

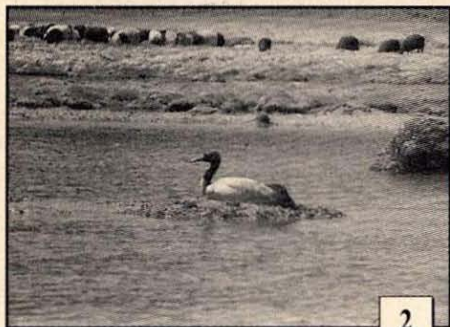
Hornbill

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BOMBAY NATURAL HISTORY SOCIETY

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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 study of natural history in the Oriental region, and for nature conservation. Individual membership can be either in personal or official capacity. Membership is also open to scientific and educational associations and institutions as well as companies.

Ordinary members get *Hornbill* free, and can subscribe to the *Journal of the BNHS* (now in its 90th volume) at concessional rates.

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For more information on the Society and its activities, write to The Honorary Secretary, Bombay Natural History Society, Dr Salim Ali Chowk, Shaheed Bhagat Singh Road, Bombay 400 023. Tel.: 2843869, 2843421 Fax: (91-22) 2837615.

EDITORIAL



The Indian Army has made pioneering contributions to the conservation movement and study of Indian Natural History. One of the founders of BNHS was Col C. Swinhoe. For years, army units were regular members of the Society. A few names of individual officers stand out. Colonel R. Meinertzhagen conducted several joint surveys with Dr. Salim Ali in the Northwestern regions and Colonel B.B. Osmaston did pioneering work on blacknecked cranes in Ladakh; Captain C.D. Lester and the legendary Col. Sykes,

Surgeon Maj. Thomas Jerdon and Lt. Col. S.R. Tickell were other prominent ornithologists. Their names have been immortalized by birds like the Tickell's Blue Flycatcher, Sykes' Crested Skylark and the Jerdon's Courser.

Since the inception of the Society, many of the contributors to the BNHS collection and publications have been officers of the armed forces. Capt R.S.P. Bates' *Bird Life of India* (1931), Brigadier Gen. W.H. Evans' *Identification of Butterflies in Indian Region* (1932) and Col. C.H. Stockley on *Preservation and Skinning of Trophies in the Field* (1926) are notable examples. Surgeon Maj. Francis Day made an excellent contribution to our knowledge of fish fauna in his two volumes *on Fishes of India*. Lt. Col. K. R. Kirtikar and Maj. B.D. Basu authored a very significant work on Indian medicinal plants.

The former Chiefs of Army Staff Gen. S. Rodrigues and the late Gen. Bipin C. Joshi visited BNHS to discuss various environmental issues and to assure support in conservation measures. The army now regularly organises conservation awareness workshops with help from BNHS. Lt. Gen. Moti Dar, Lt. Gen. Baljit Singh, Maj. Gen. E. D'Souza and Vice Admiral M.P. Awati have taken a keen interest in them. Col. M.T. Rao and others have made significant contributions to the Army's eco-cell. There has been initiative in ecorestoration projects, such as Col Suresh Patil's effort in developing the *Pakshi Tirth* complex at Kolhapur cantonment. Lt. Col. Sunil Kumar is leading the Army's wasteland development scheme at Ahmednagar and Lt. Col. S.R. Banerjee of the Army's Eco-cell is doing yeoman service for the cause of environmental awareness. There are numerous such examples. This issue is a token of our appreciation of the Army's contributions to the cause of Nature Conservation and the greening of India.

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THE CRANES OF SANGTI

M.P. Awati
Vice Admiral (Retd.) PVSM, VrC

Man has come to cherish cranes and to revere them for their legendary pair-bonding. These biological indicators of the health of wetlands are becoming rarer with each passing year in India.



Blacknecked crane nesting — livestock can be seen in the background

Cranes are indicators of the health of wetlands where they have been found since time immemorial. Man has come to recognise, in these very large and graceful birds, certain qualities which he has cherished since the earliest civilisations took shape along the world's riverine wetlands — the fertile deltas of the Nile, the Tigris-Euphrates, the Indus and the Yang-Tze. It has long been established, for example, that cranes pair for life. If one of the partners dies, the other remains single for the remainder of its life. Their courting dances are probably the most spectacular in the feathered world. Cranes migrate long distances between their nesting and wintering grounds. Without exception they are revered by those human communities which have come to live in their vicinity, the Buddhists of Ladakh and Arunachal Pradesh, for example. Because cranes are so intimately associated with wetlands, which have a direct bearing on ground water levels, grain-growing agricultural communities eagerly await the arrival of cranes in their midst. These communities, the Ladakhis and the Mon-pas for example, judge

the fortunes of the agricultural year according to the presence or the absence of the black-necked crane (*Grus nigricollis*) among them during the preceding nesting and wintering seasons.

Of the fifteen species of cranes, five are to be found in the Indian subcontinent, in India specifically. The Siberian and blacknecked crane are becoming rarer with each passing year. The eastern sarus — a greyer and smaller cousin of the sarus, arguably the largest flying bird in the world, which was such a common sight in Assam until recently, has now disappeared altogether from the north-east. It has retreated farther east into Burma and Vietnam in search of a less congested habitat.

The blacknecked crane is a denizen of the Tibetan uplands and adjoining provinces of high Western China. Its home is along the wetlands of Lake Kokö-Nor. Very small flocks stray into Ladakh. During the extreme Tibetan winter these birds migrate to the less harsh southern latitudes and lower altitudes after the paddy harvest,



This winter visitor to Arunachal is considered a good omen

towards the end of November and early December to feed on the grain which is left in the fields. In Sangti, we found that the Mon-pa farmers deliberately left a good deal of grain behind as an invitation to the birds whose arrival the villagers eagerly await. Last year the arrival of six cranes was reported on 17th December, 1993. A lone bird had arrived on 15th December (a scout?) in the morning, but it flew away in the afternoon. The following day six arrived. They, too, stayed only for a few hours.

The day after, on 17th December however, there arrived another six who stayed on until 4th January, 1994. Probably, these six were the same as those which had come in on the previous day. But why did they fly away after only a fortnight when we knew that the cranes wintered in Sangti until mid-March? If only one could communicate with them! And where did they come from? A juvenile group from the main wintering flock in eastern Bhutan perhaps. They certainly appeared to be rather smaller than the ones we had seen first in

1990 and the "lone ranger" who had remained in Sangti during the 1993 season, right up to the 8th of March. The day temperatures in the valley this year were a little higher than normal. A close scrutiny revealed that the northern half of the Sangti habitat had no grain left in it. It has apparently been cleaned out, eaten! The southern half still had plenty of rice strewn about. So perhaps the six cranes had exhausted the food. Considering that each bird would consume about 200 gm of rice, among other food, this was not an unlikely possibility. But why did they leave the southern half untouched? Perhaps because it was close to a common pathway between the villages of Sangti and Khasow to the east. Perhaps they had been disturbed. Even this remote valley is no longer free from the onrush of civilisation.

Roads are being driven through, buses ply and the great forests of Himalayan oak on the surrounding slopes are being cut down to meet the timber requirements of the great barons of Delhi and Bombay, Calcutta, Bangalore, Madras and

Hyderabad. The brown sahibs demand this high quality Himalayan timber to equip their homes with furniture and oak panelling. So the slaughter has now reached Sangti. Between 1990 when I first came upon this idyll called Sangti, and now, there has been wholesale butchery of the once great Himalayan oak forests, whole slopes have been cleared and replaced with nothing. Secondary growth of bushes and bamboo is taking over. The mindless developers do not realise the water conservation role of the forests. The water accumulating at the roots of trees, seeps down into the valley which has created the wetland vital to the blacknecked crane's survival during the winter months. It seems that one can appeal to no one to stop this unreasonable and indiscriminate cutting of trees. Already, some parts of the hills resemble the bare slopes of the Western Ghats. The tribes of Arunachal Pradesh, the Mon-pas, the Akas, the Apa Tanis have all joined in the sawing, axing and felling, with a will to get rich quick! As one political gentleman told me with typical frankness, "After all, the only resource of this State is the timber of its vast forests. We have to exploit that resource for wealth".

The last known and reported wintering of these beautiful birds within Indian territory was in the early 1950s, when a small flock was observed near Ziro in the Apa Tani valley in what was then the North-East Frontier Agency, administered from Assam. After that the bird seems to have disappeared from India. Yet in adjoining eastern Bhutan it continued to winter in fair numbers,

in Chorten Rhola, Popshila and elsewhere. In 1983 I was part of a small group of ornithologists who visited Ladakh to track down this bird. From the Shyok valley to the point where the Indus enters India from Tibet at Demchok we found only three nesting pairs, in the wetlands near Chusul below Furchuk-La, near the great monastery of Hanle', and across the wild and forbidding Polokonka-La. These sites are all between 3,600 and 4,200 m. above MSL. It is magnificent country, studded with deep blue lakes, set among snow-capped peaks, all of them above 6,000 m. Fantastic terrain, home to a fantastic bird whose courtship dance has no equal in the feathered world and whose deep bugling calls would reverberate among the high peaks for miles around. Surely a bird to be seen and heard.

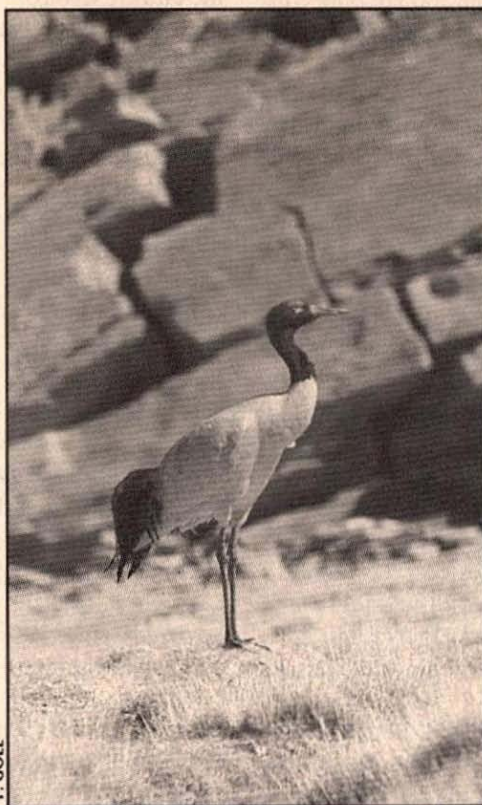
Since that first summer of my retirement from the Service, my imagination had been fired by this handsome bird, firm in conjugal fidelity and sacred to the Buddhists. It figures regularly in the Thangka paintings of the Bodhisattva done on hand-made silk with paints extracted from nature, from stones of various colours. I discovered the affinity of this bird to habitats which have a predominantly Buddhist population. Thus it was no surprise to us, Prakash Gole and I, to find it among the Mon-pas of West Kameng District, when we rediscovered its presence in India during a pleasant February afternoon in 1990 in the valley of Sangti, on the other side of Bomdi-La. That story may be worth telling, if my readers find it worth their attention.

There are fifteen species of cranes extant in the world today. They are to be seen across the five continents. Among them the whooping crane of North America and the snow white Siberian crane are on the verge of extinction. The former has been given a new lease of life by the International Crane Foundation located in Wisconsin, USA, through a spectacularly successful captive-breeding programme.

