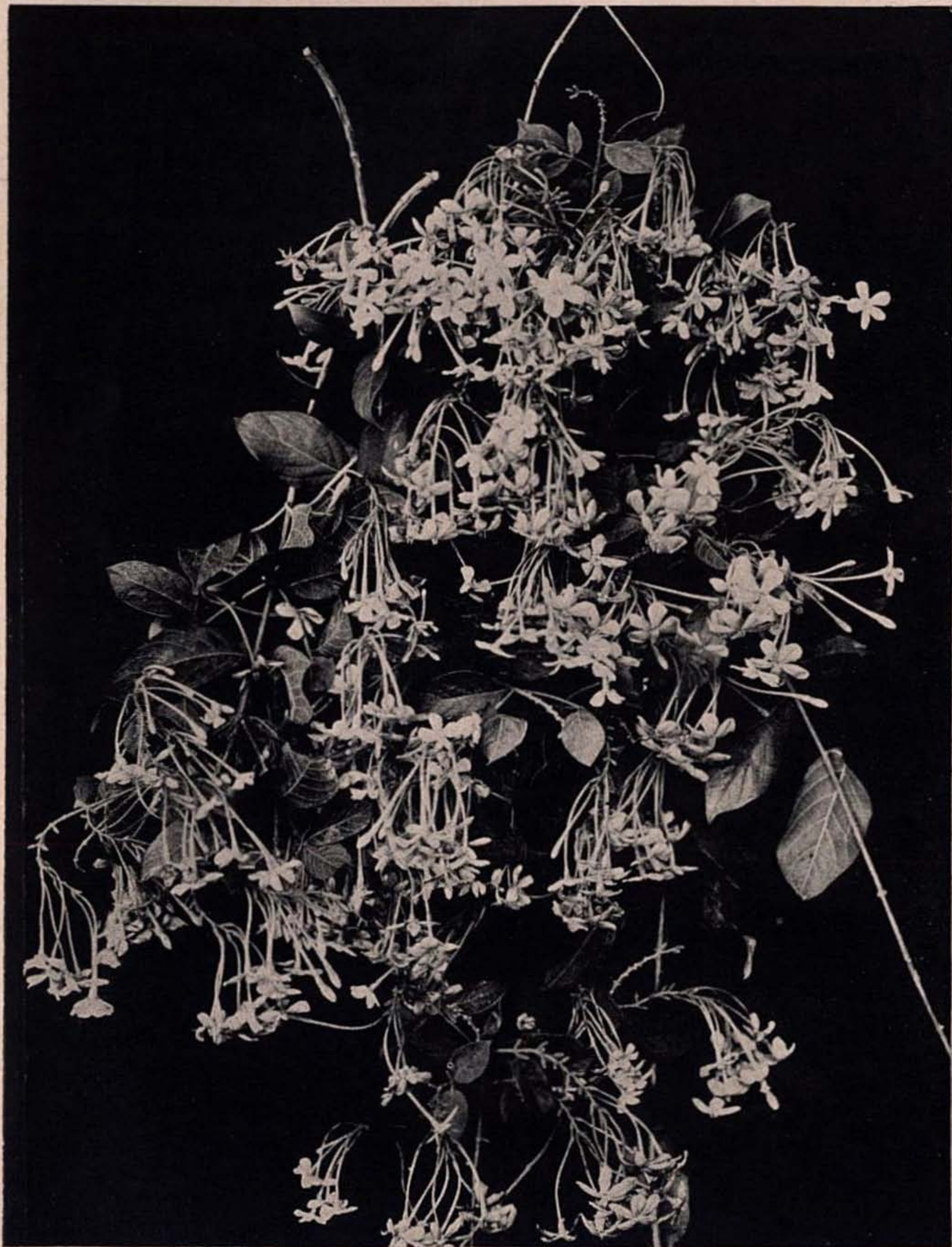


HORNBILL



BOMBAY NATURAL HISTORY SOCIETY



The Rangoon Creeper
Quisqualis indica Linn.

M. B. Raizada

From, Some Beautiful Indian Climbers and Shrubs (*in Press*)

The Society was founded in 1883 for the purpose of exchanging notes and observations on Zoology and exhibiting interesting specimens of animal life. Its funds are devoted to the advancement of the study of zoology and botany in the Oriental Region. The Society also promotes measures for conservation of nature.

Membership of the Society is open to persons of either sex and of any nationality, proposed and recommended by one or more members of the Society; and also to persons in their official capacity, scientific societies, institutions, clubs, etc. in corporate capacity.

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Members receive during a year three issues of the *Journal of the Bombay Natural History Society* now in its 75th volume, and four issues of *Hornbill*, the Society's popular publication.

Journal Editors

J. C. Daniel, P. V. Bole and A. N. D. Nanavati.

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The first annual subscription of members elected in October, November, or

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December will extend to the 31st December of the year following the election.

Write to:

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

EDITED BY

J. C. DANIEL
 S. A. HUSSAIN
 J. S. SERRAO

On cover: *Shortnosed Fruit Bat*

Photo: T. N. A. Perumal

EDITORIAL

1978 — The year of Sheikh Cheeli

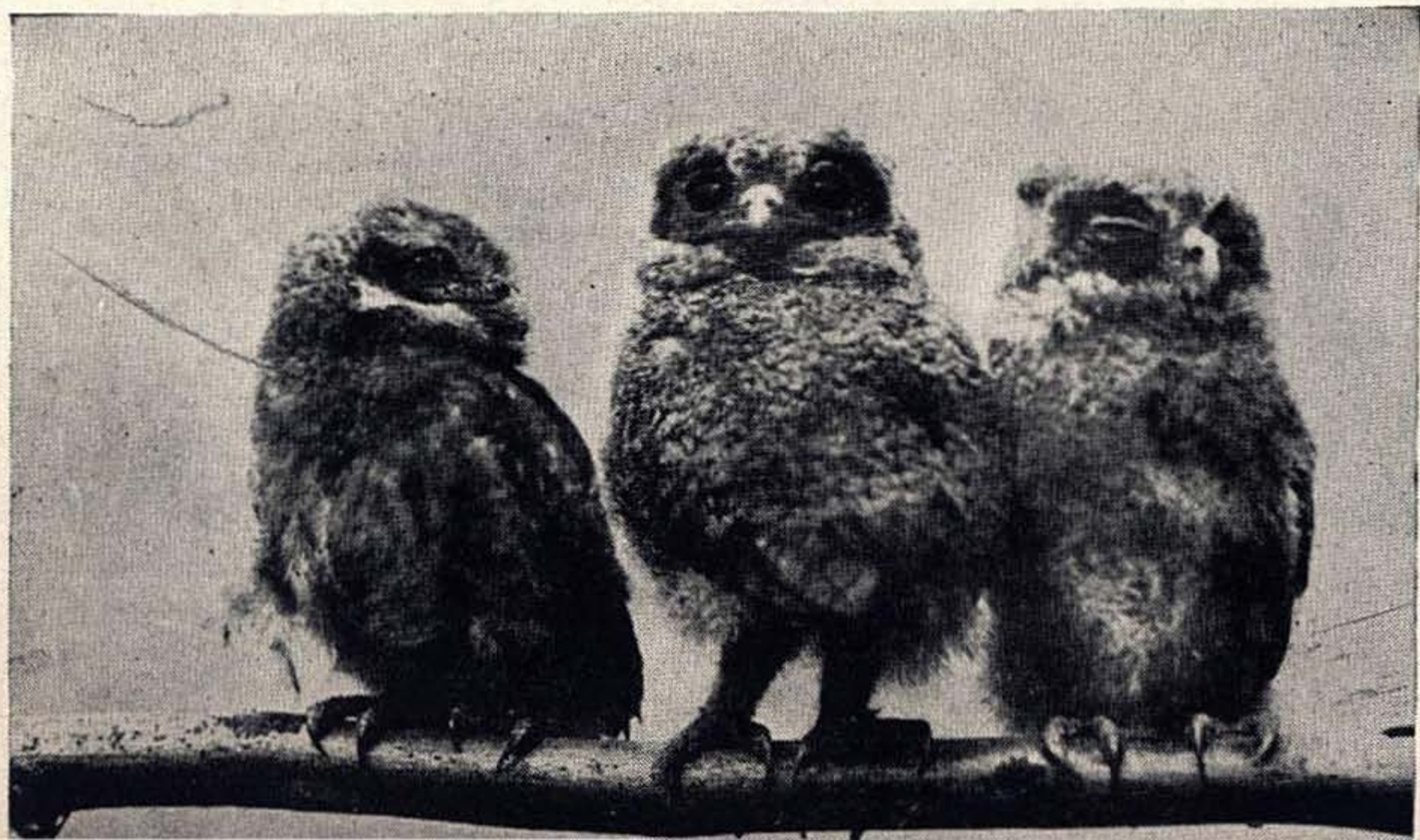
Building castles in the air, that's what we were doing in 1978. The foundation for this endeavour was laid early in the year when we participated in discussions at Delhi on how best to use PL-480 funds (American money with India) for wildlife conservation. Send projects, and you will be blessed we were told. We sent projects (50 copies of each) requiring a total funding of 10 lakhs or a million rupees, rather timid of us considering the fact that other people thought in terms of millions of rupees but then we are not a government department, and any sum above a lakh looks large to us. Excellent projects you have, we were told and only 10 lakhs—chicken feed. You shall have it. We came back rubbing our hands in glee, except when we were using our fingers to count our unhatched chickens.

The whole structure of the Society will have to be changed, we told the Society's President. We have

never seen so much money. The President was not impressed; he told us a story. It seems that Sheikh Cheeli, a poor farmer, was walking along carrying a pot of curds on his head, for sale at the bazar. As he strode down the path he thought of what he could do with the sale money. Perhaps buy a cow calf, and as his herd and his money multiplied in his head, his dreams turned to the satisfaction he could have from the power that the new found wealth would give him. Those who had been unkind to him would come and ask for favours, and he would refuse with a curt shake of his head and as he involuntarily shook his head in tune with his thoughts, the pot of curds crashed to the ground, and with it went his dreams.

We thought the story may be worth repeating as a cautionary tale to those, situated as we are today—Penniless. Someone up in Delhi knocked down our pot of curds.

Three wise owls



FEEDBACK

'Sport shooting and Conservation'

I refer to the remarks by Dr. and Mrs. Groves (*Hornbill*, No. 9, Oct.-Dec. 1978). The misinformation offered by the Tourist Department is unforgiveable—our country is beset with the curse of officers and others talking about things they know little or nothing about! But I am sorrier to read the disparagement of the President's remarks, which were a belated but correct assay of the difficulties experienced in Wildlife Conservation in India. There is a general feeling that a ban on shooting would automatically save wildlife, and most of the work for Conservation has been in the form of pious resolutions and loud talk.

