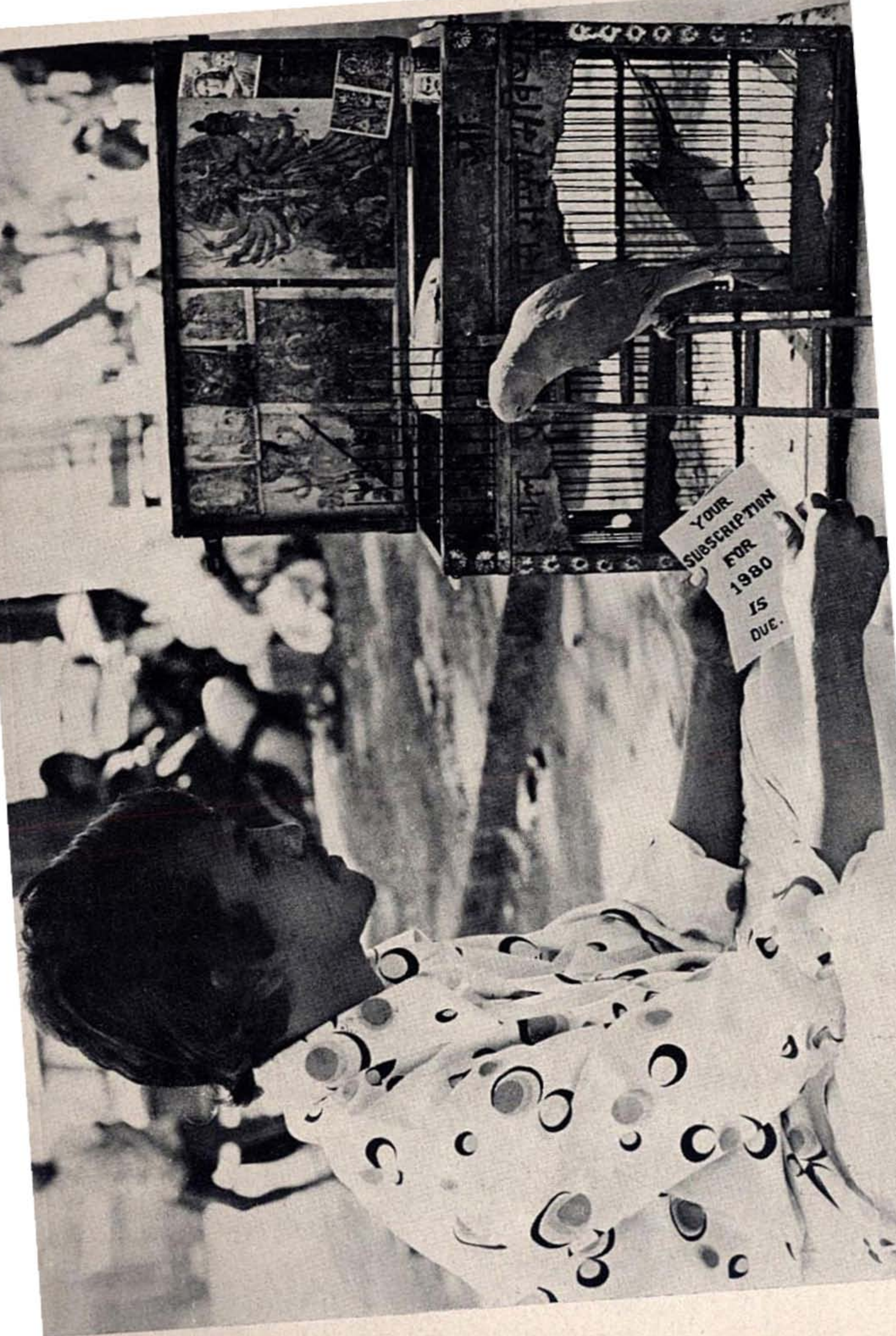


HORNBILL



BOMBAY NATURAL HISTORY SOCIETY



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The Society was founded in 1883 for the purpose of exchanging notes and observations on Zoology and exhibiting interesting specimens of animal life. Its funds are devoted to the 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.

