

HORNBILL



BOMBAY NATURAL HISTORY SOCIETY

The cover picture of the Sambar (*Cervus unicolor*) was made by our member, Mr Mervyn Sequeira. The Sambar is the largest of all Asiatic deer and seemingly attains its best development in India. A big stag often stands about 140 cm high and weighs about 320 kg., and a small stag is about 120 cm high, and about 200 kg. However, there does not exist any correlation between the body size and the antlers.

Enough has been said on the Sambar, when it appeared on the cover page of *Hornbill* 1982(3). The animal is being repeated on the cover of the current issue as it would be of value to our members interested in wildlife photography.

The picture exemplifies the deep tranquility experienced in the heart of a forest. Its effect is reminiscent of an oil painting. The back-lighting emphasizes the contours of the animal, which in warm, low-key browns contrasts well in a soft yet firm manner with the fore- and background, most of which is in high-key.

Acknowledgement

We are grateful to Seth Purshotamdas Thakurdas & Divaliba Charitable Trust for financial help for the publication of *Hornbill*.

The Society was founded in 1883 for the purpose of exchanging notes and observations on Zoology and exhibiting interesting specimens of animal life. Its funds are devoted to the advancement of the study of zoology and botany in the Oriental Region. The Society also promotes measures for conservation of nature.

Membership of the Society is open to persons of either sex and of any nationality, proposed and recommended by one or more members of the Society; and also to persons in their official capacity, scientific societies, institutions, clubs, etc. in corporate capacity.

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Members receive during a year three issues of the *Journal of the Bombay Natural History Society* now in its 83rd volume, and four issues of *Hornbill*, the Society's popular publication.

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J. C. Daniel, P. V. Bole and A. N. D. Nanavati.
Advertisements for publication in *Hornbill* are welcome. Rates: Inside full-page Rs. 500/-; half page Rs. 250/-; back cover Rs. 1000/-.

Annual and other membership subscriptions

<i>Entrance Fees</i>	Rs	25.00
<i>Subscription</i>		
Ordinary individual membership	Rs	60.00
Ordinary corporate membership	Rs	250.00
Life membership	Rs	800.00
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The first annual subscription of members elected in October, November, or December will extend to the 31st December of the year following the election.

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EDITED BY

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DESIGN & ILLUSTRATIONS
 CARL D'SILVA

There is nothing more disastrous to a wildlife researcher than to be stopped from continuing his studies because the management resents his attitude or blames him for happenings over which he has no control. Helping wildlife researchers through their projects, the Society has often had to smoothen ruffled feathers. In one instance a senior officer was killed by an elephant and the student who accompanied him was debarred from his study area and was with great difficulty rehabilitated. In another instance a senior police officer was caught poaching by one of our researchers. In spite of veiled and not-so-veiled threats he insisted on pressing on with the prosecution. The result, his permission to work in the sanctuary was withdrawn — a classic instance of Oliver Goldsmith's Mad Dog syndrome "the dog it was that died".

Poaching itself has become a direct threat to wildlife studies. In one instance the majority of a troop of Nilgiri Langurs in a sanctuary accustomed to man through the efforts of the researchers was slaughtered by poachers, leaving an

inadequate number for further studies and making useless the data collected over many months through painstaking effort. Those who study elephants are the main losers. Poaching of tuskers has now become a fine art. The process has been streamlined. A tribal collecting minor forest produce (honey etc.) sights a tusker, he passes the location to his contact and is paid for the information. The gun is brought in and buried. The hunter picks up the gun, shoots the tusker, replaces the gun and disappears. The tusks are hacked off and brought out and sold. Each link in the chain is kept separate. Anyone who plans to study tuskers in south India faces a ninety percent risk that the object of the study will be dead before the study is completed.

Poaching continues to be the greatest danger to endangered species in unprotected areas. The Dugong in the Gulf of Mannar is a sad example. Over 250 were slaughtered in 1984; the killing continues and unless vigorous steps are taken for their protection the Dugong of the Gulf of Mannar will disappear within this decade.

BNHS researchers inspecting a dying Blackbuck shot through the chest in Karera





A view of the Dihaila jheel

Dihaila jheel: An unknown bird paradise

Bharatpur and migratory birds, the two terms have become almost synonymous. Many people think that most, if not all, the migratory ducks and waders coming to our country in winter concentrate at Bharatpur and just by protecting Bharatpur, we can save our winter visitors. It is generally overlooked that there are many jheels, of course not as spectacular as Bharatpur, which attract tens of thousands of waterfowl and can play a significant role in the conservation of birds. Unfortunately, most of these jheels are neglected as a result of which they are disappearing at an alarming rate. As these jheels are generally outside the jurisdiction of the Forest Department there is practically no control on shooting.

Dihaila jheel is fortunate to fall within the Karera Bustard Sanctuary in the Shivpuri district of

Madhya Pradesh. Before the sanctuary was declared in 1981, this jheel was also a favourite shooting ground for the military people of Jhansi, Babina and Shivpuri. Villagers remember, some nostalgically, military officers camping for five to ten days and slaughtering thousands of birds. Non-tasty birds were magnanimously tossed to the poor villagers who were also employed to walk in the cold water to chase the birds towards the waiting guns. Locals belonging to the *thakkur* caste also used to shoot a few birds for pot. Interestingly, since the area was closed for shooting, the price of village fowl has gone up because now that is the only bird which can be legally eaten in the sanctuary!

Dihaila jheel is highly dependent on rainfall. In 1984 when the rains were insufficient, the jheel was dry



Ducks over Dihaila jheel

except for about ten hectares near Dihaila village after which the jheel is named. However, in 1985 due to excess rains, the jheel extended to more than 100 hectares and thus attracted thousands of birds. During summer the water dries up and the resulting pasture is used for grazing.

Common teal



Though the jheel is in a slight depression which collects run-off water from up to ten kilometres, it is partly man-made. Two bunds near Dihaila and Rajpur villages store water and help in extending the submerged area. This guano-rich water is used in winter for irrigation. Thus the villagers have inadvertently created a paradise for water birds, and the birds repay it by enriching the water with their faeces. Every three or four years, when the rains fail, the jheel remains dry and the agriculturists who own the land in the jheel have a bumper harvest thanks to the accumulated guano. The only sufferers of this jheel are the paddy and *chana* growers. One night's neglect and the crop is likely to be harvested by ducks and geese.

All the common ducks, geese and waders reported from north-west India can be seen at Dihaila. Pintail, shoveller, gadwall, wigeon, garganey, common teal, redcrested pochard, common pochard, tufted pochard, barheaded goose, greylag goose, redshank, greenshank, ruff

and reeve, curlew, stints, sandpipers — the list is so impressive that we can easily claim that except for the Siberian crane and a few reed birds, all the water birds seen at Bharatpur can be observed at Dihaila. I am sure that once the jheel is taken over by the Forest Department and some emergent vegetation is allowed to grow, birds of the reeds like rails will also come. Even the flamingo is seen here. In 1983 we counted up to 40. The stork group is represented by openbill, painted, whitenecked, blacknecked and an adjutant. Marsh harriers are frequently seen worrying coots and small ducks, and the greater spotted eagle can be seen waiting patiently on one of the innumerable rocks to usurp the legitimate prey of an unwary harrier. Two ospreys appeared in October 1985 for a few days but as the fish population is low and the jheel very shallow, they probably could not get enough food; so they left the area.

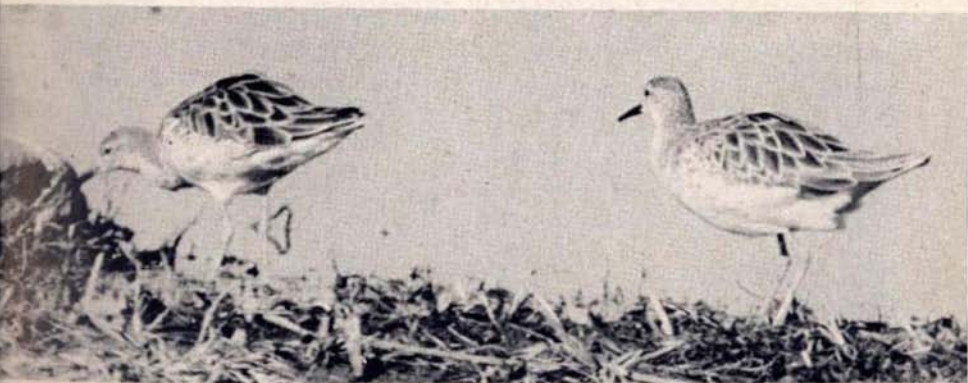
Innumerable numbers of stints criss-cross the edge of the jheel for small insects and worms, while the

