

1990 (1)

Hornbill



BOMBAY NATURAL HISTORY SOCIETY



COVER PICTURE

Asian Elephant (*Elephas maximus*), by Ajay Desai

The Asian Elephant is the sole survivor in India of the assemblage of species that constituted the order Proboscidea — 7 species of elephants and 8 mastodons have been known to exist in the Indian subcontinent in remote geological periods.

The species is extremely adaptable and found in a wide variety of habitats, from dry deciduous to wet evergreen forests. Elephant tracks have been found in snow in Sikkim, over 3,500 metres above sea level.

Loss of suitable habitat, mainly for cultivation and human habitation, has put increasing pressure on elephant populations (a full grown animal can eat over 200 kg of forage every day). As a result, the incidence of crop raiding and other potentially dangerous encounters between elephants and man has increased sharply in recent years.

Relocation of "problem" elephants after capture is sometimes the only solution, and chemical immobilization techniques are now being used more widely (see p. 16).

Acknowledgement

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Hornbill

CONTENTS

2

Editorial

3

Chilka Lake
Asad Akhtar

7

Turtle chasing
Jack Frazier

10

Wildlife Photography
T.N.A. Perumal

16

The Tirupathi Tusker
V. Krishnamurthy

20

News, Notes & Comments

24

Butterflies: Early stages in the
life cycle
N. Chaturvedi & I. Kehimkar

26

Seashore Lore
Beefsea

30

A heronry with a difference
Sattayasheel Naik

32

Folklore
J.C. Daniel

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 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.

Members receive during a year four issues of *Hornbill*, the Society's popular publication. Life members receive, in addition, three issues of the *Journal of the Bombay Natural History Society*, now in its 87th volume.

Membership fees and subscriptions

Entrance Fees, Rs 50
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Ordinary individual membership Rs 75

Ordinary corporate membership Rs 250

Life membership Rs 2000

Ordinary members may subscribe to the *Journal*; annual subscription Rs. 80 for members resident in India.

For membership forms and information on the Society's activities, write to:

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EDITORIAL

The drowning forests

Three years ago (*Hornbill* 1987(1)) we drew attention in this column to the misery awaiting the oustees of the Narmada project. Since then, enlightened public opinion has repeatedly drawn the attention of the governments concerned and the international organisation funding them to the fact that the forests of the country have reached a stage where they are now forever non-negotiable. What we have we must keep, if the nation is to survive in the years to come. However, we have now reached the stage of mourning for a wealth that is being wantonly destroyed. There has not been a second thought, and with a senseless stubbornness the governments are going ahead with the construction of the dams for destruction. Inexorably the waters will rise, and life that has been spared the axe of the woodcutter will drown in the floods.

It is not only the forests that will be destroyed. Over a hundred thousand people will be uprooted like weeds from the planned agricultural paradise of the governments. Only those who have been uprooted from the land of their forefathers can understand the agony of separation from the environment of birth. Nothing has been more shameful in this country than the treatment of those deprived by so-called 'development'. Land is costlier than gold in this country, as any city dweller can vouch for; and to lose one's birthright for promises is indeed tragic.

We repeat — forests are forever non-negotiable. We seek your assistance for upholding the tenets of the Forest Conservation Act and to see that it is not amended to impotence



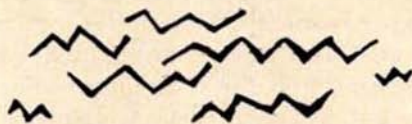
Dry deciduous forest soon to be submerged by the Narmada Sagar.

B. BHUSHAN

The Konark Express sped through the Orissa countryside, and I sat back, almost mesmerized by the beauty of the sight which greeted me. The waters of Chilka lake shimmered in the early morning light; and the track hugged the shores of the lake, whose waters seemed to creep up the side of the tracks. The breeze sent a shiver of anticipation through me. I was on my way to the lake, on a bird ringing assignment.

CHILKA LAKE

By Asad Akhtar



The Chilka lake, one among the 20-odd field stations of the Avifauna Project of the BNHS, first came to the Society's notice as a potential bird ringing station in the mid sixties. Initial surveys were launched, and a few birds ringed in early 1967. In 1980, Dr Salim Ali initiated bird ringing in collaboration with the Orissa State Wildlife Department and INS Chilka, a naval establishment on the lakeshore. A field station was set up, under the leadership of Mr S.A. Hussain, Project Scientist. Over 4500 birds of 62 species were ringed during two short camps in '81 and '84, and some 150 species recorded

from the lake. Largely as a result of these efforts, Chilka is now on the Ramsar Convention list; in other words, it is recognised as a wetland of no less importance than, say, the Keoladeo National Park at Bharatpur.

The lake sprawls over an area of about 1040 sq. km — the largest brackish water lake in India. It lies on the eastern seaboard, connected with the Bay of Bengal by a narrow channel. A number of rivers and streams empty into the lake, which becomes almost fresh with the high discharge levels attained during the monsoon. During the drier months the ingress of seawater increases the salinity of the lake, especially around the area near *Mugger mukh* (Oriya for crocodile's mouth), where the main channel from the sea enters the lake.

Our base camp consisted of a self-contained sailboat anchored off the Nalban island. (*Nalban* is Oriya for reed-covered marsh.) This 672 hectare island has been declared the core area of the recently gazetted Chilka Sanctuary. The other prominent landmark in the lake is a small rock island, on which stands the Kalijai temple. The temple is named after an Oriya maiden who drowned off the island. Her spirit, according to local legend, still haunts the area. Nalban island forms the core area, not only for the huge concentrations of waterfowl and waders, but also for the fishermen who throng the lake, and whose uncontrolled operations are perhaps the most serious problem now facing the lake. More than 700 tons of fish (mainly prawns) are harvested from the lake



Gadwall ducks in flight.

E. DASGUPTA

each year, yielding an annual revenue of Rs 7 crores. About 24 villages in Puri and Ganjam districts depend exclusively on fishing in the lake.

The first few mornings after our arrival at Balugaon, the fishing village on the lake, we commuted by motor launch to the ringing site off Nalban island. The trip was time-consuming, and the launch particularly noisy. We soon decided to move house to the boat. My first experience of living in a 'houseboat' proved every bit as pleasant as I had anticipated. A large piece of bamboo matting served as the sail during the day; every evening it was taken down, and became the roof to the house. It was wonderful to be stationed so close to the scene of action, with thousands of waterfowl flying overhead in formation, and the dabbling and diving ducks feeding along the reed-covered shores of the island.

Our ringing sessions would start with the first rays of the rising sun, and engage us for the next few hours. The work was fun, made even more so by the bracing early morning breeze. As

soon as the last bird was ringed and released, we would plop into the lake with all the enthusiasm of a duck taking to water. The thought of sting rays lurking in the muddy water would bother none of us. After a general ruckus and horsing around in the lake, it would be time for breakfast, cooked on the boat itself. We did have a regular supply line from Balugaon, but the thought of potable water running short was always at the back of our minds. It was indeed as in the case of the Ancient Mariner: water, water everywhere, but not a drop to drink".

Our major catch consisted of waders and ducks. The most important and thrilling catch, rather recovery, was of a spoonbilled sandpiper *Eurynorhynchus pygmaeus*. Interestingly, this specimen had been ringed earlier at our field station at Point Calimere, about 1200 km down the same coast. Another interesting recovery was a curlew sandpiper *Calidris testaceus*, recovered about 100 days after being ringed at Pt. Calimere. These recoveries went a long way in establishing the path taken

by migratory waders on the east coast. A similar trend has also been noticed at Harike Lake in Punjab, where we have often recovered birds ringed at our field station in Bharatpur.

All these recoveries highlight the necessity of operating several field stations simultaneously and over several seasons. The other noteworthy catches were of snipebilled godwits *Limnodromus semipalmatus* (12) and broadbilled sandpipers *Limicola falcinellus* (9).

