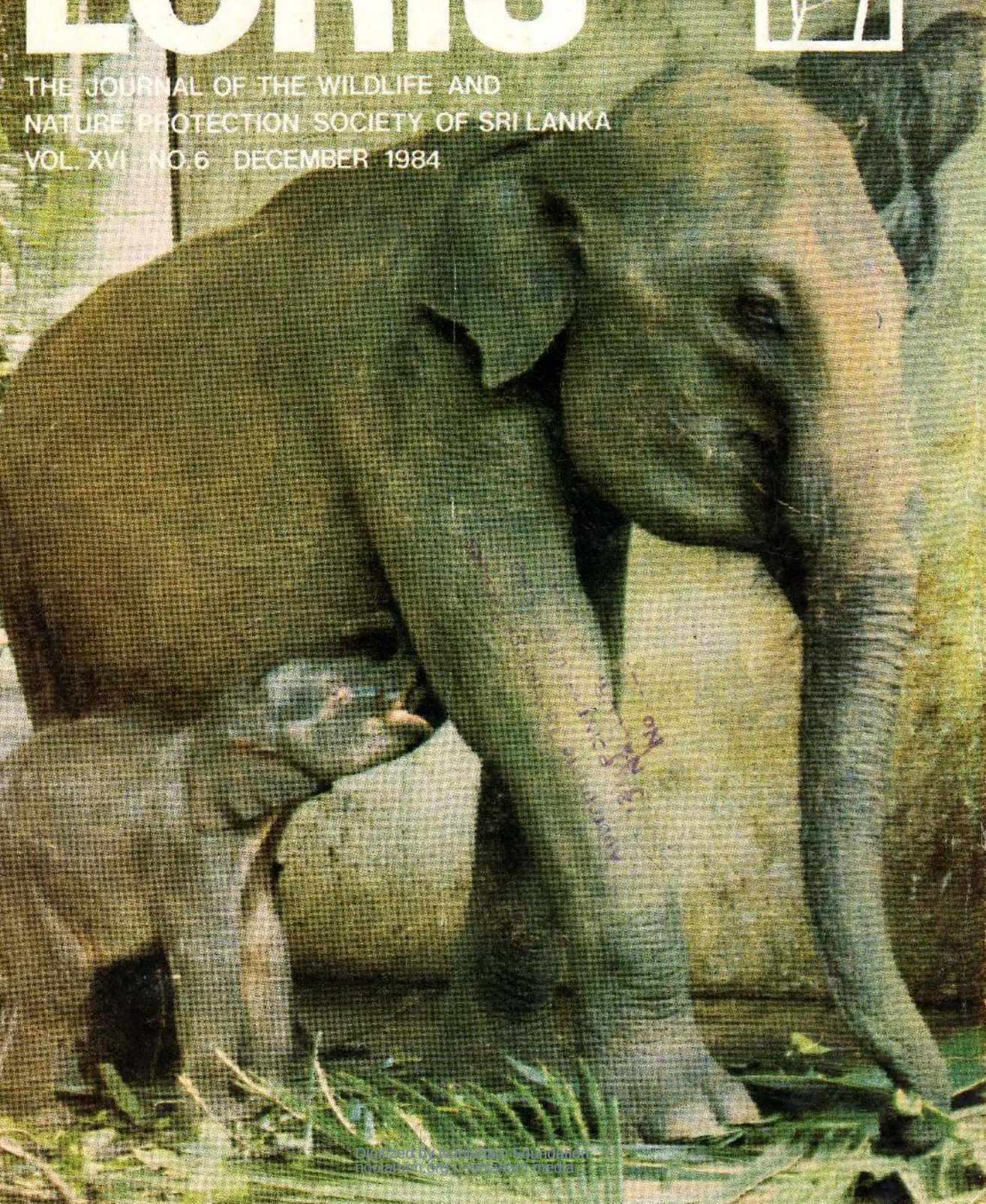


LORIS



THE JOURNAL OF THE WILDLIFE AND
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VOL. XVI NO. 6 DECEMBER 1984





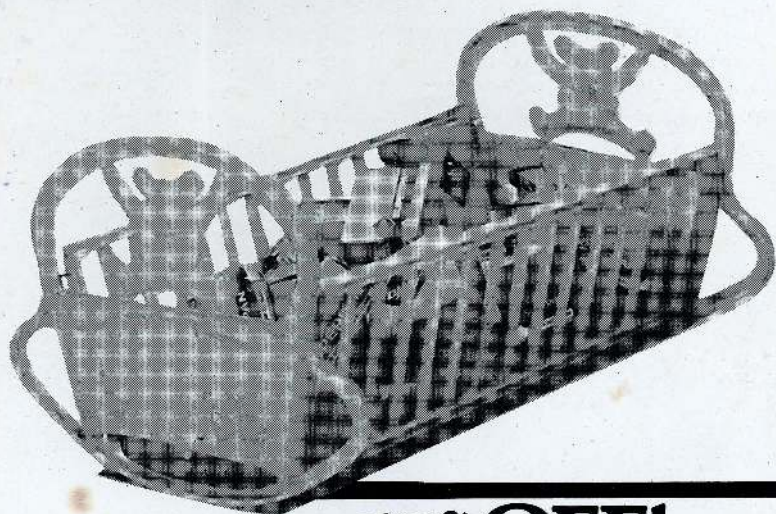
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R. A. WIJEWANSA

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KUMARI AND BABY SUKUMARI

Courtesy Lyn de Alwis

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Comment

ELEPHANT CONSERVATION — A LONG WAY TO GO

On this occasion we depart from tradition in our cover presentation. The spot light falls on a proud elephant mother Kumari by name, and her lovable daughter Sukumari.

The departure is that they do not inhabit a natural home, as did our earlier subjects; nevertheless, live in contentment at the Pinnawela Elephant Orphanage, managed by the National Zoological Gardens. And in this home Sukumari was born.

This however, is not the first occasion of elephants being born in captivity but in this instance scientists monitored and devoted greater care and attention from the initial courtship between Kumari and mate Vijaya, to the final moment of birth. We commend their diligence, skill and achievement. This event, we are told, has helped clear many a misconception about captive breeding and has provided a wealth of new knowledge.

The elephant occupies a special place in Sri Lanka's ancient history and culture. It is believed that the Asian elephant, *Elephas maximus*, originated from some Tertiary and Quarternary elephant stock in Sri Lanka. P.E.P. Deraniyagala, an authority on the Asian elephant warned some 30 years ago: "It is essential that this most complex and interesting of living mammals be studied in all its aspects by modern zoological research and an adequate number of specimens preserved for posterity before it is too late to do so. Man's rapid numerical increase and consequent deforestation of many countries are two of the principal factors for its extermination, and since a herd of elephants cannot exist in a sanctuary sufficient for smaller animals, the only feasible method of prolonging its existence is to introduce it into the vast forests of South America should these prove suitable.

"The establishment of a separate elephant department by the state to safeguard, capture and utilize the elephant is also very essential if the duration of its existence in each Asian country is to be prolonged. Such an elephant establishment existed in Ceylon under the Sinhala Kings, and the abundance of elephants in this Island was due to this wise measure."

We have now come to the crossroads in elephant conservation. They are pocketed in many parts of the Island, surrounded by cultivations and trigger-happy cultivators. Let us at least now, have a central body for elephant conservation backed by adequate funds and research. In many development areas, government agencies have collided head-on with the elephant, and tried without success -- much of it amateurish stuff -- to resolve the issues. But elephant conservation cannot be an amateur exercise.

To Sukumari

*Sukumari, born in the elephant
orphanage at Pinnawela
on July 4, 1934,
is now "a big bundle of joy."*

MANEL VAN DER POORTEN

Born free to Parents in captivity
Who have earned their freedom and
who still roam wild with passivity
Vijaya and Kumari the rescued Jumbos
At the Pinnawela elephant orphanage
Who coupled off spontaneously
(They must be a great deal romantic I gauge!)
Running off to roam together
Happy... Forever wild and free...
Being watched by their keepers vigilantly
Proud owners of their inherited property
They roamed generally a little on the spree...
And when the result was evident
Much joy ensued to watch
Kumari act indolent... and when
her resultant expansion with Babe
In good time was... an established fact...
Everyone was convinced the Romance was a pact...
At last was sealed...!
So they watched, they discussed and they
waited most patiently... for the
Great day that made grand History
When after a night's long vigil of Tender care
The great gift was delivered...
'Sukumari' ...the Jumbo - heir!
Her baby limbs proved able
for in a while after birth she was stable...
And so to roam with jumbos Mama and Papa
Protected and cared for at Pinnawela
The Elephant - home of Happiness and Glee
May she stay happy... Forever Wild and Free... ●

Vanishing Treasures

*O Flutterer of green, amid green leaves,
Is it joy, pure joy, makes you whistle like a boy
Knowing half a tune he never quite achieves?*

— John Still
From *Jungle Tide*

BERNARD KARUNARATNE

In the sprawling jungle, near the Tab-bowa colonisation scheme. The plantation skirts the main Puttalam-Anuradhapura highway. We were able to spend a brief holiday there, far from the madding crowds and the hurry, scurry and humdrum of our insufferable urban existence. We were occupying a "wadiya", a temporary shelter with a thatched roof propped by wooden pillars and wattle and daub walls built half-way. The place had gone through a prolonged drought to be ravaged later by unprecedented rain and surging floods. Though most of the crops were ruined, the rains had revived the jungle, now encroaching on the clearings. Even the arable lands were now overgrown by jungle, but this sylvan setting looked magnificent in its fresh and new verdure.

We have been visiting the place for over a decade, and the surrounding jungle once teemed with many species of wildlife. The place then must have looked idyllic with the spotted deer browsing in the glades and the sambhur giving vent to its deep cough-like call by night. The wild-boar was a frequent nocturnal visitor to the "chenas" and even herds of wild elephants visited the villages during rainless spells. Progressive deforestation and "chena" cultivation have driven these denizens of the wild, to the

innermost recesses of the residual jungle. The few animals straying out now, fall easy prey to the traps and guns of famished peasants eking out a bare existence in an arid land, thirsty for water during the greater part of the year. Preaching conservation may not be quite meaningful to a people existing at starvation level. Conservation, is still not in their vocabulary. The exit of these wild creatures, however, has rendered the place considerably poorer.

It was gratifying to note, however, that the local avifauna has not suffered the same fate. The place remains a haven for a wide range of birds and may even prove a happy hunting ground for any bird fancier or an ornithologist. Our brief stay there coincided with one of the most fascinating phenomena to be observed in the animal kingdom. We in Sri Lanka experience two butterfly migrations during the year in March and in November. This year, the March migration was spilling into April. One morning in particular, we found these colourful insects in their infinite numbers staging a marvellous spectacle. These fliers belonged almost exclusively to the white, yellow and sulphur coloured Peiridae group. From about 9 a.m. the flights continued till almost noon though a few stragglers could be seen even later. They seemed to enjoy the burning sunlight as

they dazzlingly tossed, skipped and skimmed over the low vegetation. They were heading in a southerly direction, a fact not inconsistent with the popular belief that their destination is Sri Pada. Be that as it may, that it is nature's device, to ensure breeding among dispersed groups or to preserve the ecological balance by numerical control seems to be a more plausible explanation.

Despite the constant flow of traffic down the highway, the nights were remarkably quiet and peaceful. The bass and tenor music of the frogs inspired by the evening rains, the distant boom of an owl and the yell of prowling jackals were some of the voices of the night. The distant "ik-hoo" call heard one night might have originated from an emerald dove. Most unpredictable were the frenzied and startled screams of Kirala, the Red-wattled Lapwing, whose notes are popularly rendered as "did-you-do-it; pity-to-do-it". With the first flush of dawn comes the morning orchestra of our feathered artistes. It is a symphony-chitter-chatter, tweet-twitter, chirp-chirrup, warble - whistle, notwithstanding. The general effect is harmonious and euphonic. The discerning ear, however, can pick the honk of the coucal, the cackle of the kingfisher or the trill of the magpie, the virtuoso among the performers. We woke regularly, therefore to a morning of heavenly music. Likewise, the roosting birds sing their evening vespers when the day is done.

A foray into the nearby thickets along the narrowly twisting footpaths would be rewarded with the sight of a variety of species ranging from the Tailor Bird to the Grey Hornbill. For a distant glimpse of the gorgeous Peafowl perchance perched on a withered bough of a stately Palu tree (*Manilkara hexandra*) an element of luck would be necessary. Many varieties of babblers, warblers, flycatchers, bee-eaters, sunbirds, wagtails, bulbuls, drongos or orioles

were all there in their infinite variety of colour and song. Not being experts we were unable to identify most of them. A startled pair of Bush Quails might shoot out from almost under our feet whirring, like bullets. Our "wadiya" was between the well known Tabbowa Tank and the unfamiliar Karamba Weva—a village tank. Overhead, therefore, criss-crossed many species of water-birds engaged in shuttle-flights between the two reservoirs. In this category were flapping little cormorants, fluttering Cotton Teals, clumsy Purple Herons and many other varieties of Herons or Egrets.

In the mid-day heat from the very cosy comfort of our beds we could observe or hear many members of our sylvan aviary. The solo performance of the spotted dove often changed into a duet when its mate responded from its distant perch. A Black Robin squeaked in the flower-beds; a Red-vented Bulbul entered our shelter and surveyed the roof-beams for a nest-site but was perhaps discouraged by our presence. Over the half-walls we could watch numerous chattering mynahs and a pair of screaming Rose-ringed Parrots going in and out of their nests in the trunks of many crownless coconut palms killed by the recent drought. An Indian Roller flew tumbling and calling raucously, to its regular perch on a "murunga" (*Moringa olifera*) branch. It is distressing to record, however, that the clear clarion voice of jungle fowls so boisterous and frequent in the past, is now almost stilled even in these parts. During our recent stay we had to be content with the fleeting "kwi-kook;kwi-kook" call of a hen heard one morning. We must be thankful that at least in several remote places like this, a substantial portion of our avifauna continues to live with us. It is incumbent on us, therefore, to act with a sense of urgency and awareness in preserving our environment with all its natural heritage for the benefit of those who will come after us. ●

Important Medicinal Plants Component of the Sri Lanka Flora

D. T. EKANAYAKE

Besides commercial products such as timber, firewood, fodder, natural gums, resins, edible products, fatty and essential oils, dyes, tannins, perfumery material, narcotics and a host of other products, a large number of plant drugs used in the indigenous system come from natural vegetation. Therefore, a close relationship exists between the vegetation and the pharmacy. Despite this very important relationship people in Sri Lanka have not made much effort to conserve, maintain and develop the drug plant resources of the island. There is continued extraction of vegetable drugs from forests and other natural habitats which has resulted in the gradual depletion of some of these drug plants to such an extent that many precious medicinal plants would eventually disappear from our island without even leaving a trace for posterity. A very good example is Weniwel-geta, (*Coscinium fenestratum*) (Gaertn.) (Coleb.) This climber was at one time very common in the forests of the wet and intermediate zones, but today, it has become rare due to over-exploitation. The dried stem of this plant yields a drug which is yellow in colour containing berberine. A decoction of the stem is taken as an anti-tetanus agent. The drug is also useful as a bitter tonic in fevers. It is also useful in the treatment of wounds as it is considered to be antiseptic.