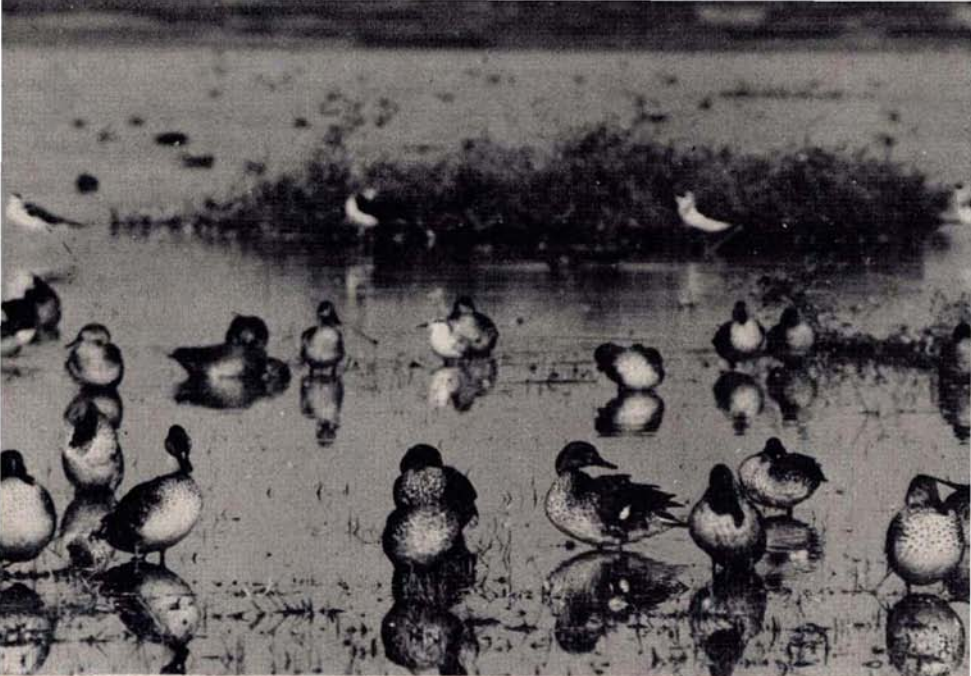


Whitetailed Lapwing

stately blackwinged stilt quarters the shallower zones, taking advantage of its long legs. Ruff and reeve are seen in thousands, especially in February and March when the water starts drying up. The little grebe breeds in small numbers and its cousin — the great crested grebe —

Ruff (Philomachus pugnax)





Common teals in Dihaila jheel

can be seen in winter with the diving ducks in more deeper parts of the jheel where the maximum depth can reach up to three metres.

Though it is difficult to estimate the number of birds at Dihaila, my conservative estimate is one lakh, with the common teal, pintail, ruff and reeve and stints contributing a major share. About a thousand to fifteen hundred barheaded and greylag geese and a few hundred spoonbills can also be seen at Dihaila.

At present, due to lack of trees, very few birds nest near the jheel. Once the trees are planted and protected, this jheel will certainly serve as a nursery for the chicks of spoonbill, egrets, storks and cormorants.

This was amply proved to me by discovery of about 20 nests packed on two trees in a small pond, four kilometres from Dihaila. The birds of Dihaila need a few secluded trees to start a breeding colony.

The Bombay Natural History Society under the Avifauna Project started bird ringing at Dihaila in October 1985. It is hoped that this ringing will prove that the Dihaila jheel is one of the important water bodies in the country for the migratory birds. With the Central Government's recent concern to protect the wetlands, Dihaila jheel is a strong contender to be listed under the Ramser Convention.

ASAD R. RAHMANI



A Chinkara doe and fawn

Sitting by a desert waterhole

The fortress of Jaisalmer was behind us. Its medieval walls, perched on a hilly foundation, slowly grew smaller as we rattled away in a jeep that often seemed intent on killing us. We were headed for Sudasari, one of the numerous *chowkis* of the Desert National Park.

The winter of 1985-86 saw Dr Asad R. Rahmani and myself surveying Rajasthan, to assess the population of the Great Indian Bustard and locate an ideal field station from where these birds could be studied in a typical desert ecosystem.

Forty-five kilometres from Jaisalmer we turned off the metal road. A seemingly endless dirt-track stretched ahead of us. A *tibba*, in Marwari for shifting sand dune, had engulfed the road. In 1983 Dr

Rahmani had been stuck on the very same dune until help arrived four hours later in the way of half a dozen robust villagers to push the jeep out of the sands. Eyeing my skinny body, he was rather reluctant to attempt crossing the dune but my optimism (no doubt from being a novice in these matters!) got to him too and we managed to inch our way across the dune. A couple of mini *tibbas* later we could see Sudasari ahead.

Sudasari is just a cluster of round mud huts manned by a few boisterous forest guards. The warmth and hospitality was characteristic of the people of the desert. A few plump chicken vigorously scratched the mud, a camel tethered to a post by its nose complacently chewed cud, some donkeys hung around a water

trough as if deep in their melancholic thoughts. As far as the eye could see there was no other sign of human habitation. Time seemed to have been arrested ages ago.

Water is the scarcest commodity in the desert. The Rajasthan Forest Department has made a small waterhole which the guards fondly call the *guzzler*. The denizens of the sands invariably made a bee-line to this surface water at some time of the day or the other. Overlooking the *guzzler* was a permanent hide from which one could watch or photograph animals and birds from close proximity.

Having always fancied myself as some sort of 'Lawrence of Arabia'. I got onto a camel at the earliest opportunity to scout around. I was fortunate enough to see some houbara. This endangered bustard preferred for sport by falconers and

The King Vulture

hunters is today completely protected in our country. Some hours later, somewhat richer in my knowledge of desert fauna, I returned. My back felt as though every vertebrae had been dislocated. The fact that the camel alternated between a terrifying gallop and a jarring trot had not made the ride any easier. Meanwhile Dr Rahmani made arrangements for our stay in Sudasari. He also went to check the hide from where three years ago he had taken some excellent photographs of the bustard drinking.

Next day I went to the hide as Dr Rahmani was busy in surveying the area for bustards. The afternoon was warm and sunny as I walked the odd kilometre to the *guzzler*. I settled down and after a long wait I heard the sounds of an approaching animal. Action at last! I quickly got my eye to the peephole but I was





The Common Indian Fox

thoroughly disgusted to see that it was only a camel. I did not like the idea of taking photographs of a tame camel from a hide.

I resigned myself to another long wait when silently a king vulture dropped to the waterhole. This carrion feeder, unlike its commoner relatives is quite a handsome bird. Its bald, red head, black feathers and its ever watchful yellow eyes were a most impressive sight. Warily it drank, rapidly bringing up its head after every gulp. Thirst quenched, it was soon gone.

The warmth had made me drowsy when I made spot check on the waterhole. All traces of sleep were rolled out of me. Lapping thirstily at the *guzzler* was a desert fox. I clicked. At the sound of the shutter it was off. Weaving rapidly through

the *sewan* grass clumps, it was soon lost to sight. In my excitement I had forgotten to adjust the speed and aperture of the camera as a result of which it was a poor shot. I guess it is something every budding wildlife photographer learns the hard way.

The wait between the 'arrivals' can be tedious. Within the confines of a small hide, one tends to fall into some kind of a trance. The anxious snort of a *chinkara* doe with her fawn broke my reverie. Nervously looking around, they froze at every rustle, real or imaginary. I clicked and they did not stop running until they were well away.

After another long wait, the star attraction of the Desert National Park arrived. Two male Great Indian Bustards were walking slowly and regally, carefully looking



A male of the Great Indian Bustard drinking

around in their haughty way towards the *guzzler*. Softly they *hook*-ed as they made sure all was safe. It was not long before they were thirstily drinking. Squatting on their tarsus, they used to bring their head up to ascertain whether all was still safe. Satiated, they walked away, stopping every now and then to peck at something that had caught their eye. It is truly a pity that this aristocratic bird has become so rare today to be listed in the RED DATA BOOK. The sight of the Great Indian Bustard at close quarters more than compensated all my troubles to come to this remote *chowki* all the way from Bombay.

The following day both of us were eager to sit in the hide. Thankfully

there was space in the hide for two people with all their photographic paraphernalia. It turned out to be a most exciting afternoon of my photographic career.

Not long after we had made ourselves comfortable there was a murmur of wing against the air. A raptor landed. Pale fierce eyes glared unafraid around. A wild power emanating from it held us spell-bound. Unafraid it drank again and again. When satiated it looked around for a while before leaving as silently as it had come. Awed, I could only ask 'What on earth was that?'. Dr Rahmani said it was a buzzard, but which buzzard?. It turned out to be a longlegged buzzard when we identified it



The Longlegged Buzzard

A male Chinkara snorting





A Tawny (?) Eagle and a fox

from our slides and the specimens at the Society.

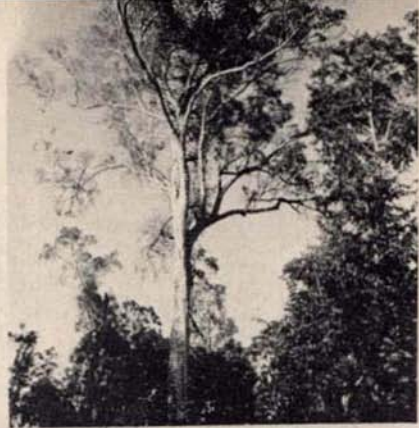
As the hour passed a *chinkara* came and went; a fox which did not care much about being photographed. Seemingly endless wait later, the bustards arrived. This time too there were two males and they seemed to enjoy being caught on film as they posed for us in every conceivable posture.

We were contemplating leaving the hide when a most interesting thing occurred. Just as a common Indian fox reached the waterhole an eagle landed by the water. Promptly the fox changed course and trotted around to the other end of the trough. Settling down, for no imaginable practical purpose it went to

sleep. The eagle seemed to expect such deference, for it paid no attention to the fox and drank its fill. The moment it took to wing, the fox was up and lapping water. A case of eagles first. And thanks to that; at last I had got a photograph of the shy fox.

