Hornbill

April-June, 2000

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April-June 2000

Cover:
Veiled Mushroom
Isaac Kehimkar

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FEATURE

4. The hidden world of mushrooms

— Priti Sawant

The monsoons have arrived and so have the mysterious residents of the forest floor. These simple, but interesting newcomers help maintain the delicate ecological balance of nature. An invaluable gift of nature, lets acknowledge the presence of these priceless beauties this monsoon.

OTHER FEATURES....

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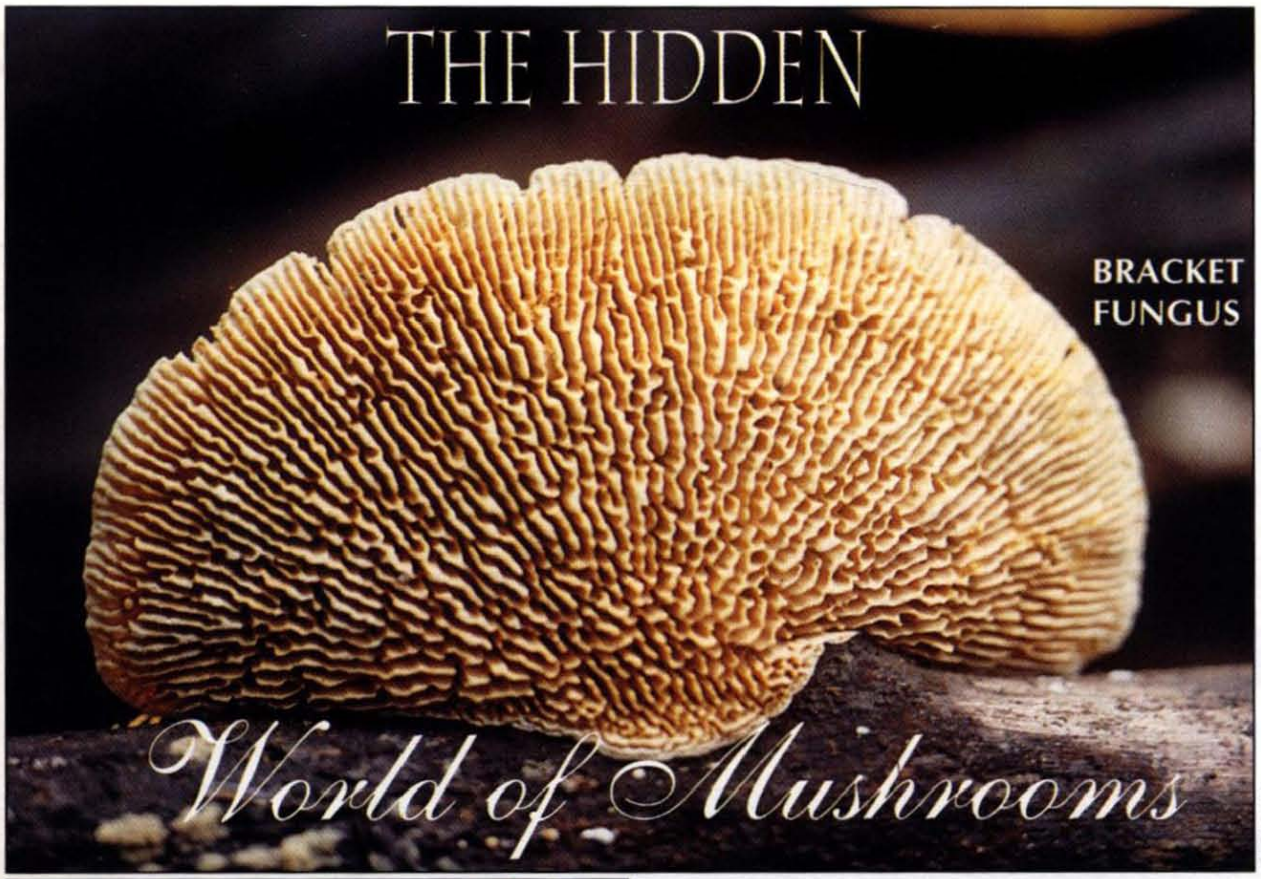
VIEW POINT

URBAN ENCROACHMENT

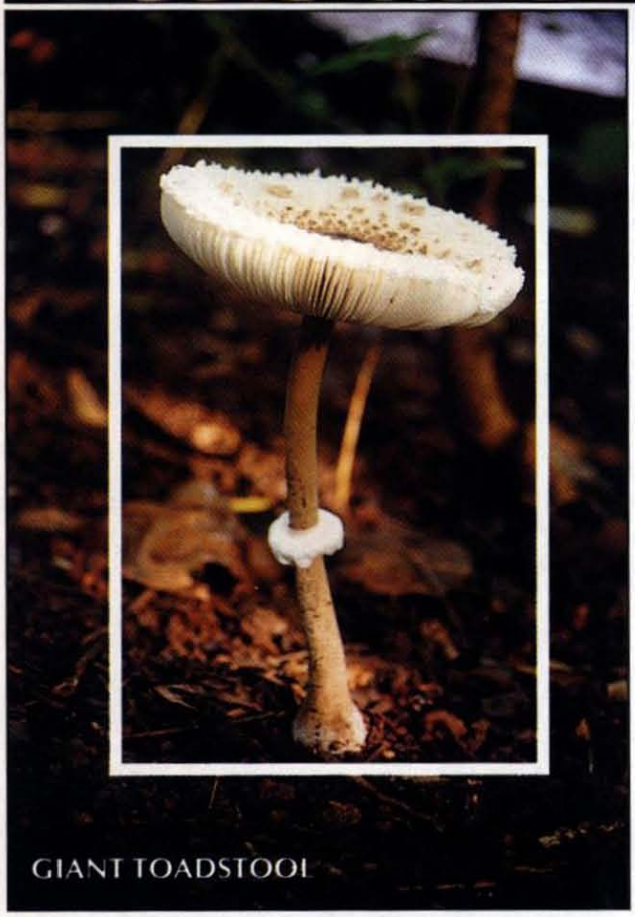
INDIA, although having hardly one-fortieth of the world's land surface, supports more than one-half of the world's water buffalo and more than one-seventh of its cattle and goats. The effect of the constantly increasing pressure of these domestics on the land (particularly grasslands and forests) has been disastrous. In India, land urgently in need of rehabilitation because of wind and water erosion, salinity and alkalinity, now exceeds an area of 100 million hectares. The Chambal valley, with four million hectares ruined by eroded ravines, demonstrates what can happen elsewhere. On top of these continuing pressures on land resources, urbanisation has now become a major threat. The urban Indian population is the fourth largest in the world, and it will continue to grow while agriculture on impoverished land, fragmented by inheritance distribution among members of a family, fails to support the increasing rural population. At the same time, more agricultural land is taken up to meet the demands of urbanisation. Approximately three million hectares of arable land have been lost in this manner since 1950. These losses are borne in the final assessment by the forest and grassland habitat of India's people and wildlife. With an ever-increasing human population we cannot afford to lose agricultural land to urbanisation.

J.C. DANIEL

THE HIDDEN World of Mushrooms



DEEPAK APTE



GIANT TOADSTOOL

DEEPAK APTE

By Priti Sawant

Mysterious Mushrooms

Cute little umbrellas, they sprout from the ground,
in the season of Monsoon they are often found.

Sometimes on woods, sometimes on floors,
growing on leaf litter, with millions of spores.

Colourful caps with gills below,
appear on stalks like a soft pillow.

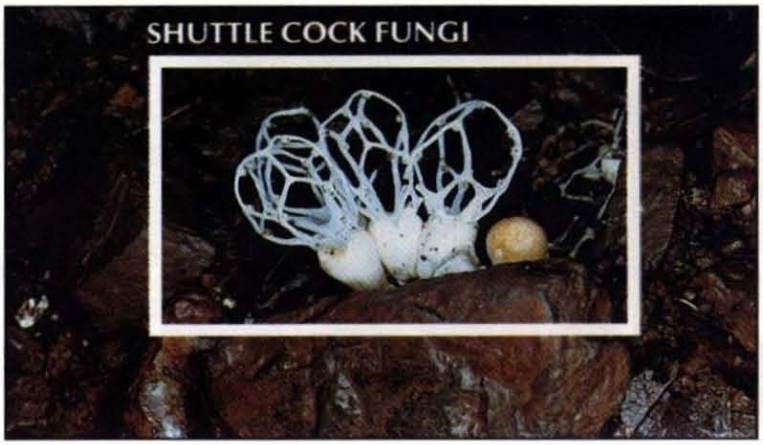
Throughout the year they sleep in the ground,
but when they arrive, they don't make a sound.

Recycling experts of mother nature,
they usually feed on dead creatures.

That's the mystery of Mushrooms you see,
sometimes in clusters, sometimes free.

Priti Sawant

No sooner than the monsoon starts, almost overnight, the woodland floors are taken over by myriad mysterious shapes. Caps and parasols, balls and crumpled sheets, layered plates and overlapping shingles, muted and gaudy, they seem to appear from nowhere, thrusting up among the fallen leaves, or encrusting dead wood. These newcomers are all fungi, which burst into view only when their fruits are formed. Mushrooms and toadstools are the well known ones, but the list is endless: truffles, yeast, mildew, moulds, rusts, puffballs.


SHUTTLE COCK FUNGI

DEEPAK APTE

Strange as they are, you never know in what disguise they may appear, just like extra terrestrials. They have no stems, roots or leaves. Even the most advanced and complex of them are but an interwoven tissue of branching threads most of the time. At first sight, they appear to be simple plants like the algae that for some reason have lost their chlorophyll. In fact, early naturalists considered them to be exactly that, which is why fungi are still within the province of Botany.

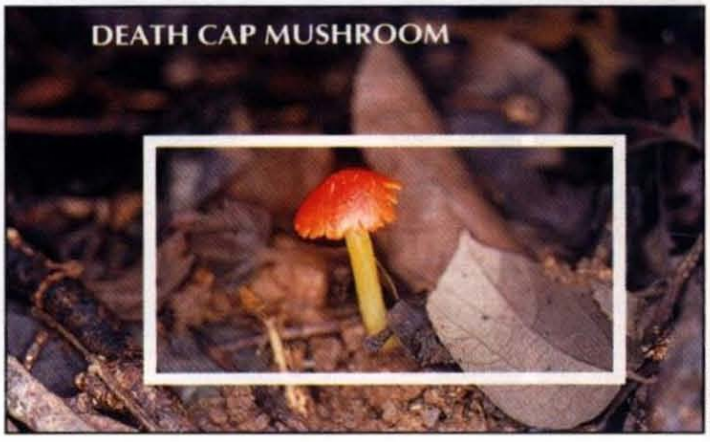
Fungi are not fussy: dead or alive, a fungus will find any source of nourishment in order to live. They lack cholorophyll and therefore cannot use solar energy to manufacture their own food. Instead, they absorb carbohydrates directly from plants and animals through a network of fine, branching threads called hyphae which are always hidden inside the substrate. The hyphae group together in a cobweb-like net called a mycelium.