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

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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 :

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 Bombay Natural History Society
 Hornbill House, opp. Lion Gate
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 Bombay 400 023.

EDITED BY

J. C. DANIEL
 S. A. HUSSAIN
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EDITORIAL

In the first issue for this year we expressed our disappointment at our failure to obtain funds for field projects by narrating the story of Sheik Chili who built castles in the air and came down to earth with a thud when reality caught up with him. We were very pleasantly surprised when during this quarter of the year we found that the projects were going through and that our castles in the air were not mirages. It is a wonderful feeling to know that Santa Claus is not a myth. The two projects which have been approved for funding are: 'Hydro-biological (Ecological) Research Station, Keoladeo Ghana Sanctuary, Bharatpur', and 'Studies on the movement and population structure of Indian avifauna'. Both have Dr. Sálim Ali as the Principal Investigator. We have, in the News, Notes and Comments columns of this issue, briefly described the aims of

the projects. More than anything else the projects will enable us to train up young scientists in field biology and pay them reasonably well, while doing so. Our thanks are due to the Ministry of Agriculture, Government of India and the Fish and Wildlife Service, Government of U.S.A.

There are many ways of fortune telling practised in India. To the naturalist the most interesting are the fortune tellers who train birds to pick up a card which details ones 'future', all in black-and-white, so to say. The birds usually used are Java sparrows, munias and parakeets. Our member, Mr. S. R. Nayak, had his fortune cast, and the Parakeet, as can be seen from the picture on the inside cover, correctly predicted that he owes us the coming year's subscription. Do you?

E. P. Gee whose photograph of the Blood-drop Orchid appears on the cover of this issue was not only an indefatigable conservationist of India's wildlife but also an avid orchid collector. His orchidarium at Shillong was one of the best in the country.

*The Blood-drop Orchid *Cryptochilus sanguina* grows as an epiphyte in the Himalayas from Nepal eastwards between 5000 and 7000 ft. Flowers from June to August and the flowers are long lasting.—EDS.*

Wildlife Conservation and the Bombay Natural History Society

In the absence of the President on a field trip to the Andamans, we thought we would publish extracts from the speech delivered by the former Curator of the Society, the late S. H. Prater at the Society's Golden Jubilee function in August 1933. The problems still remain with us, 47 years later—EDS.

For many years, the Bombay Natural History Society, through the medium of its *Journal* and other attractive publications, has endeavoured to create and stimulate in India an interest in the wildlife of the country.

During the past, extensive undisturbed areas of primeval forest, jungle and desert gave safe harbourage to wild creatures, and provided sure guarantee of their survival. But changing conditions in the country, the gradual conquest of forests and waste lands, above all, the building of new roads and the radical improvement in methods and rapidity of transport have left few areas in the Peninsula of India which are free from intrusion by Man.

Ruthless destruction of wildlife and a prodigal wastage of natural resources have invariably preceded the establishment of material and prosperous civilization. Thus the magnificent animal life of many tropical and subtropical lands—and our country is no exception—has been driven to its ultimate retreat in fast diminishing forests and is today threatened with utter extermination.

In many districts wild animals have been totally wiped out. In

others, where they were once common, they are now hopelessly depleted. One does not wish to overdraw the picture. There are parts of India where the position of wildlife is still satisfactory though insecure. But equally there are extensive areas where conditions are so appalling that, if left unchecked, they must lead to the complete destruction of all the larger wild creatures which live in them. There is yet another point which must be stressed. Any scheme for the Protection of Wildlife would be incomplete without due provision for the protection of our Birds. Quite apart from a sentimental value, birds render incalculable service to Man. While certain species may damage crops, such harm as is done by birds is overwhelmingly offset by the benefits we derive from them. Without their protection, our crops, our orchards, our food supply would be devoured or destroyed by hordes of ravaging insects. Birds are the principal agency that controls the bewildering multiplication of insect life which, if unchecked, would overwhelm all life on this planet. Birds by reason of their predominating insect food are an indispensable balancing force in Nature. The abundant bird life of this country

is one of its valuable possessions. Those who appreciate its value, cannot but strive for its conservation.