Today Sudasari is just a memory and often when mundane living gets to me I wish I were back once more in the desert and going to that much-visited hide near the *guzzler* where the majestic Great Indian Bustard still strides confidently and where the wily fox makes way for the arrogant eagle.

RAVI SANKARAN



A forest — wet deciduous, semi-evergreen

Chuck-chuck, chuck-chuck-chuck, ... in quick succession. What's that?! was the query in a chorus by the birdwatchers. And Ganapati, the local Siddi guide, showed them the Giant Squirrel as it leapt from the high branches of a *Terminalia*.

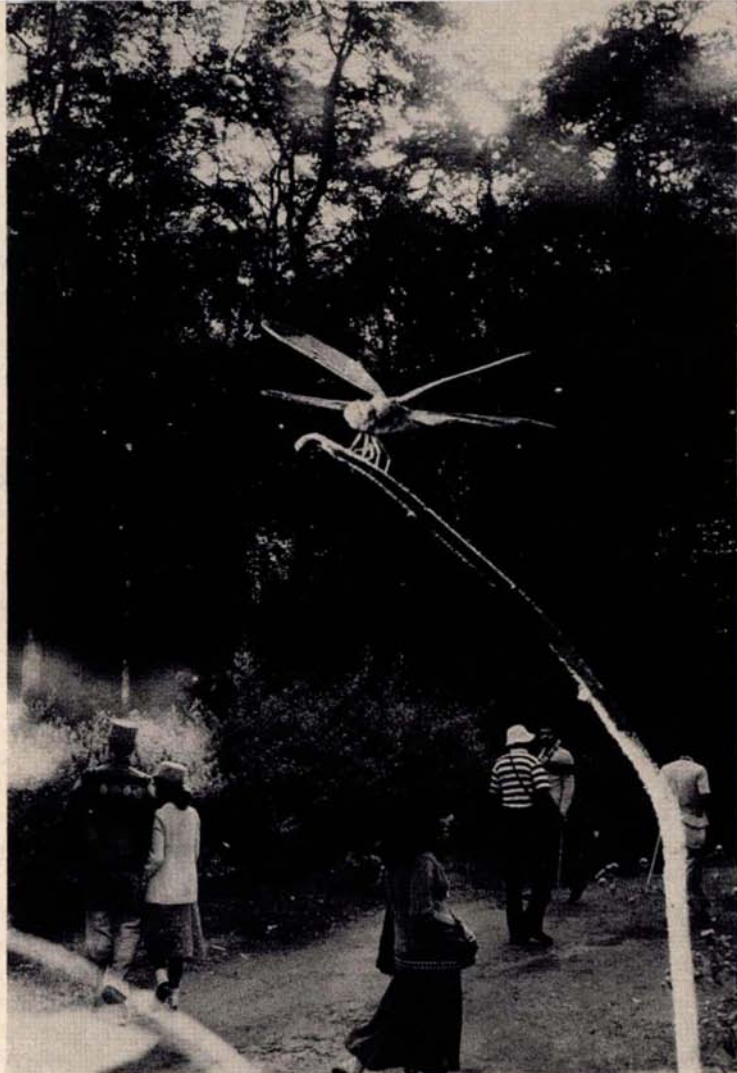
The Society's members were camping at Magod, near Yellapur in Karnataka. The state government had planned a hydel project here some years ago. Fortunately, due to the opposition by the local people and on the advice of conservationists and naturalists the project was abandoned. Today, a small colony of Karnataka Power Corporation (KPC) is nestled on the periphery of this rich biotope. The roads constructed by the Power Corporation for the project have remained in good shape, thus making excellent nature trails for visitors. One such road leads to the waterfall, another to the abandoned dam site, and a third to the riverside where the hydroelectric power

generator was to be located. A circular road connects all the three, thus making a complete, well-laid-out nature trail, through rich forestland, interspersed with cultivation.

River Bedthi flows full during the monsoons and rushes down into a rockpool, overflowing into a waterfall. A spectacular sight of a gorge can be had when seen from high above, where a visitors' gallery is built for the benefit of the tourists. This is Magod waterfall. We enjoyed every moment of it. Nature's bounty was abundant. Rich in flora and fauna, Magod forest offered us a pleasant week end.

My desk job does not permit frequent outings. When this trip was offered, I accepted with alacrity, and today I reminisce the pleasant week end I spent at Magod.

Walking through the green forest itself is relaxing. Besides, Magod offers a variety of birdlife. A list



A dragonfly's eye-view

prepared earlier by an ornithologist contains about 100 bird species, which include: the paradise flycatcher, bluewinged parakeet, imperial pigeon, emerald dove, lorikeet, Malabar trogon, grey hornbill, pied hornbill, goldenbacked

woodpecker, bronzed drongo, racket-tailed drongo, whiteheaded myna, hill myna, bank myna, blackheaded cuckoo shrike, large cuckoo shrike, pied flycatcher shrike, yellowbrowed bulbul, scimitar babbler, Nilgiri verditer

flycatcher, blacknaped monarch, Malabar whistling thrush, velvet-fronted nuthatch, fairy bluebird, and the spiderhunter. We saw most of these birds.

The joy of birdwatching in Magod consists not in the birdwatcher seeking out birds, but in birds coming to the birdwatcher. This is a clear indication of the abundance of birdlife. Sitting on the palmshoot bench in the canteen at 6.30 a.m. for tea, the group saw a flock of hill mynas flying overhead shrieking in chorus. Later in the day green pigeons too were seen in a large flock. The racket-tailed drongo assailed us with its joyous repertoire of calls.

The canteen we patronised was in idyllic surroundings. The owner has retained its rustic look and has not built to advertise his eating house.

Palmshoot benches, thatched roof, mud walls and flooring plastered with cowdung add to its indigenous look. He has planted flowering shrubs, *tulsi* and bananas around. At lunchtime butterflies alighted on marigolds, and spiderhunters visited the banana flowers. The photographers among us abandoned lunch to grab their cameras.

Curiosity which was aroused in me a few years ago about 'bird-eating' spiders has made me seek out spiders wherever I go. Magod rewarded me with sightings of many catleg spiders.

Mammals other than giant squirrel, monkeys and mongoose were not come across. I cannot forget the funny drama on that moonlit night, when the local guide took us out for viewing wildlife. Marching silently

Catleg Spider — Hunting posture (a night picture)





Busy looking for fauna

tions to each other, the group rushed on to find it to be a plastic water bottle! A member who had carried it for an emergency, finding that it sloshed around, left it on the road to fetch it on his way back. Thus ended our night search for wildlife.

An ant nest on an electric pole!

The insulator is covered by the ant nest



in twos and threes our guide switched on the Commander torch occasionally to see if any animal was lurking around. Finally we managed to find a tree frog, after walking 2-3 kilometres towards the waterfall. On the way back something brown-and-white in colour was sitting pretty in the middle of our path. Seen in the bright beam of the torch it was presumed to be a hare and all were delighted to see this hare, the only mammal for that night. Marching together and whispering descrip-



Vandelekai, an epiphyte growing in clusters on a tree; single plant (inset)



Magod falls gushing into a rock pool and overflowing in a triplet



The waters of the River Bedthi glistening at sunset

In this wet deciduous, semi-evergreen forest tall trees are aplenty. We learnt a few local names like *Nandi* (?), *Vandelekai* (?), *Honne* (*Calophyllum* sp.), *Hebbidru* (*Bambusa* sp.), *Karibidru* (*Dendrocalamus* sp.), *Karimatti* (*Terminalia alata*), *Senti* (*Terminalia bellerica*), *Huluva* (*Terminalia paniculata*), each *Terminalia* species having its own local name. Frequently we came across *Dalchini* (*Cinnamomum zeylanicum*; or could it be *C. tamala*?), the leaves of which we crushed and smelt.

We spent one late evening at a pond where nightjars gratified us. One hovered and circled us and as I

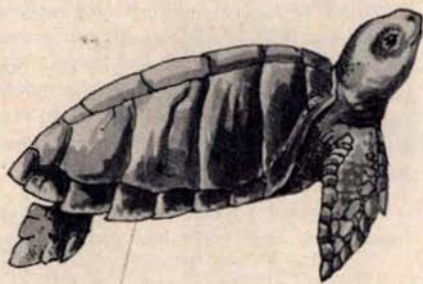
switched on my torch two red eyes shone like jewels. The bird alighted on a stone on the ground and obliged photographers.

City dwellers, many a time, have to forgo the comforts of life and enjoy such outings. 'Roughing it out' is the term for it. At the rest house we had rationed water supply. Thanks to the man who obliged us by providing scanty water for morning's ablutions, because we bought our morning cup of tea from him! This *chaiwalla* happened to be the holder of the key to the water tank of the KPC!

S. R. NAYAK.

Olive Ridleys recovering

Olive Ridley turtle (*Lepidochelys olivacea*) numbers are recovering in India due to the Government's crack-down on the turtle trade. In 1982, 170,000 Olive Ridley turtles arrived at Ekahula Beach in Orissa, the world's largest nesting site for the species. In 1985 300,000 arrived. More than 90,000 turtle eggs in Tamil Nadu, 300,000 in Orissa and 1000 in West Bengal's Sunderbans have been collected by the state governments for hatching and release. New hatcheries have been established in the Sunderbans, Kerala, Karnataka and Gujarat, and the Central Marine Fisheries Research Institute in Cochin, Kerala, has launched a turtle management and conservation programme. — *Oryx*, April 1986.