When a fungus is ready to reproduce, it forms fruiting bodies, such as toadstools, above the surface. These fruiting bodies are the equivalent of flowers. A parallel must not be drawn though, for the genetic particles produced by these structures are not seeds but spores. Spores are microscopic, consisting of a single cell, and carry no food store to sustain the young individual that will emerge from them. There is no courtship display, nor does one need to fuse with the other to reproduce, they propagate vegetatively. The fruiting bodies' function is solely distribution. If the spore lands in a suitable spot a new fungus will grow. In mushrooms and other fungi, forming of the spore-bearing cap is not triggered by light, but by the alternation of dry and wet conditions, coupled with the right temperature.

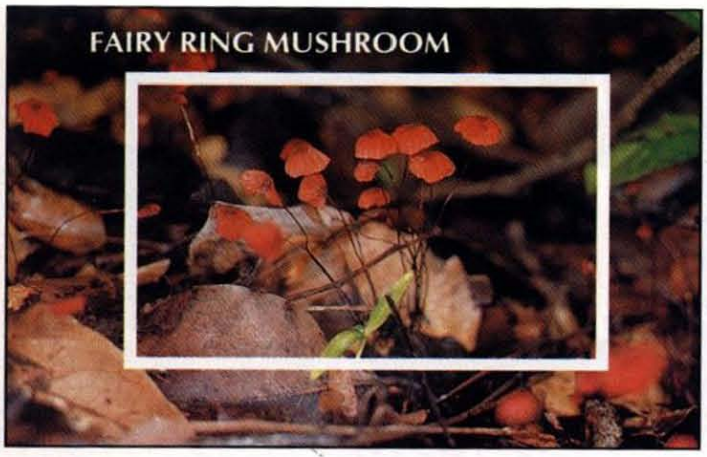
The small spores are easily carried away by the slightest breeze, but even so, they have to be released so that the wind can catch them. Mushrooms and toadstools, with their heads several inches above the ground, simply shed their spores from the vertical plates on their underside, their so-called gills. A single mushroom, in the few days before it decays, may discharge ten thousand million of spores.

Some fungi produce spores in tiny tubes. As these structures mature, they change chemically so as to absorb water. They do it with such vigour that the tube bursts, usually at the tip. These fungi are usually in the shapes of cups or discs. A cap is thrown off or a lid cast back and the spores shoot out. In some fungi, they travel on food. One such fungus can be found on cow-dung. The deposited spores are eaten along with the grass by cattle, eventually emerging on dung elsewhere.

Mushrooms, no doubt, have attained popularity and are certainly in the hall of fame for

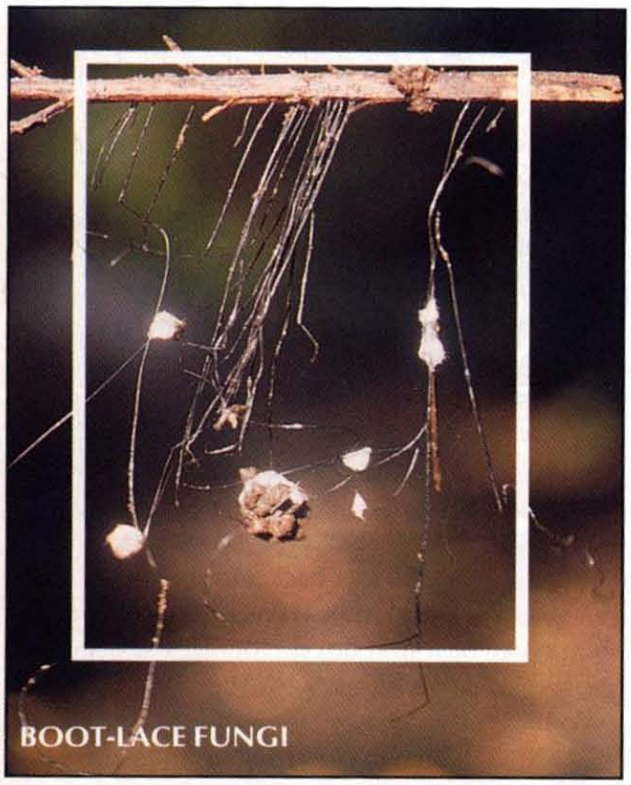

DEATH CAP MUSHROOM

DEEPAK APTE



DEEPAK APTE

their edibility as well as toxicity. The number of species is just mind boggling. Statistically speaking, about 1.5 million fungal species occur on our planet. Mankind has succeeded in understanding clearly, only about 70,000. Of these, around 10,000 are mushroom species, from which 2,000 belonging to 30 different genera are proven edible, while about 25 varieties are poisonous. Many toxic mushrooms belong to the genus *Amanita* and are widely known as fly agaric, death cap or destroying angel. About 8,000 comparatively less studied species are collectively listed as edible. From the 2000 proven edible species, only 80 have been artificially cultivated in research laboratories around the world.



DEEPAK APTE

The common name given to mushrooms explains their physical appearance, the Ink cap (*Coprinus* sp.) mushroom resembles an ink-filler, it also releases a dark fluid from the periphery of the cap at the time of maturity.

You will at times come upon long strips or circular areas where the grass is greener and more lush. Numerous mushrooms grow in these areas, at the right time. Arranged in circles, the "Fairy Ring" has a life span ranging from 3-7 days. An old superstition narrates that mushrooms growing in a circle represent the path of dancing fairies. This natural phenomenon has taken the shape of a beautiful story, or was it the magical way of teaching children an art that is endangered like the many species known.

During the early rains, many pinkish white 'puffballs' (*Lycoperdon* sp.) project their spores vertically into the air from the moist soil. As they mature, they turn yellow, become hollow and shed their spores internally. The ball hardens and becomes so rigid that the impact of a rain drop causes it to vibrate and a fountain of spores is ejected from the top, like a cloud of smoke.

DEEPAK APTE

Often seen on wood piles, the tiny fungi called bird's nest (*Cyathus* sp.), produces a small crucible in which nestle a few small 'eggs' which are actually small capsules with spring-like filaments at their base that attaches them to the crucible. The number of eggs varies from

a couple to eight or ten. The crucible is so shaped that if a heavy raindrop falls into it, water droplets are deflected up around the sides, detaching the capsule and projecting it up to 2 m. Their attaching threads unwind behind them and finally break. They have a sticky end that catches on to a leaf or a stem and the capsule hangs there, releasing spores when conditions are just right.

Corals (*Clavaria* sp.) resemble corals found in the sea. They can be seen in clusters of whites, yellows and pinks at the base of large trees. They are branched and usually with a forked tip. Similar to Corals are the so-called cauliflower fungi (*Sparassis crispa*) with fruiting bodies consisting of multiple flattened branches arising from a thick stalk. The large white to yellowish bodies resemble a bouquet of egg-noodles. Bush or club fungi cannot be ignored as they share the woods and grounds equally with the corals. As the name suggests, they are often found in clusters.

Imitating the human anatomy is the ear fungi, *Auricularia* sp. which looks exactly like a human ear. Growing on dead planks of wood this fleshy, soft, pale pink fungus is dark brown when it matures. *Xyalria* or dead man's finger, sounds dangerous but is interesting to observe. These fungi live long, and can be seen even after the monsoon, projecting straight or curved finger-like from logs of dead wood. Initially white, it turns brownish black as it matures. Tooth fungus (*Hydnum* sp.) grows on wood, is mostly yellow with a number of tooth-like structures coming out. The funny looking Boot-lace fungi are long, black, hair-like strands that run out from dead branches, and look like shoe laces.

The Stink-horn or Veiled mushrooms like *Phallus* and *Dictyophora* use insects as distributors. When they first push up through the ground, they look like eggs, but soon a spike, capped with a slimy brown head breaks through the skin of the egg and grows upwards with astonishing speed. The spike carries a long lacy netted skirt all around from the top. This strange fruiting body gives off a foul smell that is as unpleasant to our nostrils as it is attractive to flies. Flies are attracted by the odour and visit the sweet, sticky cap, disseminating the spores, which cling to their mouth parts and bodies and pass through the alimentary tract. Speaking of the stink-horns, *Clathrus* which somewhat resembles a shuttlecock is another of the same type.

PRITI SAWANT

PRITI SAWANT

Flat, shelf-like fruiting bodies called Brackets (*Polystictus* sp., *Ganoderma* sp., *Polyporous*, *Hexagonia* sp.) infest trees. The brackets usually grow horizontally from the tree trunk and release spores into the air. Some brackets become hard and woody after their spores have been shed. Although they are often slow-growing, they probably kill more trees than any other group of fungi. *Pleurotus*, the soft, white Oysters are look-alikes of the brackets but do not harm the tree.

The Earth-stars (*Geastrum* sp.) produce a ball with a double skin. When this ripens, the outer skin splits, turns inside out, and pushes the inner sphere upwards. The under surface of the split skin is bright red or yellow, so that an earth-star at this stage looks almost flower-like. The spores then puff out from a hole in the centre of the inner bag.

Truffles, no, not the chocolate, but an edible fungus found underground. Dark brown, they look like roots of the Yam plant. It is difficult to find them as they leave no tell-tale signs above ground. But they smell good.

Perhaps the most remarkable of all these fruiting bodies are the luminous mushrooms of the tropics. It may well be that their greenish lights, glowing on the forest floors at night, serve to attract animal messengers or serve as lamp lights for the tiny creatures of night.

Yeast, Mildews, Moulds and Rusts mainly occur on leaves and crop plants. Except yeast which is used in pharmaceuticals, all others infect the host on which they live.

The variety of substances that fungi can digest is extraordinary. Some can live on petroleum, others on thin films that coat lenses. Silica, magnesium, iron, even plastic is consumed.

They sail high in the sky, float in rivers and in the sea. They can live anaerobic conditions and tolerate temperatures as high as 140 °F and as low as 6 °F below freezing.

