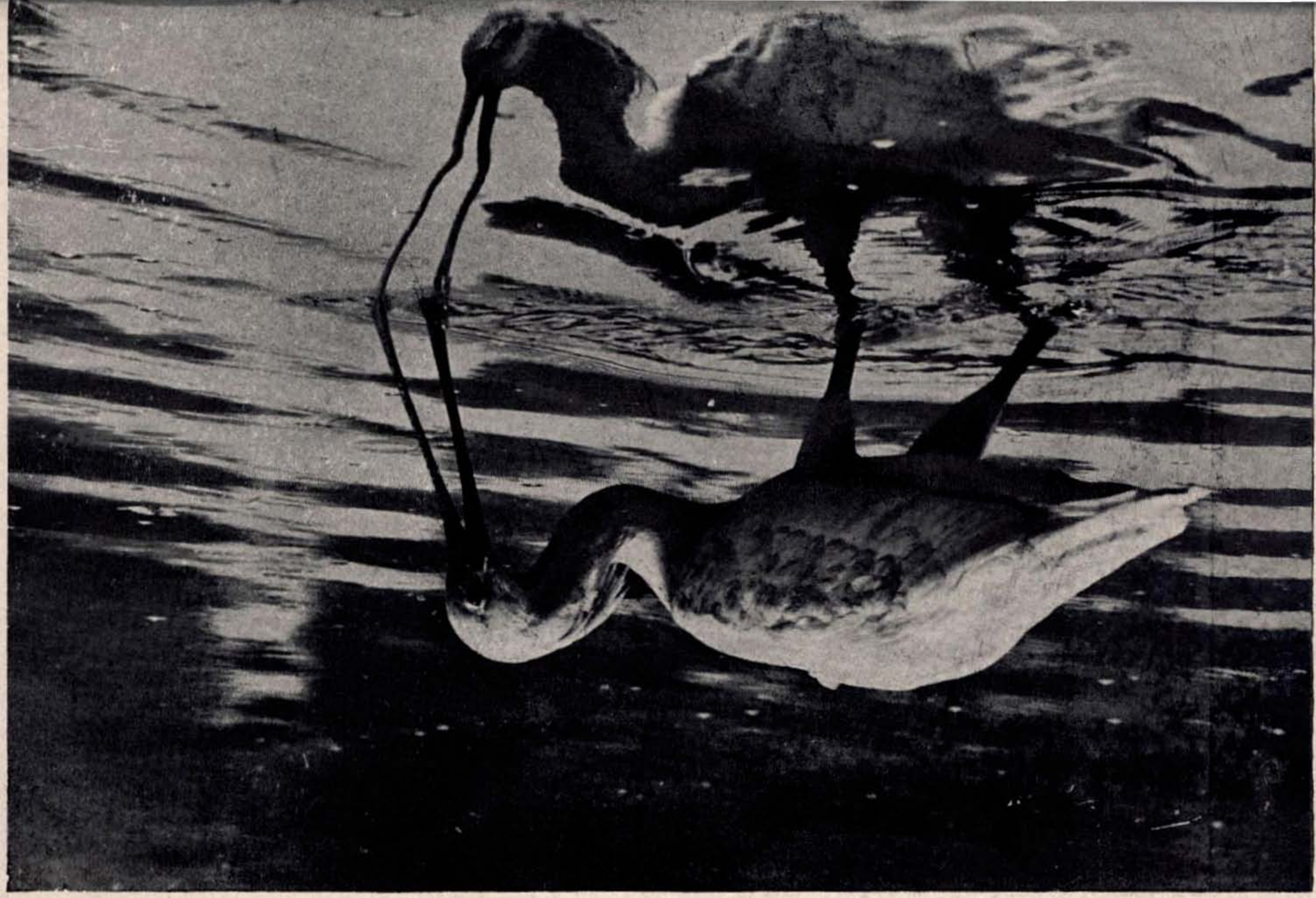
HORNBILL

1983 (1)

BOMBAY NATURAL HISTORY SOCIETY



1983(1) January-March

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.

Members receive during a year three issues of the *Journal of the Bombay Natural History Society* now in its 79th volume, and four issues of *Hornbill*, the Society's popular publication.

Advertisements for publication in *Hornbill* are welcome. Rates: Inside full-page Rs. 500/-; half page Rs. 250/-; back cover Rs. 1000/-.

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Subscription		
Ordinary individual membership	Rs	60.00
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CONTENTS

The first annual subscription of members elected in October, November, or December will extend to the 31st December of the year following the election.

Write to:

The Honorary Secretary
Bombay Natural History Society
Hornbill House, opp. Lion Gate
Shahid Bhagat Singh Road
Bombay 400 023

EDITORIAL

The year of the Hornbill

And finally a hundred years of natural history are behind us, perhaps a microsm in terms of earth and world history, but to an organisation built on the part-time endeavour of its members something to look back with satisfaction. It is to us the year of the Hornbill, the symbol of the Society's endeavours. When and how the Hornbill became the Society's emblem is not quite clear, but none contributed more to its adoption than William, the Great Indian Hornbill, the 'Office Canary' as he was known.

The Golden Jubilee (1933) commemorative volume of the Society gives the following information on William.

"Most famous among the many animals that had found a place at the Society's offices at 6 Apollo Street (presently Shaheed Bhagat Singh Marg — EDS), William was taken as a nestling in 1894 and lived in the Society's rooms till 1920.

"William was quite a character and is so intimately associated in the minds of the many who knew him with the Society and its museum that he is fittingly honoured with a case in the Bird Gallery in the Prince of Wales' Museum which shows the curious nesting habits of the Great Indian Hornbill. 'William' is here given the role of *pater-familias*—a privilege he did not in life enjoy, and is seen feeding his imprisoned spouse through the narrow slit in the wall which the birds build to close the entrance to the nest hole.

"William apparently was very happy during the 26 years he lived in his large cage. He made a great fuss of his personal appearance, and painted his great casque and beak with bright yellow from his 'Vanity-box' (the oil gland at the root of his tail) and he finished this daily ritual off with a dash of colour carefully placed on each wing. He was then ready to play a game with you. He would catch easily a tennis ball thrown from a distance of 7 or 8 yards. The long curved beak prevented him from ever drinking anything, but he got all he wanted from the juice of ripe berries and fruit, and this in no way affected his cheery disposition. Cockroaches were to his liking, and a mouse, a snake or even a large rat he dearly loved, but it was not easy for him to get these as he was hardly ever on the ground. One rat he held in his pickaxe beak for more than an hour before finally crunching it up. If he had not overeaten himself on a bit of wire he would probably be alive to this day. Others have succeeded him but the 'Office Canary' as he was affectionately called is greatly missed."

'William' in the role of pater-familias *Photo*: Peter Jackoon

The Yellow Monitor: Is it non-poisonous or poisonous?

In the winter of 1981, the Society had arranged a snake exhibition at Bombay's Cross Maidan. This turned out to be a great success where people of all walks thronged to see the reptiles. The curiosity about these animals, resulted in long serpentine queues at the entrance; people would wait for hours for their turn and school children would pour in during the afternoons.

On one such busy afternoon, P. B. Shekar, the chief technical adviser for the show, was giving a guided tour to a group of interested school children. After the snake-pits and the star attraction, the king cobra, he came over to the lizards and turtles section and while he was explaining about the Yellow Monitor lizard, he observed that the monitor had overturned its water container. He opened the top lid of the monitor's cage to remove the container, over looking the fcat that the monitor was already agitated by the passing onlookers. As he put his right hand to retrieve the container, he suddenly felt the side of his palm seized in a vice-like grip. Instantly from reflex action he withdrew his hand and to his surprise the monitor too came hanging firmly on to his hand. Shekar, being a seasoned veteran in handling reptiles took it coolly. He cradled the monitor in his right hand and began slowly dislodging the backward curving teeth from his palm by trying to wedge open the tightly locked jaws. Sensing the commotion, I too took a peek at the milling crowd of visitors and saw Shekar bent over cradling the monitor and trying in vain to unlock the clamped jaws with his left hand. I went to his aid and got his hand released. There was not much blood drawn, except for the few punctures made by the monitor's very sharp teeth. Shekar just wiped the hand clean, dabbed it with an antiseptic, and resumed his guided tour. Then suddenly, I remembered having read of a pet Yellow Monitor named Georgia, which had bitten an English herpetologist and made him unconscious for two hours. I suggested to Chaturvedi, our Assistant Curator, that Shekar should be watched for symptoms, just to be on the safe side. Soon our fears turned out to be true, as Shekar started feeling nausea and vomitted once, a feeling of numbness was felt all over the neck, and head region, which made him retire to the rest room. These symptoms lasted for about 45 minutes and this experience made us wonder whether secretions of the salivary glands of the Yellow Monitor, *Varanus flavescens*, are poisonous.