Captive-bred whoopers have been released into the wild. It is generally agreed, though, that for a captive-bred chick to live successfully in the wild it needs a very carefully graded programme of return to self reliance and food gathering.

However, without captive breeding many of the world's rarest species of birds and animals, now on the brink of extinction, would certainly have died out. Indeed, many zoos around the world have become repositories of some of the rarest species of wildlife of the world, cranes among them.

For several years after my friend and colleague in the Ecological Society in Pune had seen and studied wintering flocks of *Grus nigricollis*, aka black-necked crane in the Kholas of eastern Bhutan adjacent to Arunachal Pradesh, we had been fired with an urgency to locate them in India; we were sure that the old Ziro flock must be around somewhere in a more secure habitat, perhaps in an area dominated by Buddhists. It was also known that the bird did not usually descend below 1,800 m. in winter. Fortunately for us, the Department of Environment was, at that moment, headed by a zealous ornithologist who was like-minded. A small expedition of three was approved and on its way to Tezpur which is the road and the railhead into Western Arunachal Pradesh. The Corps Commander at Tezpur, General Lahiri, expressed his delight and assured us of every support. In that late January in 1990, Prakash Gole and I, accompanied by Professor Mahajan, a well known botanist from Shivaji University, travelled to this distant outpost of North-East India to look for a legendary bird. What luck for a sailor well into his sixties and already into his third innings! I took special leave from the editor of Blitz, with whom I was



P. GOLE

Thung Thung framed against its rugged habitat

ancient monastery at Tawang is still a great centre of Tibetan-Buddhist learning and devotion. Now the search began among the terraced paddy fields along the Tawang-Chu. The habitat here is what the blacknecked crane would want. However, the population of Tawang has increased manifold. "Too much human activity", thought Prakash, who had seen the Bhutan habitat. The older people on being questioned expressed their regret that "Thung Thung Karmo" (Tibetan and Ladakhi for the bird) which used to visit their valleys regularly, did so no longer.

Now it is seen sometimes and these sometimes become rarer with each passing year. The younger generation, with its increasingly westernised life style, does not associate it with good fortune and happiness as their parents and grandparents did. A fairly exhaustive search in and around Tawang had drawn a blank. But there were many reports of sightings, usually by village elders and peasants in their fields. There was ample food available for the birds if they chose to alight here, but obviously they preferred quieter places, perhaps in the adjoining, almost inaccessible valleys for which we would need animal transport. We had already exhausted more than half the time allotted

working in Bombay, got onto a plane for Calcutta and reached Guwahati where Prakash Gole and Prof. Mahajan joined me. The army immediately took charge of us and drove us to Tezpur. From Tezpur the Arunachal border at Bhalukpong is some 60 km away where the climb into the foothills begins. After successive stops in Tenga and Sengye we crossed the Bomdi-La and Se-La in two days and reached Tawang. This is Mon-pa country of Hinayana Buddhism, which holds the Dalai Lama in great reverence. My older readers will recall that in 1959 the Dalai escaped into India through Tawang. The

to Arunachal Pradesh. It was time to turn back to the low country of the Brahmaputra, to get on with our other task of confirming the absence of the eastern sarus crane in Assam, Nagaland, Manipur and Tripura. Reluctantly, we crossed the Se-La for the plains on 15th February. As we descended from the 4,500 m. snow-clad pass towards Bomdi-La we stopped every likely gentleman to enquire, "Thung-Thung?" with the help of large colour photographs of the bird. Many old and wise heads would nod in assent but indicate with gestures that it no longer came to their country. Then quite miraculously, we

met a lone old man, almost in rags with the typical Bhutia headgear of woven yak hair, very close to the township of Dirang. We asked him the usual plaintive question "Thung Thung?" and showed him the photographs. The moment he saw the picture he nodded his head very firmly and said "Sangti! Sangti!!" pointing east across the Dirang-Chu. Our maps showed Sangti as a small village about 10 km from where we were, on a small river of the same name. We veered off the highway, crossed the township of Dirang which is a tehsil of West Kameng District, crossed the Dirang-Chu and got onto what was then a barely jeepable track leading to the village of Sangti.

The track moved just above the Sangti-Chu, along its northern bank through a beautiful alpine valley with oak, 'chir' and blue pine and the occasional rhododendron. We took enough photographs then to show what a beautiful glen it was just four years ago! Alas, in 1994, it is now bare of trees, the result of logging on a truly massive scale. My regret surfaces spontaneously and I must record it at this wanton destruction. The glories of this remote and idyllic place a mere four years ago will not be seen. I am filled with a foreboding that we are on a suicidal path.

We reached the village of Sangti just before 3 p.m. and parked our vehicles where the road ended near an old suspension bridge across the Chu. Eastwards stretched the rice fields harvested a few months previously. They were dotted with grazing cattle, horses and sheep. We looked through our binoculars for any sign of the tell-tale black and white shades among the grazing animals.

Prakash Gole, ever the keen bird spotter, said in his matter of fact voice, "There they are!" It took me some time to locate the pair of blacknecked cranes feeding along the northern rim of the fields, just below a newly constructed road. They were feeding placidly, heads down, occasionally looking up for anything unusual in that placid scene. I was jubilant on seeing these birds after a gap of seven years. We quickly noted the bare facts in the expedition diary. "One pair blacknecked crane sighted in the valley of Sangti, Lat. 27° 18'N, Long. 92° 20'E, at about 1500 hrs on Thursday 15 February 1990. Temperature 15°C, Wind from NE, light breeze. Bright and sunny afternoon. Baro pressure 1015 millibars". It was a historic afternoon. The blacknecked crane had been formally rediscovered as a wintering bird in India

after a gap of forty years!

It was a historic moment for the ornithological world too. We observed the birds for over an hour. There is no point in a Sanctuary here because a sanctuary has statutory implications which would exclude other animals and man from within it. That would be against the observed need of this bird which goes only where paddy is cultivated by people who revere the bird. It recognises the locals from their dress. I recall with some amusement how we had to don Tibetan gonchas and top hats when approaching the birds in Ladakh! They accepted us as part of the local scenery and continued with their nesting and feeding.

During 1992 and 1993 we completed the survey of the entire state of Arunachal from Lohit in the east to Kameng in the west. We carefully scrutinised more than two dozen likely crane habitats. Except for the Apa Tani plateau in and around Ziro and the valley of the river Papu in East Kameng District not far from Sepa, we did not see a high plateau with rice-growing people around it. In both Ziro and Sepa the people are Doni-Polo animists (Sun-Moon worshipers) and may possibly be inclined to persecute the bird, though one could not say this with absolute certainty. Among the Apa Tanis at least, the bird was well known as the 'Kenda' and as I have related earlier, it did visit their locale in the 1950s and perhaps even after that. At the end of our survey in 1993 it became clear to us that the Sangti was perhaps the only valley in India still favoured by the blacknecked crane. On 17 December 1993, our rapporteur S. Kalita, Head Master of the Government Middle School in Sangti, telegraphed to us in Pune to tell us that six blacknecked cranes had arrived in Sangti! That was good news. Prakash and I decided to visit the valley yet again in the New Year.

A word about the nesting habits of this bird. In India, the bird nests only in Ladakh in high altitude wetlands, above 4,300 m., during the months of June and July. The female usually lays two eggs. The nest is a fairly tidy mass of twigs and moss on a hummock, an islet or a convenient high ground in the middle of a marsh. It is not easily accessible, surrounded as it is by wet, squelchy, often dangerous bog.

The egg is slightly elliptical, about 300 gm in weight with an off-white shell. Both parents take turns in brooding the eggs which hatch at intervals between a few hours and a few days.

The chicks must fledge quickly during the short Ladakhi summer and be ready to accompany their parents to the wintering grounds by early October. The older chick succeeds in appropriating the food brought in by the parents, leaving the junior sibling to die through lack of nutrition. Amazingly, the parents take no interest in this apparent neglect of the younger offspring. This may be nature's way of ensuring that population never outstrips food supply in a harsh environment. Within four weeks of hatching the surviving chick is strong enough to take to its wings. It is then taught to gather food, to soar and become adept in all the arts of survival in an exacting habitat. By October it is ready to accompany its parents on a journey of a few thousand kilometres.

All through we have received the closest possible support from the army. The names of Lt. Generals Baljit Singh, Lahiri, Ajay Singh, Mehmood and now Kapur and their Division Commanders high-up in Tawang and Tenga, Maj. Generals Batra and Walia, Gill and Kalkat and of course the legendary Ian Cardozo will be writ large if and when the blacknecked crane puts Sangti on its regular itinerary. When and if Sangti valley has been successfully turned into a permanent home for all the five types of cranes seen in India, then we would have succeeded. Not until then. □

Vice Admiral M. P. Awati (Retd.), a keen naturalist and BNHS member, is also Chairman of the Ecological Society, Pune.

ARMY DRIVE TO PRESERVE ENDANGERED SPECIES

The Indian Army, whose role in the north-east is mainly perceived as that of a counter-insurgency force, has now adopted a new cause, that of preservation of the ecology of this region.

The forces stationed in this vulnerable area have taken to the planting of saplings for afforestation programmes, fish farming, including breeding of trout and developing of areas for bird sanctuaries. With the aid of the civic authorities, they propose to set up a bird sanctuary in Sangti valley for the endangered black necked crane, as has been reported in the press.

Sangti Valley in West Kameng District of Arunachal Pradesh enjoys the reputation of being the only winter time location of the migratory blacknecked crane in India.

The blacknecked crane, a highly endangered species, visits Sangti Valley during winter between November and March every year. The low-lying area astride the Sangti and Gouri rivers is known to be a breeding ground of the cranes, which are locally called Thung Thung.

Prior to commencing of winter, the cranes migrate from far off places like Leh, parts of Tibet and the colder regions of China during November to December. They breed during the winter and return to China from April to May, taking along their young ones.

Cranes, which normally live in pairs, are known for their lifelong conjugal devotion; these birds have won popular reverence and protection, resulting in tameness and lack of fear of human beings. Thung Thung Karmuk, as the cranes are called by the locals, are considered a good omen.

The Indian Army's plan is to establish a sanctuary

in Sangti Valley, where breeding in captivity can also be planned. This plan is intended to cover the blacknecked crane alone at present.

It is intended that some time in the future, the project can be expanded to include other rare migratory birds. This would not only provide an ideal habitat for the endangered bird species, but would also increase the tourism potential of Sangti. With professional management, such a sanctuary could attract tourists with an interest in field studies and nature conservation.

Although the army is handicapped in terms of lack of an adequate number of trained personnel, this is not preventing it from making a serious effort towards nature and ecological conservation.

To propagate the idea of establishing a bird sanctuary in Sangti Valley, a party of junior commanding officers and five other ranks, camped at Sangti Valley during the winter of 1994 and kept vigil to study the habits of the migratory blacknecked cranes.

The party established itself at various vantage points in the wetlands and kept a keen watch on the arrival and the habits of the blacknecked cranes. Some interesting observations were made by the party located at the Sangti Valley. It was, however, evident that human presence other than that of the locals alarmed the birds.