Olive Ridley's Turtle

Kouprey

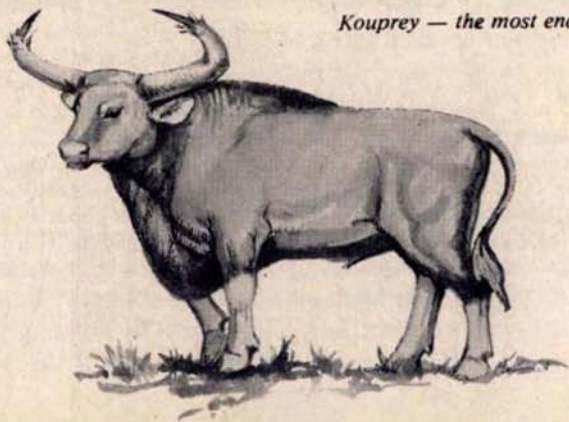
To save the Kouprey, the world's most endangered bovine, Laos, Kampuchea and Vietnam have come together at an international agreement. The pact sets out a management plan including the establishment of transfrontier reserves and cooperation in preventing poachers from slipping between countries.

Recent estimate of the Kouprey population is about 200 which makes its position precarious. The cause is mainly hunting, followed by a long period of warfare within its range. According to Charles Wharton, an

American Scientist, Kouprey may be resistant to rinderpest since it is known that one kouprey population had survived an epidemic of rinderpest when large number of domestic cattle had perished in its range.

As part of the WWF Kouprey Project two Vietnamese scientists have just returned from India after undergoing training from Indian scientists in capture, immobilization and translocation of wild animals. Earlier all attempts to capture kouprey for captive breeding had failed. — *WWF News*, May-June, 1986.

Kouprey — the most endangered bovine



Wild Condors

Recent effort by the US Fish and Wildlife Service to take all the remaining wild California Condors into captivity was halted for twenty days under a temporary restraining order by a Federal Court at the instance of the National Audubon Society. If the efforts to capture are resumed and completed, all twenty-six of the currently surviving condors will be located in captive breeding programmes in Los Angeles and San Diego zoos, where biologists are attempting to promote condor reproduction without the risk of further deaths in the wild. Last winter six condors died in the wild.

Wild condors were found to be suffering from severe lead poisoning, probably the

hooded cranes feeding near the edges, further out some two kilometres away a vast assemblage of white, long-legged forms slowly materialized out of the mist. It was the largest flock of Siberian Cranes ever seen and when counted there were 1350 Siberian cranes. — *Newsletter of the Survival Species Commission*, Jan. 1986.

Cats plague Australia

Domestic cats turned wild have thrived in many areas of Australia until some species of small mammals and birds are threatened with annihilation. In 1978, 2,000 feral cats were trapped in Sydney's Royal National Park. Experts believe that over 10,000 such animals live in the nearby Kuringai National Park and that they have eliminated completely certain

The Californian Condor — about to land



result of lead fragments the bird had ingested. One wild condor had eight shot gun pellets embedded in its wing.

Capturing condors is a temporary measure aimed at starting a breeding group to produce birds for establishing a secure self-sustaining population of California condors in the wild. — *Endangered Species Technical Bulletin* 11(1):4;1986.

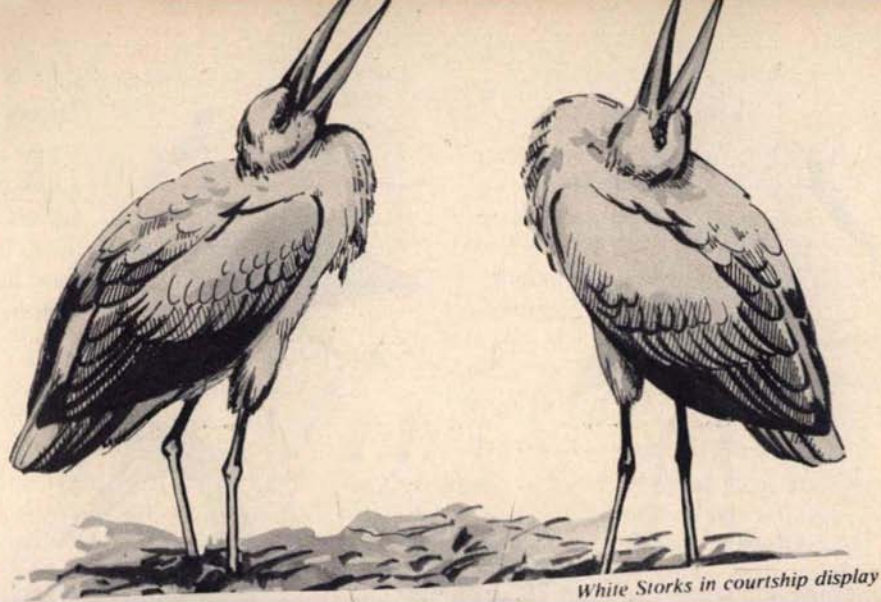
Siberian Cranes

Last year Dr George Archibald of the International Crane Foundation led an expedition to Lake Poyang in China to investigate the report of the Chinese scientists finding 840 Siberian Cranes in the Lake Goyang marshes. What he saw was even more astonishing. Besides the hundreds of whitenaped and

types of birds. As a result of the plentiful food, cats have been caught weighing up to 16 kg in weight! The pelts are larger and thicker than those of domestic cats and fetch up to ten Australian dollars each. — *Journal of the British Deer Society* 6: 9, 1986.

Dugongs in the Arabian Gulf

A herd of three hundred to five hundred dugongs was found east of Bahrain during a helicopter survey as part of Saudi Arabia's Dugong Replacement Project sponsored by the Meteorology and Environmental Protection Administration. The herd was only five nautical miles from Qatari waters and twenty nautical miles from Saudi waters. The Gulf states are aware of the importance of the dugong and are keen to cooperate for its conservation. This discovery establishes the Gulf as a significant region for dugong and their range is likely to be multinational. — *WWF News*, May-June, 1986.



White Storks in courtship display

The White Stork *Ciconia ciconia*

Do you know why a Stork is a Stork? A Swedish legend says that when Christ was hanging on the Cross, the stork felt sad, and circled over the hanging Christ crying all the while *Styrka! Styrka!*, meaning *Strength!, Strength!*. For this the Stork came to be considered as a sacred bird. Storks are also enemies of snakes, and so man who lived in fear of snakes sought to be closer to the bird. The Anglo-Saxons called the bird *Storc*, and from it came the English word Stork.

There are six species of storks living and breeding in India all the year round. However, in the cold months from September to March come into our country the White Storks, and go back to their homes when the summer heat starts in India. Two races of White Storks are concerned — the red legs and red beak bird, which is the West European bird,

and the red legs and black beak bird, which comes from Korea, Japan and Eastern Russia.

Man always encouraged the Stork in Europe to live with him. He put cart wheels on chimney tops and on poles, providing platforms for the Stork to build their nests on. The Romans during their rule made a law called *Lex Ciconaria* or "Storks' Law", which made it obligatory for children to look after their aged and helpless parents and keep them in comfort, as Romans believed the Storks did the same to their parents.

The White Stork is mainly white in colour with black flight feathers, long beak and long legs, and also a long neck. Their tail is short. They fly with slow wing-beats, glide when they land, and soar on thermals or heated air. They walk majestically, with neck held high, and head tilted

STORKS

White



1 Eurasian
2 European

White Necked



Painted



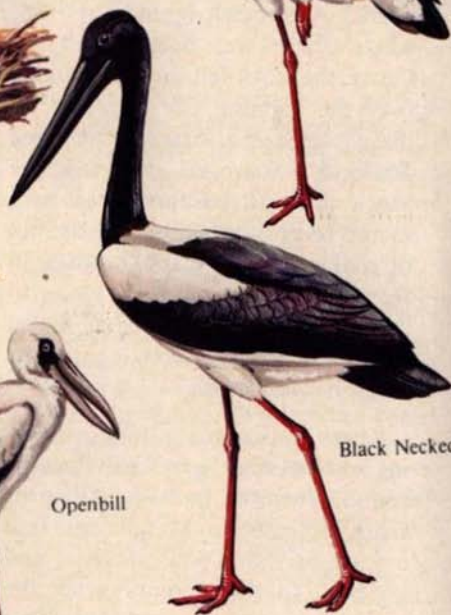
Black



Lesser
Adjutant



Adjutant



Black Necked

Openbill



© Carl D'Silva vii/86

a little downward to scan the ground.

Once the White Stork was very common all over Europe. Since the Second World War its numbers there are greatly reduced. This caused concern among the various European nations.

The International Stork Symposium held at Vogelpark, Walsrode, W. Germany from 14th to 18th October 1985 states in its report that White Stork populations have suffered serious and extensive decline in western and southern Europe, but that they have increased in eastern and northern Europe. From 1979 to 1983 between 166,000 and 227,000 storks were counted each year during autumn migration along the Black Sea Coast of Bulgaria. About 167,500 storks were counted during 1984 spring migration in the Bet She'an Valley of Israel, and the total number of migrant storks passing through that country was estimated at 300,000 birds. In 1985 autumn Spanish scientists counted over 27,000 storks passing through the Straits of Gibraltar to their winter migration grounds. White storks face significant reduction of feeding areas due to alteration in the land, and many die consuming pesticide contaminated food. Many storks meet with accidents with the high power lines in their flight, and they also lose their traditional nesting sites. While they are on migration, many of them are killed and eaten in the countries they pass through.

