HORNBILL

BOMBAY NATURAL HISTORY SOCIETY

Photo: M. Krishnan

The Asian Elephant—an endangered National heritage.

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CONTENTS

With this issue Mr. S. A. Hussain is leaving the editorial board. His field activities leave him little time to attend to his editorial functions. Mr. Hussain will continue to assist us as a Consultant. In his place we have inducted Mr. Isaac Kehimkar whose articles you would have read in earlier issues. Mr. Kehimkar is the Society's librarian and has herpetology and horticulture as hobbies.

EDITED BY

J. C. DANIEL
J. S. SERRAO
I. D. KEHIMKAR

EDITORIAL

Integrity is an essential requirement in Natural History as it is, for that matter, for any other field of endeavour. Yet one is often dismayed when one finds that persons who had established themselves as authorities had been 'adjusting' data where nature and their thinking did not coincide, for instance in egg clutch size of a species of bird or on which species of bird a cuckoo should cuckold. It is equally disconcerting when photographs of wildlife taken in zoos are published in books on wildlife without an indication of the source.

We were recently the victims of a similar deviousness when a member gave us a photograph of a sleeping lion (*Hornbill* Oct/Dec 1982 (4)). Two of our members blessed with sharp eyes and sharper memories drew our attention to the fact that the photograph was definitely a black and white copy of a colour photo by John Dominic which had appeared in Life Magazine. Our apologies to Mr. Dominic and the editors of Life Magazine.

We can hardly sympathise with our member if he laments.

"Reputation, reputation! O, I have lost my reputation! I have lost the immortal part of myself, and what remains is bestial".—*Othello*

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Through the courtesy of Larsen & Toubro Limited, Bombay Natural History Society in its centenary year is offering a limited edition of a set of 4 beautiful greeting cards, superbly reproduced on imported art card, from bird paintings by J.P. Irani. These are available at Rs. 12/- per set of 4 cards (Rs. 10/- for members). Orders of 10 or more sets @ Rs. 10/- per set.

Bangladesh: A general survey

I spent six weeks in Bangladesh during April-May 1982, mainly looking at crocodiles and gharial but also running into a lot of frogs, turtles, lizards, and snakes. Two weeks of this time were spent in the Sunderbans, the largest mangrove forest in the world.

FROGS AND FROGLEGS

Because I was looking for possible sources of protein for crocodile farming, I examined the frog leg industry. 80% of the frog is thrown away and the hind legs skinned and frozen for export to European countries and the United States. The bullfrog *Rana tigerina* is the main species used in the trade because of its large size. However, dealers mentioned that some European countries prefer the smaller legs and it seems likely that the ubiquitous skittering frog *Rana cyanophlyctis* and the paddy frog *R. limnocharis* are also used.

Exports of frogs legs (in lb.) for the last four years have been:

1977-78	1,585,000
1978-79	3,723,000
1979-80	1,810,000
1980-81	1,981,000

The average for the four years was 2,270,000 lb. with an average value of 15 Taka per pound (70cUS). The frog-leg season coincides with the monsoon (May-September) and unfortunately also with the breeding season of the amphibians (though some breeding was evident in the pre-monsoon showers during April). Some of the obvious factors which should be examined regarding this massive frog kill are: actual numbers exported, optimum commercial size and selectivity in catching, population densities and habitat requirements, diet.

One point of interest extrapolated from this trip was the number of frogs exported. This was done after learning that 75% of the legs were in the range of 6 to 8 pairs per pound; most of the rest in the 9 to 12 and 13 to 15 pairs per pound range and some in the 4 to 6 range. The estimated annual export of legs equals over 18 million frogs. Wastage conservatively accounts for another 2 million — 10%, for a whopping total of 20 million frogs. At the time of writing Food Administration Organization consultant is in Bangladesh assessing the situation and closed seasons, closed areas and frog farming are being discussed. The government is to be congratulated on this step; and important outcome would be to establish a size limit, banning the taking of frogs in the 4-6 pairs per pound range and over; in other words, protecting the adults.

As a matter of interest, some details of the Indian frog-leg industry as reported in *The Hindu* of March 28th: 8,736,000 lb. of frog legs were exported from India in 1981 to Netherlands, USA, Belgium, France, West Germany and Canada for a total earning of Rs. 133,000 (about US$13,300). Assuming a similar size breakdown to the Bangladesh exports, India gave the chop to a grand total of 70 million frogs in 1981, a lot of them

Indian Bull frog, the mainstay of frog leg trade in the Sub-continent

Photo: G. S. Sidhu

Rana hexadactyla the green frog (which is according to Dr Reza Khan, not abundant in Bangladesh). The Kerala Agricultural University has started a 'frog breeding centre' at Kumarakom near Kottayam which is good news. But if the industry is to withstand this pressure then size limits and closed seasons had better be implemented in a hurry. It should be stressed here, that the people who catch and earn money from frogs are often tribals with no other source of income.

To go back to Bangladesh frogs, there were a large number of *R. tigerina* and *R. cyanophlyctis* in the Sunderbans in areas 5 km from the sea, such as Supoti Forest Station where water salinity in November is recorded to be 425 mg per litre. In Rajshahi, paddy frogs were calling everywhere in response to the May rains: the tonal differences made calling frogs of different size classes sound like different species.

TUTLES, SACRED AND PROFANE

Fortunately Muslims do not eat turtles or else Bangladesh would see exploitation levels like those of West Bengal, Orissa and Bihar in India. As it is, many thousands of turtles are caught every month for local consumption by Hindus and Christians and for an increasing export trade. While figures are available for numbers exported, numbers of turtles caught for the local trade can only be qualitatively estimated. Hundreds of common pond turtles (*Lissemys punctata*) were seen in markets in Chittagong, Chalna and Narayanganj (near Dacca) this year in April, as were also about 150 peacock softshells (*Trionyx hurum*) and 20 Ganges softshells (*T. gangeticus*). Emydine turtles were less common in the markets; at Chalna I saw a large sack with about 50 *Morenia petersi, Kachuga dhongoka* and *Kuchuga tecta*. The main turtle season is in winter. Two

export firms in Chittagong handle a large percentage of the turtle exports, the majority of which go out alive to Hong Kong, Malaysia and (to a lesser extent) Thailand. The main softshell exported is apparently *Trionyx hurum* with an average weight of 4 kg and maximum of 20 kg. A large hardshell is also apparently exported which from dealers' descriptions may be *Hardella thurgii*. *Lissemys* are mainly caught by hand at pond edges and in paddy fields; other species are usually netted.

The value of turtle exports for the last 5 years is given below in US$:

Jul-Nov	1976/77	1977/78	1978/79	1979/80	1980/81
Live turtles	59,350	276,000	345,700	647,000	299,950
Turtle meat		2,300		3,450	
'Tortoise shell	450	2,300		3,450	

Rob Oliver (1978) writes: 'it is openly admitted by officials that the legal, documented trade in turtles represents the visible "tip of the iceberg" with large quantities being smuggled out, principally to India. The ecological implications of this massive exploitation are unknown.'

Turtles are still abundant in Bangladesh and a day rarely passed when I did not see one or more basking at the roadside pond, or coming up for air. Sitting for several hours on a high bank of the Padma River in Rajshahi District. Reza Khan and I watched numerous turtles — the Ganges softshell, *T. gangeticus* and little Kachugas — coming up to breathe below us.

SACRED TURTLES AT CHITTAGONG

For $3 I was taken to the Biazid Gostami Shrine outside of Chittagong in a very bumpy motor rickshaw. The large pond (100 × 150 m) has a small mosque at one end and the shrine is on a small hill behind it. About 100 people, mainly women and children, were at the edge of the pond feeding the turtles with puffed rice, bananas and squares of bread on skewers, bought from vendors. There were usually 12-15 of the big locally endemic softshells (*Trionyx nigricans*) being fed at a time with smaller ones joining in more timidly. The larger specimens were up to 80 cm in length and the largest one I saw appeared to be a male, judging from the tail length. There were several which had head markings like *Trionyx hurum;* the carapaces of all were covered in algae. The big ones were especially crusty looking with white callosities on front of the shell, top of head and feet, which could be scars from the frequent bites they get while feeding. Some of these weigh an estimated 20-30 kg.