Under an ambitious project of afforestation the army has planned to undertake conservation of this area and its flora and fauna in a big way. According to records available from the army authorities, more than 200 million saplings will be planted and this area will be further developed. □

WARRIORS IN THE GREEN KINGDOM

Pervez Cama



The coveted trophy — Capt. Beddington, 2nd Dragoon Guards, British Army, with a tiger he shot in Mysore State in 1922

During the tender years of this century a member of the BNHS happened to go on a shooting trip in the remote mountains of the Empire along the distant frontier with China. Charmed by his experiences and enthralled in particular by the spectacular panorama that greeted him at his mountain top perch, he wrote to the Society, "It is a wonderful scene. As you sit here in the midst of Nature's grandeur drinking of the champagne-like air, this feeling of exaltation of being removed from the world of dull care and monotonous routine, of being in part with Nature, is worth living for. You feel that God is near"

Captain West of the 2/3 Queen Alexandra's Own Gurkha Rifles did not survive long to savour Nature's wonders or to delight fellow members with his scintillating pen. An ambush in Burma claimed him shortly afterwards. West was typical of British Army officers in India with their penchant for shikar and

myriad outdoor diversions. They were illustrative of the primeval link between fighting men and the wild. In diverse lands and different ages, the warrior class interacted with animals through hunting and by frequenting the untamed borders of their nations where wildlife abounded. Hunting helped to foster certain combat skills, especially where spear and sword were pitted against deadly tooth and claw. Various animals have found their way into the emblems and ethos of martial races and present-day armies because of the qualities they were perceived to embody, or due to their geographical ties with troops hailing from regions which included their haunts. The 1st battalion of the 14th Punjab Regiment in the old Indian Army, was known as the "Sherdil" or lion-hearted battalion. The lion is the most ubiquitous representative of wild beasts in army insignia. It enjoys this privilege thanks to Emperor Ashoka who accorded the lion the prestige of

adorning his famous pillar whose capital is now our state symbol. There is a bit of irony in this, though, for the lion has been practically hounded out of almost the entire country and is more common on uniforms than in the wild state! A number of Infantry Divisions of our army have animals like the elephant, leopard, and bison as their formation signs. The Assam Regiment sports the badge of a rhino, whilst the Dogra Regiment soldiers on under the regimental crest of a tiger.

The 18th century monarch, Tipu Sultan, who earned the epithet 'Tiger of Mysore', was an ardent exponent of the tiger cult. His near veneration of the tiger was very visibly evident in his tiger-striped clothes and his defiant banner which was emblazoned with the arcane legend — 'The Tiger is God'. The striped cat also made a profound impression on the minds of the British military in India and it was incorporated into the insignia of British units such as the Gordon Highlanders and the Lancashire Regiment.

Since time immemorial hunting had been a prized pastime amongst Indian royalty. The Rajput princes and some of the Mughals who presided over the dynasty founded by Babur greatly relished hunting. But we will restrict our attention to the British period which concerns the erstwhile British Indian Army, and the British Army occupying India.

The dawn of British power in India heralded the beginning of an era that was to witness climacteric changes in the fortunes of the subcontinent's wildlife. Up to that point a host of factors had enabled wild animals to maintain their ascendancy over large areas in the country. In the words of A. Dunbar Brander, a famous Conservator of Forests speaking of an even later period in the early 19th century, "They (tigers) were so numerous it seemed to be a question as to whether man or tiger would survive". The landscape was now to begin a radical transformation.

This epoch was inaugurated by a terrific assault on forests and fauna, with huge tracts of prime forest being ravaged for timber, a sizeable amount ending up in the warships of the British fleet. Whilst the native inhabitants of Hindustan spent their waking hours eking out a living, the new lords and masters of India, in common with other sovereigns in the land, had ample opportunity for recreation. Consequently, many different pastimes were contrived to alleviate the enervating monotony of



Lt. Col. Tickell — one of the outstanding naturalists of the early years

colonial life. Thus, apart from indoor games, they had 'sports' like fishing, pig sticking, hunting, hunting with bobbery-packs, and other modes of entertainment.

The early hunters of this era, many of them British Army and Civil Service officers, slew such prodigious quantities of game that let aside the contempt it evokes now, it even made a later generation of hunters blench. "The most exciting and glorious sport this world affords", declared Maj. Gen. Rice of the Indian Army in 1857, of tiger hunting, killing and wounding 158 tigers in just 4 years in Rajputana. Tiger hunting was ultimately elevated to the status of the number one sport in India and held sportsmen in thrall right up to the twilight of the empire. Many of its adherents came from the army, and at a later stage it became something of a mandatory ritual for officers to head for the jungle and bag at least one tiger. Col. Gordon-Cumming, another Nimrod of the old era, shot 73 tigers near the Narmada river and once had 10 in 5 days besides the Tapi. Lt. Gen. Montague Gerard of the Central India Horse, bagged 300 in Central India and Hyderabad territory, and Lt. Col. Faunthorpe, originally of the I.C.S., more than 300 tigers; in addition, around 1905, almost a hundred panthers fell to his gun in Muzaffarnagar District in about

one year. The now unenviable distinction of being one of the front-runners in this sordid tally went to George Yule of the Bengal Civil Service, who forsook the bother of keeping count after he had passed the figure of 400 tigers!

In this day and age such profligacy might well provoke an indignant uproar, but in those times the tiger was proscribed with the same abomination that is today reserved for household vermin and, in some areas, it did kill a considerable number of humans. "The embodiment of devilish cruelty, of hate and savagery incarnate", was the verdict of Inglis in 1892, a view that was more or less endorsed by the majority of his contemporaries and predecessors, saving dissenters like Sanderson and Gen. E.F. Burton who spoke up for the tiger. There was even a policy of disbursing rewards for the killing of tigers for some years in the 19th century; fifty rupees per dead beast — a large sum in that day.

Towards the last decades of the 19th century, game laws and other regulations came into being and the hunting of some animals was regulated to conserve their stocks. Nevertheless, British rule oversaw the extinction of the pink-headed duck and the imminent demise of the Indian cheetah, with over-hunting being one of the main contributory factors in the case of the former.

Wildlife in the late British Period was afforded a measure of protection due to the game laws operational in Reserve Forests and even more so in many of the princely states, to the zeal of whose rulers we owe some of our finest National Parks.

The forests were better protected and harvested from the incipience of the 20th century onwards. Forest administration was efficient and strict unlike the decades after independence where illegalities and mismanagement have levied a grievous toll on our forests.

Alongside hunting, and even eclipsing it as a cause of wildlife depletion, was the increase in population and the incessant inroads of tillage and forest clearance into wildlife habitat. The lion was all set to make an ignominious entry into the list of extinct species, preceding the cheetah, but for the Nawab of Junagadh who rescued it in the nick of time at the prompting of Lord Curzon. Once found over the northern half of India, it was extirpated over all but a tiny fragment of its range, by hunting, cultivation, and as some opine — the tiger. The annals reveal that a British Cavalry Officer killed 80 lions

in Kathiawar during his tenure of 3 years and then continued his exploits in the Gir, where he accounted for 14 lions in 10 days.

In the first half of the 20th century, the pangs of conscience prodded some individuals to turn their backs on the gore of shikar and espouse the cause of conservation and photography — a bloodless and more difficult form of hunting. One of them, Col. Sleeman, had taken to hunting with zest from the time he first set foot in the land, where, years ago, his grandfather Maj.

Gen. William Sleeman had obliterated the menace of *thuggee*. Another convert was Lt. Col. Corbett, the legendary nemesis of man-eaters, who was influenced by the celebrated photographer and wildlifer, F.W. Champion of the Forest Service. Some authorities aver that quite a number of the British hunters of the 20th century showed high standards of sportsmanship and fidelity to the game laws, which were well enforced. The Second World War's inordinate demands for wood heavily damaged the forests and there was extensive poaching by army men stationed in Jungle Warfare Camps that were set up to train the troops for the grim fighting in the daunting Burmese jungles. Independence and the years up to the seventies, constituted one of the most destructive and shameful chapters in the story of the



Col. F. Wall — a distinguished herpetologist

devastation of India's forests and wildlife. The rule book of game laws was thrown into the sea after the departing British, and villagers and townsfolk poached with such lethal enthusiasm that the carnage began to vie with the slaughter of the early British period.

The officers of the British and Indian Army certainly did participate with gusto in the decimation of India's wildlife, but there were also many with a phenomenal curiosity for the animals and plants they encountered in an exotic land and it was they who, along with their comrades of the Civil and allied Services and other professions, laid the bedrock of the scientific study of Indian natural history. The BNHS is an offshoot of that extraordinary interest in their surroundings.

They were amongst the pioneers of ornithology and mammalogy and they have left their indelible mark on many different branches of zoology and botany. One of these titans was Surgeon Maj. Thomas Jerdon, of the Madras Army, who made monumental contributions to bird study and that of mammals with *The Birds of India* (1862) and *The Mammals of India* (1867). There was also Lt. Col. S.R. Tickell of the 31st Native Infantry, who collected and documented mainly in the 19th century. Today, beautifully hued birds like Tickell's flycatcher and the Jerdon's leafbird, remind us of the efforts of these trail blazers. A botanist of distinction, Col. Beddome, wrote the *Handbook to the Ferns of British India*, in 1883. *The Butterflies of India, Burmah and Ceylon* was co-authored by Maj. G.F.L. Marshall of the Royal Engineers, in 1882.

For many years, information on the enigmatic phenomenon of bird migration was available largely from the records of Army and Civil Service officers stationed on the turbulent border contiguous to Afghanistan; men like Maj. H. Magrath and Capt. Whitehead.

One of the founders of the BNHS in 1883 was Colonel Swinhoe. A shikar enthusiast, Swinhoe was also an internationally famous entomologist, writing much on butterflies and moths. Army officers were an important constituent of the BNHS, ranging from the C-in-C of the Indian Army to callow subalterns. They served on its managing body, they contributed towards building up its bird, mammal and reptile collections, and the Journal of the BNHS was full of their articles and notes, on detailed scientific matters and on hunting. As I was rambling through the

delectable old issues of our Journal, I was confronted with a list of members in 1915. Almost an entire page was covered by Army units that were members of the Society, like the Royal Scots, Border Regiment, Dogras, Rajputs and the Maratha Light Infantry. Today, if one scans post-independence Journals, one finds that the contribution of the army has first narrowed to a trickle, and then almost evaporated.

While we cannot do justice to the entire and manifold contribution of these officers, a few facts can be spotlighted. Lt. Col. Rattray, Brig. Betham, Col. Bailey, Lt. Barnes and others made valuable inputs of research on Indian birds. Mention must be made of the vital work of the collectors in the Society's surveys, a noteworthy episode being the epic collection of squirrels made in the jungle along the river Chindwin in Burma by Capt. Shortridge and Capt. Macmillan during the mammal survey of 1911-23. Such was their abiding devotion to nature study, that the outbreak of war and involvement in fighting did not dampen the ardour of the Society's members in the Expeditionary Force that marched off in 1915 to what is now Iraq. Whereas the mammal survey was officially planned and sponsored, so many of the officers in Iraq began voluntarily collecting and despatching specimens of animals back to their Society in India, that the huge aggregation of all this material was dubbed the "Survey of Iraq", and it filled in a hiatus in the information on the Iraqi fauna. It must have indeed been a strange sight to see Capt. Pitman of the 27 Punjab Regiment train his regimental scouts to scour the land for the enemy as well as for animal specimens!

Within the BNHS too, there were distinguished authorities. Brig. W.H. Evans of the Royal Engineers was the author of *The Identification of Indian Butterflies* (1927). Col. Frank Wall was an expert who wrote an important book on poisonous snakes and treatment of snake poisoning in 1917. One of the pioneers of bird photography in India was Lt. Col. R.S.P. Bates, whose masterly production was *Bird Life in India* (1931). An important work on plants was *Indian Medicinal Plants* (1918), authored by Lt. Col. Kirtikar and Maj. Basu. Almost all these officers could be bracketed under the label "Hunter-Naturalist".