SIGHTINGS IN INDIA

The response to the Society's appeal to members on behalf of the White Stork Working Group, Walsrode, West Germany which appeared in *Hornbill* July-Sept. 1985(3) is indicative of the interest taken by our readership. Some 15 individuals among our members have communicated to us their sightings for the season 1985-86.

The bird is reported from Gujarat (Kutch), Bihar, Maharashtra, Tamil Nadu (Nilgiris and Madurai), Andhra Pradesh, Karnataka, Kerala and Pondicherry on the east coast. This accounts for nearly 250 individuals sighted. The majority among the sightings refer to the nominate race *C. c. ciconia*, and one definitely to the Eastern *C. c. boy-ciana*.

While most of the observations were of solos or a brace of storks, flocks ranging between 20 and 50 were reported by reliable sources between December 1985 and January 1986. A telegraphic report which came in from Bihar referred to a 'large scale' congregation at Madhubani on 28th December 1985.

The appeal also elicited reports of vast flocks of White Storks seen in bygone years. One such from Gujarat (Kutch) reported a flock of 300 to 400 individuals in Kutch in 1977-78, 20-24 (1978-79), and up to 100 (1979-80). The figure of 300-400 which appeared dubious on the face of it is confirmed by knowledgeable bird students, especially from

among the princely house of Kutch. To sustain the authenticity of vast numbers seen in earlier years, a report from Kutch for 1984 records a count of 900+ birds on the borders of the Great Rann of Kutch on 2nd December of that year. Simultaneously, claims the reporter, a flock of over 3000 White Storks was seen circling in the air. However, there are no reports of appreciable numbers of White Storks during 1985-86 from Gujarat, and the reason could be water scarcity which this region suffers from because of the failure of rains in 1985.

Generally storks of all species are unmolested in India by villagers from times immemorial. However, one instance of a killing was brought to our notice. It happened

in September 1985 in Quilon district of Kerala. A group of three birds of the nominate race was snared and captured. Two of them were eaten by the meat hungry villagers, while the third with its flight feathers clipped and rendered flightless kept fending around the village feeding on fish and frogs. It was retrieved by our correspondent.

The Bombay Natural History Society has been appointed by the ICBP/IWRB Specialist Group on Storks, Ibises & Spoonbills as Regional Representatives for S. Asia. The Society would be happy to receive reports of White Stork sighting over this region and co-ordinate them for onward transmission to the Group.

J.S. SERRAO

The White Stork in Indian Literature

I have no information on the numbers of the White Stork visiting India, but in the far south, to which I belong, it is the hospitable custom at wedding feasts when someone asks for another helping of a dish that has been exhausted, not to tell him it is no longer there, but to press a quite different dish on him in spite of his protestations. It is in this spirit that I offer you the enclosed verse and translation, and the notes on them below — especially as I cannot conceive of any symposium on storks that will not be enriched by this address to the stork messenger.

நாராய் நாராய் செங்கால் நாராய் !
 பழம்படு பணயின் கீழங்கு பிளந்தணை
 பவளக்கூடர்வாய் செங்கால் நாராய் !
 நீயும் நன் பெட்டையும் ஏதன் துணைக்குமரி ஆடி
 வடநீரைக்கு ஏருவீர் ஆயின் ,
 எம்மூர் சத்திமுத்தம் வாயியுள் தங்கி
 நுண்சுவர்க் கூடரை கண்ணுரல் பல்லி
 பாடுபார்த்திருக்கும் என் மணவியைக் கண்டு
 எம் கோன் மாறான் வலிந் கூடலில்
 ஆடையின்றி வாடையில் மெலிந்து
 லையது கொண்டு மெய்யுது பொத்தி
 காலது கொண்டு மேலுது திரவியி
 பேழையுள் திருக்கும் பாம்பென் உயிர்க்கும்
 உழையாளனைக் கண்டனம் எனவே.

சத்திமுத்தப் புலவர்

The following is a very close rendering literal except for the need to bridge the basic syntactical differences between Tamil and English.

O stork, O stork, O red-legged stork!
O red-legged stork with coral beak sharp as
the split palmyra sprout!
Should you and your mate, after sojourning
in the southern waters of Kanyakumari,
turn northward in your flight,
halt at the tank of my village of Saththi-
muththam—
and there seek out my wife,
listening to the gecko's whinnying voice
for augury of my return
within our wet-walled leaky roof,
and tell her that you saw this poor wretch
in the city of Madurai of our Pandya king,
grown thin with no cover of clothing against
the cold north wind,
hugging his torso with his arms
clasping his body with up-bent legs,
barely existing
like the snake within its basket!

This celebrated poem is one of the oldest surviving occasional verses of classical Tamil. We do not know the names of some of the poets of that distant past, whose work now survives only in a verse or two in a contemporary anthology: we call them 'the poet of' and add the first few words of their poem. In this case, because the poet refers to his village of Saththimuththam (in the Thanjavur district) we call him Saththimuththa-p-pulavar, i.e. the poet of Saththimuththam. We also do not know when he lived precisely, but carefully researched inquiry establishes that he probably lived 17 or 18 centuries ago. This is the only poem by him known to Tamil, but though it is so brief and only an occasional verse, generations of Tamil scholars have acclaimed it for its stark power.

I bring this poem to the notice of ornithologists interested in migratory storks for a reason. The terse description of the bird in it is unmistakable — red legs, coral beak sharply tapered like the sprout of the palmyra (*Borassus flabellifer*) — it can only be the white stork. Even today the farinaceous sprout of the palmyra which is eaten by poor people in the south (it is peeled and sold, boiled and eaten) displays the extraordinary similarity it has to the white stork's beak, with the longitudinal furrow on one side suggesting the bird's mandibles. Furthermore, though there are early Western records of the seasonal arrival of migratory birds (as in the Bible), the specific mention in this verse of the white stork coming as far south as Kanyakumari (it is virtually unknown in Sri Lanka) and then turning north on its homeward flight after winter is remarkable. Many early poets write of the bitter cold of Madurai during and after the north-east monsoon in their times — today it is an inferno but even today in December-January a strong, cold north wind is a feature of Madurai.

My translation, too literal, fails to convey the power of the original, but I thought that in the context in which I send it to you, it should be a very close rendering.

M. KRISHNAN

'A trip to Dachigam and Hygam Sanctuaries in Kashmir,

In my above article *Hornbill* 1984(4), pp. 7-12, I inadvertently omitted to mention my sponsors. We were a group of 7 students of the Indian Institute of Technology — Bombay, and we visited the sanctuaries on behalf of our Wildlife Club. This was one of the many such field trips sponsored by the Wildlife Club of IIT — Bombay.

JAYANT KULKARNI

I have just seen the latest issue of *Hornbill* 1986(1). It was a great idea to change the style of the headings of articles; the colour makes the pages come alive. There is a positive difference in the visual appeal of the magazine, and I thought I should put my appreciation on record. I presume it is Carl D'Silva who is responsible for the new look, and my congratulations to him.

ARCHNA MEHROTRA

Kihim, Alibaug, Maharashtra

BIRDWATCHER

An Adjutant gobbles ducklings

Come summer and a small population of the huge Adjutant storks descends on the marshes of Bharatpur. For a few months these ugly birds sustain themselves mainly by feeding voraciously on big fish that abound in the rapidly diminishing puddles. It is a common sight to see an adjutant capturing a fish with a resounding splash, and then toss it about till the prey gets thrust head first down the throat.

But quite recently, I had the fortune-cum-despair of observing a Greater Adjutant making a meal of Spotbill ducklings. It was one of those placid summer evenings, and I

was closely following the group of tiny ducklings with a telescope. The light was fading rapidly. I was beginning to pack up to start the long ride back to camp, when I saw the adjutant landing in the very spot where I had seen the ducklings a few seconds earlier. With remarkably adept, jabbing movements, the monstrous bird literally picked a duckling from underwater (where it had retreated in evasive action), shook it about 'by the scruff of the neck' and wolfed it down. I was truly saddened as I had been following the cute ducklings since that morning. But I was in for more shocks. Hardly had the first bird been

Continued on p-35



Ravi's Hanuman langur study troop, resting together prior to roasting

Langurs of Mundanthurai Plateau

Mundanthurai Wildlife Sanctuary (567 km²) in Tirunelveli district, Tamil Nadu is at the southern end of the Western Ghats. Due to a great altitudinal variation (foothills to nearly 2000 m) it encompasses different vegetation types such as lush evergreen forests (with canes *Calamus rotang*, reeds *Ochlandra travancorica* and endangered palms such as *Bentickia coddapanna* and *Arenga wightii*), moist and dry deciduous forests, scrub forests and plantation forests of teak, eucalyptus, sandal and softwood species (*Ailanthus excelsa* and *Ceiba pentandra*). On Mundanthurai plateau — a 60 km² tract at an elevation of about 200 m, the notable vegetation type is the riverine forests of the two perennial rivers, the Tambiraparani and the Servalar which drain the plateau. Gigantic trees harbouring arboreal mammals such as Nilgiri

langur (*Presbytis johnii*), bonnet macaque (*Macaca radiata*) and giant squirrel (*Ratufa indica*), not to mention the diverse avifauna and herpetofauna, with the beauty of swift flowing waters and fishes, transport one into a picturesque world of natural charm.