Women were stroking and cleaning the big turtles which seemed to enjoy the attention. Some of the old women were crooning to the turtles and calling them: ah, ah, bah, bah, in the village manner of calling

Softshell turtles on sale

Photo: Author

livestock. The local belief is that if a woman is barren she should visit here, eat some mud off a turtle's back and drink some of the pond water to achieve childbirth.

From talking to the people it is assumed that the female turtles lay their 15-20 eggs on the hillside behind the mosque, as the surrounding banks of the pond are submerged during the monsoon. No young were observed but there is plenty of good habitat close by, with village ponds and small *khals* or streams. Eggs are said to be laid in April and May, hatch in May a year later. Two females were seen outside the pond, walking jauntily down the road past people and rickshaws 100 metres from the water. The turtles' muddy backs indicated their liking to stay buried at the bottom of the pond. I have a hunch that a thorough investigation of the ponds and *khals* around the pond will reveal that the *T. nigricans* population is not restricted to the semi-captive group at the shrine. A careful approach to the religious leaders at the shrine would enable a zoology student to collect valuable data on the natural history and breeding biology of this rare and interesting species.

Batagur baska, ALIVE AND WELL?

Ed Moll, in Pritchard's ENCYCLOPEDIA OF TURTLES gives a fine account of this fascinating estuarine turtle. Once said to be common on the Hoogly River in West Bengal and heavily exploited, its numbers rapidly dwindled and the species have not been reported on the Indian subcontinent since the early 1900s.

In July 1981, Dr M. A. Reza Khan of Dacca University and myself identified a large turtle at the Mirpur Zoological Gardens in Dacca as a female *Batagur baska*. Its origin was not known but the nearby Sunderbans seemed to be the obvious place. In April this year I had a chance to chase up this clue. While talking with fishermen and forest workers in the Sunderbans, it was mentioned that the Noliyan villager, Korna Kantabodi, knew all about this big hardshell which they call *Kata*. A few days later our launch pulled into Noliyan Forest Station and we met Mr. Kantabodi. He and his people catch up to 200 *katas* during the monsoon (May-August), using strings of hundreds of hooks baited with *keora* (*Sonneratia apetala*) fruit. They recognize three types of *katas*: *Sundi kata* — female, tan colour, weighs up to 1½ maund (1 maund = 40 kg); *Pora kata* — male, black, up to 1½ maund; *Balli kata* — female, tan, very large, up to 2 maunds with smooth tightly fused shell.

Eggs are laid on sandbanks during November-January, mostly during full moon but also otherwise and sometimes even by day. The main nesting beaches are in the southern part of Chandpai and Sarankola ranges on the Sipsah, Katka and Kaga creeks. Kali Char and Passur Island were also mentioned as good areas. Eggs are said not to be generally collected in large numbers, but are preyed on by the abundant monitors and wild pig. Hatchlings are seen in March and April. The turtlers sell about half of their catch, getting up to 200 taka (US$10)

Batagur Turtle, one of the few survivors of an once abundant species

Photo: Author

for a big one over 15 kg.

Mr. Kantabodi produced 4 shells which measured 36-56 cm carapace length over the curve, which looked to me like they had to be *Batagur*. Then someone mentioned that a live one was being reared in the next village. We rushed across the fields under a noon sun and surprised the villagers with our interest in their turtle. It was a Batagur for sure, about 53 cm carapace length and about 20 kg caught last year at Kaga Khal.

The Sunderbans Divisional Forest Officer Mr Ghulam Habib has been apprised of the existence of this important breeding population of *Batagur*; he mentioned that the fishing permits issued within the Reserve Forest are not valid for turtles. It appears that the Batagur's future is secure here. It is hoped that a research scholar from Dacca University or the Forest Research Institute will take up a study on the breeding biology of *Batagur baska*. The recent Khulna District Gazetteer mentions an island 10 km off the southwest of the Sunderbans where large numbers of marine turtles lay their eggs in winter. It appears very likely that a Pacific Ridley arribada beach is awaiting to be discovered!

R. WHITAKER

Reproduced from *HAMADRYAD*
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(To be continued)

Elephants

This is a section of an article entitled 'Some reminiscences of sport in Assam' by H.G.H.M., which appeared in two parts in Vol. 45 of the Society's Journal *in 1945.* — EDS.

We had toured through the Garo Hills, my wife and I with our two children, then quite small, and had been walking until we reached Damra. It was winter time, and between Damra and Goalpara good duck shooting was available. When tired of walking in the hills Douglas and Dorothy used to be carried on a Garo's back in a basket supported by a strap going across the forehead: even grown-ups are carried in this way by the sturdy hill-people. At Goalpara we boarded the river steamer. The trip down the Brahmaputra to Dhubri is a very enjoyable one and we always hoped the steamer would run aground, for if this occurs it takes perhaps three or four days for another steamer to arrive and pull the ship off the sandbank. A rest of a few days on the river craft is always appreciated, for the food, at any rate in those days, was good, as also the accommodation. After a day at Dhubri we crossed the river by ferry to Fakirganj and from there went on to Fulbari whence, after a short stay, we proceeded to Hallidaygunj.

Elephant catching was in progress near Fulbari and we saw some of the newly caught animals. It was mostly done by 'mela shikar' that is, no stockades had been built and the wild elephants were caught singly. There was one baby elephant caught only a few days previously and this little creature thought it great fun to undo one's boot or shoe-laces; very pretty to watch and highly amusing for the children. The people responsible for the taking of this small elephant said that had they not done so it would have died, or been killed by a tiger, and that it was of no advantage to them to capture it as it costs a lot to feed and would be of no value for a number of years.

The roads were in a dreadful state but passable by the old tin Lizzie brought along from Dhubri. Hallidaygunj Inspection Bungalow is on a small hill so I backed the car into a sheltered place off the road and left it there covered by a tarpaulin. Next morning villagers came to me saying that a rogue elephant had killed one of their buffaloes, and asked me to shoot it. I thought it might not be a wild elephant but one of those belonging to the elephant catchers, in which case the killing of it might mean a very large sum as compensation. That afternoon they again came to me and said, 'You would not shoot the elephant and now it has killed two men whose lives would have been saved had you listened to us.' Now I felt fully justified in going in pursuit of the beast so, taking my .475 rifle and some cartridges, went with the men and saw the two bodies being taken to the village in a bullock cart.

I followed the tracks of the killer

until it became dark, and then returned to the bungalow. Early next morning we packed up and went down to the car, finding the elephant had been quite close to it; why he had not attacked it was difficult to say. We drove to Mankachar, the .475 ready for action if needed, but saw no sign of the animal which was evidently keeping to the hills. After tea with the Mauzidar we pushed on to the ferry which takes loaded cars across the river, and landing on the other side saw things wrapped in matting, and asking what these were learned they were the bodies of three men the rogue elephant had killed. One was a tailor of Mankachar, the place we had just left. The elephant, they said, was following the main road and was on its way to Garobada, and for all they knew might be in the jungle along the road we were travelling. Though I said nothing I was fairly terrified as there would be 3 miles of a mud road and no possibility of turning: and glad and relieved I was to get into the bangalow at Rangapani. The building was not much protection, for an elephant could have easily knocked it down. I had thought that the cartmen, learning of the killing of the three men, would not have faced that length of road, but they came on to our great relief and comfort.