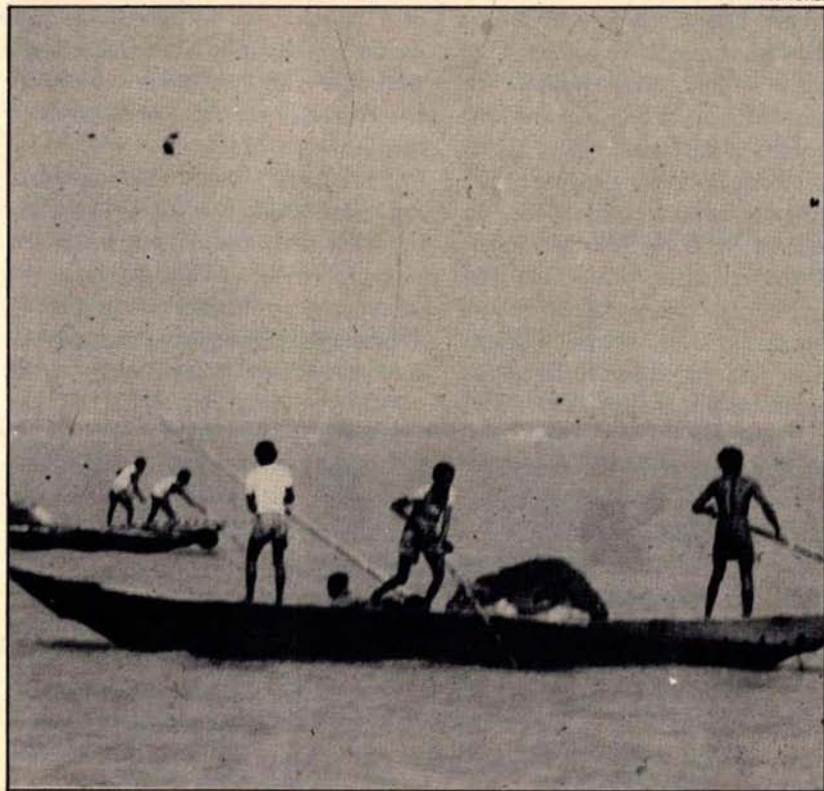
We recorded several species breeding on the island — the little tern

Sterna albifrons, gullbilled tern *Gelochelidon nilotica*, blackwinged stilt *Himantopus himantopus*, collared pratincole *Glareola pratincola* and the skylark *Alauda gulgula*. Often, while rambling on the island, we came across nooses set by the local villagers to trap birds, and dismantled many of them. At times we also had to chase the poachers away. These cases were also brought to the notice of the local officials.

Besides the birds, there were the snakes. Scientists of the Estuarine biological station of the ZSI based at Berhampore recorded the beaked sea

Fishing at Chilka: the problem is caused not so much by these methods as by trawlers and mechanised equipment.

E. VESSAOKER





Greater flamingo at Chilka; the shallow waters of the lake harbour thousands of these birds.

E.DASGUPTA

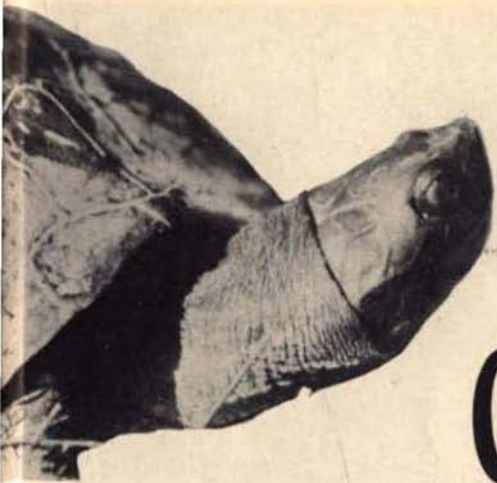
snake *Enhydrina schistosa*, locally known as 'Dushta sarp', (Oriya for a very bad snake), indicating the fear of the snake's highly toxic venom. The smooth water snake *Enhydris enhydris* also occurs at the lake.

During the first ringing session (1981), the ringing camp was based on the island itself. My colleagues Mohapatra and Shahid Ali still remember one dark stormy night, when gusty winds accompanied with heavy showers blew off one of their flimsy tents. They somehow managed to salvage a few perishable items, and most important, the data sheets and equipment. In the melee, some of the bird trappers were bitten by the dog-faced sea snakes *Cerberus rhynchops*, hordes of which swarmed into the lone tent. Eight frightened men huddled inside, six trappers and two research staff of the Society, along with the camp paraphernalia. Quite a few of the swarming snakes had to be killed in desperation, but the effort had to be given up because of their sheer numbers.

In the absence of a proper identification of the species' venomous or non-venomous nature, the next few hours were agonizing, till dawn broke over the horizon and the victim survived the bite.

During our visit in 1984 too, we had a similar experience. We were woken up in the middle of the night by the violent swaying of the boat and the accompanying thunder and lightning. The bamboo matting which served for a roof was all but blown away in the wind. We gritted our teeth, said our prayers, and clung to the roof, trying desperately to hold it down. And all the while the boat's moorings creaked ominously, threatening to give way at any moment.

In spite of a few other hair-raising experiences, when it came to closing camp, we did it with a heavy heart, vowing that it would not be goodbye but Au revoir. Chilka's hauntingly beautiful landscape is still fresh in my mind ■



TURTLE CHASING

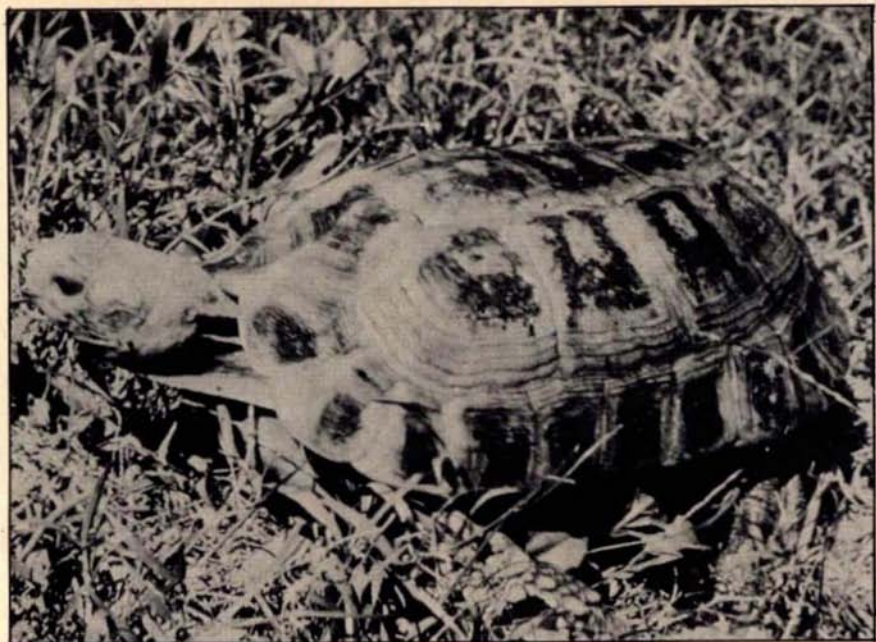
It may not have occurred to you, but turtle chasing is not a sport for the weak. This not to imply, of course, that athletic nirvana comes only after you have closed on your first chelonian disappearing in a cloud of dust over a distant hill. But chasing turtles is a demanding sport, and requires certain rare qualities that the uninitiated might mistake for symptoms of lunacy.

My most recent turtle chase began in June 1986, when I came to India for a ten month study on the biology and conservation of Indian turtles. The project actually lasted 14 months, with an officially sanctioned extension, and I have to admit to anyone concerned with the finer points (like who won) that the turtles finished way ahead. The plan was to use my highly developed mammalian brain to outwit the turtles, gathering strategic information about their

private lives — where they lived and what they did. Never underestimate your quarry: I did not see a single Travancore Tortoise *Indotestudo forstenii*, Spurtailed Tortoise *Indotestudo elongata* or Six-legged Tortoise *Manouria emys* alive in the wild. What little I learnt about these three Indian species was gleaned from the few written records or dead specimens that I found in museums. At best there are a few live individuals in captivity that can be examined, but in general these three have been outmanoeuvring tortoise chasers for decades.

The most exasperating problem is that of habitat selection and geographical distribution. The character of the Indian landscape has been altered so drastically during the last few decades that it would take a biological wizard to interpret why certain animals occur where they do

TEXT AND PHOTOGRAPHS BY JACK FRAZIER



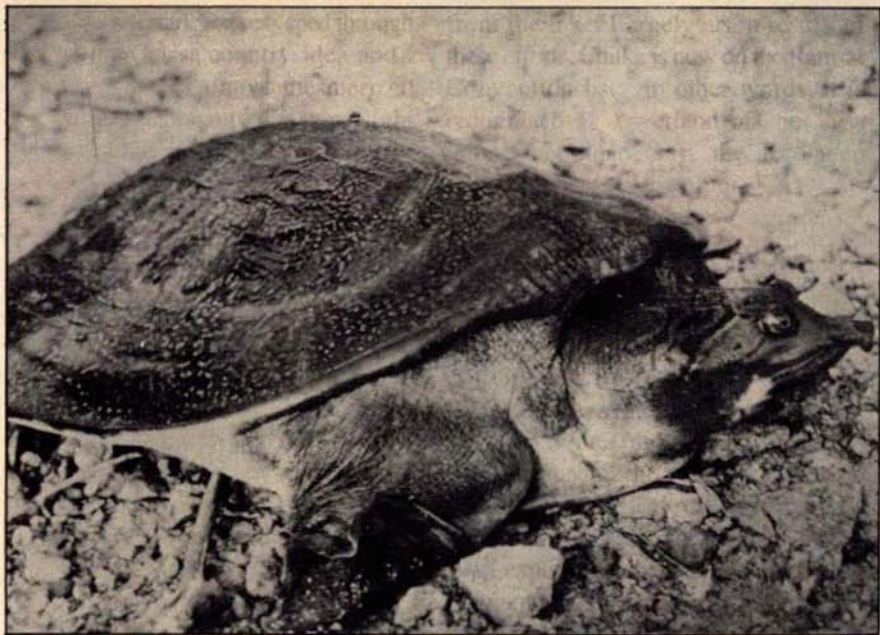
Indolestudo forstenii

and why they are absent from other areas. I have yet to see a Star Tortoise *Geochelone elegans* for example, in anything resembling natural habitat. Instead, they are consistently found in heavily overgrazed and deforested scrublands, almost seeming to occur preferentially in places where man has cut down almost everything.

