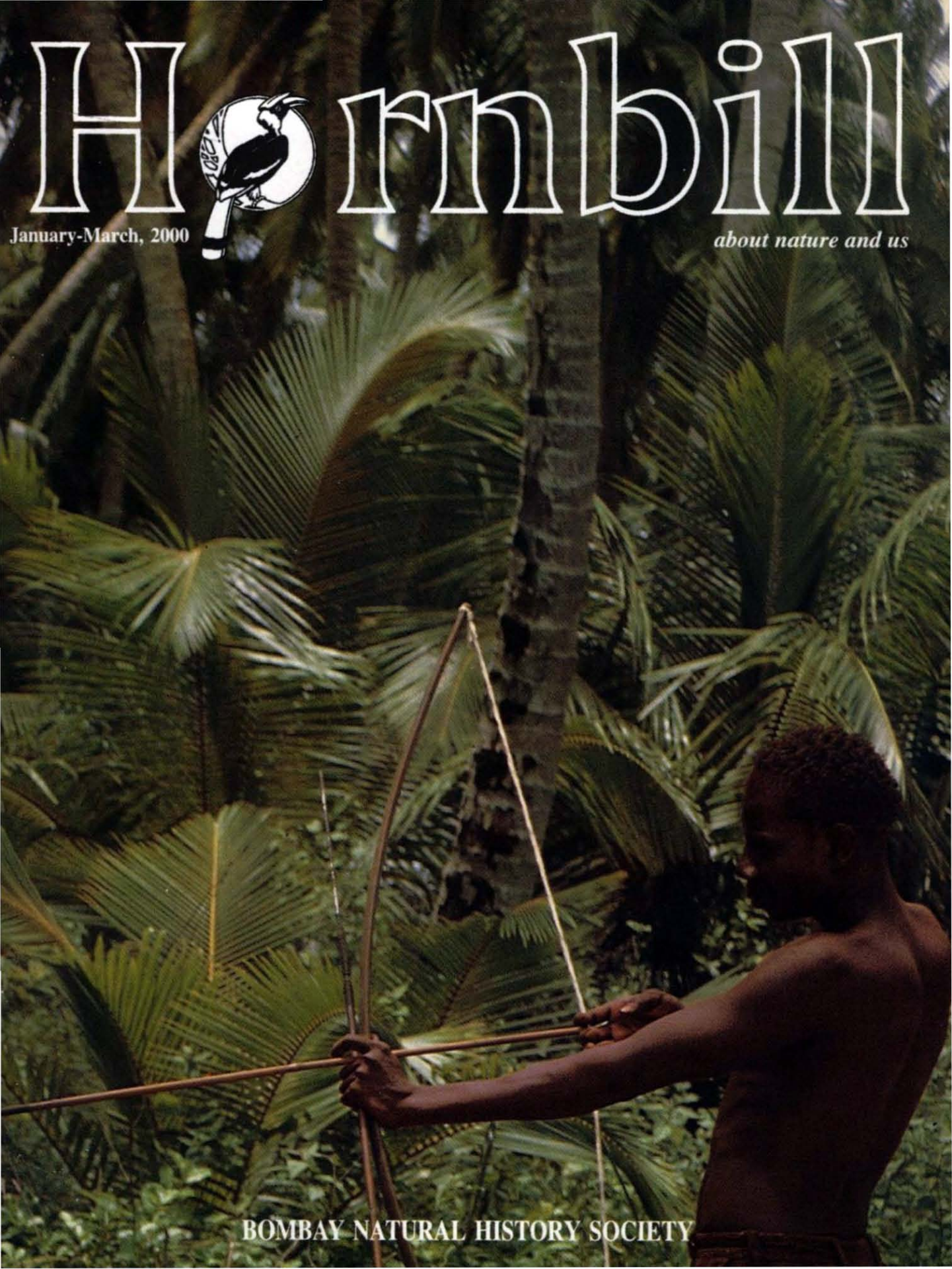
Hornbill

January-March, 2000

about nature and us



BOMBAY NATURAL HISTORY SOCIETY

HORNBILL
January-March 2000

BNHS

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Naresh Chaturvedi* and *Isaac Kehimkar

Early stages in the life-cycle of the Common Mime is the first to be dealt with in this new series on the butterflies of India.

For more information on the Society and its activities, write to the Honorary Secretary, Bombay Natural History Society, Dr. Sálim Ali Chowk, Shaheed Bhagat Singh Road, Mumbai 400 023.
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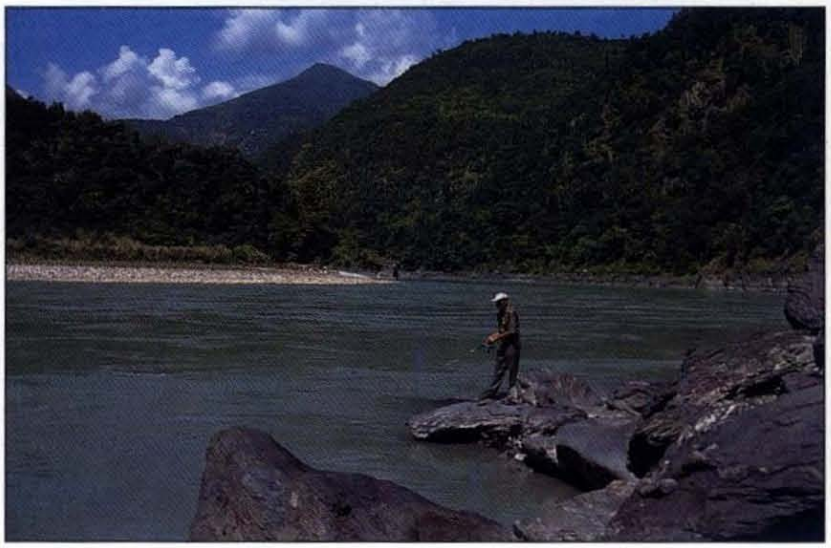


Other Features...

VIEW POINT

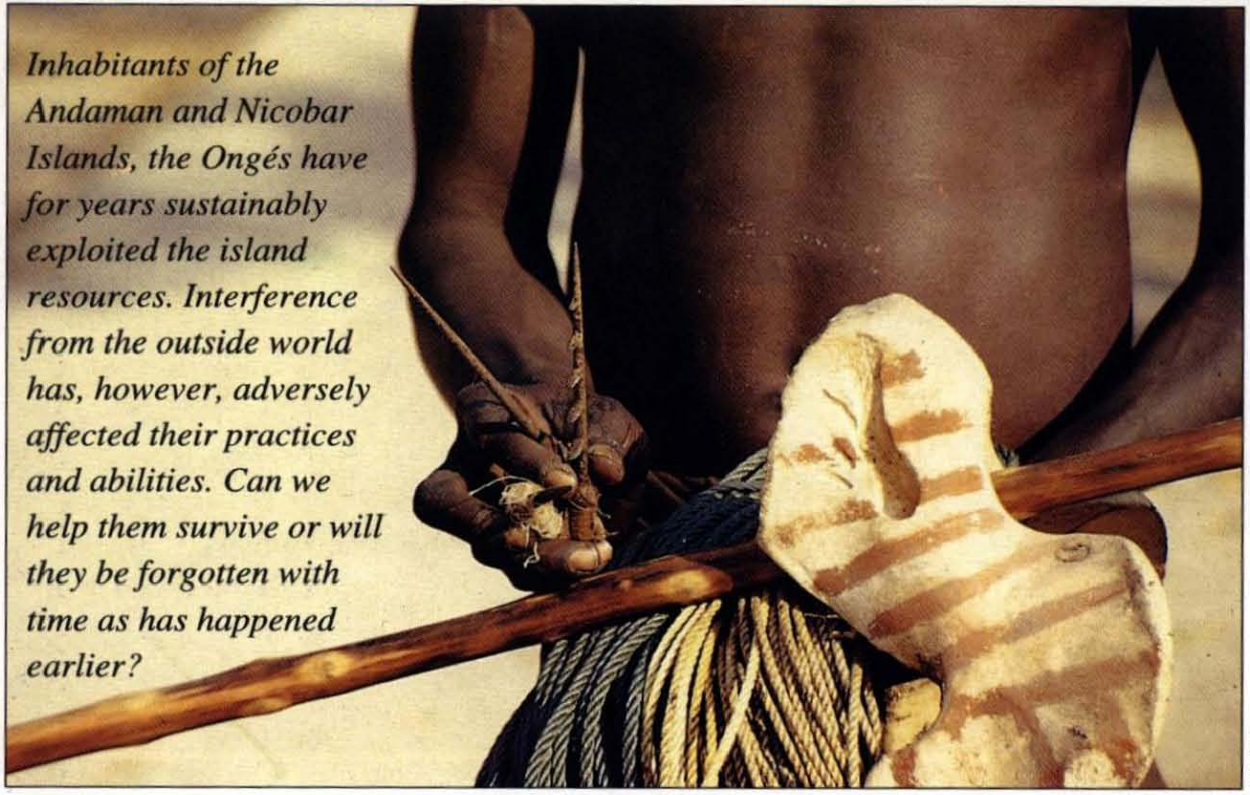
PONDS IN PERIL

ISAAC KEHIMKAR

V. SHUBHALAXMI

An area of great concern is the status and conservation of the smaller water-spreads, such as village ponds and temple tanks which are under severe stress. Many of these are important repositories of biodiversity, and some have become important sanctuaries for birds and other wildlife. Sadly, over the years due to the increasing human population and hunger for land, and the advent of piped water into homes, the need and care of village and temple tanks is gradually diminishing. Many are now neglected or have been filled up to be put to other uses, and even serve as dumping grounds for the wastes of villages and cities. The Envis Centre (Environmental Information System) at the Society, which gathers and disseminates data on ornithology and inland wetlands, did a sample survey of the status and problems facing small waterbodies in three districts of Tamil Nadu, namely Chengalpattu, Rameswaram and Kanyakumari. The findings of the Society's scientists are revealing. Human population pressure and the high cost of land leads to encroachment (68% in Kanyakumari) for extending paddy fields, coconut groves and housing colonies. In spite of the manifold benefits of wetlands to the locals in terms of resources such as water for irrigation and domestic use, fish, food plants, recharging of the water-table, these waterbodies are more or less neglected. One major reason could be that most wetlands in India are public property. Protection of wetlands is lax or non-existent. Some of the offices entrusted with the care of the wetlands do not even have basic information on the wetlands under their jurisdiction. It is evident that there is an urgent need to document and collect baseline information on the wetlands of India and take steps for their conservation before this "waterlogged wealth" is frittered away and lost forever.

J.C. DANIEL



Inhabitants of the Andaman and Nicobar Islands, the Ongés have for years sustainably exploited the island resources. Interference from the outside world has, however, adversely affected their practices and abilities. Can we help them survive or will they be forgotten with time as has happened earlier?

H.S. DAS

Ongés and their Vanishing Mermaids

H.S. Das

H.S. Das is a noted wetland ecologist. He is presently associated with the Environmental Research and Wildlife Development Agency, Abu Dhabi, UAE.