Next morning we could obtain no definite information so drove on to Garobada, the .475 affording a comfortable feeling of security. Nearing a bamboo bridge which is renewed every season after the rains, a Policeman ran into the road with violently waving hands and gave the news that the elephant had just gone into the jungle this side of the bridge. The safest thing was to get on to the bridge as speedily as possible for no elephant would venture on such a structure. Learning soon that the dreaded beast was across a small jungle stream we hurried on to the foot of the hill on which is the bungalow and there parked the car in a safe! spot, my wife and children went up to the house.

From the time the policeman was met all information gained was shouted from men perched in the safety of trees. There were nine men in trees, each with a gun or rifle, and I was asked to go in after the elephant and kill it; they would protect me! 'Yes,' I said, 'you will see the grass moving and take me for the elephant. Not much' or words to that effect. The cover was tall elephant grass interspersed with clumps of bamboo, so small hope of obtaining a successful shot.

There were some elephants not far off belonging to a party of elephant catchers but none of them, very naturally, would consent to giving me a mount to go after the rogue. I told the men in trees to get away from the jungle and I would go and have some lunch and think the matter over. While at this pleasing occupation some men came to say that the elephant was now out in the river and might make his way towards a 'hat' (a market held on certain days) where there would be hundreds of people, and that not

more than a mile away. It was evident that something in the way of action was necessary. Already this brute had killed two men at Hallidaygunj; three near Rangapani; had met carts on the way to Garobadha and there smashed up several carts, killed two cartmen and destroyed a bullock or two; seven human beings had he already slain, and at the 'hat'—? It was a terrifying thought.

All who had seen him described the animal as a single-tusker. Taking a handful of cartridges (Solids) and the .475 I ran down to the road leading to the 'hat' and there saw the tusker in the river sporting about in the water which was about 4 feet deep at that place. Directly I showed myself on the bank of the stream he curled up his trunk and charged. His head was held very high. I sat down for the shot and tried to put the bullet past his trunk in the hope of reaching the brain, but failed. On receiving the shot he screamed and went back on his haunches, but so quickly did he turn in his tracks that the second shot aimed at his chest (side) hit him near the tail: those who have not seen elephants in the wild state can have no conception of the rapidity of their movements on such occasions as this. I only had time to ram in one catridge and fire as the beast was disappearing into the bamboo on the futher side of the stream. This shot fairly knocked him over, but only temporarily. I heard the crash but did not actually seen him fall. My wife and children up on the hill saw and heard the whole affair: the charge, the scream, the backing on the haunches, the second shot, the third shot, and the fall. Servants and Garos standing on the hill also witnessed the whole affair; such an exceptional scene as can have but rarely been laid out as a spectacle for spectators.

Had I only known it at the time I could have gone along the road until opposite the car and then got close to the bank without being seen. the shot would have been a close one and from safety, as there the bank was very steep. However I did not know all that and had to act quickly and take my shot at about 30 yards. There was no elephant I could use for following the wounded animal. One of the elephants was a 'Jung Bahadur', but not such a grand animal as G's elephant of that name. Had he been available the hunt after this rogue would have been a highly exciting business, and a successful one also. Hurrying down the road I found the elephant had crossed about three miles on and I followed on some miles further, but got no news of him. He was found dead near a Garo village fifty miles away and Mr. B, the Forest Officer, sold the tusk for me for Rs. 400.

Those who have been charged by an elephant will tell you that the oncoming animal appears as if a great railway engine is advancing on you and that it is impossible to stop it. That is what it feels like even though experienced several times. Every time you feel as if nothing could stop the huge thing. The charge usually takes place from grass

jungle and you do not see the animal until it is almost on top of you, so all the more do you feel that it cannot be halted. That is my own feeling. With all dangerous game I am terribly excited and frightened until I am actually taking aim and then I become perfectly calm and able to shoot accurately. As soon as the danger is over reaction takes place with me and the whole of my body trembles for minutes. I have never killed a charging elephant dead in its tracks but have always been able to stop and turn him. It seems to me that a charge of shot into the turned-up trunk would stop a charge, for elephants greatly dislike their trunks being hurt; watch a mahout make an elephant obey him by jabbing the trunk lightly with a spear: but I will let someone else try the shot gun experiment.

Padre P of the American Baptist Mission located at Tura, Garo Hills, was keen on big game shikar. I had obtained permission to kill two rogue elephants, a tusker and a mukna which always went about together. The Garos came to say that these two were giving trouble near a village five miles away, so I wrote to the Padre and asked him to come along and he should have the first shot. He arrived with his .400 H.V.D.B. H'less express and we started off, I with my .475. Some distance from the village the Garos began to track, and after about an hour we arrived at a small stream which was not fordable. As I am unable to swim I held on to two Garos who swam through the deep portion with me. Having had a rest and dried ourselves we slowly followed the tracks up a hill, on the top of which we found a flat portion of ground covered with lantana having among it a few open spaces. Soon we spied the two elephants standing in the shade of a tree. The mukna was clearly visible, but not the tusker. P, moving a bit to one side said 'I can see the tusker', and before I could stop him dived into, or rather under the lantana. The mukna backed and the tusker moved round the tree. P, who of course could not see what was going on, got very near the mukna—actually within ten feet of it!—and the beast rolled up its trunk, put its head down and was about to charge into the lantana when I decided that the Padre was in a very dangerous position and fired from the side to reach the brain. I was fifteen paces away and the solid bullet, though not reaching the brain, knocked the animal over. P stood up immediatley and told me he had, before it fell, fired a shot into it at very close range. As soon as he could he came back on his hands and knees, got up a small tree and stood on a branch no thicker than one's arm and started firing shot after shot into the fallen elephant's head and chest.

He suddenly said that his rifle was misfiring and I handed my .475 to him. This also misfired and then the elephant stood up. I was now behind a large forked tree with the supposed disabled weapon and put in two cartridges in the hope that perhaps the rifle would act. Then P. actually succeeded in getting off a

shot which, fired from above, found the brain and the beast fell dead. The poor beast had eleven bullet wounds, and when standing blood was streaming down its chest, a terrible and piteous sight. When an organ that is not usually protruding, protruded it was certain that the beast was dead. This was P's first elephant. It turned out that he had been loading the right barrel and pulling the left trigger; then he would load the left barrel and pull the right trigger. In excitement funny things happen. There was nothing the matter with the rifle. When my weapon was examined it was found that the right striker was broken.

It will be noticed that this story furnishes at least one moral: one's rifle should be carefully examined before starting after dangerous game.

On another occasion we had permission to shoot a large tusker and, to cut the story short, P took the shot and immediately started running; he had not got very far when he naturally fell, tripped up by a creeper. He persisted in running away after a shot and I could not get him to give it up. He did it every time, and fell every time! This time the elephant was only stunned and we never came up with it again.

That little tale leads up to this one. A rogue makna elephant had been proscribed by the D.C., Garo Hills and three of us — Mr W. I.C.S., the D.C., Padre P and I started out to hunt it. The only one with any experience was myself. I made a bad mistake and we were lucky to get out of the difficulty as easily as we did. The mistake was in following the beast in very dense grass jungle. I should have gone round the hill until it was certain where the animal was and then planned an attack on it. As it was I followed the tracks into difficult jungle well knowing that an animal, especially an elephant, is likely to return on its own tracks. This is what happened, and it is fortunate we saw the upraised trunk reaching for some food. I immediately put P, who was to take the shot, into position near an opening in the cover where it was certain the elephant would pass. He came into the clearing as expected, affording a clear side shot at the side of the head to reach the brain. This is supposed to be an easy shot and a sure one, but I have seen it to be not a sure one for the bullet may strike a projecting bone and glance off in a wrong direction, or the cancellous bony structure of the skull may divert it. The shot on this occasion was a very close one, and the Padre discharged both barrels of his .400 H.V. rifle simultaneously. The animal fell over dead—but we did not know it was dead. P, after firing, did his usual sprint and ran away to, as usual, catch his foot in a creeper and fall sprawling. W jumped backwards at the shot and fell into thick lantana which supported him, but he was in a difficult position had anything happened unarmed as he was for he had only come out to see the fun. As the animal fell a fairly thick bamboo hit me on the head and knocked me

Continued on p. 17

NEWS, NOTES AND COMMENTS

ASC annotated checklists

The Association of Systematics Collections (ASC) is currently compliing an annotated checklist of the amphibians of the world. Information to be carried in the checklist for each species includes current scientific name (based on most recent literature), original name, author, date and literature citation of description, museum registration number of primary type(s), type locality and distribution. Comments citing pertinent reviews, revisions and alternative systematic opinions will be presented with appropriate bibliographic citation. In addition, regulatory status under the Convention on International Trade in Endangered Species (CITIES) and the United States Endangered Species Act (US-ESA) will be included.