Eventually the biggest and most vigorous of trees must fall. Its body contains several tonnes of carbon, nitrogen, phosphorous and other valuable elements that the tree has extracted from the atmosphere and the ground. But in this form these valuable substances are locked away and beyond the reach of any other plant or animal, for the cellulose and lignin, which makes up the bulk of a tree are extraordinarily stable substances. No animal digestion can break them down. No plant root can dissolve them. Only the two, Bacteria and Fungi can reduce them to their basic elements.

In forests, fungi feed predominantly on dead plant tissue. Great quantities of it lie on the ground and all of it is at their disposal since no other organism can digest it. They attack it with a powerful acid. The fact that their own bodies are constructed from chitin is clearly very significant. Were they made of cellulose, they would be in danger of dissolving themselves.

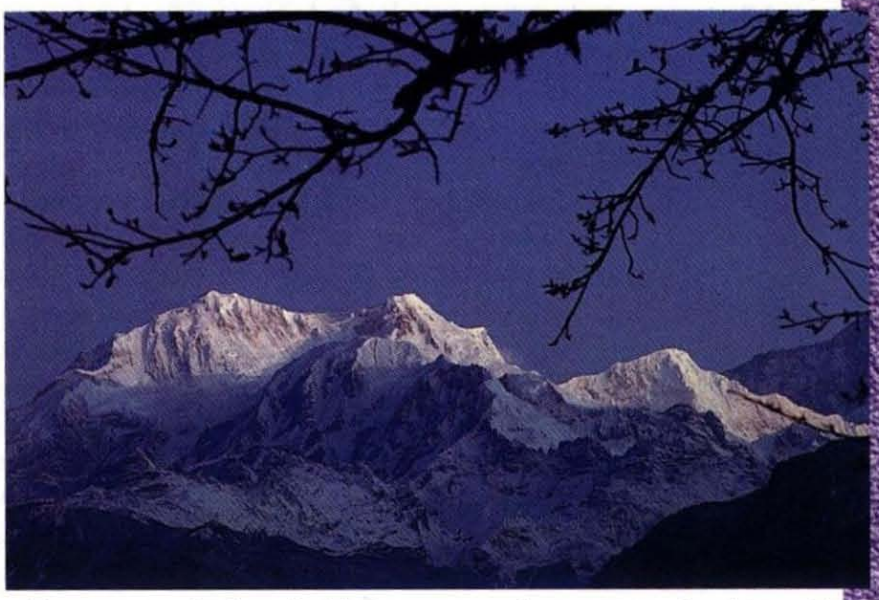
Without fungi, the woodlands would soon be buried under piles of plant and animal remains. When the fungi feed on this dead and decaying material, they release some of the nutrients back to the soil. Fungi are a vital link in this cycle.

Mushrooms are relished all over the world. Indians have started realizing the food value of mushrooms only lately. Better late than never. Some Indians still do not know that the mushroom is a hundred percent vegetarian delicacy. Low in calories, and high in B-vitamins and minerals, they are excellent sources of Vitamins A, D, K, C and the B-complex group — Thiamine (B1), Riboflavin (B2), Niacin, Pantothenic acid, Biotin and Folic acid. These vitamins are well retained even when cooked. The mineral content in these fungi is much higher than in many fresh vegetables and fruits; phosphorus and potassium being the main constituents, copper and iron are also present in appreciable amounts besides sodium, calcium, magnesium and some trace elements. They are rich in proteins containing most of the essential amino acids, required for human beings. Mushrooms are almost devoid of fatty acids and cholesterol. In short, mushrooms make an ideal food for obese persons, heart patients and diabetics. Scientific evidence proves that many varieties have compounds which help in reducing blood cholestrol and hypertension. Needless to say, mushroom pizza is loved by children of all ages.

They were the second group amongst the plant life to arrive on the earth. In India, they grow almost in any habitat, right from evergreen and deciduous forests to the coniferous forests of the North. In countries like America, Australia and United Kingdom people relish mushrooms. In some places they have museums and research centres to study various mushrooms and fungi of their forests.

In a nutshell, fungi and mushrooms play a vital role in maintaining the ecological balance of nature. The only problem is that this Gift of Nature has been largely ignored by us Indians.

Priti Sawant, is an Education Assistant, at the Conservation Education Centre, BNHS. She is presently doing her doctoral studies on mushrooms.



No one can resist the call of the snow covered mountain peaks of this cold desert of India which beckons one and all

WILDLIFE IN SIKKIM

Text and Photographs

Lt. Gen. Baljit Singh (Retd.)

Most people who once venture into Sikkim get smitten for life. Some have written sensitive accounts. Usha Ganguli-Lachungpa's article (*Hornbill Jul.- Sep., 1999*) is among the more descriptive prose on Sikkim that I have come across. My wife and I enjoyed her account immensely, more so because in 1980-82 we had the chance to walk over the same ground.

In an otherwise very well informed text there is perhaps one flawed inference. Talking of the Chho Lhamo Plateau she writes, "the few kiangs we see today are only a remnant of a bigger population of bygone days when the area was not occupied by our armed forces." Fact or folk-lore?

From the point of view of natural history observations and the records for the period 1901-1999, it would be interesting to recall the doings of our armed forces on and around the Chho Lhamo Plateau. Indeed, way back in 1901, the British Expeditionary Force to Lhasa (three battalions of Indian troops) under Col. Sir Francis Younghusband had staged up to Thangu, about 20 km south of this plateau. A mounted detachment of less than one hundred established contact with the fort at Kamba Zong, about 30 km north of Chho Lhamo. They were to remain there for nearly nine months in perpetual stalemate, as the Tibetans could not be provoked to even look at them. The accounts of the Expeditionary Force make frequent mention of birds and animals encountered and trophies acquired, but there is no mention of kiangs either on the Chho Lhamo Plateau nor on the vast plain stretching to and beyond Khamba Zong. Lord Curzon, the Viceroy, in a letter to Younghusband wrote "I have an idea that Khamba Zong has become a sort of scientific playground

Stone shelters used by yak graziers enroute to Chho Lhamo; this is how far Col. Sir Younghusband established base in 1901

with botanists, geologists, mineralogists sticking their heads out behind every rock". Also, there is just no mention in a recent biography of Younghusband of any sizeable population of kiang anywhere. Usha Ganguli-Lachungpa may access their original reports from the India Office Library, London, which would be of historic significance, as in all likelihood that would be the first recorded natural history of southern Tibet.

The entire force was withdrawn and relaunched in 1902-03, from extreme East Sikkim via Jelpa-Chumbi Valley-Gyantse and on to Lhasa. In the vicinity of Gyantse about 150 km northeast of Chho Lhamo and separated by a formidable mountain range, and the first, truly trans-Himalayan plain, there were kiangs sighted and recorded: "As they entered this wilderness, rumours of an impending attack by hostile cavalry ran down the column. This was due to the sighting, for the first time, of the large wild asses known as kiangs skirmishing in the middle distance in troops of ten or twenty. At first we mistook them for detachments of Tibetan Cavalry, the wild horsemen of the Changtang, as they came galloping along in a whirlwind of dust, executed a perfect wheel-round, then extended out in line at regular intervals and advanced again, and as if at the word of command reformed into close order and came to an instant halt. No troop of cavalry was ever more symmetrically ranked, more precisely simultaneous in its evolution."

Once the Expeditionary Force withdrew from Tibet in 1903, there was no armed presence in Sikkim till about 1952.

Post Independence, I have had very extensive exposures to Sikkim. The first occasion was in 1959. Our Army presence was less than two hundred, mostly on the outskirts of Gangtok and occasionally very small detachments were set up at Kupup and Nathu La-Jelap La. I walked across the Chho Lhamo Plateau and what I can recall today are three scattered groups of kiangs not amounting to more than twenty animals in all.

In 1962, we were at war with China and by that year-end, there was one Army Division in Sikkim. By mid '63, I was on the staff of the Division Headquarters at Gangtok. The entire Army presence remained exclusively east of the line Gangtok-Nathu La. It was now that I traversed the Plateau east-west, also made several north-south transects and walked a good deal along the International border in the Plateau region and in the Lohnak Valley to its west. I cannot recall having seen more kiangs than in 1959. By now, an Assam Rifles contingent had established at Chungthang, which is more than 70 km south of the entry to the Plateau. In 1962-63, I read on Sikkim all and sundry writing that came my way. The most detailed was a book by Claude White, the first British Resident at Gangtok. Around 1895 (?) he had camped at the northern Crest-line of the Chho Lhamo Plateau which he believed to be the watershed. He remained there for a month or more and gave a detailed description of the Plateau but again no mention of a large kiang population.

In 1981, for the first time in Sikkim's history, army troops (one battalion) were located on the southern fringes of the Plateau. I had the honour of being the Brigade Commander responsible for the defence of North Sikkim. I confess I did not notice any change in the status of kiang population from the 1959 figure.

What is the information source on kiangs having "bigger population of bygone days..... on this Plateau?" Of the many beautiful tales from Sikkim there is one which assigns to a mountain saddle, barely 20 km north of Gangtok, the name Kiangnosa La which translates as 'the pass of hundred kiangs'. But that is a fable because it never was a kiang habitat. Till the 1950s, that entire area was claimed as the best Rhododendron forest in the world (with rainfall close to Cherrapunji). In patches, it still is a dense forest, though a mere ghost of the past, but certainly even in its degraded form, no habitat for kiangs.

Lastly, what I think did impact adversely the ecology of the Plateau post 1962, was the rehabilitation of 20-30 Tibetan refugee families in north Sikkim (where not one permanent human habitation existed till then). Their subsequent growth, and the year round presence of a few thousand heads of grazing cattle (I learnt of this figure in 1995), where not more than a couple of hundred transient yaks and sheep used to wander up to the 1970s, have had consequences.

Miscellanea from JBNHS

Hawk-Moth and Spiders

I have this moment witnessed the following occurrence in my garden. Probably it is a common one but on the chance of it being worth recording, I describe it. I was watching a bee-hawk moth, with clear wings, darting about over a bed of zinnias. As it hung over one flower it suddenly was caught as if in a trap, and beat its wings violently. I took it by one wing, put it in the palm of my hand, where, in a moment or two, it died. I then looked at the zinnia, and found squatting on it a lemon-coloured spider with a triangular body and long yellow legs. I lowered the dead moth near it when the spider caught at it with its fore legs, pulled it down, buried its face in the moth's chest, and doubtless started sucking the moth's juices.

The amazing thing was the strength of the spider in comparison to its small size. It had a smaller brownish spider on its back. Everyone knows what a vigorous creature the hawk-moth is. This was a very fine specimen, yet in under 15 seconds it was moribund.