I. D. KEHIMKAR

Above. *The Yellow Monitor.* Below. *The Yellow Monitor with Star Tortoises*

Photos: Isaac Kehimkar

CONSERVATION ACTION

IBWL award for best managed National Parks/Sanctuaries

In 1975-77 the Indian Board for Wildlife (IBWL) had instituted an award for the best managed National Park or Sanctuary, and the recipients were the Gir Sanctuary (Gujarat) in 1975-76 and Kaziranga National Park (Assam) in 1976-77. Thereafter the award was held in abeyance till the IBWL's 15th meeting on 1st October 1982 with the Prime Minister, Smt. Indira Gandhi in the Chair, when a modified system of the award was revived.

The award is mainly aimed at instilling healthy competition among the management authorities of the different national parks, sanctuaries and such other reserves in the country and to focus attention on scientific management of wildlife. It carries a cash grant of Rs. 2 lakhs for setting up and developing a proper interpretation centre for the concerned wildlife reserve and also incentive rewards totalling to Rs. 50,000/- for all the staff right from the Director to the non-gazetted staff of the lowest level. The award also includes a silver plaque to be retained permanently and displayed in the reserve.

The selection criteria is severe and expects the reserve authorities to take care of many of the chronic maladies from which our wildlife reserves suffer. The main conditions on which the eligibility depends are: the reserve representing the locality biogeographically; extension of wildlife protection and management to the buffer zones; efficiency of the anti-poaching and fire protection squads; control over livestock grazing; relocation of villages; development projects like the dams or a highway and attempts to thwart it; forestry operations and ecological constitution of the core area; control of contagious cattle diseases; estimates of population trends and its management; status of endangered species; regulation of tourism; interpretation facilities and guide services.

The award will be given away by the Board once in every two years. The two year block is to commence from 1981-82 onwards.

Wildlife and the Israeli farmer

Some time back Israeli farmers too killed animals that came in and ate their crops or destroyed their livestock; but today they have been convinced by the Israeli Nature Reserves authority through intensive campaigns that killing an offending animal would not solve the problem but would only open the way for another animal to come in and thus a series of endless killings would begin. The authority is working with the farmers to invent and experiment humane and biologically acceptable methods for fending off wildlife. One of the weapons used is a blaring transistor radio set in the

middle of the field and connected to a local station.

Avinoam Lurie, the authority's animal damage control expert, finds army radio station the best since it has a variety of mixed programmes which keep changing and this tends to discourage animals from feasting on the crops. Taped bird alarm calls are also being used. These are sounds a bird makes to warn the rest of the flock of danger. This technique works quite well with the starlings but not so with the species like the bulbuls.

A two-dog system is also being worked on using a dominant and subdominant dog. Dominant dogs have a tendency to sleep more soundly. So a more timid, subdominant dog is allowed to roam free and alert the leashed up dominant dog at the first sign of an intruder. With the leader leashed up, the subdominant dog only scares off the animal without actually attacking. This method is still experimental but seems to be working.

The most popular device is the electrified fence which has proved quite effective against gazelles, wild boar, hare, porcupines and even predators. In this device, 7000 volts is conducted through rows of ordinary 2 mm galvanized wire. When an animal attempts to climb through or over the fence it receives a high voltage shock but the amperage being very low (0.08 amps/hr) the animal suffers no physical damage. It can work at 30 pulses per minute off a standard 12 volt battery for a month without recharging and with a small solar charger the battery can be kept operating indefinitely.

—*News from Israel*, Vol. 30, January 1983

Pakistan restocks

A pair of Onehorned Indian Rhinoceros of Nepalese origin was brought to Pakistan last March for reintroduction in the Lal Sohanra National Park, which was once the habitat of the rhino and is still considered suitable for the rhinoceros.

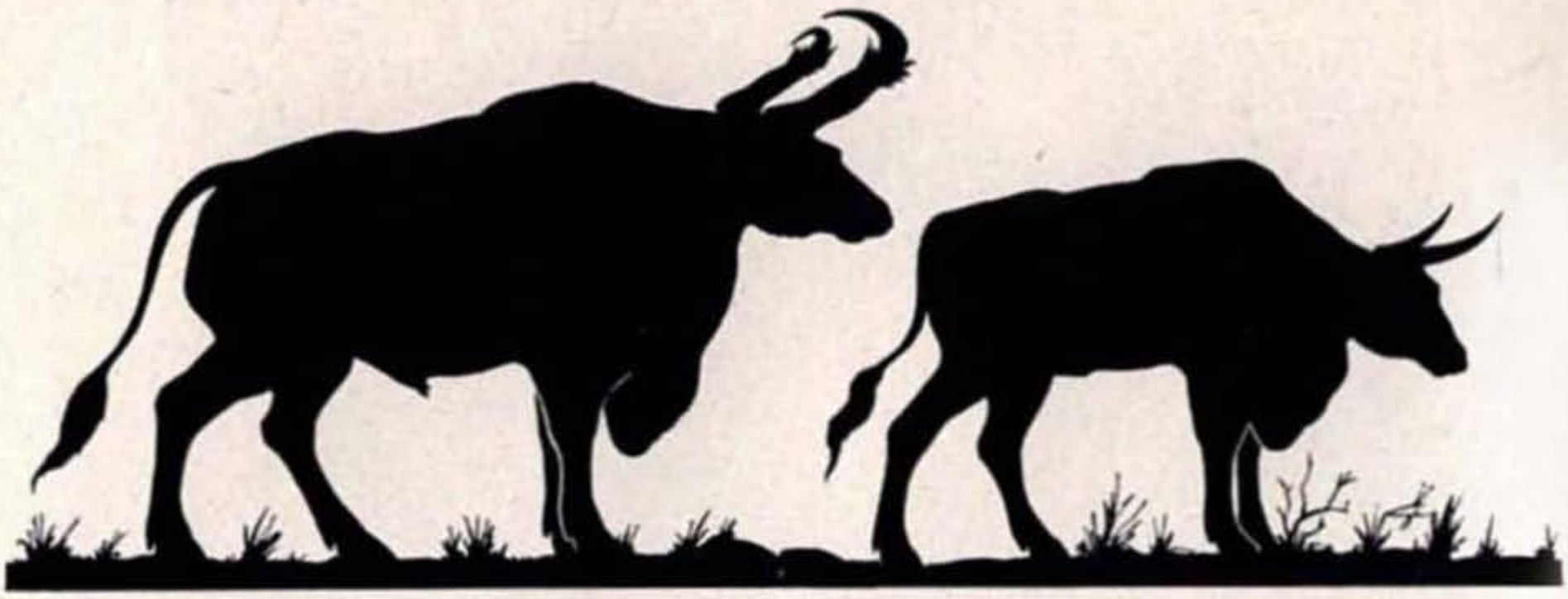
In 1971 ten blackbuck were sent to Pakistan from Texas (U.S.A.) for reintroduction. These animals descended from stock which was originally exported from Pakistan in the 1940's. Six more blackbuck were airlifted from Copenhagen (Denmark). Now 41 blackbuck are present in Jallo Park at Lahore.