The checklist is designed to be a reference volume for practising systematists, a source of 'current' taxonomy for non-systematists and a source of regulatory information for those who trade in amphibians. This checklist can be computer sorted to accommodate requests through ASC and will be updated at predictable intervals.

Sections of the checklist are currently being completed, corrected and augumented by individually recruited contributors. The accuracy of this draft checklist will be ensured by a process of open review. Like the contributors, the reviewers will be attributed by name with the section(s) of the checklist on which they have worked. And for the accuracy and completeness of the checklist, ASC wishes to enlist the co-operation of the members of the Bombay Natural History Society. If any member is willing to review taxonomic and/or geographic sections of the checklist, please write to

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National Symposium on *Calotes versicolor*

A Symposium is to be organized on *Calotes versicolor* during late 1984/early 1985 at Poona/Mysore. It will cover all aspects of this lizard: systematics, ecology, behaviour, anatomy, biology, reproduction, development, endocrinology, immunology, pathology, parasites, etc. It is proposed to publish the proceedings of the Symposium as a monograph containing all avilable information on *Calotes versicolor*. All scientists working or having worked on *Calotes versicolor* are, therefore, requested to participate in the Symposium. For achieving harmony and coordination, a network is being formed of all persons willing to participate in the Symposium. All interested scientists are requested to communicate their participation content to any one of the following:

Common Calotes or Bloodsucker

Photo: I. D. Kehimkar

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Symposium of the Indian Society of Developmental Biologists

The Vth Annual Symposium of the Indian Society of Developmental Biologists will be held from October 11th to 13th, 1983 in the Department of Ecology, Meerut College, Meerut.

The Symposium will cover all fields of knowledge covering morphological, biological, molecular and genetic approach to development of man, animals and plants. A discussion group will be organized to consider the relevance and application of developmental biology research/knowledge in India.

Full papers accompanied with three copies of abstracts (around 250 words) may be sent to

DR SURESH C. GOEL, *Secretary*
INDIAN SOCIETY OF DEVELOPMENTAL BIOLOGISTS
UNIVERSITY OF POONA 411 007

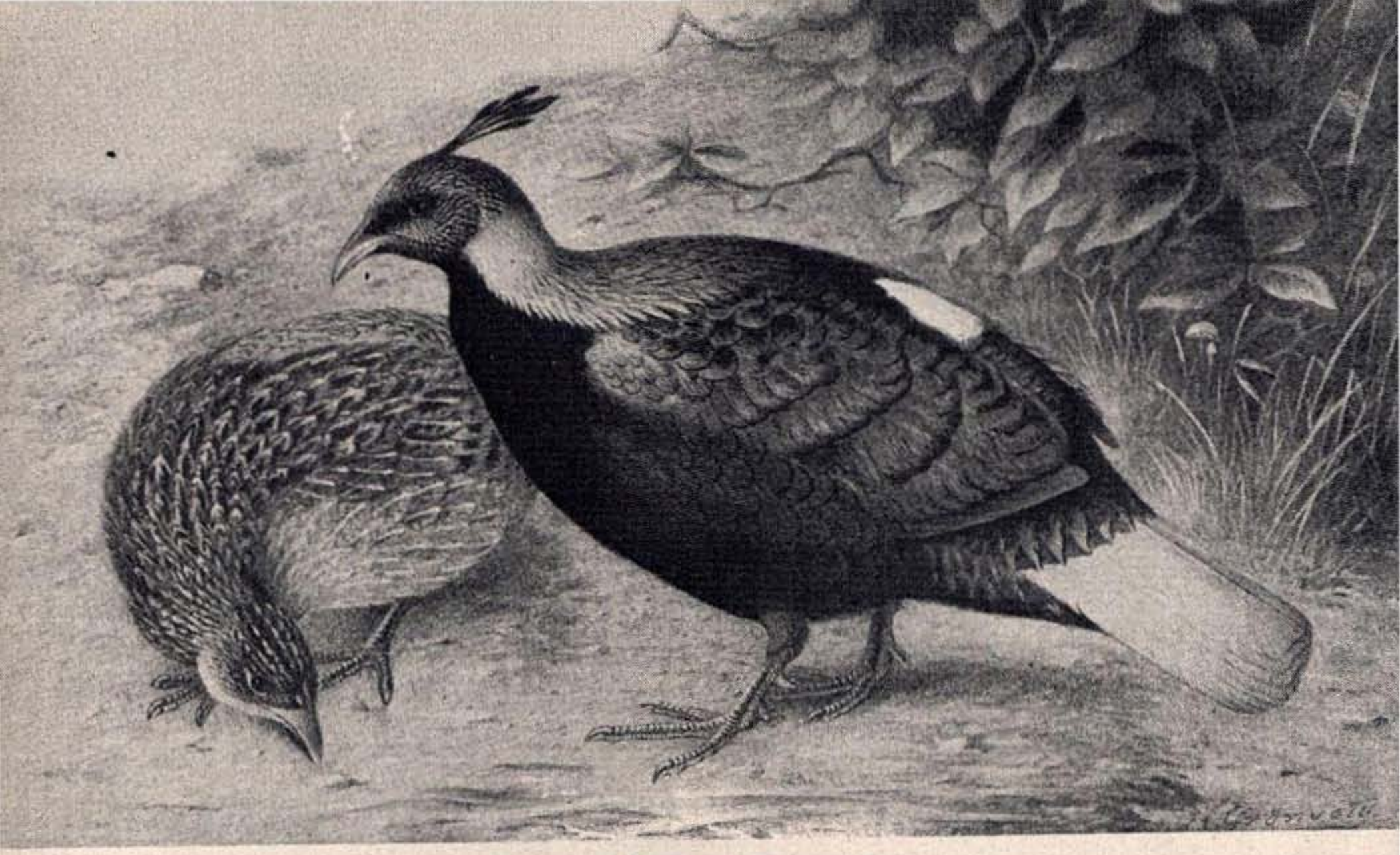
latest before August 29th, 1983 but preferably in July 1983.

For all details of local arrangements please write to

DR S. K. AGARWAL, *Convenor*
LOCAL ORGANIZING COMMITTEE
VTH ANNUAL SYMPOSIUM OF ISDB
DEPARTMENT OF ZOOLOGY
MEERUT COLLEGE
MEERUT 250 001.

Request for information on lesser-known Game-Birds

As a member of the World Pheasant Association, which is concerned with conservation of Galliformes (Pheasants, Grouse, Partridges, Quails, etc.), I am at present attempting to collect information on the status of some lesser-known Indian game-birds. I would be most interested to hear from anyone who has encountered any of the following species during the last ten years, or knows of anyone else that has: Painted Partridge, Burmese Francolin, Swamp Partridge, Ladakh or Tibetan Partridge, Bluebreasted Quail, Rock Bush Quail, Painted Bush Quail, Assam Painted Bush Quail, Rufousthroated Hill Partridge, Whitecheeked Hill Par-



The Monal Pheasant

tridge, Redbreasted Hill Partridge, Assam Bamboo Partridge, Painted Spurfowl, Mountain Quail, Sclater's Monal Pheasant, Hume's Barredback Pheasant.