Fortunately, my search was not entirely unsuccessful. The Asian Leaf Turtle *Cyclemys dentata* was found in north Bengal, in the same area from which it was first reported in India, after having eluded naturalists for the last fifty years. Breeding populations of the Three-keeled Terrapin *Melanochelys tricarinata* and the closely-related Indian Pond Terrapin *Melanochelys*

trijuga were found in the Corbett National Park in Uttar Pradesh, hundreds of kilometres from where they were known to be. There were several other records that also represent range extensions which, although much less dramatic, are still important for a better understanding of the species.

These few points were not won without risk — chasing turtles is not merely an intellectual exercise. There were treks across the thorn scrub where, no matter how carefully you stepped, an infinity of spines was lurking, ready to pierce through your boots into your very soul. In the Western Ghats you may avoid the elephants, but on every leaf is a leech.



Trionyx leithii

And if you don't mind giving blood to hundreds, or even thousands, of these lowly animals, don't discount the possibility that your legs, instead of getting thinner, may swell up like balloons.

For more excitement, add a couple of months in bed with jaundice and dysentery. And, interspersed liberally among all this, scenic drives through the countryside (starting well before sunrise and stretching well past dusk), in country buses that would have been quaint had they been less crowded. The space between the seats could just about accommodate the average six-year old, and the seat 'padding' and the suspension were cleverly designed to provide the most memorable massage of your

life. These activities were sustained with special roadside meals seasoned with enough chilli and oil to provision the average western kitchen through several decades. About the highest of the hurdles — the world of permits and officialdom — the less said the better.

But don't mistake these comments for complaints. No tortoise chase is complete without an ample supply of challenges. My only regrets came when the chase ended. I didn't mind being so thoroughly routed by the turtles — that was bound to happen anyway. I only hope to be able to take them on once again. The lure of India — overcrowded country buses, inflammable roadside meals and sly turtles all included — is too much to resist ■

Wildlife Photography

by T.N.A. Perumal

WILDLIFE PHOTOGRAPHY HAS A UNIVERSAL APPEAL, perhaps because the caveman's instinct for sketching the animals feared by him, hunted by him and loved by him, is in all of us. It is also a form of creative and artistic expression; a manifestation of the great ecological bond between man, animal and Nature. This tie of relationship is renewed, strengthened and broadened by one's quest to capture the images of the fauna and flora in wild places.

In the early 1900s it was a fashionable pastime, even a matter of pride and prestige, to hunt with a gun. Fortunately, a few enlightened persons discarded the gun for the camera to prove that photography was a far better sport, demanding even greater stealth and skill, better knowledge of animals and a sound sense of aesthetics. Animals shot with the camera are not dead, but alive and free to roam the jungles. Photographs are lively, more permanent and what is more, copies of such trophies can also be shared with friends.

Best of all, photography leaves no wounded animal in the forest, which may turn into a killer or man-eater. (But there may be wounded egos, when photographers mess up a good shot by jerking the camera trigger (shutter) instead of squeezing it smoothly at the right moment.)

Most of our pioneer wildlife photographers were hunters-turned-photographers, who were the first to realise the need to stop killing and start shooting with a camera to save our wildlife. We owe much to these pioneers: F.W. Champion, Col. Jim Corbett, Col. Bates, Phillips, E.H.N. Lowther, Loke Wan Tho, Dr. Salim Ali, E.P. Gee, O.C. Edwards and M. Krishnan. Most of them have set an example to us by having produced masterpieces of wildlife photography in spite of tremendous handicaps, by way of heavy and slow equipment and photographic materials. Especially F.W. Champion, in my opinion, is an unbeaten champion till today. His photographs of tigers and leopards obtained with trip-wire and power-flash are hard to beat.

Though they were all of different temperaments and from different walks of life, what was common to all of them was the spirit of adventure, perseverance, patience, determinat-

Peacock

On Ant-hill

T.N.A. PERUMAL





Tiger

Photo by F.W. Champion, IFS

ion, dedication to the study of animals, pride of craftsmanship, resourcefulness and love for out-door life. Their passionate concern for wildlife devotion to their craft and to natural history is evident from their photographs and from what they wrote. These are the qualities required in the making of a wildlife photographer. We are fortunate to have inherited this heritage of good photography from these pioneers. The increasing popularity of wildlife photography in Karnataka, for example, is due entirely to the inspiration of Mr. O.C. Edwards and his work.

What is a good wildlife photograph? The criteria have changed with changing circumstances and a new outlook among photographers. A good photograph can be described as one that portrays the animal best: in its natural habitat and ambience, living its natural life. Capturing its movements, character and mood with good composition, colour fidelity, lighting, tonal rendition, tonal delineation and tonal harmony make it



Leopard

Photo by F.W. Champion, IFS

infinitely better.

In simple words, a good picture is a sharp picture of an animal in its natural habitat and ambience, in soft pictorial light, doing something interesting or in motion; well composed and in truthful colour, (or if in monochrome, with a good range of tones and good tonal separation of the subject from the background). The emphasis should be on truthful representation within the parameters of the medium, be it B & W or colour, as the value of a nature photograph is much enhanced by the accuracy of the statement. At the same time, the need for evocative, sensitive and pictorial interpretations — the plus factor — is not to be overlooked. In other words a wildlife photograph can be either precise prose, or a poetic essay.

Simply gone are the days of static pictures of wildlife, winning awards in salons, because such pictures have become too common. Today, much



more is expected in a wildlife photograph as standards, techniques and technology in photographic equipment have all greatly improved. This does not necessarily mean that every photograph should be an action shot or a pictorial piece. But it does need to be of the required technical quality; in addition, the photograph must provide visual impact and significant natural history information of the species. Pictorialism is not always possible in wildlife photography, because neither the animals nor the picture opportunities are under the direct control of the photographer. But it is possible at times, when everything seems to fall correctly into place. When an ideal opportunity presents itself, one should be able to recognize the situation and click.

The film and camera vision and human vision differ in many ways. Camera vision is two dimensional and the film's chromatic sensitivity restricted, and human vision is linked to the brain, which the camera lacks. As the camera and film see the scene differently from the human eye, it is necessary to learn to see as the camera sees, and the film sees. Therefore one's experience and knowledge of the chosen medium, either B & W or colour, will help in visualising and developing an 'eye' for good pictures. It is really the ability to see and one's talent of intuition, and the competence to 'feel' the picture as it presents itself, that makes a successful photographer.

Light is the illuminating source that transforms an ordinary photographic scene into an extra-ordinary picture situation. Side-lit, back-lit scenes of wildlife are very pleasing and make the subject stand out. A rim-lit shot of an animal gives it an ethereal quality. Similarly, angular texture light, spot-light effect and soft diffused light have their own special quality of enhancing the picture. The magic hours of the early morning and evening, when animals are active and soft pictorial light conditions also exist, are the best periods for wildlife photography.

It pays to be consciously aware of the play of light on the subject that will dramatise the animal and give a properly balanced brightness value of light on the subject and the background to give it a three dimensional effect. On the other hand, improperly balanced light conditions and an obtrusive background with distracting highlights and shadows and other jarring elements will completely ruin an otherwise good photograph.