Cheer Pheasants raised from eggs received from the World Pheasant Association have been released in the Margalla Hill National Park, near Islamabad. Today Pakistan has 5 National Parks, 70 wildlife sanctuaries and 74 wildlife reserves that cover a combined total area of 9,605,918 hectares to conserve its flora and fauna. Pakistan's efforts to revive its lost fauna and conserve it are now gaining momentum.

I. D. KEHIMKAR

Kouprey or the Indochinese Forest Ox

Kouprey, the world's oldest wild cattle which was feared to be extinct has been sighted after a long gap since the early days of the Indochina war.



A pair of Kouprey or Cambodian Forest Ox

Dr Boosong Lekagul, Thailand's leading conservationist and winner of the Paul Getty prize visited the Thai-Kapuchea border area along with a team from the Thai Wildlife Conservation Division and received reliable reports of the sighting of one adult male, two adult females and two calves. Unfortunately, the expedition had to be abandoned when the team's guide was injured as he stepped on a booby trapped land mine. The surveying of the kouprey habitat is not only hazardous but the area is remote and heavily forested, because of which almost nothing is known about the habits of these wild cattle.

The kouprey is known to be the most primitive of living cattle and resembles some pleistocene forms. This makes the animal more interesting for evolutionary studies and as a genetic resource for cross breeding to improve disease resistance. Paintings of Kouprey have been found in prehistoric caves in Thailand.

Bull koupreys have the longest and widest horns of all the living wild cattle except the buffalo and are split at the end. Females have lyre-shaped horns which cork-screw upwards. Both male and female are known to display graceful movement like that of a nilgai which makes them look more like antelopes than cattle.

The Survival Service Commission's Wild Cattle Group which met in Kuala Lumpur in October 1982 has drawn up a series of recommendations to ensure Kouprey's survival. In the meantime Thai authorities are considering declaring the area of sightings as a wildlife sanctuary and the IUCN along with the World Wildlife Fund is keen to lend its helping hand to keep the kouprey alive.

—*IUCN Bulletin*, Vol. 3, Nσ. 10/11/12

Elephant migration routes in the South

During the 3000 sq. km survey of the Nilgiri Hills in South India for assessing the status of wild elephants, the Asian Elephant Specialist Group's convenor for the south, Mr E. R. C. Davidar found that the migration routes of elephants were blocked by roads, settlements, cultivation and hydro-electric projects. With all these developments there has been rapid fragmentation of elephant habitats which implies urgent need for maintaining communication by having corridors between such fragmented habitats for the movement of elephants. Shrinking and blocked habitats result in elephants raiding crops along the forest fringes and such depredation endangers the conservation of elephants. Studies are now being made to help elephants and people (and their crops) co-exist.

—*Species Survival Commission (IUCN) Newsletter*, No. I, October 1982

Electricity comes to Elephant Country. Mudumalai Sanctuary Masinagudi

Photo: M. Krishnan

A Year at Bharatpur's Keoladeo National Park

This is the third part of the article on the Ghana, continued from p. 22 of Hornbill *1982(4).* - EDS

Mid-August. Cloudbanks and heavy downpours are less frequent. There are long periods of sunshine. Days, even a week, may go by without rain. On average the maximum temperature is 34°C or even 39°C. Humidity is high. It is the most torrid time of year.

Yet it is a time when the National Park looks its best. Plant growth is fresh and green. There are more butterflies, giant beetles, dragonflies than at any other time of the year. It is the time when Keoladeo's most imposing nesting birds, the Painted Storks, arrive. By the end of August 4000 pairs or more mill around the babul trees in the marshes to select their nest-sites. With them come the last of the colony nesting birds, the spoonbills, now wearing the shaggy crests of their breeding plumage.

The storks and spoonbills stay well away from the two densely packed breeding colonies that are already well established. They spread out to wherever there are babuls standing in a swamp. These wide-crowned trees, deep green with yellow flowers now wear headdresses of pink, white and black storks engaged in noisy beak-clappering displays.

In the two heronries it is reasonably quiet now. Most birds are sitting on eggs. Only a few are still building nests. The only commotion is caused by House Crows looking for opportunities to steal some of the eggs. Many birds have undergone colour changes. The egrets have lost the fire from their eyes which are now pale yellow. Colour too has faded from their facial skins and legs. The strangest change is in the Openbill Storks; those parts of their plumage that were pure white have tarnished to a dirty grey.

Great as the regenerating surge amongst the birds is, an even greater one is taking place largely unnoticed by human eyes.

Those mature fish that survived the ravages of the dry season and the depredations of the Adjutant Storks, together with others that came with the waters from Ajan Bund have staged a regneration that borders on the miraculous.

By mid-September the new generation of fish have reached fingerling size. At certain times of the day these multitudes come to the surface and swim in such dense masses that the water seems solid with them. These sheets and sheets of fish occur throughout the marshes, mostly in areas that were bone dry three months ago. The milling fish swim tightly packed together in the clear water but often they are harassed; by turtles and catfish

Painted Storks on nest at Bharatpur *Photo*: E.P. Gee

A fishing cat fishing *Photo*: S & B Breedan

from below and by any number of birds from above. Dangers are communicated and a million fish react as one to a marauding turtle or a hovering kingfisher, sending flashes and ripples of alarm across a hundred metres of water.

So numerous and so easy to catch are these fish that the Fishing Cat which lives at Sapan Mori is soon satiated. In late afternoon on a September day he walks through the shallows up to his belly in water. Time and again he plunges headfirst into the canal and re-emerges with a small, silver, wriggling fish in his mouth. The first few are crunched quickly and eaten. But the fifth fish is a larger one and for ten minutes or so the brown cat, streaked and spotted with black, plays with it. Seizing it in his mouth he leaps in the air and flings the fish high, then dives after it as it hits the water. He is of a stocky and muscular build and though only a little larger than a domestic cat, he gives an impression of far greater power.

The egrets and cormorants seem to have worked out a system whereby they hunt the fishes jointly. The kind of place they prefer to fish is where open water meets an area of aquatic vegetation such as grasses and sedges. Early in the morning when it is pleasantly cool, Indian Shags and Little Cormorants, perhaps 500 strong dive and tumble in the water. Now and again the whole party takes wing to land a small distance away — all the time feasting on the fish and driving them towards the grasses. Here egrets pounce on the fishes as they seek refuge from the diving cormorants and shags. The egrets in their frenzy jostle for a position, take the fish on the wing, skimming low over the water. it is a milling, thrashing frenzy of black and white.

But once the birds have filled their gullets their frenzy leaves them. They flap lazily back to one

of the colonies where their nests by now contain small young. A Median Egret lands on her nest in the heart of the Sapan Mori colony. All around are the mutters and gurgles of young begging for food. At the nest the egret is greeted by her mate who has stood watch over the young. The two bow to each other, raise their plumes, briefly entwine their necks. In their excitement they momentarily forget the chicks between their feet and stand on them. The young with outsized yellow beaks and fierece yellow eyes squirm between the adults' large toes. The male flies off and the female closely inspects her young. She adjusts a few sticks of the nest-platform. The four young have recovered from their trampling and vigorously grab their mother's beak, tugging and pulling it. After a few moments this has the desired effect and the female disgorges a stream of small fishes onto the nest. The young gobble them up hungrily.

Out on the open marsh of Ram Bund, surrounded by white waterlilies, a male Bronzewinged Jaćana raises himself from the four eggs he has been incubating for the last 25 days. The eggs on the floating platform are exquisite; so glossy that they seem permanently wet and covered by black lines and squiggles as though inscribed by a master calligrapher. The male notices a change. The eggs are pipping and he can hear the peeping of young inside them. By late afternoon the first egg hatches. The chick's first action, while still damp and tottering, is to squirm under one of the male's wings. Soon another chick breaks its egg shell — but before it can struggle out the male sees the approach of a Marsh Harrier sailing the skies low over the marsh. The jaćana drops the small chick and dashes off with such force that one of the eggs rolls off the nest onto the waterplants. Danger soon passes and the male returns. He rolls the unhatched egg back on the nest and removes the empty egg shells.