I WAITED for MV Chowra to leave Port Blair harbour and then settled down in the stern of the ship on a wooden bench. The ship was on its long south trip to Campbell Bay, Great Nicobar, but I intended getting off at Hut Bay, Little Andaman. Excited that I was visiting Dugong creek, I had nine hours in hand to plan. Little Andaman was not new to me as I had visited it to survey seagrass habitats on earlier occasions, but had never been to Dugong creek. The last two days were chaotic. Getting permission to visit, even for scientific research, was not easy. I had made several rounds to various offices to get permission to survey seagrass beds at Dugong creek without much success. Dugong creek is home to an endangered tribe — the Ongé. Many officers concerned with the preservation of tribal culture were, therefore, hesitant to allow outsiders to visit tribal settlements without sufficient reason. At last, the Deputy Commissioner of Andaman, Mr Awaradi, who knew my work when he was DC of Nicobar, queried, "Do you think the Ongés are going to benefit from your study in any way?" I had faced similar questions in the last two years. My objectives were bonafide, "Ongés get animal

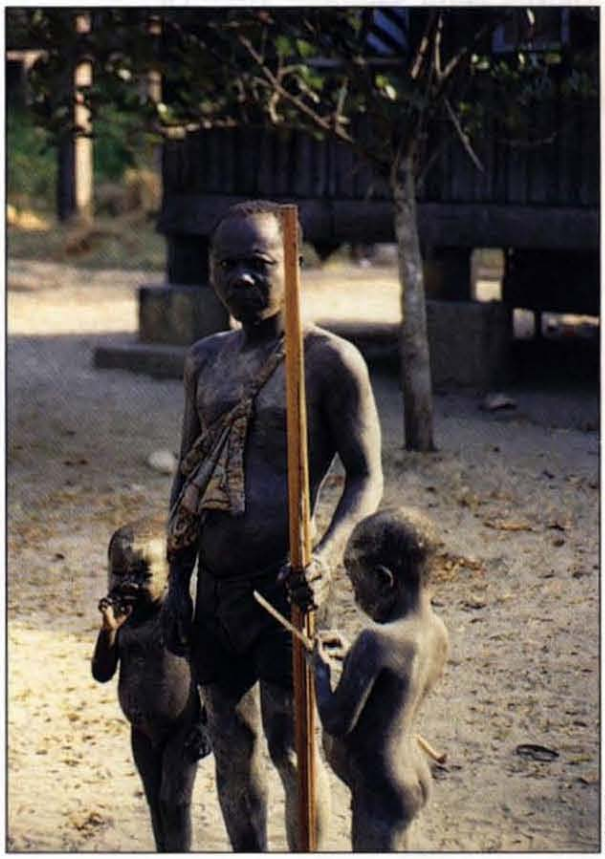
protein mainly from turtle and dugong; my study on the status of seagrass beds at Dugong creek would help in the conservation of these habitats and ensure long term availability of food for the Ongés. With the depleting wild pig population from the forest, due to over hunting by settlers, the Ongés have been forced to rely increasingly on animals from the sea." And, I was permitted to survey the seagrass beds of Dugong creek.

Journey to Dugong creek

The engine "Doonghi" of the *Andaman Adima Janajati Vikas Samiti* sailed slowly through the serpentine mangrove creeks of Little Andaman flanked by nypa palm (*Nypa fruticans*) and rhizophora (*Rhizophora mucronata*) on a chilly January morning. I was accompanied by a social worker, a pharmacist and a school teacher, posted at Dugong creek to provide support to the Ongés. My ration for two weeks was carefully kept under the wooden planks to protect it from getting wet with salt water spray. After two hours of sailing through the creek and sea, we reached Dugong creek.

I was amazed at the integrity of the seagrass habitat at the creek. I encountered a large number of sea cucumbers, star fishes, fishes and marine shells and found signs of grazing by turtles and dugong in the pristine seagrass beds. Of late, this had been a very rare sight in the coastal habitats of the Andaman and Nicobar Islands due to over exploitation. I was keen to know the degree and nature of dependence of the Ongés on the seagrass habitats. I was aware that they hunt turtles and dugongs in the intertidal and subtidal zones and in seagrass beds, since the animals come to the seagrass for food. My initial brief meetings with the Ongés, the aborigine tribes of Negroid race were, however, disappointing. The elders of the community did not show much interest in talking about the traditional dugong hunting techniques. By the end of my stay, I had developed a warm friendship with the captain of the settlement and some of the younger Ongés. They had realised that I was not there to photograph them, which they disliked intensely, but that I genuinely sought knowledge about the seagrass beds. I got permission to survey the seagrass beds at the Dugong creek again in April 1998. I was eager

BITTU SAHGAL



H.S. DAS

Ongé adult (above) and children (below) paint themselves white to escape from the spirits

to come back to the same place again and to meet my Ongé friends. My reception was exceedingly friendly this time. The Ongés talked freely about their culture and rituals over a cup of black tea or honey.

The Ongés

The life of the Ongés revolves around the forest and the sea, which includes collection of forest produce, and hunting pigs and turtles. However, these activities are so planned, governed as they are with a belief in spirits, that they do not hunt animals in their breeding season. Thus, this tribe sustainably exploits island resources. Moreover, they were well aware of the limited resources in an island ecosystem, and ensured that only that which could be consumed was hunted.

Dr. Viswajit Pandya, Professor of Anthropology at Victoria University, New Zealand, in his book ABOVE THE FOREST has elaborated on Ongé beliefs. The principal beliefs of the Ongés on which their myths and rituals are based are: All (pigs/turtles/plant) belong to the spirit. The Ongés are not supposed to plunder nature, the spirit would otherwise get angry and bring misfortune. Hierarchically, spirits are above the Ongés and the Ongés above animals and plants. Transformation between the spirits and the Ongés is possible. Spirits live in and around the Ongé settlement. They are formless and odourless. Their unseen presence makes the Ongés do good.

The tribals do not volunteer the information regarding their myths, rituals and traditional practices. I was interested in knowing why the bones of pigs and dugongs were kept above the cooking area in every Ongés home. They had not expected an outsider to differentiate dugong bones from those of pigs and the man of the hut was happy to explain the beliefs associated with this practice.

The skull and lower jaw bone of pigs, turtles and dugongs are preserved by the Ongés and kept in their homes. At the end of each hunt and after cooking, the skulls of the animals are carefully preserved. The skull is dried over smoke and covered with red clay. It is kept above the cooking area, and is believed to release the smell of the dead animal. The smell disperses and attracts animals from the forest or sea to its origin, thus facilitating future hunts. The red clay is considered to further aid the release of smell.

The Ongés believe that the difficulty in hunting dugongs was that they are related to both turtles and pigs. *Tuove* — dugongs, share their identity with both the turtles and the pig. This shared identity positions the dugong between the forest and the sea. A myth tells us that during a full moon tide, some pigs tried to run away from the forests into the sea, and some turtles into the forests. The level of the sea changed as the pigs and turtles started moving in and out of the water. Some were caught in between, (intertidal and subtidal zone) and became dugongs.

H.S. DAS

Will these young Ongés ever use the traditional canoe for hunting?

The Ongés now live in settlements in the northeastern part of the Little Andaman island. A small group of their race lives in the southern

part of the island. The sea near their settlement forms picturesque beaches and bays that support one of the largest and richest seagrass areas of the Andaman and Nicobar Islands. The area abounds in marine life — turtles, crayfish, trochus and other marine shells, and rarest of all, the dugong.

H.S. DAS

A female dugong killed in the fishermen's net

The Dugong

The dugong (*Dugong dugong*) is a grey brown animal which looks a bit like a cross between a seal and a whale. It has a powerful fluked tail and small front flippers which act like paddles to stabilise it when it swims. It measures about 2-3 m in length and weighs up to 350 kg. An air breathing mammal, it is totally adapted to life in the sea, and spends much of its time grazing on the seagrass. For this reason it is also called sea cow.

Dugongs are the only marine mammals which are strictly herbivores. If the seagrass is short, they stir up the bottom, eating rhizomes, stems and leaves, causing sediment to cloud the water. If the seagrass is tall, they just strip the leaves from the stems. Given a choice, they select young and soft plants, but will eat any available species. Small amounts of algae are also eaten in the process. Seagrass is nutritionally low, hence consumed in vast quantities. In captivity, they eat 20-30 kg a day. Most marine animals do not eat seagrass as they cannot digest cellulose. Dugongs crush the leaves and roots against the special horny plates in their mouth before passing it back to their teeth. The seagrass quickly wears the teeth down. Dugongs have, therefore, evolved a special way of replacing them throughout their lives.

Dugongs are shy animals and very difficult to approach. They have poor eyesight, but their hearing is sharp. Though the external ear opening is tiny, their large internal ear enables them to hear well, both on the surface and under water. Although capable of staying submerged for 6 minutes or more, dugongs must surface regularly, albeit only for 1-2 seconds. However, they are hard to see as they breathe by exposing only the nostrils on the snout.

Hunting a Dugong

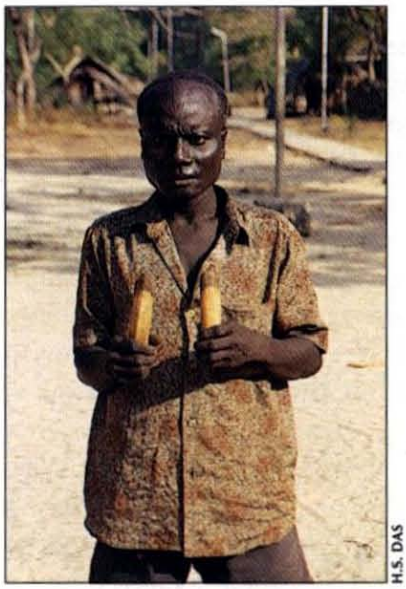
Catching dugongs is no easy affair, for they are secretive and elusive animals. To be successful, a hunter needs to have an intimate knowledge of dugong behaviour, their favourite feeding spots, what they eat, the best tide for hunting, and relationship between the tide and the phases of moon. Earlier, when the population of Ongés was high, only a few were allowed to hunt. Now, with their decreasing numbers, this skill is dying, and the chance of getting a dugong slim.

As the full moon neared, I requested the Ongés who I knew had planned a hunt, to let me accompany them. After much discussion, they agreed to give me a place in their canoe. Normally, outsiders are not allowed to come along while hunting. When the tide started rising, we headed for a place where the seagrass was dense and dominated by *Thalassia hemprichii* (commonly called dugong grass). The practice is to wait at some strategic points till the tide rises to a

comfortable height for the dugongs to come. Unlike their distant cousins of Papua Islands who make wooden platforms over a seagrass bed and wait for the dugong to come during high tide, the Ongés of Little Andaman use canoes with harpoons. There seem to have been elaborate rituals in earlier days for the hunt to be successful. Now they just rub some wild ginger on the harpoon, and recite a few lines in appreciation of the spirits before leaving for the hunt.

As the rising tide came in to cover the reefs, the hunter at the tip of the canoe signalled the movement of dugongs towards the seagrass bed. We followed without making a sound. It was almost evening, biting insects attended to me more than to my Ongé companions. I was firmly told not to react to these incoveniences. The tide was rising high and visibility was very low. I was in the middle of the canoe, unable to see anything ahead. I had to contain my eagerness for a better view, as any movement would have disturbed the balance of the canoe or, more probably, the animals. The hunter stood on the bow with a harpoon ready in hand, silently reciting sacred spells to attract dugongs towards the canoe, spells that had been given to him by the spirit in a dream. His face brightened when he saw a trail of mud where a herd of dugong had been rooting through the seagrass. However, the moment they were within reach of the harpoon, the dugongs escaped in a swirl of mud. Though dugongs usually swim slowly, they can put on a burst of speed over short distances. And was I relieved at their escape!

Over the last decade, the population of Little Andaman has expanded rapidly. Though the Ongés are confined to a portion of the island declared prohibited, the isolation is not absolute. Their population is declining with the shrinkage of their habitat. The dugongs face a similar fate.