D. T. Ekanayake is retired Deputy Director (Botanic Gardens), Sri Lanka Department of Agriculture.

In contrast to the above plant, there are relatively abundant medicinal plants such as Nelli, (*Phyllanthus emblica* L.) Bulu (*Terminalia bellirica* (Gaertn.) Roxb.) and Aralu (*Terminalia chebula* Retz) which are found growing in the Ampara and Moneragala districts.

It has been estimated that the Savanna lands where these plants are found are about 72,000 ha in extent and these resources are quite adequate to meet the local demand. These three plants in combination constitute the well known 'Triphala' in ayurvedic treatment. Besides their medicinal value, Aralu and Bulu, known as Chebulic Myrobalan and Belleric Myrobalan, are good sources of tannin for tanning leather and dyeing textiles.

Ekaweriya, (*Rauvolfia serpentina* (L.) Benth. ex Kurz), was a common shrub in the wet zone up to an altitude of about 600 m, but it has become rare due to over-exploitation. Nearly 3000 years ago, it was being used in ayurvedic medicine in India as a remedy for snake bite, anxiety, fever, diarrhoea, dysentery and insanity. Today, an alkaloid extracted from its roots, namely reserpine, is used in modern clinical medicine for lowering arterial blood pressure (hypertension.) Besides reserpine, about 21 other alkaloids have been isolated from the root.

Three species of the genus known as *Berberis* have been recorded from Sri Lanka namely *B. ceylanica* Schneid.

B. wightiana Schneid. and *B. tinctoria* Lesch in Ahrendt's (1961) taxonomic revision of the genus. Trimen has grouped all these three species under *Berberis aristata* DC. *B. ceylanica* is an endemic species while *B. wightiana* and *B. tinctoria* are also found in the Nilgiri Hills and Ootacamund in India. All these species are recorded from Nuwara Eliya, Pidurutalagala and Horton Plains.

An alkaloid called berberine is found in *B. aristata* and certain other related species. It is used in the treatment of ophthalmia and other eye diseases, besides its use in fevers and as a mild laxative and tonic. The drug has a depressant activity on respiration and the heart. It is said to be valuable in tuberculosis. Phytochemical screening may be carried out with the Sri Lankan species to determine whether their roots contain berberine.

The genus *Rubia* of the family Rubiaceae is represented by a single species in Sri Lanka. This species is *R. cordifolia* L. which is known as Welmadata in Sinhalese and Manjista in Sanskrit. It is also called Mandamadiniwel or Yogana wel locally. The plant is found in the montane zone above 1000 m altitude. It is not a very common plant, but seen growing occasionally in the transition zone between the wet patana grassland and the montane forest. Welmadata is an important drug plant used in the ayurvedic system. The roots are used in medicine, and also contain a red dye. The drug is an astringent, antiseptic and parasiticide used in the treatment of wounds and skin diseases. Taken internally it acts as an expectorant and diuretic. Roots are used in the treatment of skin diseases, urinary complaints, jaundice and piles. The drug is also a mild laxative. Sri Lanka imports a large quantity of

welmadata annually from India. Thus Welmadata is a promising crop for cultivation in the montane zone.

The Asoka tree of India, (*Saraca asoca* (Roxb.) De Wilde), occurs in Sri Lanka but it is not a common plant in the wild state. It occurs rarely along streams in the intermediate zone, but it is often cultivated for its showy flowers. The dried bark of the tree is of value in ayurvedic medicine. It is used as an astringent in the treatment of uterine disorders as a substitute for Ergot. The bark is also considered to be a cooling tonic. It is the principle constituent of the well known Asoka Aristaya of ayurveda. The Asoka tree deserves to be included in reforestation programmes.

Embelia ribes Burm f. of the Myrsinaceae is a common plant in the low country wet zone and locally it is known as Walembilla. This plant is actually Walanga-sal of the Sinhalese and Vidanga or Baibirang or Bhungi of the Hindus. The dried fruits of this plant form Walanga-sal. It is used in the treatment of worms in children and infants. The drug is also a mild laxative. In Sri Lanka, the roasted seeds are given to infants in the form of an infusion with hot water as a vermifuge and for minor bowel complaints. Local children chew the purplish pulp of the fruit which has a sweet - sour taste.

Despite the fact that the tree known as Maila in Sinhalese (*Bauhinia racemosa* Lam.) is a very common plant in the dry zone, the dried flowers of this plant are imported. The drug contains tannin and it is used in the treatment of diarrhoea, dysentery and bleeding from haemorrhoids.

The common Gotukola, (*Centella asiatica* (L.) Urban) is considered to be a

tonic for nervous and brain disorders in the ayurvedic system. The leaves of this plant contain a glucoside called asiaticoside. It was used for the treatment of leprosy. The plant contains amino acids, glutamate, resin, alanine in large quantities as well as aspartate, serine, threonine, lysine, histidine, amino-butyrate, triterpenoid and sterol compounds. Juice extracted from the raw leaf is a diuretic. A decoction of Gotukola leaves, flowers, roots and seeds is reputed to remove cholesterol from the blood vessels and helps to lessen hypertension. If it is taken regularly it acts as a tranquilizer. It is said that a certain drug firm in France uses the extract of Gotukola in the form of powders, tablets, injections and creams to induce faster cicatrization of wounds, burns, various ulcers and certain dermatological ailments.

Gaultheria rudis Stapf. (= *G. fragrantissima* sensu Trimen) known as Wel kaduru in Sinhalese is a common plant in the upper montane zone particularly in the patana grasslands. The plant contains wintergreen oil. This volatile oil is used in the treatment of rheumatism. It is also useful in destroying hook-worms and has stimulant and carminative properties.

One of our most important forest resources is Goda kaduru, (*Strychnos nuxvomica* L.). It is a very common tree in the northern, eastern and south eastern dry zones. This valuable resource is endangered due to the clearing of forests for irrigation, agricultural projects and chena cultivation. Action is needed to conserve the existing trees. The seeds of Goda kaduru contain a number of alkaloids of which strychnine and brucine are important. India exports 20-25 tonnes of strychnine and brucine annually valued at 3.0 to 3.2 million rupees. USA is the chief market followed by UK and Japan.

Strychnine is used as a respiratory stimulant, but it is mainly used as a rodenticide. Dymock, Warden and Hooper (1891) quoting Dunstan and Short report that in a sample of seeds from Sri Lanka, as much as 5.34 per cent of total alkaloids was found. They have found that the pulp of the fruit contained 1.4 per cent of strychnine and 1 per cent brucine. It would be profitable for Sri Lanka to extract the alkaloids locally rather than exporting the crude products to India.

Thebu (*Costus speciosus* (Koen.) Sm.) of the family Zingiberaceae is a promising steroid yielding plant. Indian workers have found that the rhizomes of this plant contain as much as 2.7 per cent of diosgenin. Thebu is found in the wet zone and the diosgenin content of plants growing in various localities may be determined so as to obtain the best strains for cultivation. The world prices for diosgenin in 1969 ranged from U.S. dollars 12.50/kg to U.S. dollars 17.00/kg. Since then prices have risen.

Niyangala, (*Gloriosa superba* L.) of the family Liliaceae is a common creeper in Sri Lanka particularly in the dry zone. Its tubers and seeds contain colchicine which is used in the treatment of gout and rheumatism. It is also used in botanical research for inducing polyploidy in plants.

The plant called Rodanti in Sanskrit, (*Capparis moonii* Wight.) is a very rare plant in Sri Lanka. It is a large, woody climber reported to be occurring in the moist country up to about 1000 m altitude in Hunnasgiriya, Alagalla and Panwila. Fruits of this plant have been used effectively in the treatment of pulmonary tuberculosis.

The common Kumbuk plant (*Terminalia arjuna* W. & A.) is found growing near streams, tanks and waterways

in both the wet and dry zones. It is said to be a cardiac tonic in ayurveda literature. The bark contains a crystalline compound arjunine, a lactone, arjunetin, essential oil, tannin and reducing sugars. Kumbuk wood ash contains about 50 per cent lime, about 12 per cent potash and about 5 per cent phosphoric acid.

The plant known as Malitha, (*Woodfordia fruticosa* Kurz.) is a somewhat rare shrub in Sri Lanka. It is locally abundant in the Uva patanas, Bandarawela and along the Badulla Road below Hakgala, but it is nowhere common. The flowers of this plant called Malitha mal is imported in large quantities as it is frequently used in the preparation of 'Asawas' and 'Arishtas'. The flowers contain 10.19 per cent reducing sugars, 15.90 per cent non-reducing sugars with sucrose 15.11 per cent and tannin. It can be grown on a commercial scale in the waste lands in the Badulla and Bandarawela areas.

Madan, (*Syzygium cumini* (L.) Skeels) of the family Myrtaceae is a common tree in the wet and dry zones of the island. The bark and seeds of this plant are of medicinal value. They are useful in the treatment of diabetes, the seeds being more potent than the bark. The bark is also used in sore throats, bronchitis, asthma, ulcers and dysentery. The drug has antibacterial activity.

Gas kela (*Butea monosperma* (Lamk.) Taub.), known in English as the Flame of the Forest is a rare tree of the dry zone forests. The bark yields a red gum called Bengal Kino. The gum contains tannins and is valuable in the treatment of diarrhoea. The seeds are useful in the treatment of roundworms and it is a substitute for santolin. They are also

useful in the treatment of certain skin diseases. The Gas kela tree should be protected and its cultivation should be included in reforestation schemes in the dry zone.

The Mee tree, (*Madhuca longifolia* (L.) J. F. Macbr.) of the family Sapotaceae is a common tree of the dry zone. It is cultivated in the wet zone and is a very important medicinal tree, all parts of the tree being used. The bark is useful for skin diseases, bleeding gums and ulcers. Internally it is given for diabetes. Ash of the leaves mixed with butter is recommended for burns and scalds. Flowers are used in cough and bronchitis. Some antibacterial properties have been detected in the flowers. The oil from seeds is good for skin diseases and it is a mild laxative. In industry, it is used in the preparation of soaps and cooking oil. The oil cake is a cattle food and a manure.

Amukkara, (*Withania somnifera* (L.) Dunal), is a weed in cultivated ground but it is often cultivated in home gardens. The plant is known as Ashwagandha in Sanskrit and it is imported in large quantities for the preparation of ayurvedic medicines. The root is prescribed for nervous disorders, insanity, hypertension, ulcers and swellings. It is said to be a sex stimulant, aphrodisiac and rejuvenator. The fruit is also considered as a diuretic and coagulative. The leaves are supposed to reduce inflammation and promote the healing process. The root contains an alkaloid known as Ashwagandholine and two saponins. These alkaloids possess a mild depressant activity on the nervous system. The plant can be cultivated on a commercial scale in the wet, intermediate and dry zones.

Bimtal ala or Heen bimtal ala (*Curculigo orchiodes* Gaertn.) is a common weed in grassy places, but it is imported in large quantities. The root is supposed to be an aphrodisiac, alterative and appetiser. It is also recommended for bronchitis, indigestion, vomiting, diarrhoea and lumbago. The drug is considered to be a diuretic, demulcent and tonic. This plant can be grown in the wet zone.

An endemic plant called Valerian, (*Valeriana moonii* Arn. ex C. B. Clarke), occurs in the upper montane zone such as Horton Plains. This plant is closely related to the Indian Valerian, (*V. officinalis* L.). The root has the characteristic smell of Valerian and could undoubtedly be used as a substitute for the Indian Valerian. The root of this plant is the drug which has a depressant action on the central nervous system and is used in the treatment of hysteria and other nervous disorders. This plant can be grown on a commercial scale in the montane zone, after conducting phytochemical screening.

Thippili, (*Piper longum* L.), of the Piperaceae is doubtful as an indigenous plant, but it is often cultivated in home gardens. However, the plant has been included in Trimen's Ceylon Flora. Thippili is imported in large quantities for the preparation of ayurvedic medicines. The Sri Lanka Ayurvedic Drugs Corporation alone has imported 7000 kg of Thippili in 1980 at a cost of Rs. 635,951.00. This plant can be grown successfully in medium elevations of the wet zone as an intercrop with pepper, since Thippili requires the same climatic conditions as pepper. While pepper is grown on supports, Thippili being a straggling plant, can be easily grown in beds. It is easily propagated

from cuttings. Production commences about 3 months after planting.

In this paper only 27 important indigenous medicinal plants are mentioned, but there are over 500 indigenous species used in ayurvedic medicine. This paper is intended to alert botanists, biochemists, physicians and others interested in our flora to take cognizance of its drug resource component and formulate plans to conserve, develop and promote research and cultivation of the drug plant resources of Sri Lanka.

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Indian Paradise Flycatcher

"The beautiful white-phase males are now believed to be all winter visitors from India, while the Ceylonese race appears never to develop white plumage."

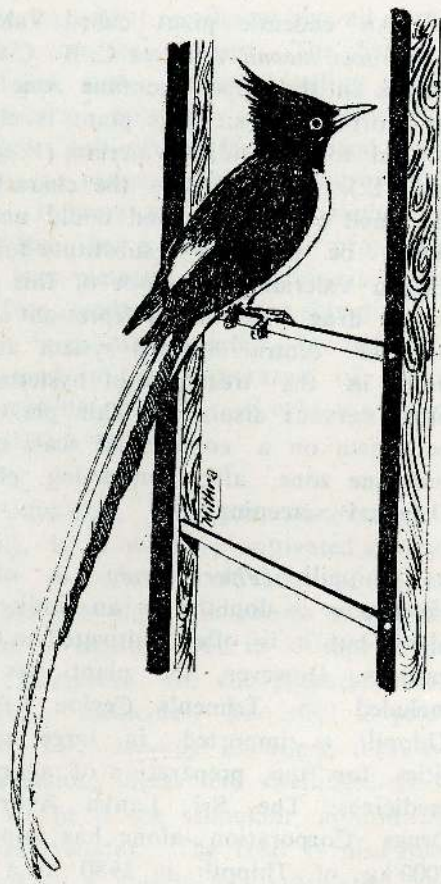
— Henry
from "A Guide to the Birds of Ceylon"

LUCKY ABEYWARDENA

Many fruit trees growing close to each other where the branches form a closed canopy, offer an excellent resting area, with an abundant supply of food—both insects as well as fruit—to the variety of birds who are daily visitors to my garden in Nawala. I have observed twenty-three varieties, from my verandah.