A few years ago I made enquiries and discovered that of the 170,000 arms licences in Maharashtra, only 700 bought small game licences, of whom 600 (out of 40,000 arms licences) were from Bombay City—the obvious reason being the Honorary Game Wardens operating from Bombay. All these game wardens were sportsmen who went out to shoot. They have not yet been appointed under the new Act, and there is no doubt that poaching is again rampant.

The *modus operandi* of the trappers or *Phansi-pardas* is to net birds within walking distance of their camp for 10-12 days, and then take them to market. Some years ago, I apprehended near Karnala, which

was not yet a bird sanctuary, a party of trappers with about 20 junglefowl, 20 spurfowl, 40 partridge and 700-800 bush quail. Though a keen small game shikari myself, I have not got a single junglefowl within 50 miles of Bombay over the last 40 years, and perhaps only a dozen spurfowl. Commercialization of wildlife is the surest way of writing it off and the only means of keeping a check upon the activities of those who operate with snare or gun is to have the cooperation of the sportsman. I cannot imagine a poacher with snare or gun being noticed and apprehended by a photographer sitting in a hide waiting for birds or animals to come within range.

The note referred to also carries a fallacious implication regarding the effects of the transfer of a few chital head from the forests of Kanha to the dining-room walls of Delhi. I visited Kanha a couple of months ago and was told that the chital population had increased over the last few years from 7500 to 15,000. Every tiger requires a specific area, and though the number of chital may be enough to feed a couple of hundred or more tiger, I am quite sure that the area cannot support them. These points have not been studied, and such suggestions are misleading—the whole environment needs protection.

In addition to providing a healthy

outdoor sport, shikar brings the sportsman in touch with nature and natural history, the latter a trait which cannot be associated with any other sport. In India at least, most of the work on the natural history of birds and beasts has been done by shikaris. Every outing brings him in touch with aspects of nature which would otherwise remain hidden and unexplored. It also introduces young men to the manly art of handling weapons which would otherwise be quite unknown to all except those who joined the army. This is another matter of national value.

But, and this is important, it is necessary to emphasize as is implied in the President's letter that we have been talking loudly of Wildlife Conservation ever since Independence, but have achieved very little. The reason is not far to seek. This is the work of people who are dedicated and trained for the administration of suitable laws. The average forest officer is not very

Bombay.

efficient as a game warden. He does not know the birds and animals which are to be protected. He works during office hours while 90% of the hunting and poaching, at least with guns, which require his supervision and detection is done outside office hours and on holidays. He holds the position of wildlife officer in the ladder of his forest service. He may learn something about wildlife in one or two years but as soon as he is promoted he leaves it to another officer who starts learning all over again, at the cost of wildlife.

Again forests today occupy only 15-17% of the whole country. Does the wildlife in the rest of the countryside not need protection? As time passes it will not be possible to save the larger animals like the elephant and the tiger except perhaps in national parks and sanctuaries and the smaller animals need more protection so that they keep with man over a greater area and a longer time.

HUMAYUN ABDULALI

With compliments of

**THE INDO BURMA
PETROLEUM CO. LTD.**

1978-Happenings at and from the Society

Arunachal Pradesh

The Society's field surveys are now extended to the little known wilderness areas of this State. We hope that the mistakes that have been committed elsewhere will not be repeated and that natural resources both plant and animal will not be wastefully destroyed. The State presents a challenge for the wise use of the environment.

Harike Lake

Approximately 150 km NW. of Chandigarh was examined as a wild-fowl refuge. With an area of about 35 sq. km this man made impoundment across the Beas and the Sutlej offers excellent opportunities for

studying the development of a wild-life habitat out of a man made environment.

A bird's eye view of the Flamingo City

Dr. Salim Ali, Lavkumar Kacher with M. A. Rashid of the Gujarat Forest Department had a look from a helicopter at the nesting site in the Rann of Kutch and associated areas which are to be declared a sanctuary. We plan to ring the juvenile flamingos in the coming breeding season.

Encyclopedia of Natural History

The Society's centenary is hardly four years away and work is in progress on this Centenary Publica-



Flamingos at Nal Sarovar, Ahmedabad

Photo: S. P. Patel

tion. Mr R. E. Hawkins, the general editor of the volume was the General Manager of Oxford University Press prior to his retirement.

Nature—What is in it for the blind?

Bird songs, the texture of flowers, leaves and bark, the gurgle of brooks, that's what the blind have and that's what was taught to them by the Nature Education Organizer when she took a blind school to the field. If you feel the shape of a stuffed bird and relate it to its call you have understanding.

Bhimashanker

Another sacrifice to tourism. One of the few remaining wilderness areas in Maharashtra is being considered for development as a tourist resort. The Society feels that enough areas have been destroyed in the name of tourism and is trying to convince Government 'primitiveness is natural and should not be improved.'

Bandipur Shibir

Prof. Madhav Gadgil is to be congratulated for organising the first field training course in Wildlife Ecology at the University level. The Society's staff provided technical and teaching assistance.

Petrochemicals and the Taj

The Taj Mahal could be a victim of chemical pollution if the Mathura Refinery is situated in its present siting. The Petro Chemical Industry published its expert opinion of assurance. Our contention is that if there is even a remote possibility

of pollution affecting the Taj, the refinery *must* be sited elsewhere.

Sholas—not every one's cup of tea

In the name of rehabilitation of refugees and expatriates, governments have a tendency to go berserk. In Tamil Nadu expatriate tea garden labour from Sri Lanka had to be rehabilitated. So the Government decided to provide them with tea gardens, probably to make them feel at home. The result was irrevocable damage to relict Shola forests of the Nilgiris. From what we have seen of the destruction, there is little hope that Shola forests will survive.

Eastern Ghats—unknown but endangered

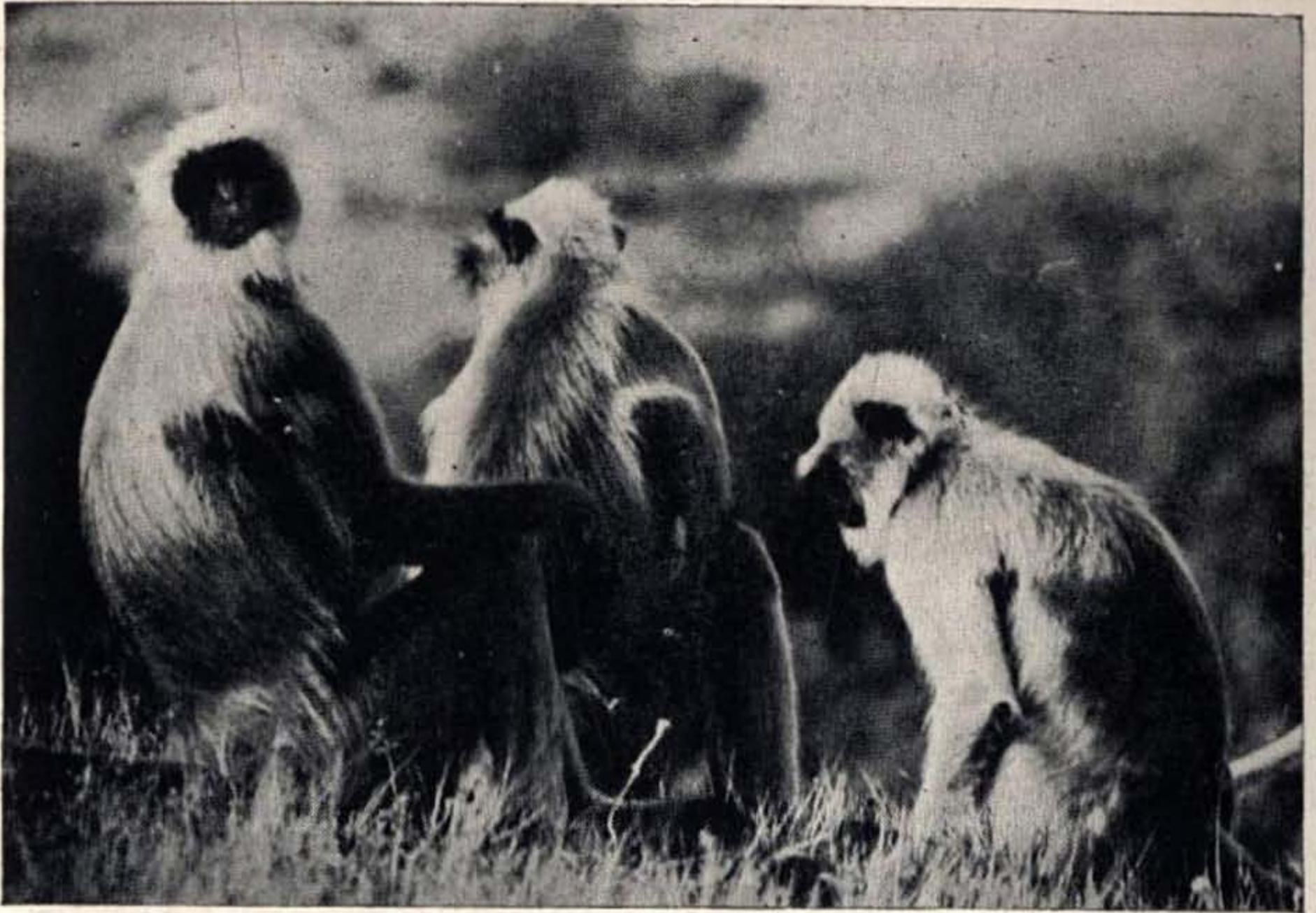
The conservation of the forests of the Eastern Ghats requires urgent attention if a very crucial zoogeographical area is not to be destroyed. The Society has made recommendations and will channel its efforts through its members in Andhra Pradesh.

Silent Valley—Requiem?

It seems unlikely that the international concern for this national treasure would prevent the Kerala Government from destroying this rain forest ecosystem.

Owing to Dr. Salim Ali's absence from Bombay in Arunachal Pradesh on an avifaunal survey, this issue does not contain the President's Letter.—EDS.