Some of these are confined to very inaccessible areas in the north-east, but others occur over wide areas of lowland India. Any information on numbers, localities or habitat would be gratefully received, particularly if you can make any comment on changes in abundance. If I can get a sufficient response to this request I hope to publish a brief summary of the results in a later issue of *Hornbill.*

ANTONY J. GASTON

30th Dufferin Road, Ottawa KIM 2A8, Canada

International Union for Conservation of Nature and Natural Resources Red Data Books

The IUCN Red Data Books (RDB) are acknowledged as the authoritative international works on threatened species. The IUCN MAMMAL RED DATA BOOK part one and the IUCN AMPHIBIA-REPTILIA RDB part one are the first two volumes of the new hardback fully revised 1982 editions of this internationally renowned reference series. Part one of the Mammal RDB covers 155 threatened taxa in North and South America and Australia, including representatives from all 13 orders (excluding Cetacea - whales, dolphins and porpoises) which inhabit these regions. The Amphibia-Reptilia volume covers 82 threatened taxa in the orders Rhychocephalia, Crocodylia and Testudines from all zoogeographic regions.

For each taxon, a detailed and up to date account of distribution, population status, habitat, ecology, threat to survival and conservation

measures are provided along with a comprehensive reference list.

A recent addition to these series is the Invertebrate RDB which presents a wide-ranging and balanced set of case histories illustrating pressure on invertebrate population and habitats and the range of threatened invertebrates world over. Each phylum is discussed to include its biology and significance to man.

The cost is £12 plus £2 for postage and packing per volume by surface mail. For orders please write to

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1196 GLAND, SWITZERLAND, or
IUCN CONSERVATION MONITORING CENTRE
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Ornithologists and Wildlife Ecologists

The Department of Environment, Government of India are contemplating compilation of a Directory of (1) Ornithologists and (ii) Wildlife Ecologists, actively engaged in the studies of Indian Avifauna and Indian Wildlife respectively.

The concerned Ornithologists and Wildlife Ecologists are requested to send their brief biodata mentioning precisely the branch/group of their specialisation to

The Director of Wildlife Preservation,
Department of Environment
Bikaner House
Shahjahan Road
New Delhi-110011
with a copy to
THE HONORARY SECRETARY
WILDLIFE PRESERVATION SOCIETY OF INDIA
7, ASTLEY HALL
DEHRA DUN.

Continued from p. 13

down. Fortunately the elephant was dead.

When the usual sign proclaiming death was seen we walked up to examine the beast. It was seen to have a number of bullets just under the skin—projectiles from native weapons, so no wonder that it had turned rogue. By the wound on its head we thought that both the bullets had reached the brain, but it was later found that both had been deflected and that the cause of death was injury to the spine—a badly fractured spinal vertebra: an altogether very extraordinary affair; and, 'all's well that ends well!'. The bullets used were soft nose; and not solid as are usually used for elephant.

H. G. H. M.

A Year at Bharatpur's Keoladeo National Park

This is the fourth and concluding part of the article on the Ghana, continued from p. 17 of Hornbill *1983(1).*

Such a blissful day in January dawns cool with a low mist lying close over the blue coldness and signals the stirring of the marsh birds. Above the nasal babbling and honking of the ducks and geese come clear, flute-like notes — *dee-dum, dee-dum, dee dum.* These are the unison calls of Siberian Cranes waking in their roosting place. Before the sun has given any of its warmth the snowy birds are in the air calling in softer notes as they fly to their feeding grounds in another marsh. To hear these sounds and see the cranes flying low overhead is to experience all that is good and joyful in the Keoladeo. These cranes, pure white with black primaries and red beak and legs, somehow embody the spirit of winter on the marshes. In earlier days this species occurred much more widely over northern India and held an even more special place in man's affections. Nineteenth century naturalists called it the "Snow-wreath" and "Lily of the Birds", giving it a romantic aura they bestowed on few other species. In the 1880's ornithologists estimated that about 2000 Siberian Cranes wintered in northern India each year. The birds were then known from a dozen different localities. For the last 40 or 50 years Siberian Cranes have only been seen at the Keoladeo and in 1981-82 a mere 38 birds over-wintered there.

After circling the National Park a few times the Siberians, on this winter's day, land in an area of shallow water where the aquatic grasses and sedges have died back to a golden yellow colour. The birds preen for a while and then begin to feed.

Siberian Crane chorus

Photo: S & B.Breeden

They dig in the mud with their long stout beaks searching for the tubers of waterplants. Around them are greylag geese and pintails nibbling on the seedheads of some of the plants or upending, tails in the air, to dig for roots in the soft mud. Walking, running on the waterplants, almost between the cranes' legs are wagtails — Yellow, Yellowheaded and an occasional Pied — chasing tiny insects. In taller reeds, glowing like a brilliant blue jewel in the now warm sun, sits a Whitebreasted Kingfisher. Occasionally it dives, catching a frog or a water beetle which it then mashes thoroughly in its bright red beak. Overhead emerald bee-eaters pirouette through the air in pursuit of dragonflies and wasps. Nearer the dyke that holds back the water, where the marsh is even shallower, Whitetailed Lapwings, Marsh Sandpipers and snipe are busy foraging for their food. Out beyond the cranes is an expanse of open water where ducks dive and squabble — pintails, shoveller, wigeon, Redcrested Pochard and perhaps a Falcated Teal. A few Spotbilled pelicans sail the pond and 20 or so Greater Flamingos stand on one pink leg each and rest.

Suddenly a Ringtailed Fishing Eagle hurtles out of the sky and shatters the peace. Ducks explode into the air in a hurricane of sound. But a coot is too slow and the eagle snatches it from the water with its giant talons and takes it, struggling, to its nest. The huge stick platform, which holds two downy young is just visible in a tall *kadamb* across the marsh. Other Eagles, mostly Spotted and Tawny, circle overhead but lack the speed and skill of the Fishing Eagle. They must scavenge their food or steal it from other raptors.

These are the species that readily catch the eye. But a diligent search could easily reveal 150 species in a day — and there is always a chance of seeing a rarity — a Common Shelduck, Black Stork or Whitetailed Fishing Eagle. It is even possible, with so many birds on the move in the migratory season, to spot a species not before recorded from the Park. Every year new names are added to the list.

The morning sun warms the insects out of lethargy in the woodlands. Indian Rollers sit on prominent perches watching for grasshoppers and beetles moving about the golden grass. Suddenly they pounce in a swirl of electric blue wings. Deeper in the forest where only dapples of light reach the ground, a male Paradise Flycatcher trails his long, white tail across a clearing as he pursues a flying insect. In the foliage of *babuls, jamuns* and *kadambs* a confusion of tiny warblers prise moths and spiders from between leaves. A Chesnutbellied Nuthatch pulls his tiny prey from the cracks and folds in the tree-bark. A Greyheaded Flycatcher's yellow chest glows as it is momentarily caught in a shaft of sunlight.

Out in the open patches of saline soil, Hoopoes and Grey Partridges stir up miniature dust storms as they "bathe" in the powder-dry earth. Bluethroats fossick in the dark recesses of a huge piloo bush. A few

Hoopoe feeding young *Photo*: S & B Breeden

tentative butterflies are coaxed by the warmth to flit, yellow and orange, through the foliage. Beside his home in a porcupine burrow a huge python lies coiled in the sun, storing up warmth for the cold night. In the occasional *babuls* that grow in this somewhat barren part of Keoladeo, sit the raptors — waiting, watching — an Imperial Eagle, a Short-toed Eagle, a Crested Serpent Eagle.

The woodlands and savannahs too have their rarities, the Indian Pitta, certain buntings, wheatears and possibly a warbler or prinia that has not been spotted before.

In the late afternoon, with unexpected suddenness the sun loses its warmth. There is a chill. As the sun once more casts its red stains on the marshes, cranes, geese and ducks fly up and fill the air with their wild cries. As they circle and finally settle down for the night, dusky Horned Owls call in gruff-voiced duets from the kadamb groves.