One morning in late September 1983, I was happy to hear the now familiar "Kreech Kreech" from the mango tree. Expecting to see the usual visitor from India, the white long-tailed male Paradise Flycatcher, I went out to the garden. Here, I was in for a pleasant surprise. Flitting actively from branch to branch, with its characteristic style of flight, was a full grown chestnut-winged male, but its long tail streamers were pure white with a thin brown line running along one edge. The shorter tail feathers underneath the long streamers were chestnut coloured. There was also a white patch on its rump, somewhat "V" shaped. From the day it was first observed in September upto the time of departure in the first week of March, its daily visits to the garden were very regular in terms of arrival and departure times. It announces its arrival around 6.30 a.m. and leaves the garden by 7.15 a.m. the latest. It is again seen late in the evening preening its feathers after a bath in the nearby Diyawanna Oya.

It was also amusing to see being chased away, the other early callers like the Magpie Robin, the Red-vented Bulbul, and even the squirrels from its



territory, until itself chased away by the common Drongo.

During a stay of nearly 6 months, it was observed that there was no appreciable change in appearance or colour. Is it possible that this was a cross between a migrant and a resident bird? Readers comments are welcome. ●

My Tailor Birds

JAMES SENARATNE

I was knocked down by a motor-bus,
And after all the pain and fuss
My foot was grafted with new skin
And here I shall my tale begin.

I lay upon a sofa, my foot immobilised,
To pass each long and dreary day my brain had oft devised
So many things for me to do to pass the tedious hour –
I ended in my garden amidst the trees and flowers.

At length, quite bored, I chanced to look
At an obscure and shady nook.
A twig I saw began to shake
Although no breeze blew through that brake.

'Twas then I spied an olive ball
Of feathers give a cheepy call.
This first delightful chirp I heard
Was uttered by a Tailor-bird.

This little three inch ball of fluff,
Had sewn a nest just big enough
To house his wife and family,
With leaves on our Ixora tree.
His industry was such that he
Had quite forgot to notice me.

His house consisted of three leaves,
They formed the walls, the roof, the eaves;
A corner that he did not sew
Became his one and only door.

And snug inside he made his bed
With bits of fluff and cotton thread,
E'en P.M. can't protest
That he could make a cheaper nest.

Perched by this nest his mate he wooed,
And they betwixt them raised a brood.
Then how they rushed about post-haste
For not a moment did they waste.
They searched for insects, (they taste good),
And baby birds need lots of food.

Then when the fledgelings fluttered out,
They argued long to clear a doubt
Of who resembled Pa or Ma
Or which young bird could flutter far.

My days of pain and boredom done,
I scarce could wait the morning sun,
For me to watch this family
That lived in our Ixora tree.

For many days his mate and he
Would come and keep me company,
And though more busy than a bee
They never failed to chirp to me.

These happy birds gave me such a joy
I think that doctors should employ
A cheerful feathered friend or two
To soothe your pain and comfort you.

I really can't express in words.
The debt I owe those Tailor-birds ●

LEARNING TO LOVE TREES IN THAILAND

Poor farmers and forestry officials have clashed for years in northeast Thailand, the farmers wanting food for today, the foresters protecting forests for the future. Farmers have threatened forestry workers, pulled up seedlings and even tried to start forest fires. There are signs that peace is at hand.

Intense farming in the fertile south is squeezing the poor and landless northwards. Three-quarters of northeast Thailand, once half covered with hardwood and evergreen trees, is now barren. The government is so alarmed at the speed of deforestation that it has threatened severe punishment, including summary execution, for the illegal cutting of trees. Such threats are aimed mainly at poachers of valuable hardwoods.

But for political reasons the government is also committed to aiding farmers in the northeast, which borders on communist Laos and Kampuchea. It is aiding agricultural development there, while at the same time encouraging farmers to plant trees.

Key to this policy has been a type of land reform whereby farmers are given "user rights" to land which technically belongs to the forestry department. Each family can cultivate and profit from about 2.5 ha (six acres) without owning it outright. Families are grouped into "agro-forestry villages", and water, roads and schools are supplied to each village. Security of tenure means farmers can get bank loans for farm implements, seed and fertiliser.

The land is given on the condition that they plant a certain number of trees. In early 1983, the forestry department reported "nothing but trouble" in its attempts to enforce this rule. By mid-1983, however, farmers began planting fruit trees around their homes and were asking for eucalyptus seedlings. It seems they were prepared to plant trees once their own basic needs were met. They no longer saw the trees as standing in the way of their own survival.

— EARTHSCAN

A JUNGLE HOLIDAY

On a warm sunny day, in the middle of December, voyaging on a sea of glass, I beheld a seeming long white cloud low on the horizon. It was Ceylon - the land of dreams.

— Moncure Daniel Conway (1883)
From "Images of Sri Lanka through
American Eyes."

EILEEN WYNELL-MAYOW

Looking through some papers of my father's (W.W.A. Phillips), I came across a report in the Ceylon Daily News of the AGM of the Ceylon Game & Fauna Protection Society—now the Wildlife & Nature Protection Society of Sri Lanka—in which Dr. R.L. Spittel is quoted as saying "That they had in Ceylon some very lovely jungles which were particularly well adapted for holidaying in, and those of them who visited the jungles knew that there was no holiday better than a jungle holiday". This was dated Monday, November 27, 1939 and is as true today as it was then.

After 13 years, I returned to Sri Lanka for a short visit in March/April this year and I was extremely lucky to be invited to join a party at Patnagalla Bungalow in Ruhunu National Park. We left Colombo

early on the Tuesday morning, motoring along the coast road which is busy and crowded, more so than I remembered; had a quick stop at the unusual and charming Tangalla Bay Hotel and ate our picnic lunch under the huge wayside trees just beyond Tissamaharama. Checking in at the Park Office, we collected our tracker and reached Patnagalla about 3 p.m. to be greeted by our kind host, Dr. Brendon Gooneratne, and just in time for a swim before doing an 'evening round'.

That first evening set the standard for our entire visit; a bear jumped onto the road just in front of the car, had a good look at us and ambled off into the jungle. A leopard walked down the road, allowing us to follow slowly behind for a good distance before he too, disappeared into the jungle. We watched an elephant having a dust bath and saw herds of deer, many (perhaps too many) buffalo and several

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families of wild pig. We were up at dawn the next day and what a magnificent dawn it was, with the sky gold and red and the 'dawn chorus' in full voice. This is my favourite time of day in Sri Lanka and one I often think of, as I struggle out of bed on a chilly winter's morning in England; Yala looks particularly beautiful in the early morning light, and this year with the unusually heavy rains the jungle was green and lush. Sambhur were dozing in the sun and we had an excellent view of a very fine lone stag. Leopard were seen each day—once up a tree—on other occasions on the main road; several times we saw a lone elephant, feeding or indulging in a dust bath, and once a small herd of six or seven. The morning we were leaving, a bear scurried across the huge rock behind the bungalow, and peculiar noises heard on the last evening were identified by Brendon as bears mating.

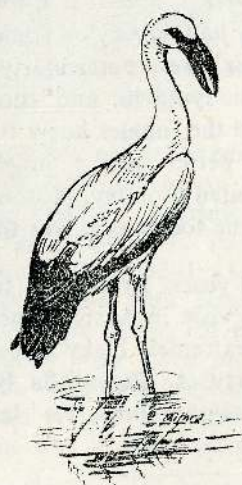


Spoonbill

For me, these animals are an added bonus, my first love is for the birds and how many and how varied they are in the early morning; jungle cock were frequently seen on the road, giving their distinctive cry; peacock were displaying, the sun glinting off their tails; openbill, spoonbill, white ibis and painted stork foraging in the streams for breakfast. In the evenings hoopoe, bee-eaters (green and chestnut-headed) and nightjar settled in the warmth of the

roads, and we saw three fine Black-necked Storks feeding near Buttuwa. A White-bellied Sea Eagle flew over daily during our midday swim and Brahminy Kite, Ceylon Hawk Eagle, Serpent Eagle and two beautiful Fish Owls were seen in the Park. In the vicinity of the bungalow I noticed, amongst others, a pair of Imperial Green Pigeon, Red-backed and Pied Woodpecker, and a noisy party of White-throated Babblers. Ceylon Paradise Flycatcher, Yellow-eyed Babbler, Ceylon Shama, Little Minivet, Malabar Pied Hornbill, Orange-breasted Green Pigeon Great Stone Plover, plenty of Pintail Snipe, Garganey and Whistling Teal, a family of Little Grebe, two Bar-tailed Godwit, and a few Blue-tailed Bee-eater, Bustard Quail, Golden Plover—these are only a few of the wealth of birds that abound in this beautiful corner of Sri Lanka,

I spent a further three days in the comfort of the Tangalla Bay Hotel with Mrs. Nugawela, my friend and companion on so many, happy trips (see Loris Vol X No. 5, June '66). With the help of a guide we made an interesting visit to the Blowhole near Nakulugamuwa, a place I had read of in R.L. Brohier's book 'Seeing Ceylon', and



Openbill

I was glad to have the opportunity to see this natural phenomenon. The sea churns through a narrow fissure and is forced up through a vertical tunnel, with a tremendous roar, sometimes as high as 50 feet. Although relatively calm when we were there, it was still impressive and in monsoon times it must indeed be a magnificent sight.

The area between Tangalla and Hambantota is particularly attractive—grassland, paddy fields and coconut plantations border the road, and in the distance, a backdrop of the blue hills of Uva, which was my home for so many years. There are a multitude of birds; Egrets, Paddy birds, Grey and Purple Heron, Cattle Egret just coming into their breeding plumage; overhead Gull-billed Tern, Little Tern and a few White-winged Black Tern circle and dive, and large flocks of Spotted Munia raid the paddy fields. We spent a wonderful day in the Hambantota area, birdwatching with Dr. Sunil Wickremasuriya and his wife picnicking in an ideal spot under the trees with Jerdon's Chloropsis feeding overhead, Blue-faced

Malkoha flitting through the undergrowth, White-browed Bulbul calling, and a Ceylon Wood Shrike sitting on her nest close by. There was a small flock of Flamingo on the saltpans, and still a good number of waders feeding at the edges of the wewas. At Kalametiya we had an excellent view of the Brahminy Mynah; the first time Sunil had seen one in this area, but though we spent some time searching the tank, the Glossy Ibis, which are known to be there, eluded us.

Truly Sri Lanka is a paradise for the bird and nature lover. Even in the busy metropolis of Colombo, Tailor Bird, Loten's and Purple-rumped Sunbird, Ceylon Small Flowerpecker and Black-headed Oriole were in the garden, all remarkably tame, and Pied Kingfisher, Little Green Heron, Cormorants, Egrets and Pelicans were seen on Beira Lake. My time was all too short, but I hope one day to return to this lovely island and its kind and hospitable people, who made my visit so memorable and enjoyable. ●

SAVE THE HIMALAYAS

The awesome, otherworldly Himalayas, revered by Hindus and Tibetan Buddhists as the temple of planet Earth itself, are being ecologically spoiled says an international body formed to meet the problem. Mountaineers say Mt. Everest is becoming a high-altitude rubbish dump as treckers discard non-decayable refuse. A burgeoning population of 30 million in the mountains is putting enormous pressure on the ecological system, causing deforestation, overgrazing, severe erosion. The International Centre for Integrated Mountain Development (ICIMOD) was recently formed by UNESCO and three countries to "help improve the living conditions..... and strive to preserve the mountain ecosystem."

"The Nation behaves well if it treats the natural resources as assets which it must turn over to the next generation... Conservation means development as much as it does protection."

— Theodore Roosevelt

—The News Savite World
News Supplement
(Sent by Sam Wickremasinghe)

Metamorphosis of a Moth

"It is not the creature we must wonder at....it is to that infinite wisdom, to whom under various names and denominations we all pay homage, which controls the world, that our admiration is due whose indelible stamp is found even among a group of caterpillars feeding on the back of a leaf".

- Fabre

CLEVO WILSON

On October 17, 1983, an unidentified species of caterpillar was taken feeding from a rose plant in our garden. Previous to this date I had read about the breeding of butterflies and moths. I knew that one of the best ways of getting to know Lepidoptera and their habits is to keep and watch them at home, preferably in as natural surroundings as possible. I also knew that it will give me great satisfaction in watching a butterfly or moth emerge from the larva stage to the chrysalis that I myself had nurtured and more important was their conservation. I was delighted at the idea of helping at least in a small way of conserving an insect which is fast disappearing as a result of the so-called progress of civilization. We know that Lepidoptera multiply in captivity more than they possibly can in the wild, so breeding butterflies for release can be very worthwhile in aiding conservation. This proved to be so in my experiments. Their was almost 100 percent success because none of the specimens died during the time they were under my care.

Clevo Wilson is an Advanced Level student of St. Anthony's College, Kandy.

The caterpillars or larvae that were taken on October 17, 1983 proved to be the ideal specimens for my programme. I took the whole lot from the rose leaf, numbering about 450 - 500. The specimens were so tiny that it was impossible to count them. But later when they were big they were counted and the figure 450 - 500 noted.

These tiny creatures (the larvae) had just hatched out from a clutch of eggs. I arrived at this conclusion from the fact that they were motionless and so tiny. They were presumably taking their first meal from the egg shells which constitute their first diet. It should be noted that the newly hatched caterpillar or larva usually takes its first meal from the egg shell and many will not survive unless they do this. It is an important point to remember when breeding butterflies and moths. These tiny creatures were taken with the leaf itself and placed in a large Horlicks bottle which was lined with paper thus covering the transparency of the bottle and making the inside of the bottle dark. More rose leaves of the same plant on which they were taken feeding were put into the bottle. Utmost care was taken when transferring them from the leaf to the bottle. They can also be bred by

transferring them by picking them up gently on the tip of a soft paint brush on to a pot of the correct food plant.

If not, by using a large plastic box, lining it with paper and by putting freshly cut leaves on top of the paper lining. The box should be of clear plastic so that you could see everything taking place inside. But I covered the whole bottle with paper since the glass of the bottle was slippery. From then onwards careful observations were made.