Early the next morning all four chicks have hatched and for a few hours the male remains on the nest. The chicks sometimes peck at tiny snails, insects and minute blades of grass around the nest, but always they return to the male and squeeze under his wings. Finally, by mid-morning, the male with two chicks under each wing, their legs dangling from beneath him like pink spaghetti, leaves the nest and carries his brood out onto the marshes. He does not return.

By the end of September it is cooler, especially at night. Flocks of Common Teal and pintails swim on the marshes. Shore birds such as ruffs and reeves, godwits, stints and sandpipers are arriving in increasing numbers. This first influx does not come into Keoladeo but settles just south of it, on Ajan Bund. The reservoir is being drained. Most of the water is let into the National Park to top up the marshes. As the water recedes from Ajan Bund clouds of ducks and shore birds are busy feeding on the animal life that is exposed.

One afternoon in the last few days of the month, after almost two

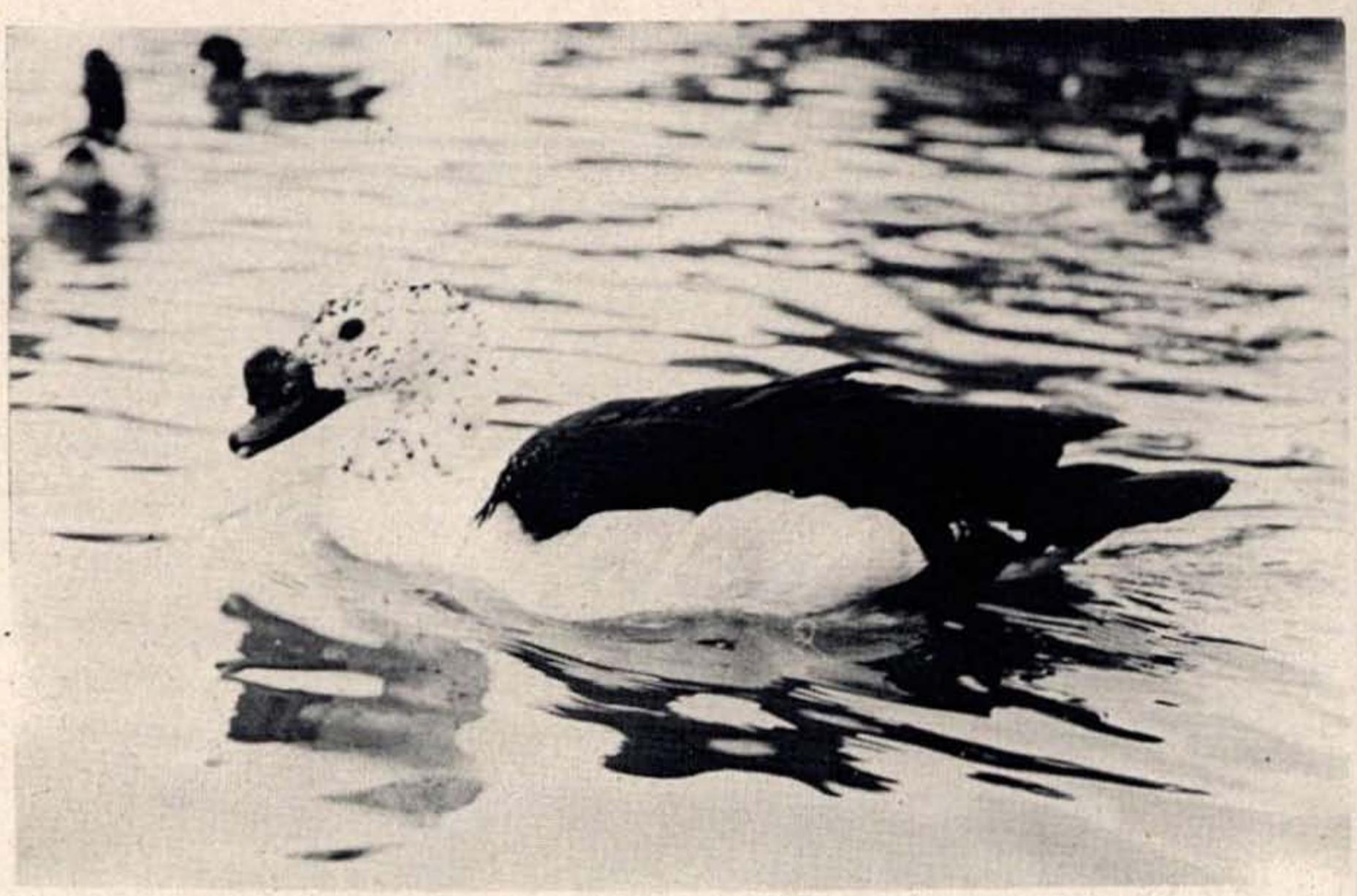
weeks without rain, ink-black clouds blanket the park. The downpour that follows is solid and steady but without violent wind or thunder. It seems a cleansing rain. Birds do not seek shelter. The Bronzewinged Jaćana sits on a patch of matted vegetation out in the marsh eyes half-closed with his young tucked under his wings, the water streaming off his back. Painted Storks stand on exposed branches or sit on their nests as the rain trickles down their beaks. Egrets fluff their plumes and shake the water drops from their feathers.

An hour or so before sunset the rain and clouds retreat. Only a dense black cloudbank remains in the western sky and soon the setting sun spills its golden light over the top. Looking against the sun across the heronry there is a moment of pure magic. In the foreground is open water which looks as black as the distant clouds — but further out the floating leaves of waterlilies and the elegant form of a Pheasant-tailed Jaćana are edged with gold. The sky too is a dazzle of gold — countless thousands of dragonflies have taken wing forming a mass of gauze wings as far and as high as the eye can see. The sun's rays strike sparks off every vibrating wing and the sky glitters.

It is a spectacular spectacle, for it is the last monsoon rain for the season. Except for the occasional winter shower no more substantial rain will fall till next summer.

October belongs to the new generation of fledging birds. In the two heronries many young are ready to leave their nests by the middle of the month. The colonies are raucous with the jabbering of countless young demanding food from their parents. The babul trees, white-washed by the droppings of the growing birds, sway with fledgelings flailing their new wings. Egret young no longer gently pull at their parents' beaks to ask for food but assault their elders, aggressively grabbing their bills and pecking at them or their siblings if food is not immediately forthcoming. Regurgitated fish which earlier were taken from the nest are greedily gobbled up straight from the parents' gullets. Young darters almost ready to fly have left their nests and scrambled to the tops of the nest trees, their long necks snake out above the foliage. As soon as they see one of their parents flying towards them they begin to jostle and beg. The parent when it lands is overwhelmed and almost disappears under the clamouring bodies of as many as five offspring. Openbill Stork young are better behaved. They call noisily, head-nodding, for food but at least wait till it is regurgitated onto the nest; they do not try to forcibly extract it from their parents. The Painted Storks and spoonbills have young as yet too small to join the general noisy clamour. Painted Stork chicks are about a quarter grown and still covered in soft white down. But unlike their parents, who are virtually mute, they have strong voices which incessantly, insistantly call for food. Some of the adult storks are unable to match the size of their

Spoonbills on nest, Bharatpur *Photo*: E.P. Gee



A male Nukta or Combduck *Photo*: E.P. Gee

catch to that of their young. Often small chicks can be seen struggling to swallow fish almost twice their size. Eventually the youngsters must give up the unequal struggle in exhaustion; the parent will then reswallow the fish...only to offer it again to the noisy youngster a few minutes later.

Many ducks too have been successfull in hatching their eggs despite raids by crows and mongooses. Here and there can be seen flotillas of a duck followed by fluffy, downy ducklings: a Lesser Whistling Teal with ten, a Cotton Teal with perhaps 15 and a Comb Duck with as many as 17 youngsters. These are complete families but even now there are many hazards — Marsh Harriers constantly hovering overhead, giant turtles which can swallow a little duckling whole, lurking below.

