HORNBILL

ABOUT NATURE AND US

January-March, 2001

BOMBAY NATURAL HISTORY SOCIETY

PHOTO: © RAFEEQ ELLIAS

I wish I could never stop learning.

JASRAS

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January-March, 2001

BNHS

Cover:
King Cobra
Shekar Dattatri

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4. The Catching of Snakes

TEXT: ROMULUS WHITAKER
PHOTOGRAPHS: VARAD GIRI

The 'snake man' of India, Romulus Whitaker has worked with these beauties for decades now. But for this issue we share with you his snake catching experiences from an old journal of the BNHS, which is a treasure trove of information on nature.

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VIEW POINT

Three retired judges looked at the humanitarian aspects of the eviction of encroachers from the Sanjay Gandhi (Borivli) National Park and concluded that it is a human rights violation. May be. However, they have overlooked the fundamental fact that encroachment on public land such as a National Park, is an attempt at converting public land, which is the property of a nation of a billion plus people, into private property. This fact is conveniently forgotten in all cases of encroachment. True, encroachment is an admission of failure of the administrative machinery, but why should the nation be penalised for it? It is time the departments of government did their duty and preserved the property of the people. It is also time that the politicians realised that when they take the oath of office they are committed to the conservation of national property and not to its distribution among their vote banks.

J.C. DANIEL

Text: Romulus Whitaker
Photographs: Varad Giri

(Reprinted from the JBNHS Vol 68(1), 1971)

The Wildlife Protection Act 1972, forbids the catching and keeping of snakes in captivity in India. Snakes should be caught and released immediately after conducting biological studies by ophiologists. This fascinating reptile, however, is like forbidden fruit; it tempts many, but how many can actually resist this temptation?

THE CATCHING OF SNAKES

Let not the size of this hatchling cobra deceive you to handle it carelessly. Its bite is as deadly as that of an adult cobra

Finding a snake is the first problem a prospective ophiologist must take up. One can learn by experience, by searching 'likely' places repeatedly, at different times of day and night, during different seasons of the year, to ascertain which species may be found where and when. Even in areas of heavy snake populations a collector may not find many snakes because he has not 'learned' the area. In India, if a local snake-catcher with a good knowledge of the area is available for help, he will provide very important shortcuts to what could be the tedious job of years of gaining experience. A rewarding (but be prepared to be bothered) practice is to publicize the fact that you're interested in snakes, and if your area is suitable, the monsoon will not only bring rain, but a deluge of village people to tell you of the snake that is currently inhabiting their dwelling or field. In looking over collection data, I find that of fifty snakes recently caught, thirty of them were from information brought to me by farmers, field workers etc. Today while working on this paper I was called down the road to the quarry where I found a fine two foot long Russell's viper that had taken refuge under a pile of stones.

During and just after the monsoon are usually the best seasons for collecting snakes; early morning and evening hours are the times of most activity. Areas such as rock piles or old ruins, paddy harvest and storage places (rodents are numerous), hedges, roadsides are all good places to look. Walk slowly and lightly and look carefully — snakes are well camouflaged and though deaf are extremely sensitive to the vibration of your foot-falls. During the dry season especially, listen for snakes crawling; any rustling in

LOOKS CAN BE DECEPTIVE: Be careful when you land yourself on a snake, a cobra (*Naja naja*) (above) can easily be mistaken for a rat snake (*Ptyas mucosus*) (below) by an inexperienced catcher

the undergrowth should be at least briefly investigated. Hunting at night on likely roads (check during the day for snakes killed at night by vehicles which will help determine the potentiality of the road) either by walking with a torch, or better still by car or motorbike, can be very rewarding especially on very humid or rainy nights. I have found as many as twenty snakes, of five different species, on roads on the outskirts of Bombay (=Mumbai) while driving at night, and other collectors have told me of very large numbers collected by this method. If you are interested in catching aquatic varieties such as *Xenochropis* (*Natrix*), *Cerberus* and *Geradia*, and hunting in flooded paddy field, especially around and in fish traps, and drainage streams will yield good results. The listing of possible spots for snakes is endless, you will discover your own best spots, the main thing is to be persistent, keep looking. Turn over rocks, look in old tree stumps, tear pieces of loose bark from dead trees, search around stacked building materials.

Upon finding a snake, the next thing is to catch and bag it. There are some 'standard' methods of snake-catching, but each capture depends a lot on the type of snake and the circumstances. One of the first pre-requisites to snake catching is to learn the species which are poisonous and which aren't. If you suddenly come upon (and it usually is sudden) a snake and ascertain that it is harmless, let's say a fast one like a rat snake or bronze-back, the only way to get it is to make a fast grab, or even dive on it if the terrain permits. Once you get over the fear of the superficial scratches a non-poisonous snake can make with its bite (big ones like large water snakes, big dhamans and pythons excepted of course), jumping on a snake becomes a reflex action, your only thought is that you are sure it's a harmless one. You have to know your snakes well, for a cobra (or a king cobra) can look like a dhaman (rat snake) to someone who has not seen plenty of both, and it would be a dangerous surprise to land on the former.

DEADLY BITE: Be careful when you handle the long-fanged Russell's viper *Daboia russelli* its bite is more deadly than its looks

Gloves, clamp-sticks, nooses and other apparatus you may try, but you'll probably not use them long; they just make you clumsy, and if the snake doesn't escape you may still end up injuring a specimen. The snake hunting tool many snake men find to be most useful is a 'snake hook' which I will describe shortly. Once you have grabbed a harmless snake you can best control it if you secure a grip behind the neck with one hand, using the other hand to control its flailing body (I make light of non-poisonous snake bites, but there is no reason to invite being bitten). Always support the snake's weight as it can easily injure its delicate neck vertebrate by its whip-like activity while trying to escape. You may evolve your own procedures for securing the neck grip; one that I find useful is to swing the snake back between the legs (long pants of course) and, legs pressed together, ease it through until you have the neck encircled by thumb and fingers. Then bag the snake; a double-stitched muslin bag the size of a pillow cover, but longer (for tying the knot) is probably the most convenient container for harmless and poisonous species until transferred to a cage or terrarium. Fangs easily penetrate cloth, therefore hold a bag containing a venomous snake above the knot and keep it away from inquisitive people and animals.

Ideally, a poisonous snake should be captured without ever touching it with your hands, but this is by no means always possible. As I mentioned, using mechanical devices or nooses on a snake will too often result in the snake being injured, sometimes an internal injury not immediately apparent, but later the snake may refuse to eat and die of injury and/or starvation. A snake hook, made from a length of bamboo, golf club shaft (or whatever else is convenient), with a heavy wire 'L' attached to the working end, is the most versatile tool in the snake business. If

DOUBLEHEADED BEAUTY? The calm red sand boa *Eryx johni* is a favourite of the snake charmers who mutilate its tail, leaving a scar, suggesting a mouth

the wire 'L' is made strong enough, it can be used for turning over rocks, probing holes, as well as its most valuable function, that of lifting and 'pinning' a snake. When it is feasible to lift or guide a venomous snake into a bag or another container with the snake hook, this is obviously to be preferred to picking it up. A useful apparatus to have is a snake bag pinned (so it can be easily removed) to a butterfly net frame which holds the bag wide open from a safe handle-length distance and has often facilitated an easy and safe catch. When this procedure is impossible because the snake is too active or otherwise, the procedure of pinning must be adopted. This is the most common method of snake catching, used by catchers in the forest, professional snake men in zoos and venom production laboratories. A fast snake like a cobra must first be detained; a careful foot or stick pressure on the tail is usually enough to cause a cobra to rear up in its defence. Then the snake hook or other rounded stick is placed horizontally across the junction of the snake's head and neck and pressed gently but firmly, enough to keep the snake from pulling out before you are able to get a safe grip. Extreme care must be taken in dealing with any poisonous snake, both for yourself and for the snake. A Russell's viper or cobra will often thrash about once it feels the pressure of the stick on its head and neck; if it looks as though it may injure itself, release the pressure and try again. Secure a firm, but not a strangling grip just at the base of the snake's head so it cannot reach around and bite. An interesting and instructive note is that some long-fanged species like the Russell's viper may bite so vigorously when being held, to penetrate their own lower jaw, and your thumb if you happen to have it in the wrong place. Occasionally I hear of someone being bitten at the moment of letting the snake go into the bag or box. If some help is available, have him hold the bag open while you place the snake's body deep in, keep your eyes on the position of the snake's head. When you feel the snake pulling away from your hand or if it relaxes let go and jerk your hand clear off the bag. The reason for long bags becomes clear, you are much safer with the snake at the bottom in that few seconds gap in letting the snake go and twisting the top of the bag for tying a secure knot. If alone, or without help, tuck one edge of the bag into the belt or wherever convenient, holding the other edge of the bag with the hand not engaged with the snake. Keep snakes in separate bags when possible, small snakes shouldn't be kept with large ones, poisonous ones separate from non-poisonous ones, and Russell's vipers and kraits away from other species, or you may have dead and/or devoured snakes.

Snake catching methods cannot be taught in writing. They have to be learnt from observations and personal experience.

It seems hardly adequate for me to try to explain snake catching methods in writing, but this will serve as an introduction. The rest comes with observation of a skilled snake handler (not most 'jaadu walas'), and finally personal experience.