The caterpillars were black in colour with orange stripes on their bodies. The head was also orange in colour. The hair on their bodies was black. The caterpillars were tiny and looked like ants.

On October 18, the leaves were unchanged. The caterpillars were observed moving around the bottle, one after another in single file. About 2 to 3 leaves were devoured by the caterpillars. The rest were untouched.

On the October 19, the leaves in the bottle were changed in the morning. Fresh leaves from the same plant were put after cleaning the bottle and lining it with fresh paper. The black droppings of the caterpillars were removed when cleaning.

On October 20, there was no movement at all. They had not devoured a single leaf which was put the day before. I got the shock of my life! Were they dead? However the bottle was left untouched without even removing the leaves. But the next day on the 21st to my surprise they were seen again moving about, with some leaves devoured. There I was to make my own discovery and learn things by myself. They had for the first time shed their skins. That is why there was no movement at all

and all feeding stopped. Once they had shed their skins they looked bigger than they were before. The skin is only capable of stretching within certain limits; so the caterpillar sheds its skin several times during its growth and a new larger skin appears beneath the old one which splits down the middle and is shrugged off at the tail end.

The specimens under observation shed their skins 9 times. Most species change their skins about four times though as many as 40 changes have been known. The skin that was shed was pale in colour and looked like wool. The significance of skin shedding is to allow the caterpillar to grow. It is this skin shedding that helps the tiny creature to grow and eventually increase its weight by as much as 1000 times.

Caterpillars are voracious feeders. Its sole purpose is to eat and grow and some caterpillars hardly take a rest. This was also the case with the caterpillars under observation. They would devour about 4 to 5 rose leaves in about 3 minutes or even quicker than that. So a constant supply of rose leaves had to be at hand to feed this army of caterpillars. When not fed they would move around one behind the other in single file. The caterpillars preferred tender rose leaves than the mature leaves. As it was difficult to feed them solely on rose leaves, I mixed the rose leaves with mulberry leaves. There the tender leaves were left out (partly devoured) and the mature leaves devoured. I have also seen this species of caterpillar feeding on the bark of Christmas trees.

When they feed, they start from one corner of the leaf or from the edge of the centre of the leaf and then work their way through. The chipping of leaves is carefully executed without any leaf being left out. No wonder it is regarded as a pest by many a farmer and agriculturalist. The sound of a rustle of a leaf was heard when the caterpillars chip the leaves off.

Each day the bottle had to be cleaned (removing the droppings) and fresh green leaves put in. Week by week the caterpillars grew in size and the Horlicks bottle was too small to house them all. So they were shifted to 2 more bottles. The mouth of the bottles were covered with nets in order to prevent them from escaping. When transferring they sometimes came in contact with the fingers thus causing skin irritation, but this lasted only for a few minutes.

These observations continued for exactly 75 days with the caterpillars growing huge, measuring about 4.75 cm (average) and some as long as 5 cm.

This time on January 18, 1984 the larvae shed their skin but instead of their being another larval skin beneath, the new one was in the form of a pupa. The pupae were still soft and was not the colour of the final pupae. They were still rather larval in shape but after some hours, had hardened and taken the full shape and colour of the pupae. The pupae were chestnut in colour. The caterpillar had earlier spun a cocoon with silk and it was inside this that the pupa was formed. The second pupae were formed on the 17th day after the first pupae had emerged. These pupae seemed larger than the first. Earlier I had released many of the caterpillars to the wild. The remaining caterpillars all turned into pupae.

The first pupae remained in this state, when one night, 48 days later, March 7, 1984, a Lepidoptera (meaning scaly wings) emerged. I was quick at identifying it. It was not a butterfly as I had expected it to be. But it was in fact a moth. There are several ways of distinguishing between butterflies and moths. Butterflies can be recognised by their antennae which have a rounded or clubbed end, whereas those of moths may end in one of several other ways, possibly finely pointed or even pectinate (comb like). In principle moths settle with

their wings held back over the body (like the roof of a house) while butterflies either hold them upright or spread out flat on either side.

The 2nd moth appeared on March 17, 1984, ten days after the first one had emerged. Subsequently other pupae too emerged to see the world as moths.

Next came the most difficult task, that of identifying the moths. It is difficult to identify (not butterflies) because there is very little information and because there is no standard book which refers to the moths of Sri Lanka in detail.

The moths that emerged were golden-yellow in colour. Some of the moths had a reddish-brown stripe running across their wings while the others had sporadic spots on their wings which was of the same colour as that of the stripes. (This could be the distinguishing features of the two sexes). The ones with a reddish-brown stripe running across their wings had a fatter abdomen and the tail was more rounded than the ones with the spots. On the other hand the ones with the spots on their wings had rounded wings.

This species was somewhat similar to the Buff Emperor Moth in its colour scheme or that of the Scarlet-windowed Silk Moth which is found in Sri Lanka. This species is not rare in Sri Lanka as I have seen it several times.

Since this experience I have had the opportunity of rearing three more species of caterpillar which have all turned into moths. None of these have yet been identified.

At the time of this script being typed there is yet another moth in its pupal stage inside a silk spun cocoon. ●

Wasgomuwa Comes of Age

*The sun bursts from behind the shelter of purple cloud
... and you look upon the glory of space and light...*

The world is awake, and one turns to the turmoil of another day.

— R. L. Brohier
From "Seeing Ceylon."

R. B. L. ST. JOHN

Harry Storey in his book "Hunting and Shooting in Ceylon" refers to the Yala and Wilpattu Sanctuaries and states : "The third Sanctuary, also in the North Central Province, is not yet gazetted, but I expect soon will be. It is situated in the extreme southeast corner of Tamankaduwa and is likely to be known as the Wasgomuwa Sanctuary." Storey was at that time the Hony. Secretary of the Ceylon Game Protection Society. The likely boundaries were the Amban Ganga in the north from around Angamedilla to its confluence with the Mahaweli, the latter river in the east, the Wasgomuwa Oya in the south and the Sudu Kande Range in the West. In fact, in 1906, the Ceylon Game Protection Society had recommended the establishment of Wasgomuwa Sanctuary but without success. This was one of the earliest attempts to conserve the wildlife of the Wasgomuwa forests. Yala and Wilpattu had been proclaimed as sanctuaries under chapter 2 of the Forest Ordinance in 1900 and 1905 respectively.

Wasgomuwa though not a sanctuary was preserved by its inaccessibility and its naturally difficult boundaries - the Mahaweli, the Amban Ganga, the Kalu Ganga, and the Wasgomuwa Oya. For

this same reason perhaps, Wasgomuwa was hardly visited or studied and hence there is little or no reference to it in most of the books about Sri Lanka, such as those by Spittel, Brohier, Baker, Clark and several other authors. It has remained a wild, relatively untapped forest reserve until a few decades ago. Its wildlife remained unprotected until the Fauna and Flora Protection Ordinance No. 2 came into force in 1937. This vital piece of legislation recommended that all lands reserved for the protection of wildlife should be classified as national reserves or sanctuaries. National reserves were to be strict natural reserves, national parks or intermediate zones. Thus was Wasgomuwa declared a Strict Natural Reserve in February 1930. Again on November 8, 1940, Governor Andrew Caldecott increased its area, when 11131 ha in the North Central Province and 17611 ha in the Central Province, amounting to 281.25 km² were added on. The area however was slightly smaller than that suggested by Harry Storey mainly because the northern boundary did not continue along the Amban Ganga to its confluence with the Mahaweli but was taken south from near Angamedilla and then east along the Navagaha Ela. The fact that the southern boundary was demarcated along the Dunuwila Oya and not the Wasgomuwa Oya did not compensate. However, in 1945, under the same ordinance an area of 32 km² along the northern boundary was declared an Intermediate Zone. This still left out a

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substantial area, stretching from approximately one km west of the village of Kotawella, through the Dastota area—outside the protected Wasgomuwa region. This omission was due to the existence of many purana (old) villages in that northern region.

The very existence of this beautiful wildlife reserve was endangered when the Minipe Left Bank Scheme came under consideration in the 50's. This scheme, had it been implemented, would have resulted in it being developed for agriculture. In fact, the Committee on the Preservation of Wildlife appointed in December 1957, had as one of its terms of reference; "To enquire and report on the location of any new Fauna and Flora Protection Reserves in relation to development schemes". In its Report published in 1958 it appeared to accept the fact that Wasgomuwa would in fact be excised for development – "With the proposed development of the Mahaweli Ganga / Minipe left bank scheme most of the area constituting this Reserve (Wasgomuwa) will be excised. Recent surveys and expeditions into this reserve indicate that considerable poaching has taken place and that the elephant population has alarmingly decreased. When excision is complete only the Sudu Kande hills would probably survive. We suggest that whatever is left of Wasgomuwa be declared a Sanctuary"! It continues, – "To compensate for the loss of a part of Wilpattu, and Veddikachchi and Wasgomuwa, we strongly recommend the establishment of a group of National Reserves and Sanctuaries in the Baron's Gap area"! Thankfully, that project did not materialize and Wasgomuwa was saved for posterity.

Once again in the early years of the Mahaweli diversion project, Wasgomuwa

was mapped for development. But the importance of habitat conservation was realised and as a result of the Environmental Impact Assessment study in 1979/80 by the US firm of TAMS and their Environment Plan of Action followed by McNealy's report (IUCN) in May 1982, the need to preserve and enlarge Wasgomuwa in a system of protected natural areas was finally accepted.

Under the Mahaweli Environment Project, Wasgomuwa was gazetted a National Park on August 07, 1984. Its boundary in the north has been extended to include the Intermediate Zone and all that area extending along the Amban Ganga up to its confluence with the Mahaweli. The Flood Plains National Park, also declared on the same date will connect it to the proposed Somawathie National Park. A CORRIDOR along the Ela-Kotaliya will connect it to the Maduru Oya National Park. A proposed Nature Reserve will connect it to from its western boundary, across the Elahera Road northwards through the villages of Dambagolla, Bambaragahawatte, Ridiella, the Wewella ridge and to the watershed of the Minneriya Tank and the Minneriya – Giritale Sanctuary, and thence southwards to include the Sudu Kande Range, north of the Amban Ganga and the watershed of the Parakrama Samudra.

The usual access to Wasgomuwa is from the south, starting at Hassalaka and thence along the Minipe anicut road to Handungamuwa, Niligamuwa, and Kathupitiya. A bus plies up to Handungamuwa, and the Wildlife staff are located at Wilgomuwa and Kathurupitiya. The intention is to provide the new National Park with access from the north i.e. from Polonnaruwa by way of a new bridge across the Amban Ganga near

Angamedilla. A throughroad will connect it with Kadurupitiya in the south. More check points and staff quarters will be established along the Mahaweli and Amban Ganga. These, while being a deterrent to poaching will also help to control the movement of elephants across the Mahaweli to the cultivated lands in System C.

Nearly all species of wildlife inhabit Wasgomuwa but elephant and bear have been observed most frequently. A large bear population is believed to inhabit these jungles particularly near the Sudu Kande Ridge. The elephant herds here traditionally moved to and from across the Mahaweli seasonally. Much will depend on efforts to confine them to the boundaries of the National Park.

A most striking geographical feature of Wasgomuwa is the Sudu Kande range which has its beginning at the Knuckles. It is a long, comparatively low, north - south running range of hills, which is the spinal cord of Wasgomuwa. Its highest point in Wasgomuwa is Nimbiliya Kande in the south, 526.8 m, while the Sudu Kande Peak reaches 462.9 m. This range extends across the Amban Ganga in the north towards Minneriya and beyond. It is clearly seen and recognised from the Elahera Road and the Parakrama Samudra bund. The Sudu Kande ridge marks the "divide" between streams flowing into the Amban Ganga, and those to the main Mahaweli. The forest cover consists of dry evergreen and semi-evergreen species which are widely distributed. The commoner species are Weliwenna (*Dimorphocalyx globellus*) Mora (*Euphoria longana*), Velang (*Pterospermum canescens*), Burutha (*Chloroxylon swietenia*) and Gal-siyambala (*Dialium ovoideum*). The latter tree in fruit attracts not only the

villagers but the bears as well. There have been several instances of serious injury as a result of such sudden or chance meetings. Every indication is that these hills are the home of a sizeable bear population.

The next marked geomorphological feature is the extensive peneplain that stretches from the foothills of the Sudu Kande Range to the Mahaweli. Here the average elevation is 75 m. It is part of the lowest peneplain and comparable in that sense with the Maduru Oya National Park on the other side of the Mahaweli. A feature of this plain is the erosional remnants scattered throughout e.g. Nuganagala (140 m) in the north and Udawewalanda (107 m) towards the south. These could provide ideal locations for observation huts.

A glance at the 1 inch to a mile topographical sheet will show the remnants of several tank systems. The largest tanks are Dastota and Malagomuwe in the north and Wilmitiya in the south. The Wasgomuwa Oya and its tributaries have been used as a tank system. Obviously what we see on the map are but a few of the ancient tanks. A walk along the Wasgomuwa Oya revealed square holes cut into its bed rock. What purpose did these serve? A crossing and anicut? The island of Kalinga and the ruins on it stand in silent testimony to the activities of centuries past. The Kalinga Ela extending for considerable distance on both sides of the Mahaweli was clearly a well planned and intricate irrigation system. Moreover we cannot ignore the fact that the Mahaweli was navigable up to the city of Kalinga. Some of the inscriptions found around Maduru Oya, not far off, have been identified by Dr. S. Paranavitana as dating to the 3rd century B.C.

Improvements to the ancient tanks will serve to provide water for thirsty animals during the long dry months. They will also attract more bird-life than is now found in the Park. Similarly reforestation and habitat enrichment in previously cleared and cultivated lands will be necessary.

Another interesting feature of the Wasgomuwa plain is the Ebbe, which is a natural collection of flood or rain water on the banks of the Mahaweli. It is not as extensive as the villus of Wilpattu or Tamankaduwa, but still clearly a natural feature, e.g. Wavul Ebbe, Kiri Ebbe and Kobe Ebbe. Ebbes are found along the Flood Plain of the river even north of Wasgomuwa.

The establishment of this 475 km² National Park is another stage in the Mahaweli Environment Project funded by USAID and the Government. The first step was the declaration of Maduru Oya National Park in December, 1983. The implementation of the project, which is planned for four years, is carried out

jointly by the Mahaweli Authority, Department of Wildlife Conservation and the Ministry of State. Other aspects of Park development will be reforestation and habitat enrichment, in an effort to make the Park more attractive particularly to wildlife. Barriers will come up at entrance and exit points. The necessary roads for Park management and wildlife observation are being designed. Buildings for staff quarters, offices and visitors are being carefully located.