Langurs and their seraglios



A sultan and his seraglio

Photo: B. Srinivas

The most widely distributed monkey of India, the blackfaced, grey langur, is commonly known as the hanuman langur, after Lord Hanuman, famous for his life long, strict celibacy. A majority of langur males indeed lead a life of celibacy, but unlike Lord Hanuman not voluntarily. The celibates amongst the Hanuman langurs are the weaker monkeys forced into bachelordom. Juvenile males in a troop of hanuman langurs are driven out as they approach maturity. When thus forced out, they join an all-male bachelor troop, waiting for an opportunity to make an entry into a bisexual troop which have many adult

and subadult females with infant and juvenile males and females. The troop is ruled over by a single adult male in most cases, though occasionally, more than one adult male may be present. This Sultan lordling over his seraglio of females and their infants keeps all other adult males away from the troop. The males from the bachelor troop make every attempt to dislodge the males governing bisexual troops. Every now and then their attempts meet with success and the bachelors drive out the overlord of a bisexual troop. Now begins a struggle among the bachelors which eventually leads to one of the bachelors becoming the

dominant male of the bisexual troop. He in turn drives all other males out who retreat back to their position as members of a bachelor troop.

Most adult males never get a chance to leave the bachelor troop and establish themselves in a bisexual troop. They thus lead a life of enforced celibacy. But even those who succeed in establishing themselves in a bisexual troop do not have a long reign. No sooner they take over a troop, attempts begin to drive them out, and eventually, often much before they reach a ripe old age, the males have to make way. As a consequence, while the females may enjoy a long reproductive life-span of a decade or so, even the few males who succeed in taking over a bisexual troop have to rest content with a reproductive life span of two to four years.

We now know that natural selection acts largely at the level of an individual. It therefore favours traits which maximize survival and reproduction of an individual, even when this has deleterious effects on the survival of the group or species. Any behavioural trait that would increase the reproductive success of the males who have taken over the troop will therefore be favoured by natural selection. One such trait appears to be that of infanticide. For a male who has newly taken over a troop, the infants carry the genes of a stranger—of the male he has displaced. If these infants continue to survive, their mothers will go on nursing them and may not come to

heat again for some months to come. If these infants were to go, however, their mothers will quickly come into heat again and then the new male will get a chance to breed and start propagating his genes that much more quickly. This hastening of his reproductive success will be particularly valuable when the male's expected reign is short and the hastening is likely to mean three instead of only two successive breedings of his own progeny by the female of the troop. In fact, an analysis of the situation clearly indicates that murder of the suckling infants will considerably enhance the ultimate reproductive success of a male who has newly taken over a troop. And, this is what the new male proceeds to do. He systematically bites and kills all the nursing infants in his troop.

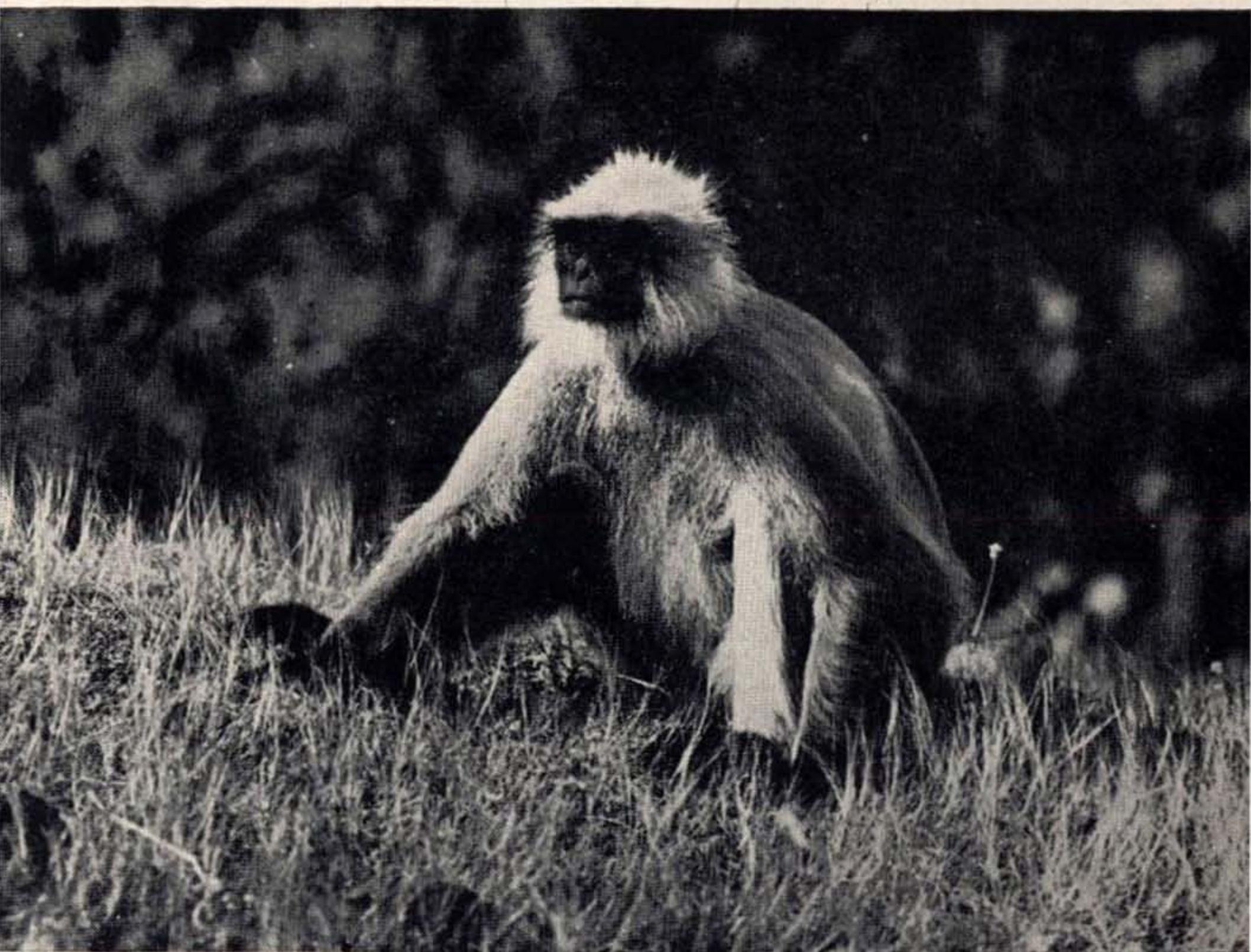
This grisly act, first recorded by Sugiyama and M. D. Parthasarathy in Dharwar and subsequently confirmed by Mohnot at Jodhpur and Hrdy at Mount Abu has sent shockwaves particularly through the ranks of anthropologists. For this phenomenon clearly shows that traits which may in fact reduce the fitness of the species as a whole may nonetheless be favoured if they promote an individual's survival or reproduction. By now the point is in fact becoming well established that much of social behaviour is in fact geared towards maximizing the survival or reproduction of an individual.

Our example of Chital showed

how the herds of that deer have their genesis in every individual's attempts to promote its own survival, and the phenomenon of infanticide in the langur shows how behavioural traits may arise from every male's attempts to promote their own reproductive success. Is then all social behaviour only nakedly selfish? Obviously, this is not so, for we know that honey-bee workers throw away their lives in the defense of the hive and elephant aunts take very good care of their nephews and nieces. There are

clearly ways in which evolution goes beyond favouring an individual's narrow selfish interests at survival and reproduction. Indeed, natural selection can also favour the evolution of co-operative, self-sacrificing, altruistic behaviour. This seems to happen whenever the beneficiaries of the self-sacrificing individual's altruistic act are its own blood relatives. This phenomenon is known as kin selection, and we will turn to it in the succeeding article in this series.

MADHAV GADGIL



The outsider—Ready to move in

Photo: B. Srinivas

The Shortnosed Fruit Bat

The photograph of the Shortnosed Fruit Bat on the cover of this issue was taken by the well-known wildlife photographer Mr. T. N. A. Perumal of Bangalore. Incidentally, Bangalore seems to have the largest number of wildlife photographers and the majority of them produce high quality photographs.

—EDS.

The majority of bats eat insects, the fruit bats are the non-conformists. They eat only fruits. They are not so widespread as the insect eating bats and are confined to areas of the world where fruits occur throughout the year—the tropics. Fruit bats have an uncanny ability to locate ripe fruits and this knack can be used to photograph these elusive animals. All that are required are: a ripe fruit hung at a convenient location; a camera and flash prefocused and set for instant use; and abundant patience. The rest of the story reads like a tiger hunt of the old days. As they (the tiger hunters) used to say suddenly the bait becomes obscured. They fired a rifle, you click your

camera. The tiger left its skin as a memento, the fruit bat leaves its picture. The shortnosed fruit bat which is on the cover of this issue is a much more subdued animal than its relatives, the flying fox and the fulvous fruit bat which live in screeching, squabbling colonies. Distinguished by its white margined, nearly naked ears and divergent nostril, it lives singly or in small groups, among palm leaves and aerial roots of banyan, coming out at dusk to flit silently from fruit tree to fruit tree. A nibbler, it destroys more than it eats, occasionally flying off with a fruit to eat at leisure. It is widely distributed in peninsular India and south-east Asia.

NATURE CAMP 1979

A bird banding camp will be organized at Point Calimere in Thanjavur district, Tamil Nadu, during the period of the Diwali Holidays. This would be strictly a working camp. Details would be communicated to members in due course.

NOTES, NEWS & COMMENTS

Nepal Symposium and Trek

The World Pheasant Association is now busy planning a 'First International Pheasant Symposium' to be held in Kathmandu, Nepal, in November this year.

Exciting treks are being arranged around the Symposium dates of 21st to 23rd November 1979 for members who want to attend the Symposium and have a holiday at the same time. The first trek from 18th to 21st November is to the famous Tiger Tops Jungle Lodge where tiger, Indian rhino and leopard are frequently seen. The second trek is into a part of the Everest National Park, where the organisers are confident they will be able to show their members Himalayan monal pheasants and blood pheasants in the wild.

The complete package deal holiday from 18th November to 3rd

A male Blackcrested Kalij Pheasant

December 1979 will cost World Pheasant Association members £875/-.

Birth of a Panda

Recent newspaper reports (*South China Morning Post*—Reuter) indicate that Peking Zoo has successfully reared Giant Pandas in captivity through artificial insemination. This is apart from the ten cubs bred through natural matings in the past five years. Facts that emerged during the insemination experiment are that the pregnancy period is 40 days and that the ideal mating age is after eight and below 20 years. The panda live in the bamboo forests of the Yunnan Province in China and are protected, and are not, according to the Chinese, threatened with extinction. Only 12 pandas are found outside China and these are in the zoos of Mexico, U.S.A., U.K., France, Japan and North Korea.

Photo: E. P. Gee



The Asian Elephant in China

Recent information received from the Chinese delegates to the international Tiger Symposium held at New Delhi indicate that there are approximately 100 resident wild elephants in China. These are now restricted to the tropical and sub-tropical 2200 sq. km Moyang Reserve in southern Yunnan. Transient herds occasionally enter China from Burma and Vietnam.