If our wildlife is to find protection at all, it must find it somewhere in our forests. It is often claimed that the proximity of forests to agriculture makes them a constant source of harassment to the cultivator. If this argument is pushed to its logical conclusion, the only remedy would be to remove such protection as is now given to wild animals in our forests, for it would not be possible to remove the menace entirely, until all the large wild animals in them were killed, died of wounds or were exterminated over large areas because of their inability to breed. Surely our goal is not the total extermination of our wildlife—which is what must happen unless some form of protection is given to it within its natural domain. While it is essential that the cultivator should have reasonable latitude to defend his property, it is equally essential that there should be certain areas or reserves where the shooting of animals is regulated and where the laws for their protection are rigidly enforced. . . . while we have extensive forests to shelter and laws to protect it, our wildlife is everywhere on the decrease. The time has surely come when it is necessary for us to review the position and to take such measures as are necessary to give real protection to the wildlife of the country.

Whether our reserve forests remain the principal sanctuaries for wildlife in this country or whether in some of the Provinces the purpose is affected by establishing national parks, there is need for a real organization whose sole concern will be the protection of wild animals in these preserves. Our efforts to protect wildlife have failed mainly *because of the haphazard methods we employ, the lack of any co-ordinate policy and the lack of any real protective agency to carry that policy into effect.* The Forest Department which ordinarily administers the Forest Laws has multifarious duties to perform and, while the Forest Officer has discharged this trust to the best of his ability, he cannot give the question his personal attention, nor can he find time, except in a general way, to control the protection of wildlife in our forests. Experience of other countries has shown the need of a separate and distinct organization whose sole concern is the protection of wildlife in the areas in which it operates.

S. H. Prater joined the Society as an Assistant in 1907, and became its Curator in 1919. For nearly a quarter of a century prior to his retirement in 1948, Prater's name was synonymous with the Bombay Natural History Society. He died in 1960.—EDS.

Jagara Valley Sanctuary

The account which follows relates to a visit made from 1st April to 6th April 1978 to the Jagara Valley Sanctuary in Karnataka. The visiting party consisted of the author, Mr. Humayun Abdulali, Mr. Owen Martin, a keen birdwatcher and photographer from U.K. and Mr. Murray Bruce, a young Australian ornithologist.

Jagara Valley Sanctuary in Karnataka is a five-hour drive from Bangalore. It is 36 km from Chikmagalur, the headquarters of Chikmagalur district. The sanctuary is 490 sq. km in area. The Bababudan range of hills form the NE. boundary and the Rudragiri range of hills the southern boundary. To the north of the sanctuary is the Bhadra Reservoir, over 200 sq. km in area, formed by the dam on the River Bhadra at Lakhavalli.

The altitude within the sanctuary varies from 660 to 1440 m. The forest types change to semi-evergreen, evergreen and shola forest in the high ranges. The annual rainfall is from 200 to 250 mm and the temperature varies from a minimum of 5°C in winter to 35°C at the height of summer.

As may be expected in an environment not yet under severe pressure from human beings, there is a wealth of animal, bird and insect life. Among the large mammals are elephants, gaur, tiger, bear, sambar, panther, spotted deer, pig, barking deer... The smaller mammals include langur, bonnet monkey, the Indian giant squirrel, porcupine... Over 90 species of birds, resident and migrant, may be seen. Ants,



The Giant Squirrel whose rattling call is a feature of these forests.

