was born last autumn to Zhen Zhen, one of the five wild pandas radio-collared in a unique World Wildlife

Fund (WWF - China) joint project. According to latest reports from the remote Wolong Natural Reserve in the mountains of Sichuan, no trace of the cub has been found for several months and the scientific team fears the worst.

Dr George Schaller, Co-director of the WWF-China joint project, dramatically discovered last October that Zhen Zhen had given birth when she uncharacteristically chased the American scientist up a tree as he approached to investigate bleating sounds coming from her den.

In the latest communique from the field, Schaller notes that tracking Zhen Zhen in the snow, made possible by the radio transmitter around her neck "has never revealed any footprints of a youngster and we presume that her infant died."

The panda is the symbol of World Wildlife Fund, which in 1981 launched a major international fund raising campaign to enact a panda conservation programme.

Bamboo is the most important element in the panda's diet. The bamboo species which predominates in Wolong may be due to flower, an event which occurs roughly every 100 years and which is followed by a die-off of the plant, thereby eliminating the animal's major food source. In order to obtain a clearer understanding of the role of bamboo in the panda's mountain ecosystem, Dr Julian Campbell, a plant ecologist from the University of Kentucky, recently joined the WWF-China team at the Wolong Natural Reserve.

WWF, News Release

AZRA S. BHATIA



## Weeds and their biological control

I was recently (end of January 1981) in the Bandipur and Mudumalai wildlife sanctuaries area and was appalled to find how extensive is the growth of the two weeds *Lantana camara* and *Chromolaena (Eupatorium) odoratum*, which reduces very considerably the area of available grass. Some of these are admittedly unsuitable as food for herbivorous animals but what grass is left is very over-grazed by the large numbers of very scrawny cattle which are apparently permitted, unchecked, to graze (if that word can be applied to their scraping the last vestige of foliage from the roots) in the 'sanctuaries'. If it is the intention to encourage game this practice should certainly be rigidly controlled—or better forbidden.

*Lantana* and *Eupatorium* produce dense very wide-spread covering over vast areas of the scrub, and efforts should be made to reduce this encroachment on the local flora by these South American 'imports'. The obvious way for both species is by the introduction of highly specific natural enemies which will suppress these species without any danger that they will attack other plants. With *Lantana* some start has been made in India with this biological control and *Teleonemia scrupulosa* (Tringidae), an insect of Mexican origin, is widespread (and is very common in Bandipur and Mudumalai). However, whilst it sets *Lantana* back in the dry season, the rain reduces its numbers catastrophically, and at the same

time enables the *Lantana* to put out new growth—thus minimizing any permanent effect on the weed.

There are two other insects already introduced into India against *Lantana* - the Hispid beetles *Uroplata girardi* and *Octotomma scabripennis*. Little has been heard of the effect of these in India on *Lantana* and neither has been tried in this area. There are several other well-known (and extensively tried elsewhere) natural enemies of *Lantana* which should be tried in this area (and others).

The position with *Eupatorium* is less hopeful. Extensive research has been carried out in Trinidad and South America to discover specific natural enemies which would control - or diminish the competitive power of - the weed. Several have been found and well tested, but only one has to-date been tried extensively, in Asia and Africa (India (Coorg), Malaysia (Sabah), Sri Lanka, Ghana and Nigeria). This is the Acrtiid moth *Ammala insulata* (or *pseudoinsulata* - there has recently developed some confusion over this) which has, even after very extensive trials, failed completely to become established permanently anywhere except in Sri Lanka, where it is widespread (it was also established for some 3-4 years in a small area in Sabah but then died out). Even here it is not controlling *Eupatorium*; spectacular defoliation over several acres occurs in many areas and then the moth disappears, after which the *Eupatorium* springs



up as before, and other areas show similar defoliation by the moth. It is obvious that complementary natural enemies are also needed to be established if success is to be achieved.

A small beetle—the weevil *Apion brunneinigrum* has also been tried (in Ghana, India, Sri Lanka, Malaysia) but only became established briefly in Malaysia, and trials of it have been abandoned. There are several other species which could and should be tried.

It may be added here that the (again of New World origin) weed *Parthenium hysterophorus* ('congress weed'), the most talked of weed in India today—covering vast areas near Pune, Bangalore, Mysore, Delhi, Bombay, Nagpur (where it is becoming a serious problem in game sanctuaries) and where much talk has been used against it, has also been seen in restricted areas at Mudumalai and near a local hydroelectric tank—rosettes of the plants on damp soil. The fact that *this* is also in the area makes it certain that, unless the soil/rainfall position is very unfavourable to it, it will spread into the sanctuaries and compete for space, nourishment etc., with the already very seriously diminished fodder grasses for the herbivores.

Research work is at present in progress in Mexico to try and find

suitable natural enemies for the control of *Parthenium* in Queensland, Australia and there appear to be several species showing promise.

Biological control of these three species should be tried *very perseveringly* as soon as possible in India, and for each species some Rs. 50,000/- would be required initially from some body or bodies (Central or State Government, Department of Forestry, World Wildlife Fund, etc.) so as to initiate implementation of practical biological control. Once initial results are achieved further consideration would be given to the future course of the work.

It should be *emphasised* that, whilst it is virtually *impossible* to predict the degree of success, if any, such biological control is self-regulatory and permanent, spreading over all areas ecologically suitable for the biotic agent's use, hopefully, though not necessarily co-extensive with the range of the weeds themselves.

If there is interest in this proposal further details on the possible biological control of all or any of these species will willingly be provided by me at the following address:

C/O KOTHANUR P.O.  
BANGALORE 560 007,  
INDIA.