We are grateful to

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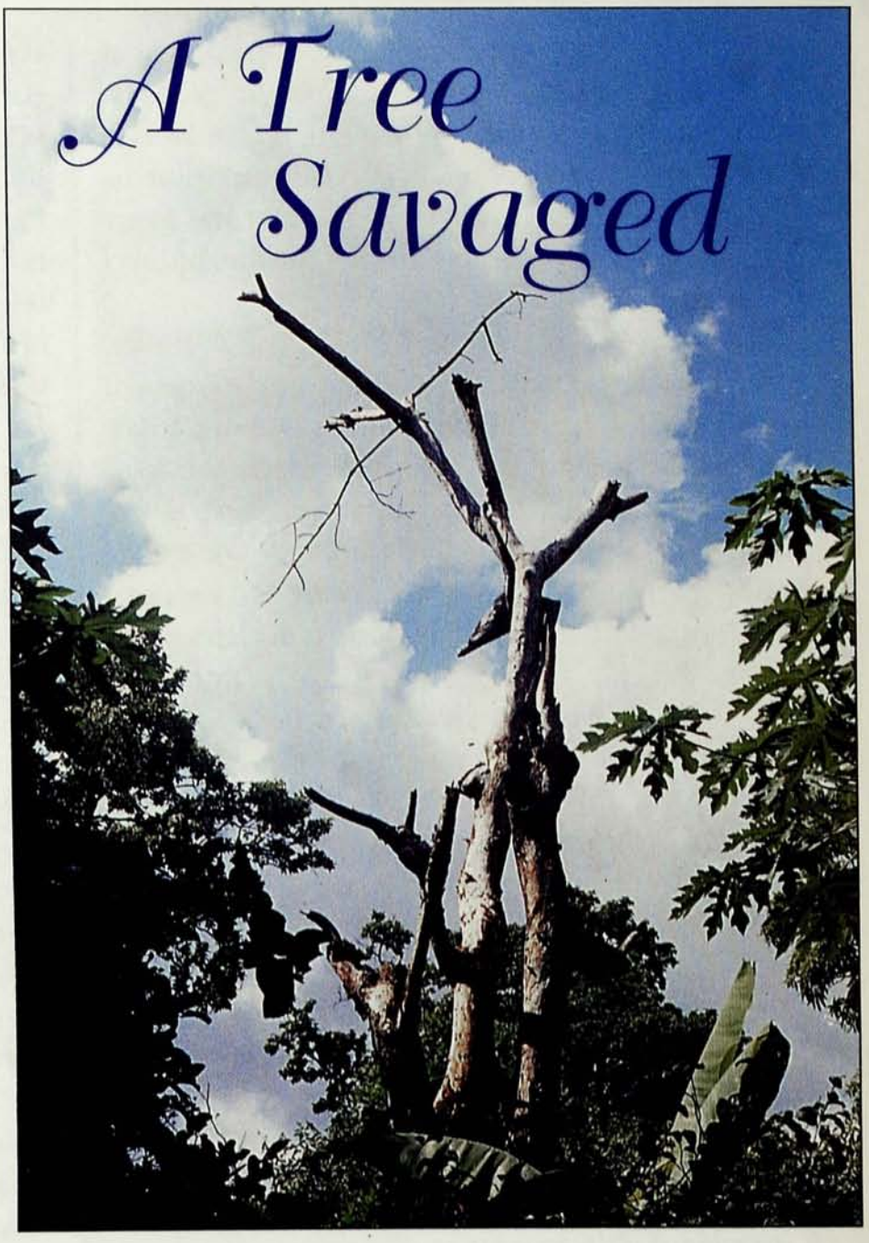
A Tree Savaged

Text and Photographs:
Lt. Gen. Baljit Singh, (Retd)



How painful and devastating it is to watch something you cherish, slide from prime of life into an irreversible terminal phase. Knowing that the end is near, you mount vigil in utter helplessness and resignation, but do not give up hope to the end. In moments of deep despair, the mind narrows down to a choice between a swiftly induced mercy death or a lingering, gnawing, spasmodic withering to the end. Whether it be a human being, an animal or a tree, the emotions are not different.

Within our cottage compound was a *ginjjan** tree *Lannea coromandelica*. It had a stout trunk, measuring 2.1 m in girth 60 cm above the ground, and 1.7 m at 180 cm from ground. The bole was straight as a lance up to 3 m, where it forked into three sturdy, thinner trunks and many branches spreading outwards, mostly curving upwards at the tips and some dipping downwards as well, all adding to a perfect, symmetrical structure the shape of a parasol, beautiful to behold in and out of leaf. The bark was up to half an inch thick, but not hard, mainly silver grey with a pale green tinge. At places it had small fungal blotches of brownish-pink and a more smooth texture.

We noticed that one of its three forks was severed near the junction; the stump looked black and charred. On enquiry we found that a shaft of lightning had sliced it here in 1987. How lucky for us that the tree as a whole had been spared. It was a favourite perch with almost every bird species. Small clusters of green berries, the size of black gram, appeared every January. Some birds did eat them, but it was not their preferred fruit. Two to five pairs of mynas (brahminy, pied and common) nested each season and successfully raised their broods. My wife had noticed that while the brahminy *Sturnus pagodarum* and pied *S. contra* mynas happily built their nests on branches, the common myna *Acridotheres tristis* appeared to be dejected as it could not find a cavity for nesting. We fastened two small earthen pitchers suitably in the forks of the branches, which were promptly colonised by the common myna. Black-backed woodpeckers *Chrysocolaptes festivus* were often seen scraping food with their beaks, from grooves in the bark. The green barbet attempted to chisel cavities, but never persevered. The wood may have been too hard.

There were several custard apple *Anona squamosa* and mulberry trees *Morus* spp. around

*Known as *jhingan* in Hindi, *moi* in Marathi but in the tribal dialect of the Oraons, Mundas and Santhals of the Chhota Nagpur plateau the tree is called *ginjjan*.

the *ginjjan* and one *Ziziphus mauritiana* tree as well. The *ginjjan* was therefore a favourite platform with birds to sally forth for fruit, to return to for a breather, and to scrub their beaks clean on its branches. It was also a link on one of the many aerial highways of the five striped palm squirrel *Funambulus pennanti*.

Twice a year, around March and October, the *ginjjan* exuded a thick, resinous, dark brown fluid from its trunk. One fissure was about 1.8 m above the ground and the other barely 0.6 m. I don't know what caused this exudation or its purpose, as neither the birds, animals nor tribals showed any interest in it. The colour and viscosity of the exudate reminded me of a bull elephant in 'Musth'.

When we came by our cottage and this *ginjjan* in March 1988, we guessed it to be around twenty years old. After the usual leaf-fall in the winter of 1996, when one of the two forked trunks and its branches did not sprout fresh leaves by April-May, we wondered why. Could it be the result of a delayed concussion, as it was the closest to the lightning struck fork? By the end of 1996, a large piece of the bark, some 45 by 100 cm, was shed like a dried scab. The exposed wood was blotched with a dried layer of fibrous paste, almost as thick as the bark itself. By the summer of 1997, the adjoining branch suffered a similar fate. The bark began to develop cracks and shed at random in large chunks from all over the *ginjjan*. The exudate from the two fissures decreased noticeably.

One day, we suddenly noticed reddish-brown piles of finely grated bark or wood on the ground, directly beneath the bald barkless patches on the trunk. The culprit had, however, escaped our eyes. The piles kept growing, with a fresh, moist layer each day. Much later, when I read a chapter describing the anatomy of a tree trunk in THE LIVING WORLD did I realise that the fresh piles I saw everyday were grated remnants of the *ginjjan's* cambium (the layer of living cells, about an inch from the surface of the bark) and phloem (transports food made by the leaves to the trunk and roots) all put together.

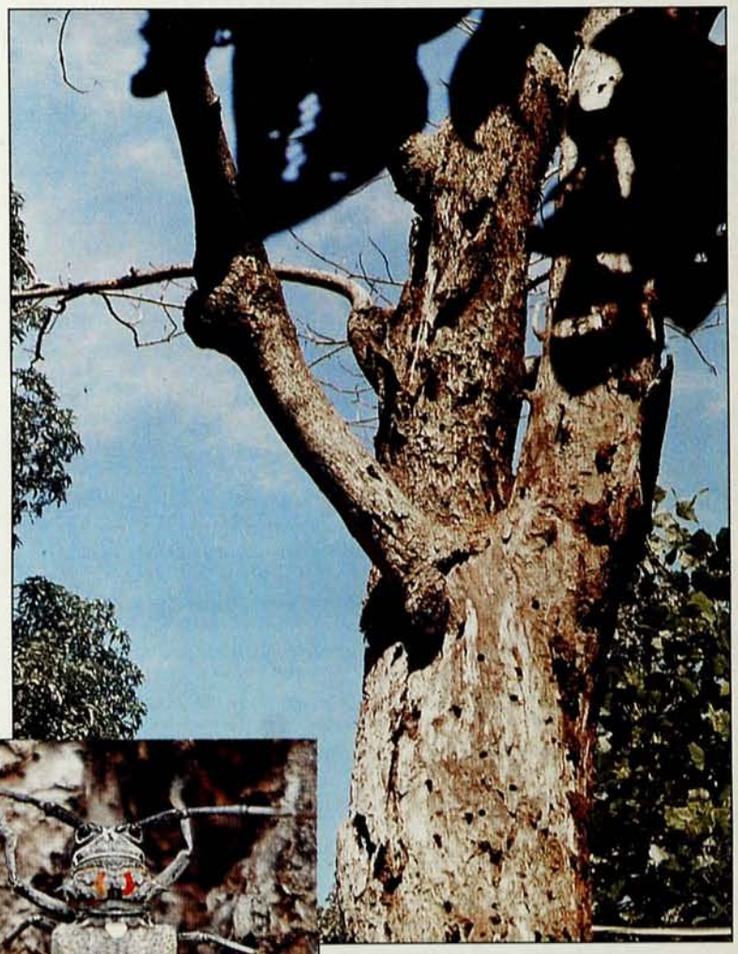
By mid-1998, only a few upper branches remained green. The trunk had many large, barkless gashes and holes. The earthen nesting pots of the common myna had long since been dislodged due to the shedding of the bark. That year only the pied myna built two nests. Then one day, I noticed a beetle 'basking' on the bark. A beautiful one, its body below the neck looked like a replica of a long, hunting body-shield carried by the Masai warriors.

My fascination soon gave way to horror, panic and fright when I discovered one September morning in 1999, that the entire bark was crawling with countless beetles. They were obviously lodged beneath the bark, drilling holes deep into the sapwood. They were not out 'basking', but in essence this was an intense mating phase. Practically all the beetles were paired. The males clung to the females with the pads on their forelimbs, while the females kept crawling, dragging their mates, until the moment of copulation. A pale, hose like male organ was attached to the female sex organ more by suction than by insertion. Then one day, I discovered that these beetles also fly; just short sallies, possibly to exercise their muscles and then back to the host tree. Beneath the Masai-like warrior shields were in fact perfectly folded wings!

These then were responsible for the grated, dark brown piles around the roots. Their numbers were frightening and more so their presence in our compound, a tenderly nurtured three acre wilderness. Could we smite them all and save the *ginjjan*? Use a chemical spray or simply singe them by smoke and flame? Where were their predators in nature's chain? In describing the golden-backed woodpecker *Dinopium* spp., Whistler alludes that "woodpeckers do feed on the wood-boring larvae of beetles...". We did have woodpeckers, but why were they avoiding this gargantuan offering of a natural delicacy? Why was the *ginjjan* being savaged? We had no answers. Our tribal domestic staff assured us that this beetle preys exclusively on the *ginjjan*. Placing our trust in their knowledge, we hoped and prayed that our tribals are prophets too. And that the remaining *ginjjan* trees will not attract this beetle.