H.S. DAS

An Ongé proudly displaying the dugong tusks in his possession

Reports on dugongs of India have been made from the Gulf of Mannar, Gulf of Kutch, Palk Bay and the Andaman and Nicobar Islands. Dugongs were common during the British era, but the population has dropped drastically in the recent past as evidenced by sporadic sightings and rare records of poaching. With an estimated population of about 100 individuals all over the Andaman and Nicobar Islands, the species is the most threatened of all marine life of the bay island. The primary reason for the decrease in their population in this island group is loss of habitat, which has resulted from several human activities along the coast and immediate upland, adversely affecting the clarity and quality of water. Conservation efforts have been superficial, since necessary information regarding their population, distribution and home range, besides their ecology and biology are not known from India.

It is time we enforced strict legislation to protect dugongs in the wild. Their potential habitats should be completely free from human disturbance. Regular monitoring of the species and habitat should be undertaken and conservation measures reviewed periodically. Ongés have a similar story. With the influx of settlers from the mainland, the forest area available for Ongés has decreased and their activities are restricted to a very small portion of the island. Besides, interference from the outside world has adversely affected their practices and abilities.

The Ongés do not hunt dugongs as often as they used to. They know dugongs are a near extinct species and live in very small groups, as small as the Ongés themselves. Time will decide whether the Ongés will vanish before their vanishing mermaids ... maybe we can help both live longer!

The Hedgehog

Ishwar Prakash

Ishwar Prakash, formerly Professor of Eminence at the Central Arid Zone Research Institute, Jodhpur, is presently working at the Desert Regional Station, ZSI, Jodhpur.

Hedgehogs are distributed in Europe, north Africa, India and Sri Lanka. The European hedgehog, *Erinaceus* spp. extends from Britain to Pacific Siberia, eastern China and parts of north Africa. The other genus, *Hemiechinus* is also distributed from north Africa to western China through the subdeserts of Libya, Afghanistan, Pakistan and southern a. The third genus *hinus* occurs in the region, *P. micropus* us from the Indus o Kutch, Rajasthan Maharashtra, up to The subspecies, *P.m.* *ntris* has a limited bution in parts of an be distinguished presence of a naked on its forehead. *H.* *micropus* is yellowish tensive geographical the old world is due propensity and their s of climate by being ones of extreme cold ly cold regions, they orpor when it is too

rs of Rajasthan and hts, with a petromax in one hand and a stout stick in another, I have observed *H. collaris* commonly in the extreme desert districts of Barmer, Jaisalmer and southern Bikaner. And, *P.m. micropus* doubly prominent, in the Shekhawati region of Churu, Sikar and Jhunjhunu districts. This could be as the *barchan* sand dunes are spread over more than 60 per cent of Shekhawati, and since *micropus* is poorer in excavating than *collaris*, it finds the sand more conducive to burrowing. *H. collaris* is always found inhabiting burrows, whereas, *micropus* is found

mammalian hair. The tail is devoid of spines. Locally called the *jhau chuha*, they are at times confused with the porcupine and thought to be its young. The skin on the back is very thick and is constituted of strong muscles, the strength of which helps it roll into a tight ball of spines. It is very difficult for a human being, with his full strength, to unroll a hedgehog. The head and limbs are all concealed under the armour of spines. The rolling behaviour of the hedgehog is an effective defence mechanism.

The Hedgehog

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The description of the collared hedgehog by Gray in 1830, is based on this picture drawn by an Indian artist Gen. Hardwicke (Illustrations Indian Zoology, Vol. 1, pl. 8, 1830-1834)

During the golden period of Indian mammalogy, the Britishers were quite interested in hedgehogs. Anderson, Blanford, Dobson, Hutton described their behaviour during the late nineteenth century. After a lapse of about 50 years, I got an opportunity to study the ecology and behaviour of the Indian hedgehogs in the Thar desert. These nocturnal, shy mammals are usually found near hedges and have a longish snout like the hog, probably hence the name: *Hedgehog*.

Hedgehogs are cute little animals clad with short spines on the dorsum and sides. The ventrum and part of the head bear normal mammalian hair. The tail is devoid of spines. Locally called the *jhau chuha*, they are at times confused with the porcupine and thought to be its young. The skin on the back is very thick and is constituted of strong muscles, the strength of which helps it roll into a tight ball of spines. It is very difficult for a human being, with his full strength, to unroll a hedgehog. The head and limbs are all concealed under the armour of spines. The rolling behaviour of the hedgehog is an effective defence mechanism.

Hedgehogs are distributed in Europe, north Africa, India and Sri Lanka. The European hedgehog, *Erinaceus* spp. extends from Britain to Pacific Siberia, eastern China and parts of north Africa. The other genus, *Hemiechinus* is also distributed from north Africa to western China through the subdeserts of Libya, Afghanistan, Pakistan and southern Russia. The third genus *Paraechinus* occurs in the Indian region, *P. micropus micropus* from the Indus river to Kutch, Rajasthan and in Maharashtra, up to Pune. The subspecies, *P.m. nudiventris* has a limited distribution in parts of south India. *Paraechinus* can be distinguished from *Hemiechinus* by the presence of a naked furrow, devoid of spines, on its forehead. *H. collaris* is blackish, whereas *P. micropus* is yellowish in appearance. Such an extensive geographical distribution of hedgehogs in the old world is due to their omni-carnivorous propensity and their ability to escape the vagaries of climate by being nocturnal and fossorial. In zones of extreme cold they hibernate, but in mildly cold regions, they undergo a short period of torpor when it is too cold.

During extensive tours of Rajasthan and long walks in the desert nights, with a petromax in one hand and a stout stick in another, I have observed *H. collaris* commonly in the extreme desert districts of Barmer, Jaisalmer and southern Bikaner. And, *P.m. micropus* doubly prominent, in the Shekhawati region of Churu, Sikar and Jhunjhunu districts. This could be as the *barchan* sand dunes are spread over more than 60 per cent of Shekhawati, and since *micropus* is poorer in excavating than *collaris*, it finds the sand more conducive to burrowing. *H. collaris* is always found inhabiting burrows, whereas, *micropus* is found

hiding under bushes. Burrows of both the species are simple and shallow structures. They are straight pouches in the earth without any 'bolt run' as seen in rodent burrows. The absence of 'bolt run' or escape hole in hedgehog burrows can be explained: most snakes readily enter burrows, however, hedgehogs in halfcurled postures, covered by spines cannot be tackled as easily as rodents. Moreover, hedgehogs feed on snakes! The burrow of a hedgehog is about a metre long. A sole individual inhabits it except during the breeding season, when the mother widens the inner pouch to accommodate the young.

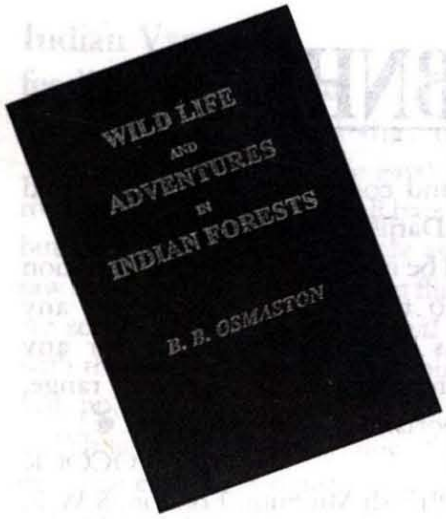
For years, I maintained colonies of hedgehogs to study their behaviour in the *kacha* courtyard of my house. I kept them in large glass cages filled with layers of soil. Long hours were spent with these nocturnal animals observing them under the dim red light of the laboratory. The hedgehog draws its spiny armour over the snout at the slightest approach and if touched rolls over. After a few minutes, it carefully unrolls, but keeps the spiny hood over its head. Perceiving no danger it resumes its activities. In 7 to 8 days it gets acclimatised to humans. A newly captured animal, when all rolled up, if touched or pressed, forcefully jerks its head upwards and exhales loudly with a hissing noise.

I studied the food habits of captured hedgehogs. Their stomach contents yielded: insects, amphibians, egg shells, reptile skin and mammals. Insect mandibles and leafy wings were identified to be those of *Heliocopris bucephalus*, *Anthia sexguttata*, *Onthophagus longicornis*, *Gryllus* spp. and some ant lion. Mandibles of sunspiders and scorpion sting occurred in several stomachs. Egg shells, feathers and *Uromastix* skin were commonly found. It is worth noting here that hedgehogs, especially *H. collaris,* are also cannibalistic in habit.

After starving the hedgehogs for 24 hours in captivity, I had fed them with a variety of food. Both the species did not prefer earthworms, ants, bees and wasps. A live scorpion was not attacked, but a dead one was readily taken, even the sting! They were unable to tackle hens' eggs, but the contents were readily accepted. A number of birds and mammals were eaten; goats' meat, however, was relished most. Bats ordinarily do not fall prey in nature, but in captivity, the rat-tailed bat was completely devoured except for the patagium. No interest was shown in cereals and vegetables, cow and buffalo milk was readily lapped up.

I witnessed the birth of *H. collaris* in captivity one morning. One of the hedgehogs was behaving unusually. She kept herself aloof from the others and kept licking her genitals. After sometime she lay down with the forelimbs fully stretched forwards, the snout extending forwards, the hind limbs kept straight so as to keep the hind quarters above the ground. At 8 a.m. she gave birth to one young, whose head emerged first. Immediately, another hedgehog came forward, caught hold of the snout of the young and almost pulled the baby out. I thought that it was trying to help, but to my surprise, the young was soon devoured. Thereafter, the mother was separated and lodged in a separate cage where she delivered three more young ones. The whole process lasted for five hours. The mother soft-held the babies between her jaws and kept them under her body. The young were born with closed eyes. They had about 2 mm long, dirty white, soft spines which hardened in 5 to 6 days. The mother dug a shallow burrow in the cage and lodged the babies inside it. The small, rolling spiny balls emerged from the burrows after 22 days. The young had a remarkable sense of identifying their mother. They started rolling in 23 to 25 days. The breeding of hedgehogs lasts from July to September in the desert.

Foxes are reported to have killed hedgehogs. The villagers believe that the fox urinates over the opening of a rolled hedgehog. As soon as it unrolls, the snout is caught by the fox. I kept a young fox in the cage with several hedgehogs, but never witnessed anything. The Sansi tribals helped me procure hedgehogs for my research. I once found nine hedgehogs being cooked at their camp. Some tribals feed on hedgehogs to cure rheumatism.The rolled hedgehogs were encased in a large ball of tank clay and were barbecued on coal fire. I was saddened to see the fate of my experimental material. For the tribals, however, it was one of their most delicious dishes!



Wild Life and Adventures in Indian Forests,
by B. B. Osmaston.
Edited by Henry Osmaston,
Antony Rowe Ltd. U.K. 2nd edn, 1999.
Pp. 290, (15 x 21.5 cm).
Price Hardbound: £ 20 (Europe) + £ 3 (Elsewhere).

Revieved by
Asad R. Rahmani

Despite the fact that I abhor sports hunting, I liked this book due to two reasons: one personal and another academic. B.B. Osmaston, popularly known 'B.B.', spent a large part of his distinguished career in the Indian Forest Service in Dehra Dun-Saharanpur division, where I spent my childhood. It was, therefore, easy for me to relate to the places mentioned in the book. Also, the book is well written, with a lot of interesting information on natural history. For instance, Osmaston found a pre-eminently arboreal rat in the 7.5 sq. km Narcondam Island, where he went in October 1905, to study the endemic Narcondam hornbill.