Conserving India's rare Flora

Several hundred species of Indian flora are threatened with extinction. In order to conserve such endangered genetic resources the Government has placed certain restrictions (or ban) on their collection, trade or export.

India is also a signatory to the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITIES). According to the Convention, even if any scheduled species is smuggled out of a country, the country of destination will not allow its entry. The Convention is administered in different countries by small national committees comprising of Management and Scientific Authorities.

Laymen and scientists not aware of these restrictions, often encourage or assist traders and foreign visitors in collection of living wild plants of orchids and other endangered groups. Such material is held up at sea- or airports, and is not permitted to be exported causing disappointment to collector.

Traders and exporters in plants and plant-products, and hosts or

collaborators of foreign visitors interested in details about plants banned or restricted for export are advised to contact in advance the Scientific Authority (Flora) of the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITIES, 1973) in India, namely

THE DIRECTOR

BOTANICAL SURVEY OF INDIA

P. O. BOTANIC GARDEN

HOWRAH 711 103, INDIA.

Problems of Preservation: Species, Faunas and Ecosystems

Addressing the members of the Society and their friends on the "Problems of Preservation" at the Hornbill House on 26th February 1979, Dr Colin P. Groves urged that whole ecosystems must be preserved intact, and interactions between species be studied, for if one species is not preserved, others may also suffer. He cited the interdependence of ungulates in the Serengeti National Park, Tanzania as an example. Different wild ungulates eat the common grasses at different heights and stages of growth, so that a decline in one species such as buffalo means that the grass remains long and coarse and unpalatable to the next species in the succession, such as Thomson's gazelle. Domestic stock generally compete with wild herbivores directly; moreover the regular paths used by their huge herds cause erosion, so that an area can only support a lower number of domestic stock than of wild ungulates.

(contd. on page 17)

Handbook of the Birds of India and Pakistan

Volume 1: Divers to Hawks

SALIM ALI & S. DILLON RIPLEY

This volume is part of a monumental ten-volume series completed in 1975. The text of the second edition has been extensively revised. Four new monochrome plates have been added to this second edition and one of the colour plates has been redrawn. *2nd edition Rs 150*

Jim Corbett's India

Stories selected by **R. E. HAWKINS**

This is a selection of Jim Corbett's writings, taken from, among others *Man-eaters of Kumaon*, *My India* and *Jungle Lore* which will introduce Jim Corbett to a new audience, as well as give renewed pleasure to the old one.

The stories and extracts have been selected by R. E. Hawkins, who was Corbett's publisher and editor, and who provides an Introduction on the man, his life and his work.
Rs 50



OXFORD UNIVERSITY PRESS

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The Fossil Frog Beds at Worli Hill, Bombay

Bombay forms part of a volcanic upheaval which cast up several small islands of black basaltic rock, and whitish grey trachite, about 70 million years ago.

During periods of quiescence between volcanic eruptions, the weathering process formed small lakes on the surface, which received the sediments drained from the surrounding areas. In these sediments were caught up the remnants of the plant and animal life of the area, and when subsequent lava flows emerged, these sediments (intertrappean beds) were sandwiched between two layers of lava and have

thus remained permanently preserved.

The intertrappean beds of the Malabar, Cumballa, Worli and Sewri-Bhoiwada hills have yielded, and still yield, fossils of plants and animals (frogs, tortoises, etc.), giving us a glimpse of the plant and animal life, and, from location of these beds, an idea of the geography of old Bombay, from about 70 million years ago.

This fascinating natural museum has been all but destroyed by digging, quarrying, and new constructions. There is one remaining area, at Worli Hills, which has been preserved so far because it is situated



Nature's own museum—Layers of Fossil beds

Photo: S. A. Hussain

below a temple, adjoining the hill-top public garden at Worli Hill.

Very few, if any, cities in the world can boast of such an area in the heart of the city, where the geological formations, indicating the geological history of the site, as well as fossils of life forms of that period, can be very easily demonstrated.

Since 30 years, efforts are being made to interest the authorities in preservation of this very important heritage. At various times, the government, the municipal corporation, the archaeological department, and other authorities, have expressed their interest and undertaken to see that this is preserved, but no action has been taken so far, and the erosion continues.

At the present time, the base,

A fossil frog

and approach to the fossil bearing part of the Worli Hill is surrounded by tenements which fill up all the space around. If the area is fenced off, it may be possible to preserve this monument as a relic of prehistoric Bombay, and as a national museum, where students can be brought to learn about our past.

It may be possible to extend the garden on top of Worli Hill to encompass this area, along with the temple, so that approach to it could be made through the garden.

Once the area is demarcated and protected, it would be possible to erect signboards and illustrative diagrams which would add to the educative value of the place, and also arouse the interest of casual visitors.

A. N. D. NANAVATI, M.D.

Photo: S. A. Hussain



Fossil Frog beds—A record of earlier attempts at protection

A resume of the attempts made by Bombay Natural History Society over the years to get the Fossil Frog Beds at Worli preserved as a Geological Monument is worth readers' attention.

Negotiations for preserving the deposits commenced as early as 1941. After a lapse of inactivity they were revived in 1953. The land desired to be preserved was approximately 7610 sq. yards, and at the land rate prevailing at the time it was worth Rs. 40/- per sq. yard. The site to be preserved formed a part of the land reserved for construction of quarters for the Municipal Water Purification Plant staff attached to the then proposed reservoir at Worli Hill. The Hydraulic Engineer of the Municipality was requested to state whether it would be possible to relinquish the area so as to preserve it as a Geological Monument. In response to this in 1954 the Hydraulic Engineer offered to review the matter when the actual work of building the reservoir and staff quarters was taken on hand.

A lull followed, and on reopening the matter the Deputy Municipal Commissioner (General) February 1958 suggested to the Education Department of the erstwhile Government of Bombay that about 800 sq. yards (bounded by a yellow border in Municipality's Plan

82 of 2.iv.1957) be preserved as a National Monument. What the revised Municipal proposal conveyed was to preserve the vertical face of the eastern side of the Worli Hill carrying the temple on the top for study purposes, and left accessible to students and visitors interested in the area. This was referred to the Municipal Commissioner, requesting him to look into the matter.

However having failed to elicit any action in the intervening years, by 1963 construction work was in full swing all round the area. With this state of affairs all attempts to preserve the fossiliferous rocks got shelved, and the hopes of creating a Geological Monument receded. The shanty town that came up over the rest of the vacant space provided a gap in further encroachment of the fossil beds by high rise constructions, and thus saved the area from complete destruction. The present negotiations for the preservation of the fossil beds are the result of a fresh survey of the area made by the Society in association with Nehru Science Centre in November 1978.

What is now being sought is to have the 150 feet of the exposed area along the eastern face of the Hill declared as a Geological Monument and an inviolable National property, and to get it included with the temple at its top within



Fossil hill surrounded by 'progress'

Photo: S. A. Hussain

the precincts of the Worli Hill top garden. A passage provided all round the foot of the eastern face should enable students and visitors to conveniently go round the area and study the same.

The writer feels that unless Governments—Local, State and Central,

as well as scientific and cultural bodies and institutions—maybe also various political parties—are prepared to be involved, there is very little hope of retaining these unique fossiliferous rocks as a Geological Monument.

J. S. SERRAO

(contd. from page 12)

Tiger to Spider

Mr S. P. Shahi, Chief Conservator of Forests (Retd) of Bihar gave a slide illustrated talk entitled 'Tiger to Spider' to the members of the Society and their friends at Hornbill House on 5th March. Mr Shahi pointed out that to be interested in Natural History need not necessarily involve visiting forests. Interesting items, requiring

investigation, existed around one's own home, and many of these escaped one's notice unless carefully looked for. Most of the slides he displayed were made around his home, and covered themes like camouflage of bird nests and chicks, crab spider blending in its body colour with the racemes of the Australian acacia, the stages of nest building activities of a potter wasp, the caterpillar, imago and the emergence of the butterfly blue mormon.

A Cheetah family in the Mara, Tanzania

In 1977 I had been camping at Musiara in the Masai Mara Game Reserve. The rains were just getting over and most of the wildebeest had migrated across the Mara into Serengeti. It was still very green. Many of the ungulates had young and it was a good time for the cheetah family I had been observing. On the average the mother made two and sometimes three kills a day depending on the prey size, which was usually hares and Thomson's gazelles.

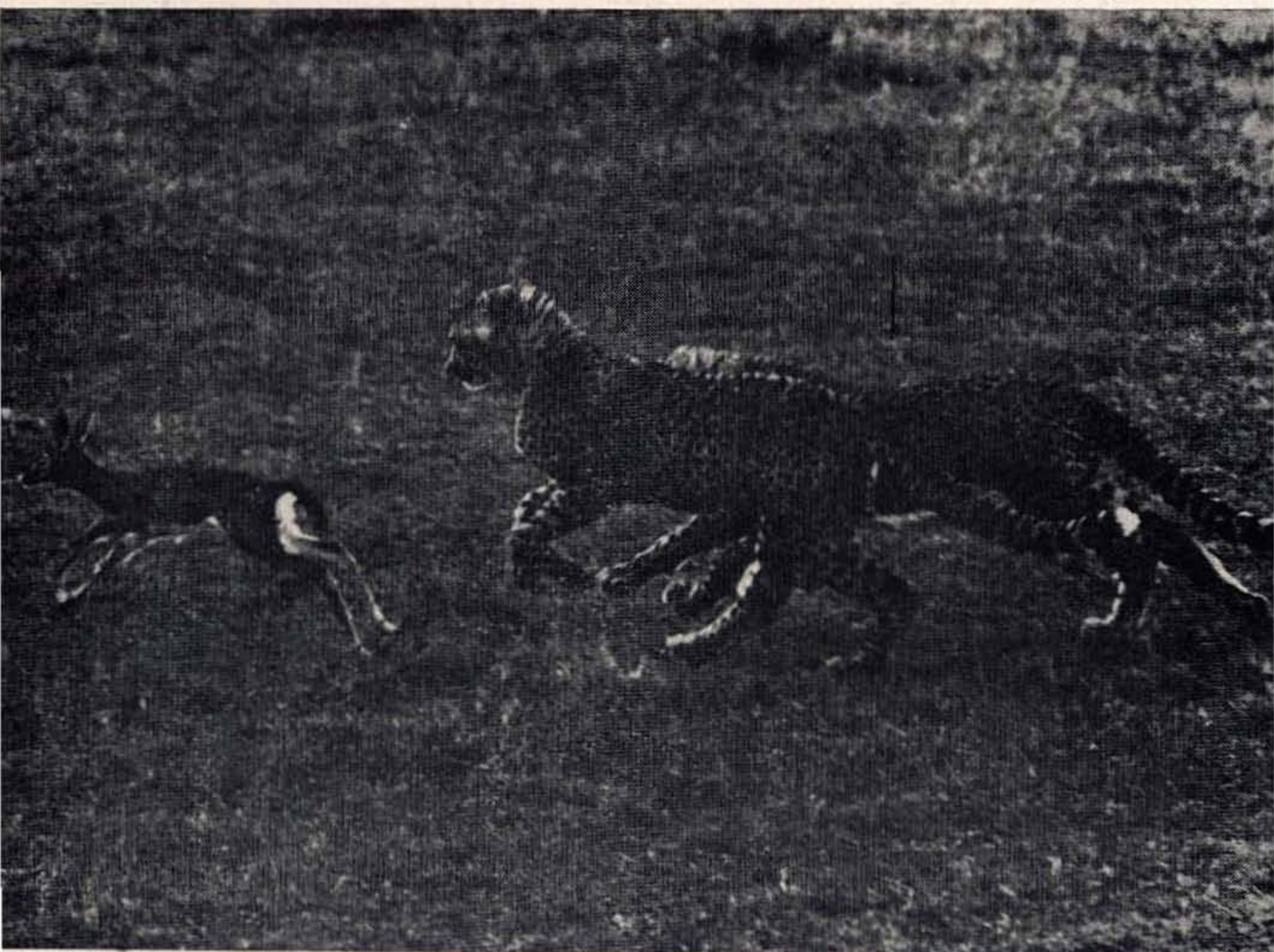
An unusual incident took place one evening. The cheetah had already killed in the morning. A herd