The spider was on one of those virulent mauve zinnias and there was no effect whatever of any protective coloration.

C.G.C. Trench, I.C.S.
Damoh, C.P., 30th July 1910

Cobra with Kingfisher in its throat

Recently a cobra (*Naja naja naja*) was brought to us alive with the head and bill of a white-breasted kingfisher (*Halcyon smyrnensis*) caught in its throat. The long beak and broad head of the bird was too much for the cobra to swallow or regurgitate and the snake would probably have died if we hadn't carefully removed the bird. There are a few records of cobras swallowing large, active birds. This adult kingfisher was perhaps caught by the cobra on its roost at night.

R. Whitaker
Madras Snake Park,
Guindy Deer Sanctuary,
Madras 600 022,
February 10, 1974

■

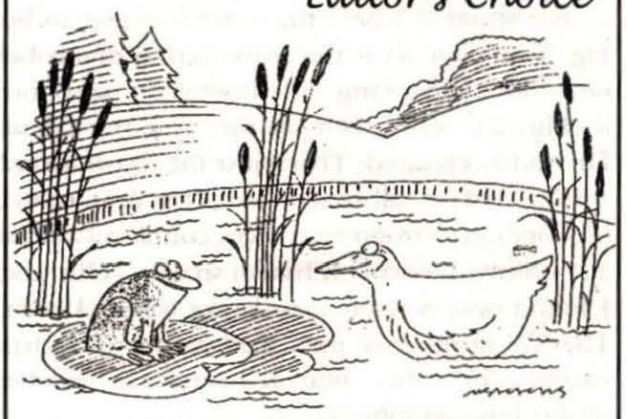
An egg-eating Cobra

A short time ago a large-sized cobra was killed on a Guinea-fowl's nest; the nest contained 15 eggs and the cobra had swallowed six.

After killing the cobra the six eggs were pressed out and set, three of them eventually hatching out.

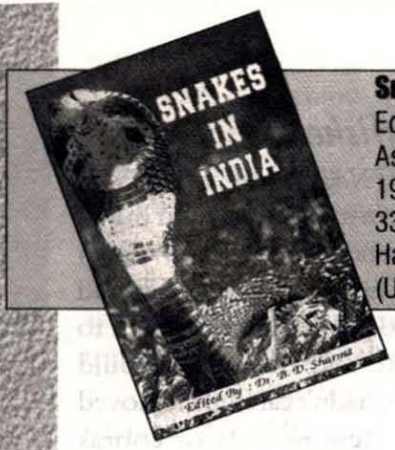
E. Brook Fox
Bankipur, 1st January, 1905

Editor's Choice



"My lawyer finally got me on the endangered-species list"

Drawing by M. Stevens,
Courtesy: The New Yorker Magazine, Inc.



Snakes in India
Edited by: B.D. Sharma, Asiatic Publishing House, 1998, pp. xvi+352, 33 fig., 33 plates, (22 x 14 cm) Hardbound price Rs. 995 (US$95).

Reviewed by Romulus Whitaker

According to the not so subtle subtitle, this book is "An indispensible (*sic*) book on Indian snakes, their ecology, conservation and clinical study". This volume is, in this reviewer's opinion, almost wholly dispensable. The first draft of this review was a blow by blow (actually chapter by chapter) account of this disastrous production, but it ran to 6 long pages. This is an edited version which samples some of the classic blunders.

With a few exceptions, the illustrations are either poor to begin with, printed badly or both. Many pictures are twisted, preserved specimens; one is sideways (Pl. 37), several are misidentified (Pls. 17, 19, 20 and 21) and one is actually a negative image (Fig. 30)! The pictures serve little purpose, since they are so unclear as to render them useless in helping to identify the random collection depicted, and as a result also render the associated Chapter 8 worthless. Fig. 3 on page 29 shows the profile of a cobra's head, but with its eye situated where the nostrils ought to be. Fig. 5 on page 31 is the cross section of a cobra fang, not a viper fang. The Russell's viper photo in Fig. 21 was taken by me, not my friend Dr. Vad as credited. That's just the illustrations!

The preface informs us that "the up-to-date" bibliography of 666 references contains "almost all published works on Indian snakes." Of these, I found only 5 references dating to the 1990's. The real number of published works on Indian snakes is probably about ten times the number in this bibliography.

Chapter 1 (by Anil Khaire) is one of the few that stand out. It is a nice, simple description of snakes in general, obviously written by someone who likes and knows them well. Chapter 9 by T.S.N. Murthy is also a well written but dated piece, dealing with the venom systems in snakes. Perhaps the most important fact brought to the fore is that snakebite is rarely fatal and that fast administration of antivenom serum is of prime importance. Advice, however, for avoiding snakebite is "just avoid snakes"! The editor is responsible for Chapters 2 to 8 (except 6) and though you can find some useful facts therein, you must read through a lot of poorly edited shoddy writing, rife with confused facts. Need a few examples? Try page 9, where the author states that 'in India alone 15,000 to 30,000 people die of snakebite' and a few sentences later says that "deaths due to snakebites in India alone tune to two million per year"! And in Chapter 3, the casualties come down to a lakh of people each year. On page 14, the author repeats an error started by P.J. Deoras in his book SNAKES OF INDIA that in a cobra fang "the venom simply trickle (*sic*) down the groove of the fang".

Scientific fact no. 39 is titled "Cobras and the kind (*sic*) cobras are the hooded terrors among the venomous snakes." In a book purporting to "dispel the fear and detest in the minds of the people", the purpose is defeated by such statements.

Chapters 6 and 16 are ones I'm partly to blame for. Both were written 30 and 20 years ago respectively. While the first isn't worth much, the second (on snake conservation) is not too bad but very out of date.

Impatiently going down the checklist of Indian snakes in Chapter 11, I noted at least 20 omissions (*Eryx whitakeri* – my single claim to immortality!) and several errors. Since 1990, the three Indian cobras have been given full species status. *Vipera russellii* is now *Daboia russelli* and several pit vipers have been renamed.

In Chapter 12, besides wrong statements like "cobra venom is the most potent venom known", it is stated that Russell's vipers cause more deaths than cobras "due to its unflinching fatal bites". A humorous choice of words but untrue; cobras, just by being so common, almost certainly cause more bites, and deaths, than any other Indian snake.

Chapter 15 by S.K. Talukdar is on the ecology and conservation of snakes. He put me off

immediately by calling snakes "repulsive creatures" in the first paragraph. Repulsive authors is more like it! And moreover he tries to credit me for more than I deserve – I seem to have "recorded" a 33 foot long reticulated python in the Nicobar Islands! Having not set foot on the islands, I wonder how I was bestowed the honour of "recording" this mythical creature. Then he says that this python is "the most threatened amongst the Indian serpents" which is way off the mark.

The meaty, fairly current stuff comes from the highly respected American snakebite and venom expert, Sherman Minton. Although it is only 4 pages long, Chapter 17 deals with the relationships of Asian venomous snakes as evidenced by comparing proteins in snake blood serum. We're so used to looking at snakes as evidenced by comparing proteins in snake blood serum and aligning them by their external characteristics that the results of this kind of study (and DNA comparisons) are sometimes a jolt. Dr. Minton moves on to a generalized discussion of snakebite in Chapter 18. Though brief, it brings us up to date and discusses some of the obsolete (and sometimes dangerous) first aid measures. In Chapter 19, Dr. Minton lists the species of snakes generally considered to be non-venomous, but which actually have toxic saliva and can cause serious bites. Several of them have relatives here in India and he cautions that we should be careful with snakes like the checkered keelback, olive keelback and some of the cat snakes. Chapter 20, also by Dr. Minton introduces the venom detection test using ELISA which is available in American and Australian hospitals and can be used to confirm envenomation (useful when the snake is not seen or symptoms are slight). This system is not in use in India, but it would be very helpful. Chapter 21 is on rattlesnakes. Though interesting, why is it in this book on Indian snakes?

Chapter 22 is a lengthy discourse by Australian snakebite authority Dr. Straun Sutherland. The only problem is, it's about the treatment of bites by Australian snakes! Useful for the Indian tourist planning to visit Australia, I suppose.

By this time the reviewer is very weary with this tone and sure enough my apprehensions are justified. Here's a quote from Chapter 23 by N.P. and S.C. Misra: "the tapering part of the body (of a snake) has greater capacity of movement has been called tail". And how about this howler: "these seasnakes cause more deaths in America than any other variety... Most of the snakes in sea non-poisonous. Various types of rattlesnakes belong to this variety," (Phew! And omigod!) In fact, dear reader, only one species of seasnake occasionally ventures as far as Central America (*Pelamis platurus*). All seasnakes are highly venomous and rattlesnakes are certainly not related to seasnakes!

Chapter 25 is engagingly titled 'Snakebite Disease in Jammu' by R.N. Bhatt. I won't comment on the minor blunders but just read this one for flavour: "one strong lucky man gave history that a large cobra, which he had brought along after killing it, had pursued the person from his own compound to a nearby house." And the author ends with this advice: "People living in tents must built (*sic*) snake trenches around the tents which prevent snakes from crossing over sharp stones." Make of it what you will.

Chapter 26 has this advice, "even a thin layer of clothing may afford great protection" from snakebite – don't ever try it! Chapter 27 by I. Jena and A.P. Dash is on snakebite in Orissa and is not a re-hash but quite an interesting, brief analysis of the situation in that very snakey state. Deaths by cobra and krait are high and it could partly be because the antivenom used there is made from snake venoms from other parts of the country — venoms in the same species can differ that much!

Readers may think this review is a bit hard on the Editor and some authors. I think that it is a crime to produce such books in the name of Indian science and to shamelessly publish decades old facts as if they were current. This is especially dangerous when publishing first aid measures for snakebite that are obsolete. In scientific circles abroad, this book will make us a laughing stock and anyone overseas paying US$ 95 for it (that's Rs. 4,000!) would certainly not trust scientific publications from India anymore. If there is no law already against producing such low-grade work, the Indian scientific community should make one!

Butterflies
THEIR EARLY STAGES

By Naresh Chaturvedi & Isaac Kehimkar
Photographs: Isaac Kehimkar

Spot Swordtail
Graphium nomius

The female lays yellow spherical eggs, singly, on the upperside of the tender leaves or buds of the larval food plants while still hovering. Plants of the custard apple family Annonaceae, like the Mast tree (*Polyalthia longifolia*) and *Saccopetalum tomentosum* are the food plants.