At 21, Osmaston was appointed to the Indian Forest Service, where he served for 35 years, from 1888 to 1923. As Sir Harry Champion, a distinguished forest officer, well known to Indian naturalists for his book with S. K. Seth, FOREST TYPES OF INDIA, writes in the foreword, "B.B. Osmaston was a first class shot with both gun and rifle... he never missed an opportunity to indulge his love of adventure, whatever the risks, shooting rapids in homemade canoes, exploring deep caves, hanging on bush ropes over precipices, climbing the tallest trees for bird nests, and natural dealing with man-eating tigers and leopards, and rogue elephants."

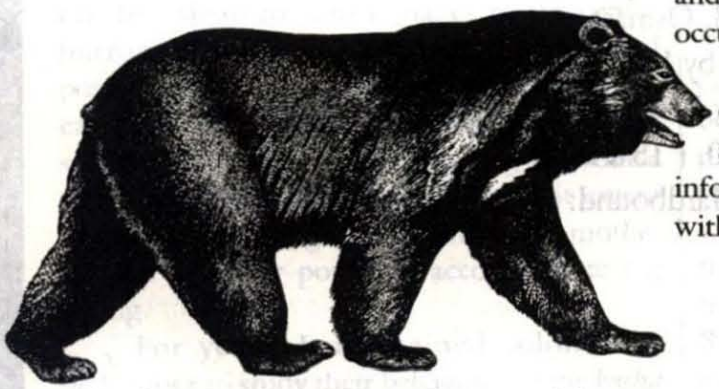
This book, first privately published in 1977, 16 years after B.B.'s death, for members of the large Osmaston family, contains 56 eminently readable chapters from his diaries (now sadly lost). Osmaston describes his adventure in the period when the Indian subcontinent (including Burma) had extensive forest cover. Tigers and leopards were so numerous that 9,000 tigers and 27,000 leopards were destroyed, for which rewards were paid. Now sadly, less than 5,000 tigers are left in the whole world, although the leopard is still common in many parts, especially the Kumaon region, which B.B. so loved.

B.B. was a fine observer and recorder of nature, which is proved by his numerous articles on birds. His first paper was published in 1894, in the *JBNHS* on the nidification of four Himalayan birds. He wrote 50 papers, the last being in 1941, on duetting in birds, published in the *Ibis*, London.

The book is full of details of hunting episodes and I am sure the devoted animal rights activist and former actress, Brigitte Bardot, also called B.B., would not like to share the nickname with B.B. Osmaston. Times have changed. This book is for old-timers who still like to read shikar stories of a bygone age when the tiger was meant to be shot, and the partridge cooked, as our hunter turned devoted conservationist Dr. Ranjitsinh puts it. I am sure, if B.B. Osmaston was born a century later, he would have been one of the greatest naturalists, conservationists and raconteur of nature stories, and not a hunter.

Miscellanea from JBNHS

Wanted Bears!!!



It has been suggested to me that an article on Indian bears — on the lines of the articles on the tigers, panthers and lions already published in this *Journal*, might prove interesting to Indian Sportsmen and Naturalists. Since I should like to make the account as complete as possible, I venture to appeal to the kindness of the members of the Society for help in various particulars.

In the first place, the British Museum has hardly any specimens of the Himalayan red bear; and skins and skulls of both sexes from various localities are very much needed to show its variations with age, sex, season, altitude and locality. It is not even known whether this bear is merely a local race of the European brown bear or a distinct species.

Of the Himalayan black bear and the common sloth bear of Peninsular India, specimens would also be acceptable. There is probably much to be learnt about the local variation in these two widely ranging species. It was not until recently, indeed, that the examination of a skull of the sloth bear — presented by H.H. the Maharajah of Gauripur — convinced me of the existence of this species in Assam.

From the Shan States a race of the brown bear has also been recorded; but of this practically nothing is known except a single skull.

Even of the little Malayan bear, examples are badly needed, especially from Tenasserim, Burma and farther to the north in the eastern Himalayas and Assam; and confirmation of its reported occurrence at Darjiling would be interesting.

I should be most grateful for the donation or loan to the British Museum of any specimens of Indian Bears or for any information, regarding their overlap in range, with which sportsmen could supply me.❦

R.I. POCOCK
British Museum, London, S.W. 7.
March, 1931.

Accidental death of a crimsonbreasted barbet

In volume 39 of the *Journal* (p. 339) Sálim Ali writes that the emerald dove [*Chalcophaps indica* (Linn.)] sometimes meets with accidental death by getting dashed against whitewashed walls, in flight. He adds: 'The birds, flying as they do at great speed, no doubt take the sunlit patches of this wall (as seen through the dense surrounding shrubbery) to be the open sky and rush towards it with fatal results to themselves.'

At twelve noon on the 11th November, 1956, the body of a freshly dead crimsonbreasted barbet [*Megalaima haemacephala* (Müller)] was brought to me. I was told that the bird in flight dashed itself against a whitewashed wall of our house, fell down because of the impact, struggled for a few minutes, and then gave up the ghost. The bird's neck was broken and a pink liquid was oozing out of its beak. This case looked strange especially considering the fact that the crimsonbreasted barbet does not usually fly at such break-neck speed as the emerald dove obviously does. The wall mentioned here is not surrounded by much of shrubbery either. To top it all the unfortunate bird hit the wall at as low a height as six feet from the ground!❦

B. VIJAYARAGHAVAN
Chandramandiram,Puthur, Palghat,
December 13, 1957.

Indian Vampire feeding on a pipistrel

It is well-established that the Indian vampire bat (*Megaderma lyra*) is carnivorous, feeding chiefly on small bats and birds, but I record the fact once more as I actually saw this bat capture a pipistrel in flight. There are several records in the *Journal* dealing with the food of the Indian vampire (vol. xvii, pp. 835, 1021).

While sitting by the bedside of a sick man one evening, a pipistrel entered the room at about eight o'clock, the light was on. It seemed to be in an awful hurry, circling round the room at 'full speed'. Shortly after it entered, in came an Indian vampire bat and immediately chased the pipistrel. The chase lasted about a minute before the vampire caught the smaller bat. The vampire carried the pipistrel about for a little while, but in trying to get out of the door it dropped its prey. It re-entered the room to recover the lost meal, but as I had risen from my seat it took fright and left altogether. This observation was made in Poona.

C. McCANN
Bombay Natural History Society, Bombay,
January 25, 1934.

Bats feeding on birds

Referring to Mr. Ernest Green's query on page 835, Vol. XVII of this *Journal*, there is no doubt whatever that *Megaderma lyra* habitually feeds on birds and mice. These verminiferous vermin (the bats) used to annoy me greatly by catching mice about my house, and fetching birds out of their comfortable nests in the night and chewing them up in the corners of rooms or verandahs. We are spared the use of our inductive and deductive faculties (which would perfectly suffice) by the simple fact that I have seen them do it many times. The well known zoologist, Mr. F. Finn, was living with me at that time. We caught and caged the bats and he fed them on small birds brought for sale by natives. The hanging bat watched his time, made a grab, had the bird by the back of the neck and killed it instantly. No chase or excitement, simply a swoop or even a grab with the wings when the bird passed close enough. Having got the bird by the neck close behind the head, the hanging bat made a clean job of it in wonderful fashion. He started by chewing the neck in two and dropping the head as neatly as any one could with two hands and a knife and fork. Never by any chance did he drop the body though the wings were not used for holding it. Wings were occasionally used for turning the body round by a mere touch but never for supporting it. He chewed steadily along the feet and tail, which dropped in their turn with the same matter-of-course facility.

F. GLEADOW
Camp Bandra, Salsette,
March 10, 1907.

We are grateful to
SETH PURSHOTAMDAS THAKURDAS & DIVALIBA CHARITABLE TRUST
and
MEHTA SCIENTIFIC EDUCATION & RESEARCH TRUST
for financial support for the publication of *Hornbill.*
Their consistent support is greatly appreciated.

Butterflies — their early stages

By Naresh Chaturvedi & Isaac Kehimkar
Photographs: Isaac Kehimkar

Many people are fascinated by the beauty of the butterflies and would like to learn more about these flying fantasies. This series will help them unravel the mysteries of the early stages in the life-cycle of some common Indian butterflies.

Swallowtails

Among butterflies, the Swallowtails are some of the most spectacular. Most butterflies in this group have tailed hindwings. However, some swallowtails like the Common Lime, Blue Mormon and Common Mime are tailless. India's 105 species of swallowtails range from the 22 cm birdwing to the quaint little dragontails of the northeast, with their transparent, black-banded forewings and enormously long tails. Most of these butterflies are confined to forests, but some are seen in the cities too.

Their eggs are smooth and spherical. The caterpillars are never hairy, but may have fleshy spines or tubercles, and always have a gland called the osmeterium. This forked, scent gland protrudes from behind the head whenever the caterpillar is disturbed or attacked. It secretes a strong smelling fluid containing organic acids, which the caterpillar tries to rub against the attacker. This defence is effective against ants, parasitic wasps and flies.

Common Mime *Chilasa clytia*

A common butterfly during the monsoon, it is seen again from April to May. It prefers well-wooded tracts, where large numbers can be seen mudpuddling along the damp sandy banks of streams. It is a frequent visitor to flowering plants.

This butterfly is seen in two forms i.e. *Chilasa clytia clytia* and *Chilasa clytia dissimilis*. In the darker form (*C. c. clytia*), it mimics the Common Indian Crow, while in the *dissimilis* form it mimics the Blue Tiger. In flight or when it sits with wings folded, it could be easily mistaken for a Common Crow or Blue Tiger. Both these models are distasteful milkweed butterflies.

Larval foodplants: Mainly cinnamon *Cinnamomum* spp. and other laurels like *Litsea chinensis*, *Litsea deccanensis*, and *Alseodaphne semecarpifolia*.

Egg: Spherical, creamish yellow, darkens as hatching approaches. Laid singly on the upper or underside of growing shoots of the food plant.

Larva: The egg hatches within 4 to 5 days. The newly hatched larva is brownish, oily looking, with yellowish orange-brown markings like a fresh bird dropping. It remains on the upper surface of the leaf resting on a bed of silk made along the mid rib. In the final instar, the velvet black larva is consipicous with a dorsolateral row of carmine circular spots and creamy bands. This colour pattern is aposematic. The osmeterium is a pale indigo blue.

Pupa: The larva wanders for a while and shrinks in size before pupation. The silk produced by the larva for making the pad and the body string is black in colour. The pupa is cylindrical and looks like a piece of dead stick broken off at the top. It is attached to a branch at an angle of 45°. It appears rough with a slightly tubercular surface to resemble dead bark. It is pale pinkish-brown, washed with smoky black. The flat upper side portion of segment 2 is pale yellowish-brown, extending to parts of the thorax and head.

In all stages of its life-cycle the Common Mime illustrates a classic example of adaptive coloration for survival.

Common Mime

Anti-clockwise: Caterpillar, pupa,
Chilasa clytia dissimilis,
Chilasa clytia clytia

Quo vadis Panthera tigris?

VIVEK R. SINHA

Seashore Lore

Beefsea

36. The Sidewalk Specialists

There are three species of creatures which,when they seem to be going, are coming, and when they are going, seem to be coming.They are: diplomats, women and crabs.

John Hay

(With apologies to the first two categories)

Probably the first crabs you encounter will be swimming crabs, as they are the ones sold in fish markets. They are quite large and many are pretty in colour.