By early March it is warmer. Spring. Winter's peace and complacency change to exuberance. Migratory birds are changing into their breeding plumage — Yellow Wagtails are yellower; Bluethroats have shining new bibs; Spotted Redshanks are no longer mottled grey but black with white spots. Out on the marshes the ducks are also in brilliant new plumage and constantly milling and thrashing the water, already busy in courtship. Without warning flocks will take to the air in a roar of wings, fly a few fast circuits and land again. Shore birds too are congregating in tight flocks and testing their wings in formation aerobatics. The Siberian Cranes

have already left and every day there are fewer ducks and geese.

The longer days and greater warmth have a more immediate effect on the resident birds. Barbets and woodpeckers are chiseling new holes into the hard *babul* wood or are cleaning out old nests. In screeching noisy discord Roseringed Parakeets fight over nest-hollows. Green Pigeons, by contrast, converse in soft voices as they place a few sticks together for a nest platform. Tumbling through the air on flashing blue wings, Indian Rollers court each other. *Jamun,* caper trees and *piloo* bushes are in full flower and attract swarms of insects. The woodlands vibrate with new energy.

But spring is short-lived. By mid-April it is over. Nesting birds have lost much of their verve as they sit on eggs or are busy feeding young. The marshes are shrinking again leaving areas of parched soil and banks of sticky mud. Except for a few stragglers the winter visitors have gone. But there is still some migratory movement. Huge flocks, up to 1000 strong, of Rosy Starlings come in to feast on the profusion of *piloo* berries. Golden Orioles have returned from the warmer south.

It is hot again, as much as 40°C in the shade. Keoladeo's heartbeat slows. But on the evening of the full moon, in the middle of April, it is balmy and cool like most nights even in mid-summer.

Before the sky has darkened completely a fluttering, whirling mass of small bats skims low over a stretch of open water at Sapan Mori. They drink on the wing and feed on the midges that dance in clouds over the marshes. From all corners come the *pick pick pick pick* of courting Stone Curlews. Spotted Owlets chatter in a huge *babul*. Soon the sky is dark. The pale light of the full moon and the black shadows it casts reinforce the feeling of coolness. Out on the canal otters are fishing, their twittering whistles mix with the splashing of disturbed fish.

A loud trumpet-call from an alarmed Sarus Crane pierces the night. It is answered by the gruff stuttering bark of a pair of Dusky Horned Owls. The night birds have left the seclusion of their *Kadamb* grove and sitting in a small dead tree are silhouetted against the round moon — their ear tufts upright. Nose to the ground a Palm Civet snuffles along the edge of a dyke, searching for frogs and lizards. It is no more than a grey shadow in the grey light, only the white spots on its face stand out.

From his burrow on the slight rise at Python Point a porcupine emerges. He pauses briefly at the entrance, clicks and rattles his quills as he shakes off the sand. It is a huge burrow with many entrances and exits. It accommodates other animals besides the porcupine. From a side entrance a python slowly emerges, feeling its way with its sensitive, flickering tongue. While the three metre long reptile slowly emerges, tiny bats flit in and out of the burrow. Leaving a straight track in the bare saline soil, the python glides towards a *piloo* bush. Here it half buries itself in the leaf-litter. Barely visible, it is ready to strike at any

A Roller lands *Photo*: S & B.Breeden

animal that passes by from a hare to a jackal. In these times of heat pythons come out only at night.

Hawking through the air on strong, pointed wings nightjars dive and swoop on moths, beetles and other insects and take their catch to small young sitting in little scrapes in the sand that pass for nests. A quavering *kroo-kroo-ah* comes from a patch of *babuls* near Python Point as the beautiful Mottled Wood Owl calls to its newly fledged young. The more bulky form of a Great Horned Owl is silhouetted against the sky as the giant bird watches for stirrings of animal life below — an unwary gerbil perhaps or a Sand Boa. But all that passes by is a Striped Hyena half-cantering, half-shuffling in its peculiar gait.

The first light that colours the morning sky is a reminder of the coming heat. Nilgai walk slowly to the marsh for a last drink before seeking out the shade of a dense thicket. Sambar, which have been grazing at the marshes' edge, wade out to a tree-studded mound and lie down to chew their cud.

The sun rises. It is hot. There will be no relief until the monsoon returns in late June. Our year has come full circle.

STANLEY AND BELINDA BREEDEN

CONSERVATION ACTION

DDT and its effects

DDT in the southern California's offshore waters, poured from the Los Angeles sewerage between 1950 and 1970 brought down the Brown Pelican and the Doublecrested Cormorant population crashing down as DDT residue caused egg-shell thinning. But surprisingly the gulls seemed to produce sturdy eggs.

And like many environmental contaminants the full impact of DDT cannot be immediately assessed, and the poison may affect different species in different ways. No one realised that something was amiss among the breeding colony of the Western Gulls on the Santa Barbara Island until a University of California biologist, George Hunt, discovered an extremely disproportionate sex ratio in the colony. He not only found more than the normal number of eggs in some nests but further investigation revealed that two females had been laying eggs in the same nest and both were incubating them. The 'bachelor' birds in the colony also proved to be females.

Then the question arose about where had the male gulls gone. Two avian biologists, D. Michael Fry and Cyndi K. Toone theorized that gulls were extremely sensitive to estrogenic compounds, one of DDT's breakdown products and during experiments they proved hormone-like residue of DDT could cause feminization of male birds. These feminized males not only are unable to breed but also are not migrating to the island at mating time.

Audubon, Vol. 83: 6; 1981

Endangered species

Arizona (U.S.A) will soon pass a state law with provision for up to four months imprisonment and a fine of up to $600 for interfering with or disturbing hunting. The new legislation is aimed at curtailing the activities of the anti-hunting lobby, which in its attempts to disrupt hunting has resorted to the use of fireworks, sound producing grenades and even low-flying model aircraft.

Journal of the British Deer Society
Vol. 5, *No.* 10

Whales win a verdict

After years of prolonged deliberations the International Whaling Commission (IWC) has voted to end commercial whaling which will be phased out over the next three years. The victory was by a resounding majority of 25 to 7 votes. The opposing votes were from Brazil, Iceland, Japan, Korea, Norway, Peru and the USSR, while the winning votes came from Antigua, Argentina, Australia, Belize, Costa Rica, Denmark, Egypt, France, Germany, India, Kenya, Mexico, Monaco, the Netherlands, New Zealand, Oman, St Lucia, St Vincent, Senegal, the Seychelles, Spain, Sweden, the U.K., the U.S.A. and

Blackbuck, more successful elesewhere than at home *Photo*: E. P. Gee

Uruguay.

This was the outcome of the resolution of the 15th Session of the IUCN General Assembly Meeting in Christchurch, New Zealand, where representatives of 56 state members, 121 Government agencies, and more than 300 non-governmental organizations concerned with the conservation of natural resources, resolved to call on member nations of the IWC to call off commercial whale hunting. This ban is imposed till the whale population recovers to a level when its regulated exploitation can be considered safe. After all it will be unreasonable to overlook the fact that livelihood of many depends on the whaling industry. But in the absence of proper management of these levethians their profits would be short lived.

IUCN Bulletin, Vol. 13, No. 7-8-9; 1982

Blackbuck in Australia

Eighty years ago Blackbuck was introduced into Australia along with red, fallow and hog deer, eland, zebra and the African buffalo. While most of these fell prey to poachers, the Blackbuck held its own and by the last war its numbers had reached several hundred, spread over five large farms. During the war, this area was handed over to the military and the blackbuck were almost wiped out.

Today around 100 blackbuck in the Geraldton district live under total protection, although they can only be seen during the rut, when they venture from cover into the grassy valleys. Their horns rarely exceed 40 cm in Australia, compared with 81 cm in Argentina and 77 cm in India.