In early November the marshes begin to lose some of their brightness. Sedges and other waterplants are dying back. Waterlilies no longer flower. In the woodlands the veneer of tropical lushness is falling away. Grasses and herbs are browning off. Vines are dying. Fungi have dried up. Few butterflies grace the shrubs. Once more the woodland stands revealed as a tough, semi-arid shrub ready to withstand a long dry season.

It is cooler now, especially at night, and the days are noticeably shorter. Still, for a brief period in the early afternoon the temperature may climb to 30°C, which is too hot for the Painted Stork young still in their nests. The chicks must be cooled by a cold shower. The parent Painted Stork, when it notices heat stress in its panting young, flies down to the water and taking sip

Darter or Snakebird family Portrait *Photo*: E.P. Gee

after sip fills its beaks and gullet, then flies back to the nest and showers the young with a surprisingly copious stream of water.

Only the Painted Storks still have young. The young of all the other species, even those of the spoonbills, have fledged. Rather the young have been abandoned by parents who were perhaps put off by the assaults of their hungry, boisterous offspring. The heronries are deserted and strangely silent. But at the same time other species and other sounds fill the air. Since early November migratory waterfowl, shore birds and many other have streamed into the National Park. The clamour of their voices heralds a new season and by the end of the month the winter pattern has set in. In this season the days are warm, balmy with clear light. Nights are crisp and cool. An occasional ground frost may briefly brush the grass. Both marshes and woodlands are filled with migratory birds enhancing an already colourful and rich variety of resident species. This enthralling concourse of birds combined with the benign and glowing weather can induce a state of true euphoria in the sensitive visitor, touching him or her with the inimitable Keoladeo magic. These enchanted days continue into early February. Only a few cold, rainy days sometimes intrude in late December or early January.

STANLEY AND BELINDA BREEDEN

(*To be continued*)

A battle royal between tigers and an elephant

While Hitler and Stalin were carrying out a cruel and ruthless attack on Poland, two other tigers carried out an equally cruel and ruthless attack in another part of the world. The account below of a jungle battle to death was given to me by entirely reliable eye- and ear-witnesses, and in its main details is very well authenticated.

The Sarda river, one of the major rivers of the Himalayas, where it debouches from the hills, spreads out into a mile-wide bed of boulders and sand, dotted with islands of *shisham* trees and coarse grasses. On the right high bank, sixty or seventy feet above the river, is the small townlet of Tanakpur, with a railway terminus, a bazaar, and several bungalows situated on the bluff, looking across the wide river bed to the wild forest clad foothills of Nepal. In the cold weather Tanakpur is alive and populated with hill people. Forest contractors are busy exporting timber from the extensive forests, and there is a stream of cross traffic to and from Nepal. In the rains, it is almost deserted. Malaria then drives away the hill people, and the flooded river cuts off all communication with Nepal.

Late one evening in the last week of September, three men were fishing with nets in the waters of the Sarda, two or three furlongs from the bungalows on the bluff, when suddenly two tigers and a half-grown cub emerged from one of the grassy islands close by. The men shouted and yelled and the tigers moved off across the dry bare bed of the river towards the forest on the right bank, a quarter of a mile away up stream from the bluff. Simultaneously from this forest the men heard the trumpeting of a wild elephant. Shortly afterwards the fishermen, and the few dozen inhabitants of the bazaar, heard the nerve-shattering roar of a charging tiger, and the fishermen saw a big male tusker elephant come out into the open river bed, being attacked by the two tigers. For three hours the battle between the elephant and the tigers raged up and down the river bed, below the high bluff, in full view, in the moonlight, of the bungalows on the cliff. Would I had been there to see and hear! The bazaar inhabitants were so terrified at the appalling noise and infuriated roars of the tigers so close at hand, that they barricaded themselves in their houses and no one, except the petrified fishermen who were cut off, saw this awe-inspiring and unique spectacle. About 11 p.m. the noise died down, and next morning the tigers had departed, but the dead elephant was lying at the foot of the bluff, within a stone's throw of a bungalow.

The marks on the unfortunate elephant were very instructive. The trunk was quite untouched and so was the face except deep scratches around the eyes, and *both eyes had been clawed out*. There were terrible bites and scratches on the top of the head and neck, back and rump, and

finally the throat had been bitten and torn open—evidently the *coup de grâce*.

These are the facts as told to me by the eye-witnesses and by the *tahsil* officer who heard the battle and who had the job of getting rid of the body of the elephant. From them we can deduce the probable—or at least possible—course of events.

It is inconceivable that the tigers made a senseless and unprovoked attack on a full-grown tusker elephant, and equally inconceivable that the elephant started the fight. (He was neither 'musth' nor a rogue.) It is probable that the tiger cub was the cause of the trouble. He may have blundered into the elephant or gone sniffing around in curiosity and received a kick or a blow for his trouble, causing him to yelp. This would at once raise the maternal fury of the tigress, and the tiger would come to the help of his mate.

The wounds on the elephant give an indication of the tactics of the tigers. It is clear that no frontal attack was attempted, or the trunk and face of the elephant must have been mauled. Probably one tiger threatened or demonstrated in front, enabling the other tiger to leap on the back (an easy leap for a tiger) and start biting and scratching. It was probably shaken off several times, but again returned to the attack. At some stage of the fight, one of the tigers must have managed to jump or crawl on to the top of the head and from that position to have clawed out the eyes, perhaps deliberately, for it seems a natural instinct of the cat tribe to go for the eyes. One can imagine the poor blind elephant, tortured with the fiendish laceration of its back, stumbling along in agony over the boulders and rough ground, falling ultimately over some low bank and exposing its throat to a hellish mauling from the other tiger, and dying from loss of blood or severance of its wind-pipe. Truly the tigers took a terrible revenge for any possible injury to their cub.

No measurements of the elephant were taken. The tusks were small but old and worn, about 32 inches long excluding a foot or more embedded and 14 inches girth at the base, and the two tusks together weighed 122 lb.

Although I have heard of elephant calves being occasionally killed by tiger, I have never before heard or read of a fight to a finish between tigers and a full-grown bull elephant. That it should have taken place before eye-witnesses, and within ear-shot of many more, is a piece of remarkable luck.

E. A. SMYTHIES C. I. E., I. F. S.

LUCKNOW
December 22, 1939.

Encounters between tigers and elephants occasionally occur. Mr. Q. G. Corbett writing in our Journal *(Vol. 7, p. 119) gives three instances. Two deal with attacks on female elephants: the objective in one being a calf which was killed despite the mother's attempts at rescue. The third records an attack*

on a big tusker, which was so dreadfully mauled along the whole length of its back, that it died a few days after. As is usual with big animals which cannot be easily mastered, the tiger's attack in the three instances reported by Corbett was not frontal, but directed from the rear: the tiger biting into the hindquarters, back and shoulders. The tiger's way with elephant calves is to hamstring them or attempt to do so. Mr. Milroy (J. Bombay nat. Hist. Soc., Vol. 32, p. 370) in two seasons' shooting in North Cachar came upon 4 or 5 elephant calves that had been attacked in this way. In the instance reported in our Journal *by Mr. J. .K. Swaine (Vol. 36, p. 983) the tiger's attack on a cow elephant was directed to the belly and underparts. This change from the usual method was probably an adaptation to circumstances. The tiger is a versatile killer and follows no stereotyped method in his killing. The cow elephant was laying down, and Mr. Swaine concludes that the tiger attacked her as she lay probably clinging on with teeth and claws tearing away the flesh by its weight as the elephant got up. She appeared in camp the next morning with a huge wound stretching from her right foreleg to well under her belly, the torn flesh hanging almost to the ground.*

—EDITORS (H. M. McGUSTY, J. P. CAIUS and S. H. PRATER)

This note and its accompanying editorial appeared in Volume 41 of the Society's *Journal* published in 1940. —EDS.