Swimming crabs do not swim all the time. In fact, the first three pairs of legs (after the large claws) end in pointed tips, and these are used for walking. Crabs walk sideways, with a quick shuffle, as the joints of their legs are like our elbow joints capable of moving only in one plane. On dry land their gait is clumsy, though quick, but under water, these crabs walk daintily on the tips of their legs. Swimming is also done sideways, the claw in front being folded while the claw at the rear is stretched out.

The commonest crab encountered in the markets is the mangrove swimming crab or mud crab (*Scylla serrata*). It is usually sold at a size of about 8 cm (across the width of the back), but it can grow to a whopping 21 cm. The claws of a crab of this size can easily break one's finger. Luckily for the gourmet, they are sold with their arms trussed up. They are a drab olive green or earthy brown in colour. The sides of the body have nine spines each, all of equal size.

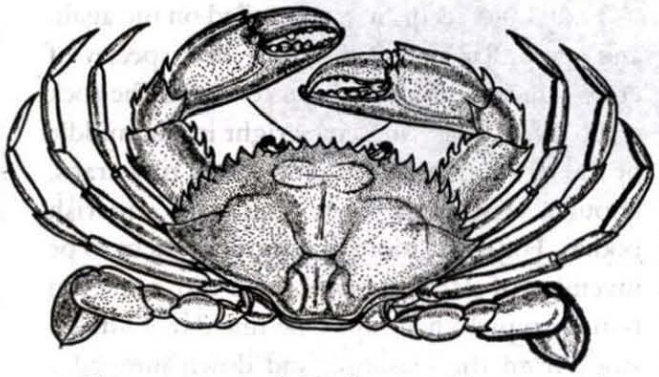
B.F. CHHAPGAR

The pretty calico crab or Dolly Varden crab (*Matuta lunaris*) is a dainty swimmer sometimes found stranded on our shores

The blue crab (*Portunus pelagicus*) and three-spotted crab (*Portunus sanguinolentus*) are some of the prettiest. Both are characterised by having their body curving in a semicircular arc with nine spines on the border, of which the last one is elongated. In the blue crab, the male is much larger than the female, and its body and

legs are blue, while the female's body tends to a yellowish-grey. Both have white spots scattered all over the body.

Crabs of the genus *Charybdis* have only six spines on the sides of the body, and *Thalamita* have five. An interesting *Charybdis* species is the Christ crab, which has a design of a cross on its back, and on either side, what looks like an angel with flowing wings. One of the most pugnacious swimming crabs is the ring-legged crab (*Charybdis annulata*). I should know because I have been bitten most often by it. Though the crab usually broke off its claw, fell to the ground and ran away, the claw would remain tightly pinching my finger. When accosted, this crab rises on the tips of its legs, spreads its claws upward and forward, and clashes them together in a fit

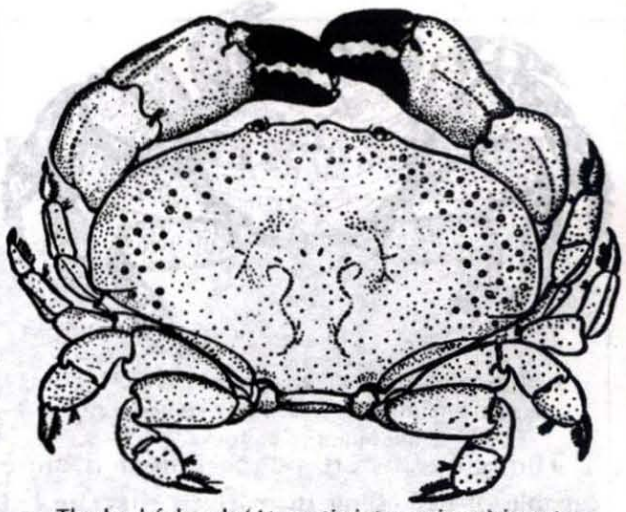


The mangrove crab (*Scylla serrata*) is a gourmet's delight met with in seafood restaurants

of absolute rage. If this does not suffice to deter you, you deserve to be pinched hard for your audacity!

Yet another swimming crab is the dainty lady or calico or oar-footed crab, also called Dolly Varden (*Matuta lunaris*). All its legs have flattened paddles so that, while it can swim easily and gracefully, it cannot walk and is helpless if washed ashore on the beach. The body is yellow with numerous dots or meandering lines and loops. Two long and stout spines are its protection.

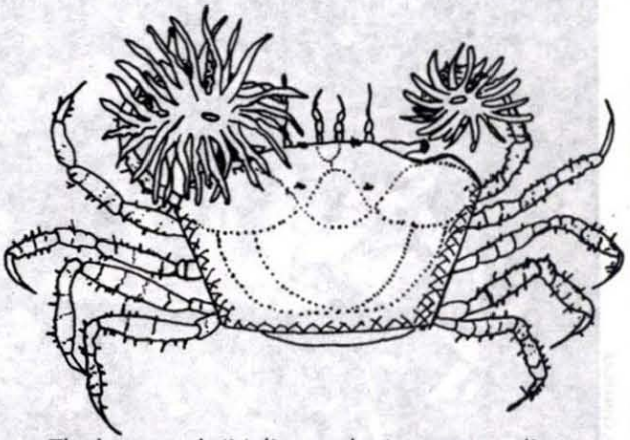
If, as a novice, you want to catch a crab, go for the bashful crab (*Atergatis integerrimus*), *Ozius rugulosus* or an *Actaea*. On being picked up, any of these will just fold its legs and claws against its body and feign death. And how do you catch and hold a crab? First, with your



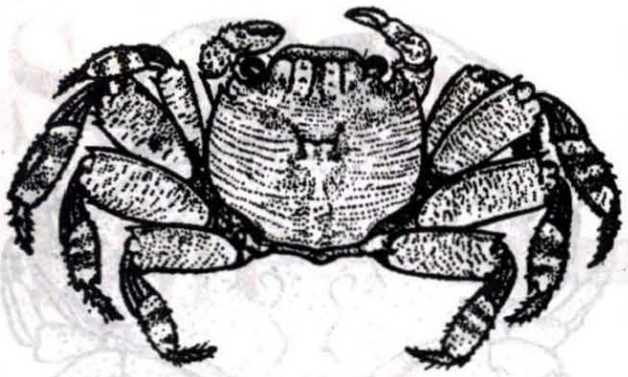
The bashful crab (*Atergatis integerrimus*) is not pugnacious; when held, it just folds its legs and claws, and remains motionless

thumbs pressing down on the crab's body, immobilise it so that it cannot escape. Then, carefully bring the forefingers against each claw and force the claws against the front of the body. You can now lift the crab from the ground. Do not worry if the pointed ends of the walking legs try to unnerve you. Alternately, you may hold the crab with the thumb below its belly and the fingers on its back. Watch out, however, for many crabs can bring their claws down and pinch your thumb.

One crab has found out a novel way of protecting itself from enemies. It holds a live sea-anemone in each claw and when threatened, waves the claws about. Any enemy that has earlier been stung by a sea anemone knows how much it hurts and, therefore, keeps away.



The boxer crab (*Melia tesselata*) grasps two live sea-anemones in its pincers and waves them aloft when confronted by an enemy



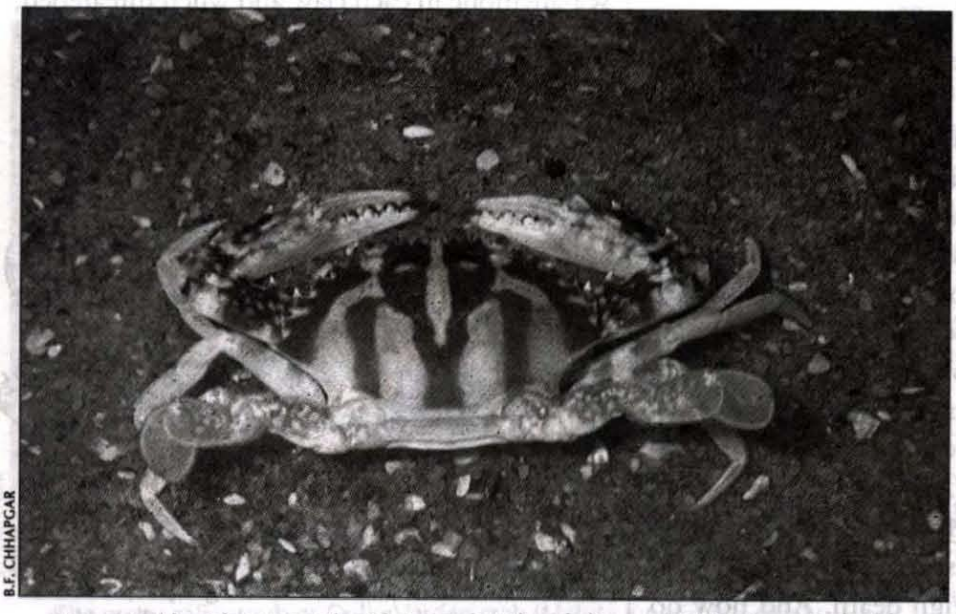
The Sallylightfoot crab (Grapsus strigosus), as its name implies, is a nimble-footed runner and jumper on rocks

Though crabs are pugnacious and quite capable of defending themselves, they are fed upon by trigger fish, box fish, wrasses and, of course, octopuses. And they have a parasite named *Sacculina* which, curiously, is a primitive relation allied to barnacles. The baby parasite attaches itself to a bristle on the crab's leg, enters the crab's body, and migrates to the stomach region. At the next moult, it appears under the crab's body as a brownish mass. A male crab parasitised by *Sacculina* turns into a female. (It may not be able to function as such, but the shape of the abdomen and the sexual appendages resemble those of a female crab.)

While taking a stroll on a marina, where boulders and concrete tetrapods are placed to protect the sea wall, you will notice crabs with squarish bodies and prickly legs covered with spines, but with no hair. The flattened body may be bottle-green (in *Metopograpsus*) or reddish brown (in *Grapsus*) and, unlike the arching front of shore crabs, has a straight front with eyes at the extreme angles of the square. They are rock crabs, also called Sally Lightfoot, and are very inquisitive. If you remain perfectly still, they will approach nearer and nearer, and may even crawl over on to your legs. But make the slightest movement, and off they scuttle away, dashing off and hiding in the nearest crevice or, if no shelter is nearby, jumping into the sea. Look at their claws and you will see why they did not put up a fight. The claws are puny, shorter than the legs. The crabs may be four to five cm across, and the shell is thin and papery. They scrape off algae for food.

Lady Luck seems to have smiled on me again and again, for one of the three new species of crabs which I discovered is a cousin of the rock crab. While collecting crabs right in the middle of the city, I frequently came across tiny crabs, about a centimetre wide, and with squarish bodies. For many months, I thought them to be juveniles of *Metopograpsus*, and did not even bother to pick them up. One fine day, I lifted a stone from the seashore, and down jumped a small square crab. It landed upside down, and I saw an orange yellow mass of eggs. This meant that it was an adult female, and so it could not be a juvenile rock crab.