Larva: The caterpillar is either yellowish-green or dark brown with a dark band across the broader part behind its head. The osmeterium which protrudes from the back of its head is glossy green. The caterpillar moves jerkily and usually remains on the upperside of the leaf.

Pupa: The fully grown larva stops feeding and turns pinkish to dark brown before wandering off from the food plant to pupate. It descends to the ground and hides under stones or dead leaves to pupate. The pupa is squarish in front and pointed behind. The pupa to remains dormant for almost 9 to 10 months. The butterfly emerges when the host plants put forth new leaves before the onset of monsoon. The adult is seen on the wing from January to July, however, on the southern hills it is seen from February to October.

Seen in the deciduous forests of Peninsular India upto South Gujarat, Madhya Pradesh and West Bengal, it also occurs further north from Shimla eastwards upto Assam.

Tailed Jay
Graphium agamemnon

The greenish yellow, round eggs are laid singly on food plants like Champa (*Michelia champaca*) of the Magnolia family, as well as Custard Apple (*Annona squamosa*), *Artabotrys hexapetalus*, *Polyalthia cerasoides*, Mast Tree (*Polyalthia longifolia*), *Saccopetalum tomentosum* from the Custard Apple family and Cinnamon (*Cinnamomum* spp.) from the Laurel family.

Larva: In the early instar stage, the young caterpillar, with a white patch on its back, appears like bird dropping and is seen resting on the silken bed made along the midrib of the leaf. The dull green mottled larva, with darker green spots, and a green osmeterium, is broad nearer its head and gradually tapers at both the ends. It turns bright green when nearing pupation and begins wandering to pupate.

Pupa: It usually pupates on the underside of the leaf or on twigs. The pupa is green with a horn-like projection which is laterally compressed, bent forward and twice as long as broad. The butterfly emerges within twelve days.

More common among these two swallowtails, it occurs in well wooded regions with good rainfall in South India upto South Gujarat. In the north, it is distributed from Kumaon eastwards upto Assam. Moreover, the recent popularity of its preferred food plant, Mast tree in cities as an ornamental has certainly benefited this swallowtail.

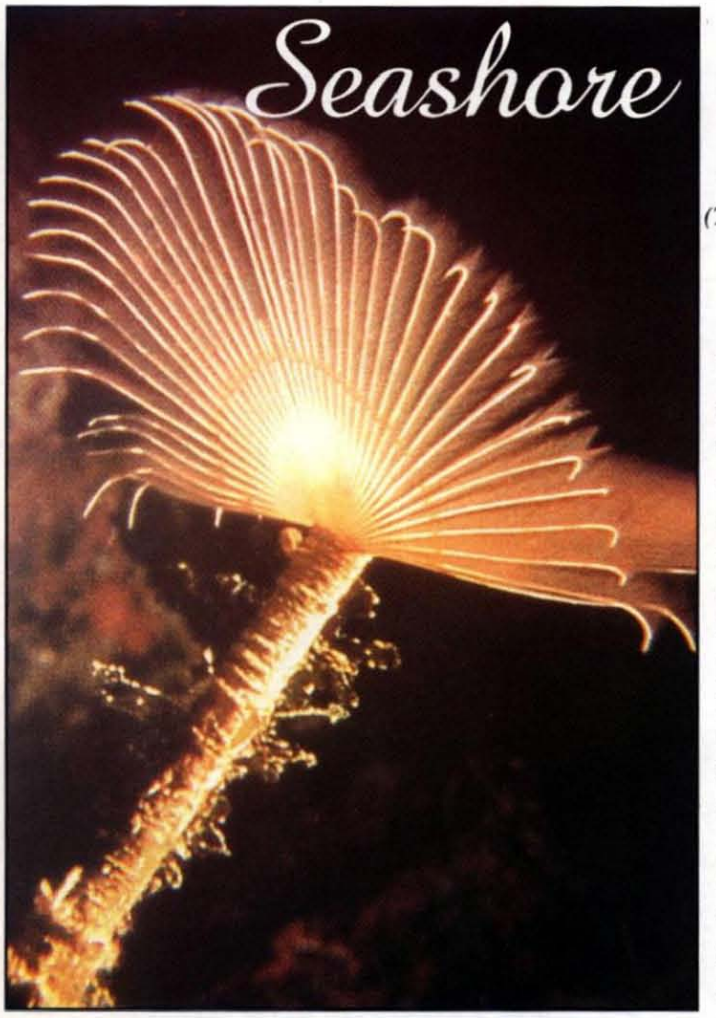
Swallowtails

The Society's association with the Great Pied Hornbill began in 1894, with 'William' the hornbill which resided behind the Honorary Secretary's chair for 26 years.

RAJAT BHARGAVA

37. LEGS
Fuzzy-wuzzy creepy crawlies of the sea

Seashore Lore



Above: Tentacles from the head of a tube-dwelling worm fan out to capture food.
Below: A typical polychaete is the cat-worm *Nereis*.

I would not enter on my list of friends
(Tho' graced with polish'd manners and fine sense,
Yet wanting sensibility) the man
Who needlessly sets foot upon a worm.

Cowper

Unlike the so-called "worms" (such as flatworms, ribbon worms, round worms), the true or Annelid worms have their body consisting of a series of similar, repeated divisions (metameres or segments) separated by cross-partitions or septa. Each ring of the body of the marine annelids (the Polychaeta) has a pair of flaps called parapodia (false feet), divided into parts and provided with bundles of many bristles (setae); these are used as paddles for swimming. There is a distinct head with eyes and tentacles.

Polychaete worms can be divided into two main groups — (1) the Errantia or wanderers, and (2) the tube-dwelling Sedentaria (sedentary worms). Typical swimming polychaetes are the red cat-worms (*Nereis*) and rock-worms (*Marphysa*), found burrowing in mud banks and dug out by anglers for bait. The body is long, slender and with segments throughout its length. Each segment bears laterally a pair of swimming parapodia. The prostomium (front of head) carries four eyes and two tentacles (also called antennae). The second joint, or peristomium, is perforated by the mouth, and has two pairs of tentacles (called tentacular cirri) on either side. They also have a pair of horizontally moving jaws which can give a painful nip if handled carelessly.

The worms are muddy brown in colour and grew to 30-40 cm. Some nereid worms are found living in sea shells

occupied by hermit crabs; they can be seen sharing the hermit crab's meal.

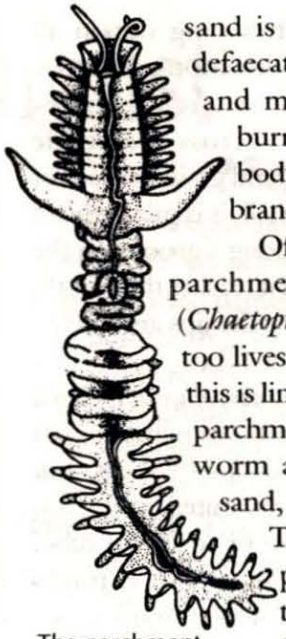
The advantage of having so many feet was brought home to me at a marriage. The bride's brother as well as the bridegroom were our colleagues in the office, but only the former had invited me for the reception and lunch thereafter. Four of us had some work later in the day, so we had informed the bride's brother that we would attend the reception but not stay for lunch.

At the hall, however, the groom insisted on our staying for lunch, and would not take No for an answer. We tried to slink out, but were accosted by the groom. We gave an excuse that the hall was stuffy, so we wanted some fresh air outside. Just opposite the hall was a bus terminus, and there was open ground all around. We planned to take a circuitous route in the fields, come back unnoticed to the bus stop and take a bus to the railway station. But the groom must have smelt a rat, as he was standing on the verandah and looking at us all the time. The only hiding place was a small temple, so we made our way there, hid behind it and looked for a chance to go to the bus stop.

The groom was still peering intently at the temple. Fortunately for us, there was a ditch by the side of the temple which ran all the way up to the bus stop. It was only waist-deep, so we could not get into it and walk erect without being noticed by the groom. The only recourse was to get down on our hands and knees and crawl inside the ditch all the way to the bus stop, some 100 metres away. Our elbows and forearms were scratched all over, while our trousers and shoes badly needed a laundry-wash and a shoe-shine. But we managed to reach the bus stop and scramble in when a bus arrived.

But this was one occasion when a couple of hundred legs would have helped us a lot in the ditch!

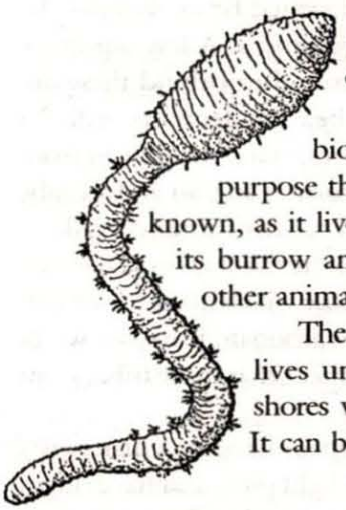
The lugworm (*Arenicola cristata*) elsewhere is found on clean sandy beaches, but at Mumbai it was discovered in the filthiest possible habitat – the sewage outfall at Haji Ali Bay. Rather stout and some 25 cm long, with a greenish brown body, it makes a U-shaped tunnel by eating sand and mud as it burrows. Organic matter in the sand is digested and the waste is defaecated as mounds of ropy sand and mud at the entrance to its burrow. About a dozen of its body segments bear bright red, branching, tree-like gills.



The parchment worm (*Chaetopterus*) shines inside its burrow

Of the various Sedentaria, the parchment or bull's head worm (*Chaetopterus*) is most interesting. It too lives in a U-shaped burrow, but this is lined with a dark green, tough, parchment-like tube secreted by the worm and externally coated with sand, pebbles and shell fragments. The two ends of the tube project for about 2 cm above the sandy mud of estuaries (creeks), but are constricted, looking like the straws used for sipping cold drinks. The buried portion of the tube is much broader.

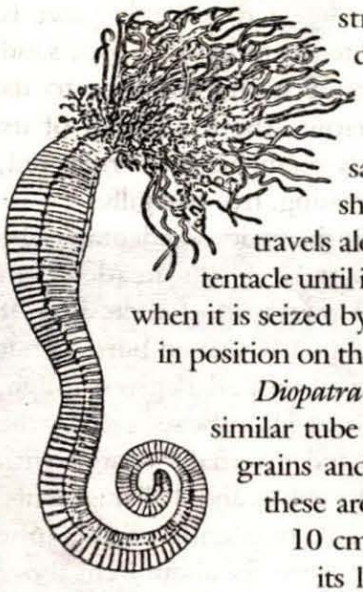
Its body is divided into three distinct regions. The front region has nine closely packed segments with large parapodia with prominent bristles. Of the five elongated segments in the middle region, the first has two tentacles looking like a bull's ears, and the last three segments have fan-like paddles. These beat to create a current through the burrow, bringing oxygen and food. The rear portion looks more like that of a typical worm, but the parapodia are more developed.