Attention will have to be paid to the serious problem of abandoned gem pits. The land along the Amban Ganga in the north and also along it to the south have been intensively dug for gemming and this still goes on. The pits will be a menace to wildlife and must be covered. This will be a major operation but it has to be accomplished and illicit gemming prevented.

Thus Wasgomuwa has come to the fore – it has come a long way indeed – in a relatively short time – from an unknown jungle to a National Park. ●

I love Nature partly because she is not man but a retreat from him. None of his institutions control or pervade her. There a different kind of right prevails. In her midst I can be glad with an entire gladness. If this world were a man, I could not stretch myself, I should loose all hope.

— Henry David Thoreau
From The Journals

In a Cave - Amidst Leopard, Bear and Elephant

The groves were God's first temples

Ah, why

*Should we, in the world's riper years, neglect
God's ancient sanctuaries.....?*

— William Cullen Bryant
From "A Forest Hymn"

SAM WICKRAMASINGHE

Six weeks, as our primitive forefathers lived in a jungle cave !

In 1963, when my friend, His Excellency James George (Jim), the then High Commissioner for Canada, invited me to join him in a safari to an ancient Veddah shrine in the Ruhuna jungles, little did I guess then, that this location could bewitch me so much to draw me there many times subsequently, sometimes to stay weeks in a cave where Arahats once lived and bears dwelled now.

Going on a 100-year old map of India, Ceylon, Burma and Baluchistan by Bartholomew & Sons of London, which strangely did not bear Kataragama on it but had this spot, hallowed by the Veddahs, indicated thereon as **KEBBILITTE** — meaning "potsherd" in Veddah lingo. The journey began from the Karawila Irrigation Circuit bungalow, one week after it was newly opened at Kataragama ; in V.I.P. style with all the frills of full diplomatic privilege.

The caravan consisted of three four-wheel drives and nine of us—Jim, his wife Carol, daughter Dolphi, sons, Brian and Graham, the late Swami Gauribala, Adrian Snodgrass from Australia, a Tamil and myself. Collecting the late, one-armed, Garuwa (of Veddah descent) and pingo carriers for baggage and victuals, from Kumana village, we headed 22 miles upstream of Kumbukkan Oya, to camp the first night sleeping under the stars on the right bank of the river. Next day, leaving the vehicles behind, we began the 7-mile trek along an animal track to reach the place.

Garuwa explained the significance of the shrine as we walked..... The spot was sacred to the Veddahs who worshipped the Mother Goddess there. He pointed out two large rocks in the river, near the shrine, which were known as "swearing rocks" according to legend aboriginal men brought their grievances to the goddess and slept the night on these. Justice was meted out to the complainant by a leopard calling and destroying the miscreant.

During this first visit, we performed a pooja at 3 in the morning, as enjoined by Garuwa, following the tradition and style of that of the Veddahs of yore.

Seven wells were dug on a sand-bar and all had to bathe seven times from each before marching in single file to the shrine on the other side of the river for the ritual offering of seven kinds of fruit and grain and boiling of rice.

The shrine itself was just a bare, circular patch, without any sign of a former building or structure. In the centre a wild tree of some sort grew, rooted by five, thick off-shoots which bore down from about 60 cm above ground. Garuwa said that in the olden days, a Tamarind tree stood there, and even today the place was known as Siyambalawa to the villagers who came from Okkampitiya and Moneragala areas, trekking through the forest, to offer the first grain after harvesting and for ceremonies involving curses and vows..... On the short foot-path from the bank to the shrine, we passed an aged Bo tree (*Ficus religiosa*) and a chaitya in ruin.

With this prelude, my second visit, a year afterwards with another Australian, Barry Windsor, was full of thrills and excitement.....

Taking a walk from the shrine, towards Kumana along the river, Barry banged against a stump and tore his toe-nail. First aid with a strip of my sarong and a wild-leaf to stop the blood, together with agitated talk, took our eyes away from the guiding oya as we walked back.

Before long, we had missed the path and gone into thick, overgrown wood, with river and track out of sight. It was about 5 p.m. already dark in the dense undergrowth and panic gripped us. The sound of silence all round was sinister and sickening....Just then the pall was shattered by something like a mighty trumpet of a startled elephant.

Later, we were to learn that we were fooled by the back of a surprised sambhur in a bush on our way.

Battling the gathering fear, Barry climbed a tree and spied something like a large hill to our right. Breaking our cautious way through thick foliage we made towards it which was to be our haven for the night.....

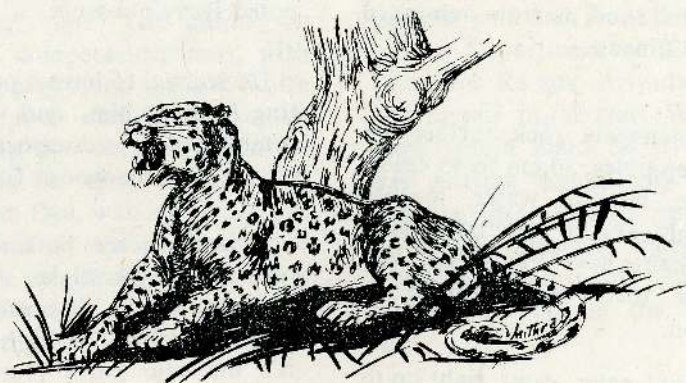
Also for a couple of visitors already there before us .. elephants having their dinner, quite noisily (fortunately), breaking branches and munching the tender leaves. Getting our scent as we moved in the gloaming, they crashed away into the jungle, leaving our newly found "Hill-top Hotel" all for the two of us—2 grown-up babes lost in the woods!

The night advanced steadily, without even a match to light a bonfire or a cover to protect our bare torsos against the chill air. Fortunately, waxing moon and a star-bright sky gave us some silver light as the darkness slowly dragged on, intermittently broken by the cry of leopard, elephant and bear....From a beacon in the southern horizon we knew that we were somewhere in the direction of the Besses off the southeast coast.

The following morning was a voyage of archaeological discovery..... the place was replete with ruins-walled-up caves with drip-ledges, headless Buddhas and chaityas ruined by age and treasure hunters.

Later, we learned that this was the site of an ancient hermitage, where Arahats (spiritually-realised monks) lived about 2000 years back. This perhaps explained the singular silence, almost palpable, which we felt so sharply during the night.

The hill was known to the villages as Diwulanagala—owing to the profusion of woodapple (*Feronia limonia*) in the area,



Leopard

and some others, more appropriately called it Vihara-gala. Looking across the hill, we were overjoyed to see the ridge of Kumbuk (*Terminalia arjuna*) trees indicating the direction to the river, which appeared to be quite close-by and not far from our open-air camp at the Kebbilitte shrine. In the shrine itself we were in for another thrilling surprise, which made us offer thanks to the jungle "deviyo" (god) for veering us away from the return path and putting us up in the hill for the night ... a thief had broken into the sack of foodstuffs.

A deep impression on the top of the gunny indicated that the sneak had sat on it, and enjoyed the Kraft cheese, tearing-off the half-opened lid which was thrown on the ground.

What was puzzling was the fact that this thief had only gone for the Australian cheese, leaving all the other tempting "goodies" untouched. Then we spotted the visiting card of the nocturnal prowler—dung—a bear with a weakness for Kraft cheese!

Barry muttered a prayer of thanks to the "Deviyo" for his hurt toe, if not for which, he may have been the substitute for the Cheddar!

Our six-week stay, waging war with only ticks and mosquitoes, was more than compensated with many, hair-raising thrills and exciting encounters.

More ruins and caves were found, some with still decipherable Brahmi script above their drip-ledges. Reading them, with tracings taken, later in Colombo at the Archaeological Department, we were told that they were in the ancient "Hela" script announcing the gift of land by the monarch to the Sangha. Digging the bottom of a six-foot tall ant-hill one day to take some clay for the construction of hearth, we unearthed thick, dish-pattern, clay pottery, later said to be at least 2000 years old. They were found neatly stacked, before time put up the ant-hill to cover them, suggesting a mass and quick exodus from the site. What could have brought about this, we wondered - enemy attack, famine, pestilence?

In the distance were other imposing hills—the two-humped DEMATAGALA in the south, and beyond it loomed another red giant known as TALAGURU-HELA, the hill of the head guru or hill of the brown earth. A monk was rumoured to have lived in "tapas" there.

In the northern side, a rod-shaped, chimney-like rock, tall and narrow reminded one of a Siva Lingam.

On the Diwulanagala rock surface we found many deep holes, 30 cm to 45 cm in diameter. These retained water longest during the drought, and it was interesting to see how elephants have introduced large stones to raise their water-levels to drinking position.

One day, an ant-eater came right up to my toe, and suddenly getting the scent—too late—ran away in panic and haste! In a “KEMA” (rock pool) I surprised a beautiful, young leopard about 10 in the morning, barely 4.5 m away.

When I summoned Barry to witness this rare sight, he came rushing down the hill with axes (we carried no firearms) thinking I was mauled by a bear.

The vision of the two bears he had seen the previous evening, just 4 m away when he ventured to fetch some “Karapincha” (curry leaves) for cooking, was still haunting him!

On another occasion, we heard quite a noise, something like a brawl between two humans and investigation revealed two bears fighting near the pond, mid-way down the hill.....

Our next visit to this spot took place a year later. This time, we stayed during the Wesak and Poson full-moons—over a month—in the largest cave in the Diwulanagala complex. The last two weeks were spent by myself living alone, as Barry had to appear in a court case in Hambantota.

One evening, we took a walk out of the cave, in the twilight. Before we reached the pond, we heard the unmistakable hoot of a bear approaching us. We got back to

our cave-retreat hurriedly, and then I noted Barry's absence..... he was up a tree!

He seemed to have a penchant for attracting bears to him, and was also adept in climbing trees to escape them and to find “hotels” in the woods for the lost!

Animals never bothered us inside the cave. On Wesak night, an elephant came right up to the entrance and went away after a delightful, half hour's exhibition of its majestic self. During a siesta one afternoon, I got up to see the slough of a reptile on the dusty floor, a few inches away from my head. It had slithered out of a hole and gone leaving track and skin behind.

Barry attributed my good luck and safety to the headless Buddha, fallen on the ground beside me, and to whom I lit an oil lamp daily!

We also saw a grand sight of a full-grown, hooded cobra basking in the sun on top of an ant-hill. We were able to get quite close from behind.

Another spectacular sight which often greeted us as we went on our numerous exploratory walks, was the vast range of multi-coloured spiders, with webs, small and large, shimmering in the sunlight, across our way in the glades. Some velvety-red, others black and gold, some silver and orange—all glistening in the bright day, luminiscent and gaily mosaic in the arboreal arcades.

After 18 years, the magnetism of this wonderland pulled me again, and last year, again with another Australian friend, gold-mining tycoon, John Baker, we made a trip.

Vast changes seemed to have occurred during this lapse of time. The journey on this occasion was comparatively easy, with a well maintained jeep track and a Wildlife Department outpost very close to the devale. In the past the only direction to the path leading to the spot, on the bank of the Kumbukkan Oya, was a Bo leaf sign etched into the bark of the kumbuk tree there. Now this is no more, covered by a departmental sign-board, proclaiming the area, a strict sanctuary.

The Buddha statue too has been raised up and fixed to the pedestal inside the main cave, in which we stayed earlier, and the surrounding wall partially erected with the ancient bricks that were strewn all over. This we understood was the commendable work of the timber cutters working this area now.

This time too we had many exciting encounters with hundreds of deer, sambhur and boar on the way up.

Camping on the open bed of the dried-up river, we were just getting ready to cook lunch, when a mother elephant and calf crossed from one bank to the other, just 30m away. As the calf climbed the bank, the mother decided to turn and walk towards us, heading for the stagnant pool behind us.

We sat dead still as John poised his camera, seated in front with Arulananthan of the Department of Wildlife Conservation and Ranger Ariyadasa, driver Bertie and myself in the rear. When the animal came within about 20 m Arul decided it was getting dangerously too close, and, standing up trumpeted, imitating a pachyderm. The elephant halted, raised trunk and trumpeting loudly scampered off fast with twisted tail in the direction of the calf.

The night was spent in the centre of the dry river with two large bonfires. Soon after, we settled down after a hearty meal cooked on the spot by Arul and Ari, the jungle sounds assailed our ears, keeping all of us awake with ears cocked.

Once Arul called loudly again and flashed his torch to surprise a nosey bear coming to probe the unusual gathering in his territory.

On the way back, the day after, we saw more animals, including plenty of crocodiles. Halting at GAL-AMUNA (a stone viaduct spanning the river) we bathed and cooked our last meal there. Relaxing in the company of deer and sambhur, we saw another big, male elephant sauntering in for an after-meal drink. ●

To create a little flower is the labour of ages.

— William Blake

From "The Marriage of Heaven and Hell"

Notes from the Ceylon Bird Club - 1983

THILO W. HOFFMANN

General

In June G. M. Henry died in the UK at the age of 92 Years.

Habitats

Natural bird habitats continue to diminish in extent and quality. This happens despite much talk about the need for conservation in Sri Lanka, despite symposia, seminars and meetings. There is a great gap between good intentions and the will and ability to put these intentions into practice. Although there is a proliferation of organisations and agencies concerned with the environment, actual conservation in the field has not been strengthened but rather weakened. It would appear that many of these agencies are unaware of each other's activities and there is even rivalry. The urgent need of the hour is a national co-ordination of all conservation plans and activities.

Duck Count

The first organised Duck count in collaboration with the International Waterfowl Research Bureau, Slimbridge, UK, was carried out in January (see Loris, XVI, 3, 1983, 116-123).

Raptors

As in the past Raptors on the whole seem to be able to hold their own despite continuing diminution of their ranges. Exceptions are the Mountain and Rufous-bellied Hawk-Eagles; only once was a Rufous-bellied Hawk-Eagle reported during the year, namely

in February from Sigiriya, against 4 Mountain Hawk-Eagles in February and December. Of the other resident species the Brahminy Kite is probably the most common, followed by the Black-winged Kite. Hawk and Serpent Eagles too are common; so is the Shikra, and there are fair numbers of Sea Eagles. The Black Eagle is rarely seen, and so are the Crested Goshawk and the Shahin Falcon. The Grey-headed Fishing Eagle is becoming scarce.