*Photo: Hanumantha Roa
Courtesy WWF.*

wasps, beetles, moths, lizards, spiders, butterflies, dragonflies, cicadas are among the numerous animal residents.

We stayed the first two days at the Muthodi forest bungalow which was built in 1977 and is at the top of a hill, commanding an impressive view of the forested valley. The birdlife seen here was splendid and varied but to our great disappointment it seemed to be the season for forest fires.

Thankfully, the forest bungalows

both at Muthodi and at Kesave, where we stayed later, were without electricity and at night the soft ambience of the kerosene lantern enhanced the beauty and mystery of the jungle around us. To read and for dinner we had the luxury of an incandescent, hissing petromax which, when we sat with it outdoor, drew a host of winged insects. Iridescent green beetles, moths with delicate patterns traced on wings of silk, dragonflies and winged ants. Fortunately there were no mosquitoes. On the wall inside the bungalow a couple of geckos or house lizards said their grace with cheerful anticipation as they prepared for dinner on some of the insects which would come their way.

There is nothing sweeter than the sounds of the Indian jungle. Just before daybreak the whistling Schoolboy or the Malabar whistling thrush sang his slightly offkey song to be followed a little later by the koel, then by that grandest of jungle bird calls, the grey jungle cock and then by a profusion of others who had woken up—the drongo, the magpie robin, the green barbet, the sunbird, the golden oriole, the clownish grackle and to this was added the scolding, chattering bark of the Indian giant squirrel.

After a cup of tea at six in the morning, we would stroll in the jungle or go on a jeep drive, returning after a couple of hours for breakfast. Then out again until it was time for lunch. A snooze after lunch, then out after a cup of tea, returning when it got dark for a refreshing bucket bath and dinner.



A forest sculpture
Photo: Author

One morning we came across a party of grackles or hill mynas. They are glossy black with yellow wattles. There were tall, teak trees in this part of the jungle and the undergrowth was carpeted with dried teak leaves that crackled noisily as we walked on them. The grackles were doing aerobatics, swooping from tree to tree like clowns with a repertoire of grunts and squeals and squeaks, whistles and churring



A lone tusker

Photo: Author

sounds. The thrum of their wings reminded me of the drumming wing-beats of the Great Indian Hornbills in Bhutan near the Manas river. Grackles are the jolliest of jungle birds and make you want to join them in their circus act.

On the numerous jeep drives through the jungle we saw elephant twice—both times it was a lone elephant, adult with well developed tusks. And both times it was close to dusk, so not favourable for photography. Gaur we saw three or four times from quite close. Sambar also we saw twice, both times a doe. Spotted deer ran across the road twice. The largest number together we counted was seven. There was a handsome stag with an impressive pair of antlers in one of the herds. Both herds were relatively small, not more than 8, unlike the large herds one sees at Bandipur or Nagerhole

where I have counted up to forty or more. They also seemed shy unlike the deer in other sanctuaries.

There are several hundred coffee estates in Chikmagalur district, many of them around the sanctuary and planters from long back have been much given to shikar. One hopes that they are the guardians and not the predators of the wildlife in this beautiful sanctuary in their midst.

Near the Kesave Lodge are a pair of dead trees with a number of woodpecker holes running up the bole from a height of 6 m from the ground. They could be a woodpecker's training school! In the same patch of jungle the Indian giant squirrel, of which there were two or three drays (they look rather like a crow's nests) high up in the tree.



A woodpecker's training school

Photo: Author

We discovered a greyfronted green pigeon's nest half a mile from the forest lodge, built c. 4 m up in a clump of bamboos alongside the forest track. There was always either the female or the male sitting on the clutch of eggs. Both birds were handsome; the male was resplendent with maroon patches on his olive

green wing with white bars, yellow breast and with eyes a lustrous deep blue. Twice every morning on our way out and back we stopped a few minutes to observe the parent bird sitting on the nest. The camouflage was so good that it was difficult to spot the nest without binoculars.