Journal of the British Deer Society, Vol. 5 (10); 1983

The Spinytailed lizard or Sanda

It was really a gruesome sight as the roadside 'medicine man' turned the sanda over on its back and with a flick of his knife slashed open its belly. He then put the still alive and writhing lizard into the pot of hot oil in which previously killed lizards floated. There were still a few more live lizards laid on their backs awaiting to be slaughtered. But the day's quota was over and he would repeat this act somewhere else where there would be a good gathering of potential buyers for his lizard oil.

While the quack had begun his sales talk I wondered why the lizards were not attempting to escape and as I picked up one to examine I was shocked to find that, not one, but all had their spines broken. This was done to paralyse their hind legs.

Sandas or Spinytailed lizards are brought to cities like Bombay from the arid regions of northwest India, collected by the tribals who in turn sell them to these quacks. This harmless lizard is a herbivore and stores excess fat in its tail, which is used while the lizard hibernates during winter. This fat when melted is believed to possess aphrodiasic properties. The belief has no foundation in fact. The lizard falls a victim to man's eternal search of medicines to bolster failing virility. On paper, sanda (*Uromastyx hardwickii*) is protected under the second schedule of the Wildlife (Protection) Act, 1972. Authorities for the welfare of animals do apprehend these quacks but the law courts let them out on payment of a meagre fine.

I. D. KEHIMKAR

Sanda lizards and medicine man

Photo: Author

The Grizzled Giant Squirrel

The dry deciduous forest from Neerkaatha Ayyanarkoil to Alagarkoil valley on the slopes of the Western Ghats in Rajapalayam and Srivilliputtur taluks of Ramnad district, Tamilnadu, is the home of the Grizzled Giant Squirrel *Ratufa macroura,* an endangered species. This large squirrel whose proportion — a full foot in length from nose to the root of the long and bushy tail — entitles it to the description as Giant Squirrels. The Grizzled squirrels are so named from the grizzly dorsal surface and tail. In some the nose is rose in colour. Some of them have brown patches near legs and head. As they are very shy and solitary animals, it is very difficult to see them.

While resting, it lies flat with its drooping tail on one side. When disturbed, it hides itself behind a heavy trunk or branch or in a nest. One can very well understand the concealment value of its colour and the resultant protection from enemies when it moves on trees like *Terminalia arjuna* and *Syzygium cumini*. With their well-developed claws they are able to climb trees merely by digging the claws in a typical mode of locomotion. They jump easily from branch to branch with their powerful legs and the bushy tails help them balance while moving. Its rattling call is loud and metallic, and warn the jungle folks of real or imaginary dangers; chatty, it likes to communicate with friends at long distances.

One should thank the Forest Department of Tamilnadu for giving some protection to these bright eyed, arboreal and diurnal animals at least in Alagarkoil valley.

Their population may be about 50 in this 5 km long protected area covering about 60 hectares with an elevation varying from 170 m to 380 m. One could see the concentration of their nests both new and old (black) on the tall trees on either side of Nanganut-aar, the main stream in this area. One cannot but admire their engineering skills in building nests. The huge globular nests lined with tender leaves are of twigs and bunchy leaves properly arranged to last for many seasons on the forks of the slimmer branches at higher levels of the tall trees. There is a through passage along the diameter of the globular nest with two small openings facilitating escape/entrance of squirrel from any one direction. The dome-shaped roof of the nest permits quick flow of rain water and helps to keep the inside of the nest dry. Each squirrel has more than one nest used as nurseries or merely as sleeping quarters.

The Forest Department has a record of the trees and the nests on each one of them in this valley starting from Vandipannai Saragam up to Ainjupuli in Maruthadi Saragam as per the census made in May 1982. An analysis of this record shows that there were 52 new nests on 37 trees and 185 old nests on 129 trees. This includes three trees on which 237 nests (both old and new) were seen. There were many trees having two nests each. The maximum

Grizzled Giant Squirrel at Home *Photo*: Author

number of nests observed on any one tree was three. Although there were 29 different kinds of trees on which the nests were built, they were mostly found on: Tamarind, *Albizia* spp., *Terminalia* spp., Indian Beech Tree; Indian Cherry, and *Stereospermum personatum*.

Some of the old nests become weak due to weathering and fall off during the months of April/May, usually marked by strong winds.

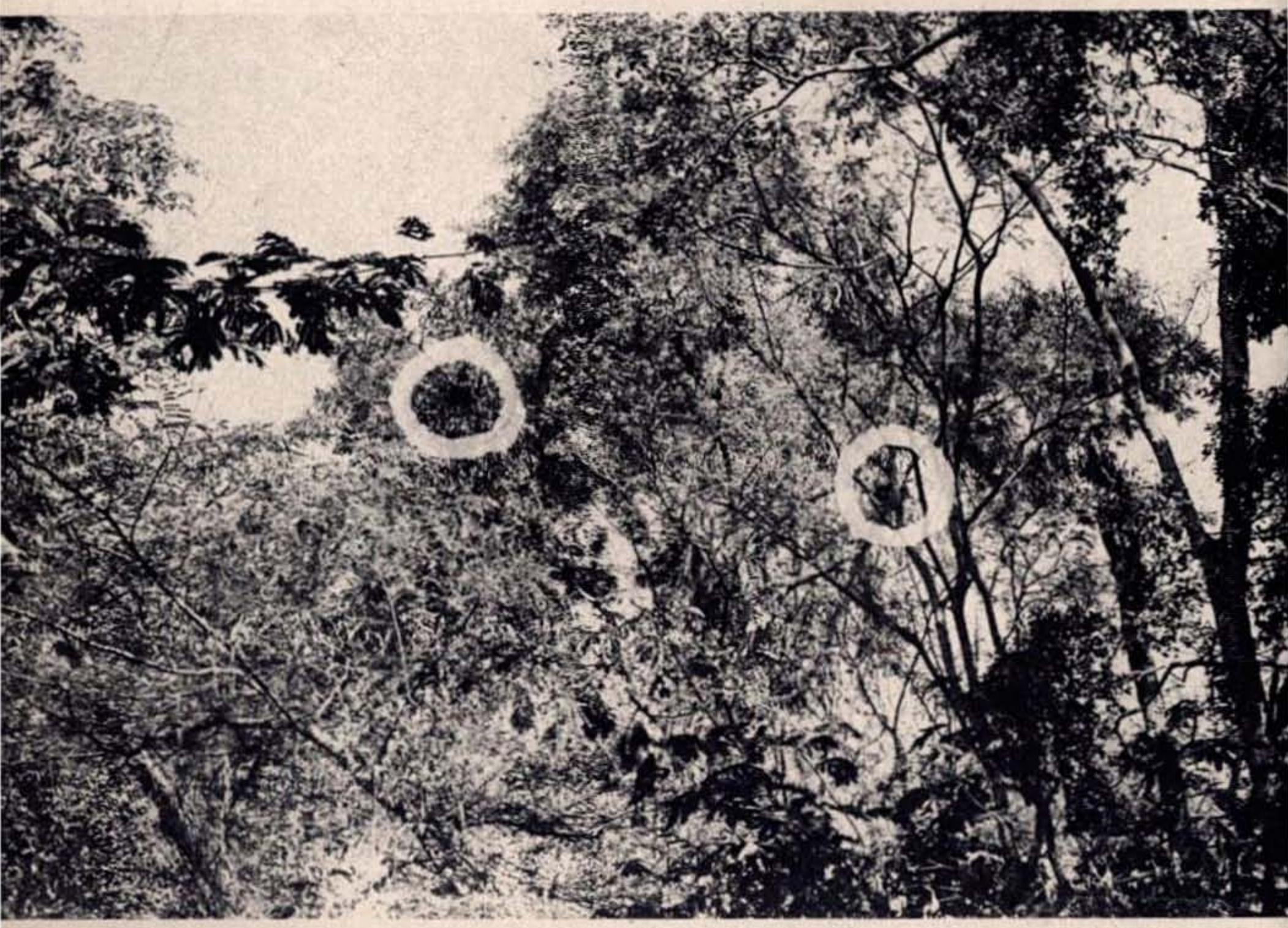
It is gathered from the discussions with people who have been frequenting these forest areas for gathering minor forest produce that: (a) the squirrels have been observed building nests from January to March; (b) the building time for each nest is about three weeks; and (c) the squirrels have been seen in pairs during November/December, the young ones being seen coming out of nest in May.