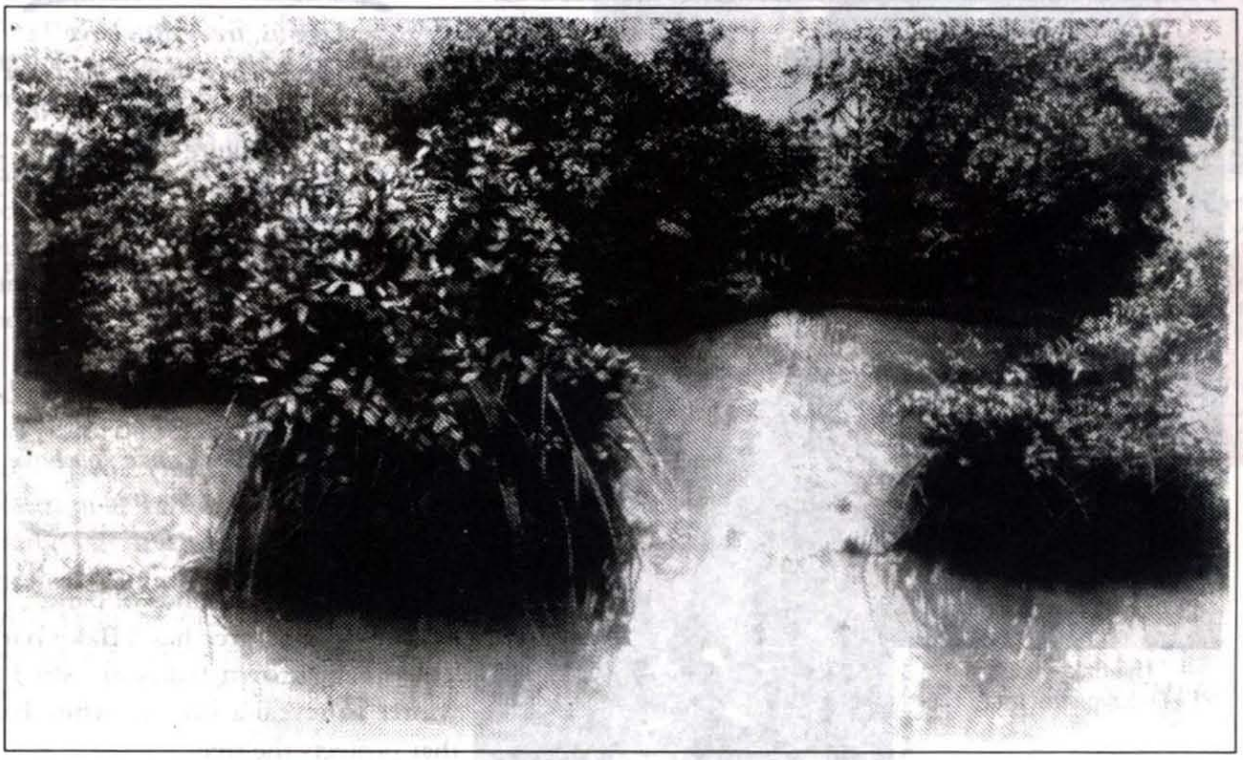
When I examined it more closely, I found that the legs were hairy (those of rock crabs are thorny), and the claws were more massive than the walking legs. After a detailed study, it turned out that I had discovered another new species!



B.F. CHHAPGAR

Venereted by Christians, the Christ crab (*Charybdis cruciata*) is decorated with a crucifix on its back and a long-winged angel motif on either side

CONCERN FOR THE ENVIRONMENT



A unique feature of the Industrial Garden Township, Pirojshanagar, is a large expanse of swamp, one of the very few such areas existing in the city under original mangrove forests.

At a time when mangroves are being destroyed at an alarming rate in the process of excessive and damaging reclamation..., Godrej has taken steps, at considerable care and expense. to preserve and protect this Nature's gift in the awareness that mangrove destruction leads generally to loss of food, breeding grounds and shelter for numerous forms of life.

It is almost unbelievable that, like the Sanjay Gandhi National Park in Borivli, such a mangrove still exists in the excessively congested and polluted megapolis that Mumbai is

HELP BRING OUR INDIA UP - QUICKLY!

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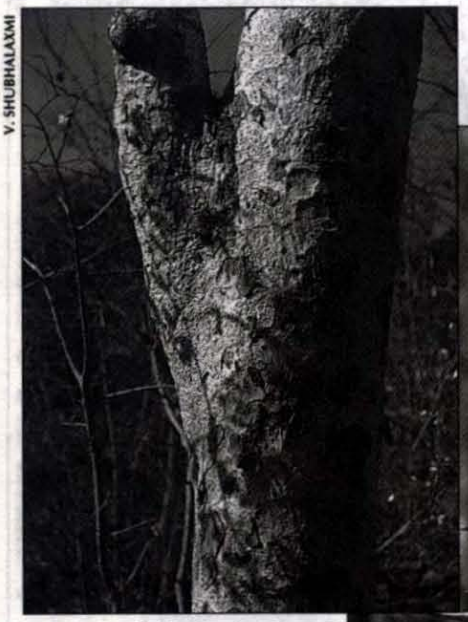
WELFARE : ENVIRONMENT / POPULATION NEXUS...

Compiled by: V. Shubhalaxmi and Vibhuti Dedhia

Autograph of a Tree

Like us, trees also have signatures. They sign in the form of leaves, flowers, fruits, but the bark signature is the most popular one. Interested in collecting these autographs? Start by placing a plain paper on a tree trunk. Rub it with a crayon. The impression formed is unique for each tree type. You can paste these autographs in your nature diary once you have identified the tree.



The flaky bark of *Lagerstroemia*

The thorny bark of *Bridelia*

Just below the surface of the trunk, there flows constantly an invisible sap that transports nutrients all over the tree. This rich pathway is protected by a tough bark. Fungi, insects, and parasitic plants, however, sometimes manage to breach this barrier. The fungi rot the wood, exposing the interiors, for the larvae of countless insects, which now become food for the birds. These organisms form the base of the food chain.

The bark of a tree is like the skin. It protects the tree from drying and forest fires, and all life forms. The inner layer consists of constantly dividing cells. Produced in millions, these cells die when the supply of water and sap is cut. These dead cells now become the outer bark, forming an effective barrier. Hence, removal of bark can cause the death of some trees. This is why trees that are translocated with stripped bark do not survive. The bark tissue produces a new layer each year, pushing the earlier layer outwards i.e. the oldest bark is always outside.

There are different kinds of bark:

- The ghost tree has a **flaky bark**. The small, brown flakes are shed in winter to reveal a smooth white bark that protects the tree.
- *Terminalia* and *Morinda* have **cracked bark** or **crocodile bark** that look like cubes.
- Guava and eucalyptus have smooth bark, striped in the form of long **papery strips**.
- Some trees have **fissured bark**. Here the bark in divided into columnar fissures.
- Deciduous trees like the coral and red silk cotton have **thorny bark** that protects the tree from predators and helps reduce transpiration.
- Some trees like *Grewia* develop knots on their flaky trunks.

Some commercial uses of bark:

- Most of the world's rubber is made from the white latex collected from rubber trees.
- The traditionally used cork is made from the bark of the cork oak tree of Europe.
- Some kinds of bark contain chemical defences, besides physical barriers for protection. Some of these chemicals are used by man, e.g. the *Cinchona* tree provides quinine for treating malaria.
- The curled cinnamon sticks used in our kitchen are cut from the bark of young saplings of the cinnamon tree.

Egg Shell Paintings

Almost a decade ago, I saw an UGC programme showing cartoons on egg shells. The programme did not have much impact then, but the idea of painting on egg shells somehow remained in my subconscious. A memory of gaily painted Easter eggs may have helped the idea to materialise. Finally, one day I collected some egg shells from the waste, washed them, rubbed them with sand paper and subsequently sketched a number of foreign birds, using sketch pens on one side of the shell.

The compliments from friends and relatives encouraged me, and I started sketching local birds, with the result that my collection gradually crossed the century mark. I exhibited my collection at various places during seminars on ornithology. It has been interesting that, through egg shell paintings, I could educate people about birds. Many people, known and strangers, often contact and inform me about their observations on birds.

I would be glad to know of other members who have the same interests as mine in egg shell paintings, as a means of ornithological study and conservation.

ARUN KHER

▲

1. India's oldest zoo was established in
   (a) 1820 (b) 1857
   (c) 1890 (d) 1859
2. The largest rose garden in India is the
   (a) Chandigarh rose garden
   (b) Calcutta Botanical Garden
   (c) Ooty Botanical Garden
   (d) Mughal Gardens
3. The first man-made bird sanctuary is
   (a) Keoladeo Ghana (b) Vedanthangal
   (c) Rangantittoo (d) Nalasarovar
4. The first marine national park is in
   (a) Maharashtra (b) Andhra Pradesh
   (c) Gujarat (d) Karnataka

1st Prize
A bumping, swirling Whitewater rafting trip on the Ganges.

2nd Prize
Camping at Full Timepass, Igatpuri

3rd Prize
India Outdoors Nature Club Life Membership

* Inclusive of meals and overnight stay; not including arrangements to reach the appointment destination.

Send your answers to:
Editors, Hornbill,
C/o Bombay Natural History Society

Ans. (Jul.-Sep.): c. Para gliding, c. Descends, d. December, b. Sahayadris

Ans. (Oct.-Dec.): b. Sikkim, c. Corbett, a. Indian Wildlife, b. Andhra Pradesh

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

All for the *Mahseer*

A.J.T. Johnsingh and A.S. Negi

A.J.T. JOHNSINGH

Devprayag, where the meeting of the Alaknanda and Bhagirathi create serene environs for the tourist

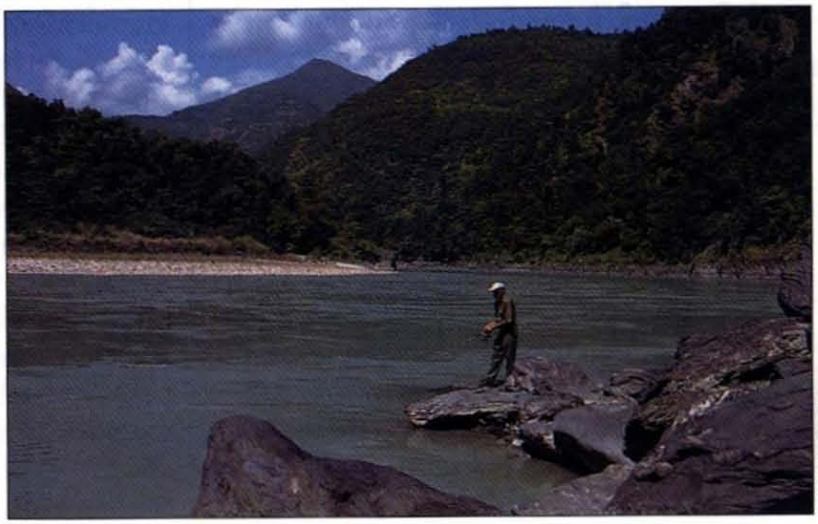
A strong smell of death permeated the air around the confluence of the Nayar and Ganga near Byas Ghat. A dead and dry cattle calf lay on the Ghat amidst the burnt out pyres of human bodies cremated in recent weeks. In the water floated carcasses of a cattle and a buffalo calf, circling in the current at the confluence. Bluebottle flies hovered on the carcass of the buffalo calf, while a large pied-wagtail was perched upon it. Dead fishes, large and small, floated on the water. Surely, dynamite had been used again upstream, in the Nayar.

We had arrived at Byas Ghat to fish. The ideal time to fish here is towards the end of the southwest monsoon, in September, when the water in Nayar becomes clear. The water was clear when we arrived, but despite our best efforts, no fish took the bait. The confluence, once famous for the giant golden mahseer (*Tor putitora*), yielded only two fishes, a 200 gm and a 400 gm, in spite of our best angling efforts. We wondered whether our visit to the confluence was late, and the major migration of the spawning fishes was over. The smell of death lingering around the confluence gave us a creepy feeling — had we rung the death knell for the mahseer in Ganga?