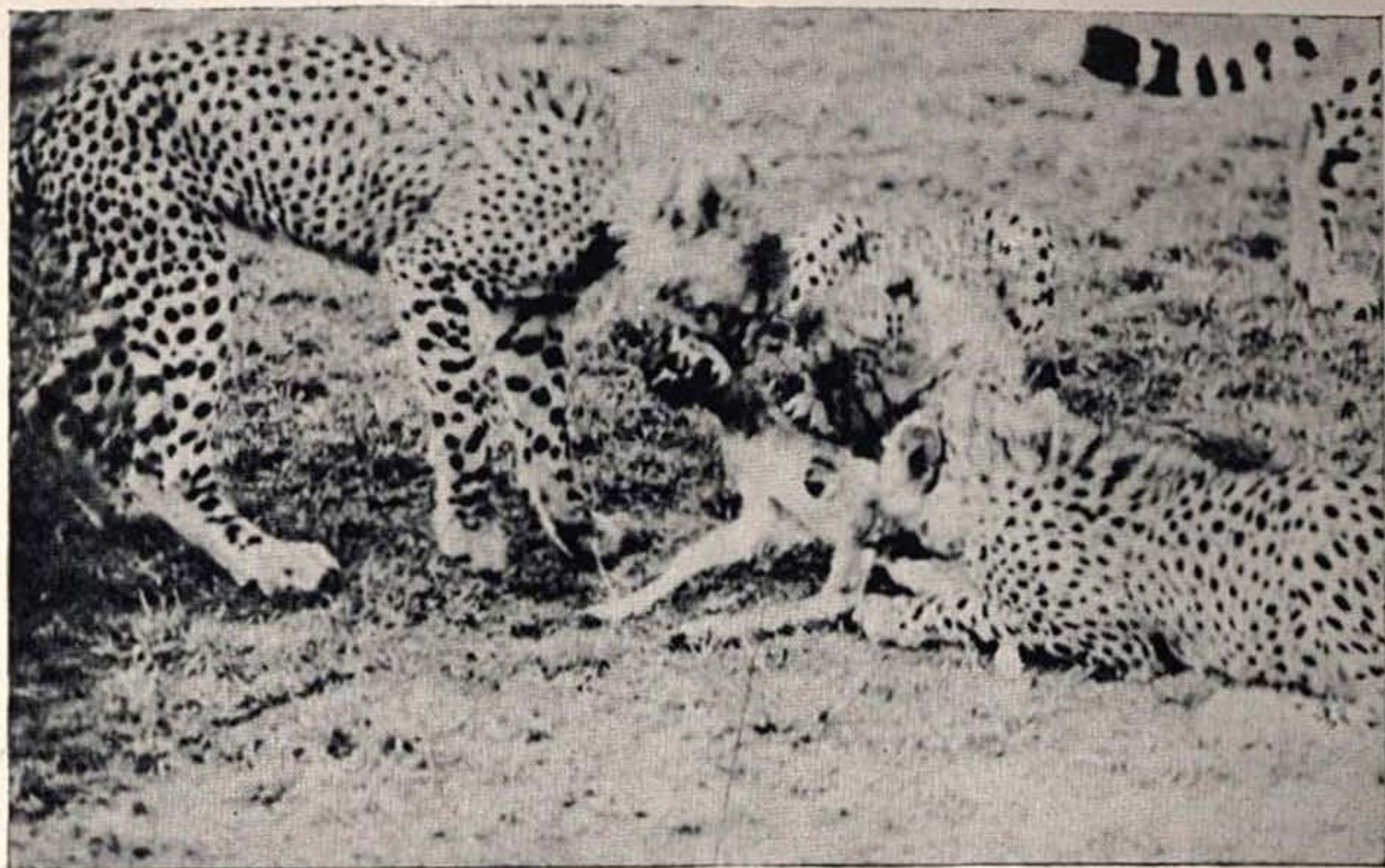
of wildebeest wandered into view and the mother suddenly sat up and watched them with increasing interest—or so I thought. As there were quite a few young in the herd, I presumed she was singling one out. She stood up and lopped steadily towards them in full view, her three cubs following behind her at some distance. She then broke into a run (not her optimum speed), and the wildebeest scattered. Another young wildebeest added to the menu I thought, but it turned out quite different.

She had spotted a tommy (Thomson's gazelle) hiding in the long grass which I had not seen. When

Cheetah cubs chasing their prey

Photo: Rishad Naoroji





End of the hunt

Photo: Rishad Navroji

I drove up, I found her sitting on it; the tommy scared out of its wits but otherwise completely unharmed; its mother watching the scene from a safe flight distance. When the cubs came up to her, they got very excited and started licking and sniffing the tommy all over and generally playing with it as if it was another cub. The tommy did get a lot of rough treatment at the hands of the cubs while the mother kept a watchful eye on them. They would allow the tommy to run a short distance and then chase it in unison bringing it down in a few seconds. This was valuable live experience preparing them for their adult lives, as their survival depended mainly on their hunting technique and experience. This sort of play went on for about an hour, and if the tommy sometimes ran

too far, the mother would go after it and bring it down. I noticed that whenever the mother cheetah wanted to stop the baby from getting up or running away, she would partially sit on it with her paws over the prey, keeping it imprisoned with her weight until the cubs caught up. Sometimes, they would also pick it up in their mouths and drag it around as they would their dead prey. At one stage the fawn even took shelter under my land rover but the cubs were used to the car after so many days' contact and flushed the tired tommy from underneath the car. By this time the tommy was quite exhausted and it would run a few paces before being overtaken and bowled over by the cubs.

(contd. on page 21)

BIRDWATCHER

Farther afield

Birdwatching in new areas is always a wonderful experience. I, with friends from the Bombay Natural History Society, visited a sea shore village, Dummas, in Surat district for birdwatching on 13th and 14th November 1978. Though there was a cyclone in the vicinity the previous day, and cloudy weather throughout, it turned out to be a very good birding experience. In all 63 species were seen, including openland birds, waders and marine birds. Some points of interest: Black Drongo, Grey Drongo, and Whitebellied Drongo were seen quite active in the same region. After watching them for two days at different times of the day, it was clear that they had no dispute over territory. They were flying, singing and feeding in the same region, sometimes on the same acacia tree.

On the 13th night, we came out for a night walk at about 10 p.m. It was a beautiful moonlit night. Going through thick acacia cover and hearing the fluttering of flying foxes, identifying owls from their calls, and listening to calls of jackals and trying to see them, was quite an interesting experience. When one of us flashed a torch at baya nests on an acacia tree, something unusual was seen. Most of the nests were incomplete as we had observed during day time. By flashing a light into them from below we could clearly see a bird roosting inside which had a crim-

son patch at the root of the tail and white underparts. They were Red-whiskered bulbuls roosting in baya nests. We examined some more nests in the vicinity and saw all together four Redwhiskered bulbuls using baya nests at night.

ULHAS RANE

The Great Indian Bustard

I have been in quest of the Great Indian Bustard for nearly five years. I saw the bird for the first time at Karmala, a taluka town in our district in Maharashtra on 7th September 1978. We saw it again on the 8th. The news of these rare birds, frequenting the region, came from the Forest Officer, Shri S. P. Gabale. Shri Moon, the Chief Wildlife Officer, M.S., was also with us.

Near the area of sighting the Forest Department has planted a number of trees, that have now grown up to a height of about 4-5 ft. This area is protected from trespassers, and there is plenty of grass and quite a number of bushes.

We were indeed very happy to have had the opportunity of seeing this rare bird; and that too, a flock of seven birds together at a time. As we waited and watched, from a distance of about 9-10 feet, in our jeep, without disturbing the birds, three more Bustards turned up one after another.

News was brought to us that the birds were breeding at a place 16 km from our district town. We went to the spot and found the eggs on



Great Indian Bustard incubating

Photo : R. S. Dharmakumarsinhji

7th October. This is also a protected area. We photographed the egg, and visited the place again after 10 days to see if the egg had hatched out. We again saw a pair of these birds. There is no attempt in making a nest and the egg was in a scrape on the hard ground. Some time later we received information that the egg had hatched and went back to the spot on 22nd October 1978, but could not see the hatch-

ing. There had been heavy rain in the area two days previous to the visit and perhaps the chick may have been moved to some place of safety.

The Great Indian Bustard is locally known as *Maldhok*. The egg shell which has been preserved is 60 mm in length. This is indeed an unforgettable experience for any birdwatcher.

B. S. KULKARNI

(contd. from page 19)

By now the tommy's mother had vanished and it was getting dark. It had also started drizzling making photography difficult as I was on the top of my land rover, being the best vantage spot to photograph as the cheetahs were constantly running around the vehicle. The mother then bit the fawn in the lower abdomen. On seeing the blood the cubs went wild and started tearing

the fawn in a frenzy while still alive from the very spot where it had been bitten. The mother also participated in the meal. Within minutes there was nothing left but skin and bones.

Similar observation had once before been made in the Serengeti by Mrs. George B. Schaller. But I do not know whether it has been photographed.