No one has observed their babies immediately after birth to know whether they are naked without hair, whether their eyes are closed, and incapable of moving about.

They eat the sprouts or tender leaves of Tamarind, mango, Indian cherry, *amla* and *Zizyphus oenoplia*. There is seasonal movement of these animals during the mango season to the private groves in Shenbagatoppu from the adjoining areas. These squirrels sit up (like palm squirrels) while munching leaves.

As they have quite a good 'come back' power given good protection of the habitat, they are bound to increase their population. There should be a proper conservation plan and provision of a belt of open treeless bushy area all along the reserve to prevent their movement to private groves where they are considered as pests and are likely to be poisoned. Further, people visiting Alagarkoil for picnics or for worship should be prevented from taking radios, crackers as they will be a source of great disturbance to the habitat of not only the Grizzled

Close up of the nest *Photo*: Author



Nest among the trees *Photo*: Author

The Grizzled Giant Squirrel habitat *Photo*: Author

Squirrel but also the other animals like elephants. Collection of minor forest produce and firewood even on head loads in this area must be banned.

Someone should take up a research on the project Grizzled squirrel regarding its nesting habits, nurseries and sleeping quarters, sex ratio, gestation period and the feeding habits. Voice is the commonest means of communication. There is a definite vocabulary of stereotyped sounds and individuals react to these sounds in predictable and consistent ways. The vocabulary of sounds and the effect of each on other members have to be studied. It may prove to be an intriguing zoological puzzle. This will be a pioneering work.

The Wildlife Association of Ramnad District founded in 1981 has taken an abiding interest in the study of the Grizzled squirrel and has been taking active steps for the protection of this rare animal. The members of the Association have, with assistance from the officials of the Forest Department, made a number of trips to the area and collected data on the habitat and behaviour of the animal. The keen photographers amongst them have taken a number of protographs of the squirrels and the nests some of which are used in this article. The Association has represented to the Government pleading for taking speedy and effective steps to declare these areas as protected areas and also for the continued preservation of the squirrel.

With the involvement in the preservation work of this species of agencies like the Central and State Governments and the Bombay Natural History Society, the Grizzled Giant Squirrel *Ratufa macroura* appears to stand a good chance of proliferating its numbers thus fulfilling the objectives and aspirations of the lovers of wildlife.

S. S. RAMACHANDRA RAJA

BIRDWATCHER

A little-known bird sanctuary

An overnight train journey from Sealdah (Calcutta) to Malda railway station in north Bengal, and then a 72 km road journey on the National Highway 34, takes you to the sub-divisional town of Raiganj in West Dinajpur district, adjoining Purnea district of Bihar. This is a part of the great Indo-Gangetic Plain that extends across the whole of northern India along the outer spurs of the Himalayas.

The Purnea-Saharsa-Malda-West Dinajpur region is characterised by water bodies, big and small, the home of indigenous birds — storks, pelicans, egrets, cormorants, moorhens etc., and wintering duck and teal from east Siberia. In such an ecological niche is the Forest Rest House of Raiganj located on the Highway itself, commanding an area of 150 acres of forest land known as 'Sohrai forests'. 35 acres of this derelict forest around the Rest House was planted in 1959 principally with *jarul (Lagerstroemia flosreginae), sissum* (*Dalbergia sissoo*) and the *maharuk* (*Ailanthus excelsa*). Plantations have come up excellently over the years and the 730 and odd trees, 20 to 25 feet high are occupied by some 15,000 birds that arrive to nest in mid June immediately with the onset of the monsoon, and begin departing by December with their young ones till all the trees are deserted completely by February end.

I visited Raiganj in September 1982 and the sight of thousands of adult birds with their chicks barely 25 feet above me all around the forest bungalow was a spectacular sight and no wonder the forest name 'Sohrai' is forgotten and the place is now known as 'Raiganj Bird Sanctuary'.

Only four species of birds, openbilled stork, large egret, little cormorant and the night heron colonise the sanctuary, mostly on separate trees. There is nothing like a mixed heronry. *Jarul* constitutes 75% of the planted trees and with its dense thick umbrella-shaped crown, is nested by the heaviest of the four birds — the openbilled stork. Cormorants, egrets and night herons nest on *sissum* and *Ailanthus*.

Jungle crows hover around all the time to predate on the young chicks and those of the night heron are the most vulnerable. Night herons are known to be largely crepuscular and nocturnal, resting during daytime in the shade of trees in the lowest branches. At Raiganj, however, these herons had perforce to give up this habit and keep day long vigil from a nearby branch on their offspring. Yet the crows frequently swept down and robbed a chick or two daily. I wonder why the forest authorities do not shoot the crows. There is nothing wrong in doing this as part of sanctuary management. Crows are afraid to raid openbills' nests while those of the cormorants are deep inside the branches making their nests safer from the marauders.

Night heron on nest *Photo*: Loke Wan Tho

Night herons had to become diurnal for the safety of their young.

In 1981, a year earlier to my visit 3956 nests of openbilled storks were counted. With two parent birds and two chicks on each nest (an assumption very largely correct) a population of 15,824 of openbilled storks had arrived in November, the month in which nest counting was done. There were that year, 1030 nests of night herons. Though they are known to lay four to five eggs, due to heavy predation by crows not more than two survive. In 1982 when I was there I did not see more than two chicks in any nest; most had only one. On the basis of four birds per nest (two parent birds and two chicks) the night heron population numbered a little over 4000. On a similar assumption there were over 3000 egrets and 2700 little cormorants. 13,000 adults of the four species had arrived to nest at Raiganj in mid June and at the end of their breeding season, they departed with an addition of an equal number of fledgelings.

According to the local forester, egrets arrive first at the beginning of monsoon followed by cormorants, night herons and openbilled storks in that order in quick succession and

settle down by mid June. Egg laying to hatching takes 3 to 4 weeks (mid July). The birds begin their departure from mid December. Egrets are the first to leave; openbilled the last. Being a heavy bird the stork's young take time to fully fledge and they depart last by February end.

Not all trees are occupied each year. Trees adjacent to Kulic river that forms the Sanctuary's boundary on one side, are often avoided as fishermen disturb the nesting birds. In fact, as I was told, until 1966 eggs were stolen in large numbers; even birds were killed for meat. This is now a thing of the past. This was so evident by the large number of birds nesting in the Sanctuary.

There is, however, no forest staff exclusively for it. The Forester located at Raiganj looks after other forestry work including plantations. In the 1982 rains he was busy raising 100 km of roadside plantations. Plantation season coincides with the bird's nidification, yet to his credit he maintained a record of whatever could be possibly noted with the time at his disposal.

A water channel has been taken from the Kulic river to girdle the Sanctuary, making it more picturesque. The depth of water was, however, ten feet when I was there in September. If the depth could be reduced, to say, four feet, perhaps migrant birds could winter here too — they do so in the neighbouring shallow water areas of Adina.

Raiganj is a Sanctuary still unnotified under the Wildlife (Protection) Act 1972. A proposal for its

Little Egret on nest *Photo*: S. P. Shahi

legal status, I am told, has been pending with State Government for quite some time, with the result it is not eligible for Central assistance. A whole time forester with some training at Bombay Natural History Society or any ornithologist residing in Calcutta could collect interesting information on nidification and other biological factors of this Sanctuary.

In years of drought lesser number of birds arrive and their time of arrival and departure too varies. There is, however, no rain gauge; not even a book on birds at Raiganj.

S. P. SHAHI

Reg. No. R. N. 35749/79

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