The golden mahseer can reach up to 2.7 m in length and weigh over a hundred kilogrammes. It was once common in the montane and sub-montane rivers and streams of the Himalayan region. According to A. St. J. Macdonald, author of the book CIRCUMVENTING THE MAHSEER, the fish ascends considerable heights during floods to gain the upper reaches of the river, travelling long distances, for fresh feeding grounds and spawning. It lays eggs in sheltered rock pools. Unlike the salmon, it lays a batch of eggs at a time, repeating the process several times through the season. This is a critical period when the mahseer needs most protection. Unfortunately, over the decades, it is during this vulnerable period that it has been decimated by all forms of

fishing methods. Traditionally, people living on the banks of the Ganga, particularly the Dhondar community, have fished with a line and hook, snares (a long, strong fishing line across the river with several nooses tied to it), traps and throw nets. With the coming of the British, anglers began fishing for the mahseer with rod and line. All these had only a negligible effect on the fish population. But the use of dynamite, easily available from the Public Works Department and Border Roads Organisation engaged in construction work in the area, has indiscriminately killed adults, young fishes, fry and even the developing larvae, sealing the fate of the mahseer in most parts of its range.

A.J.T. JOHNSINGH



A.J.T. JOHNSINGH

The turbulent Ganga becomes peaceful as it moves towards the plains (above) All forms of fishing have taken their toll on the mahseer population (below)

Byas Ghat is one place where a large mahseer, up to 30 kg can still be caught, and fishing is particularly good for a week in September when the turbidity in Nayar clears after the rains. With this information, on September 18, we made our way to this dream fishing site, for a day of what we expected would be ideal fishing. The best way to reach Byas Ghat is to drive to Bachheli Khal, about 55 km from Rishikesh, on the way to Devprayag, walk down the gorge, cross the suspension bridge over the Ganga and walk to Byas Ghat, 4 km from the bridge, down the river.

However, on the day of our departure we were informed that it was risky to cross the bridge near Bachheli Khal, as some of the wooden planks had got damaged and the bridge swayed too much. We therefore, decided to go to Byas Ghat via Devprayag. We spent the night in the seldom used serene environs of the Devprayag forest bungalow overlooking the Alaknanda and the steep scrub-covered hills of the outer Himalaya. Next morning, we crossed the Alaknanda using the suspension bridge near Devprayag, travelled 4 km by bus to Pauri, and walked down the gorge on the old pilgrim path along the left bank of Ganga. The mountain tops were shrouded in mist when we started, but soon it became bright and sunny. Jim Corbett had walked along this path about 75 years ago from Haridwar to Rudraprayag, a distance of 165 km, in pursuit of the dreaded and elusive man-eating leopard of Rudraprayag, which had by then killed 125 people. Man-leopard conflict continues in the region even today. In Pauri, Garhwal district, between 1988-97, 98 people have been killed and 117 injured by leopards. Seventy-eight leopards, of which several may not have been man-eaters, have also died as a result of this conflict.

At Randi Ghat, we crossed a beautiful, joyously running stream, which joins the Ganga

The Game Fishes of India, *JBNHS*, Vol. 41, p. 272

about 100 m downstream. The forest guards accompanying us informed that this stream, a spawning site of mahseer, is also heavily dynamited. The well-maintained pilgrim path, all along, went through dry deciduous forests which largely under the care of the village community, were in excellent condition. The common tree species were *Adina cordifolia, Holoptelia integrifolia* and *Anogeissus latifolia*. The regeneration of the last species, which is poor in most places, was good here. *Euphorbia royleana*, a large cactus-like shrub, with a stout trunk and many thick green fleshy branches and leaves, grew in profusion amidst the trees. The crimson, narrow, tubular flowers of *Ipomoea quamoclit* (native to Tropical America; naturalized in the Himalaya), pink flowers of *Impatiens balsamina* and the bright red bracts of *Costus speciosus* added a tapestry of colour to the environs.

We found the steep mountainous habitat on both sides of the river, with many grassy slopes and plentiful vegetation to browse upon, extremely suitable for the goral and barking deer. Black bears (which raid the village fields for ragi, maize and cucumber) and leopard (which take a heavy toll on goats) are also occasionally seen. The valley echoed with the musical call of the white-crested laughing thrush. Several Himalayan whistling thrushes crossed our path. A lone brown dipper and a Himalayan pied kingfisher flew low over the Ganga.

We stopped briefly for breakfast at Umrasu village, with its ripening golden-yellow paddy fields. At the entrance to the village, on the road, there was a heap of smouldering wood and a fairly frightening scare-crow. The villagers said, it was their ploy to prevent wild pigs from raiding the rice fields. The tea shop was close to a giant pipal tree which could be 500 years old. After walking for an hour from the village, we went past the suspension bridge across the Ganga, which we had been warned against crossing. On closer examination, we found that with care it was possible to walk along the bridge.

Byas Ghat was under blistering sun by the time we reached. A tented fishing camp on the other bank of the river was being wound up. Even at 11 am, the white powdery sand and rocks on the banks of the river radiated immense heat. A solitary grey-headed fishing eagle flew over the confluence, looking for an unwary fish. Since our angling efforts were not yielding fruit, and the heat was terrible, by midday we eagerly sought the shade and shelter of a nearby tea shop where a lunch of rice and *dal* was being cooked. During the lunch break we had ample time to talk to the villagers. We learnt that the mahseer go up the Nayar river from Byas Ghat for about 27 km to Satpuli for spawning. All along they are dynamited or killed using bleaching powder, the main reasons for the decline of the mahseer.

Around 2:30 pm, clouds gathered over Byas Ghat, the weather became cooler and we resumed fishing till 4:30 p.m. hrs when rain forced us to wind up. Besides, we needed at least two hours of daylight to reach Bachheli Khal, crossing the Ganga by the suspension bridge. With thoughts of encountering man-eating leopards of Pauri Garhwal prowling the area, we walked to the bridge with a sense of excitement.

Crossing the bridge, swaying like a cradle 30m above the Ganga, which we did one by one, was thrilling. The 3 km climb was steep and in the twilight the sight of the Ganga flowing peacefully was superb. As we waited in Bachheli Khal for our vehicle to come from Devprayag, we talked to

the villagers. They complained about the leopard which visited the village almost every night looking for dogs, goats and sheep. We tried convincing them that the leopard depends on the village for its meal largely because the people have decimated the barking deer and goral, food of the leopard.

On the drive to Devprayag, we saw a beautiful, well-grown male leopard, eyes gleaming and coat shining in the headlights, strolling towards the village. As we veered our vehicle to have a closer look, he unhurriedly descended a few metres from the edge of the road, sat among the bushes on the mountain slope and watched us.

Looking at our poor catch for the day, we realized how unregulated harvesting has become a major threat, eliminating wildlife directly beneficial to man. The best way to regulate it is to enhance species protection. In India, the first step toward conserving an overexploited species is to give protected area status to a part of its range where it can survive and prosper. Several stretches of the golden mahseer habitat enjoy some form of protection as they fall within the existing protected area network. The Ramganga river and its tributaries in Corbett Tiger Reserve (Uttar Pradesh), Teesta river in Mahananda Wildlife Sanctuary (West Bengal), Bhareli in Nameri Wildlife Sanctuary (Assam) and Noadebinj in Namdapha Tiger Reserve (Arunachal Pradesh) are key examples.

The exciting accounts of fishing by Jim Corbett in the MAN-EATING LEOPARD OF RUDRAPRAYAG, illustrate that in the past large mahseer occurred in abundance even at Rudraprayag, the confluence of Alaknanda and Mandakini, 70 km beyond Devprayag. The local people also report mahseer in the past in Nandprayag, the confluence of Nandakini and Alaknanda, 50 km upstream of Rudraprayag. The mahseer habitat was continuous downstream of Rishikesh. But it got broken and altered by the construction of barrages in early 1970's at Rishikesh and Haridwar and the Chilla power canal. The status of mahseer in the entire Gangetic system of Garhwal Himalaya, including Bhagirathi and Mandakini, the tributaries of the Ganga, is alarming.

We plead for a collaborative conservation programme between the Ministry of Environment and Forests, and the Uttar Pradesh Government, particularly the Forest Department, to immediately halt the destruction of the mahseer in the Ganga. The river stretching from Devprayag to Rishikesh, which has a 100 km habitat of enormous potential, should be declared a sanctuary as early as possible. This scheme should include a conservation education programme to enlighten the people of the habitat. The present practice of using Ganga and its tributaries as a dumping ground by the local population should be stopped. A trained and motivated guard force of about 20, largely of local people, should enforce protection.

Nayar river will need special protection from dynamiting through the year as according to Dr. P. Nautiyal, Garhwal University, Srinagar, the young mahseer stay in the tributaries for a year before they descend to the main river. His studies have shown that now Nayar is the major tributary for spawning. Collection of pebbles and sand from the Nayar river bed, otherwise vital for good spawning grounds, should be banned. Such a programme, if launched immediately and effectively, would enable us to see, in a few years, the giant mahseer rollicking in the confluence where dead fishes now float. It would then be possible to encourage the local people to run sport-fishing camps to generate revenue which would promote catch and release operations. Local NGOs like the Nayar Ghati Gram Swaraj Samiti, Uttarakhand Gram Vikas Samiti and Pahar Hara Pahar Bhara should be actively involved in this programme. The 10-15 rafting camps on the banks of the Ganga could contribute to this conservation effort by protecting the 500-1000 m stretch of river in front of the camps from dynamiting. Food that may go waste from the rafting camp kitchens can be fed to the fish to aid their growth and localize them to stretches of river that could be protected. Will all those interested in conservation join hands, work together single-mindedly to enable the golden mahseer to stage a comeback in the Ganga?

Memoirs from Sikkim

I was delighted to read Usha Ganguli-Lachungpa's delightful article on Sikkim — The Little Green Gem of India, in the *Hornbill*, Jul.-Sep., 1999. I would like to add my own observations on this now spoilt jewel, having served in those areas in 1955/56 and again from 1964/67.

In December 1955, I was posted from London to Gangtok to command a sub unit located in what was then the Bhootia School on the north Sikkim highway, full of leeches. In February 1956, I was required to escort and hand over a Chinese Prisoner of War at Natu La. The road ended at Mile 5 and we had to trudge the long distance to Natu La via the mule track, now a Class V road. After stops at Karponang and Chhangu Dak Bungalows we returned to base. It was then that I saw my first ever male monal pheasant moving unconcernedly in front of me in all its finery. I was tempted to take a pot shot at it, but refrained from doing so because its movements indicated that it was untouched by the locals.

A source of constant pleasure and amazement were the profusion of wild orchids growing on the hillsides in our camp, and the brilliant view of Kanchendzonga and Siniolchu in the clear dry air.

My battalion returned to Sikkim in 1964. Gangtok was no longer the quiet town that it had been. We were located on the slopes leading to Penlang La. One day a wounded barking deer entered our position. The men took hold of it and restored it to health. It was a source of much pride to have it for company for quite a few months. When it had recovered we returned it to its habitat. I recall the patrol to Kishong La at 15,500 feet overlooking the green plain at the base of Kanchendzonga and the famous Tolung Gompa en route with its hot springs. Apart from the ubiquitous tiger leeches, we saw the most wonderful array of butterflies feeding on cattle dung along the tenuous track.