The lugworm (*Arenicola*) swallows mud to extract organic matter

The worm is bioluminescent. To what purpose the worm shines is not known, as it lives permanently inside its burrow and cannot be seen by other animals.

The shell-binder (*Terebella*) lives under stones on sandy shores with broken shell bits. It can be distinguished by the numerous, long, slender, cream-coloured tentacles wriggling and



Tentacles on *Amphitrite* spread over the sea bottom to collect food.

stretching out in all directions. When a tentacle comes across a suitable sand grain or piece of shell, it is grasped and travels along a groove on the tentacle until it reaches the mouth, when it is seized by the lips and placed in position on the tube.

Diopatra neapolitana makes a similar tube by cementing sand grains and bits of shells, but these are limited to the top 10 cm or so of the tube; its lower part is parchment-like. You can see a long but narrow patch — a metre by 15 cm of tubes, separated by a gap from another patch, and so on. These discontinuous rows are parallel to other similar continuous rows so as to cover a fairly wide area of sandy mud. In Mumbai, people dump flowers and coconuts on the beach, so bits of coconut husk are invariably an ingredient of the tubes.

Although *Diopatra* lives in a tube, its body characters are typical of a wanderer (Errantia) rather than a typical tube-maker (Sedentaria), being closely related to *Eunice* or *Onuphis* (which look like giant nereids). Eyes are absent. There are five tentacles with ringed bases. Behind the head, the segments are similar. A few segments behind the head are bare, but behind these are about 36 segments bearing feathery gills in association with the parapodia; the gills in front are the longest. The worm is so thin and its tube so wide that the worm can turn around inside it.

Next we come to the fan-worms. There are two main groups — those which make limy tubes by extracting calcium carbonate from sea water (serpulid worms) and those that make tubes from mud (sabellid worms).

The tubes of *Serpula* have irregular twists and turns, are white or light pink, and have ridges encircling the tube at intervals. They are found on stones and sea-shells. *Serpula* has a tiny head region consisting of a prostomium hidden by two large palps (lappets). These are surrounded by 36 brilliantly coloured extensions of the lappets, which form a brilliant red tentacular crown. The tentacles are used as gills as well as for catching food and conveying it to the mouth by cilia (fine hairs). Each tentacular filament has a comb-like fringe on either side of a central stalk. One of the filaments is enlarged, being a blunt, club-like structure at the end of a long, narrow stalk. This is the operculum or lid and shuts the mouth of the tube when the worm withdraws into it. The sculpture of the lid is intricate, with ribbed sides and a vase-shaped extremity ending at the rim in a minute lobe. A subsidiary peduncle (stalk) next to the opercular stalk is sometimes enlarged, so that there are two opercula. The front portion of the worm is scarlet. There are five to seven segments in the thoracic (chest) region behind the head, followed by a long series of similar looking segments in the abdominal or tail region.

When the animal is undisturbed, the tentacles expand into bright red fans. But fan worms are of a very nervous temperament. The slightest splash or even a shadow falling on them, makes them withdraw immediately into their tube. The fans come out of the tube after quite some time, and that too very slowly, as if they are unsure of their safety. The instantaneous withdrawal is possible because of the pressure of a row of tiny hooks on the upper part of each foot, extending halfway across the back, with the edges formed into long teeth. With seven teeth on a hook, and some 1900 hooks, there is the combined pull of 13,000 to 14,000 teeth gripping the tube.

Spirorbis is another, very small worm living in a limy tube built on the undersurface of rocks or the fronds of seaweeds. The tiny white shells are of the size of a pin-head and have a single, flat spiral.

Sabella makes short (6 to 8 cm) straight tubes, about the thickness of a bicycle tyre valve-tube, from mud. Its "fan" is as pretty as in *Serpula*, being bright orange or sometimes banded with violet and white. It, too, is very nervous, and bolts rapidly into its tube at the slightest disturbance.

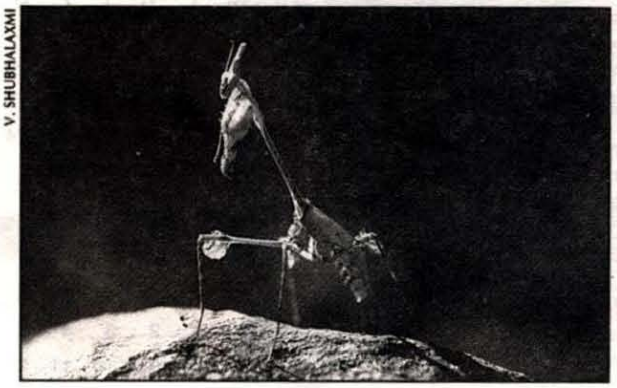
The Young Naturalist

Compiled by:
V. Shubhalaxmi and Vibhuti Dedhia

Survival of the fittest

The prey-predator relationship is unique with each trying to survive in this battle of the fittest. The predator has perfected ways to catch the prey which in turn has learnt the art of escaping. Below are some examples.

V. SHUBHALAXMI



Predator

Perfect cover: The gongylus praying mantis resembles a dry twig. Completely invisible in the dry foliage, it traps any approaching insect and eats it alive.

Stinging tentacles: The sea anemone paralyses its prey with its stinging, poisonous tentacles before drawing it into the mouth.

A deadly disguise: The perfectly camouflaged crab spider lies in wait for unsuspecting insects that visit the flower.

Poison fangs: The silently moving pit viper strikes swiftly, embedding its needle-sharp poison fangs, deep into the victim.

Setting the trap: The antlion larva makes a funnel shaped hole on dry ground. An unwary ant or spider passing by slips into the trap of the waiting larva.

Prey

Faking injury: The redwattled lapwing leads the predator away from its young. Pretending a broken wing, it moves away from the nest. When a safe distance away, it flies off.

All puffed up: When threatened, the puffer fish swallows water, becoming twice its size. The balloon shaped body with spines sticking out, keeps the predator at a distance.

Bag of Tricks: Bagworm, a moth caterpillar, stays inside the bag of dry twigs, it weaves while hunting for food. When touched, the bag falls on the ground. A bunch of dry twigs is not very appealing to the predator and gives the caterpillar a chance to crawl away.

Foul Spray: The green Swallowtail caterpillar with a false eye-spot on each side, appears like a snake. When its protective adaptations fail, the caterpillar curls back towards the tormentor and shoots out a bright orange, forked organ, called 'osmaterium', emitting a strong odour, from behind its head.

Mafia in Nature

V. SHUBHALAXMI

You may come across a number of black ants running up and down a babul tree. On close observation, you will see the circular glands on the branches, which the ants are visiting. These glands secrete a sugary fluid, a bribe for the ants, which in turn protect the whole tree. Ants are considered the mafiosi of the insect world, besides having a nasty reputation they are very much vigilant to their client's needs. The caterpillar of Acacia Blue, a butterfly which feeds on the babul tree, also seeks protection from these ants. A honey gland on the caterpillar's abdomen secretes a sweet liquid to attract the ants, which in turn protect the caterpillar from predatory wasps. The ants keep watch even on the pupae, and bid them goodbye only when they are ready to fly. Be it a helpless caterpillar, or juice sucking plant pests such as aphids and mealy bugs, a small bribe is all that's needed for protection in this world too.

ECO CALENDAR 2000

JANUARY

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Jan.	14-30	Animal Welfare Fortnight.
Feb.	2	World Wetlands Day.
	28	National Science Day.
Mar.	21	World Forestry Day.
	22	World Water Day.
	23	World Meteorological Day.
Apr.	5	National Maritime Day.
	22	Earth Day, Water Resources Day
	28	World Heritage Day.
Jun.	5	World Environment Day
	17	World Day to combat desertification and drought.
Jul.	1	Vanmahostav Day
Aug.	6	Hiroshima Day.
Sep.	16-18	Clean up the World Campaign
Oct.	1-7	Wildlife Week
	2	International Natural Disaster Prevention Day
	4	World Animal Welfare Day
	5	World Habitat Day
Nov.	19-Dec. 18	National Environment Month
Nov.	24	World Biodiversity Conservation Day
Dec.	2	Bhopal Tragedy Day
	3	World Conservation Day
	29	International Day for Biological Diversity

JUNE

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DECEMBER

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24	25	26	27	28	**29**	30

WIN ADVENTURE HOLIDAYS

The prizes* are sponsored by India Outdoors
Neelkanth Niwas,169/C, Dr.Ambedkar Rd, Dadar T.T., Mumbai 400 014
Tel: 412 5897/416 4785, Fax: 416 6944,
Email: info@indiaoutdoors.com, www.indiaoutdoors.com

MUMBAI'S LARGEST
ADVENTURE TRAVEL CO.

1. The longest venomous snake is the
   (a) Common Krait (b) Russell's Viper
   (c) King Cobra (d) Bamboo Pit Viper

2. The largest Indian deer is the
   (a) Cheetal (b) Barking deer
   (c) Sambar (d) Barasingha

3. The largest Indian frog is the
   (a) Indian bull frog (b) Malabar gliding frog
   (c) Skipper frog (d) Fungoid frog

4. The largest Indian butterfly is the
   (a) Blue Mormon (b) Southern Birdwing
   (c) Grass Jewel (d) Paris Peacock

1st Prize
2 nights / 3 days package at Ladakh
2nd Prize
Camping at Wildpoint, Dharap
3rd Prize
India Outdoors Nature Club Life Membership
* Inclusive of meals and overnight stay; not including arrangements to reach the appointed destination.
Send your answers to:
Editors, Hornbill,
C/o Bombay Natural History Society
Ans. (Jan.-Mar.): d. 1859, a. Chandigarh rose garden,
a. Keoladeo Ghana, c. Gujarat

No all correct entry received for the Oct.-Dec. contest

Young Naturalist

OBITUARY

S.P. GODREJ
1912-2000

Mr. Godrej's association with the Society related largely to his concern with the conservation of endangered wildlife. He would consult the Society on any problem that he felt he should intervene personally with the highest authorities of the country and he wanted his facts to be correct. A man of remarkable gentleness he strode a path of peaceful and quiet Gandhian protest against the appalling and callous increase in human population in the country and its disastrous effects on the environment. He believed in the Gandhian philosophy that each of us must be a living witness to the change we wish to see in the world. He was our conservation conscience reminding us quietly and firmly that we have only reproduced ourselves and thereby denied every other life form its place in the sun.