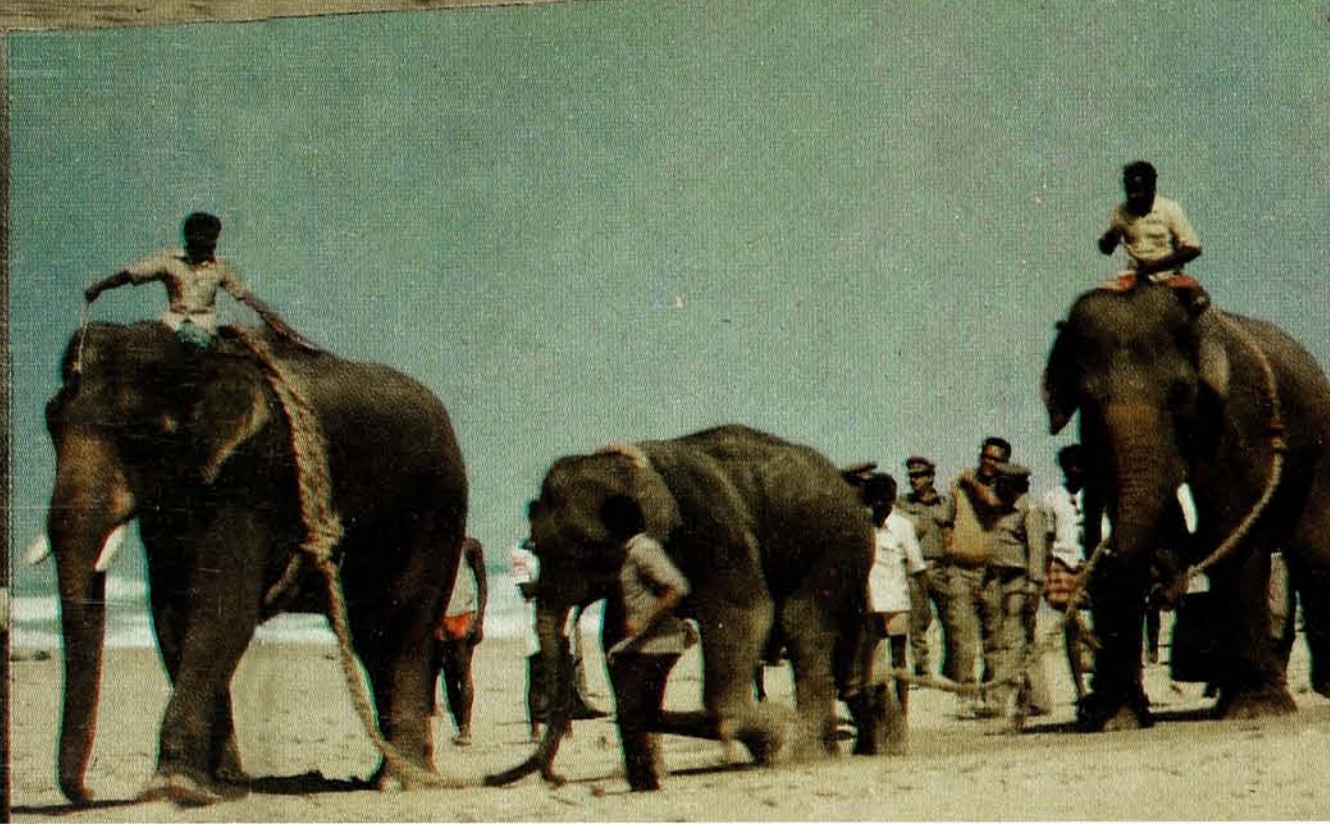
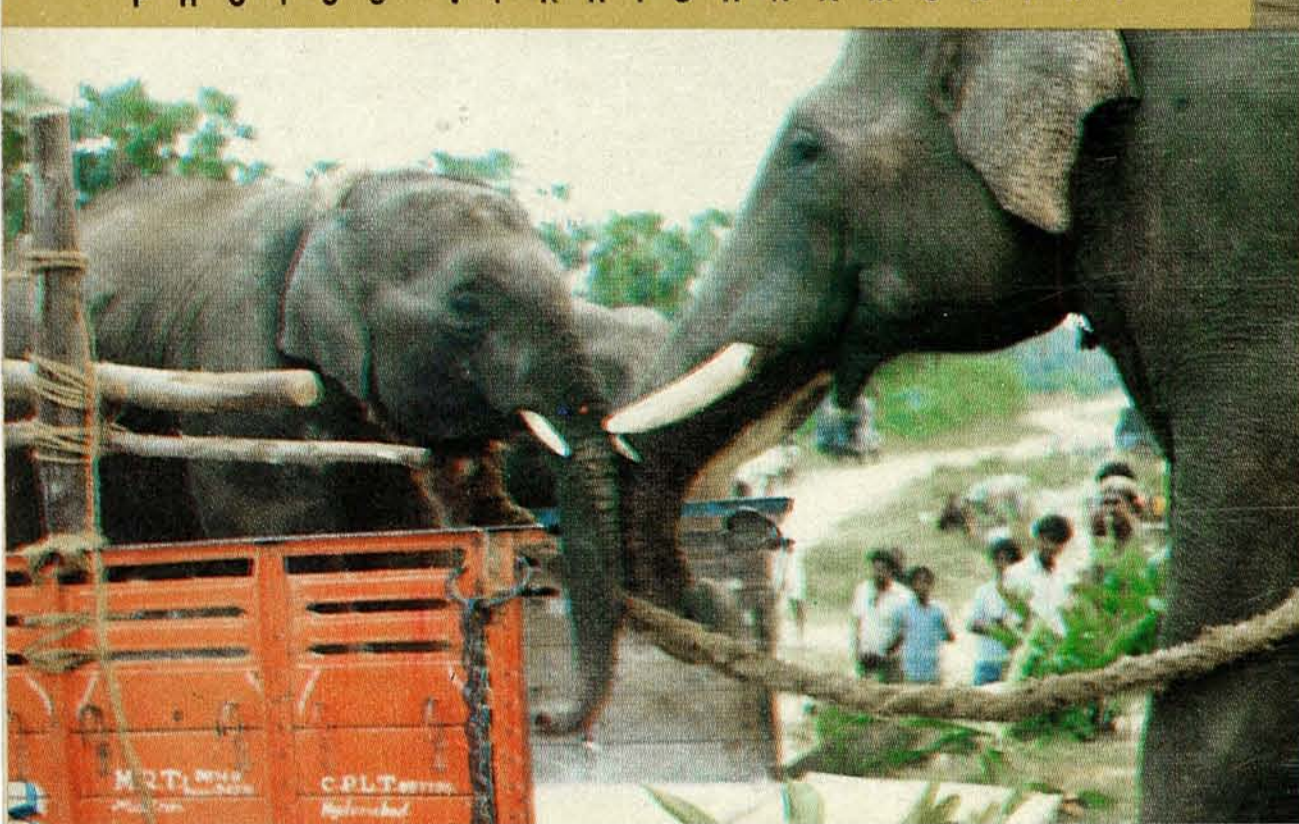
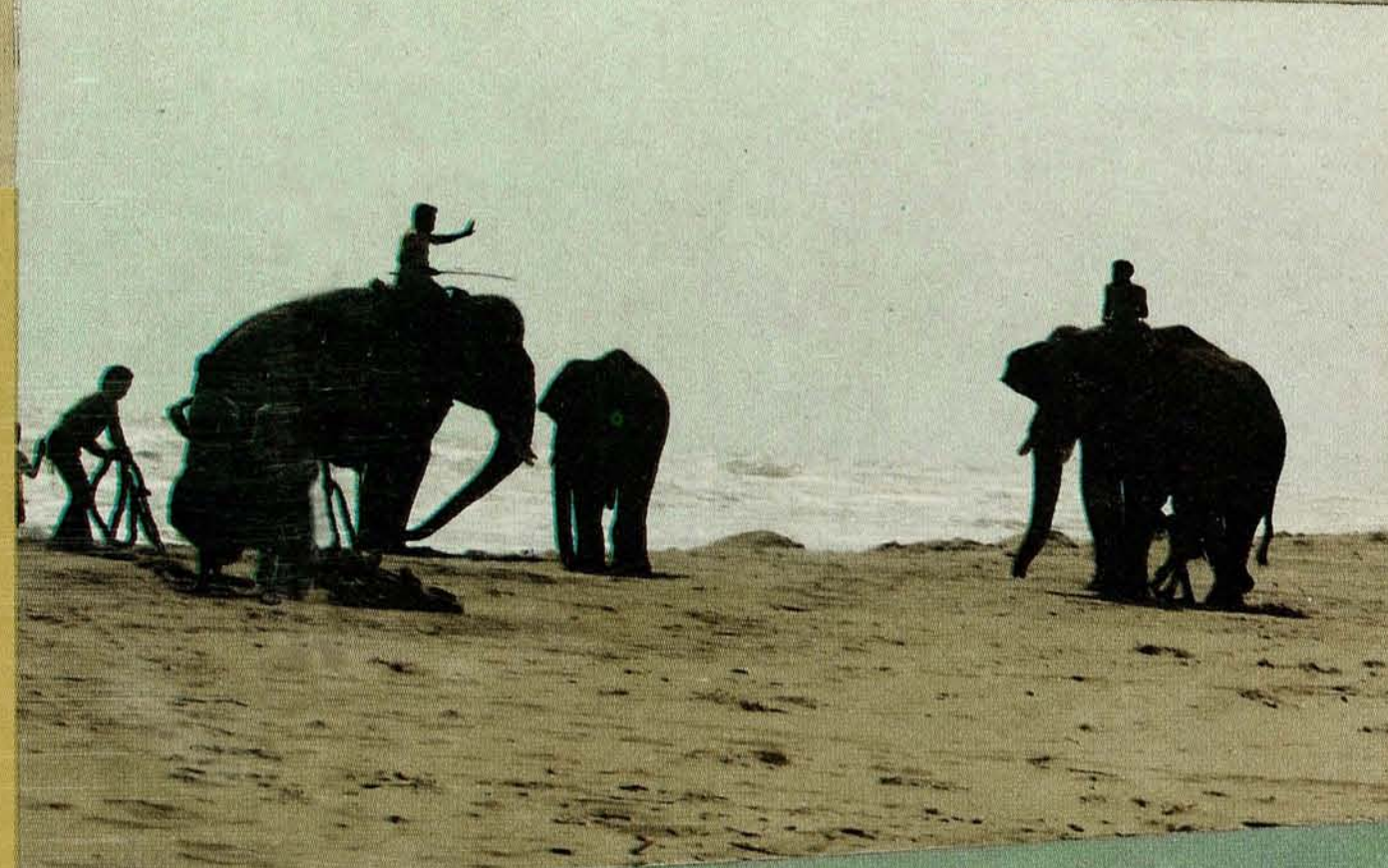
The significant role of proper background is to be understood and remembered; this point needs to be emphasised, stressed again and again, because it can really make or mar a picture. A natural background, slightly diffused, free of all distractions, with balanced brightness values and tonally complementary to the subject makes an ideal background, which will add immensely to the picture content.