F. J. SIMMONDS





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S. M. Satrah.



## Butterflies of Bombay—10

In continuation from p. 29 *Hornbill* 1982 (1), we are describing 8 more species of the family Lycaenidae.

GRASS BLUES. The butterflies of the genus *Zizeeria* are commonly known as Grass Blues. Three species are met with in Bombay out of which the Grass Jewel and the Dark Grass Blue are mainly insects of the plains, while Pale Grass Blue prefers to remain in hilly areas. They like open grassy areas and fly close to the ground.

74. GRASS JEWEL *Zizeeria trochilus* Freyer. Common from July to October. Larvae feed on *Heliotropium* and *Rhynchosia* spp.

75. PALE GRASS BLUE *Zizeeria maha* Swin. Common from June to October. Larvae feed on *Tephrosia* and *Strobilanthes*.

76. DARK GRASS BLUE *Zizeeria lysimon* Hubner. On wings from July to September. Larval food plants are *Zornia* and *Amaranthus*.

77. RED SPOT *Zesius chrysomallus* Hubner. Common in August and September. It is an insect rarely seen at flowers but often met with at damp patches. The eggs are laid on *Anacardium*, *Psidium guajava* and *Terminalia* trees infested by red ants which tend their caterpillars. The larvae are cannibalistic and avidly devour their weak helpless siblings.

78. ORCHID TIT *Chliaria othona* (Hewitson). A weak flier, occasionally settles on flowers and damp patches. Not common. On wings in March, and August to October. Larvae feed on varieties of orchid buds.

THE FLASHES. The butterflies of genus *Rapala*, commonly known as Flashes, are reddish brown or purple above with dark borders to the forewings. Males are brilliantly coloured. Three species are recorded from Bombay. Fond of flowers; these butterflies also frequently visit damp patches.

79. INDIGO FLASH *Rapala varuna*. Moore. Common on the wing from October to December. Larvae feed on flowers of *Sapindus laurifolius*, *Zizyphus rugosa* and are being attended to by red ants.

80. SLATE FLASH *Rapala schistacea* Moore. Common from October to December and again in February and March. Larval food plants belong to the family Rosaceae, Euphorbiaceae and Leguminosae.

81. INDIAN RED FLASH *Rapala melampus* Cramer. Common on the wing from August to November. Larvae feed on *Zizyphus* spp.

NARESH CHATURVEDI  
S. M. SATHEESAN



## Malabar Frog

The Malabar or Fungoid frog prefers forested land though it has been recorded in open country particularly in the breeding season. It is semi—arboreal and may often be seen at considerable heights on trees. When on trees the red coloration of the back is said to resemble red bark fungus and the oblitative pattern of the rest of the body breaks the outline of the body merging the animal into the background; hence the trivial name "Fungoid Frog". It is recorded that a powerful fungoid odour was given out under excitement by a specimen. The frog is not as agile as other species and is easily caught and perhaps the coloration is apsomatic. In summer months a large number may gather in moist areas. Such congregations have been observed in the moist cisterns of Kanheri Caves at Bombay and in a well at Edanad in Kerala.

The species breeds in still water at the beginning of the monsoon, preferring shallow pools holding weeds or grass in forest or open country. The call which is given out by the male while sitting at the edge of such pools, sounds as *wack, wack, wack*.

The Malabar frog occurs in the Western Ghats and the lowlands west of the Ghats from Kasara Ghat in Nasik Dist., Maharashtra to Edanad, Chenganur Dist., Kerala. It is possible that the range extends further south. The species is known from the Nilgiris and has been reported from Jagdalpur Bastar, M. P.

The photograph of the Frog on the cover of this issue was taken by Mr. Isaac D. Kehimkar, librarian at the Society.

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### CENTENARY SEMINAR

To commemorate our centenary the Society is holding an International Scientific Seminar on 'Conservation in developing countries'. Mrs Indira Gandhi, the Prime Minister of India and Patron of the Society has consented to inaugurate the seminar.

The seminar will include status surveys of different areas and reports of original studies related to some aspect of the main topic. The delegates to the seminar will consist of persons who present papers at various sessions, as well as persons who wish to attend and to take part in the discussions. All sessions will be open, i.e. interested persons will be free to attend.

If you wish to participate please write for further details and tentative programme to

THE HONORARY SECRETARY  
BOMBAY NATURAL HISTORY SOCIETY





THE YELLOWISH DHOBIE'S TREE *Mussaenda luteola* Del.  
FROM SOME BEAUTIFUL INDIAN CLIMBERS AND SHRUBS



## **BOMBAY NATURAL HISTORY SOCIETY**

The Bombay Natural History Society is one of the oldest scientific societies in India and has been publishing a journal since 1886, which is recognised throughout the world as an authoritative source of information on the fauna and flora of this subcontinent.

### **Our members enjoy:**

1. A four-monthly natural history journal acknowledged to be the finest of its kind in Asia.
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3. A library with many rare books on shikar and natural history unavailable elsewhere, which may also be borrowed by outstation members.
4. One of the finest research collections in India on Mammals, Birds, Reptiles, Butterflies and other forms of animal life. These are available to members for study on the Society's premises.
5. Up-to-date information and advice on birdwatching, wild-life photography and fishing; natural history field trips and information on possible areas for field trips.

In short, the Society offers a range of activities and interests for the scientist, the amateur naturalist, the sportsman, and the lover of nature. Even if you are none of these the Society deserves your support because it is struggling to preserve our natural heritage and to safeguard it for our children.

*Please write for a membership form and also introduce your friends to:*

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