Unexplored Sikkim

I read with great interest, the enchanting account on Sikkim's Wildlife by Usha Ganguli-Lachungpa (*Hornbill*, July-September, 1999: 4-8). The article is informative and lucidly written. However, had she given a map of potential wildlife refuges and the best season to visit these areas it would have been of great help to readers. Usha is based in Sikkim and has the unique opportunity to explore/study these habitats and animals, I suggest that she write a more illustrative and scientific account of various animals with their present status, distribution and population for possible publication in the *JBNHS*. A complete updated checklist of birds would also be very useful for future ornithologists.

Prof. H.S.A. Yahya
Aligarh.

■

Summer Bloom

On May 5, 1999, when on a trail to Silonda, we saw a very interesting phenomenon. Amidst the dry leaves, in this deciduous forest of the Borivli National Park was a 8 cm long, pink flower popping out of the forest floor. On close examination we identified it as the hill turmeric (*Curcuma pseudomontana*) without leaves. There was, however, no water source around. Nature can really surprise us all year round.

Sanal R. Nair
Mumbai.

An Adventurous prize

This is about your contest featured in the *Hornbill 1999(3)*. Firstly, I wish to say that it was very nice to see a contest in your magazine offering such exciting prizes. The prizes are very apt for the kind of members you have.

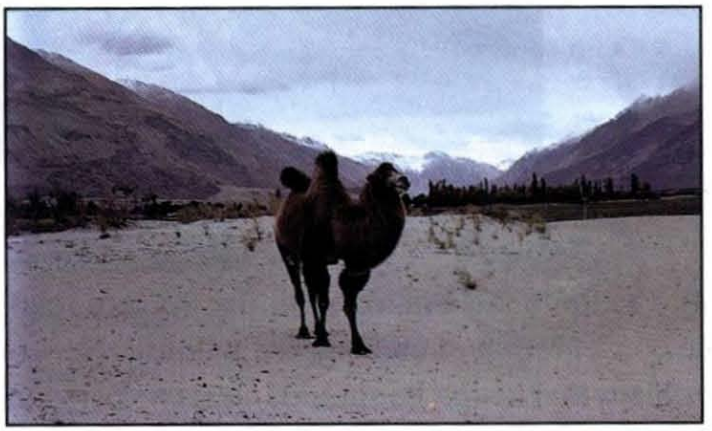
I was sent a gift voucher by India Outdoors for river rafting, the first prize of the contest. This was my first experience with an adventure sport of any sort and was a memorable one. At my age, I instinctively assumed this to be for someone fit or younger. I was, however, convinced by Rajshree from India Outdoors to go for it without thinking more about 'should I or shouldn't I? I wish to thank them for the encouragement and special treatment given to me on my first adventure holiday. River rafting was a great experience and I hope to be a part of such activity in future also.

To all at *Hornbill*, keep it up!

Anil Kamdar
Mumbai.

Bactrian camels

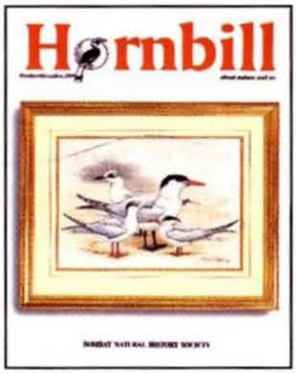
We have been receiving *Hornbill* regularly. The article on the bactrian camels by Lt. Gen. Baljit Singh (*Hornbill Oct.-Dec. 1999: 26-28*) is very interesting and informative. A photograph of this animal at Nubra Valley would have been a welcome addition to the article.



What is needed at present is a rapid survey of the area to determine the current status of bactrian camels in the Nubra Valley and adjacent areas, and if the species still thrive there, measures are to be initiated for their protection as Lt. Gen. Singh aptly felt. The presence of bactrian camels in India is certainly a pleasant surprise for those interested in the varied richness of Indian mammals.

C. Srinivasulu & Bhargavi Srinivasulu
Hyderabad.

Keep it up, Hornbill!



The front cover of *Hornbill Oct.-Dec. 1999*, is the best so far. Good show!

John Swamy
via email

■

What's in a name?

Bird-watching is an exciting hobby, as also is their scientific study, conservation and protection. How dare do these 'scientists' then mess up matters by all this name changing nonsense.

I read with interest an e-mail by Tim Inskipp on bird names. I have a few useful suggestions based loosely on some points in that e-mail. Two of the most important considerations for bird names are apparently: "To suit the bird as a whole...", and "Describe accurately the bird....". Based on this I make a few suggestions. Let's start with the redvented bulbul. This bird should be named the horned bulbul, no muddle there between redvented and redwhiskered, it's very descriptive, and anyway the true whiskers are not red but black; and this thing they now call the blackcrested bulbul has hardly any crest at all, what's against calling it the white-eyed bulbul. It is all so very confusing now, it was bad before, now it's a total chaos! Look at the darkfronted babbler. What kind of dark front has it got? Dark brown? Dark white? Or what? Why not darkheaded babbler, or mouse babbler after its skulking mouse like behaviour. Then there's the Puffthroated Babbler. Do we have to wait for it to puff out its throat before we can identify it? Why can't it be the spotted, or streak breasted? Are these new names deliberately chosen to confuse us? If they are trying to be accurate they're doing a pretty poor job. The greyheaded bulbul has not got an all grey head, but has always got a distinctive waxy yellow bill, so why not call it the yellowbilled bulbul? It also has a very distinctive grey tail, the black outer feathers are no excuse for not calling it the greytailed bulbul, especially when you see that the chestnut-tailed starling has grey, central tail feathers! You name changers you should at least try to be consistent. How is anyone supposed to sort out the purplerumped sunbird from the crimsonbacked by their names? What a mess it all is now!

I give some credit, however, I think green-leaf bird for chloropsis is quite good, except of course that people are very likely to get muddled between the green-leaf bird and the leaf warblers, but I do miss the lorikeet!

Alan H Morley,
Wales, UK.

■

Vanishing waterbodies

The January-March 2000 issue of *Hornbill* made beautiful reading. The cover story on Onges and Seashore Lore by Beefsea were very interesting. This edition of *Hornbill* (like all the past efforts) was sleek, informative and generated interest among the readers. In view of the Earth Day 30 years, since the first on 22 April, 1970, the 24/4/2000 issue of the international magazine 'News Week' had a beautiful story on *The Battle For Planet Earth*. It too focused on unfinished business, despite massive efforts undertaken by Europe to clean rivers, and by the US to recycle plastics. The challenges are daunting! The editor of *Hornbill*, J.C. Daniel aptly pointed out in View Point, "wealth is being lost forever" (He was referring to village ponds, temple tanks and other unprotected, fast depleting water sources). One feels helpless, dwarfed by the enormity of the pollution and loss of greenery everywhere. I still like to hope and have faith. Once again I express my pleasure and satisfaction for the efforts behind *Hornbill* and all other actions of the *BNHS*.

Sumitra Rath
Orissa.

In search of a NEW MONAL

Text and Photographs: R. Suresh Kumar

R. Suresh Kumar is a research scholar at the Wildlife Institute of India, Dehra Dun

A new subspecies *Lophophorus sclateri leucurus* has been added to the already large family of Indian birds. This is but an introduction of the new entrant, the true taxonomic status of the monal will take some time. Keep in touch.

While embarking on this survey, little did I know that I would stumble upon a new species of monal.

Three species of pheasants belonging to the genus *Lophophorus*, commonly called monals, are known to date, all of which are found in the high mountains of the Himalaya close to the tree line. The best known among these is the Himalayan monal *Lophophorus impejanus*, which is distributed extending from Afghanistan in the west to Myanmar in the east. The other two species: Chinese monal *L. lhuysii*, classified vulnerable, and Sclater's monal *Lophophorus sclateri*, classified endangered, have restricted ranges within the Eastern Himalayas Endemic Bird Area. The Chinese monal occurs in parts of China and

The Eastern Himalayan alpine meadow zone is the home of the new monal

Tibet, while Sclater's monal occurs in Arunachal Pradesh, Tibet, China and Myanmar. There has been some research on the Himalayan and Chinese monals in the wild, but little is known about the Sclater's monal. Pheasants in Arunachal Pradesh are poorly known owing to their remoteness, difficult terrain and adverse climatic conditions of the region. However, several recent surveys have provided some information on pheasant distibution.

During a survey conducted in western Arunachal Pradesh, in the interior Lower Subansiri district, several local people at Tali Circle readily and correctly identified the pictures of the Sclater's monal shown to them. However, they insisted that the tail was entirely white and not chestnut.

Later, during a visit to Damin and Sarli Circle in Lower Subansiri district, we were shown four complete sets of white pheasant tail feathers. Locals hunted this pheasant and kept the tail feathers of the male as a status symbol or to use as a

Top: Can you spot the pair of new monal photographed at a height of 4,200 m in the Sarli Circle
Centre: The new monal feeds on the undergorund tubers of *Arisaema* sp.
Bottom: The tail feathers of the new monal (centre) are distinctly different from the Himalayan (left) and Sclater's monal (right)

Detailed study of the skins of the male (above) and female (below) will help determine the taxonomic status of the new monal

fan. We examined the feathers, which resembled the tail feathers of neither the Himalayan monal nor the Sclater's monal, suggesting the presence of a new monal. I saw the new monal during a subsequent survey of the area from September to November 1998.

After a gruelling four-day trek from Sarli Circle, I reached Pakdhung camp close to the Indo-Chinese border at 4,000 m. The new monal had been sighted by the locals in this area. On 17th October, early in the morning around 500 m from the camp, I saw the new monal for the first time. It was a male, calling from a rocky outcrop at 4,200 m and as expected, it resembled a Sclater's monal except for its white tail. Over the next two days, I had nine sightings of 13 birds within 1 km distance from the camp, all in the alpine scrub and meadows above 3,900 m. The scrub was characterised by several species of dwarf rhododendrons, *Rubus* sp. and *Berberis* sp. The higher forests in the area were dominated by fir *Abies densa*, and various rhododendron species and dense thickets of bamboo *Thamnocalamus spathiflorus* as understorey. According to the locals, the monal descends to these forests during winter.