NOTES, NEWS AND COMMENTS

A book on Freshwater Fishes

The Zoological Survey of India has brought out a handbook on the FRESHWATER FISHES OF INDIA, BANGLADESH, BURMA, PAKISTAN AND SRI LANKA, by K. C. Jayaram which covers all the known fresh- and brackish water fishes, both indigenous and exotic, found within the entire Indian region.

The commercial importance, food, feeding habits, bionomics and their status in nature are indicated and key characters to facilitate identification are illustrated. The concluding part of the book contains a glossary that gives the meaning and usage of 100 technical terms, a bibliography of over 400 references on the literature of the fishes, and an index that contains over 2500 scientific names found in the text to provide easy retrieval. Along with 208 figures, there are 3 colour plates including the frontispiece and 11 black and white plates.

To sum up, it makes an up to date compendium of all information on the piscine fauna of the subcontinent.

The book is priced at Rs. 100/-per copy, and orders for it should be placed with

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IUCN Commission on Education

Smt. Indira Gandhi is now the Honorary Chairman of the IUCN Commission on Education. The Commission on Education was established in 1949 and is an international voluntary group dedicated to help the general public understand the need to protect the environment and use natural resources wisely so as to benefit the present as well as the future generations. Its activites are directed towards policy makers and planners, educators, young people and the public in general.

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For more information contact:

RAISE SCRIABINE
DIRECTOR, PUBLIC AFFAIRS
IUCN, CH - 1196 GLAND
SWITZERLAND

—IUCN News Bulletin

American Ornithologists' Union meet

The American Ornithologists' Union announces its Centennial Meeting to be held at the American Museum of Natural History in New York, 25th September-1st October 1983. There will be a special Centennial Day with a Symposium, plus varied scientific and social events to mark the occasion of its founding, in late September 1883, at the

American Museum of Natural History. The Union especially would welcome attendance and participation by members of sister ornithological societies all over the world. For further information contact the Local Committee Chairman

LESTER L. SHORT
AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK,
NEW YORK 10024, U.S.A.

or the Programme Committe Chairman

GEORGE BARROWCLOUGH

address as above.

Integrated Mountain Development

The International Centre for Integrated Mountain Development (ICIMOD) of the Hindukush Himalayas located in Kathmandu, Nepal will be officially inaugurated in October 1983 during which an international symposium 'Mountain Development 2000': Challenges and Opportunities' will be held. The Centre's objectives are to help promote development of an economically and environmentally sound mountain ecosystem so as to restore the balance between man and mountain resources.

Besides Nepal and India the countries which stand to benefit are Afghanistan , Pakistan, China, Bangladesh, Burma and Bhutan. ICIMOD will serve as a focal point for multi-disciplinary documentation training and applied research as well as a consultative centre in scientific and practical matters. ICIMOD is an autonomous international organization, sponsored by His Majesty's Government of Nepal, the governments of the Federal Republic of Germany and of Switzerland and the UNESCO.

For greater details contact:

ICIMOD, C/O SATA, EKANTAKUNA, G. P. O. BOX 3226,
KATHMANDU, NEPAL

Fish and Pollution

Fishes have a very highly developed sense of smell that enables them to detect extremely low concentration of natural or artificial substances in water. This characteristic (on which many species depend for finding their migration routes) has been put to use in some drinking water pumping stations where behaviour of trout is constantly checked to detect signs of pollution.

M. Jean-Louis Huve assistant lecturer at the Pierre and Marie Curie University has developed a method of recording the electrical activity of the olfactory bulbs of fish using two electrodes. A transmitter which is mounted on the head of the fish picks up and transmits the current impulses to a micro-computer. These are then decoded to show the electrical activity of the bulbs and with the help of the spectral analysis it is possible to determine the polluting substance detected by the fish.

M. Huve's 'electronic fish' is capable of indicating in half a second the presence of a gramme of pesticide in 100 m^3 of water. This detection is found to be highly accurate and gives continuous surveillance. Water supply agencies,

(Continued on p. 31)

Irritant stinging plants found in India

Many of us at some time or the other, whilst in the forests, have been suddenly caused distress by a class of innocent looking plants. A mere touch of these nasty, yet beautiful looking, plants, with the naked parts of our body results in an irritation leading to painful blisters and sometimes long persistent ailment. Naturally, one always wonders as to how they do it; why they do it; and what should one do if caught unawares.

In recent days more and more people have become conscious of the need for conservation, and participate actively in the study of nature. The aim of this article is to familiarise them with these plants which are commonly known as Nettles.

WHY DO PLANTS PRODUCE IRRITANTS?

It is an established fact that all living organisms respond to different types of stimuli. In the case of some plants, irritants are the potential defence substances which are directed against the attacker.

HOW DO THEY CAUSE HARM?

In these plants the tips of the stinging hairs act as reservoirs for poisonous chemicals. The tips break off when they come in contact with soft skins and manage to pierce it. These broken tips of hair pour the poisonous irritants into the inflicted wound.

SUBSTANCES RESPONSIBLE FOR IRRITATION

For many years formic acid was considered the only chemical substance responsible for the irritation caused by plants. Recent investigaions, however, attribute the cause to different chemicals in different plants, which are commonly known as plant toxins. Besides formic acid, acetylcholine, histamine, serotonine (5-hydroxy tryptamine), acetic acid, tartaric acid and resinic acid have been considered to be responsible for irritant activity. However, claims attributing this phenomenon to some unidentified alkaloids, enzymes, glycosides, proteins, salts as well as calcium-sensitive factors etc. are also available in the literature.

The biogenic amines histamine, acetylcholine and serotonine mentioned above have been recently detected in the glandular hairs of the plants under discussion. Their pharmacological properties are consistent with the type of action depicted by these plants. Furthermore, these amines are present in many animal defence secretions, such as coelenterate venoms and in venoms of South American Comb Spiders. Histamine is present in the venom apparatus of bees and histamine and serotonine in that of wasps. This mixture is supplemented in hornet venom by a large quantity of acetylcholine, which is responsible almost exclusively for the action of hornet sting on the heart. Histamine has an acute effect on the circulation and all three biogenetic amines cause the initial pain after the sting.

COMMON REMEDIES

A wash with warm water containing mild alkalis sometimes gives relief, and the reason for such relief is believed to be the neutralisation of the acid from the plant with alkalis. The popular remedy to obtain relief from the sting has been provided by the same Mother Nature which has created the nettles. Rubbing of fresh leaves of *Rumex visicarius* (Chuka) or *Rumex maritimus* (Jungli palak, Bijband)—commonly known as Docks—on the itching parts has been known to cure the itch. Strange as it may seem these 'Docks' are invariably found very close to the nettles.

It is said that prevention is better than cure. The object of this article is to familiarise readers for the purpose of avoiding these plants in Nature.

In India about 18 species belonging to 6 different genera and three families, namely Urticaceae, Euphorbiaceae and Fabaceae are known for their stinging behaviour. Their botanical identities, popular as well as regional names and their distribution in India along with effects they produce on human skin are given below:

Laportea (URTICACEAE)

Laportea crenulata Gaudich (*L. stimulus* Mig.)

POPULAR NAMES. Devil nettle, Fever nettle, Elephant nettle (English), *Utigan* (Hindi), *Chorpata* (Bengali), *Ottarpilavu* (Tamil), *Anachoriyan* (Malayalam), *Sirnat* (Assam),

Laportea crenulata *Photo*: Author

Sorot-gach (Torash), *Thlak-pui* (Lushai), *Gilmat-jakma* (Garo hills), *Ongyalop* (Lepcha), *Moringe* (Nepal).

A large stout shrub or a small tree, 3-4 metres tall, found in evergreen forests in tropical Himalayas from Nepal eastwards, Bihar, Chota Nagpur, North Bengal, Assam, Rampa Hills in North Circars, Anaimalai Hills, Western Ghats in South Kanara and in Kerala.