Of migrant Raptors there were 2 sightings of the Osprey, 3 of the Booted Eagle, 3 of the Desert Buzzard, and several of Marsh and Pied Harriers. The Indian Hobby was seen at Tangamalai in December. Kestrels were less common than usual. No sighting of the Peregrine has been reported.

Not many Owls were noted during the year, and a fair number of species must find survival rather difficult with the continuing onslaught on their forest habitats. 2 Barn Owls were found in Colombo when earlier it had been thought that this species was confined to the far north and the dry North-Central regions of the island.

January

A Yellow-headed Wagtail (*Motacilla citreola citreola*) at Bundala. One Pied Shrike at Panikkar Villu, Wilpattu. The migrant Indian Grey Drongo, carefully identified and fairly frequently found by John and Judy Banks at Wilpattu and elsewhere throughout the year (see Checklist, p. 65). One Indian Reef Heron and 3 Indian Large Pratincoles at Kalametiya.

It is regrettable that this unique area for migratory and resident birds is still not protected and that as a consequence shooting on a massive scale is taking place here, especially during the crucial winter months. 2 Large Pied Wagtails (*Motacilla maderaspatensis*) at Delft Island; the third report of this species in Sri Lanka.

February

One Thick-billed Flowerpecker at Maradanmaduwa in Wilpattu. One Long-toed Stint and one Avocet at Nilaveli salterns. One Frogmouth at Giritale, and 2 more at Sinharaja (an adult with newly fledged young). One Orange-headed Ground Thrush at Sigiriya and another one at Lahugala. Layard's Flycatcher seen several times during the month. One Spotted-winged Thrush at Sigiriya. One Baillon's Crake in a Colombo garden.

March

One Layard's Flycatcher on the Menik Ganga at Yala. One Reef Heron at Hambantota.

April

The Common Coot has spread from Giant's Tank to the tanks of Anuradhapura and beyond, where this species can be seen by the hundreds now. One Red-faced Malkoha near the Yala Park Bungalow. Indian Cormorants nesting at Gal Oya. 4 Glossy Ibis and one Common Coot at Kalametiya.

May

John Banks identified 86 species around the rock at Sigiriya, which is a very good bird watching site. Nest of Common Indian Nightjar at Gonalabbe in Yala. Koel fledgling in a Common

Babbler's nest at Kandana (similar observation of Common Babblers feeding young Koel made some years ago at Colombo); the literature does not mention the Common Babbler as a host for Koels. 2 Large Cuckoo Shrikes at Kuruwita in the Wet Zone.

June

Indian Cuckoo calling at Inginiyagala; the species is resident in eastern forests.

July

Over 450 Common Coot at Basawakulam, Anuradhapura. At the same place a pair of Black-headed Yellow Woodpeckers feeding a young. Some migrants arrive very early, end of July. Fair number of Black-tailed Godwits at Embilikala, Kalapuwa; also 19 Avocets; as well as 3000 Flamingo of the 5-6000 seen throughout this year in the south-east. A pair of Green-billed Coucal at Gilimale, in the crowns of an arecanut palm and a coconut palm.

August

Two Barn Owls flew into a house at Colpetty. Apparently these would have roosted and nested in old buildings (warehouses), possibly in Slave Island, which are now being demolished. So far this Owl was only known from the far north and the Kurunegala area. Interesting notes about the distribution of Owls by Ismeth Raheem in the August notes.

September

Nothing of special interest.

October

One Ringed Plover near Okanda. 49 Avocets at Malala Lewaya in Bundala,

and again many thousands of Marsh Sandpipers amongst other Waders.

November

In these and the previous month's notes, a discussion about recent sightings of new species of birds and criteria for their acceptance or rejection.

December

Juvenile Black-necked Stork at Yala; also Philippine Shrike. 5 species of Woodpeckers well established in the same small tea estate habitat near Welimada. The Layard's Flycatcher has been frequently observed this year, especially in the Hill Country. Scaly Thrush at Hakgala. ●

ROYAL BIRTH IN CAPTIVITY

It is an exciting moment for everyone at the Madras Snake Park, Guindy, because, for the first time in Asia, they have successfully bred the king cobra.

As the first of a clutch of 12 fertile eggs hatched this morning, a baby "king" wriggled out, breaking open the shell. The other eggs are expected to hatch any moment.

Everyone was agog at the event and thrilled, researchers said, "Several years of our efforts have finally borne fruit."

"This is the only place outside the U.S. where king cobras have been bred in captivity", said Sekhar Dattatri, a young naturalist, associated with the Park. He said the Bronx in New York and Gladys Porter in Texas were the only other zoos to breed the king cobra successfully.

The eggs were laid in the last week of April by the youngest of three female snakes at the Snake Park, when she was

mated with a 13-foot male brought from the Mangalore Wildlife Trust in early February. About 24 eggs were found in the clutch, but only 12 were fertile. The oval-shaped eggs, five to six cm long and four cm in girth, were incubated for 60 days in a thermo-regulated chamber maintaining ideal temperatures of 27 to 29°C, and a high relative humidity. Once they hatch, these cannibalistic reptiles must be separated. They are fed with tiny snakes. The king cobra's diet consists chiefly of other snakes.

The idea of captive breeding of king cobras dawned in 1976 when Romulus Whitakar, Director of the Park, brought a female king cobra with a clutch of eggs laid in the wild, from the Andamans. The mother died soon after reaching the Park, and out of the dozen or so eggs which hatched, only three snakes survived to adulthood. All three are females, now about three metres in length. The smallest is the proud mother of this particular baby. An earlier attempt, last year, to breed these snakes in captivity failed. ●

— Hindu

Sent by S. R. Ratnapala

Wildlife Habitats - a point of view

H. M. D. SOYSA

The disappearance of our wildlife, which is taking place on an unprecedented scale all over our country, is a serious problem we have to face and adopt quick and effective measures to arrest this disastrous trend. If we do not do so now we may in about twenty-five years or even earlier, be faced with the near absence of all forms of our wildlife except that found in the national parks, forest reserves and in the zoo. The great loss of our wild creatures is mainly due to man's intrusion into their territories and destroying them and their habitats. This destruction of wild creatures and their homes is still rampant everywhere without let or hindrance. If we are to save our wildlife we must provide them with suitable homes to live in peace and security, where they could find sufficient food and rear their young safely and well without being harassed and harmed by man. Animals like human beings, cannot exist without suitable homes.

Small forests, marshland or uncultivable wasteland ranging from about 20 to 40 ha should be set apart in various parts of the country for the establishment of these homes for wild creatures; each district getting two or three of them. The size of each could be determined according to the needs and place of the proposed sanctuary and availability of land. Such places would form excellent refuges for all kinds of wildlife found in those regions. They should be situated in suitable and accessible places but far away as possible from highly developed areas and human habitations so that they may not interfere with people's interests like agriculture and housing, now or in the future. The jaded town dwellers living in congested conditions and the people in rural areas could occasionally

enjoy the healthy atmosphere and refreshing beauty and serenity of nature in such places. School children from the towns and rural areas could make educational excursions to these homes of wildlife and learn something of the wonderful ways of nature and the fauna and flora of our country at little cost.

These homes should be well protected and left untouched by man. Shooting, cutting down of trees, removal of plants, cultivation, gem mining, building of huts, houses and roads of any kind should be strictly prohibited. Under no circumstances should squatters or any other person be allowed to settle down in them.

These miniature sanctuaries should be protected, managed and maintained by the Gramodaya Mandalaya of the area in which each is situated. This would create an interest and involve the people of the place in the responsibility of looking after these homes and maintaining and protecting them properly and well. People's participation in such a scheme would be absolutely necessary for its success. These little havens of wildlife could be developed on similar lines to the Udawattelekele sanctuary within Kandy town.

The total area of about forty or fifty such small sanctuaries would not exceed 2000 ha for the whole of our country and will not be a great economic loss to the people but the gain for wildlife by the public at large is an absolute necessity for without, it would be impossible to implement any wildlife laws. To get the interest and sympathy of the public and their involvement in the conservation of our wildlife their value and beauty must be brought home to them at the grass roots level of the common man both in urban and rural areas.

These wildlife refuges will make the people live more closely with nature and wildlife and help them to appreciate and understand the vital part they play in making life better and happier for them. The vast mass of our people cannot visit our national parks because of their remoteness from their homes and very high cost of making such a trip and so they are denied any contact or association with the beauty of nature and wildlife in their natural surroundings. At the beginning, the people might oppose the establishment of these sanctuaries in their area as they would like to cut down the trees and cultivate these lands and build houses for themselves in them. However, once they are established and they are convinced of their rightful purpose and true value in the scheme of things for nature and our life by education and various means they will not want to revert them back for any cultivation or for making houses or roads or for any other need or use by man. When they began to realise that these little reserves for wild creatures are the last refuges of nature and wildlife in their area and feel the beneficeal influence of the serene scenes of the natural beauty of these places on their lives and see the economic benefits they could get from the local and foreign visitors who come to see these homes in the wild they will not like to lose them by restoring them back for use by man for his needs.

The peaceful lives of the gentle creatures of these sylvan abodes could be an example to the people to live in peace and harmony with nature and not in perpetual conflict with the natural order of things. They could also help to create in the people an awareness of the value of nature and wildlife and concern for the need to protect and preserve them for us now and our children in the future.

These small but beautiful isles of verdant green, set in the midst of a vast sea of vigorous human activity, in what would soon be highly developed and thickly populated regions of our land

would provide the people with a life giving source of deriving mental recuperation by the contemplation of the infinite peace and beauty of nature which are very necessary attributes for man's well-being and happiness. Wildlife and beautiful places should be preserved for all time for man's delectation and the spiritual enrichment of his life. One could foresee a time when the people will preserve these havens of nature and wildlife like the pearl of great price, which once lost can never be found again and they would become the rarest gems of natural beauty and last refuges of wildlife in the inhabited regions of our country by their own free will and firm commitment to protect and preserve them now and for posterity. The time will surely come when the people begin to appreciate and enjoy these oases of charming beauty and realise their value in stimulating a greater desire to follow their religion of the gentle teachings of the Buddha to show compassion and love to all beings and improving their sense of well-being and their culture and quality of life, they themselves will become their guardians and look after them like their own precious possessions without even having any resource to enforcing laws and employing guards to protect them. They could also be made into holiday resorts by building a few simple guest houses on a modest scale mainly for our people and not so much to promote tourism.

Let us give some permanent homes to the helpless, homeless and dwindling denizens of the wild to live in them in peace and security and perpetuate their kind and enrich our land by their beautiful presence for all time. Providing sanctuary for wild creatures is also a beautiful and meritorious act in keeping with the noble teachings of the Buddha. It would be a great boon for our people if such sanctuaries are established where wildlife is protected and they could get so much pleasure, health and happiness by the enjoyment of the peaceful serenity of these beautiful places and cultivate a love for nature, wildlife and beauty. ●

A Stranger in the City

BERNARD KARUNARATNE

I report this experience, as I feel that it might be of some interest to the bird-fanciers of our country.

Pathiba Road, where I live is a comparatively quiet lane situated in the border-zone between Narahenpita and Timbirigasyaya. About 2.30 p.m. on July 21, 1984, my elder daughter, quite excitedly called me to our verandah having seen a strange bird, the like of which she had never seen earlier, thinking that I would be able to identify it. The bird was perched on the ridge of the roof of the adjoining house at an elevation of about 6 metres. Through the mesh of the wide window in our verandah we could view the bird at a distance of 7.5 metres.

It was obvious that the bird belonged to the group of pigeons and doves. In size it was slightly bigger than the domestic pigeon. It looked like a strange bird not knowing where to fly thence. Evidently, it was unsure of and unused to the environment where it found itself. Looking quite puzzled it stood there motionless for nearly 25 minutes before flying away. Except for a slight swing of the head occasionally and a rolling motion of the eyes it hardly stirred all that time. It could not be a Pompadour Green Pigeon, the Green Imperial Pigeon, the Emerald Dove or the Spotted Dove, all species which I have seen. From its colour, it was evident, that it could not be a Yellow-legged Green Pigeon, Orange-beasted Green Pigeon, or the Blue Rock Pigeon, described by Henry and Wait.

Being not quite familiar with, and knowledgeable about the more rare species of our avifauna, I hastily pulled out Henry, Wait and even Banks. The bird was facing our direction and the back of its neck was not quite observable. Occasionally, it tilted its head, however, allowing a glimpse of the back of its neck, but no ring was noticeable. That rules out the Ring Dove too.

The bird was generally rufous-brown back and wings; while the underside of the neck and breast were grey and of a lighter shade. The bird seemed to answer to the description of the Rufous Turtle Dove in Henry's and Wait's books. A striking deviation from the description of this bird in the books, was the orange beak of our visitor which according to Henry should be black.

The identity of the bird could have been established beyond doubt, had the bird been photographed. This was however not possible.

Both Wait and Henry state that the Rufous Turtle Dove which is a migrant has been recorded only twice in our island, and that too not in the recent past. Fools must not rush in where angels fear to tread. So I would not venture to hazard a guess that the bird we saw was a Rufous Turtle Dove. ●

Maduru Oya with Bird Watching as a Bonus

**SIRANCEE
GUNAWARDENA**

We set out in April, ostensibly to see the 2nd Century B.C. sluice, Bisso-Kotuwa at Maduru Oya with its terra-cotta frieze and to view the modern dam and later to see the Madirigiriya complex and the Watadage, but bird watching was an unexpected bonus.

At Kurunegala, our first stop, while eating sandwiches and drinking hot coffee under a tree by the wewa (artificial lake) we saw a Jacana lightly tripping from one water lily leaf to another oblivious of the charen of a half open lily, bringing to our minds the lilting strains of Strauss' "Water Lilies". The panoramic view of Maduru Oya was breath-taking and it was amazing to know that the ancient dam had been sited at the same spot that the modern engineers had selected and we were glad that the ancient sluice, which was excavated, was to be preserved as a monument of ancient engineering skill. The terra-cotta mural with dancing figures, (mutilated in parts) and the ancient brick sluice were very interesting to see. There was much speculation as to its exact date but the consensus of opinion was that it had been built in the 2nd Century B.C. Having spent a delightful afternoon in Maduru Oya we returned to Giritale for the night.