One remarkable feature which implores our attention is that most of these luminaries were amateurs in the strictest sense of the term. This was

a tradition exemplified by some of the outstanding figures in Indian ornithology. A.O. Hume belonged to the I.C.S. while Hugh Whistler and E.C. Stuart Baker were in the Police.

Before we draw the curtain on our narrative, we must highlight the work of two prominent individuals. The first is Col. R.W. Burton, who arrived in India in 1890 following in the footsteps of his father Gen. E.F. Burton of the Madras Staff Corps. His fondness for big game hunting took him to varied places in India. A devoted member of the Society for 70 years, Burton was the primary force behind the vigorous campaign launched after independence, in the media and in society, to influence public opinion and the government to take

urgent steps to conserve India's wildlife. Largely as a result of his efforts and others, the Government set up the Central Board for Wildlife. Then there is 'Billy' Arjan Singh, who after retiring from the army,

plunged wholeheartedly into saving India's wild inhabitants. Principally responsible for the creation of Dudhwa National Park, his fascinating affair with the leopards and tiger he reared at his home, "Tiger Haven", has propelled him to world-wide fame. The recipient of an

international award, he is also the author of many books on his beloved felines and other animal friends.

The decades after independence have seen much devastation but also the steady growth of environmental consciousness in India. The Indian Army has had some fiercely dedicated conservationists who have done commendable work within its organisation and in the field. There remain, however, many who need to be imparted environmental awareness. There are also some incorrigible elements who continue to indiscriminately kill. The army has been doing some excellent work in afforestation and other areas. The modern officer of today is not an inveterate shikar buff, pursuing tiger and other animals, thirsting to

turn them into worthless exhibits. He has to be caught young and educated, so that he utilizes the immense potential in his organisation and his authority to benefit the environment. In retrospect, it should also be remembered that the British Officer was the sword arm of a colonial power and it was his task to conquer and keep India subdued, to facilitate its exploitation by England. In that sense, the Indian jawan and officer, by the very basic objectives of their roles, are safeguarding the natural resources of the country from those who would covet them and its other riches, as invaders have done through millenia.

What then does the future hold? For an answer, we could journey to the arid plateau of the Deccan.



Surgeon-Major Thomas Jerdon — a great name in Indian Natural History

There, on the fringes of the Khadakvasla lake that slakes the thirst of Poona city, we enter an oasis of green which contrasts so starkly with the dreariness of the desiccated landscape outside. Strolling down its main avenue which bisects the establishment, we contemplate a sylvan scene with grand edifices and stone buildings, standing beneath the majestic gaze of the precipitous Sahayadri mountains in the background. If we are attentive, we will observe, apart from the sprightly young men hurrying along in completion of their

interminable chores, a skittish deer or a graceful peacock, and numerous other birds that fill the air with their melody. Here in the National Defence Academy, one of the nurseries of the Indian Officer Corps, we are presented with a splendid example of the way nature has bloomed with the nurturing and protection the military has given the land. Ultimately, it is the wisdom imparted to the men who will pass through its portals and those of the other training institutions, that will stimulate them to replicate such marvels in the diverse corners of the country where they will stand guard over their land. □

Pervez Cama, a member of the BNHS, has been involved in helping the Army Environment Cell of the Society.

NEWSLINE

ENVIRONMENTAL IMPACT ASSESSMENT CELL

The BNHS has recently instituted an Environmental Impact Assessment (EIA) Cell-cum-environmental analytical laboratory.

This Cell will undertake physico-chemical environmental analysis of soil and water and EIA Projects.

BNHS now has a well-equipped laboratory, at Hornbill House, housing sophisticated analytical equipment like the Atomic Absorption Spectrophotometer (AAS). The parameters to be analysed are primarily heavy metals and physico-chemical in nature. However, subsequently, with the acquisition of related equipment, biological analysis such as electrophoresis will also be part of the laboratory's activities.

The concept of Environmental Impact Assessment was first introduced in India a few years ago and also made statutory under the Environmental Protection Act, 1986, when it was realised that rapid industrialisation and developmental activities could cause irreparable damage to the country's natural

resources and environment. The objective behind this concept was to monitor the changes in physical, ecological and socio-economic components occurring due to these activities and to prevent or reduce the resultant degradation of the environment.

The BNHS, from time to time, has assessed the environmental impact on flora and fauna of various development activities. Be it a proposed site for a cement factory or a lignite mine, BNHS is known for its unbiased assessment of the project. In addition to the Environmental Surveys already undertaken for various government and private bodies, the BNHS now intends to undertake Comprehensive EIA Studies, to expand its sphere of activities in this area.

With the encouragement and whole-hearted support of members and various statutory bodies in India, BNHS has ventured into the field of EIA studies and will strive to live up to its established reputation.

You may contact Alex Abraham, EIA Scientist, for further information. □

INAUGURAL SALIM ALI BIRD COUNT

— A Preliminary Report

The inaugural Salim Ali Bird count was conducted on 14th November, 1993. About 4000 forms were despatched to BNHS members and others interested in the count. Only two hundred and seventy-three completed forms were returned. These data sheets covered two hundred and forty-nine sites in eighteen states and one union territory. The analysis of the count data received yielded some interesting results.

The sites represented seventeen out of the twentyfive biotic provinces, covering nine out of the ten biogeographic zones identified in the country. The count sites included lakes, tanks, reservoirs, seashores, river deltas and mangroves, riverine habitats, pastures, grasslands and farmlands, urban and rural areas, national parks, sanctuaries and reserved forests.

The maximum number of sites were covered

in Maharashtra (70) followed by Rajasthan (32) and Karnataka (28). During the course of the count, more than 440 species, both migratory and non-migratory, were recorded. A few doubtful identifications have also been reported. The compilers included defence personnel, forest officials and guards, scientists, school teachers and students, engineers, doctors and laymen. A number of NGOs took up the count in their localities; besides, quite a few nature clubs also took a lead in identifying sites. Compilers organised themselves into groups, to avoid overlapping of counts and sites. Some compilers covered more than one site and gave detailed maps of the area. They also identified ecological problems being faced at the sites and highlighted conservation aspects. The compilers exhibited a deep sense of motivation and enthusiasm. □

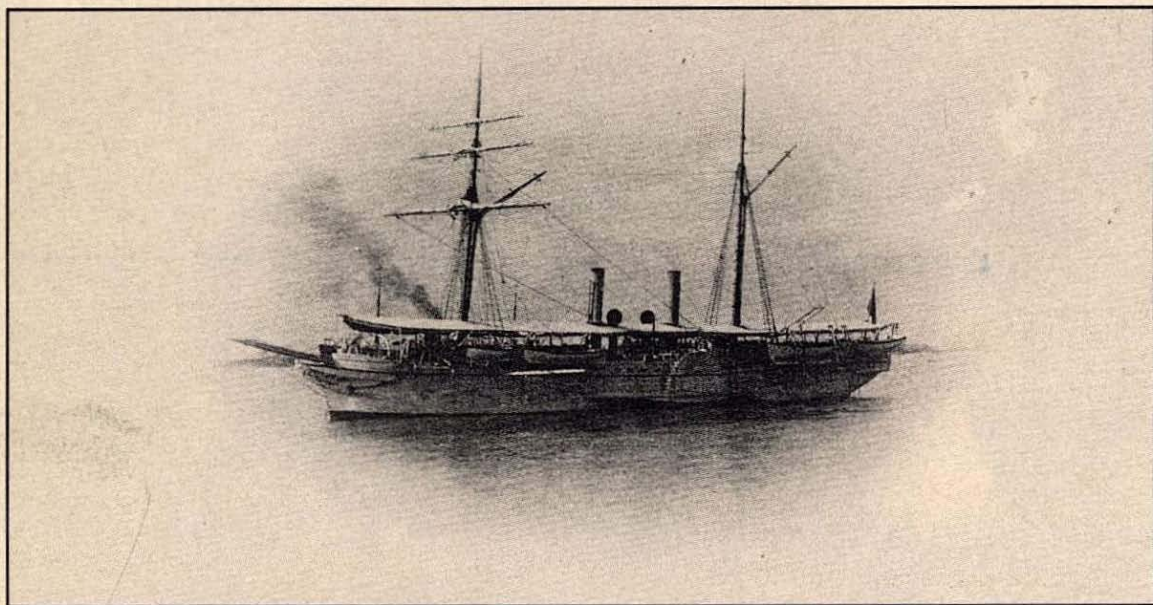


PHOTO: S. ASAD AKHTAR

Conservation: a new role for the Indian Army

DOCTORS AT SEA

B.F. Chhapgar



The Investigator in the Rangoon River

Just as the Indian Army played a big role in gathering knowledge of our terrestrial flora and fauna, so did the Indian Navy regarding sea life. But, unlike the army where it was the individual's personal liking for, and spontaneous effort to know more about wildlife, the navy went about it in a more official manner, by employing persons who were paid to study marine life. They were designated as Surgeon-Naturalists, and, while they were basically medical personnel looking after the health of the crew, they were also interested in biology and involved themselves in scientific studies. One of the earliest descriptions of an Indian marine animal by a sailor dates back to *Observations made on a tour made from Bengal to Persia in the years 1786-87* (page 236), in Pinkerton's voyages and travels (1811), wherein Ensign W. Francklin states that "the most remarkable animal curiosity the island" — he refers to Bombay — "produces is a small fish ... about four inches long, [having] upon the top of its back and near the head, a small valve on the opening of which you discover a liquor of a strong purple colour which when dipped on a cloth, retains the hue. It is found chiefly in the months of September and October".

(This obviously refers to the sea-hare, *Aplysia*.)

Organised studies of sea life started with the Marine Survey of India, established in 1874. The primary aim of the marine survey was the safeguarding of navigation along the local lines of commerce by making charts and sailing directions for mariners, studying local peculiarities of currents and tides so as to make a safe approach to land, and conditions of ports and harbours for shelter and supplies. Added to these was a secondary purpose — that of obtaining knowledge of the hydrography of local sea-basins, their depth and temperature, deposits forming in their abysses and the life that inhabited them.

The surveying of Indian waters is an old undertaking. Prior to the Marine Survey of India, marine surveys were conducted by the Indian Navy from 1832 to 1862, when this service was abolished. These operations covered an extensive area from Iraq to the Seychelles, and involved the upper reaches of the Euphrates and Tigris, the ruins of Nineveh and Babylon, and the discovery of the source of the Oxus. Dr. H.J. Carter, F.R.S., a medical officer in the Indian Navy became a leading authority on the lower

invertebrates, especially sponges.

Even before the advent of the Indian Navy, marine surveys were carried out by the Bombay Marines, ranging from the Red Sea to China. The first Surgeon-Naturalist of the Marine Survey was J. Armstrong of the Indian Medical Service, but, as the Marine Survey had no ship capable of deep-sea research, he had to confine himself to studying the zoology of the shallow-water and littoral (shore) zones, though he did occasionally manage to dredge down to 150 metres.