Under scanning electron microscope it has been observed that, in addition to large stinging hairs like other nettles, it has large number of smaller glands which could well be the source of violent action promoting secretions. Due to this very action, it is reputed as the

worst stinging nettle in India. When the leaves come in contact with exposed skin, a keen sensation of irritation to the mucous membrane of the nose and eyes is experienced, which brings tears to the eyes, inducing running of the nose and causes profuse sneezing followed by severe body ache, sleeplessness and fever. The effect in some cases lasts for several days and is aggravated when water is applied to the affected part. The sting is said to be more powerful particularly during the flowering season, when the volatile components of the plant are probably discharged in the air as a systemic poison.

According to some observers (Haines, BOTANY OF BIHAR AND ORISSA, Vol. 3 p. 852, 1961) the plant is quite innocuous at certain times of the year. This may be so on account of the hairs being deciduous during the period.

Laportea terminalis Wight

POPULAR NAME. *Patle sisnus* (Nepal).

This is an erect herb 0.6-1.2 metres tall with orbicular to oblong-ovate or lanceolate leaves. It is found in sub-tropical Himalayas from Kumaon eastwards, North Bengal, Naga and Aka hills in East India, Nilgiris and Palni hills in Tamil Nadu and in Kerala.

This like the preceding species, is also armed with stinging hairs which are variable in number. The sting is, however, not very severe but causes blisters leading to dermatitis.

Fleurya (URTICACEAE)

Fleurya interrupta Gaud.

POPULAR NAME. *Lal bichua* (Hindi & Bengali).

An annual erect herb, 2-4 feet tall, with ovate, accuminate coarsely toothed leaves. The plant is found in Khasi Hills, Bengal, Bihar, Orissa, Maharashtra and in South India.

The stinging hairs cause pronounced itching and dermatitis.

Urtica (URTICACEAE)

Urtica dioica Linn.

POPULAR NAMES. Stinging nettle, Common nettle (English), *Bichhu booti* (Hindi), *Bichhua, Chichru* (Western Himalaya), *Han, Jharan* (Kulu).

A robust deciduous herb, up to 2 metres tall, with grooved stems and abundantly armed with stinging

Urtica dioica **Photo**: Author

hairs. It is found in the North-Western Himalayas from Kashmir to Kumaon at altitudes between 2100 and 3200 ft.

Hairs on leaves and stem cause irritation and produce symptoms of urticaria or nettle-rash.

Urtica parviflora Roxb.

POPULAR NAMES. *Paharah bichuti* (Bengali), *Berain, Shishona, Bichu, Kanyali* (North-West India), *Sousni* (Nepal).

A slender sparingly branched perennial herb, up to 3 metres tall, copiously armed with stiff stinging hairs. It is found abundantly in the temperate Himalayas from Kashmir to Sikkim, Darjeeling in West Bengal, Mishmi Hills in Arunachal Pradesh and the Nilgiri Hills in South India.

Urtica hyperborea Jacq.

POPULAR NAMES. *Zatud, Latud, Stockpo* (Ladakh).

A slow, tufted herb found in alhine regions of the Central and Eastern Himalayas and in western Tibet between 12,000 and 15,000 ft altitude.

Urtica pilulifera Linn.

POPULAR NAME. Roman nettle (English)

An eye-catching weed found in hill stations.

All plants belonging to the genus *Urtica* are provided with stinging hairs. Explanations regarding the stinging hairs of *Urtica dioica* are available in the literature, which may hold good for all other species as well.

Contact with hairs produces urticarial inflammatory nettle-rash, accompanied by a considerable burning and itching in the affected part. The rashes may come in large or small patches, remaining for a few minutes to several hours and may disappear quite abruptly. It usually does not leave any trace after subsiding.

Girardinia (EUPHORBIACEAE)

All three species of *Girardinia* found in India are robust erect undershrubs, 4-10 ft tall, with coarsely dentate or errate leaves. Plants cause dermatitis.

Girardinia zeylanica Decne (*G. heterophylla* var. *zeylanica* Decne).

POPULAR NAMES. Ceylon nettle (English), *Kolti* (Marathi).

Girardinia zeylanica *Photo*: Author

A shurb up to a metre tall found in the mountains of Rajasthan, Madhya Pradesh, the Deccan and southwards to Kerala.

Girardinia heterophylla Decne

POPULAR NAMES. Himalayan nettle (English), *Awa, Alla, Bichua, Chikri* (Hindi), *Ulla, Sishnu* (Nepal); *Kazubi* (Lepcha), *Serpa, Herpa* (Bhutia); *Taintham, Tingthap* (Khasia).

A shrub found in temperate subtropical Himalayas from Kashmir to Sikkim up to an altitude of 7000 ft and in Assam and Khasi Hills.

Girardinia palmata Gaudichand (*G. leschenaultiana* Decne)

POPULAR NAMES. Nilgiri nettle (English); *Guddanelli* (Telegu); *Turike* (Kannada); *Anachchorian* (Malayalam); *Keri* (Punjab).

A common shrub in the mountains of Western Ghats at an altitude of 4000-7000 ft.

Tragia (EUPHORBIACEAE)

All the *Tragia* species are climbing or twining annual herbs, with stinging hairs and cause dermatitis. Stinging hairs have sharp ciliceous ends and their actions are almost similar to those of *Urtica* species.

Tragia cannabina Linn. f. (*T. involucrata* var. *cannabina* Muell-Arg.)

POPULAR NAMES. *Telladuradagunta* (Telugu); *Cheruhanjaru, Eirrukancharivaya* (Tamil); *Cherukodithura* (Malayalam); *Kirituraчhi, Sannaturachi* (Kannada).

An erect or a climbing shrub found throughout the hotter parts of India. Leaves palmately 3-partite.

Tragia involucrata Linn.

POPULAR NAMES. Indian stinging nettle (English); *Dhussparsha, Vrishchikali* (Sanskrit), *Bharanta* (Hindi); *Bichati* (Bengali); *Khajkolti, Churki* (Marathi); *Teegaduradagunta* (Telugu); *Chinnaduradagunta* (Telugu); *Kanchoorie, Poonaikanjan* (Tamil); *Dulagondi, Haligilu, Kiriberalu* (Kannada); *Choriyan, Kotittuva* (Malayalam); *Bichhuati* (Oryia); *Sengel-sing* (Santal); *Germa-dukhaguphu, Jong-ma-sai* (Cachar).

A perennial evergreen twiner with hispid stinging hairs. Distributed throughout India from Punjab and lower Himalayas onwards to Assam and Meghalaya ascending up to an altitude of 750 metres and southwards to Kerala.

Tragia involucrata *Photo*: Author

Tragia muelleriana Pax & Hoffm. var. **unicolor** Pax & Hoffm.

POPULAR NAME. *Churki* (Marathi).

An abundant climber found all over Maharashtra. The burning sensation caused by stinging hairs may last well over three hours.

Besides the above mentioned species three more species, namely *Tragia bicolor* Miq., *Tragia hispida* Willd. and *Tragia montana* Muell. Arg. are found in high altitude hills in Himalayas.

Mucuna (FABACEAE)

Mucuna monosperma DC

POPULAR NAMES. *Mothi-kuili, Sonagaravi* (Marathi), *Kagadolia, Adadelia* (Gujarati); *Enugadulagondi, Peddadulagondi* (Telugu); *Periyat-talargai, Theli-kodi* (Tamil); *Anipeballi* (Kannada); *Malanthelli* (Malayalam); *Sarni, Bai-donka* (Oriya); *Baldhengra* (Nepal); *Meisiarintim* (Khasia).

A large perennial woody twiner found from Nepal eastwards to Khasi Hills, Deccan peninsula and the Andaman Islands. Trichomcs of pods are irritant to the skin and cause dermatitis.