RISHAD K. NAOROJI

Pigeon catching muggers

One of the most exciting scenes at the Gharial Research and Conservation Unit, Tikerpada occurs when a mugger crocodile (*Crocodylus palustris*) catches a pigeon. Visitors watch the scene with bated breath and in a peculiar artificial silence.

The Gharial Research and Conservation Unit (GRACU) has 13 muggers in captivity. These are provided with live fish as food, but they go for anything that they find moving on land and anything that is unusual in their rearing pen. For example, they pick up crawling insects or a prawn, or chase and grab large bull frogs and rats. On several occasions they were seen picking up and attempting to swallow the broom used for cleaning the floor of the rearing pool! However, the interesting feeding habit of the captive muggers is their capture and swallowing of pigeons and other birds.

When a pigeon is released into the mugger enclosure, it flies in all directions and tries to escape and thereby draws the attention of all the muggers in the different pens in the enclosure (an enclosure has 3-5 rearing pens, each with a rearing pool). They become alert and each waits for a chance. Finally when the bird settles down, it may do so on the ground or on the wall separating two adjacent pens. The nearest mugger quickly moves towards it

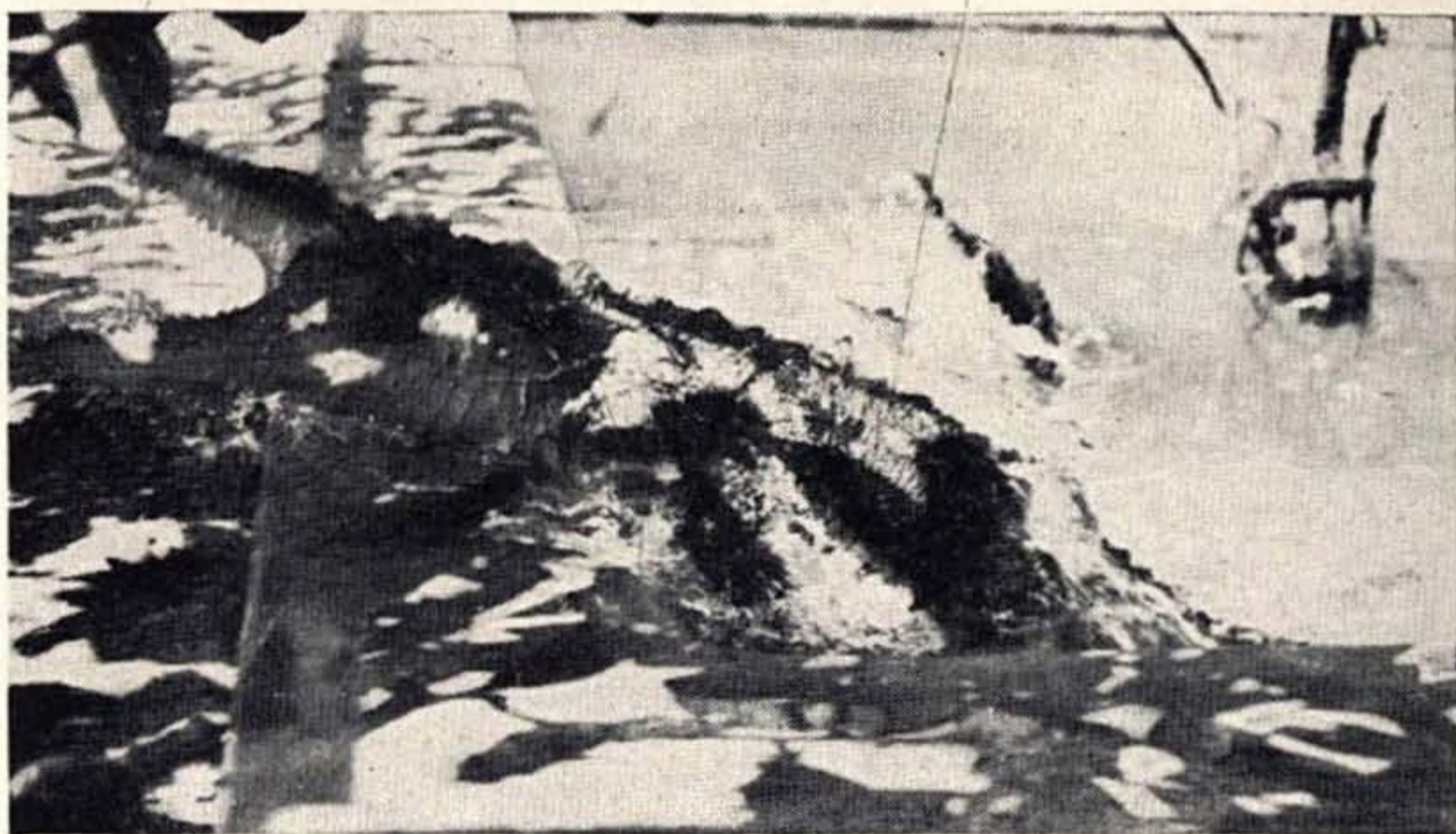
and lunges to catch it. Usually the bird escapes on the first few occasions but later it becomes tired by which time the muggers also become highly circumspect in their attempts. When the bird rests on land and the mugger is also outside the water, the latter waits with patience till the bird comes fairly close to it. It then allows the bird to settle and develop some confidence. But during all this time the mugger keeps itself ready with open mouth to lunge at the bird at the most opportune time. When the crocodile is in water and the bird sits outside near the pool, the crocodile after seeing it from a distance sinks down at the point and reappears almost exactly below the bird to lunge out in an attempt to catch the prey at the opportune moment.

After catching the prey the crocodile moves into water and remains submerged, surfacing at intervals. When it surfaces, if it is the dominant member in the pen, other crocodiles in the pen may approach it with a grunting (begging) sound. If it is not the dominant member the larger one will try to seize the food from it. However, after remaining in water for a period varying from 15-60 minutes on different occasions, the crocodile leaves the water and comes on land to swallow the prey. When the juveniles were less than two years old, they did not leave the water if there were too



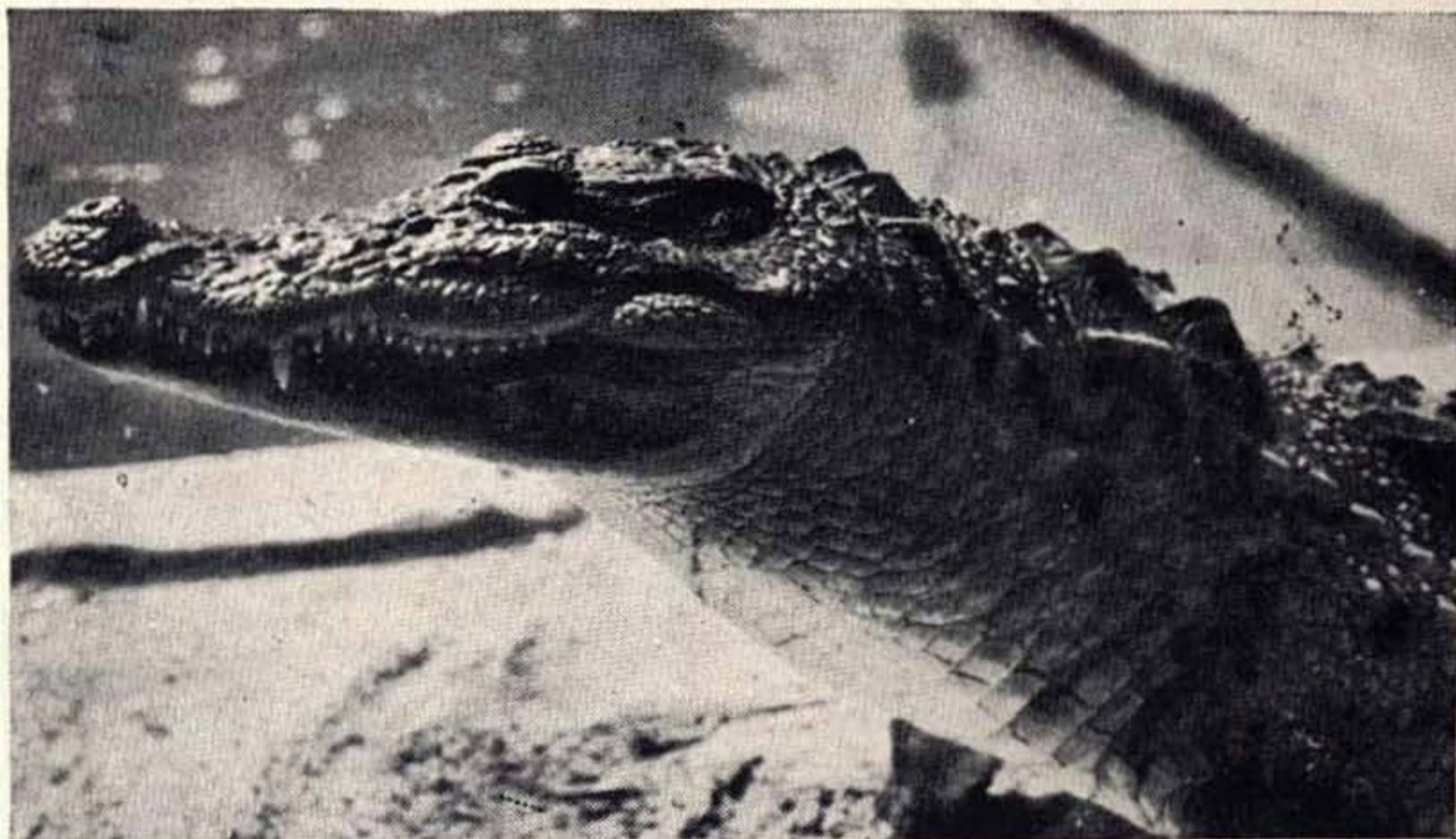
Creeping up

Photo: Lala A. K. Singh



...lunges...