The idea of possible identification of the beetle came from the ENCYCLOPEDIA OF INDIAN NATURAL HISTORY. A relevant piece of text states "The longicorn beetles of the family Cerambycidae are generally large and attractively coloured and their larvae are borers in wood." No wonder then that the entire surface of the *ginjjan* trunk was chequered with holes upto 3 cm wide at the rim and 2.5 to 15 cm deep. In due course, some rims enlarged up to 5 cm across and in some cases, became rectangular slits of 10 by 2.5 cm. Both the cambium and the phloem had been severely destroyed and consumed by this horde of beetles and their larvae. Later, I inferred that as they devoured the trunk, some grated material fell upon the ground, whereas the larger quantity was lodged between the bark and the trunk. As this increased in bulk, it got compressed into a layer, blotched the trunk and exerted pressure causing the loose bark to shed off in chunks. I can see no other reason for the bark to shed.

As the end of 1999 drew us closer to the end of the 20th century, our *ginjjan* was totally leafless. It may have had some sap yet for the beetles were still unrelenting. Then one day in December, the tree was suddenly and completely bereft of all beetles. They had gone in stealth and mystery without a trace. January 2000 witnessed only the poignant and still beautiful silhouette of the dried skeleton against the sky. Birds nested no more. The exudation had ceased. There were no piles at the roots any more. Instead, chunks of dead bark were rapidly piling around the roots. Now and then decayed branches came crashing down, reminding me of another time and another end of a life in the wilderness that I read recently (LEAVES FROM AN INDIAN FOREST by Sir S. Eardley – Wilmot, K.C.I.E. published in 1930): "Quietly we pressed the elephant to one side in an attempt to obtain a vital shot at the neck or shoulder, but each movement was followed by a snort and a change of front by the bull; he seemed determined to stand his ground...but refused to turn his back on the hunter. Then to terminate the suspense, I fired at the centre of the forehead below the base of the horns, and to our astonishment the huge bull sank to its knees and rolling over lay motionless."



The larvae of the longicorn beetles bore innumerable holes in the trunk of the *ginjjan*

When it comes to ending a life, human beings and beetles are all moved by a common crass and damnable impulse, devoid of nobility. So now we too know how it feels to mount a long vigil over a life condemned to die. Whether a human being, an animal or a tree it matters not, because the end itself and the emotions are no different. Every time I attempted to document the strife, I had to put away my camera in response to an inner voice recalling the lines of Joyce Kilmer:

"I think that I shall never see
A poem lovely as a tree..."

The habits of ants

August 24, 1913.

At this time of year the mason wasps, if that is the right name for the wasp like insects that build mud huts on the ceiling, in the angles of the walls, under chairs and tables or even against windows, are very busy bringing caterpillars and storing them in these larders against the hatching of their eggs. I once had a piccolo stuffed with caterpillars and sealed with mud.

One of these, rather more than an inch long, had been dropped on my windowsill and a small ant was prospecting around this leviathan, when I noticed it. When I next looked a minute or two later, a line of some 25 or 30 of the same species was moving obliquely up the wall, to the corner, where the end of the windowsill projected beyond the wall. They went straight to the caterpillar and began to catch hold of it all around, a proceeding which the caterpillar was inclined to resent. It was comatose, but not completely paralysed, and time after time the ants at the tail end were flung violently off or half crushed. The ants at the head seemed to have no difficulty in holding that part down. Did the ants merely hold tight with their jaws, or did they too add a little poison to the dose from which the caterpillar was already suffering?

Some minutes passed and when I looked again, caterpillar, ants and all, had disappeared. I found them under the ledge of the windowsill, some 8 or 9 inches from the original spot. The caterpillar was not yet helpless; with a final effort he broke his nether end loose from the ants, and it hung suspended, and for the ants, out of reach. It was a tremendous strain for them to prevent the front part from falling, but they succeeded; three or four minutes perhaps passed when, to my great surprise, a relief party appeared, of at least 50 ants, travelling up the wall in the same oblique line. This party did not go to the place where their help was urgently required, but straight to the place where the caterpillar was originally lying; their arrival at the critical moment seems to have been merely a coincidence. They spent an appreciable time hunting around the place for the caterpillar and then found the track by which it had been removed, and very quickly brought the hind part of the caterpillar back to a horizontal position. The caterpillar had been removed by almost exactly the same route by which both parties of ants had come up. Yet the second party passed it hurriedly on their way to the top of the window sill, although some of the first (moving around the caterpillar) and second party, must have come in contact. From this point there was no further difficulty; after traveling about ten feet down the wall along the same oblique line, along the floor and over a ledge, caterpillar and all disappeared into a crevice in the 'chunaa' floor. These ants were of a small black variety, long-legged, almost spidery in appearance; but one with the second party was rather large and much more heavily built; it took an intelligent interest in the proceedings, but never offered to help.

J. Sladen, I.C.S.
Rajkot.

A King cobra's speed

March 1, 1948.

In 1933, while trekking along the Sajek Valley, on my way to the Lushai villages, I was walking down a very narrow hill-track. This was a game-track, as there was no human habitation within fifteen or sixteen miles, and all this area was dense jungle, at the foot of the Lushai hills, the home of elephants, tiger, bison (as vast areas were covered with bamboo, and the valley itself had 'sunn' grass) and snakes of all varieties. I had met king cobras here in the previous years and had found that they were just as easily killed with a stout walking cane, as any other snake, and it spoilt the skin if one used a gun. Zig-zagging down a hill-side, I looked over the side to see the river-bed about a thousand feet below, when I found a fair-sized hamadryad coming up the same path, just below me. We were bound to meet, and the hill made it impossible for either to avoid the other. I managed to scramble five or six feet up the side of the cliff, and clung on like a spider, waiting for him to appear. I had my cane climbing stick, a .32 calibre revolver and with shorts and shirt and rubber shoes was well equipped for a fast sprint. In a minute or two the snake appeared, winding along leisurely, with his skin shining in the morning sun (probably he had lately cast his skin and was going to hole up, as this was the beginning of October). He did not notice me 'frozen' to the cliff, and after he had passed me completely, I stepped down on the path and switched his tail with my cane lightly to annoy him, and ran down the path fairly fast, but not at my best speed. I saw him erect his head and turn as I ran, which very nearly panicked me into running hard and off the cliff, into the river-bed below! About thirty yards further down, as the path turned, I saw that he had not gained on me. Another forty yards on, the path widened enough for me to use my cane with effect, allowing me space to move and manoeuvre myself. I stopped here and watched him come on. He came right on, and about nine or ten feet away, he stopped and put up his hood. He must have come up as high as my chest (I stand about five feet seven inches), and as he did this, a hard cut with my rather heavy cane broke his neck. He was soon put out of pain. My experience appeared to show that the king cobra is hardly faster than the average good-sized rat snake. I doubt very much whether an average man going all out would have any great difficulty, panic apart, in getting away from any snake, even a king cobra, which is believed to be the fastest snake in India. Perhaps other members might be able to shed further light on this.

S. K. Ghosh
Calcutta.

Butterflies

THEIR EARLY STAGES

TEXT: NARESH CHATURVEDI & ISAAC KEHIMKAR
PHOTOGRAPHS: ISAAC KEHIMKAR

The Pierids

The Pierid butterflies are commonly known as Whites and Yellows as their wing colour is mainly white or yellow with black, red, orange or yellow markings. The underside of the wings of most of these butterflies is cryptically coloured.

Some of these butterflies (Jezebels and Cabbage Whites) are distasteful to predators due to chemicals derived from food plants. Butterflies like Sawtooths and the Jezebel Palmfly mimic them and are thereby protected. These butterflies are fond of nectar and can be seen basking in the sun with their wings partially open. The males are sun-loving and congregate in large numbers on wet patches near river or stream beds for mudpuddling, while the females keep a low profile and are not seen commonly. The low flight of this group is fairly rapid. Some, like the Emigrants, Cabbage Whites and Grass Yellows are known to migrate.

The caterpillars of Pierid butterflies mainly feed on capers (Capparaceae), cabbage and other related crucifers, mistletoe-like parasitic plants *Dendropthoe* spp. (Loranthaceae), *Salvadora* sp. (Salvadoraceae), and cassias, clover and other species from the pea family (Leguminosae).

Common Jezebel *Delias eucharis*

Larval Foodplants: *Dendropthoe* spp., mistletoe-like parasitic plants of the Loranthaceae family.

Egg: The female lays tall, bottle-shaped white eggs in small clusters, which turn yellow and darken when they near hatching.

Larva: The caterpillars are gregarious and remain together till they pupate. They can be mistaken for moth caterpillars, because of their hairy appearance.

Pupa: The caterpillars pupate together and emerge almost at the same time in most cases. The pupa is yellowish with a greenish sheen. Black markings can be seen on the abdomen and wing pads.

Adult: The conspicously coloured and common adult has a wingspan of 66-83 mm, and can be seen throughout India, except the arid regions, Sri Lanka, Nepal and Bhutan. The Common Jezebel is very fond of flowers. It can be seen along the tree-lines of your city roads and forests in its typical slow and mincing flight.

Pioneer *Belenois aurota*

Larval Foodplants: Capers *Capparis* spp., *Cadaba indica*, *Maerua arenaria* (Capparaceae).

Egg: The female lays tall, bottle-shaped eggs in batches

Larva: The caterpillars are gregarious during the early instars, but scatter later as they mature. They are green with dark longitudinal stripes on both sides.

Pupa: When fully fed, the caterpillars weave a silken bed on the leaf surface to pupate. The pupa is angular with a pointed head.

Adult: The adult Pioneer has a wingspan of 40-55 mm. It is common throughout India, except the northeast region. It prefers open dry areas and thorn forests. A strong flier, it is found mudpuddling and on flowers. Vast swarms are sometimes encountered on migration. It is seen throughout the year on the plains and flies up to 2,800 m in the Himalaya. A characteristic hockey-stick mark can be seen on both sides of the forewing.

COMMON JEZEBEL

PIONEER

CATERPILLARS

PUPAE

ADULTS

February 2nd: World Wetland Day

WINTER MIGRANTS / BHARAT RUGHANI

Seashore Lore

No. 39 Pinocchios of the Sea

Beefsea

Fond man! Yon glassy mirror eye —
Go, pierce the flood, and there descry
The miracles that float between
The rainy leaves of watery green.

Along with lobsters and crabs, prawns are familiar to seafood gourmets. While lobsters can swim only for short distances by flapping their abdomen, prawns and shrimps swim daintily, using their abdominal appendages called swimmerets.