The taxonomic status of this monal is not yet known as more information on this species in the wild, and genetic studies to compare it with the Himalayan and Sclater's monal, are needed. However, from the physical features, the western population of this new sub-species has been christened White-tailed Sclater's monal *Lophophorus sclateri leucurus*.

Interestingly, neither of these species was seen in the areas where the new monal was found. However, the locals in Jang, Tawang district and in Dirang, West Kameng District recognised pictures of both the Himalayan monal *ghee* and the new monal *gheedhunkar*, white-tailed, but were not familiar with the Sclater's monal. Further east, the locals were familiar only with the new monal, indicating a probable gap in the distribution range of the Himalayan monal within Arunachal Pradesh. The confirmed westernmost limit of Sclater's monal is said to be in West Siang district. Since the new monal resembles Sclater's monal apart from the tail coloration, it may be a subspecies of Sclater's. It being a hybrid of the Himalayan and Sclater's monal, can also not be ruled out as their distribution ranges overlap in the zone the new form is found.

The new monal is relatively free from human disturbance due to its remote habitat. According to the locals, it is found in at least five districts of Arunachal Pradesh. Further studies are on to find the exact distribution limits and taxonomic status of this new monal.

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TIGER POACHING IN BANDHAVGARH

Compiled by: Satyen Wanchoo

We will not have a national animal if this blatant killing is not stopped

A local cable operator from Umaria, running a small news operation informed me in the first week of January that a gang of four poachers had been apprehended by the police.

The photograph suggests a confidence on the part of the offenders that they are beyond the reach of the law. With such a photograph around it would not be difficult to book the offenders as the Wildlife (Protection) Act clearly states that the onus of proving one's innocence in such cases lies with the accused.

Interrogation at the Manipur Police station revealed that the gang had been active in the area for the last couple of years. It had possibly poached four tigers and eight leopards, including a tigress Sita, whose bones were recovered from inside the Bandhavgarh National Park in December 1999, in this period.

Further inquiries convinced me that the Park had been facing a serious threat from poachers. We reached Bandhavgarh by the end of February, and glimpsed the big cat on our first foray into the forest. Probably the most visible tiger population in the country; sightings of the big cat are almost assured in the tourist zone of the Park.

The benefits of the growing tourism industry have yet to percolate down to the local communities living inside the Park and on its fringes. They, like most people living on the fringes of our protected areas, have lived a life of extreme poverty with almost no access to public health and education for generations. Their cattle become prey to the tiger and their crop fields, fodder to the protected herbivores. To add to this is the constant threat of relocation, which the forest department in its wisdom wields like a veritable Damocles sword. This attitude of the forest department, is the root of distrust resulting in villagers remaining tightlipped, even when they have information on poachers. Meanwhile, tour operators make a killing out of the tiger seeking masses.

A World Bank funded Eco-development Project has been introduced in the Park to mitigate some of these conflicts, but it has benefited only a small percentage of the affected, due to lack of awareness.

The utilization of funds earned from the sale of tickets and elephant rides, by the forest department at Bandhavgarh, speaks volumes of its mindset. These development funds have been used to construct libraries and orientation centres, which were under lock and key when we chanced upon them. Even more ludicrous was the gigantic open-air theatre miles away from destinations where such a structure would have any utility.

Adding to the existing pressure is the recent decision by the Madhya Pradesh government to dismiss daily wagers who have been serving since 1989 in its various wings.

Now, consider the huge demand for tiger bones which fetch a price of $25 for ten grams. In the Far East markets, a single adult tiger is worth a whopping $50,000 in tiger bones alone.

I fail to understand the desire of some to wantonly kill one of the most beautiful animals in the world. While most of the erstwhile shikaris have grown from this immature lust to a genuine

love of the wild and spearheaded the conservation movement in the last century, there are still some who haven't given up the gun. The two young men on the left in the photograph we were told come from a family, with a long tradition of shikar. In fact, their predecessors hunted down one of the last remaining Asiatic cheetahs in the area.

The forest department in Bandhavgarh is understandably under pressure as this photograph and the haul of a tiger skin and bones have created a lot of heat. This has resulted in a Vidhan Sabha question and both the field director and the deputy director of the Park have been transferred a few months ago.

A DAY WHEN ROLES WERE REVERSED

Compiled by: Prashant Mahajan

On May 10, 2000, after finishing my day's work at about 7.30 p.m., I started the scooter and switched on its headlight. Just then, I heard some leaping movements near the water tank constructed close to the Conservation Education Centre (CEC), Goregaon. This tank being a favorite water source for wild animals during summer, I was curious to identify the moving object, when I sighted a huge frog, with a long, slender, moving object around it illuminated by the headlight.

Curiosity pulled the watchmen to the site, with their torches. Parking the scooter, I moved closer with the borrowed torch and was amazed to see a young cat snake (about 30 cm) in total control of a bullfrog, a resident of the tank. The mouth and tail of the cat snake were free, but the central portion was firmly held by the powerful jaws of the bullfrog. Any attempt to escape, only helped tighten the frog's grip. The desperate and awfully irritated snake then turned back and vengefully attacked the frog's back. The frog, however, did not budge.

A predator had fallen prey to its own prey and I did not have a film roll to capture this uncommon behaviour. But then nature freak friends are always a boon. I called up Satish Amberkar, my friend and nature photographer, who resides just 10 minutes from CEC. Satish arrived immediately. He photographed the scene for about 10 minutes before the frog jumped into the tank and settled at the bottom. Though the water was turbid we could observe the drama with the help of the torch. The frog still had a tight grip on the helpless snake which was determined to escape. And then there was a long silence. "The snake is at its last breath," said Satish, when we saw water bubbles surface from its mouth.

Life is dear to all, the young cat snake making desperate attempts to free itself from the strong grip of the bull frog

Picture / Satish Amberkar

Yet it was not over, the snake opened its jaw after some time and attacked the frog in a 'do or die' attempt only to stimulate the frog's instincts. Within a moment the bullfrog grabbed the snake in its fore limbs and gulped it. The frog later vanished under the leaf litter in the tank perhaps for a good night's sleep. It was 8.45 p.m. then.

A step towards the 21st Century

From Left: Dr. A.R. Rahmani, Director, Late Mr. S.P. Godrej, Vice President, Mr. R.H. Mendonca, Chief Guest, Mr. Sunil Zaveri, Hon. Treasurer, Mr. J.C. Daniel, Hon. Secretary were among the many present for the launch of the BNHS website

The Bombay Natural History Society website www.bnhs.org was launched by Mr. R.H. Mendonca, ex Commissioner of Police, Mumbai, on April 22, 2000, as a part of the Earth Day celebrations. The website will provide information on the BNHS and its activities, and focus attention on the national conservation issues needing remedial intervention. It will provide a platform for a conservation network, comprising of BNHS members, concerned individuals and institutions across the country.

Some of the salient features of the website are: all the pages are interactive. An organisational chart has been provided to enable a surfer to navigate within the site. The wildlife photographs on the site can be enlarged, downloaded, and saved as wallpaper or as screen savers. E-greetings can be sent from any page on the site. Information and admission forms on the post-graduate degree courses conducted at the Society in field zoology, botany and other branches of wildlife research can be downloaded by applicants. The site has been registered with four search engines presently: Yahoo!, Alta vista, Hotbot and Google, and shall be registered with others in the near future.

Updating of the site will be done regularly. News flash on environment alert will be sent regularly. Guidelines on funding available from the BNHS for nature conservation and wildlife research are provided. The formulation and co-ordination of this website is by Mr. Sunil Zaveri, Hon. Treasurer, BNHS.

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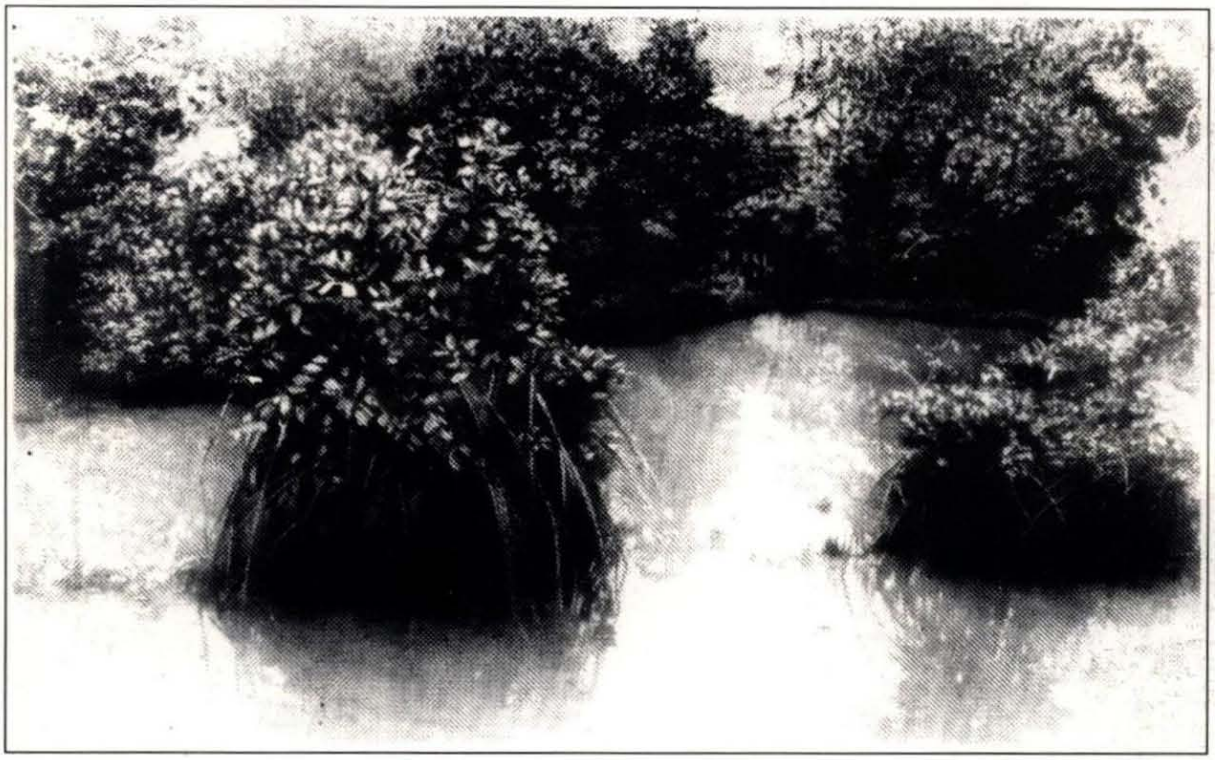

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