In February 1965, we moved to Chhangu at 13,600 feet. Natu La was our responsibility and in that drab landscape the snow pigeons nesting in the rocky mountain face and the Himalayan chough plus the alpine flowers made life livable. Occasionally, we could see the stately lammergeir soaring high above us in effortless flight. As winter approached, we could hear geese honking as they flew from the cold Tibetan plateau to the plains of North Bengal. On one occasion a pair of brahminy ducks decided to stop over in one corner of the Chhangu Lake. Strict orders were given that they were not to be disturbed. Soon we saw ducklings and this family continued to reside in the lake. Very often our ration bunkers would be raided by the Himalayan black bear foraging for sugar and condensed milk. On patrol we would come across coveys of pheasants like the tragopan and kaleej, a source of endless pleasure. Orders had been given that shooting was totally banned. One day we were privy to a very rare sight of a red panda perched on a rhododendron tree. The two lakes Chhangu and Menmol Chu

were protected lakes so that the rainbow trout would be preserved and one needed a special permit from the Chogyal to fish in these lakes.

During later visits to North Sikkim's Lachung and Lachen, we viewed with awe nature's munificence with the red rhododendron in full flower against a background of snow clad peaks.

A few years ago, I had occasion to revisit Mangan, Sanklang, and Be enroute to Tolung Gompa. There is now a pukka road. I identified the crested eagle taking off at ground level and soaring effortlessly into the sky with Kanchendzonga in the background. And standing at the Sanklang Bridge over the Teesta, I saw the khaleej pheasant and Tickel's blue flycatcher and of course numerous other species of birds.

One hopes that this green gem of India will not be despoiled. Usha Ganguli-Lachungpa, thank you for reviving these memories.

Maj. Gen. E.D. D'Souza (Retd.), Mumbai.

Ethical dilemmas

Recently, I attended a talk *Ethical Dilemmas in Wildlife Conservation and Welfare* at the BNHS by Dr. James Kirkwood, Scientific Director of the Universities Federation for Animal Welfare, United Kingdom.

The talk was enlightening and heartening, but I was surprised by his reply to my question after the talk. When asked why the issue of 'right to life' did not figure in the list of animal rights (drafted for the welfare of animals by the European community), his reply was that he (and most Europeans) do not consider the right to life of an animal as an issue. What was important was that animals (wild or domestic) should be given a decent life during its lifetime, which also meant that killing for food or sport (read fun) was perfectly okay. It appears strange to me that people who protest against cruelty and ill-treatment of animals and possess the sensitivity to even think of their mental health, cannot come to terms with their right to life!

Is this attitude (versus the Indian: read ahimsa) due to indoctrination in different religions? Do the major religions that have originated from India make us more gentle to animals. Our texts tell us that even animals have souls, and thus, the right to live.

Or is it a matter of race. Does genetics decide our kindness, or lack of it, to animals? Is this the reason why vegetarianism is largely confined to India, in spite of the spread of Buddhism to the Oriental region? Or does the environment dictate our meat eating habits? Does the traditional Indian diet, a balanced one of rice and/or wheat, vegetables, fruits, pulses, milk and ghee, permit non-inclusion of meat in the diet without ill effects? I think these are questions to ponder upon, which may alter our attitude to animals.

Ranjit Manakadan, Mumbai.

Corals in Ocean depths

I was told that corals live on the ocean bottom at depths of over 500 m. Is it true?

M.A. Achariya, Calcutta.

Beefsea replies: When people speak of corals, what they usually have in mind are the hermatypic (reef building) corals. As these have single-celled plants, called zooxanthellae living inside their bodies, these corals live in shallow seas so that sunlight can reach them for the plants to carry out photosynthesis.

There are also ahermatypic corals (mostly solitary, like sea anemones) which do not harbour zooxanthellae, and hence can live in the deep sea, down to 870 m, even in the absence of light.

An Apology: Hornbill Oct-Dec., 1999
No Passport to India: The sequence of paragraphs was unfortunately mixed up in formatting. The sequence of the paragraphs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 is printed in the sequence 10, 11, 9, 12, 1, 2, 3, 4, 5, 6, 7, 8, 13.

Errata: Hornbill Oct-Dec., 1999, p. 30
The scientists estimated... a healthy 1.7 bears per sq. km.
Read: The scientists estimated... a healthy 1.7 bears per 10 sq. km.

Rare Winged Visitors to Mumbai

BY SUNJOY MONGA

HORNBILL, PREMILA SINGH/PORPOISE AND FOREST ISAAC KEHIMKAR

On Sunday, 6th February, BNHS members Sanal Nair, Manisha Shah, Vijay Avsare and Dr. Neil Soares, accompanied this writer on one of their routine visits to the Sanjay GandhiNational Park, Mumbai. At around noon, the group came across three large, black and white birds in the Vihar catchment forests. One of these was a Malabar pied hornbill, a species never before seen north of Ratnagiri, 300 km south of Mumbai. The birds disappeared into a forested valley. Two days later, on Tuesday, 8th February, the same group along with Kiran Srivastava and Joslin Rodrigues came across a great pied hornbill on a ridge flanking the Vihar catchment forests. This is one of India's most threatened birds, requiring prime, tall forest to survive.

While there have been indefinite reports of the great pied hornbill in forested valleys around Khandala, there has been no confirmed sighting over the past 25 years. A specimen dated 27th October, 1944, collected near Mahad, below Mahabaleshwar, lies in the BNHS bird collection. The sudden appearance of these two critically important species in the Park is a matter of tremendous significance. We are not very clear as to how and why these birds concurrently landed here. The various possibilities of them having escaped from captivity have also been checked. Between 6th and 16th February, we had six sightings, including one of the great pied below Kanheri. The Malabar pied has also been sighted feeding on fruits of *Sterculia urens*. Tragically, one hornbill, reported as the great pied, based on size description, was found dead close to the Park's main road leading to Kanheri. This specimen never reached the Forest Department or the BNHS. Over the following week there have been numerous unconfirmed reports of pied hornbills sighted by observers in the Mumbai region. Regular monitoring would certainly yield better results. I request BNHS members in the Mumbai region and elsewhere to inform the BNHS about any reported sightings of these hornbills and inform us if there has been any instance of someone having released hornbills in Mumbai in the recent past.

Of acid rain, snails and egg-shells

BY RACHEL REUBEN

Birds need plenty of calcium for egg-shell formation, sometimes in excess of the amount in the female's whole skeleton in species laying large clutches. During egg production there is active foraging for calcareous grit, small pieces of bone, egg shells and most importantly, snail shells. Recent studies have shown that in areas with high levels of acid rain, and acidified and calcium depleted soil, snail populations are low, and small birds are laying a high proportion of abnormal eggs, with thin and porous shells or none at all. Researchers in the Netherlands found that providing calcium supplements at the nests of great tits *(Parus major)* reduced the occurrence of eggshell defects significantly, thus confirming the connection.

Another study was carried out in the west of Scotland by S.L. Ramsay and D.C. Houston, at a study site worse affected than the Netherlands, with very low levels of calcium in the soil and hardly any snails. Nevertheless, blue tits (*Parus caeruleus*) appeared with no egg-shell defects. Nor did calcium rich supplementation of the diet have any observed effect on clutch size or egg-shell thickness. The authors believe that calcium levels were probably just sufficient to permit the blue tits to produce normal egg-shells. Besides, there is little agricultural activity in the west of Scotland. Since organochlorines, aluminium and heavy metals are known to interfere with calcium metabolism in breeding birds, a low calcium environment might be expected to be more damaging if there is also industrial and agricultural pollution.

Although acid rain is not a recognised problem in India, pollution certainly is and it might be wise to monitor snail populations and the eggs of small birds for early signs of environmental degradation.

Luring bats to pollinate

BY RICK CALLAHAN

A Central American vine, Mucuna, is reported to rely on bats for pollination termed Chiropterophily. It attracts them by using its petals like tiny satellite dishes to bounce the animals' sonar signals back at them. The vine is believed to be the first plant species found to use such a mechanism. Bats navigate by signals bouncing off objects. The high-pitched signal is not audible to humans.

Researchers found that each blossom of the Mucuna vine contains a special petal with a concave acoustical 'mirror'. The petal directs signals back towards any nectar-feeding bat that chirps in its direction.

The discovery was made by Dagmar and Otto von Helversen, a husband-and-wife team from the University of Erlangen in Germany. They reported their findings in the journal *Nature*. "This is a very elegant, very interesting, very beautiful story, and if other researchers verify this, it will appear in all biology textbooks as a classic example of adaptive evolution," said Karl Niklas, a professor of plant biology at Cornell University and editor in chief of the *American Journal of Botany*. The Helversens tested their theory by removing the acoustic guide petals from some blossoms and stuffing others with cotton pads. They found that 20 per cent or less of those blossoms were visited by bats, compared with about 75 percent of the untouched flowers.

The vine grows along creeks and in rain forests. Its short-lived 5 cm long, whitish-green flowers are timed to open every half an hour to an hour. The acoustic device rises into its reflective position only when the night-blooming flowers are ripe for pollination, thereby discouraging bats from visiting a flower that is not yet ready to give up its pollen.

Shobha Dé and Dr. Ashok Kothari, Chairperson, Library Sub-committee, admiring the rare books

Exhibition of Rare Books

An exhibition of the Society's rare and precious books, was organized at Hornbill House, from January 10-19. It was inaugurated by writer and columnist, Shobha Dé. Held after a lapse of four years, it was the fourth of its kind in the last decade. Apart from natural history, books on other subjects were also exhibited. The books were displayed in glass cases kindly provided by the Prince of Wales Museum.

A large number of people visited the exhibition. The rare lithographs in John Gould's "A Century of Birds from Himalayan Mountains" (1832), "The Birds of Asia" (1850-1877), Patrick Russell's "A continuation of an account of Indian Serpents," Vol. 22, part I and II (1801), James Forbes "Oriental Memoirs" Vol. I to Vol. IV (1812/13) were major attractions at the exhibition. The 200 year old "Bombay Gazette and Courier" (1801-1802) describing the sale of horses and chariots under a tamarind tree (today's Tamarind Lane at Fort, Mumbai) was one of the many rare and precious books exhibited.

Mr. B.G. Deshmukh, President, BNHS, wrote in the visitors' book "A fascinating display of rare books. A heritage we should preserve."

Sálim Ali International Award Announced

The Sálim Ali International Award for Nature Conservation instituted by the BNHS for the year 1998-99, has been awarded to Mr. Peter Jackson, Chairman, Cat Specialist Group, International Union for the Conservation of Nature and Natural Resources (IUCN). The award carries a cash prize of Rs. 1 lakh and a citation for outstanding contribution in the field of protection, management and conservation nature of natural resources. The presentation will be held at Hornbill House in the near future.

A British national, Mr. Jackson became fascinated with wildlife, especially Indian birds, when he came to India in 1954, as the Chief Correspondent for Reuters. He was closely involved with Project Tiger in India as Project Officer for World Wide Fund for Nature's (WWF) Operation Tiger. In recognition of his work at the WWF, he was honoured as an Officer in the Order of the Golden Ark, of Netherlands.

Mr. Jackson has devoted a great part of his life to the cause of conserving wildlife and natural resources of India. He has spearheaded the conservation of endangered wild cats, especially the tiger, and other endangered species like the Asian elephant and rhinoceros through the IUCN's Species Survival Commission, research and publications.

BNHS correspondence course in Basic Entomology begins from 1st June, 2000. For details contact Mr. N. Chaturvedi, Curator, BNHS.

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