People are often confused regarding the distinction between prawns and shrimps. Prawns (Penaeidea) are usually larger than shrimps (Caridea). Thus, our commercially important edible prawns, such as *Penaeus*, *Metapenaeus* and *Parapenaeopsis* are all penaeids. The much smaller *Acetes* is a commercially important caridean shrimp caught in huge numbers in the local 'dol' (bag) nets around Mumbai. Though carideans are supposed to be smaller than penaeids, some of the so-called freshwater prawns, namely *Macrobrachium* (= *Palaemon*) are larger than the marine prawns, although they are carideans. The confusion is compounded by Americans calling

The long snout of this penaeid prawn reminds one of Pinocchio's nose

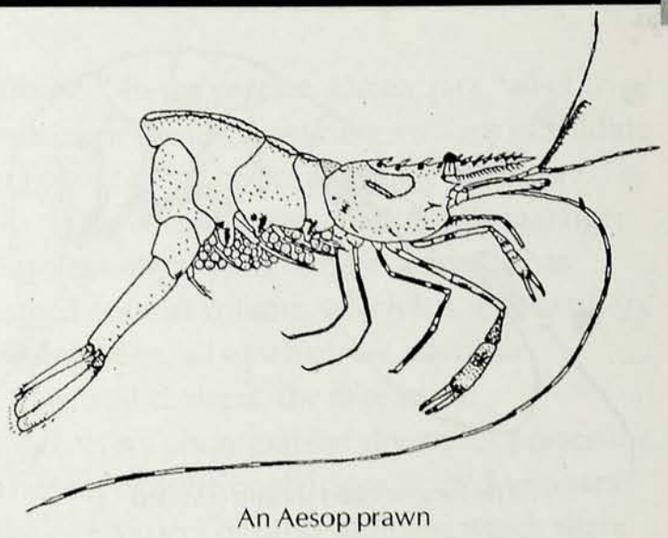
all prawns as shrimps. The word 'shrimp' is derived from *schrimpfen,* meaning shrunk or shrivelled; from Shakespeare's time it has been used derisively for a runt.

Specialists of Crustacea can distinguish prawns and shrimps by their external characters. Penaeid prawns have a long, saw-toothed snout or rostrum in front of the head. That is why I have compared them with Pinocchio, the lovable wooden puppet, which we have read about as children in kindergarten. (Pinocchio's nose grew longer every time he told a lie.)

The Aesop prawn (*Periclimenes*) is named from the prominent hump, projecting backwards from the hinder part of the third abdominal segment. (Aesop, well known for his fables, was a hunchback.) Its body is transparent and, were it not for a few colour markings, it would be invisible.

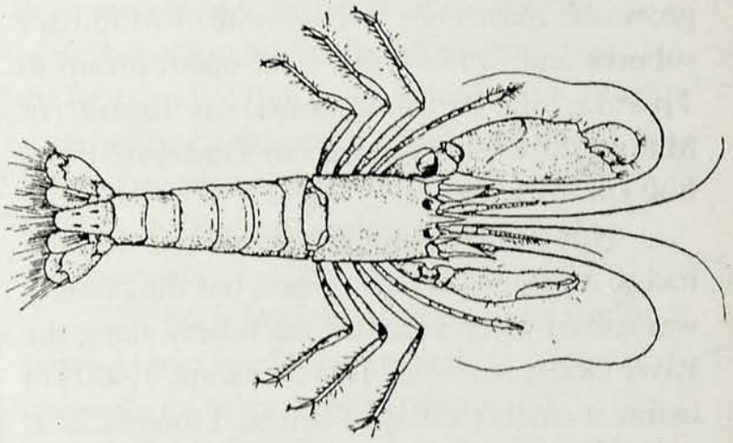
The long-necked shrimp (*Lucifer*) is common in plankton. It grows to about a centimetre and its body is transparent. Its name comes from its highly elongated, cylindrical cephalothorax behind the stalked eyes.

Among the shrimps, the ones most well known are the pistol or snapper-shrimps. The name comes from the loud popping noise which it makes. Visitors to the seashore are often puzzled to hear this pop, accompanied by a stream of water. These are made by a small (3 cm), bottle-green shrimp (*Alpheus crassimanus*). Even a cursory glance shows that the two claws are vastly unequal; in fact the larger pincer is almost as long as the shrimp. A careful examination of this claw shows a knob on the finger and a corresponding socket in the thumb. There are also two tiny, smooth patches — one near the base of the finger, and the other at its joint with the palm of the claw. When the finger is opened wide, these two smooth patches act like suckers and stick to each other. The animal has to exert great force to overcome this suction; when the force is sufficient, the finger snaps shut against the thumb, causing the popping noise and the stream of water.

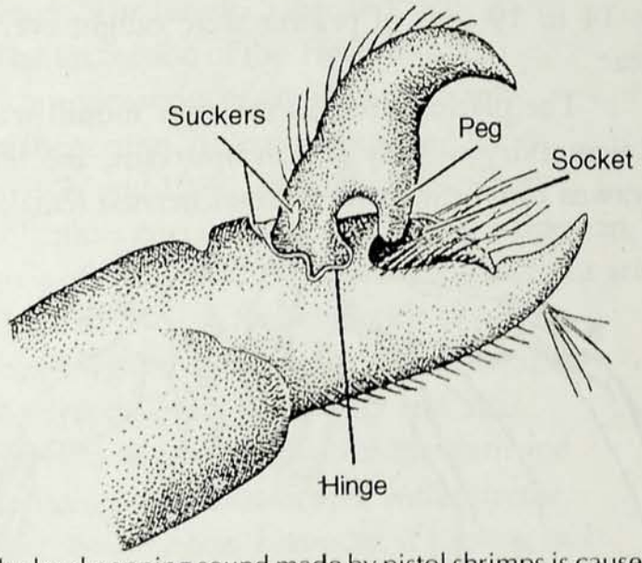


An Aesop prawn

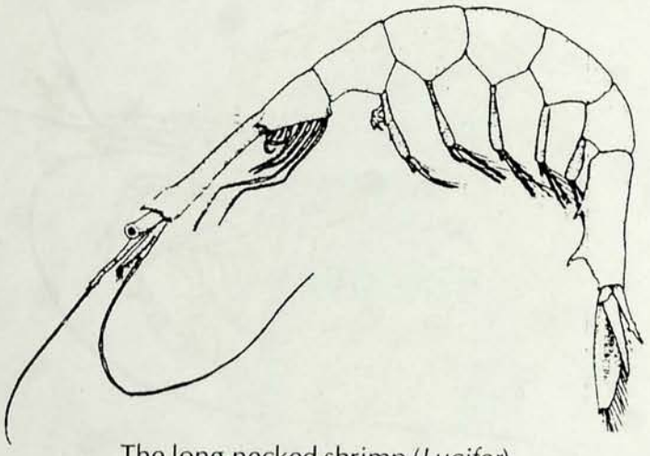
Then we have the cleaner or boxer shrimps (*Stenopus hispidus*). These help to remove parasites or festering tissues from fishes, boldly crawling over them without fear. They have been illustrated in 'Doctors at Sea' (*Seashore Lore, Hornbill 1994(3)*, pp. 18-20).



One claw of the pistol shrimp is vastly bigger than the other



The loud popping sound made by pistol shrimps is caused by the sudden pushing in of the peg of the finger, into the socket of the thumb

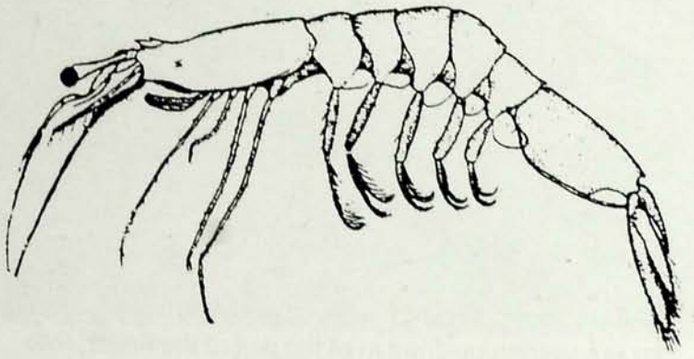


The long-necked shrimp (*Lucifer*)

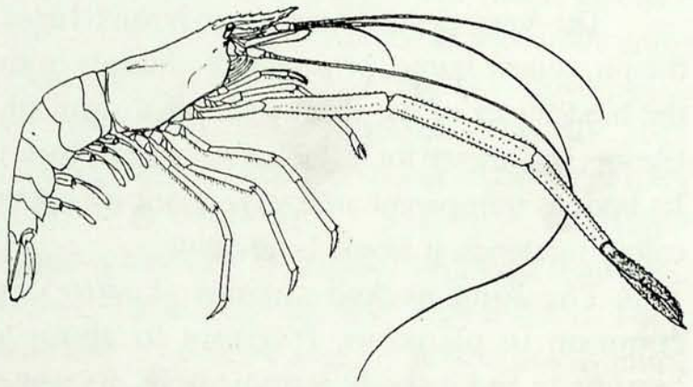
Classified among Caridea, *Macrobrachium rosenbergii* and *M. malcolmsonii* grow to the size of small lobsters; they can be distinguished by their long slender pincers. Although called freshwater prawns, as they live in streams and rivers, the young must have salty water to develop and grow. *M. rosenbergii* is common in Mumbai's suburbs and in the Ulhas river upstream up to Titwala, but *M. malcolmsonii* is found (in Maharashtra) at Nanded, in Godavari river, 800 km from the sea.

Now, where would they find salt water? I had to do some detective work, but the mystery was solved when I studied the fishery along the River Godavari, which flows for some 1,400 km before it enters the Bay of Bengal. I found that at three places along the course of the river, as many as 14 to 19 tons of prawns were caught every year.

The place nearest to the river mouth was Rajamundry — only 80 km upstream, and the prawns caught here were either berried females (carrying eggs on their belly) or fairly small (3 cm) young. The next place where a substantial fishery for these prawns existed was Sironcha, 450 km above the river mouth; here the babies were slightly bigger and were caught several weeks later than at Rajamundry. Farthest from the river mouth where yet another fishery for the prawns flourished was Nanded; the prawns here were larger than those at Sironcha and were caught many weeks after their first appearance at Rajamundry.