Indian

Giant Squirrel

T.N.A. PERUMAL

TO BE CONTINUED



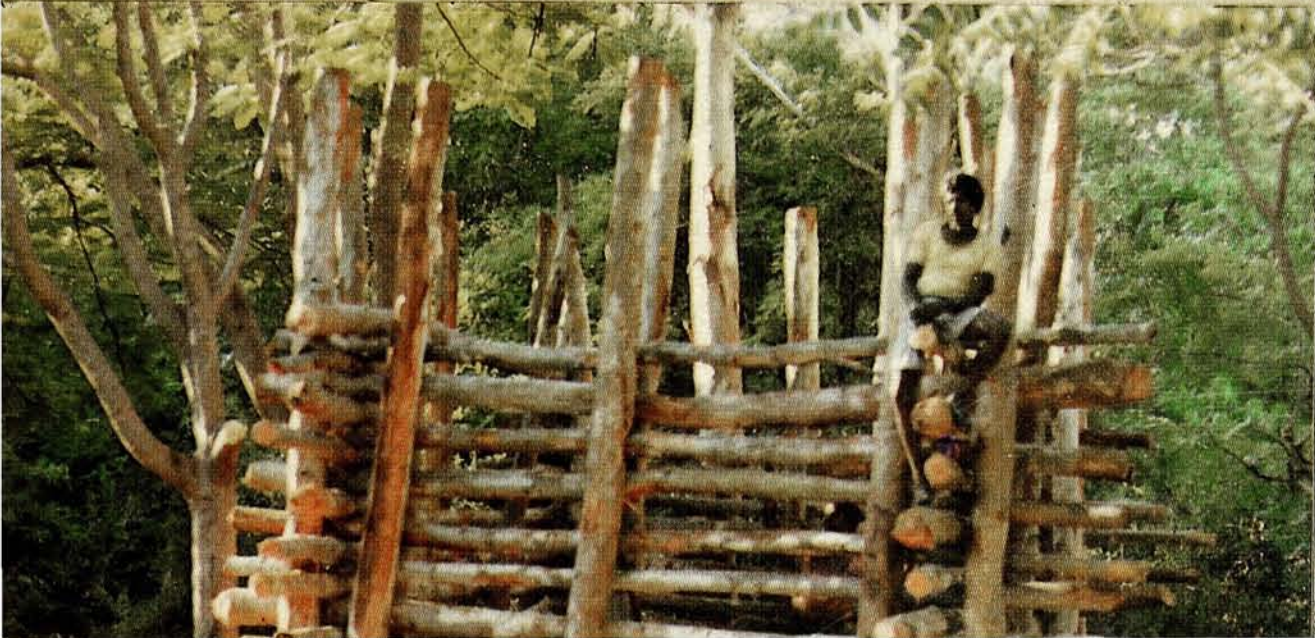
THE TIRUPATI
TUSKER

PHOTOS V. KRISHNAMURTHY

A SUBADULT WILD TUSKER was separated from his herd in Chittoor district, Andhra Pradesh. His journey through Chittoor and Nellore districts (where he reportedly killed a villager) and into Tamil Nadu finally ended on the seashore, at the Pennar river estuary. He was shot with a tranquilized dart, captured and eventually trained by the Forest Department.

Clockwise from top left

- The tusker is approached on a Kumki elephant
- He backs away nervously, but is darted from 10 metre range.
- Six minutes later, the tusker is completely sedated, though still on his feet. He is nudged away from the water...
- ... noosed and escorted to the nearby village, where he was tethered for the night.
- The next morning — into a truck, bound for Tirupathi. This tusker is still sedated with 3 hourly injections during the day-long journey. The two Kumki elephants follow in a separate truck.



Clockwise from top left

- Disciplinary action, which every six-year old sometimes needs.
- The coir rope is not by itself strong enough to hold the tusker, but the proximity of the Kumkies ensures that it will not attempt to break free.
- Company for the new recruit...
- ...and a training Kraal. A Kumki helps in the construction.
- The finished Kraal, which will house the tusker till he is acclimatised to his new surroundings.
- The Tirupathi Tusker, now part of the Forest Department staff ■

NEWS NOTES COMMENTS

Detente in the wilderness

The governments of Austria and Hungary are planning to establish the first transfrontier national park between Eastern and Western Europe. It will be located in a region of lakes which form the largest bird sanctuary in Central Europe, and a critical resting place for geese migrating from Siberia to Tunisia. Parts of the new park are already protected, with areas on both sides of the border designated as Wetlands of International Importance under the Ramsar Convention and as Biosphere Reserves.

Crane Congress

The Third Asian Crane Conference was held at Rajkot, Gujarat, in December 1989, with support and participation from a number of universities, government departments and conservation organisations. The papers presented at the 3-day conference dealt with status of different species; behavioural, morphological, habitat and migration studies; diseases and their management; and law enforcement against crane hunting.

Crane populations, especially of Siberian and Sarus cranes, have declining sharply in the recent past due to human pressure on habitats, both on breeding areas and along migration routes. A resolution was

passed at the Conference calling for greater cooperation between conservation authorities in the countries (India, Pakistan, Iran and the USSR) along the migration route of the Siberian crane.

Siberian cranes at Bharatpur.



VIBHU PRAKASH

Project Tiger

The Union Ministry for Environment and Forests has announced the establishment of a new tiger reserve — the eighteenth — under Project Tiger. The Valmiki Tiger Reserve is

located in West Champaran district, Bihar, about 320 km from Patna. The legal status of the reserve is now that of a Wildlife Sanctuary, but the Bihar government has begun the process of upgrading the core area into a National Park. The sanctuary adjoins the Chitwan National Park in Nepal, and occupies 840 sq. km: 335 sq. km of core area and 505 sq. km of buffer. The species found in the park include tiger, leopard, hyaena, wolf, jackal, dhole, gaur, sloth bear, wild buffalo, four-horned antelope, sambar, hog deer and barking deer. The vegetation is diverse, with sal, moist mixed deciduous and khair-sisoo forests, cane brakes, alluvial grasslands and *Barringtonia* swamp forests. With this new reserve, the total area under Project Tiger is now just over 28,000 sq. km (12600 sq. km core area, 15400 sq. km buffer area).

A new name for IUCN

The acronym that has been virtually synonymous with international conservation is now officially extinct. The International Union for Conservation of Nature and Natural Resources is changing its name to a less cumbersome title, the World Conservation Union.