In the morning while on a walk, we discovered a colony of Baya Weaver birds. There were a large number of nests hanging from trees in a secluded area not far from the bungalow. The high pitched calls of these birds tempted us to venture further. Parrots flying low, green pigeons and ash doves, and the Ceylon Swallows were seen in plenty. The pair of Black-headed Orioles which are frequently seen in that vicinity and had delighted us on a previous visit early this year, were conspicuous by their absence. In the tank across, we saw white tern, pond herons and plover. Just then the familiar

strains of the male jungle fowl attracted our attention and we went in search of it. We were distracted by the fascinating antics of several monkeys leaping about but we soon discovered the jungle fowl with its brilliant plumage, in the thicket.

Around mid-morning we set off for Medirigiriya. Unexpectedly we had to make a detour, as a lorry had its axle broken and a van coming from the opposite direction had veered too close to the edge of the grassy embankment and had ended up on its side in a ditch. However the longer route was rewarding. We passed through beautiful rural countryside and there was great excitement when a Lunuwarana tree (*Crateva religiosa*) in full bloom was spotted. We got off the vehicle to have a closer look and to take some photographs. The tree was a mass of pale-yellow and mauve flowers with hardly a leaf to be seen. The village elder living close-by, who was pounding his chew of betel was unperturbed that a number of strangers descended on him and warmly welcomed us with a toothless smile. He was happy that we were interested in his Lunuwarana tree and explained to us that the bark of the tree was used for snake-bite cures and for herbal remedies. Then, with a spriteliness surprising at his age, climbed the tree and broke off several flowering branches and offered them to us for closer inspection.

A close look at the Lunuwarana tree trunk revealed that strips of bark had been removed in several places and the old gentleman told us that villagers were in the habit of taking the bark for medicinal purposes. We were equally interested in a small, quaint, octagonal wooden mortar which he held in his other hand. He had been using it for the preparation of his mid-morning chew of betel when we disturbed him. We thanked him and came away admiring the delicate mauve and cream flowers he had given us.

On our way again, travelling alongside a narrow channel and quite by chance, spied a beautiful black and white Pied Kingfisher hovering perpendicularly, fluttering its wings at great speed. We stopped and watched, the Pied Kingfisher stayed in this vertical position in mid-air for more than five minutes, about three feet above the water. Its distinctive black and white markings were clearly visible as it was only a few yards away. The bird stayed upright, with wings flapping at great speed, its eyes glued on the water for signs of fish beneath the surface of the water. With an unexpected suddenness, and a circular motion, it dived into the water and in a fraction of a minute had caught a small fish and swallowed it on its way up. Once again it took up the same upright position, hovering and fluttering its wings. It was fascinating to see how the bird stayed in this stationary position for a length of time, only moving its wings. It then dived in and caught a fish. When it dived for the third time it caught a slightly larger fish and flew with it in its beak to a tree close by. As it perched on the tree, it knocked the fish on the branch and started eating a part of it. A second Pied Kingfisher joined to share the meal. They sat in companionable silence side by side for quite a long while after eating the fish. Through binoculars we noticed a third Pied Kingfisher on the same bare tree, on a branch on the opposite side at a higher elevation. The bird was preening itself and enjoying the sun. Even at a distance the black and white markings were very distinctive.

A black cormorant sat motionless a few metres away from the kingfisher on the same branch. A plover was on another branch. We watched these birds for quite a long time and as we were about to leave, the Pied Kingfisher which we had seen first, came back to the channel to the exact spot it had been fishing in earlier, and to

our great delight gave us another chance of seeing its fantastic perpendicular perch in mid-air. The flapping of its wings was in contrast to its motionless body, poised to pounce at the unsuspecting fish swimming carefree in the clear water. As we watched, with a graceful curve it dived, swooping down into the water and grabbed a fish and this time flew away to the scrub jungle. The other kingfisher too had flown away but one was still perched on the branch near the cormorant, but we had to leave as Medirigiriya was still a long way off.

Medirigiriya was as beautiful as ever. The sun was shining brightly. It looked different from when we last saw it. Our previous visit had been at dusk and the moon was up. After looking at the beautiful Watadage and architectural complex, and having gazed at the stone medicine boat, we

pondered at what herbal oils were used to cure paralytic patients of old. Having walked round the Medirigiriya complex in the hot noon-day sun, we were cooling the soles of our feet and relishing the cool comfort of lush green grass in the shade, when we spotted on a tree close by, an orange minivet. On closer inspection we noticed on the same tree, an lora, two blue-tailed bee-eaters, several sunbirds and a brown paradise flycatcher who flew at close range.

Perched on a bit of sculpture was a shama singing merrily in clear melodious tones. High up in the clear blue sky was a Brahminy Kite, moving in concentric circles. On the way back we saw several Indian Rollers, Blue Jays, Common Kingfishers. White Herons and an Ibis. The birds really added lustre to a very memorable outing. ●

LEOPARDS ON THE MULLAITIVU ROAD

Sometime in the year 1952, when I was stationed in Jaffna, my friend the late Oliver Soysa, Superintendent of Excise, dropped in at my house to enquire whether I would join him and his wife on a trip to Mullaitivu. My area of operations extended from Talaimanar Police Station on the west, to Mullaitivu on the east and I readily accepted the invitation.

We set out from Jaffna after an early dinner and my son Adrian, a second grader, also joined us. The sixty miles to Manukulam was covered in about an hour and half without incident and then we turned left to cover the next 30 miles to Mullaitivu. As this stretch was known to be frequented by elephants at two places, we carried some powerful rifles.

The time was about 10.30 and Adrian was falling asleep in the back seat. Round the

next bend, Oliver who was driving, stopped the car very gently and whispered, "See what's on the road"—a totally unnecessary remark, as the car lights brought into focus a pair of beautiful full grown leopards! They were lying across the entire width of the road—one facing north and the other facing south.

As we watched spellbound in stony silence and I nudged Adrian, the two large cats turned their heads towards the car lights, rose lazily to their feet, stretched themselves as cats always do on getting up from their sleep. They then walked majestically into the jungle, each in the direction which it was facing. It was only then we realised, that we had practically been holding our breath until Oliver broke the silence when he said, "Algy, have you ever seen a more beautiful sight in the jungle". It was indeed a reward that night. ●

(Sent by J. A. A. Perera)

We reproduce 2 instances of elephant births—one in captivity and the other in the natural state.

Source : Some Extinct Elephants,
Their Relatives and the
Two Living Species by
P.E.P. Deraniyagala.
Courtesy-Director, National
Museums.

(1) The birth of twins to an elephant owned by B. Ratwatte Dissawa, is here described. A bull elephant 25 years of age mated with a 20 year old cow early in April, 1940. Twin females were born on December 11, 1941, giving a gestation period of 20 months 11 days.

The day previous to parturition a watery fluid oozed from the cow's teats but she fed normally until 6 hours before giving birth. About half an hour before the event she became restless and although normally gentle, attempted to attack her mahout. After making a hollow about 6 inches deep, 3 feet long, and 2 feet wide in the ground and assuming a squatting posture she groaned and dropped her calf, discharging the amniotic fluid from the vagina immediately prior to this occurrence. The cow bled freely and attempted to eat the after-birth but was prevented from doing so. The first calf was born at 5 a.m.; the second at 7 a.m.; both were females. The first lived for one and half hours, and the cow gave it artificial respiration, by pressing it gently with her fore foot with a rolling motion. In the case of the second calf which was still-born she did not attempt to do so, but tears trickled down her cheeks after it was born. On the following day the cow resumed feeding. The first twin is (A) the still born one (B); the clitoris was

Some Recorded Elephant Births

so elongate in each calf as to resemble a penis. Both twins were hirsute, the vertex of the head showing and unusual development of hair which stopped abruptly at a dorsal line connecting the tops of the bases of the ears forming a whorl above each. Twenty-three strong, elongate bristles protruded from the opening of the temporal gland; there was one above the eye with another on the centre of the cheek. The caudal tuft extended upwards along the ventral aspect of the tail for half its length. The nails were of interest as they were recurved over the sole of the foot as in the newly born rhinoceros. The edge of each was split up into a number of cusp-like points which were most numerous on the second and third nails in the fore feet and in the first and second nails in the hind feet. There were 5 nails in the fore feet and 4 in the hind ones, the fifth nail being missing. The newly born animal is about $2\frac{3}{4}$ to about 3 feet high at the withers and covered with hair of three types with two tufts of black bristles on the temples. One tuft emerges from the temporal pore, while a few bristles also exist above this. The back is generally markedly convex, but this curvature reduces with age. The hair also elongates in certain parts of the body and diminishes in others, this process being most noticeable on the head, ears, back of limbs, hips, and along the lateral fold. In old age the hair is very scanty. The skin is greyish but darkens a few days after birth; in the Malayan race the young are flesh colored for some considerable length of time.

(2) A birth that occurred at Kudasilava lagoon in the Yala game reserve was

reported by Game Guard W. L. A. Andris.. The mother was one of a herd of nine that came into the open area near the lagoon at 8 a.m. She knelt down and then lay on her side while the others caressed her with their trunks. Getting up she next walked a few paces, then lay down. Seven of her companions went into the adjacent forest but one remained beside her while the prospective mother turned over onto the other side and continued thus for 10 minutes. Getting up she walked a few paces, lay down, arose with the amnion appearing and walked about for 10 minutes until the bag burst. Meanwhile her companion departed.

After a few minutes she lay down prone. It was now 9 a.m. and she remained thus for half an hour waving her trunk, and straining but uttering no sound. Presently two of her companions returned, examined her, and left. She next spread her hind limbs wide apart and the head and forelegs of the calf appeared whereupon she immediately got up for a few minutes, then knelt and lay down and the calf dropped. It appeared to be $2\frac{1}{2}$ ft. high with a trunk 1 ft. long. The cow next walked off about ten paces, bleeding profusely and lying down rolled from side to side for 20 minutes to expel the after-birth. She then got up, ate part of it and tearing up the remainder trampled upon some of it. Meanwhile the newly born calf which was covered with a slimy liquid was wriggling upon the ground until another member of the herd approached it and raised it 4 feet off the ground in its trunk, replaced it upon the ground and uttered a loud

rumbling note whereupon all its companions came up making various sounds and surrounded the calf. Each of them now moved it with the trunk and feet and threw sand upon it for the space of half an hour. Eventually the calf was quite dry and able to stand up, and it attempted to suck milk from the other elephants. Its mother after recovering came up to it, trumpeted and lifted it up with her trunk, then knelt and resting her head upon the ground to enable

the calf to reach her breasts suckled it from both teats for a considerable length of time. She then arose, picked up the calf and tucking it under her chin walked into the forest surrounded by the herd. A part of the after-birth resembled a large sac with elongate processes, and lumps (cotyledons) and a part of it consisted of tubes each about 2 inches in diameter and 2 feet long. It was purple and red in colour. (Nicholas 1954) ●

Spirits and illusions have died,
The naked mind lives
In the beauty of inanimate things.
... how noble the world is,
The lovely - flowing waters, the secret -
Keeping stones, the flowing sky.

— Robinson Jeffers
From "Life from the Lifeless"

The cover pages of this number have been sponsored by
Messrs. Hayleys Ltd., Colombo.
The Society gratefully appreciates this gesture.

The Effect of Fishing on Turtle Populations

J. JINADASA

Turtle populations of about seven species (Wickramasinghe, 1979) of the world are declining annually. At least three species; namely, Green turtle, Logger-head turtle (Wickramasinghe, 1979) and Kemp's (Atlantic) Ridley (Grassman, et. al, 1984) are listed as endangered. The decline in population size could be attributed to (1) over-exploitation of the adult turtles over the threshold value required to replenish the populations, (2) consumption of the eggs, and (3) very low survival rate of hatchlings (2%) to adulthood. Although the last factor is unavoidable, the first two could be either reduced or completely stopped by man.

Sri Lanka is fortunate to have five species of turtles belonging to five genera out of a world total of seven species (Wickramasinghe, 1979). Most of these species nest on the west, south and south-east coasts of Sri Lanka, which is about 1/3 the total length of the coastline of Sri Lanka. But their distribution around the Island where they are exploited covers almost 2/3 the length of the coastline. This means that the mortality coefficient of turtles in Sri Lanka alone could be double that of the birth coefficient.

Turtles are slaughtered for meat when they come ashore to nest and their eggs are preyed upon by animals including man.

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Such mortality is confined to the nesting areas. However, turtles of all sizes are exploited indirectly by fishermen. In Sri Lanka, the majority of fishermen use gillnets for fishing at night.

About half of them use small length, ranging from about 200 to 800 metre nets. These are operated in the inshore waters, within a distance of about 15 to 20 km from the shore and they catch small fishes like salaya (*Sardinella melanura*), Hurulla (*Amblygaster sim*), kumbalawa (*Rastroliger kanagurta*) and sudaya (*S. albelia*). The rest of the gill nets use larger lengths of net ranging from about 800 to 1500 metres with large meshes. They are operated in the off-shore waters, within a distance of about 30 to 45 km from the shore and catch large fishes like balaya (*Katsuwonus pelamis*), kelawalla (*Thunnus albacares*), thora (*Scomberomorus commersoni*), alageduwa (*Auxis thazard*), etawalla (*Thunnus affinis*) and mora (*Carcharias spp.*). The line fishermen on the other hand catch large fishes and they mostly operate during day time.

Turtles are mostly nocturnal in habit. At night they come out of hiding, in search of food and nesting sites and get entangled in the thousands of man made temporary barriers in the form of fishing nets. In their struggle to escape, they get completely enmeshed. Most of them may swim to the surface of the water and rest with the help of the floats of fishing nets.

Some of them die by drowning. These turtles, either dead or alive are hauled onto the fishing boats, in most cases during the early hours of the next day along with the fish catch. The live ones could be easily freed but no fisherman does this. The live turtles that are brought to the shore are often put on their backs in the hot sun. Secretions from the lachrymal glands pour down wetting the drying eyes. Fishermen sometimes refer to such turtles as "crying turtles", but they show no sympathy at all to save their lives.

Until 1982 they were sold privately rather than by auction. Since then they are not even unloaded at the fish landing sites due to fear of the law, instead they are sold directly from the boat to needy, but reliable buyers. Finally they are slaughtered and the meat is sold at the rate of about Rs. 15.00 to 20.00 per kg. The carapace (shell) is very often sold, also in private, for a tidy sum of money. Sometimes when the owner cannot find a buyer for the shells they are collected at a nearby hiding place, normally in shrub jungle.

The line fishermen normally do not catch turtles, not due to any sympathy for them, but because turtles are not vulnerable to their gear. Therefore, they are harmless to turtle populations.