Photo: Lala A. K. Singh



Not always lucky

Photo: Lala A. K. Singh



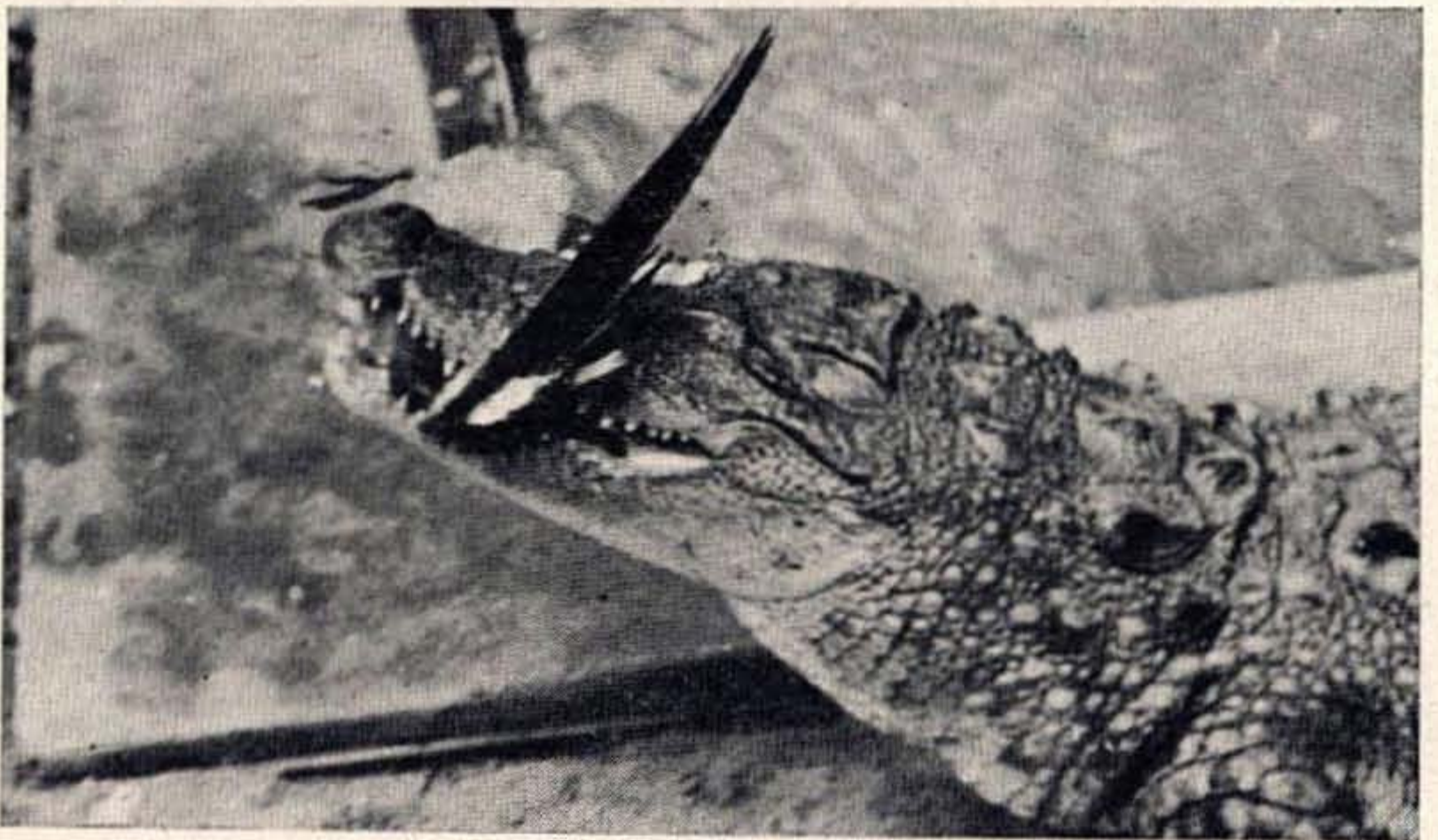
A "friendly" approach

Photo: Lala A. K. Singh



Too late . . .

Photo: Lala A. K. Singh



Down the hatch

Photo: Lala A. K. Singh

many visitors.

When a crocodile is alone in its pen, without any other crocodile with it, it may not at all leave the water. In such cases it usually swallows the food on the water surface with head pointing upward. On other occasions the forequarters may emerge from the water, and once the prey is swallowed the crocodile would resubmerge.

If the prey is of a suitable size, it is swallowed whole; otherwise the crocodile would hold the bird by one of its wings and give a strong jerk of the head (powerful neck muscles perform this) detaching the wing from the rest of the body. The wing remains between the jaws to be swallowed and rest of the body falls at a distance of up to six metres (the maximum space available within a pen). After swallowing the wing the body is picked up and if it is still large for swallowing the other wing is detached and swallowed before swallowing the amputated body.

During swallowing, the forequarters of the body are raised above the ground, supported by the forelimbs, the head held at an angle to the ground. Just at the moment the

food passes through the gullet, the neck is stretched forward and slightly upward. When the food passes through the oesophagus, the head is lowered to touch the ground. After swallowing is complete the crocodile lies down for over a minute and then retreats back to the water. The time of subsequent emergence varies.

It is interesting to note here that those muggers which more often feed on items other than fish, are more aggressive towards other members in their pen. When the muggers were only 11 months old, a live rat was put into one of the pens with five juveniles. The largest juvenile caught the rat and swallowed it whole. Immediately after swallowing, the juvenile became very aggressive and hostile towards other inmates in the pen. This was the first occasion when non-fish food was introduced to the juveniles. However, intra-specific aggressive behaviour like chasing, biting and making various sounds like hissing and grunting (different from those made while seeking food) were noticed from an age of about six months.

LALA A. K. SINGH

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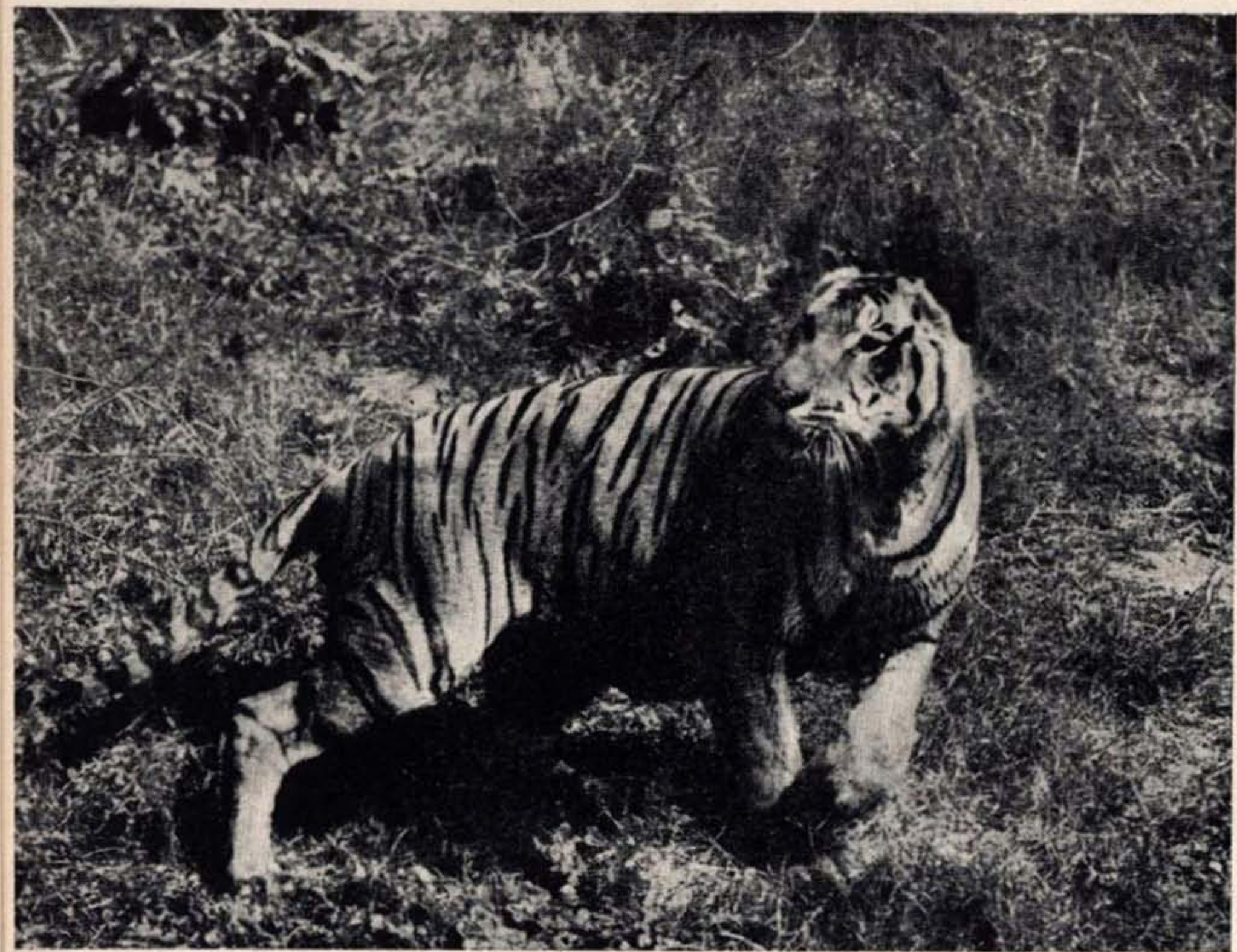


**Growth
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The bicycle tiger

The road from Banarhat ran through the tea and continued on through a mile of sun grass, Thatch Bari. Peter drove his small Ford and I occupied the passenger seat. Half way to Karballa Tea Estate, the road dipped and passed through a slight hollow. I had glanced down and on looking up was surprised to see a bicycle lying on the side of the road and a full-grown tigress sniffing at it. This was, even for the Dooars in those days, so unusual a sight, that I enquired from Peter whether he could also see what I was certain that I could—a tigress sniffing at a bicycle? He assured me that I was making no mistake! As the car approached, the tigress turned towards us, laid back her ears, snarled and walked into the five feet high sun grass. Peter stopped the car a little distance from the bicycle and for a few minutes we sat there, looking for blood or other signs of the owner. There were none: Quietly I got out of the car, for my seat was on that side furthest away from where the cycle lay and where the tigress had walked into the thatch grass. I called softly and at once was answered from inside the sun grass and some ten paces from where the tigress had gone in. The owner of the frightened voice explained that he had been chased by a tiger and had hidden in the thatch grass. I suggested that he join me on the road, as the tigress could at that moment,

be very close to him. This, after some hesitation, he decided to do and out came the Karballa Tea Estate Dak Peon. He had been cycling along, on his way to deliver the mail to Banarhat Post Office and had unknowingly passed the tigress hidden just inside the sun grass. She had 'demonstrated' at his intrusion, and frightened the lad so much that he fell off the cycle and had taken refuge in the tall grass, where the tigress also sought cover! I told him to ride back towards Karballa and that we would follow him closely in the car. There seemed little likelihood of anything more happening for we had been talking there for a full five minutes and it was certain that the tigress would have moved away. That would be the natural behaviour of any tiger. As the lad rode up the slope, the bicycle chain came off! I had not seen one put back quicker! Where the sun grass met the Karballa tea, Peter turned the car and drove slowly back along the road. Coming down into the hollow, there was no sign of the tigress. Then, she was there; Just outside my passenger seat window, less than three feet away! She gave us a full-throated roar, deafening at such close quarters, and I looked into her mouth and saw her teeth and serrated tongue. There was no getting away, the car was too small! Obviously we were not popular with her and I admit to be-



"Well...I'll be...!"