Birdwatcher's seminar

The Birdwatcher's Society of Andhra Pradesh held a 3-day seminar on 'Role of birds in the environment and their conservation' in February 1990. The seminar was organised with support from the Andhra Pradesh Forest Department

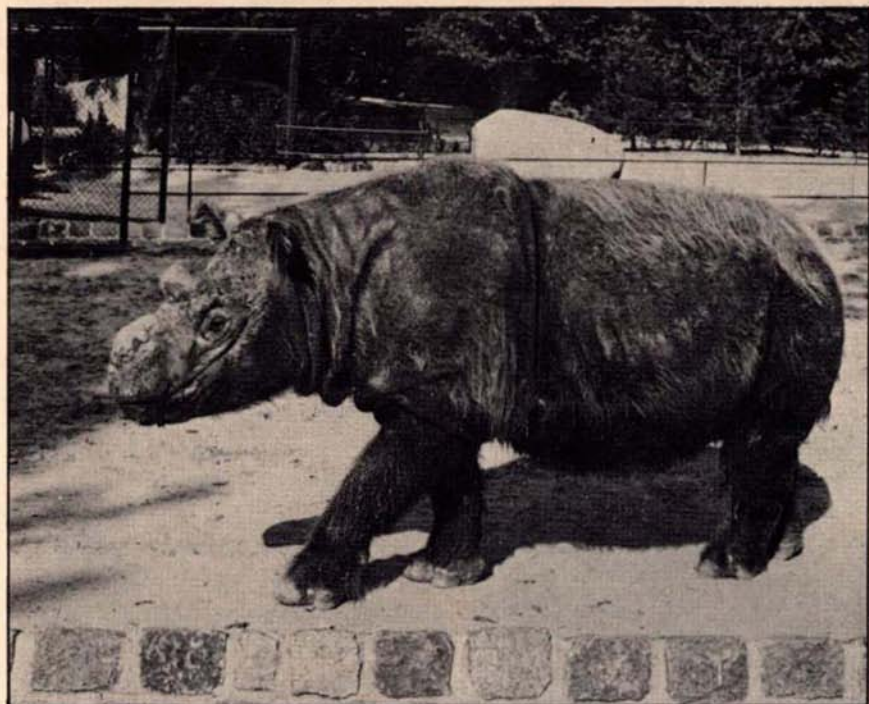
and the BNHS. Among the topics covered were the role of scavenging birds and raptors, effects of land-use patterns on bird populations, migration studies and ecology of endangered species.

Chinese sanctuary

The Chinese government, with the support of the Wildlife Conservation International Agency in the USA, is establishing what will be the world's largest wildlife reserve — a 200,000 sq. km. area in the Chang Tang area of northwestern Tibet. The fauna of the area include the wild yak, wild ass, wild sheep, gazelles, antelopes and the Tibetan brown bear. Initial studies, which are scheduled to begin in mid-1990, will be on ecology and movement patterns of large mammals.

Ramsar Convention

The fourth meeting of the Ramsar Convention (officially, the Conference of the Contracting Parties to the 1971 Convention on Wetlands of International Importance) will be held in Montreux, Switzerland, from 27 June to 4 July 1990. Programmes and budgets for the next triennium (1991-1993) will be formulated at the meeting, which will focus on development assistance, shared water-courses and migratory species dependent on wetlands. Workshops will be held on national reports, international law requirements, use of wetlands, conservation of sites listed under the Convention and establishment of wetland reserves.



Sumatran rhinoceros — dwindling populations.

E.P. GEE

Indonesia's rhinos

Indonesia is the only country in Asia with two surviving species of rhinoceros, and both are seriously endangered. The Javan rhino is reduced to some 50-60 animals in the Ujaung Kulon National Park; the Sumatran rhino numbers some 420-785.

At a meeting convened jointly by the IUCN (which has recently published a rhino plan for Indonesia) and the Indonesian government, it was recommended that Javan rhinos be caught in Ujaung Kulon National Park and bred in captivity. Way Kambas National Park in South Sumatra was recommended as a

potential re-introduction site. For the somewhat more numerous Sumatran rhinos, the meeting recommended that top priority be given to protecting the remaining viable populations, and that current efforts to establish a captive breeding programme be continued.

However, implementation of these recommendations requires money, and there is none available. It can only be hoped that the Indonesian government, perhaps with assistance from international conservation organisations, can raise sufficient funds before population levels fall too low to allow the species (the Javan rhino in particular) to recover.

Oil vs megapode

Niuafu'ou, the northernmost island in the Republic of Tonga, is the only home of the threatened megapode *Megapodius pritchardii*, which incubates its eggs in the hot volcanic soils of the island. Its colonisation and speciation on the island remain a mystery; and if scientists plan further studies of the bird to solve the mystery, they must work fast. The government of Iran has proposed the construction of a storage depot on Niuafu'ou for Iranian crude oil; the island is particularly suitable because of its location and the depth of water immediately around it.

The depot would undoubtedly benefit Tonga financially, while simultaneously driving the megapode to extinction. Whether the benefits would compensate for the loss of a species, and of a hitherto undisturbed natural refuge, is a question which only the Tongans have the right to answer. Several conservation bodies have expressed strong opposition to the proposed depot. However, none of them have offered either money or alternative, ecologically non-destructive projects

which could offset the loss of potential revenue if Tonga were to turn down the Iranian proposal.

Tax on tropical timber?

At the International Tropical Timber Organization (TITO) meeting in Japan, the association of European traders in tropical timber have proposed a tax on sales, which could raise \$200 million a year for conservation. The proposal is probably a reaction to pressure in Europe to ban imports of tropical timber. The traders argue that such a ban would be counterproductive, because it would reduce the economic value of the forests and leave them to the mercy of local agricultural colonists. Such an argument, whether valid or not, is bound to raise hackles in the countries for whose forests the traders have expressed concern. The concern probably springs from fear of a closure of the trade rather than from a love of standing timber, but the money will be welcome. It is proposed that the tax would go to a special conservation fund administered by the ITTO.

New Executive Committee

Elections for the Executive Committee of the BNHS were held in February 1990. Counting of votes was done on 2nd March, and the results declared immediately after. 1247 ballots were received, of which 22 were invalid. The Society's new management is as follows :

President : Prof. P.V. Bole; Vice Presidents : Mr. Humayun Abdulali, Mr. Kisan Mehta and Mrs. D.S. Variava; Honorary Secretary : Mr. Ulhas Rane; Honorary Treasurer : Mr. Bittu Sehgal.

The other members of the Executive Committee, which will hold office for a two year period, are : Mr. M.R. Almeida, Vice Admiral (Retd.) M.P. Awati, Dr. Erach Bharucha, Maj. Gen. (Retd.) E. D'Souza, Dr. (Ms) Meena Haribal, Dr. Ashok Kothari, Dr. Shashi Menon, Dr. A.N.D. Nanavati, Prof. Parvish Pandya.

BUTTERFLIES

Early stages in the life cycle

BY NARESH CHATURVEDI

AND ISAAC KEHIMKAR

MILKWEED BUTTERFLIES Butterflies of the Danaidae group are commonly known as tigers and crows. This group gets its common name, milkweed butterflies, from the fact that their caterpillars feed mainly on plants of the families Asclepiadaceae (milkweeds), Apocynaceae (oleanders) and Moraceae (Figs), whose milky sap contains a variety of substances poisonous or distasteful to many predators. These substances are ingested and selectively stored by the caterpillars; this protection renders both the caterpillars as well as the adults unappetizing to predators. The striking colour patterns of the caterpillars, and the two to four pairs of flexible, elongated tubercles on the back, reinforce the warning to predators. The winged adults too are conspicuously coloured, and advertise themselves with a slow flight. Generally, milkweed butterflies are long-lived, tough, leathery and exude an unpleasant smell when attacked.

PLAIN TIGER *Danaus chrysippus*

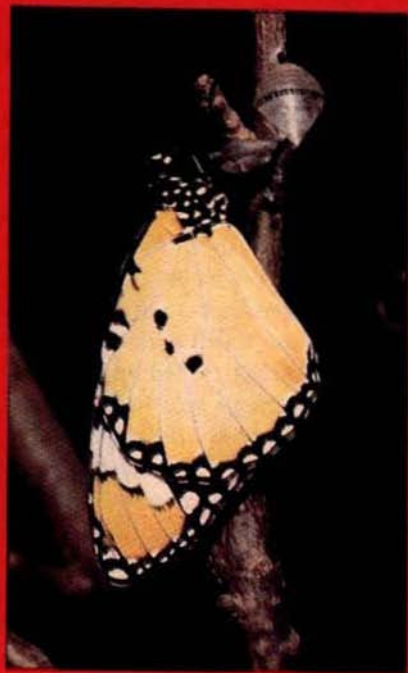
Larval foodplants Aak or Rui (*Calotropis gigantea* and *Calotropis procera*)

Egg Oval, creamish white with longitudinal and horizontal ridges or ribs crisscrossing, giving an impression of minute depressions. Laid singly on the underside of the leaf, and rarely on the upper.