In a lake a few kilometres from Kesave, we saw several large balls a foot and a half in diameter, made up of hundreds of squirming, wriggling tadpoles. They were black like many tadpoles but enormous. A few we took in a pan were about 10 cm long and about 2.5 cm thick. These 'balls' would keep changing their shape as they rose to the surface or sank a few centimetres below and all the time they kept moving, traversing 3 or 6 metres in a few minutes.

It is exciting to see spectacular animals like the elephant, the gaur, the tiger, the bear and the panther. It needs a great deal of luck to be able to see a tiger or a panther. And all too often it is a fleeting glimpse. We were told that in the 64 sq. km of sanctuary around Kesave and Muthodi there were five tigers and about 13 or 14 panthers. We did not see any. Nor did we see any bears or wild boar. But we saw plenty that made every minute of our stay a pleasure. When you come to think of it, the smaller creatures that you can see almost anywhere in our beautiful forests, if you will only take the trouble to look, are every bit as wonderful as the heavyweights. And there is lots of time to



The male of the Peninsular Rock Agama, bright red above and velvet black elsewhere during April, the breeding season.



*Enormous black tadpoles
Photos: Author*

look at the trees (which do not run away), each a living individual and different from every other.

G. S. RANGANATHAN

THE BOOK OF INDIAN BIRDS

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SALIM ALI

The Eleventh Revised edition with 74 plates in colour depicting 296 species is now in the final stages of printing off. It is expected to be available to the public by the end of March 1980.

The book has been a close companion of the newest bird watching enthusiast as of the seasoned ornithologist in India. It continues to be an indispensable Field Guide for every one who wishes to enjoy the rich and varied bird life of our country out of doors.

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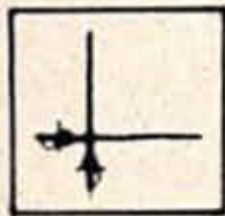
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Notes, News & Comments

Awards

The C. V. Raman Medal, awarded every three years by the Indian National Science Academy 'for outstanding contribution (irrespective of specialization) in any branch of science coming within the purview of the Academy was presented to **Dr. Salim Ali** in November 1979.

The Order of the Golden Ark. Three outstanding conservationists from India, **Mr. M. K. Ranjitsinh**, **Mrs. Anne Wright** and **Mrs. Dilnavaz Variava** recently 'entered' the '**Golden Ark**', the international award created by Prince Bernhard of the Netherlands, Founder-President of the World Wildlife Fund for acknowledging 'outstanding service to Conservation of Wildlife and Natural Habitats.' Mr. Ranjitsinh, a Vice-Chairman of the Survival Service Commission of the IUCN was formerly Deputy Secretary and Director of Wildlife, Government of India, and is presently on deputation to the United Nations Environmental Programme in Bangkok, Thailand. Mrs. Variava was till recently the Administrator of the World Wildlife Fund—India, and was instrumental in effectively organizing its fund-raising, Conservation and educational activities. Mrs. Wright is active in the field of conservation in India and is a member of the Indian Board for Wildlife.

Environmental Fellowship—1979
Dr. Madhav Gadgil of the Centre

for Theoretical Studies, Indian Institute of Science, Bangalore, and a member of the Society's Advisory Committee, has been selected for the award of the National Environment Fellowship for the year 1979.

The award, instituted on the recommendations of the National Committee on Environment Planning and Coordination is given every year on 5th June, to an Indian citizen in recognition of outstanding and valuable contributions made by him in the field of the environmental science, and to act as an incentive for high quality innovative work of the kind required for better appreciation of issues concerning environmental conservation and improvements. During the period of the award, he will work on a research project entitled 'Interaction of Nature and Man on the great hill range of the Western Ghats'.