Mucunna prurita Hook. (*M. pruriens* Baker)

POPULAR NAMES. Common Cowitch, Cowhage (English); *Kaunch, Goncha* (Hindi); *Alkushi* (Bengali); *Kaucha, Khajkuili, Kuili* (Marathi); *Kavach* (Gujarati); *Dulagondi, Piliadugu* (Telegu); *Poonaipidukkan, Poonaikalai* (Tamil); *Nasukunni, Hasagunigida* (Kannada); *Naikorna* (Malayalam); *Kaincho* (Oriya); *Kavach, Gugli* (Punjab); *Kauchir, Kauch* (Nepal);

Mucuna pruriens **Photo**: Author

Kajukoprik (Lepcha); *Itika, Santalitkar* (Mundari).

A herbaceous twining annual found all over India and in Andaman and Nicobar Islands. The bristly hairs covering fresh as well as dry pods cause intense itching on contact with skin, very often followed by blisters and dermatitis.

I am grateful to Dr J. S. Campbell and other authorities of Alchemie Research Centre for encouragement in preparing this note.

M. R. ALMEIDA

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Butterflies of Bombay-12

In continuation from page 33 of *Hornbill* 1982 (4) we are describing 8 species of the family Hesperidae.

Butterflies of this family are commonly known as Skippers and can be easily distinguished from other groups by the thickly clubbed antennae tapering to a curved hook. Over 300 species of Skippers are found in India out of which 24 species are known to Bombay. They fly early in the morning and in the evening and prefer to remain in shady places inside the forest during day time.

90. COMMON BANDED AWL *Chromus alexis* (Fabricius). Common from June to October again March, April. Larval food plant is *Pongamia glabra* and castor.

91. BROWN AWL *Badamia exclamationis* (Fabricius). Common on the wing from July to October. Larval food plants are *Terminalia* sp., *Combretum* sp.

92. MALABAR FLAT *Celaenorrhinus ambareese* (Moore). Common in July and August. Shade loving butterfly. Fond of settling under rocks and boulders. Larvae feed on *Carvia callosa*.

93. FULVOUS PIED FLAT *Coladenia dan* (Fabricius). Common from July to October. Frequent visitor to flowers; seen basking on leaves. Larvae feed on *Achyranthes aspera*.

94. TRICOLOR PIED FLAT *Coladenia indrani* Evans. Common on the wing in August-September. Larval food plants are *Xylia, Desmodium, Grewia* and *Mallotus* spp.

95. COMMON SMALL FLAT *Sarangesa dasahara* Moore. Not common; seen in August. Fly low in open country and frequently visit flowers. Larval food plant is *Asytasia* spp.

96. ORANGE TAIL AWL. *Bibasis sena* Moore. Not common; on wing in August. Larvae feed on *Combretum extensum* and *Hiptage* sp.

97. GOLDEN ANGLE *Caprona ransonnetti* Felder. Common on the wing from August to October; can be seen visiting flowers and damp patches. Larvae feed on *Helicteres isora*.

NARESH CHATURVEDI
S. M. SATHEESAN

(Continued from p. 22)

water treatment centres, fish breeders etc. would find M. Huve's invention very useful and a French company Mondialcom is planning to market a complete detection system which would not cost more than Rs. 60,000 to Rs. 75,000/-.

M. Huve is now planning to develop his technique for detecting marine pollution by using bass instead of trout and even for atmospheric pollution by using a simple type of equipment fixed on rats.

ACKNOWLEDGEMENT

We are grateful to Seth Purshotamdas and Devaliba Charitable Trust for financial help for the publication of the *Hornbill*.

SWALLOWTAIL

Crimson Rose Polydorus hector *(Linnaeus) Family Papilionidae commonly known as Swallowtails, a name derived from the tails on their hind wings recalling the forked tail of the swallow. Common in peninsular India along the Western Ghats; it also occurs in Bengal, Bihar and Orissa. It is fond of visiting flowers and is seen sipping nectar from lantana, barleria and eranthemum etc. Its larval food plants are of the Family Aristolochiaceae.*

These butterflies have an unpleasant taste and birds and other predators quickly learn to recognise them as poisonous. The female of the Common Mormon Papilio polytes *f.* romulus *takes advantage of this protective character and mimics the colour and pattern of the Common Rose and thus gets saved from predation. The photograph is by G. C. Patel.* —EDS.

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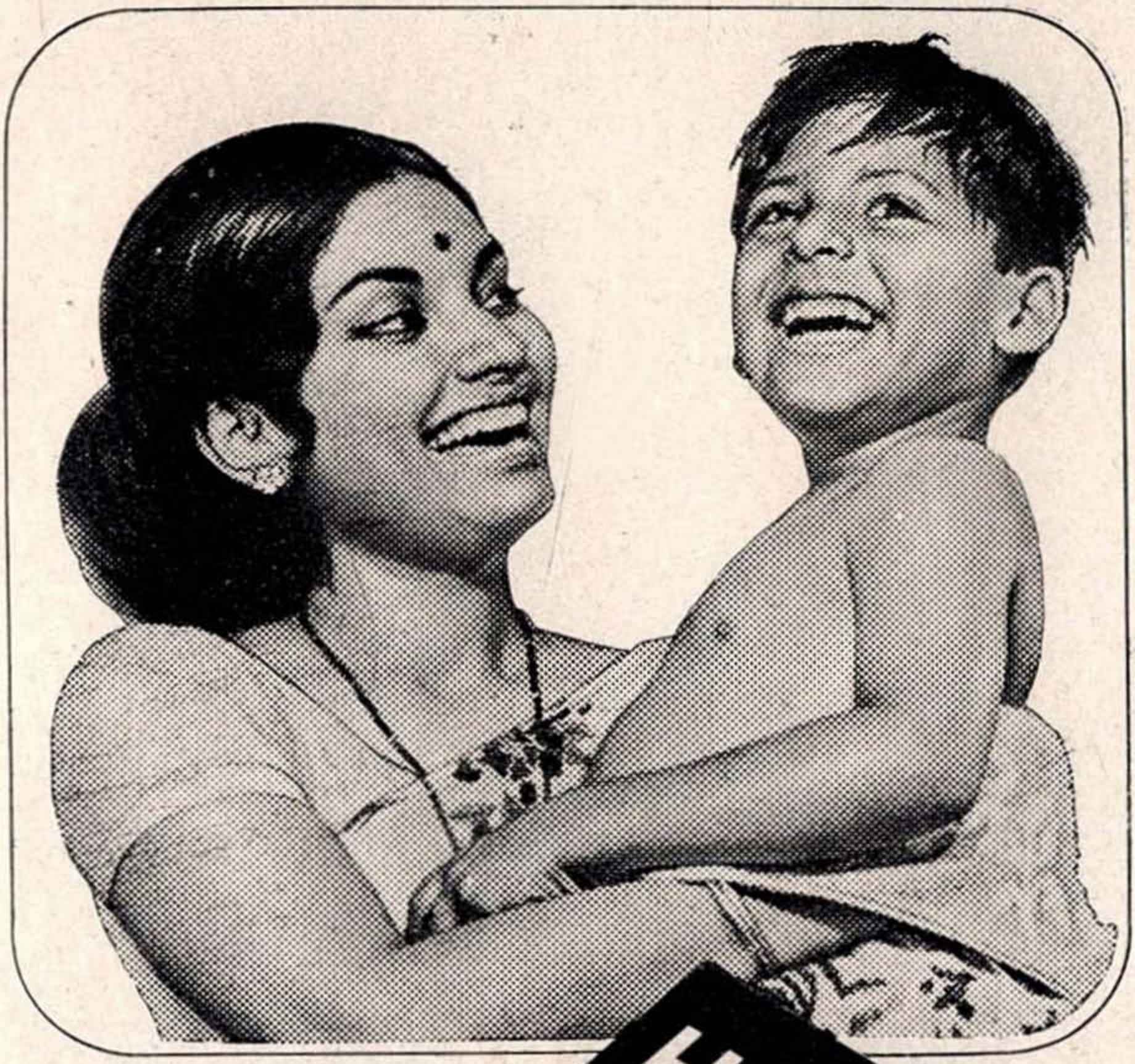

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5. Up-to-date information and advice on birdwatching, wildlife photography and fishing; natural history field trips and information on possible areas for field trips.

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