Mundanthurai and especially the plateau is a paradise for wildlife researchers and more so for primatologists. Dr Rauf Ali initiated primate research here with a study of bonnet macaques. It is indeed a unique experience in Mundanthurai to be able to view five different primate species in a day. Hanuman langur (*Presbytis entellus*), Nilgiri langur, bonnet macaque, and Slender loris (*Loris tardigradus*) can all be seen on the plateau itself, while the endangered lion-tailed macaque (*Macaca silenus*) occurs in the higher reaches



Slender Loris, the nocturnal primate - in Mundanthurai

of the Sanctuary — a brisk three hour trek from the plateau. The forest rest house, our research base, could not have been better located, on the banks of Servalar and just one hundred metres away from the confluence of the two rivers, where a cable bridge transports one across the Tambiraparani. It is an exciting experience to walk across the swaying bridge, especially when some of the sticks, which go to form the floor, are missing!

Research under the guidance of the senior author commenced on the plateau from August 1983 initiated by the BNHS Elephant project team. Since November 1983 five students of A.V.C. College, Mayiladuthurai, Bharathidasan University, have also done their research for their Master's in Wildlife Biology.

The third author (Wesley) began his study of Nilgiri langurs in

November 1983 for his M.Sc., the first study of these primates in low altitude habitats. All previous research on Nilgiri langurs was carried out at elevations 900 m, including J.F. Oates's study in Kakachi, 1000 m, in the adjoining Kalakadu Sanctuary. Initially the study concentrated on feeding and ranging patterns of a troop, but since May 1984 it has taken a more comprehensive outlook. A survey of the entire plateau for Nilgiri langur population has been completed and efforts are currently underway to habituate another troop for a comparative study.

The Bombay Natural History Society through Dr Salim Ali Nature Conservation Fund supported the study from May 1984 to February 1985 and since April 1985, Wildlife Institute of India is supporting it. A further two years of research with W.I.I. support is due to commence shortly for Wesley's doctoral degree.

The study area, riverine forests, holds many a surprise for the researchers. Very recently an arboreal skink *Dasia haliana* was collected from the riverine forests of Tambiraparani and it proved to be a first time record in India. Hitherto it was thought to be endemic to Sri Lanka. Of course, there is always some wildlife to observe as they come down to the water to drink. The months of January, February and March offer a treat of avifauna, especially kingfishers of which there are five including the Black-capped.

The beauty and the serenity of these jungles make research an extremely satisfying experience notwithstanding the troublesome ticks.

Nilgiri langurs are very difficult to observe as they inhabit the canopy of the riverine forests, obscured by foliage and often in shade. Moreover their shy and extremely active nature does not make the task of data gathering any easier. By a long and gradual process of acclimatization (4-5 hours daily for more than a month), Wesley has eventually habituated the study troop to his presence. Thus in February 1984 began the long and arduous process of data gathering, which is still going on.

The survey of the plateau for Nilgiri langur troops has yielded a minimum figure of 16 troops and a total population of 169 langurs. Fourteen troops were unimale, bisexual troops, while one was an all-male band of three, and the other had two adult males and an unsexed sub-adult. Troop size varied from 3 to 21, with 10.56 as the average troop size.

The study troop utilised in total 69 tree, climber and shrub species as food plants, *Pongamia glabra*, *Terminalia bellerica*, *Syzygium cuminii*, *Alphonsea sclerocarpa*, *Albizzia amara* and *Tamarindus indica* contributing more than 50% of the diet. Young and mature leaves, flowers, fruits and seeds were the major plant parts eaten.

Since August 1983 to date *no*

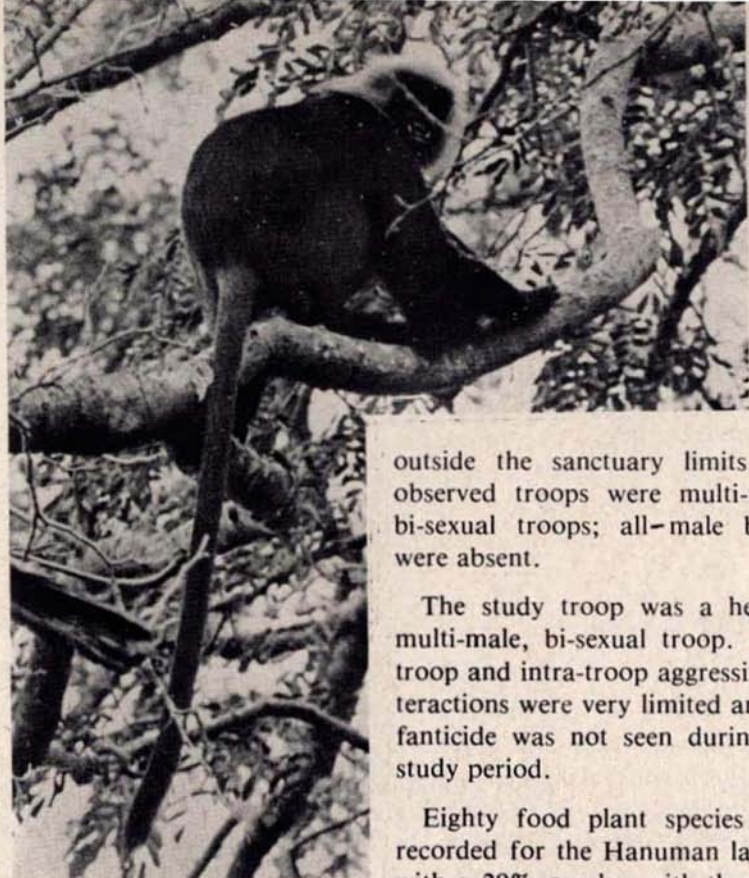


A. J. T. Johnsingh

*Servalar river with gallery forests on either side
— ideal Nilgiri langur habitat*

female Nilgiri langur has been observed either alone or in the company of other primate species. The sex ratio of adults in the population of 169 is in favour of females (43 ♀ : 19 ♂) and the population structure indicates a healthy population with a good number of sub-adults (57) and infants of various ages (50).

Hanuman langurs were studied by the second author (Ravi) for his master's thesis, from December 1984 to April 1985. Even though Hanuman langur is one of the extensively studied primates, this study proved to be a fascinating experience and yielded numerous interesting results. In May-June 1985 an extensive survey for Hanuman langur population was carried out by both Ravi and the senior author in Mundanthurai and Kalakadu sanctuaries with support from Wildlife Institute of India.



An adult male of the unimale bisexual study troop of Wesley

Seven troops numbering about 350 animals were located which is quite contrary to the figure of 50 langurs quoted for the entire Tirunelveli district by Dr Kurup from the Zoological Survey of India. In fact Ravi's study troop, near Filter House in Lower Dam alone numbered more than 120 langurs. The plateau has a population of about 250 langurs in 4 troops and a fifth troop of about 50 langurs resides in the factory campus of Madura Coats at the foothills just

outside the sanctuary limits. All observed troops were multi-male, bi-sexual troops; all-male bands were absent.

The study troop was a healthy multi-male, bi-sexual troop. Inter-troop and intra-troop aggressive interactions were very limited and infanticide was not seen during the study period.

Eighty food plant species were recorded for the Hanuman langurs with a 29% overlap with the other two primates, Nilgiri langur and bonnet macaque. Overlap of diets only between Hanuman and Nilgiri langurs was 30% and only between Hanuman langurs and bonnet macaques was 5%. Major food plants recorded for the Hanuman langurs were: *Pongamia glabra*, *Albizia lebbeck*, *Santalum album*, *Ficus bengalensis*, *Ficus glomerata* and *Strychnos potatorum*.

The most unique feature of the study troop was the constant association of an adult male Nilgiri langur with it. On occasions there were as many as three adult males

associating with the troop. The Nilgiri langurs spent all their time in close association with the Hanuman langurs, feeding, resting and even roosting with the troop.

This association may have been brought about by the eviction of the Nilgiri langur males, when nearing adulthood, by the dominant male of an uni-male, bi-sexual troop (the typical social organisation of Nilgiri langurs on the plateau). Initially it should have been a tenuous relationship but as time progressed the Nilgiri langurs have integrated into the social milieu of the Hanuman langurs. Local people refer to this inter-specific relationship as being at least 5 years old.¹

The Nilgiri langurs were dominant over the Hanuman langurs, but on occasions three or more Hanuman langurs teamed up to put the Nilgiri langurs to flight!

The most remarkable observations were of course the episodes of inter-specific mating between the adult male Nilgiri langurs and the adult female Hanuman langurs. There was no coercion involved on the part of the Nilgiri langurs, for it were the female Hanuman langurs which courted and invited the former.

Captive breeding experiments are essential to ascertain whether these inter-specific matings are fertile or not. If they prove to be fertile, these langurs offer a very interesting research problem. Who knows, we may well be a witness to a hybridisa-

tion of species in the wild.

Hanuman langurs of the study troop were dark-coated (dirty brown colour). A few of them have exceptionally darker coats very dark grey, tending to be black. It is quite possible that these dark-coated langurs are the offsprings of inter-specific matings. More extensive and long term research is essential to confirm these views.