Nature Camp—1979

Point Calimere Sanctuary in Tamil Nadu was the venue of the Society's annual nature camp for members. The camp, efficiently arranged and organized by Dr. Robert B. Grubh and Mr. P. B. Shaker of the Society's staff and assisted by volunteer members namely, Miss Usha Ganguly and Mr. K. N. Shroff, was in operation from 22nd October to 8th November. Members participated in three batches of 20 persons each. (For a report on the camp see p 31.)

BNHS Field Study Projects

Study of bird hazards at Indian airports

The project is sponsored by the Indian Air Force and aims to study bird hazards to aircraft and will endeavour to collect basic data concerning the species involved, by investigating their habits and the environmental factors in order to suggest, if possible, suitable preventive measures.

Flamingo survey

Every year thousands of flamingo, both the large and the lesser, converge to the Rann of Kutch to breed and rear their young. India has one of the largest flamingo breeding colonies in the world. Their breeding success, however, depends on the water conditions in the Rann which in turn depends on the monsoon rains. The birds stay in the Rann from about October to April and breed when suitable conditions prevail, and remain till the young are ready to fly.

We, in collaboration with the Gujarat State Forest Department are planning to study the movement of flamingo by trapping and banding their chicks just before they are ready to fly (see *Hornbill*, Jan.-March 1978, p. 38).

Recently Dr. Salim Ali, Mr. M. A. Rashid, the Chief Conservator of Forests, Gujarat, Mrs. D. S. Variava, Mr. S. A. Hussain and officials of the Gujarat Forest Department made a reconnoitring trip to examine ground conditions and to

plan a strategy for capturing chicks if breeding was in progress. Heavy rains had inundated the Rann which was under four feet of water throughout and the Flamingo City which was reached after a ten hour, back-breaking, non-stop, camel ride was found to be still under about 4 in. of water. It is hoped that the conditions will improve by the end of December and the birds would commence breeding by early January. A second reconnaissance trip is being planned for January 1980.

Studies on the movement and population structure of Indian avifauna

The project aims at an in-depth study of bird population of certain specific areas, the ecological factors which influence the population and the migratory movements of both migrant and 'resident' species. The areas selected for intensive study are Keoladeo Ghana Bird Sanctuary at Bharatpur and Point Calimere Sanctuary in Tamil Nadu. Subsidiary stations will be set up in different parts of the country to cover a network of habitats and obtain an overall picture of the structure of bird populations and inter-relationship of species and biota in the subcontinent.

Avian Ecology station

The project aims at a detailed study and monitoring of the ecosystems of Bharatpur and Point Calimere sanctuaries, particularly with reference to the bird species in order to provide an ecological basis for a comprehensive management plan for the respective sanctuaries.