Larva The caterpillar's first meal after hatching is its eggshell. Being a milkweed feeder, it has a behavioural defence against the plant's sticky sap. During its first two instars it cuts a circular trench around itself on the underside of the leaf, thus reducing the flow of sap. It then begins to feed on the underside of the leaf, often leaving the upper surface untouched. As it grows, its feeding style changes: it reduces the flow of sap by nipping at the leaf midrib before commencing feeding. The fully grown caterpillar is cylindrical and smooth, with 3 pairs of fleshy tubercles -- the first pair on the 2nd segment, the second on the 5th and the third on the 11th segment.

Pupa A full-grown caterpillar usually pupates on the underside of a leaf. The pupa hangs by the tail. It is pale bluish green when under the leaf, but creamish buff when under a branch. Gold spots are seen: one each on the eye, in the middle and at the origin of the wing, and two at the shoulders. The lateral black ridge has a silvery golden border ■

Facing page: fully grown caterpillar; pupa (pink form); newly emerged adult. PHOTOS BY ISAAC KEHIMKAR



SEASHORE LORE

V - Wolves Of The Sea



BY BEEFSEA

*When the sands are all dry, he is gay as a lark,
And talks with the utmost contempt of the shark;
But when the tide rises, and sharks are around,
His words have a timid and tremulous sound.*

—'Tis the voice of the lobster, from Lewis Carroll's "Alice".

In any series of articles on marine life, sharks are bound to come up sooner or later. The very word "shark" conjures up visions, in the minds of most people, of a huge wide-mouthed sea monster whose rows and rows of jagged razor-sharp teeth are always ready to bite the nearest man within reach. Yet people do not realise that many more sharks (tens of thousands per year) are killed by men than are people (40 to 300) killed by sharks.

Dogs — man's best friend — bite over three million people in India every year, but not a word appears in the newspapers. And more people are killed in motor car accidents, or even hit by lightning. Yet, such is the fear of sharks that their very thought sends shivers down our spines. I remember

one fine morning in November 1964, when we had caught over 450 kg of sharks, averaging two metres long, in two hours at Angria Banks, some 110 km off Vengurla in Maharashtra. In the afternoon, we were chatting on the deck of our fishing boat when I suddenly heard a splash, followed by screams. Seeing one of our deckhands clad only in shorts thrashing about in the water, I assumed he did not know swimming and had been thrown overboard. We soon had him out of the water, and I learnt that he was an expert swimmer and diver, whose services were often requested whenever a net or rope got caught in the boat's propeller and had to be freed underwater. Yet he had got so panic stricken that he even forgot he knew swimming, and screamed to be

The illustration above shows sharks attacking a bather who is, apparently, about to be rescued by the benevolent ray on the right. From Olas Magnus's (1555) *Historia de Gentibus Septentrionalibus*.

pulled out.

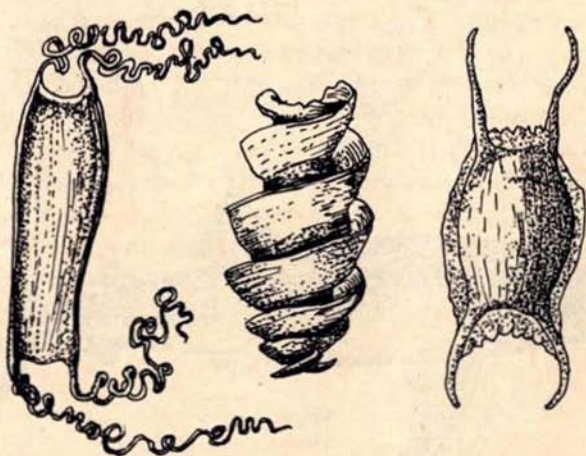
Sharks differ from bony fishes in that their skeleton (skull and backbone) is made of cartilage (gristle). There are no bones. Instead of a gill-cover, sharks have (usually) five gill-slits on each side. Their tail has a longer upper lobe (unlike the forked tail of bony fishes). And, unlike the flat, plate-like scales of bony fishes, sharks have microscopic, tooth-like scales.

All fishes swim effortlessly, but in comparison with shark's sinuous grace, other fish's locomotion seems crude. Pelagic sharks (those that swim at or near the water surface) have to swim constantly — day and night. Once they stop swimming, they are doomed to die. This is because these sharks lack the throat muscles which enable bony fishes — and bottom sharks such as the zebra sharks (*Stegostoma*) and catsharks (*Chiloscyllium*) — to pump water over their gills. Pelagic sharks swim with their mouths open, and their forward motion maintains a constant flow of water over their gills. In the aquarium, if a shark is exhausted and sits on the tank bottom, we 'kick start'

it by holding it and repeatedly propelling it forward a short distance until it revives. Incidentally, if a shark is held belly up, it goes limp, as if hypnotized, and can then be easily handled.

Stroke a shark backward, and the skin feels smooth, almost like the fur of a kitten. But stroke it from tail to head, and it feels as rough as sandpaper. This is because the minute scales tilt backward. These scales are like miniature teeth; in fact a shark's teeth are just overgrown scales. Sharkskin, called shagreen, was used earlier as sandpaper for polishing wood, on matchboxes and on sword handles to prevent slipping. With the scales removed, sharkskin is used for leather handbags, shoes, belts, wallets and watch straps. And sharks need not worry about toothache. Behind the front row of functional teeth are five to six "spare" sets, continuously moving forward so that when the front teeth drop out, new ones take their place.

Some sharks lay eggs — called mermaid's purses, mermaid's pin-boxes, sailor's purses or sea cushions. These egg cases may be spirally flanged and pear-shaped, or barrow-shaped, and have



Egg capsules
of different sharks

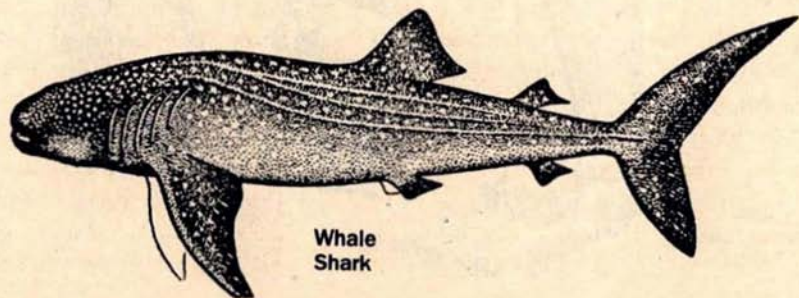
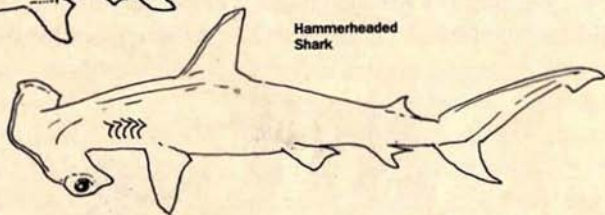
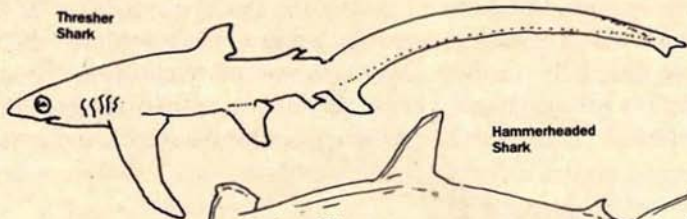
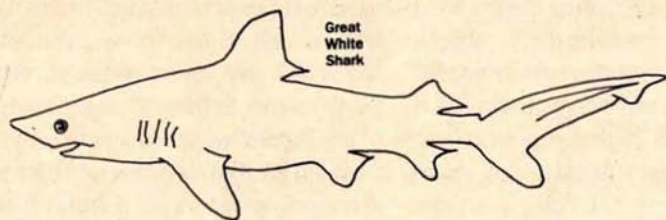
threadlike filaments or horns at the corners to anchor them to seaweeds. The young may take six months to a year to hatch.

In other sharks, the eggs, instead of being laid on the sea bottom, hatch inside the womb and are expelled into the water. In the lamnoid sharks, e.g. the sand tiger shark (*Odontaspis*), mako (*Isurus*), mackerel or porbeagle shark (*Lamna*) and thresher shark (*Alopias*), the first young to hatch feeds on the other (unhatched) eggs, so that only two young are born (one from each of the two horns of the womb).