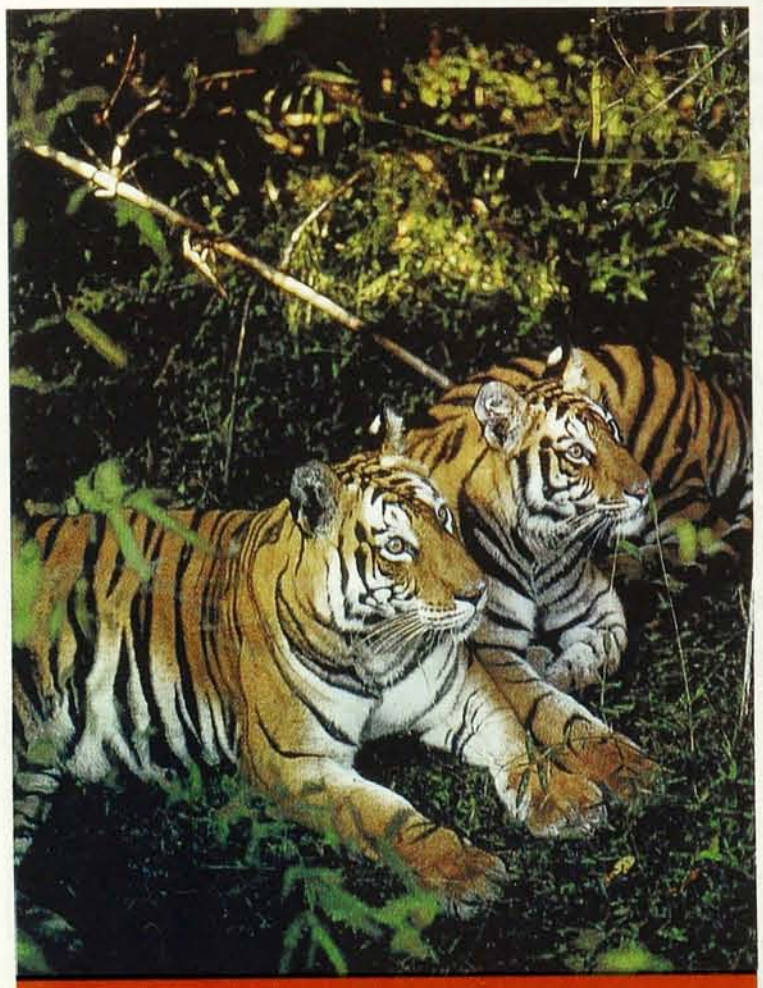


The shrimp *Acetes* is found in large numbers off Mumbai



A freshwater prawn (*Macrobrachium*)

Gradually the jigsaw puzzle was pieced together. The adult females did not have to migrate right up to the river mouth. They carried their eggs attached to the swimmerets on the belly, and when these hatched, the tiny young were swept downstream by the river flow. They reached the river mouth just when they needed salty water for further growth, and grew in the brackish water. Their need for salty water over, the young dropped to the river bottom where they laboriously crawled upstream. Their gradually increasing size at the three fishing centres, and the fact that they were caught earliest when near the river mouth, and at a later date farther up, corroborates the surmise that the young walk all the way upstream until they reach the place where their parents lived. The young reached a length of 20 to 30 mm in a month and, amazingly enough grow to an adult size of around 18 cm, larger than the biggest penaeid prawns.



TIGERLAND: On Kipling's tracks in the heart of India by Dieter Zingel, published by Jahn & Ernst Verlag Hamburg, Germany, 1999. Pp. 254 including 179 colour plates, (24 x 26 cm). Price not quoted.

Reviewed by: S.R. NAYAK

"Tiger tiger burning bright...", did someone say "you will soon be out of sight?"

Sita, the most photographed wild tigress in the world, died a violent death in 1998. On learning this, Dieter Zingel and his wife decided to embark on writing TIGERLAND. Many more tigers have died and are dying every day. Dieter's remarkable dedication, which fellow photographer Art Wolfe mentions in the introduction, "his 30 or more visits to the Indian region, his boundless energy and enthusiasm has culminated in this volume." In the preface, Dieter says "all of us will lose if the last remaining vestiges of wildlife in India, cannot be preserved for the future."

Dieter has a passion for the Bengal tiger. Through many years of hard work, he has turned out this volume, which has high quality photographs, all of which are taken on Hasselbald cameras, the elite brand which every photographer dreams of possessing. The scope of the book is not limited to tigers alone. A variety of other animals, which share the domain of the tiger, are also included in the book, thus providing a sense of perspective and location. Dieter acknowledges that for nature studies, his choice is the Indian jungle.

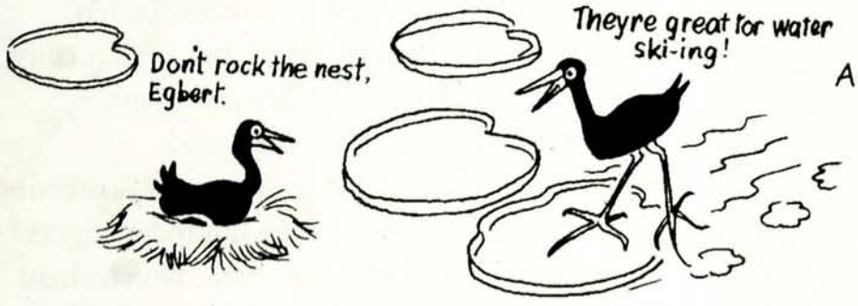
A fan of Rudyard Kipling from the age of 9, he has built the theme of the book around Madhya Pradesh, the heartland of India, which his hero Kipling chose as the backdrop for the Jungle Book. Most of the photographs of TIGERLAND were taken in the national parks of Kanha and Bandhavgarh.

The book begins with a pictorial section, followed by a brief write-up and photographs of the people, culture and history of Madhya Pradesh state, and two brief essays, 'The Jungle: Tigerland' and 'The Protection of the Tiger' followed by another series of grand photographs. In the section 'Excerpts from the Diaries of 1997 and 1998', the author describes difficulties encountered in getting the tigers in front of the camera. The remaining sections are then dedicated to Sita, the pride of Bandhavgarh, the male tiger Charger, and Mohini, daughter of Charger and Sita. The lives of the tigers at Bandhavgarh and Kanha are well documented with extreme close-ups of tigers. I wonder, if Kipling had gone around with a camera, would not the JUNGLE BOOK have looked different? 📖

The Young Naturalist

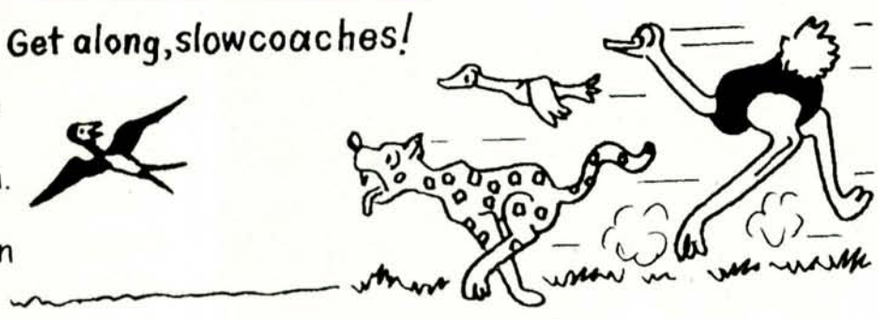
Compiled by V. Shubhalaxmi & Vibhuti Dedhia

FANTASTIC FACTS



The Jaçana bird, found in India, Australasia and the tropical regions of America and Africa, has long legs and extraordinary long toes, which enables it to walk on the floating leaves of water-lilies. Its nest floats on the water.

The fastest creature on four legs is the cheetah which has been known to top 70 mph when catching its prey. A racehorse travels at 47 mph, ducks 70 mph. Ostriches can touch 50 mph on their strong legs, but tend to run in a wide circle. But the well-named swift can leave them all behind, they can fly at 106 mph.



Courtesy: © Peter Haddock Ltd.

SLOGAN CONTEST

Hey, Young Naturalists would you like to book some place on this your very own page? Then get started and send us some exciting and thought provoking slogans of not more than 12 words. We are aware about your concern for the dwindling natural wealth around you. Don't miss this opportunity to voice your opinion. Start penning down your slogans today and say WE CARE.

Coin a slogan on the following topics:

- **Endangered Wildlife**
- **Nature retaliates**
- **Wonders of Nature**
- **Engulfing Pollution**
- **Lonely Planet**

The entries will be judged in three categories

- **The Barbets (Class III and IV)**
- **The Woodpeckers (Class V to VII)**
- **The Hornbills (Class VIII to X)**

You can send more than one complete entry before 12th May, 2001, with your age, standard, school's name and residence address to: The Young Naturalists Slogan Contest, Hornbill House, Dr. Sálim Ali Chowk, S.B. Singh Road, Mumbai 400 023, Maharashtra, India. The prizes, sponsored by Bombay Natural History Society, will be distributed on 5th June, 2001, World Environment Day.

HALL OF FAME

The Hornbill Hall of Fame will introduce you to some of the most interesting and famous personalities residing in the forests, seas, grasslands and other innumerable habitats in the Indian subcontinent. Our reporter interviews the beautiful, elegant Indian antelope — Blackbuck *Antilope cervicapra*, our first guest in this series.

Reporter: Good morning Mr. Buck. It's a great pleasure to have you as our first guest in the Hall of Fame.

Mr. Buck: Thank you for calling me.

R: To begin with tell me aren't you a deer?

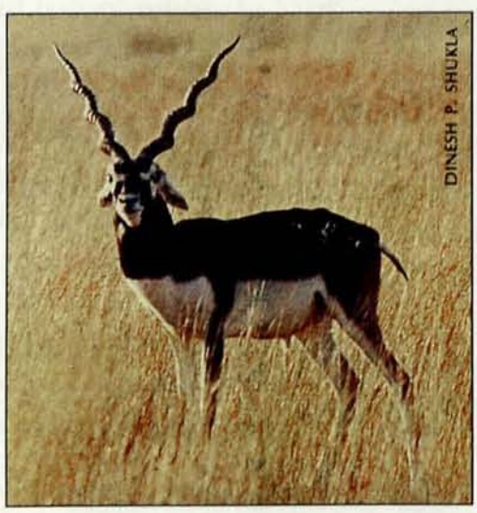
B: No. Most people mistake us for deer. We do look similar, but belong to different families. The nilgai, chinkara, gazelle and I belong to the antelope family, whereas the deer family includes the cheetal, sambar, barking deer, and swamp deer among others. Theirs is a huge family. We differ mainly in the structure of our horns. Antelope horns are hollow and not shed, whereas deer antlers are solid and branched, and are shed periodically. Also, our males and females are differently coloured.

R: I've heard that you hold the record for being the second fastest mammal on land after the cheetah.

B: Yes, we do. We start with high jumps, rising more or less vertically for a few metres into the air, for the first few leaps, and then take to a bounding gallop at 65 km per hour. Our speed, however, is no match for your modern vehicles and long-range rifles..

R: I agree, we do have an 'I don't care' attitude towards our natural wealth.