In 1876, it was decided to construct a ship suitable for deep-sea dredging. This was built at Bombay, which was renowned for the quality of its boats and the carpentry skills of the Parsee master-craftsmen. While English ships made of oakwood hardly lasted twenty years, those made of teak by Bombay's Parsee boatbuilders, brought from Surat by the English, have survived for seventy, eighty and even a hundred years. The ship, named R.I.M.S.S. (Royal Indian Marine Survey Ship) *Investigator*, was a paddle-steamer of 580 tons displacement with two funnels, and was launched in 1881.

While the R.I.M.S.S. *Investigator* was being built, the mother-of-all oceanographic expeditions — H.M.S. *Challenger* — had just returned from an oceanographic expedition round the world lasting over three years. The excitement caused by the sensational discoveries of deep-sea life was so great that the British Government allowed transfer of a substantial portion of H.M.S. *Challenger's* oceanographic equipment to R.I.M.S.S. *Investigator*.

After Armstrong relinquished his post in 1879, the post of Surgeon-Naturalist remained vacant until Surgeon C.M.J. Giles took over. From now on till

1904 was the heyday of deep-sea dredging and trawling by *Investigator*, in depths as great as 3650 metres. More than seventy percent of the species of deep-sea animals brought up by the *Investigator* turned out to be new to science.

Lt. Col. A.W. Alcock, C.I.E., M.D., F.R.S., I.M.S., who joined as Surgeon-Naturalist in 1888, until 1892 was one of the most notable scientists connected with the *Investigator*, with a chequered career varying from being a teacher of the Classics in Darjeeling and an assistant on one of the plantations in Bihar, to Medical Officer with the Punjab Frontier Force

and Deputy Sanitary Commissioner, Bengal. He was to carcinology (the study of Crustacea) what Sir Francis Day was to ichthyology (the study of fishes) in India. His *magnum opus* was the series of papers from 1895 to 1900 entitled *Materials for a Carcinological Fauna of India*. Whenever I read Alcock's works, I am reminded of *Alice in Wonderland*. This was written by a mathematician named Charles Lutwidge Dodgson. Probably thinking that this silly narration might mar his reputation as a mathematician, Dodgson wrote *Alice in Wonderland* under an assumed pen-name —



Lt. Col. Alcock, a notable member of the *Investigator*

Lewis Carroll. Her Majesty Queen Victoria liked it so much that she asked Dodgson to send her any books that he would write in future. She must have been surprised — and disappointed — when she received his next write-up — a serious tome on arithmetic! Alcock was equally versatile. His erudite treatises on carcinology will seem boring and almost incomprehensible to anyone not well-versed in this specialised subject; quite unlike the witty, easy-to-read narratives of his experiences on the ship *Investigator*, which he wrote as a series for *The Times*

of India and which form a substantial part of his popular book *A Naturalist in Indian Seas*.

Lt. Col. Alcock was succeeded by Dr. A.R.S. Anderson and Dr. A.F. M'Ardle. Details of R.I.M.S.S. *Investigator*, its history and the equipment thereon are given in a paper entitled "A summary of the deep-sea work of the Royal Indian Marine Survey Ship *Investigator* from 1884 to 1897", published in the *Scientific Memoirs of the Medical Officers of the Army of India*, 1898.

The work done on the ship started being published in several parts as "Natural history notes from Royal Indian Marine Survey Ship *Investigator*" from 1885 in the *Journal of the Asiatic Society of Bengal*. From 1889 on, they appeared in the *Annals and Magazine of Natural History*. The last memoir came out in 1905. To accompany these, a series of plates entitled "Illustrations of the Zoology of the Royal Indian Marine Survey Steamer *Investigator*" were published from 1892 to 1909; all these are invaluable to anyone interested in marine zoology.

By the beginning of the twentieth century, the work of the Marine Survey of India had attracted so much attention that, when H.R.H. Prince Albert I of Monaco erected the now world-renowned Institute of Oceanography, the name of *Investigator* was carved on its façade, along with other equally famous

oceanographic ships such as *Challenger*, *Travailleur*, *Talisman*, *Gazelle*, *Novara* and others.

In 1908, R.I.M.S.S. *Investigator* was scrapped and was replaced by *Investigator II*; this was a steel ship of 1,018 gross tons. Lt. Col. R.B. Seymour Sewell, C.I.E., M.A., M.R.C.S., L.R.C.P., D.Sc., I.M.S., F.Z.S., F.A.S., F.Z.S.I., F.N.I., F.R.S. joined as Surgeon-Naturalist in 1910. By now, more emphasis was placed on investigations on the nature of the sea-bed and bottom deposits, marine meteorology, surface and deep-water temperatures and salinity.

With the outbreak of World War I in 1914, the marine survey was suspended and resumed only in 1921, when Sewell studied the corals of the Maldivé Archipelago (then a part of British India) and the Nicobar Islands. Sewell left in 1925, and Major R.W.G. Hingston replaced him as Surgeon-Naturalist, but only for a year. The post of Surgeon-Naturalist was converted to Naturalist to the Marine Survey, now attached to the Zoological Survey of India. But the post was not filled up, so the work of Surgeon-Naturalists came to an end in 1926. □

Dr. B.F. Chhappgar, former Curator of the Taraporevala Aquarium, Bombay, is a renowned marine biologist and author of several books on marine life.

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INDIAN BIRDS

R.K. Gaur

Brijbasi Printers Pvt. Ltd., New Delhi. 1994.
pp. 120.

This is a beautiful book. Dedicated to "a great fraternity — the Indian Army", it is the work of 'Lt. Gen. R. K. Gaur, PVSM (Retd) — a keen amateur photo-naturalist. It is a portfolio of colour photographs covering a wide spectrum of bird species in India. With the exception of 9 pictures (2 by Rajesh Bedi and 7 by Sharad Gaur), the rest are from the author's own work. The group-wise photographs are preceded by three well-written chapters. There is an introduction to the biogeographic regions of India, followed by a section on various aspects of bird life such as migration, feeding, and reproduction. There is a useful chapter on bird sanctuaries in India in which 6 important sanctuaries such as Sultanpur and Bharatpur are outlined. Details are provided on the facilities available, the best season to visit, best approach and addresses for information.

In the chapter on birdwatching and photography, suggestions on how to record data will be useful for budding birdwatchers.

The bird photographs follow. And they are a treat. Most pictures are accompanied by a caption which briefly highlights the essence of the bird. Many

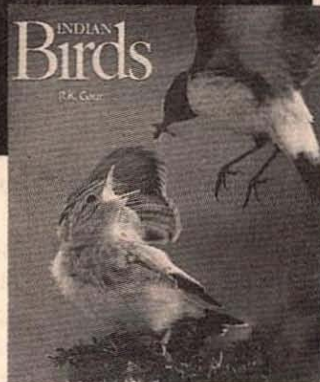
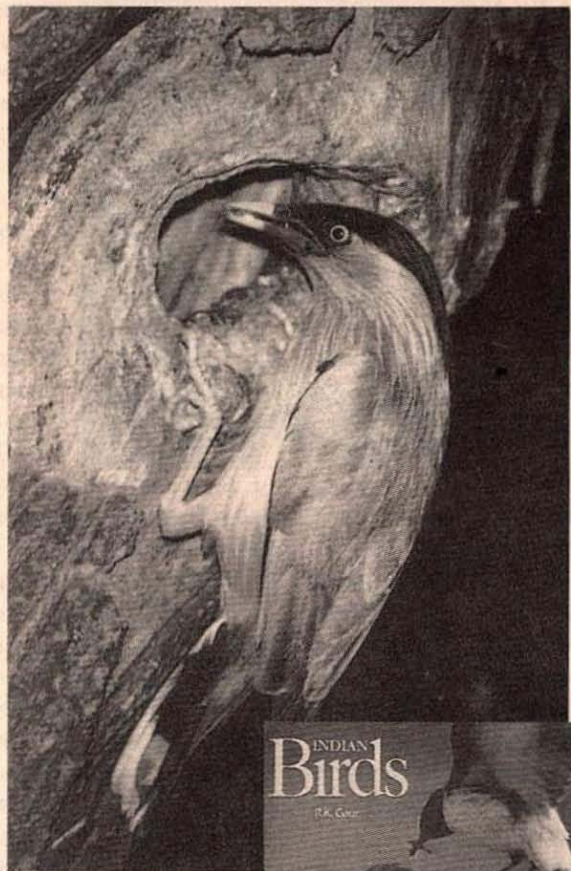
captions tell of the keen observation powers of the author. We learn, for example, that redwattled lapwings often use the dried and hardened pits of cattle hoofmarks around ponds for nesting. Many

pictures are taken in areas to which a civilian would find hard or impossible to gain access. Lt. Gen. Gaur has certainly used to good measure all the opportunities available in his remote postings in Ladakh and other Himalayan areas, and there are photographs of blacknecked grebes and blacknecked cranes from their mountain fastness.

Considering the overall excellent quality of the pictures and of the printing, it is a pity that a few fine pictures have been composed so that the subject is bisected by the pagefold as has happened, for example, with the crested bunting, the coppersmith and the great Indian bustard. Regrettably the tree pie and koel photographs do not meet the general high standard. The "black cuckoo" on pg. 92 is actually the black bulbul *Hypsipetes madagascariensis*. These and a few other grumblings apart, do not detract from the fact that this is a fine book.

I am sure that Lt. Gen. Gaur will certainly find that this effort will inspire "others to appreciate the beauty of Indian birds, realise their significance in the scheme of nature and develop an abiding concern to preserve this valuable national heritage". □

RENEE M. BORGES



CONSERVATION NOTES

VU QUANG NATURE RESERVE – War and Peace

Located in the mountains of Northern Vietnam, the Vu Quang Nature Reserve is in the limelight these days because of the rare discovery of some new mammal species. Such a find comes but once in a lifetime. A biological research team sponsored by the Government of Vietnam and the World Wide Fund For Nature found pristine mountain forests, untouched by the war and agent Orange, the notorious chemical used by American forces to defoliate large stretches of the verdant Vietnamese countryside. The Vietnamese government sponsored this project in its ongoing efforts to rebuild the ravaged country.

The research team worked out of a small army base that in earlier years had housed North Vietnamese troops. The expedition launched in May 1992 covered the mountainous divide separating Vietnam from Laos. The mysterious, almost magical domain of moist dense forest, largely unexplored by scientists, soon justified its extraordinary reputation.

Wildlife biologist John MacKinnon during his preliminary survey in the forest encountered another fellow biologist Do Tuoc who had been interviewing hunters in the nearby village of Kim Quang about wild goats in the region. He mentioned having come across skulls with long, curved horns mounted proudly on posts in hunters' houses.

During a routine enquiry with villagers about the local wildlife, the field biologists were shown sets of horns which the locals call *sao la* or "spindle horn", since they resemble the spindle used by the villagers for weaving. Dr. John MacKinnon, who examined the horns, found that they were too long and straight for a sheep or goat, nor could they be considered close to other bovines.

Subsequent analysis of the specimen's DNA by Peter Arcander at the University of Copenhagen



showed that the almost 100 kg animal, variously called the Vu Quang ox, the pseudo-oryx and the Sao-La was not a new species but a new genus, probably separated from its closest cattle-like relatives for the past 5 million to 10 million years.

The newly-discovered mammal was christened the Vu Quang ox, after the area where it was discovered. The animal typically weighs about 80 kg, stands about 80 cm high and measures 1.5 m from end to end excluding the tail. The remains found were mainly horns but also included

two sets of complete skins, one of which was stuffed and mounted.