Nearly two-thirds of all sharks give birth to live young, from six to as many

as 40, depending on the species. And, unlike in bony fishes, the sex of sharks can be easily distinguished: the tips of the pelvic fins on the male's belly have a pair of sausage-shaped extensions called "claspers" for transferring sperm to the female. Only one clasper is used at a time.

Many bony fishes have a gas-filled swim-bladder which enables them to float without having to swim all the time. Sharks do not have a swim-bladder, but this is compensated by a large liver, sometimes as much as one-fourth the size of the body, filled with oil rich in vitamin A. In some sharks the vitamin content is a hundred times



more than in cod liver oil, so that, to conform to international specifications, it has to be diluted with groundnut oil.

Sharks do not have good eyesight, but their sense of smell is acute. Further, running along each side of the body is a lateral line canal, which is sensitive to vibrations such as those caused by a thrashing fish (or swimming human). Moreover, pits in the skin of the head, called ampullae of Lorenzini, can detect electrical disturbances of less than five-thousandth of a microvolt, enabling the shark to locate hidden prey such as a sole buried beneath sand.

Sharks normally feed on fishes, molluscs and crustaceans; very few feed on marine mammals. Of some 350 kinds of sharks only nine — the great white (growing to 6.4 metres and 3,300 kg), mako, bull; lemon, tiger, dusky, blue, white tip and hammerhead -- are involved in attacks on humans. Sharks are also excellent scavengers; their stomachs have contained beer bottles, boots, bags of potatoes or coal, kerosene tins, raincoats, even chicken coops.

Fortunately for us, the largest of all sharks, the whale shark, does not eat large prey. Growing to 18 metres and weighing 13 tons, this fish, like the basking shark (the second largest at 7.5 metres), feeds on plankton and small fish. These are filtered out by comb-like gill-rakers. Consequently, their teeth are no bigger than a baby's fingernails. In contrast, the smallest shark is *Squaliolus laticaudus*, whose adult is only 15 cm long.

The thresher or fox shark (*Alopias*),

Correction: In the article on the octopus in the previous issue, the word 'ostracised' was inadvertently spelt 'octracised'.

4.6 m in length, has a tail longer than the head and body put together. The tail is used to beat the water so as to frighten a shoal of fish into a compact mass before eating it.

In the hammerheaded shark (4.6 m), the eyes and nostrils are situated at the tips of a head set at right angles to the body like a draftsman's T-square. Together with the swinging of the head from side to side when swimming, this enables the fish to sample a wider path of water to see and smell its prey. Also, the flattened head, like the ailerons on an aircraft wing, increases its manoeuvrability.

We have caught small sharks, about 60 cm long, in knee-deep water at Chowpatty beach in Bombay. But even these have to be handled cautiously. I remember one evening, at the Taraporevala Aquarium, I saw a crowd of collegians, with one person, looking pale and shaky, having his finger bandaged. Enquiries revealed that our captive shark had bitten his finger. Since aquarium sharks never jump out of the water to bite people, I wanted more details. Somebody told me that the casualty had dipped his hand into the shark tank. "Serves him right, trying to show off before the girls", was my response. At that, someone whispered in my ear that the victim was not a student, but their professor. (In India, self-styled "professors" are often only demonstrators or junior lecturers, but that's another story). The moral of the tale: never tease or otherwise provoke a shark, however small or harmless it looks ■

A heronry with a difference

BY SATTYASHEEL NAIK

Government housing is normally meant for people, but not always — the tashildar's office at Indapur (140 km from Pune, on the Pune-Sholapur road) serves as a nesting ground for several flocks of birds. I was told by the tashildar that there was a group of grey herons nesting in the trees of his office compound, and, along with several members of the Indian Nature Society, I visited the place last August.

The tashildar's office is housed within the ruins of an old fort built by Maratha leader Maluji Raje Bhosale. Within the compound are seven trees — four tamarinds, two banyans and a peepal. In a field nearby is another tamarind. All are old, large and relatively free of disturbance; and it is in these trees that we found the nests.

There were about 20 nests in each tree, some still with young birds, the rest abandoned. The predominant nesters were the 'grey herons; we found 22 nests which still had young birds. Their number varied from nest to nest: some had only a solitary chick, others two or three, and a few nests had four. The young birds were all roughly the same size (about 50 cm tall), indicating that most of the herons had laid their eggs at the same time. The adult herons were busy bringing in food for their offspring. Near the heronry is

a small, shallow lake which is drying up. When full, the lake provides fish for the herons and the black ibises, but at present the birds have to make longer trips, to the backwaters of the Ujjani dam, to collect food for their young.

The tamarind tree in the field contained a nest of a painted stork, in which a solitary young bird stood. Mr. Jadhav of the local police staff, who has been working here for the past two years, informed us that the other painted storks had left, having reared their young, in May and June. About ten pairs were still left. After the storks had left, he said, the herons arrived.

We also found two nests in which black ibis were incubating their eggs. There were about 25 ibises, and some grown-up chicks which were being fed by their parents. The eggs, therefore, had been laid at different times. Along with the black ibis was a pair of white ibis. The tree also served as a roost for bats, and a pair of roseringed parakeets were nesting in a hole in the trunk.

Playing host to the birds was not without its inconveniences. Their droppings created a mess, and especially during the monsoons, a stink. There were a lot of empty egg-shells, and sometimes eggs or small chicks lying dead; and a number of fishes, both small and large, lying strewn around the compound. But to the bird lover,



Young grey herons. Almost ready to leave the nest, but still hungry.

SATTYASHEEL NAIK

these are minor inconveniences. Two months earlier, a fairly big bird had fallen from its nest and broken a wing. Mr Jadhav and his friends decided to save the bird. They got hold of a fisherman, and arranged that he bring fish every day for the bird. The bird became so friendly that it stayed in the compound for two months, readily accepting the food offered. But one day it strayed too far, and was attacked by crows. With the wing not yet healed, it could not fly, and was pecked to death. Crows, in fact, were a menace to the nesting colony. First they came for the eggs, then for the young chicks, and at a later stage to steal the fish that the adult birds brought in for their young. In addition to the crows, there was also a pair of pariah kites which would frequently fly over the nests.

The birds, in order to nest, require

large trees, protection and plenty of food to rear their young. The trees are large enough, and protection comes from the police — the police office shares the compound with the tashildar. The lake nearby, and the backwaters of the Ujjani dam a little further away provide food in plenty.

Painted storks, grey herons and ibises are known to breed in the backwaters of the Ujjani dam, but this is the first report of a heronry located near the dam. There must be many more. We would be grateful if anyone who has come across similar nesting sites of these or allied birds could write to me (781/782, Shukrawar Peth, Opp. Jain Mandir, Pune-411 002). The heronries could then be listed and the forest authorities informed, so that protection could be provided for breeding birds ■

FOLKLORE *J. C. Daniel*

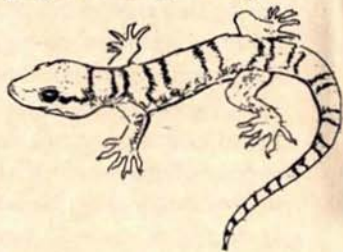
Folklore often casts a discerning eye on the relationship between animals, as the following story of the origin of the crocodile, the monitor lizard and the gecko shows. The story possibly originated in the Tamil speaking areas of Sri Lanka, specifically the Tamil population in the tea gardens of that country.

Once upon a time, the story goes, there were three brothers sorely beset by the cruelty of their stepmother. She was a paragon of virtue in the eyes of their father and a devil incarnate during his absence from home. Life became impossible when their father suddenly died, and the brothers decided to leave home in search of peace and happiness. They wandered from town to town, village to village, through forests and over hills, always in search of a place where they could live happily ever after. After yet another day's weary journey they set camp on the outskirts of a forest village.

The eldest brother went down to the river to fetch water. He was pleasantly surprised at the peacefulness of the quiet-flowing river and the warm sands, and prayed that he be blessed to end his weary journey then and there and share the serenity of the river. The gods took pity on him and turned him into a

crocodile, to be forever a part of the river. The second brother went into the forest to collect firewood to cook the evening meal. The cool silence and the whisper of wind through the trees beckoned to him to cast away the cares of the world and blend into the harmony of the forest. He raised his voice in prayer; the gods heard his plea and turned him into a monitor lizard, to live for evermore on the forest floor in the shade and silence he so loved.

The youngest brother went to a house in the village to bring fire to cook the evening meal. The warmth and comfort of the house and the laughter of the happy children brought back memories of home. He prayed to the gods to gift him the comforts of a house. They granted him his wish, and turned him into a gecko to live for all time on the walls of houses, to share the comforts of a home without being a part of the household. That is the legend of the origin of crocodile, the monitor lizard and the gecko—blood brothers, but irrevocably and forever separated ■



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