B: And this very attitude decreased our numbers from 80,000 in 1947 to 8,000 in 1964, finally putting us on the endangered list.



R: Can you tell our readers something about yourself?

B: We are is the sole representative of the genus *Antilope* in India. We are very hardy and prefer to stay in open plains of semi-deserts or grasslands.You can recognise us from our rich, black coat, white belly and chest, and a large patch around the eye. We have spirally twisting horns, which reach up to 60 cm in height. The doe is smaller and hornless. She has a lighter coat. And yes, an old, vigilant doe is usually the leader of the herd.

R: What's your favourite food?

B: We usually feed on grass and cereal crops. We enter open forests containing wide expanse of grass and graze till noon, then again after a short siesta.

R: I have heard that your males fight a lot?

B: That's during the breeding season, the male bucks fight for their doe. They ward off rivals to win over the doe. The bucks guard their harem most zealously when in rut. Besides driving off rival males, they may even attack humans intruding into their territory.

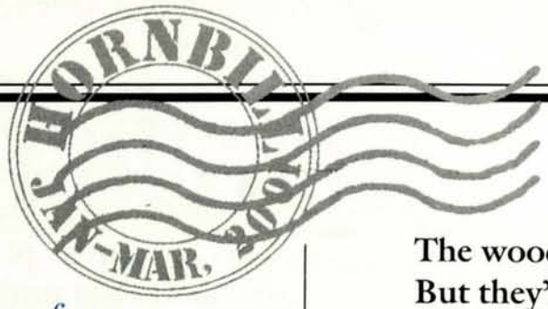
R: Tell us something about your family.

B: We believe in raising a small family. One or two young ones are produced at a time after a gestation period of 180 days. The mother conceals her young in the grass, where they gain strength rapidly and soon join the herd. They have a coat similar to their mother, which darkens at the age of three.

R: Before I conclude, tell me how does it feel to be on the Wildlife Protection Act 1972?

B: Most endangered animals have suffered at the hands of man. Once abundant, we have been killed and now survive in small pockets only. However, all men our not alike. Some of us are protected by the zealous Bishnois of Rajasthan, who respect and protect all life.

R: I do understand, but let me assure you that you have many such friends and their number is growing every day. We young naturalists promise to respect nature just like the Bishnois to change your present threatened status. Thank you very much for being with us.



Wildlife & power-fence

OF WHATEVER scanty, remnant wildlife we possess now, wildpig, porcupine, blackbuck, and nilgai are some of the commonest, that have managed to hang on even in human dominated landscapes and fragmented or honeycombed habitats. However, over much of their distribution, these animals have been relegated to less productive areas, while humans have usurped the more productive areas for their own use. One adaptation that has allowed these animals to survive despite habitat loss, seems to be crop raiding and obtaining food from outside their limited and less productive habitats.

A change threatens these animals now — the increasingly popular power-fences. Cultivated areas could hitherto augment their food, thereby sustaining some of them even in human dominated landscape. But with power-fences increasing in frequency and extent, crop raiding can become increasingly difficult, denying these animals food from croplands. This may reduce their numbers considerably in many parts of the country.

Their loss may be the loss of some large carnivores too (e.g. leopard, wolf), which are lingering on in degraded or fragmented habitats. Reduction in prey can lead to less reproduction or more livestock killing by these large carnivores. So, more carnivore killing by people in retribution!

Thus, the populations of our remaining wild mammals may be reduced by power fences, which succeed in resolving human-wildlife conflicts only in favour of the human element. Ultimately that element wins.

Such problems are related to an exploding and unprecedented human population competing for limited land and resources, and the causes mutuating with that. In order to conserve wildlife, we have to find a solution for the human population problem also.

Shridhar D. Bhat
Sirsi, Karnataka.

Save our trees

The woods are lovely, dark and deep;
But they're no longer yours to keep.
You! may've killed some trees;
and destroyed the wild and smiled!
Your! vehicles emit smoke;
which also makes you choke.
You've teased the 'Lungs of Nature';
an act of a beast, that needs to be ceased.
Man! be not proud;
It all begins where it ends.
Remember, your success is not eternal.
Trees provide for your need not greed;
Save your friends in nature;
To protect your future.
Cos! Poems are made by fools like me
But only God can make a tree.

Rahul Jain
Student Member, BNHS

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Feathered Guests

THOUSANDS OF overwintering waterbirds, of and beyond the Subcontinent, come every year to two unusual habitats, at Oousteri (Pondicherry) and Kaliveli (Tamil Nadu), in south India. Though birds such as the greater flamingo, painted stork and spot-bill pelican are rare, ducks and waders come in thousands. Migratory birds of prey e.g. harriers, are also common.

A few days ago, we visited Oousteri — a natural lake, with a vast waterbody. We were happy to see large numbers of rosy pastor, coot and ducks of different varieties. The lake also has its share of some special birds like the black-whiskered tern, pheasant-tailed jaçana, small blue and whitebreasted kingfisher, purple and pond heron, besides the bulbul, black drongo, flycatchers and bee-eaters. Though not much frequented, the lake seems to be a natural habitat of these birds.

The area besides being unapproachable, entails to trespassing on private land. Entry, however, is permissible for poachers, who are frequent visitors here. Encroachment of land for agricultural purposes and an overuse of pesticides

has endangered the birds, according to experts.

During the valedictory function of the Animal Welfare Board of India training programme, in February 1997, the Minister for Agriculture, Pondicherry, had proposed that a bird sanctuary would be established in the Oousteri area (another unfulfilled promise). Minimal rearrangements will, however, benefit the existing birdlife and allow an easy approach for man, as the two areas are within 10-20 km from the town, and will be appreciated.

Aju Mukhopadhyay,
Pondicherry.

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An unusual battle

RECENTLY IN the Rampur-Madanpur range, near Kesinga, I saw a python 'ripped open' and a dead hyena lying beside it. A surprising incident indeed! Though incidents of spotted deer being swallowed by pythons around Nandankanan, in Bhubaneshwar are common, I had never heard of a python preying on a hyena.

This unusual battle between a hyena and python, in which both ultimately died, was unfortunately neither observed nor photographed.

Pradyumna Ku. Das
Orissa.

❖ ❖ ❖

No shortcuts!

I WAS fascinated by the story of the Siberian crane, Baharami. However, in Gargi's article she repeats the suggestion that there were 200 Siberian cranes in Bharatpur in 1964, a figure propagated by Walkinshaw. Having been familiar with the cranes throughout the 1960s, I consider this utterly impossible, it may have emanated from HH or the Forest Officers of the time — not one of them credible. My highest count was 86, and there might have been a few more in some part of the swamp I didn't see, but certainly no concentrations.

I also read the article on the lesser spotted eagle and was shocked to see it described as "lse" after the first mention. This is the second time I have seen such an atrocity in an Indian magazine. The first was recently in 'Down to Earth', where a lengthy article, on the decline of the red jungle fowl, constantly referred to it as the "rjf". This is a further expansion of the growing use of abbreviations in scientific and pseudo-scientific journals, which are not widely known or accepted. Please see that this does not happen again in BNHS (acceptable here) publications.

The letter on the leopard release *Hornbill 2000(3)* prompts me to mention my concern about disposing of leopards from where they are not wanted. It is a common practice, but I wonder what effect it has on resident leopards in the release area. It seems likely that fights occur and that the released leopard, or a local resident, may be killed.

Peter Jackson
Switzerland.

❖ ❖ ❖

Reduce costs, save the Environment

I HAVE just received the *July-August, 2000*, issue of the *Hornbill*. 'The Hidden World of Mushrooms' and 'Survival of the fittest' made fine reading. It is an informative magazine, with good photographs, the only shortcoming is its laminated cover. Though many other organisations and publishers also laminate their publications I don't have to write to the BNHS about the evils of plastic. An unlaminated cover not only helps protect the environment, but also decreases the publication costs. I hope you will consider my request and stop laminating BNHS publications. Congratulations on the launch of the BNHS website. Your greeting cards are also good, but a bit expensive for me as I reside outside Mumbai.

Sandesh
Gujarat

❖ ❖ ❖

ERRATA

Page 9, *Hornbill October-December 2000*. One hundred and twenty-eight species of birds have been documented as becoming extinct in the last **500 years** and not the last 100 years as was printed. The mistake is regretted.
Source: Threatened Birds of the World; BirdLife Int.

Storks

Text and Photographs: Farah Ishtiaq

"It was the morning of October 25, 1995, the day of the solar eclipse, I was in my hide watching birds with my telescope. The eclipse was going to be a complete one in the Keoladeo National Park, my study area. My excitement, unlike that of people who had gathered only to watch the eclipse, was dual. I had this rare opportunity to observe the behaviour of whitenecked storks during the eclipse. The moon slowly began to cover the sun, then suddenly, at the blink of an eye, the earth was enveloped in pitch darkness, followed by silence. Two adult whitenecked storks, feeding until then, immediately flew back to their nest. They were silent, perhaps surprised like me by the suddenness of it all."

Storks are large, conspicuous wading birds. Being piscivorous, they occupy an upper berth in the wetland ecosystem. They are found in wetlands, marshes and swamps and are considered to be the best indicator of wetland health.

The Centre of Wildlife and Ornithology, (now Department of Wildlife Science) Aligarh Muslim University in 1994, started a three year project, funded by the US Fish & Wildlife Service, under Dr. Asad R. Rahmani, in collaboration with the Ministry of Environment and Forests, to study the ecology, behaviour and present status of storks. Dr. Malcolm C. Coulter, Co-chairman, Storks, Ibises and Spoonbills (SIS) of the World, was the technical advisor to the project. The Stork Ecology Project had three field stations — one at the Brahmaputra valley in Assam, another at the Dudwa National Park and the third at the Keoladeo National Park. Though many studies have been conducted on fish eating birds in the Park, the actual status and habitat requirements of storks still remain unknown.

The Keoladeo National Park, in the Bharatpur district, Rajasthan needs no introduction. A famous wintering ground of the western population, of Siberian cranes *Grus*

This blacknecked stork family could be studied easily from a hide without disturbing their daily routine

A whitenecked stork brings kadam leaves to line its nest

leucogeranus, it is also one of the Ramsar and World heritage sites of India. It is known for the diverse habitats it encloses in a small area of 29 sq. km, which is the main reason for its high species diversity. Around 400 species of birds have been reported from the Park, and many of them have been studied in the past. Thousands of wintering birds, in large concentrations, is a common sight in this bird paradise.

The Park supports four resident and two migrant stork species, from a total of 19 species in the world. The blacknecked stork *Ephippiorhynchus asiaticus*, whitenecked stork *Ciconia episcopus*, painted stork *Mycteria leucocephala* and openbill stork *Anastomus oscitans* are resident, while the black stork *Ciconia nigra* and white stork *Ciconia ciconia asiaticus* are the winter migrants.