The Vu Quang ox normally lives unmolested high in the forest ranging over an area of about 4,000 sq. km, though in winter when the mountain streams dry up it ventures to lower elevations to drink, where it is often snared. Described as a shy animal, it usually moves in groups of two or three. Experts opine that a few score are trapped each year, while the surviving population size is estimated to be several hundred.

Vu Van Dung of Vietnam's Forest Inventory & Planning Institute who visited the area several times, reports the evidence of over 20 specimens.

The newly discovered ox is a member of the family Bovidae, which includes oxen, sheep, goats, cattle, buffaloes and antelopes. From the descriptions it appears to be most closely related to a very primitive sub-group of the Bovidae which includes the nilgai and the four-horned antelope or the chowsingha. Its primitive characteristics suggest that it is a little-changed relic of the group from which cattle and buffalo evolved.

Biologists contend that this is the most significant and exciting large mammal discovery of the century since the discovery of the okapi, a relative of the giraffe, in Zaire in 1900. Only three other new genera

have been documented in this century. The stunning discovery of the Vu Quang ox was soon followed by news of two new species of deer-like creatures - the giant muntjac and the *quang khem* and a species of fish resembling carp. Describing the area as a biological gold mine, biologists opine hopefully that many more discoveries will follow.

A team of Laotian and British field biologists working under the aegis of the Wildlife Conservation Society of New York have taken blood samples from a live specimen of the giant muntjac maintained in a menagerie owned by a Laotian military group. This could corroborate earlier claims made by MacKinnon concerning the giant muntjac. He had analysed a skull brought to him by Do Tuoc and Shanthini Dawson, an Indian biologist. Though it resembled that of a muntjac, also known as a barking deer, the head and antlers were much larger and configured differently. After taking various measurements into account MacKinnon finally decided that it belonged to a distinct species. Arctander, at the University of Copenhagen, confirmed MacKinnon's conclusion after studying the specimen's DNA.

The spate of discoveries was soon followed by the evidence of a third new mammal, reported by another Vietnamese biologist Nguyen Ngoc Chinh, from a region north of Vu Quang. Working in the area of Pu Mat, he came across the skull of an animal locally called *quang khem* or slow-running deer, which is now referred to as Chinh's deer in scientific circles. Though not yet confirmed as a new species, its DNA has not been matched with that of known varieties of deer.

As if these discoveries were not enough to satiate the hunger of wildlife biologists for newer and newer species, MacKinnon spotted a strange pair of antlers among the unsorted bones in the collection of Hanoi's Institute of Ecology and Biological Resources. Though wary of identifying it as yet another new species, MacKinnon set the antlers aside for a proper analysis at a later date. The nail-biting suspense amongst wildlife biologists is worth the wait considering that the area has yielded hitherto unimaginable information in a relatively short span of a few months since it was opened up for regular ecological surveys.

The challenges before the authorities are many. To save the animal from extinction, although the site is already a nature reserve, the Vietnamese government has very sensibly decided to increase the

15,000 hectare reserve to 6,00,000 hectares. This area is contiguous with the 3,65,000 hectare Nakai Nam Theum National Biodiversity Conservation Area in Laos. Moreover, there are fresh proposals to add another 7,50,000 acres (@ 30,525 hectares) of reserves and the surrounding mountainous forests in Vietnam, in addition to linking these areas with other protected areas in Laos.

Unfortunately, as in any other overpopulated country, arable land is a scarce resource, which means human encroachment is inevitable. Most of Vietnam's forest region is populated by ethnic minorities known for their hunting skills. Luckily, people in the area around the reserve reportedly have very poor hunting skills. Moreover, the land is not very productive, which in the near future might force them to abandon farming in the locality. But a more immediate threat is posed by trophy hunters, some of whom have already offered money for horns. This has set off a chain reaction, whereby as news of the animal's novelty spreads, so does its perceived value.

A research project is being initiated under Dr. MacKinnon's guidance. Two field biologists will trail the animals and follow up on local news to collect more information on the species.

Fortunately for the species, high ranking officials of the Vietnamese armed forces have also shown a keen interest in the environmental problems facing the country. Some generals concerned at the havoc left behind by decades of war are spearheading movements and lobbies to conserve the natural wealth of Vietnam.

General Vo Nguyen Giap, the legendary architect of North Vietnamese military strategy during the wars against France and the U.S., has reportedly remarked to visitors that Vietnam did not fight for decades to gain control of its resources only to squander them once it was independent.

The war has left the country badly mauled and broken in spirit but peace is bringing in its own rewards. The fierce generals who once led a highly motivated force of die-hard guerillas are now appreciating the soothing breeze of the wilderness and impressing upon everybody around the ultimate desire for peace and tranquility in every human being as illustrated by the Vu Quang Reserve. □

Compiled by: S. Asad Akhtar Conservation Officer, BNHS.

Apology: A sketch on page 26, Hornbill 1994 (2), wrongly credited to Ishwar Prakash, was by Arun Ghosh. The error is regretted.

NEWS NOTES AND COMMENTS



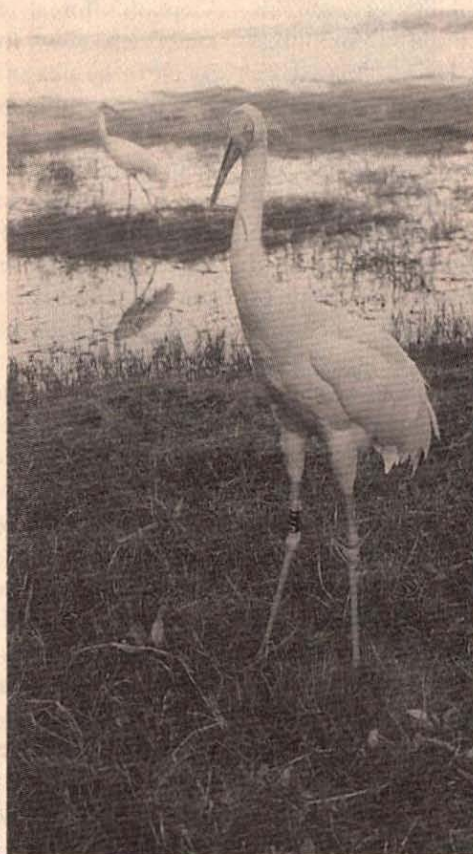
SIBERIAN CRANES AT KEOLADEO NATIONAL PARK

The winter of 1993-94 was not the usual winter for the Keoladeo National Park. It was without the gracious presence of the chief winter visitor, the magnificent white or Siberian crane. This happened for the first time since they were discovered wintering in Keoladeo National Park (KNP), Bharatpur, in 1938 by Dr. Salim Ali. The KNP is the only known wintering site of this crane in the subcontinent except for a few records. One bird was recorded wintering in Dihaila jheel, Karera Bird Sanctuary in Madhya Pradesh during 1987-88 and three birds were seen in Dholpur, Rajasthan during January 1990.

The wintering crane population at KNP has plummeted during the last three decades from 200 to

nil. This endangered crane has two populations. One breeds in the environs of the Ob river in western Siberia and winters largely at the KNP; a few birds winter in Iran also. The other population breeds in the Yakutia marshes in eastern Siberia and winters in China. The eastern population is sizable, about 2000 birds, but the western population is critically endangered; it could become extinct.

The migration route of the crane is full of hazards. It has to fly over countries like Iran, Afghanistan



JAY SAMANT

Captive-bred Siberian crane at Bharatpur

and Pakistan, where the bird is regularly hunted and persecuted by the locals. Habitat loss, both at breeding and wintering grounds, has also contributed to its declining population.

Alarmed by the drastic fall in numbers, conservationists started thinking about the ways of conserving the species. The first priority was to map its migration route correctly, so that all the possible threats to this species along its migration pathway could be identified and remedial measures taken. The second was to experiment on augmenting the wild population with captive-bred birds. Two captive-raised chicks with local radio transmitters, coloured and aluminum rings were released with the wild flock and satellite transmitters

were put on two wild chicks during the summer of 1993 at the cranes' breeding ground in Siberia. The captive-raised chicks, although accepted by the wild flock, failed to take off with them on migration. The signals from the wild chicks were received till 8° south along the Irtysh river, but thereafter the signals were received from just one location, indicating either the death of the bird or the loss of the transmitters. In any case the experiment failed. It was then decided to release captive-bred chicks in

the wintering ground at KNP, with the hope that they would migrate back to the breeding grounds with the wild flock. Four captive-bred chicks and researchers from the International Crane Foundation (USA), Russia, and the Rajasthan Forest Department kept a tireless vigil, but in vain, for the flock of wild Siberian cranes throughout the winter of 1993-94. This experiment also failed as the wild cranes did not arrive and there was nobody to guide the chicks to the breeding grounds.

The crane conservationists, in an attempt to create a resident population within the park, kept two of the chicks named Bugle and White free-ranging throughout the summer, to see how they adapt to the extreme summer of KNP and the limited food resources. The other two chicks were sent to the Jaipur zoo. The chicks went through the summer without any apparent discomfort. They would feed throughout the day and would rest outside the water under the shade of trees on the mounds.

Unfortunately, at the fag end of the summer on the evening of 8 July, White got hurt in a territorial dispute with a pair of sarus cranes and died the next day. One of the chicks which was kept at Jaipur zoo also died of haemorrhagic shock after getting injured. Crane conservationists are toying with the idea of using the common cranes, which also migrate to India and have overlapping migratory routes with Siberian cranes, as guide birds for the captive-reared chicks.

As the winter of 1994 approached, crane conservationists kept their fingers crossed, hoping to see a few wild Siberian cranes wintering at KNP once again. If these cranes were to take the captive bred-chicks with them on their flight back to their nesting grounds, it would be a landmark achievement for the conservationists. However, the Siberian cranes did not arrive. Have they been hunted in transit? Has the western population gone extinct? Are they wintering elsewhere? These and many more questions need to be answered. □

CRIMSON ROSE

Commander G. V. K. Unnithan, Resident Naval Officer at Ramanathapuram writes in to say:

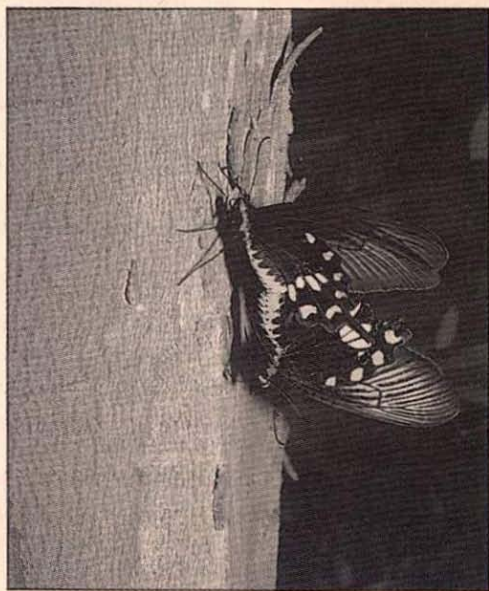
I was witness to a very strange phenomenon in which hundreds of adult butterflies migrate *en masse* from the mainland to the Rameshwaram Island and get annihilated on the way.

The tapering mainland from Mandapam at the southeast end of the peninsula is connected to the island of Rameshwaram at the Pamban end by a 2.3 km long road bridge adjacent to a rail bridge. This road bridge is at a height of 20-30 m. above the sea level. The direction of the bridge is east-west, where the breeze is generally from east to west.