The major threats to this beautiful sanctuary are extensive disturbances due to dam and road construction, firewood cutting and cattle grazing. With the construction of the Servalar dam coming to an end — a marathon project, having taken 12 years to complete — there is renewed hope for these jungles. At this point of time it is very essential for the forest department to assert itself and evict all people out of the sanctuary limits whose presence is superfluous. This would automatically cut down on pressures like tree felling and cattle grazing. Better protection and management on the sanctuary-village interface is also very essential. Intensive systematic patrolling in the higher altitudes to keep away cane and wildlife poachers should be begun immediately.

Through 1985, nine sambars were found dead through chance observations, without any obvious injuries. This could well be due to a disease contracted from cattle. Yet another compelling reason to banish livestock from the sanctuary.

A vital aspect of conservation activities on Mundanthurai Plateau, especially for the arboreal mammals, should be the efforts in maintaining the continuity of the riverine forests, along both the Tamiraparani and Servalar. These are invaluable corridors through which genetic exchange takes place between the populations of the plateau and of the evergreen forests in the upper reaches of the Sanctuary.

In May 1978 Dr Madhav Gadgil had brought a team of researchers on a wildlife training course to Mundanthurai. A drive census through a small patch of forest gave the following results: 25 sambar, 7 chital, 3 wild pigs and one mouse deer. This patch of forest on the northern bank of the Servalar, opposite to the rest house, was the site where an attempt was made to put up a mini-zoo! A totally ill-conceived idea, it was implemented due to great political pressure, in spite of protests from the Tamil Nadu Forest Department. Precious funds went down the drain as the work was never completed and today we have dug up moats, half constructed walls and cleared patches of forest staring at us and reminding us of our fallacy. We hope that the Forest Department will rise to the occasion and abandon the project forever.

In November 1985 a similar drive census was carried out in the same patch of forest, by the senior author and his students, and only a troop of Nilgiri langurs was seen. This can

only be used as an index to indicate the decline in habitat quality due to increasing pressure of various deleterious factors and does not augur well for the future.

Presence of research personnel in the Sanctuary has aided the Forest Department to keep track of events over the last two and a half years and has also served as a deterrent to malicious practices such as poisoning, poaching (sandalwood, as well as animals) and dynamiting of the rivers.

Mundanthurai has a great potential for further research, in the field of primates, lesser carnivores and the leopard. It is our sincere hope that this article will heighten public interest in the Sanctuary and induce more people to visit, enjoy and appreciate these beautiful jungles. The best way to ensure the protection and preservation of sanctuaries like Mundanthurai throughout our nation is to gain more friends for the Jungles of India.

A.J.T. JOHNSINGH

RAVI CHELLAM

S.F. WESLEY SUNDERRAJ

This is the fourth part of the series and is continued from p. 28 of Hornbill 1986(1)—EDS.

Violet snails (Family — *Janthinidae*) possess small, turbinated and fragile shell which shows a peculiar squarish aperture. Umbilicus and operculum absent. Shells bluish or purplish in colour. Pelagic in life, floating in the open sea and feeding on plankton.

19. Violet or Purple Snail (*Janthina roseola*)

A beautiful violet-tinted, thin and fragile shell, with blunt apex and squarish aperture. Umbilicus and operculum absent. Upper half of whorls light purple with the aperture side being deep purple. Live molluscs are gregarious and float in shoals using a float of jelly-like bubbles to which they remain attached and move where the winds and current take them. They are plankton feeders and emit a violet fluid when attacked. Commonly found on beaches after a storm.

Wing-shells (Family — *Strombidae*) are large and massive shells with a short, conical spire, semi-lunar aperture and claw-shaped operculum. The outer margin of aperture usually expands into a wing or finger-like projections. Shells of this family differ in size, shape, and colour.

20. Scorpion Shell (*Lambis lambis*)

A large, heavy conical shell with sharp angular shoulders having small knobs. Aperture channelled

and thickly enamelled inside. Outer lip expanded into a wing carrying five finger-like processes in the adult. The shell grows up to 175 mm in length. The surface colour is creamy white, mottled with brown, and pink columella. The species has great economic importance on the southern coasts where it serves a variety of purposes. The animal inside the shell is used as food for its high nutritive value; the shells with broken fingers are used as sinkers for nets. The shells are also used as traps for octopus. A good quality of white-wash lime is made by burning the empty shells.

The empty shells are found occasionally on beaches and live ones occur at 2-3 fathoms depth on weedy bottoms. They are also popularly called as Five-fingered Chank or Common Spider Conch.

21. Beak Shell (*Tibia curta*)

A long, tapering, smooth and shining shell that grows to about 155 mm in height. Colour ranges from yellow to brown with deeper brown below suture. Aperture channelled in front. Outer lip expanded into a wing, armed with several short and stout spines along the margin and with the anterior canal prolonged into a semi-tubular beak. The shells with broken wings are common along the shore but live ones occur abundantly buried into the mud at depths between 10 and 30 fathoms



Neverita didyma



Natica lineata



Natica picta



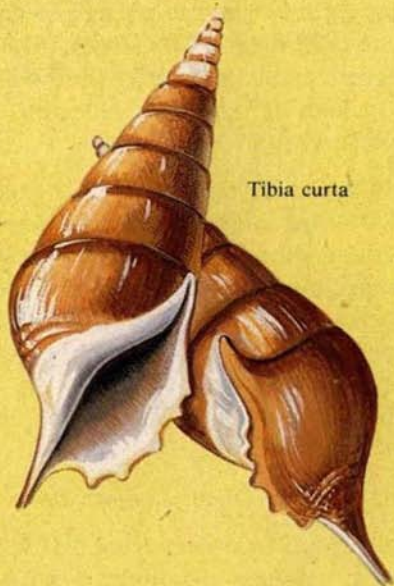
Janthina roseola



Natica maculosa



Lambis lambis



Tibia curta

with their long siphonal canal protruding out in the water.

The Wing-shells are excellent scavengers, feeding on dead as well as living marine creatures and are in great demand for the manufacture of cameos.

Moon snails (Family — Naticidae) are active and sand burrowing molluscs with large foot and globular glossy shell. Spire depressed. Umbilicus always present with variable depth in different species. Operculum horny and mouth large and semi-circular. Carnivorous.

22. Lineated Moon (*Natica lineata*)

A thinnish, polished shell, almost globular in shape. Spire short and stout. Creamish white easily distinguished by its irregular, closely drawn purple-brown lines running down the shell slantingly. Umbilicus deep. Columellar region white. Lives buried in loose mud or sand in the littoral zone.

23. Maculated Moon (*Natica maculosa*)

A small, common shell which can easily be recognised by its rows of

thick brown or purple stains or blobs. The streaks become more reddish when the shell is bleached.

24. Painted Moon (*Natica picta*)

Closely resembles the Maculated Moon but can be differentiated from it by 3 or 4 white transpiral bands between which the brownish markings are arranged in a zigzag manner.

25. Callated Moon (*Neverita didyma*)

A thick and large, polished shell that attains a good size; apex blunt and with smooth transpiral streaks on the body. Shell creamy brown or yellow, or fawn with slightly bluish apex; easily distinguished by a chocolate coloured callus covering the umbilicus.

All Moon snails live in the same habitat, very common near Shivaji Park area of Dadar coast. They are predaceous in nature and exceedingly voracious. They are collected in large numbers for burning into lime.

MANOJ MUNI
CARL D'SILVA

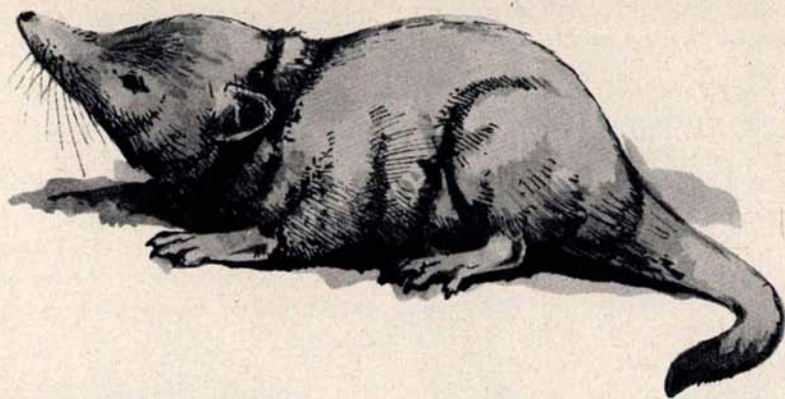
... bird watcher

swallowed, when the stork grabbed another one, and then another, before flying away satiated to a neighbouring puddle where it contently started preening itself.

The ducklings were apparently deserted ones as they appeared

derelict and parentless. Had the parents been anywhere about, this incident might not have taken place, as adult spotbills are quite pugnacious while guarding their progeny.