Over the last three years, our study has helped in understanding the status, actual number of breeding pairs inside the Park, the habitat utilized for foraging, resting and nesting of lesser known species like the whitenecked stork and the endangered blacknecked stork.

Fifteen whitenecked stork nests were located and two intensively studied for their breeding biology. This stork makes its nests solitarily, not in heroneries, and starts nesting in the monsoon. It usually nests in tall kadamb trees *Mitragyna parvifolia,* so typical of the habitat and folklore of this region, inconspicuous to its main predators — the dusky horned owl *Bubo coromandus,* jungle cat *Felis chaus* and python *Python molurus*. Both the adults spend their time and energy to successfully rear the chicks. The clutch size remains between 3-4. If the conditions are harsh and food availability less, the younger chick dies after a few days, as it is deprived of food by its stronger sibling. The whitenecked stork is an extremely shy bird. It feeds on amphibians, earthworms and small fishes, in pools of water in the forested areas and sometimes in grasslands on insects.

The blacknecked stork in the Park is also encountering problems due to habitat loss, hunting

and trapping (for zoos). Its population is stable and in good numbers in Australia and New Guinea, but unfortunately threatened in the Indian subcontinent, due to the overuse of its natural habitat by man. It is extinct in Pakistan and Bangladesh, and Sri Lanka has a small population of 6-7 pairs. This is the only stork species which shows sexual dimorphism, the male has a dark brown iris, the female a yellow one. The blacknecked stork is basically a territorial bird; it never allows other conspecifics to enter its territory. If a male does enter its feeding or breeding territory, territorial fights ensue, which end in the chasing and attacking of the intruding bird by these aggressive birds.

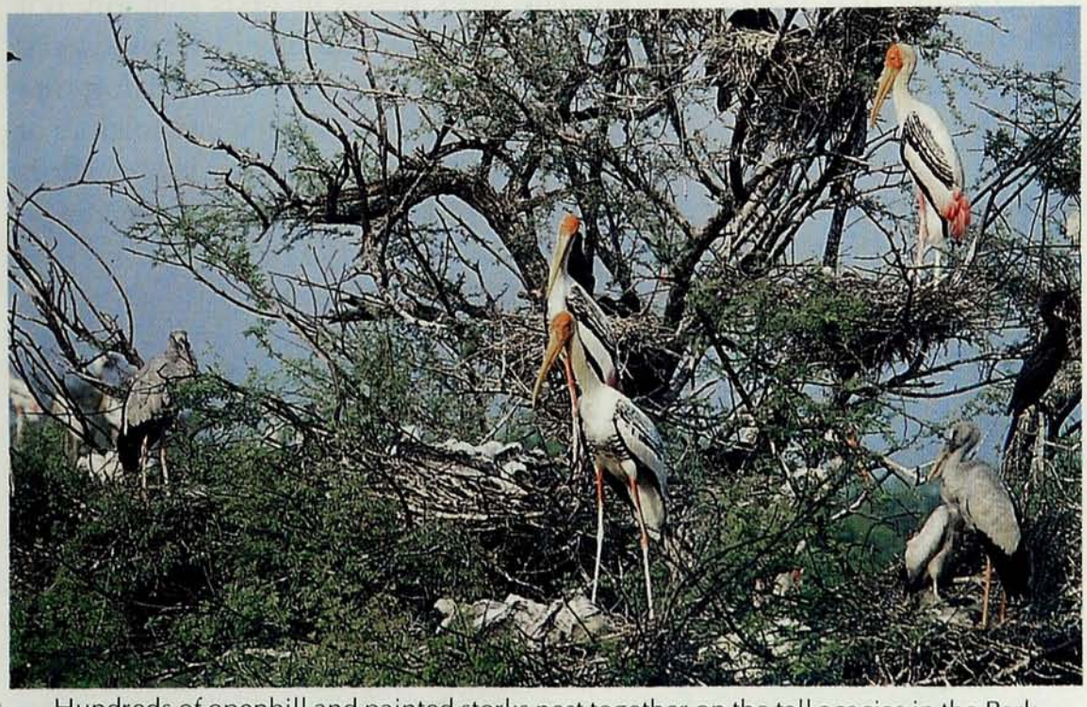
The breeding of blacknecked storks starts by August end or by the first week of October. Both the partners share all the nesting activities (from selection of nest site to the rearing of young ones). They use khus grass *Vetiveria zizanoides*, *Acacia* twigs and sometimes bulbs of water hyacinth *Eichhornia crassipes* to line their nest. Their nest is very huge, comfortable for a medium sized person to sit on. I found 12 such nests, of which three were studied in detail. To lessen the disturbance near the nest, the hide was placed after the chick had hatched. The incubation period of the blacknecked stork has never been recorded in the past. During my study, I found it to be around 40-45 days.

I tried investigating a nest by boat once as all the nests were located on trees in the wetland. I had only expected the chicks to be at home as nothing was visible from the dyke. I was wrong, their mother was home. The moment my boat approached the tree, she suddenly flew over my head, catching me unawares. This happened 20 days after the hatching.

As the chicks grew, they needed more food. The adult storks fed their chicks by regurgitating the food onto the nest floor. Initially the chicks took more time to eat; but as they grew, they gulped the food from their parents' bill in no time.

I have observed the blacknecked pairs scavenging food regurgitated by the adult painted stork many times. The pair waited for the adult birds to arrive, and flew to the nest as soon as the juvenile begged for food and usurped the regurgitated food brought by the adult painted stork.

The blacknecked stork relishes fish, snakes and at times even birds. It picks up birds only when long hunts for fish fail in winters. I have seen a male feeding on a shoveller *Anas clypeata*, on five occasions. It takes the stork about 40-60 minutes to eat the whole bird. The stork breaks the shoveller into pieces before eating it.



Hundreds of openbill and painted storks nest together on the tall acacias in the Park

Once, while walking around the wetland, I saw a female blacknecked catch a water snake *Xenochropis piscator*, while feeding in shallow water. The snake slipped into the water from its bill, and the female continued searching until she finally caught it again. The snake wrapped itself around her bill, shutting it tightly. She walked to a mound and pecked at the wet

mud to loosen the snake's grip and devoured it in the next five minutes.

Painted and openbill storks have been studied in detail in the past. Pair formation and selection of nesting sites by the breeding pairs takes place with the first showers in June. Hundreds of openbill storks nest at one site. The nesting sites are not permanent and new trees have to be found when the old trees die due to excessive guano, the droppings of the birds. The largest openbill stork colony is at Wat Phai Lom in Thailand. The painted stork lays its eggs just as the openbill chicks hatch. These birds wait for the release of water into the Park through Ajanbund — a reservoir. The water is released only if it rains heavily. It brings with it a large quantum of fingerlings, providing opportunities to all piscivorous birds. Delayed monsoon means no breeding as the birds want to raise their chicks before the winter and their predators arrive.

The Ajanbund retains water for three months, becoming very fertile. After draining off the water, the area is used for cultivating mustard *Brassica campestris* and wheat *Triticum vulgare*. Large quantities of pesticides thus seep into the water drained in the Park. This is reportedly the main cause of egg shell thinning and other congenital deformities in water birds. There is no substitute for the pesticides used, but if they are used in a controlled and measured manner, the results may not be so devastating. The other major health concern of the wetland is the water hyacinth which chokes it almost every year and needs to be removed manually. Such choked wetlands leave very few open spaces for the diving geese and storks to feed.

The Stork Ecology Project has been successful in collecting basic information on the ecology of stork species, which are needed for effective conservation, but few studies have been conducted on the habitat and dispersal of birds in India. Some species breed successfully each year, but no information on the range and preferred habitat, away from their breeding ground, is available for the fast declining species. It is well understood that the birds leave their breeding grounds when survival conditions become unfavourable. Are there any potential sites which can be utilised for nesting, or do these birds have to rely on an unpredictable monsoon? Where do these birds feed during drought?Do they have any future if this situation continues?

The questions of movement, re-use of nests by the same pair, probability of juveniles dispersing in large numbers every year and coming back to breed in the Park, and the duration of the pair-bond, time of sexual maturation, change in coloration of the iris in storks, will remain unanswered until the species can be studied through extensive ringing operations. Such a programme is highly desirable and feasible, especially among colonial breeders at the Keoladeo National Park.

The ever spreading water hyacinth is a cause of great worry for the Park

Dr. Farah Ishtiaq is the National Coordinator, IBCN at the Bombay Natural History Society

Protection of grasslands and its impact

Compiled by Rachel Reuben

RANJIT MANAKADAN

Grazing was banned in some grassland patches of the Rollapadu Wildlife Sanctuary, in 1982, after the 'rediscovery' of the endangered great Indian bustard. These measures benefited all wildlife and the area was declared as a wildlife sanctuary in 1989.

What does protection and absence of livestock grazing do to grassland flora and fauna? Are they beneficial, or would there be surprises? Answers to these questions were provided by a study carried out by Dr. Ranjit Manakadan, a BNHS biologist, at the Rollapadu Wildlife Sanctuary (RWS), Kurnool district, Andhra Pradesh, during 1992-1995. The study formed a part of the U.S. Fish & Wildlife Service sponsored project of the BNHS, investigating the ecology of grasslands in the Indian plains with particular reference to their endangered fauna. With the baseline information gathered from his earlier studies on the great Indian bustard during 1985-1988, at RWS, and in the current project, Ranjit could easily discern the changes in the flora and fauna. The salient features of his findings are as follows:

FLORA: The absence of livestock grazing had changed the species composition and structure of the grassland community. The dry above-ground biomass of the enclosures averaged about 125% more than the grazed grassland, with a fourfold difference during the early monsoon. The green biomass was available till the end of January in the enclosures, but only till the end of December in the grazed grassland. In contrast to the high biomass productivity, was the decline in the number of grassland species in the enclosures.(17 vs. 23 in grazed grassland). This resulted from the strong dominance of a few grass species in the enclosures, especially *Heteropogon contortus* and *Sehima nervosum*. There was an approximately 10% decrease in contribution of forbs (dicots) to the grassland community of the enclosures, both in terms of biomass and species richness. The ban on livestock grazing and wood cutting resulted in increased scrub vegetation in the enclosures, especially along the streams.