The day of observation was 15th January, 1995, a clear day, with a shining sun, the time was around 1230-1245 hrs, and a strong breeze blowing from east to west.

The behaviour of the flock of butterflies, the Crimson Rose, *Tros hector*, could not be fully observed. However it was seen that the flock assembled at the edge of the main land and takes off *en masse* against the breeze and along the road bridge. The majority of them are knocked down by the traffic on the bridge and some of them get blown into the sea and perish. Some were seen being carried away by the strong wind. Maximum distance crossed is seen as half of the bridge, i.e. about a kilometre

from the main land. In spite of careful observation on the eastern Pamban end of the bridge, I could not locate a specimen on the island, which means this flock never reaches the island but get annihilated en route. □



SUDHIR SAPRE

Crimson Rose adults mating

THE INDIAN ARMY AND ENVIRONMENTAL PROTECTION AND RESTORATION

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



Troops at work in Hissar cantonment

To many it may seem incongruous that the army has a role in protecting and restoring our country's degraded environment. The army is normally associated with destruction. Perhaps it was in the past, but it is certainly not so today. The army has come to realise that it too is dependent on nature and natural resources for its wherewithal, energy, clothing, food, and shelter.

During the last 15 years, successive Chiefs of the Army Staff have realised that the Indian Army does have a significant role to play in nature conservation as a result of which today it is held up as a role model globally, of which more anon.

Traditionally the army had two major roles — ensuring the integrity of our national frontiers and internal security. After World War II, two more roles were added — disaster relief and international peacekeeping on behalf of the United Nations, for which it has more than proved its credentials. Today

it has added a fifth dimension — the protection and restoration of the environment.

During the recently ended cold war, the threat was a nuclear holocaust which would have resulted in a nuclear winter and would have destroyed all life forms as we know them. This threat has since diminished. Today we are faced with twin threats arising out of fundamentalism and ethnic cleansing, but international bodies have now come to the sad conclusion that the greatest threat is the galloping environmental destruction caused by rampant consumerism.

When I was Secretary General WWF-India, I introduced this subject to two groups, at the intake level at the National Defence Academy and to potential decision makers, the *crème de la crème* of the Armed Forces attending the prestigious Defence Services Staff College, Wellington.

Why is the Indian Army suitable to take on this

fifth role? Is it capable? Can it do so inspite of its heavy commitments — protecting our borders, low intensity conflicts against militants and insurgents, internal security duties, flood and earthquake relief? It can and has done so without much fanfare. These are the reasons why:

- * By virtue of its deployment in ecologically rich wilderness areas like the Himalaya, the cold and hot deserts, the tropical rain forests in the south and east, and in coastal areas.

- * Its organisational structure which enables it to deploy self-contained groups ranging from sections of 10 men, sub-units of 40 and 100 men, units and formations.

- * In-built leadership; a disciplined and trained work force motivated and dedicated to a project allotted to it; engineering, technical, scientific know-how; mobility including foot and animal transport; communications and medical skills.

- * Ability to be an exemplar by virtue of the reputation it enjoys.

- * Manager and owner of large tracts of defence lands used for training, ranges and depots.

What the army has been able to achieve since it has taken a dedicated interest in the environment, has been thanks to three Chiefs of Staff — Gen. V.K. Sharma especially in Ladakh and Sikkim, Gen. Suneeth Rodrigues under whose directions the Army Environmental Cell (AEC) was set up under the

Director General of Military Training and a close rapport with BNHS established, and the late Gen. B.C. Joshi, whose enthusiasm and concern in this field is unmatched and who placed the AEC under the Quarter Master General who is responsible for defence lands. Gen. Joshi strengthened ties with NGOs concerned with the environment and has launched an 18-month Eco-Adventure scheme in the Himalaya under a Major General.

At the mega-level, the army convenes an annual environmental conference attended by the five Territorial Army Commands — Northern, Central, Eastern, Southern and Western — covering every possible type of ecosystem in the country, the Directorate- General Territorial Army responsible for the Eco-Territorial Army Battalions, representatives of the navy, air force and Border Roads, a representative of the nodal Ministry of the Environment and senior retired officers committed to conservation and protection of the environment. All aspects of environmental problems, and the methodology to tackle them, are discussed and ways and means of improving the involvement are taken. For instance, it was decided that when senior officers inspect Army Stations, one item on the agenda would be to discuss environmental problems and schemes. Yet another decision was to include one paragraph in a report form of army patrols operating in remote areas, on environmental degradation and species



Cantonments have been traditionally recognisable by their extensive greenery



Topographic model of target areas for afforestation

sightings and status. Minutes should then be issued to all concerned and monitored by the AEC. At Army Command level, workshops and seminars are conducted before the annual AEC meeting where environmental problems and projects are discussed. There is a proposal to set up a scaled-down version of an AEC in each Command to ensure better coordination and monitoring. The Northern Command has held a seminar in Dachigam. The Eastern Command conducted an *in situ* camp in the Buxa Tiger Reserve. The Southern Command held a meeting at the NDA, Khadakvasla and at Kotah, and the Eastern Command conducted a nature camp in Sikkim.

At the macro-level there are many outstanding examples. A Corps HQ located on the fringe of the Thar Desert has, over the years, converted an area bereft of tree cover into a veritable green belt. All the large depots located in this cantonment have become safe havens for wildlife. A division in the Patiala area has planted over 1 lakh trees endemic to the area as part of an arboriculture project, with ninety percent survival.

In Rajauri, two hill tops occupied by the army have been greened with the help of the Forest Department, and are in sharp contrast to the bare hills elsewhere. The General in-charge is a keen conservationist and sets an example by converting wet garbage into organic manure for his own kitchen

garden, encouraging others to do so. Perhaps the most telling example can be seen in Kotah where Lt. Gen. Baljit Singh (Retd.), Trustee WWF-India and member of BNHS, set the ball rolling by introducing the Abhera Arboriculture Project to green the once-bare training area, establishing four nature trails in the town itself, introducing solar cookers to make bakery products for the Station and distilled water to top-up vehicle batteries. He also established the Kingfisher Nature Club and organised nature camps for All Ranks and families and local public school children in Ranthambore, Keoladeo Ghana and Tal Chhappar Blackbuck Sanctuary with such success that his efforts were covered by the BBC. At the School of Artillery, the vast artillery ranges in and around Nāsik-Deolali have been greened most successfully with troop labour.

At the micro-level, perhaps the most successful example is the small military station of Kolhapur, home of the 109 Infantry Battalion Territorial Army. Thanks to the initiative of a committed Commanding Officer, Col. Prakash Mithare, and his deputy Lt. Col. Sohan Singh, the rolling downs have been converted to a habitat for wildlife by the planting of over 4.5 lakh trees, all endemic to the area, over a period of four monsoons with ninety percent survival, on a no-cost basis, assistance being received in kind from locals, industrialists, businessmen and golfers. The good

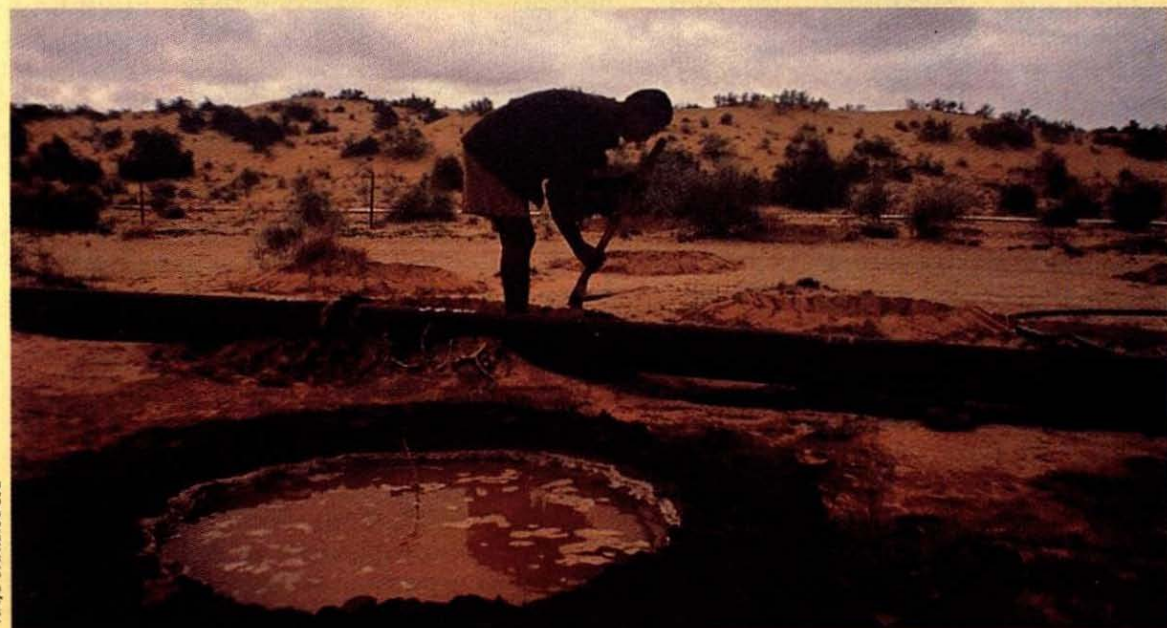
work continues. Technical advice was provided by the Forest Department and Dr Jay Samant, then with Shivaji University, who also helped the local NCC Units set up a nature trail on one of the hillsides which is a popular hill resort for the locals. In nearby Belgaum, the Maratha Light Infantry Regimental Area has planted over 2 lakh trees, especially adjacent to the five ranges and, in doing so has involved the local villagers with considerable success. And in the arid Kutch Area, the Brigade Group Commander organised a 3-day seminar to study ecological problems particular to his sector of responsibility, attended by his officers, the Forest Department, local NGOs and representatives of BNHS, WWF-India and INTACH. A project has been launched to plant 10,000 trees annually in the degraded areas of the cantonment, thanks to a nursery set up within the cantonment by the Forest Department. And in Sikkim, degraded mountainsides shorn of trees, resulting in frequent landslides, are now being systematically reforested with marked success.

Every year over 50,000 army personnel retire from the service at a fairly early age. This is a vast resource of trained and disciplined manpower. To date three Eco-Territorial Army Battalions have been raised to attend to environmental problems in the Garhwal Himalayas, along the Ganga Canal in Rajasthan and in the hills between Dehra Dun and Mussoorie which were degraded due to mining. In addition, these units

have planted over 9 million trees over a period of 10 years. They also help create awareness among villagers. There is a plan on the anvil to raise one such unit per State of 1700 All Ranks, recruited, raised, trained, equipped and officered by the army, to undertake conservation projects according to the requirements of the State with technical personnel provided by the Forest Department. The major problem, however, is finance.

The world has evinced keen interest in this unique use of the army in India and articles on the subject have appeared in a number of prestigious international journals in the UK, USA, Switzerland, Australia, and the IUCN. To end on a hopeful note, while this unique effort gains strength, it is encouraging to know that the army is aware that it can rely on the BNHS for resource material and input, as also on other NGOs like WWF-India. If this effort continues, the army will stand out as an exemplary model of how an armed force can contribute meaningfully to environmental protection and restoration without blunting the cutting edge of the sword. □

Maj. Gen. (Retd.) E. D'Souza, PVSM, is a dedicated BNHS member. He was designated for the Dutch De Twaalf Ambachten 'Three Tithes' Award for his broadcast on the BBC Overseas Service on the Military's Role in Environmental Protection and Restoration for the year 1992.