U. SRIDHARAN



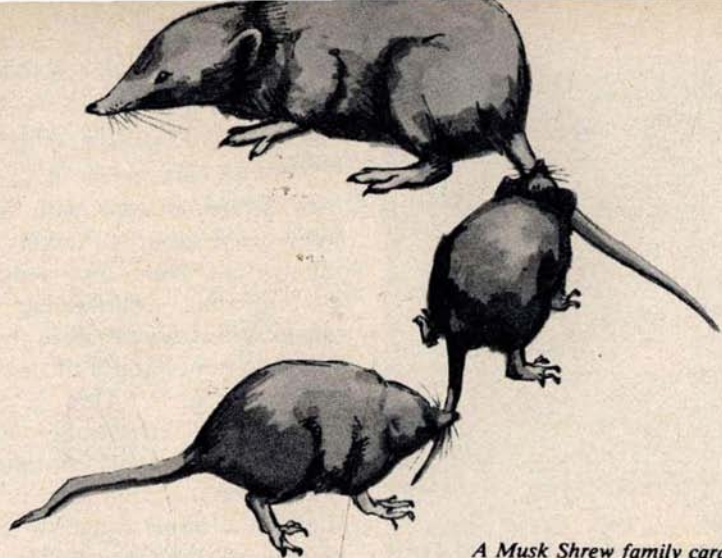
The Common Shrew (Suncus murinus)

Natural history of the Asian Musk Shrew

Everyone is familiar with the musky odour and squeaking of shrews, in and around houses. Shrews (Family Soricidae) are widely distributed in the world, but are absent from Australia, the northern part of South America and the polar regions. There are different types of shrews namely, elephant shrews, pigmy shrews, short-tailed shrews, water shrews etc. They are the most ancient direct living descendants of primitive mammals. Superficially they resemble rats but they belong to the order Insectivora. Two species of shrews (*Blarina brevicauda* and *Neomys fodiens*) are the only venomous mammals, and two others are the smallest of all mammals (*Suncus etruscus* and *Microsorex hoyi*), weighing around 2 g and being about the size of a thumb. One of the most common species is the Asian musk shrew,

chuchunder (Suncus murinus) which lives close to human beings, but about which surprisingly little is known.

S. murinus does not make permanent nests or burrows, though it may breed in old burrows of rats. It breeds in human dwellings, often in or behind boxes, or unused shoes. This animal is also found in jungles far from human habitation, but its breeding places there are not known. Although it breeds throughout the year in places like Calcutta, Malaysia and Guam, a clear-cut breeding season was observed in drier parts of Tamil Nadu, where pregnant females were captured only from September to January with a peak in November. This means that the peak of births would coincide with the period of the northeast monsoon, when insect food is most abundant. Even in



A Musk Shrew family caravanning

places where breeding occurs throughout the year, the most favourable period is the post-monsoon period which also coincides with abundance of insect food.

A female shrew gives birth to one to five babies at a time, with a mean of three. Baby shrews need their mother's care up to 25-30 days. "Caravanning" is a most distinctive behaviour pattern of baby shrews, which leave the nest forming a line or "Caravan", each holding firmly with its mouth to the tail, rump, flank or any inguinal region of the baby ahead of it, the foremost baby holding on to the tail of the mother.

Great variations in weight have been recorded in populations of *S. murinus*. Males are always larger

than females. The heaviest male shrew captured in Calcutta is four times heavier than the heaviest males captured in Guam (Pacific Islands) and Tamil Nadu, whereas the Malaysian shrews are in-between. The enormous variations can be seen at a glance in the following table:

Similarly size also varies greatly. There is a 60 mm difference in body length between the largest shrews of Guam and Calcutta. This variation in size and weight may be due to genetic factors or to quality of diet in different areas.

Although *S. murinus* is an insectivore, with unspecialized teeth, in fact it is omnivorous in nature. Its rapid digestion makes it a voracious

	MALE		FEMALE	
	Maximum weight (g)	Mean weight (g)	Maximum weight (g)	Mean weight (g)
Calcutta	177	105.6	103	67.7
Malaysia	70	50.0	70	45.0
Guam	46	30.0	29	21.0
Tamil Nadu	47	32.1	29	22.4

eater and shrews die quickly due to starvation if left without food. This is the reason why trapped shrews often die when handled, and not fright, as previously believed. Shrews have been observed to kill and eat bigger animals like snakes, frogs, leeches, chickens etc. In the Rajasthan desert, where there is scarcity of insect food, its diet included 90% vegetable matter.

The hunting behaviour of a shrew was observed under a light. At first, a 'hide and seek' game was played for 5-10 minutes, by poking the snout in and out from a hole. Then it rushed at lightning speed to capture the nearest insect on the ground, grabbed it in one movement, and returned back at the same speed to the pavilion, where chewing sounds would start immediately. This process was repeated and the animal ate about 7-15 insects per hour. In captivity shrews have accepted baby rats, mice, fish, beef,

molluscan meat, chicken food, dog biscuits, rice, wheat flour, cheese, bread, coconut fruits and Bengal gram.

In an experiment with marked shrews in a suburban colony it was found that male and female *S. murinus* had overlapping home ranges, whereas animals of the same sex could not establish themselves in the same area. This is strong evidence of territoriality in this species. The physical configuration of the habitat is important in determining the home range of shrews. When marked animals were released in isolated buildings, they confined their activities to a single building, but they moved freely between blocks connected one to another by open drains. The maximum distance recorded between two recapture points was 45 m. Marked shrews remained in their home ranges from September to February but disappeared simultaneously in the month

The Water Shrew (Neomys fodiens) has a mild toxin in its saliva



of March. Subsequently two marked shrews were captured 120 m away from their original home ranges. They were not seen again for the rest of the year. It is felt that they might have migrated to some other areas as their home ranges could no longer provide insect food during the dry season. In similar experiments in the jungles of Sagar-Sorab talukas in Karnataka, it was observed that this species does not move far from the point of original capture. Ninety four per cent of the total recaptures were within the 100 m range and the remainder were within 400 m.

The familiar pungent musky odour of the shrew is a product of post-auricular sweat glands. Whenever disturbed or put in a strange habitat it produces a musky smell. This peculiar scent may have some relation with reproductive activities as it has been demonstrated that fifty per cent of the castrated and ovariectomized *S. murinus* stopped producing musky odour. Musk may also play a defensive role as shrews are unpalatable to all predators except to owls, which have very poor sense of smell.

Shrews play some role in the epidemiology of diseases. Prater believed that shrews were very intolerant of rats and helped in keep-



The Common Shrew at a crab bait
(a night picture)

ing these vermin away from houses, whereas Pollitzer says that shrews are liable to contract natural plague in several areas and to carry infected fleas which they acquire from rats to human dwellings. Kyasanur Forest Disease (KFD) virus has been isolated many times from the spleen of *S. murinus* and species of ticks (*Haemaphysalis* spp.) which are its common ectoparasites. Shrews are also potential reservoirs of Scrub typhus. The bites of *S. murinus* may cause minor aches, hypersensitivity and reddening of the skin, specially at the finger tips.

S.C. TEWARI

The State Wildlife Advisory Board of Maharashtra held its 13th meeting on 20th April 1986 at Chikhaldara in Amravati district.

The following decisions were taken:

(a) The extension of range of the Radhanagari Bison Sanctuary in Kolhapur, Tansa Wildlife Sanctuary in Thane, Tadoba National Park in Chandrapur and the Great Indian Bustard Sanctuary in Solapur were approved.

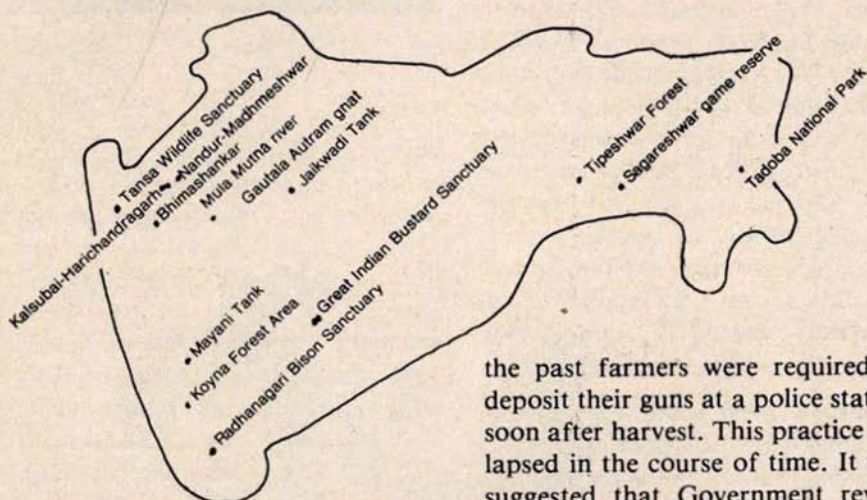
(b) Nandur-Madhmeshwar was declared a bird sanctuary while Bhimashankar, Koyna forest area, Phansad near Roha, Kalsubai-

migratory birds, and Tipeswar forest in Yavatmal district have been declared as game reserves, while Sagareshwar game reserve has been upgraded to a wildlife sanctuary.

(d) The Mula-Mutha river in the Pune city was closed for shooting along an area of 0.96 sq. km for a period of 20 years to protect the migratory as well as resident birds.

(e) Jaikwadi Tank in Aurangabad district which attracts a large number of migratory birds was proposed as a bird sanctuary.

(f) On crop protection gun licences it was pointed out that in



Harishchandragarh near Bhandaradara dam, Gautala Autram ghat in Aurangabad and Chaprala area on the bank of Vainganga river in the Gadchiroli district were declared as wildlife sanctuaries.

(c) Mayani Tank in Satara district which attracts a good number of

the past farmers were required to deposit their guns at a police station soon after harvest. This practice has lapsed in the course of time. It was suggested that Government revive the earlier practice.

The Government of India has agreed to the State of Maharashtra having the Grey Junglefowl as the State bird, the Gaur as the State mammal, the Teak as the State tree, and the Jarul or Queen's Flower as the State flower.

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