Photo: E. P. Gee

ing relieved as the car drew away and left her standing beside the road.

Back at the Banarhat Bungalow we collected the guns. Certainly something had to be done, for such happenings would cause panic among the Banarhat and Karballa labour forces and would bring the work on both the tea estates to a halt. When the car again came to the end of the Banarhat tea and started along the road through the sun grass, Thatch Bari, the tigress which had followed us back the

half mile to Banarhat after 'seeing us off' from the hollow, cleared the road and the verges on either side in one tremendous leap, bounding behind her as hard as it could go, followed the cause of these unusual happenings. A fat, sleek tiger cub, about the size of a Labrador dog! Her bound, when crossing the road, which she had all along been endeavouring to do, was all of twenty feet and at the top of her arch, I judged her to be fully eight feet off the ground! A truly a magnificent sight!

That evening, the tigress killed a cart buffalo and by morning little was left of it. There was no more trouble from the tigers after, and they were seen together during the following week.

Truly, the advent of first a bicycle and then a car, intruding on her

privacy, had been too much for a harassed, confused and doting mother, trying to make up her mind to cross the open, and therefore potentially dangerous road, with her cub, in full daylight!

R.F.T.

In the incident reported above the author attributes the peculiar behaviour of the tigress to the concern she had for the cub accompanying her. Two earlier incidents of attacks in broad daylight by tiger on bicycle riders were reported by Mr. I. H. Burnett of Kharikaria Tea Estate, in Assam in the Society's Journal (Vol. 53:255-6) in 1953. In both these attacks the riders escaped unscathed, while the tyres were ripped by the tiger after dislodging the rider. Mr. Burnett humourously suggests that the cause of this phobia of the tiger against cycles could have been an incident which happened ten years prior to the attacks, when a manager of the tea estate concerned—a man of generous proportions—was reported to have bumped into a tiger while riding his cycle.—EDS.



A tiger bounds away

Photo: E. P. Gee

The Gaur of my study area

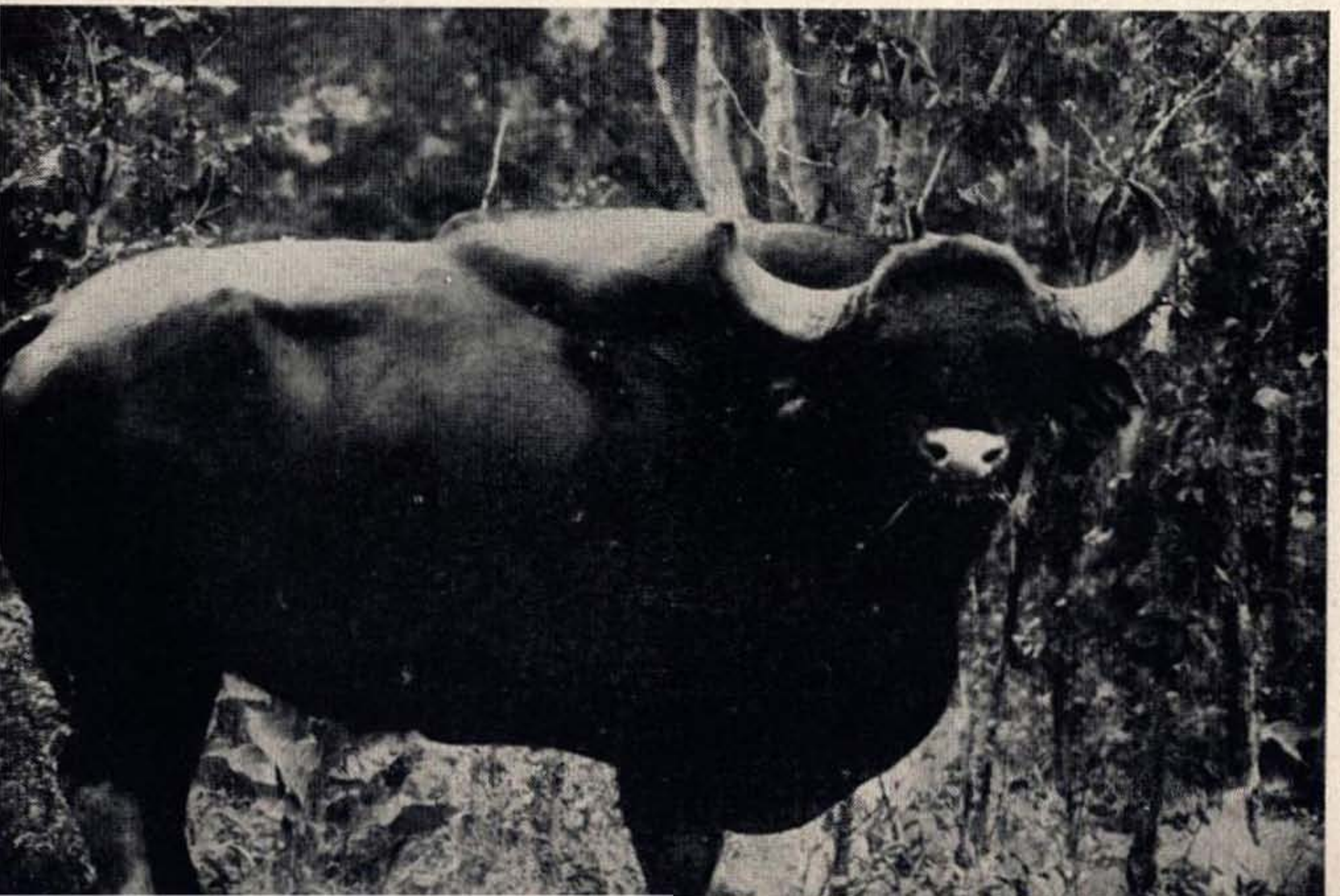
The gaur, the most magnificent of the wild oxen, has a wide distribution. In India they live in three widely separated geographical areas that correspond to the major mountain systems in India: the Western Ghats, the Central Indian highlands and the foothills south of the Brahmaputra river. In the Western Ghats, apparently the best gaur habitat, would be the Bandipur-Mudumalai-Wy-naad complex. Krishnan wrote that this must be one of the best areas for the gaur in the world. In this 'vast and varied stamping ground' gaur was one of the commonest animals before the serious outbreak of rinderpest in 1968. Hundreds of animals died of it. The Forest Department burnt some of the carcasses. *Kurubas*, the tribals, became satiat-

ed after consuming a few. The rest decomposed in the bush and the mute evidence of the bleached bones, still available to those who wander on foot, painfully reminds them of the callousness of man and the tragedy that occurred in the last decade.

Now, the gaur 'the most familiar and most impressive feature of the area' is slowly returning. Provided there is no outbreak of rinderpest again, it may take another ten years or so, for them to attain their former teeming abundance. However, when the gaur comes back, unless serious attention is given, the ideal habitat for the gaur, namely the bamboo forests, which were also a floristic feature of Bandipur 15 years ago, may not be there at all. Bamboo,

With grass in the mouth the bull vacantly looked at me

Photo: A. J. T. Johnsingh



both *Bambusa arundinacea* and *Dendrocalamus strictus*, flowered during July and August 1964 and then perished. Since then the annual forest fires and intensive and extensive grazing had been a hazard to the bamboo seedlings, preventing their regeneration in many areas. In Bandipur, for the past two years, cattle entry has been curtailed and fire protection has been fairly good in areas around Bandipur. Owing to this, in places like pond margins and banks of streams bamboo has come up fairly well. These clumps also have a retarded growth because of the large scale illegal collection of tender bamboo shoots in the months of June, July and August. To enable the bamboo to regenerate properly and to form ideal escape cover and browse, extensive care is required.

The *Kurubas* told me that when the gaur was common, it stayed around Bandipur throughout the year. Now, there is a seasonal migration. They come in May from Mudumalai-Wynaad area and stay mostly on the outskirts of the Bandipur range till October, and then slowly emigrate. I have had some wonderful hours following these bovines. As Krishnan aptly describes, few sights that the forests of India have to offer are more evocative and deeply satisfying than a herd of gaur placidly grazing in an open forest.

I always found it difficult even with the favourable wind to follow the herds closely as the cows were

very alert. Lone bulls, as they are short sighted, could be followed very easily. When compared with elephants, I found them always reliable. On twelve or more occasions when they sensed me following, it was always they that bolted. Once I stalked a lone bull, some times as close as 10 metres, as it went on grazing. Finally, when I, having seated on an 80 cm high boulder close to a climbable tree, photographed the bull with grass in its mouth, it vacantly stared at me, and then, having failed to recognize me, continued its interrupted grazing. While following herds, sometimes, cows with young calves have advanced snorting aggressively, but once the human scent was sensed they always ran.

What we know of the gaur is mostly from Schaller's *THE DEER AND THE TIGER*. Much work has to be done on the ecology and behaviour of this impressive animal. In fact, no one exactly knows about the migration of the gaur in this elephant infested area. Study of gaur would be a challenging Ph.D. topic for a tough student who should be an expert in jungle craft and indifferent or immune to tick bites. Also he must be very good at climbing trees!

The ever present danger to the gaur, besides poaching in certain border areas, is the hundreds of decrepit and diseased cattle which are driven every week end from Karnataka, through Bandipur and Mudumalai sanctuaries, to the slaughter

houses. These cattle are supposed to be immunised against rinderpest and foot and mouth disease. But the habit of giving the inoculation just before their entry into the sanctuary and the inability to keep the cattle outside the sanctuary limits for the prescribed quarantine period, always hang like the sword of Damocles over the safety of the gaur. One improvement in recent years is that the cattle are not permitted to stay in the sanctuary for the night.

In the near future, there may not be threat to the habitat of the gaur in Bandipur and Mudumalai areas.

This, however, does not appear to be the case in Wynaad, where the Kerala Government plans to develop a wildlife oriented polyculture plantation. It may not be possible for the Kerala Government to keep Wynaad as it is but it should be possible for some conservation society to send enterprising field workers to study the migration of this graceful wild ox, which study would help the Kerala Government to keep the favoured routes and places of the gaur free from 'development'.

A. J. T. JOHNSINGH



Cattle traffic: a scourge of the Bandipur-Mudumalai Sanctuary complex
Photo: A. J. T. Johnsingh

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