Observations have been made on the number of turtles caught per fishing net, per operation in Negombo and in Chilaw, once a fortnight from 1982 to 1984. Data have also been collected from Udappuwa, Kalpitiya and Ambalangoda. The results indicated that the number of large fishing nets operated around the waters of Negombo range from about 40 to 70 and that of Chilaw from about 30 to 50 per day. In these nets the number of turtles caught range from about 1 to 3 per week. Based on these results, when the whole stretch

of shore from Ambalangoda to Kalpitiya, which covers about 1/3 of the length of the shore inhabited by turtles is considered, the number caught is about 4 to 5 per week during the heavy fishing seasons (non monsoon) and about one during the poor fishing season (monsoon). Based on these findings the number caught for the entire country could be about 12 to 15 per week during heavy fishing seasons and about 3 per week during poor fishing seasons. A very conservative estimate of the catch for the entire country per year could then be about 400 turtles.

Species composition of the catch

The catch observed in Negombo and Chilaw consisted mainly of the Pacific Ridley. But other species have been reported there earlier (Deraniyagala, 1939, 1971; Wickramasinghe, 1979).

Seasonal occurrence

The catch data indicate that turtles are caught mostly in calm seas. It could probably be due to the large number of fishing nets operated there during this season or it could be that the turtles prefer calm seas to stormy seas that prevail along the west coast from September to March. It is also possible that the turtles move away to further offshore waters to evade being carried on to the beach along with strong currents that prevail during monsoon periods.

Distribution

The large fishing nets operated in the offshore waters bring in dolphins and turtles, in addition to the fish catches. But the small fishing boats in Negombo and Chilaw operating daily in shallow inshore waters, bring in only fish. Both types of boats have the capability to catch turtles but their absence in the latter nets indicates that the turtles are most probably not

TABLE : 1 Size, number and mean weight of turtles sampled off Negombo and Chilaw.

Carapace length (cm)	Number caught		Mean weight (kg)
	1983	1984	
62	4	1	18
64	7	3	20
68	2	1	22
69	1	0	24
71	1	0	28
72	1	0	28
80	—	1	33
84	1	1	35

found in the inshore waters. These waters may be too shallow for turtles to inhabit without risking their lives. However, females swim onto beaches for spawning, crossing the inshore waters and suggest that they normally live in deep offshore waters.

Size of the turtles exploited

The distribution of the carapace length of the exploited catch off Negombo and Chilaw is shown in Table 1.

From this it is evident that the population off Negombo and Chilaw inhabiting within a distance of about 30 to 45 km from shore comprise relatively small turtles falling within a relatively narrow size range. The nesting population observed around Hambantota consists of much larger turtles falling within a wider size range. (Jayawardhana, 1983). It may be that most of the turtles caught in the fishing nets are sexually mature and small; sexually mature ones are relatively large, therefore needing deeper waters. As a result they are probably found at greater distances where our local fishermen cannot operate their nets.

Impact on survival

The fecundity of turtles is about 100 eggs per season. There is very high egg mortality due to predation by animals and man (Wickramasinghe, 1979). Further, the juvenile mortality in the sea is also very high primarily due to predation by fishes. A certain number of juveniles would also die due to natural causes. Finally only about 2 to 4 per thousand hatchlings survive to adulthood (Wickramasinghe, 1979). which means that the total mortality coefficient that consists of natural mortality, fishing and predatory mortality coefficients is higher than 0.90, which is in general much higher than the total mortality coefficient of most marine fishes that lay a few million eggs per season. In such cases too 1 or even 2 to 3 eggs survive to adulthood i.e. until they spawn at least once, inspite of unavoidable mortality factors like sudden change in currents, temperature, salinity and other hydro-biological factors in addition to natural and predatory mortalities. Therefore, although turtles appear to be safe in the sea due to their hard shell it is not quite so.

To achieve 2 per thousand survival rate upto adulthood it is necessary to have 10 mature females. Based on the above assumption, an average of 2000 female turtles are needed annually to replace the exploited stock alone. It is very unlikely that such a large ratio exists in the waters off Sri Lanka or even in the world. The ultimate result of that could be the unavoidable gradual extinction of the turtles from the world oceans, if the present rate of exploitation by man continues.

How to save

Most turtles are not exploited directly like fish or whales, except for a few slaughtered at nesting sites. They are mostly caught accidentally as a bi-catch while fishing. Most of them do not die even after getting entangled in the fishing net. Therefore they could be freed. But the fishermen are unaware of their biology, more precisely the survival rate and its effect on the future of turtle populations. Therefore, education of the fishermen can play a major role to save them. It could bring better results than treating turtle hunters by a court of law.

Secondly, the fishermen should be made to understand, that they are also a component of the conservation effort and that their support and participation is essential for the survival of the turtle. Until we recognize that they are as important as law enforcing men, our effort to save the turtle would be futile.

Thirdly, the stock size of the nesting turtles in our beaches, their fecundity, mortality at different stages, maturing age and finally the recruitment to the next nesting population must be studied.

Fourthly, nesting sites should be protected from turtle hunters and more turtle hatcheries should be established from which a certain number could be

freed to the ocean and the balance perhaps could be reared in cages or even in ponds just like the cultivation of fishes. In 1981/82, about 54,000 hatchlings have been released from hatcheries to the sea (Wickramasinghe, 1983).

Fifthly, utilising growth and mortality parameters, the surplus yield should be calculated and be allowed to be harvested under a licence system just like in any other fishery system. This aspect could be implemented only after forming a world body for turtle management.

Lastly, unlawful turtle hunters and those who possess turtle shells should be prosecuted and they too should be educated on the value of conservation.

Acknowledgements

The author wishes to thank Dr. M. Attygalle of the Department of Zoology of the University of Sri Jayewardenepura, for suggesting certain changes in the manuscript. The research was funded out of money saved while the author was in the US working for the Ph.D degree on a Fulbright scholarship.

Therefore, the paper is dedicated to the US tax payers.

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Trial of "In-depth" Fencing Against Elephants

HENRY AND JILL NEUSINGER

Records of elephant damage on our Redd Barna Project holding at Udawelagama for the Maha 1982/1983 and 1983/1984 were published in the June issue of "Loris". Shortly after they went to press a survey of the estimated damage sustained on each of the 52 holdings in the village (1983/1984) was taken by Redd Barna staff showing that the total loss to the village farmers in the one season was nearly 2 lakh rupees. This bore out our own estimated losses of Rs.3840.00 for the season, by far the greatest amount of damage was done by elephants. In the village context these figures are disastrous and they spurred us to think even harder about how to stop them. We had been watching the elephant's feeding habits, paces, tracks etc.; we have seen him push down trees and posts; we know he can tread - in ditches and short-cut electric fences.

In March 1984 an idea came for a barrier which we called "in-depth" fencing. It consisted of a strip of pointed stakes, about 1.7 m wide and only 22 cm high above ground.

Henry and Jill Neusinger are British Volunteers, working in the Red Barna Rural Development Project at Udawelagama, Habarana.

Test trials of the fence were conducted in April as indicated below. (Table I) The trial occupied a strip 30 m x 1.7 m, in which stakes, ranging in diameter from 8 to 18 cm were planted at varying spacings and depths.

Timber, was used from old homesteads in the village and on the holdings.

On March 30, 6 men started collecting and cutting up timber into stakes from 60 cm to 75 cm long. Some were sharpened at one end and the stakes were dug into the ground as in tests 1, 2, 3. They were positioned on a known elephant path where it cuts across the holding.

On the night of April 2, a large wild elephant broke into the holding; his tracks showing that he had picked his way through the fence at test 2 without displacing any of the stakes, thus demonstrating that they were too widely spaced.

On April 7, two working elephants were hired to test the fence.

When first presented to it, as at test 4, they refused to cross, trying it first with their trunks and then with their feet. Encouraged by the mahouts, and where the stakes were over 30 cm high, the elephants were able to put a foot against unsharpened stakes and push them apart sufficiently to tread. Where the stakes were 22 cm high and sharpened, as in test 5, they would not and could not do so. They were unable to cross at test 5 regardless of command. When told to pull out stakes (which were freshly planted in soft ground) they were only able to pull out those over 30 cm long and unsharpened.

Table I : Layout of Trial

TEST	STAKE LENGTH/cm	DISTANCE/cm	HEIGHT ABOVE GROUND/cm	POINT
1	75	45	45	sharpened
2	60	45	30	half-sharpened
3	75	40	30 & 22	sharpened and unsharpened
4	60	30	30 & 22	sharpened and unsharpened
5	60	25	30 & 22	sharpened and unsharpened

Conclusion

The conclusion reached by the mahouts and their 3 assistants, onlookers and ourselves, was that the "fence" with stakes planted as in test 5 would stop wild elephants and that no damage would be done to them because they would not attempt to cross it.

The following week tracks showed where several wild elephants had approached, balked at the stakes across their path, and walked around.

Financial Support

Following the test a proposal for a full field trial of the fence around the whole village of Udawelayagama was submitted to Redd Barna. It was estimated from the test-trial that it would cost nearly Rupees 2 lakhs - the equivalent of one season's losses in the village from elephant damage. Almost all the cost would be in labour, estimated at about 5000 man days or at about Rs. 40.00 per metre. The overall costs, besides carting and tools, would include planting 3000 tree seedlings of margosa

(*Azadirachta indica*) round the inner perimeter of the fence to replace the timber used and also as a windbreak, a blind and for timber value, class I. The timber used in the fence would be mainly Dhamba (*Syzygium spp.*). Maintenance required would be annual or possibly bi-annual spraying with weedicide, avoiding the young trees. The responsibility for maintenance was left open for discussion. Watchers huts would be built at the three lane entrance to the village where fire-buckets could be hung and attended by two watchers each night.

During May, June and July, discussions were held with Dr. Shelton Atapattu Director, Department of Wildlife Conservation; Mr Wazeer, Assistant Director, Mahaweli Region, Department of Wildlife Conservation; Mr. Lyn de Alwis Director Zoological Gardens; Dr. Ranjen Fernando, President, W.N.P.S ; the G.A. and Addl. G.A. Matale, and the A.G.A., Dambulla; and of course, Redd Barna, who would be supporting and financing the operation. Many people came to see the test trial fence. Finally all the necessary authority

and permission was granted and on September 19, work started on an extended trial of about 1250 metres. Redd Barna agreed to finance the extended trial round the northern end of the village, the end most exposed to elephants, and provided that none had crossed it during construction, they were prepared to continue and support the full field trial.

At the present time, October 31, work on the extended trial is progressing and no elephants have crossed although tracks show where several have approached. It is a mammoth—or more aptly—an elephantine task, and the farmers have to work extremely hard, besides their other work on subsistence crops, to complete the fence.

Costings and records of progress are being kept.

Prospects

If this type of “in-depth” fence succeeds in diverting elephants, it would seem possible that it might be used to edge the corridors and buffer zones planned by the Department of Wildlife Conservation. The resources are to hand. The work is labour intensive but the cost and time could probably be cut by some degree of mechanisation.

Along with so many people, we very much want to see the elephants and the land that they need to survive in, preserved and cared for. Similarly we feel that the farmers in the frontier districts bordering these areas should be protected so that the results of their labour is not, from their point of view, wasted. The success of “in-depth” elephant fencing has yet to be proved, but we feel confident, and in any case will appreciate the courtesy of these columns to publish the results.

Our Readers Write

Sir,

HUMAN HEAD EATING ELEPHANT

I refer to the newsitem titled “Elephant Tramples Mahout to Death” published in the Ceylon Daily News of October 1, 1984. This happend in Dewalegama, near Kegalle.

The assistant mahout had said that he saw the body of Punchi Banda crushed and the head was not there.

The owner of the elephant, in his evidence has stated that this elephant had killed a mahout and eaten the head before this also.

Could readers throw some light on this strange phenomenon ?

Nugegoda.

S.R. Ratnapala.

The Society wishes to thank
P. A. Miththapala, A.M.A.I.C.
(Aus),
for having very kindly
provided the sketches in this
number.

ERRATA

We regret the following Printer's
Devils in the last issue-Vol. XVI No. 5

Contents Page (Page 260)
instead of Rowell, read Powell

Page 264: G. M. HENRY (1981-1983)
instead of 1981, read 1891

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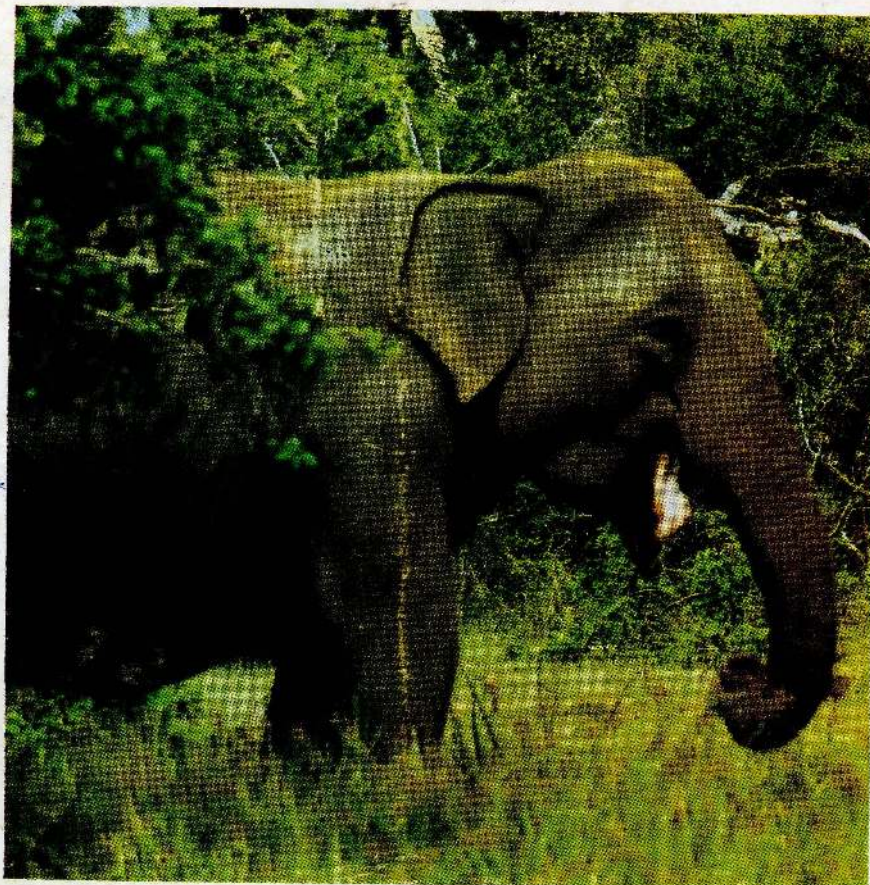
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