INSECTS: The enclosures had fewer grasshopper species than the grazed grassland, but the overall total abundance did not vary significantly between the two habitats. An important difference was that *Acorypha*, a large grasshopper species, was the most abundant in the enclosures, while the relatively smaller *Crotogonus* was common in the grazed grassland. The species richness and abundance of butterflies was significantly less in the grassland dominated areas of the enclosures than in the grazed grassland, as the butterflies found it difficult to reach the small flowering plants growing amidst the tall,

dense grass of the enclosures. The reverse was true in scrub dominated areas of these two habitats.

BIRDS: The endangered lesser florican *Sypheotides indica* and nests of the great Indian bustard were reported only in the enclosures. The eastern skylark *Alauda gulgula*, streaked fantail warbler *Cisticola juncidis* and quail were exclusively or mainly recorded in the enclosures, while the ashy-crowned finch-lark *Eremopterix grisea*, Sykes's crested lark *Galerida cristata*, Indian courser *Cursorius coromandelicus* and lapwings were common or bred only in the grazed grassland. The differences in the species composition of birds between the two habitats were probably due to changes in the grassland structure and insect abundance. Shy species such as the lesser florican and quail which prefer tall grass cover, inhabited the enclosures. In the earlier studies at RWS, *Acorypha* (abundant in the enclosures) was found to be the main diet of the great Indian bustard and thus, bustards frequented the enclosures more. The eastern skylark was an active and agile predator of the grasshopper *Acorypha*, moving swiftly through the grass in pursuit of them. On the other hand, the Sykes's crested lark, ashy-crowned finch-lark, lapwings and the Indian courser forage slowly, and probably fed largely on the slow moving *Crotogonus* and beetles common in grazed grassland.

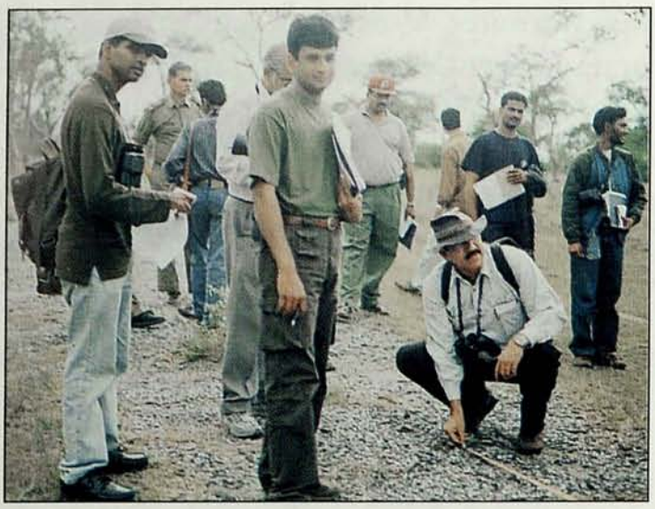
Scrub preferring birds were more abundant in the scrub dominated areas of enclosures due to the thick and diverse scrub vegetation, and lack of human disturbances in it. For example, three families of common babblers *Turdoides caudatus* had territories in the scrub area sampled in Enclosure-I, compared to one family in the grazed grassland. Also, the site in the enclosure supported 20-30 nests of the little brown dove *Streptopelia senegalensis* compared to 3-5 nests in the grazed grassland site.

MAMMALS: Among lesser mammals, the blacknaped hare *Lepus nigricollis nigricollis* was regularly recorded during census in the enclosures (unlike grazed grasslands), due to lack of human disturbance and availability of more grass biomass (for food and as cover from predators). The Indian fox *Vulpes bengalensis* has benefited immensely from the enclosures. Most of its dens were located in or near the enclosures, and a good proportion of these were dug in the trench cum mound (TCM) walls of the enclosures. Protection, absence of humans, and a higher availability of food, such as fruits of ber (*Ziziphus mauritiana*), Indian laburnum (*Cassia fistula*) and the *Acorypha* grasshopper, attract foxes to the enclosures. However, rodent abundance (important for pups) was estimated to be higher in the grazed grassland, especially the areas bordering crop fields. The fox probably moved into such area and crop fields at night, but the lack of night vision equipment and radio telemetry to follow these largely nocturnal animals hampered the efforts to collect data.

The wolf *Canis lupus* is another beneficiary of the enclosures, in terms of safe and undisturbed denning sites, resting areas, and enhanced food supplies (due to buildup of prey populations). However, as wolves have large territories, their population has not seen an increase in RWS, though their offspring may be colonising other suitable areas nearby. The blackbuck *Antilope cervicapra* population had undergone a dramatic rise after the establishment of the Sanctuary. From a low of 17 individuals in 1985, and 38 in 1988, they numbered around 450 animals during the study. The increase probably had more to do with protection than direct or indirect benefits of the enclosures. The blackbuck is now a nuisance to the local farmers due to crop-raiding.

THE OUTCOME: The study showed that the establishment of enclosures has different impacts on the flora and fauna. On the whole, it has benefited rare and endangered grassland species such as the great Indian bustard, lesser florican and the wolf. The spread of scrub, though beneficial to scrubland birds, needs to be restrained, to save the grassland flora and fauna, for which the Sanctuary was created. A serious problem is the increase in blackbuck population and the resulting crop damage, which has negatively affected the people's attitude towards the Sanctuary.

Networking of Partners



Dr. A.R. Rahmani, Director, BNHS demonstrating a bird census technique to the participants of the training workshop held in Mudumalai Wildlife Sanctuary on January 30-31, 2001

The Indian Bird Conservation Network (IBCN) is a project undertaken by the BNHS that aims to promote conservation of birds and their habitats by developing a national network of individuals, organisations and the government.The IBCN partnership aims to strengthen the capacity of its partners, NGOs and individuals in field studies. It is funded by The Royal Society for the Protection of Birds (RSPB) and sponsored by BirdLife International. The IBCN has conducted five bird census techniques training workshops for its partners in Assam, Mudumalai Wildlife Sanctuary, Hyderabad, Mumbai and Keoladeo National Park. More than 60 partners have been trained to collect data on birds in a systematic, coordinated manner.

Hornbill Clubs inaugurated

The Conservation Education Centre (CEC), of the BNHS, has initiated a project to sustain the interest of young naturalists beyond their short visits to the CEC. Hornbill Clubs will be started in fifteen select schools of Mumbai with financial support from the Burhani Foundation, a charitable trust committed to environment protection. Five Hornbill Clubs have already been inaugurated by the trustees of the Foundation. Members will be taken on nature trails, overnight camps at national parks and sanctuaries, besides other activities throughout the year. The best Hornbill Club will be awarded a cash prize and BNHS publications.

Trustees of the Burhani Foundation and BNHS officials attended the inauguration of a Hornbill Club for young naturalists

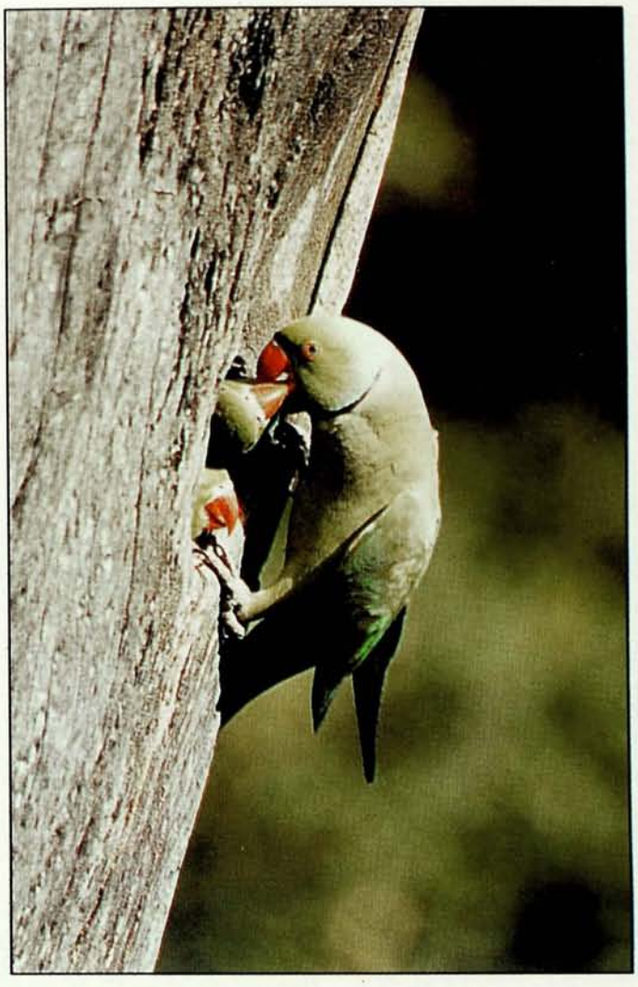
World Wetland Day Celebrated

World Wetland Day celebrations on 2nd February aims at spreading awareness about the natural or manmade water bodies and marshes, often mistakenly called wastelands. BNHS celebrated this day at the Kawar Jheel, Beguserai district, Bihar. A large number of community elders, elected representatives and administrators participated in the event. Kawar Jheel is a notified bird sanctuary and is an important wintering ground for extralimital migrant birds. It is also an important stopover point for passage migrants.

In Mumbai, students of the Hiranandani Foundation School were taken on a nature trail along the bank of Powai lake — once an important potable water source of Mumbai, it is now fit only for industrial use.

SNAP SHOTS

Text and Photograph: Hira Punjabi
Hira Punjabi is a widely travelled, award winning photographer and a BNHS member



IT was my third visit to the Keoladeo National Park, Bharatpur, in April 1996. The Park is famous for its migratory birds, which arrive from November to January. Why would one then want to be in Bharatpur, in this scorching, dehydrating heat with the temperature rising above 40 °C in the shade?

During my last visit to the Park, in January, I had seen a slide show on the roseringed parakeet, presented by a forester. I had decided then that I would photograph this bird, which breeds from March to May. Subsequently, I planned a six day trip in mid-April. I located a roseringed parakeet nest about 2.1 m high, around 7.00 in the morning, on the very first day of my trip. Excited by this quick discovery, I focused my camera on the nest, when I saw the parent bird coming to feed the young ones. I was hoping to get a good family potrait, but was greatly disappointed when the bird entered the nest and flew away after a few minutes. This happened five times. Hot, tired and dejected I left to return the next day. I had to return empty handed for four consecutive days thereafter. The nesting activity indicated that there were four chicks in the nest. On the last day of my trip, I started out as usual and waited for about half an hour, when I saw two chicks put their beaks out of the nesting hole and a parent feeding them. I shot almost half a roll in my excitement and got some more pictures the same evening.

The four chicks had grown considerably in size and there was not enough place for the parent bird to go inside and feed them giving me an opportunity to capture this shot in my camera. I had learnt a lesson — 'patience pays'. This was one of my most delightful experiences in wildlife photography in Bharatpur.

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