Greening the desert — a soldier at work

NATURE EDUCATION AND THE ARMY

Shashi Menon

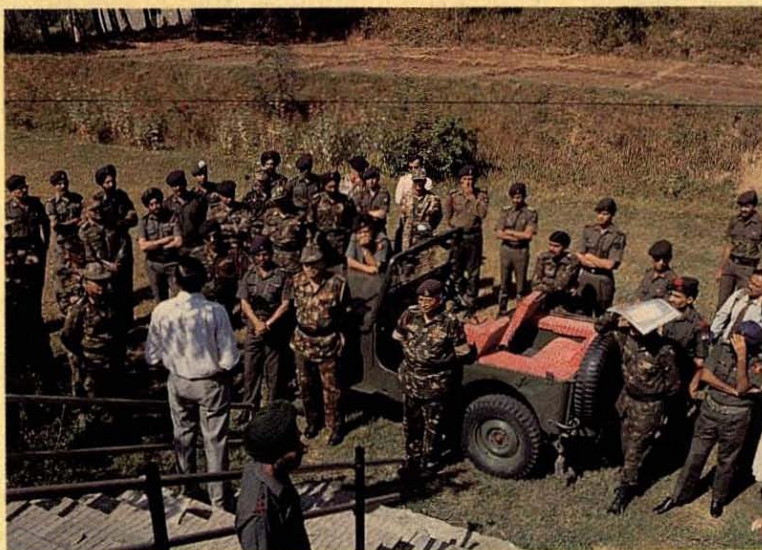
The post-cold war period has been witnessing significant changes in the role of the army the world over. The Indian Army too is not an exception, albeit our army has already been carrying out programmes beyond the call of duty. Environmental protection and conservation are two areas where the Indian Army has set an example to the world. The Eco-battalion of the army has been making enviable contributions to the preservation of our precious natural wealth. In fact, the BNHS library abounds with vivid examples of what the soldiers have contributed to the science of natural history.

My tryst with the army establishments started way back in 1979 as a participant at the National Nature Leadership camp. The

camp was organised by the World Wide Fund for Nature-India, in the exquisite surroundings of the National Defence Academy (NDA), Khadakvasla. The NDA campus itself is a monument which exemplifies the effect that proper protection can have on the environment. The campus is indeed a haven, adjacent to the sprawling industrial city of Pune. Ever since the campus has been declared a sanctuary, no effort has been spared in preserving the rich flora and fauna that abound in it. I became a regular visitor to the campus during the subsequent camps in various capacities of volunteer, instructor and then as camp director. During these camps I could interact with

many defence personnel, especially army officers. The officers, and sometimes their families, joined us during nature trails and birdwatching sessions. I found the officers to be quite aware about the richness of our natural heritage, an awareness, unfortunately, not very prevalent amongst the general public. The army officers by virtue of their postings to various places are exposed to more wildlife than most civilians, but they have limited access to systematised

knowledge of wildlife. I was able to fill this lacuna during interaction with them in the camps. I felt that the image that I carried of an army officer, a gun-toting, trigger-happy hunter, was slowly eroded away and I found in them tremendous sensitivity to the various



A field session in progress at Army Nature Education Workshop held at Palampur

problems that threaten our environment. The outdoor programs in these camps were confined mainly to the NDA campus itself, an area the officers knew like the palm of their hands. Even then, during the outings, the officers made several observations about the flora and fauna of the campus about which they were aware, but at which they had not bothered to give a second look!

I had better opportunities to interact with the officers on my visits to NDA as instructor of wildlife orientation camps for the cadets. These camps were in the form of three-day capsule courses during the mid-term break. Organised by WWF-India, these

camps were mainly aimed at orienting the budding officers to various aspects of natural history and conservation. I found in the officers and the cadets a highly motivated and receptive audience with all the untapped potential to make sizable contributions to the nature conservation movement in our country. Unfortunately, with the shifting of the WWF office to Delhi, both the programmes met with an untimely end. The feeble efforts that were made to revive them obviously met with no success.

My interaction with the highest ranks in the army started in BNHS when the Society organised nature education programmes for the army. Gen. Rodrigues, our Ex-Army Chief, along with Lt. Gen. Baljit Singh (Retd.) took a keen interest in organising these activities. When the Army Adventure Cell took on the responsibility of co-ordinating the camps, the programme was launched from firm ground. The main idea behind this programme is to impart nature education to the army officers and bring about a realisation

among them that conservation of our natural resources and the protection of our environment have the same important role to play as national security in ensuring the welfare of our people. The programme involves a series of workshops at the various regional commands of the army where officers even up to the rank of brigadiers participate. The first phase of the programme has already been implemented. Almost every participant at the workshops was convinced that the army could make a meaningful contribution to the nature conservation movement and that such an action would be more result-oriented than any civilian effort. The army has well organised, disciplined and highly motivated personnel stationed in almost every nook and corner

of the country. In such a network, implementation of conservation policies needs very little additional organisation. The magnificent efforts by the Eco-battalion in afforestation of some of the denuded northern and central hills of India are vivid indicators of this fact. The most important distinctive feature of such programmes undertaken by the army is the committed and regular follow-up action, which can be ensured only with a lot of difficulty in civilian afforestation activities.

During my involvement in the BNHS-Army programme, I could meet several officers from various army units already involved in conservation action. Some officers had taken up projects to popularise

alternate energy sources in villages adjoining their stations. Some units had even successfully implemented several energy conservation measures at their unit head quarters. These programmes I realised, were implemented thanks to the efforts of some enlightened army officers. Institutions



Re-recruited ex-servicemen of the 127th Infantry Battalion — a new frontier

like the BNHS and other non-government organisations can provide the necessary support and expertise to the army in implementing nature conservation measures. The army, in my opinion, is neither averse to the idea of implementing such programmes nor is it unaware of their importance. What the army requires is proper advice and ideas which can be put to practice. The army cannot be expected to devise plans for nature conservation and at the same time give utmost priority to national security. The Indian Army's prime objective is indeed the nation's security and the programmes that it undertakes for nature conservation must in no way undermine this fact. These can only be expected to be implemented at unit base camps and not at forward

stations. The army, in fact, has taken commendable steps to use biogas plants and solar energy at many of their establishments. The effort that the army makes to green their cantonments is itself quite laudable.

The BNHS programme aims to influence the decision-making process in the army and make the army more receptive to adopt nature conservation and nature protection measures. Unfortunately, apart from the WWF efforts of the eighties and the present BNHS programmes, very few government and non-government organisations have considered the army as a potential target audience for their nature conservation efforts. Outside India, the participation of the army in nature conservation is a difficult proposition, especially in the western countries. I vividly recall the tremendous opposition I faced at an international conference organised by UNEP while trying to convince the delegates of the potential within the army towards the nature conservation effort.

The organisational prowess and the motivated personnel that the army nourishes are of such high calibre that even if the conservation programmes are undertaken in and around the peace stations, they will surpass many of the civilian efforts in effectiveness. In my opinion, BNHS nature education activities can focus on this potential of the army. BNHS should initiate actions to revive the nature orientation programme for NDA cadets. At a few workshops during the BNHS-Army interactions I met some young officers who had interacted with me earlier in the WWF cadet camps. It was indeed delightful to learn how they had variously developed

their interest in natural history. One officer had an excellent collection of nature photographs while another had turned into a keen birdwatcher. A few others told me how they used their leisure time for nature watching, especially when they were posted at far-off wilderness areas. Since nature awareness is imperative to nature conservation action, the camps for cadets will be an important investment by the Society towards India's nature conservation movement.

BNHS can co-ordinate with other agencies to provide expertise to the army for their afforestation efforts especially in the selection of tree species and plantation techniques and also in energy conservation actions. The Society should consider different strategies of membership extension to the army, targeting specific units. Educational material, especially the *Hornbill* magazine and similar booklets and posters can be sent regularly to the units. It is advisable to target the officers since, in my opinion, an officer can develop better rapport and can lead more effective programmes with the lower ranks.

The Indian Army is not just green in appearance; it is definitely green even in its outlook! It is for organisations like the BNHS to see how best the army can contribute to nature conservation,

keeping in mind the official bounds of duty. I am sure it will not be long before both the Indian Navy and the Indian Air Force also start contributing more effectively to the cause of nature conservation. □

Dr. Shashi Menon teaches Zoology at R. Ruia College, Bombay and is actively involved in nature education activities including the current Conservation Education Project, BNHS.

Eco-battalions of the Indian Army are involved in various nature conservation activities. The army has re-recruited ex-servicemen to provide the labour.



Their activities include soil conservation in the Himalayas and sand dune stabilisation in the desert.



All this is due to the increased awareness of the importance of nature education and conservation activities for an organised body of men like the Indian Army.

NATURE ALIVE



G.N. JHA

The Asian open-billed stork inhabits a range covering the Indian subcontinent and southeast Asia. It is a local migrant, nesting from July to September in the North and January to March in the South in large colonies sometimes shared with herons and egrets. Nests are flat beds made of twigs or small branches with two to four eggs which are

white in colour. This bird migrates over short distances in search of a suitable aquatic habitat, usually returning to traditional nesting grounds for breeding. Its food consists of snails, frogs, lizards, crabs, and small insects. This photograph was taken by Lt. Col. G.N. Jha who is stationed at Danapur Cantonment, at Patna in Bihar. □

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for financial support for the publication of Hornbill.



**PADMA VIBHUSHAN DR. SALIM ALI
BIRTH CENTENARY YEAR
NOVEMBER 1995-1996**

The Birth Centenary year of the late Padma Vibhushan, Dr. Salim Ali, ex-President of the Bombay Natural History Society will be celebrated with a variety of programmes in which the participation of his friends, admirers, well wishers and the general public is invited. The following are some of the programmes contemplated:

Salim Ali International Awards for outstanding work in Field Ornithology/Nature Conservation.

Salim Ali Young Scientist Award for outstanding research work in the field of Natural History, Conservation Biology or Restoration Ecology.

Salim Ali Memorial Lecture by an eminent person in the field of Natural History and Nature Conservation from India or abroad.

Salim Ali Memorial International Seminar on Ornithology and Nature Conservation on issues related to nature conservation.

Dedication of the BNHS Conservation Education Centre at Goregaon, which is an outcome of the vision of the late Dr. Salim Ali. The Centre will be dedicated to the nation in his memory on 12-11-1995.

Release of Commemorative Stamp on Dr. Salim Ali during the Centenary Year.

Exhibitions at Bombay and other places on Natural History and Wildlife on coins, Ornithological Surveys by Dr. Salim Ali, History of the BNHS, Wildlife and Nature paintings.

Other activities include Workshops, symposia, regional meetings of NGOs, publication of revised and enlarged edition of the **Book of Indian Birds** by Dr. Salim Ali, special issue of the **BNHS Journal** and **Hornbill**, release of **Bird Call Cassettes**, fund raising to augment the Dr. Salim Ali Memorial Fund to perpetuate the work done by him and by the BNHS for the study and conservation of nature.

We invite you to participate and help to make the celebration a success.
For details contact the Director, Bombay Natural History Society, Hornbill House,
Dr. Salim Ali Chowk, Shaheed Bhagat Singh Marg, Bombay 400 023.

Ph: 2843421, 2843869. Fax: (91-22) 2837615.