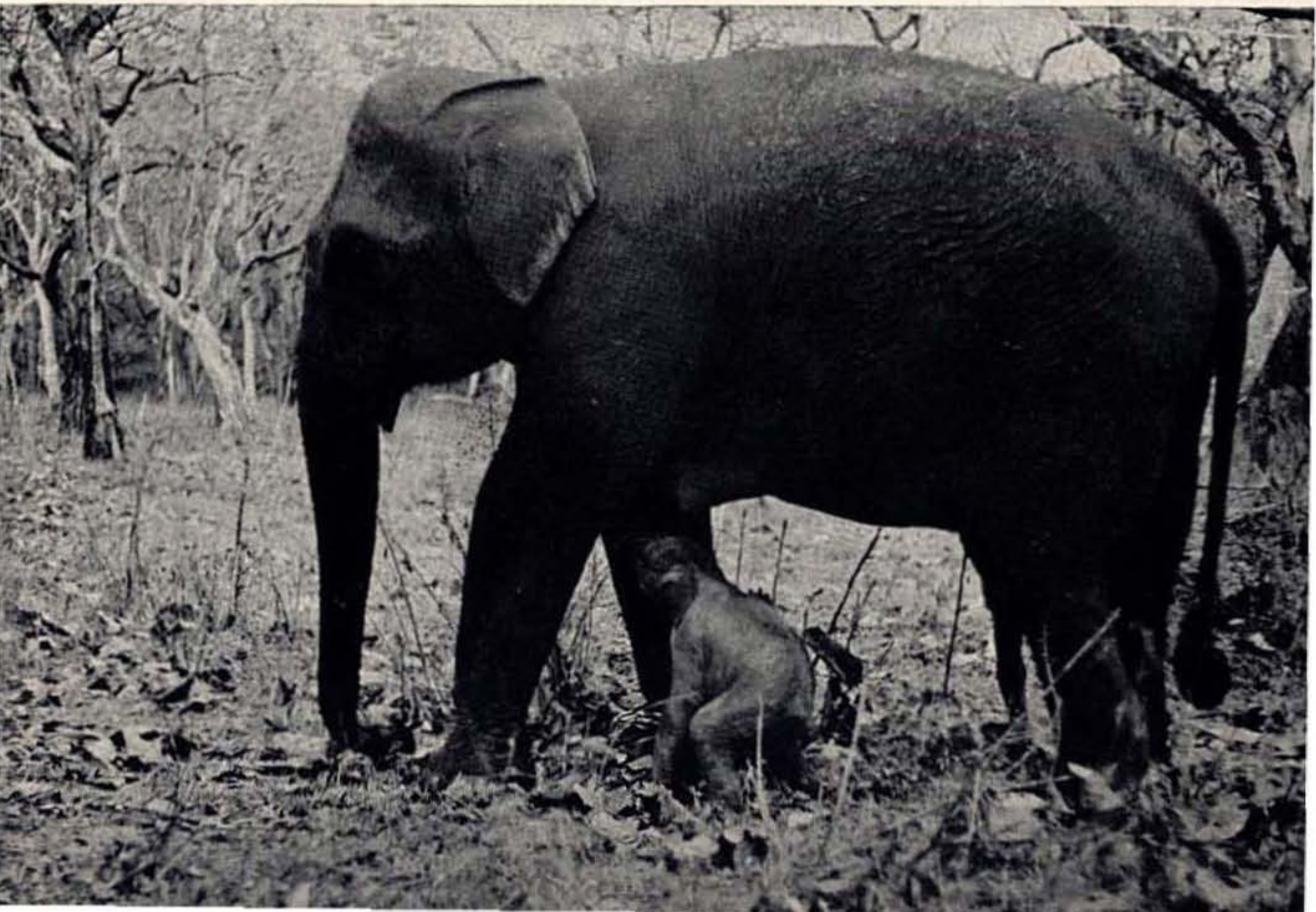
Baby Elephants and their aunts

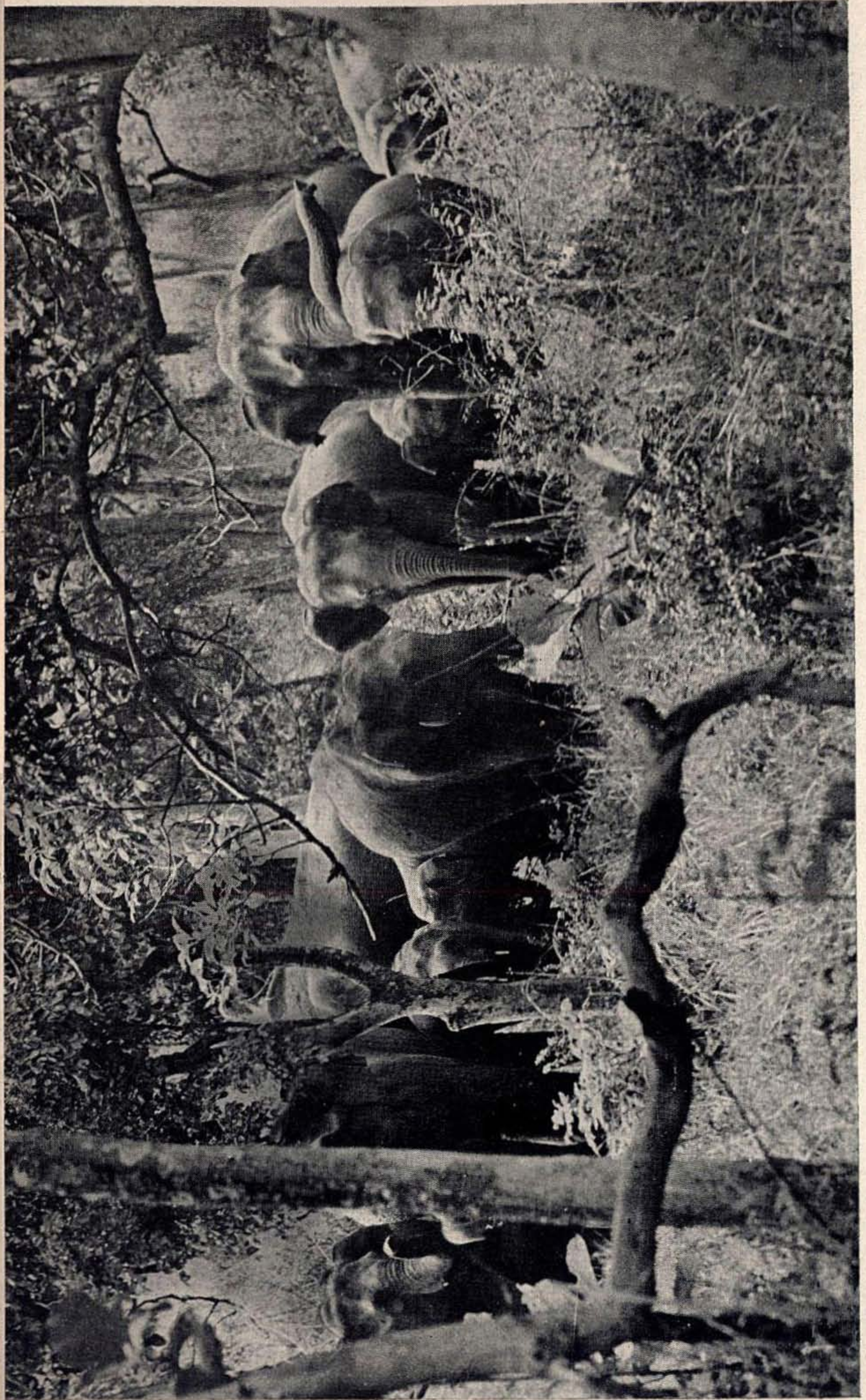
It was mid afternoon. The week old calf had just got up from its siesta where its mother and "aunt" had stood guarding over it, and the elephant herd had begun its slow march out of the bamboo-clad ravine in which they had spent the afternoon. It was tough going, up-wind up the slope in the slush when the calf suddenly lost its foothold and shrieking tumbled down past its mother and aunts. It was then that the tiger which had been stalking the herd sprung upon it. As the calf stumbled all the adult females had turned round as one to retrieve it, but the going was too tough down the slope and the tiger was on the calf before they could

reach it. With a tremendous roar, the females charged down the slope, just as the tiger hastily let go of its grip on the neck of the calf and bolted away. The "aunts" went charging after the tiger, blind with rage, while the mother stood near the panting calf which was bleeding profusely from the neck, ear and trunk. The chase by the "aunts" was of no avail, and the tiger quickly disappeared down the ravine. They all returned and stood around the calf trying to raise it back on to its feet. But the calf was too badly hurt, and after trying it all evening, they abandoned the calf and moved on as the sun set. The tiger had a feast that night.

Newborn Elephant Calf trying to suckle

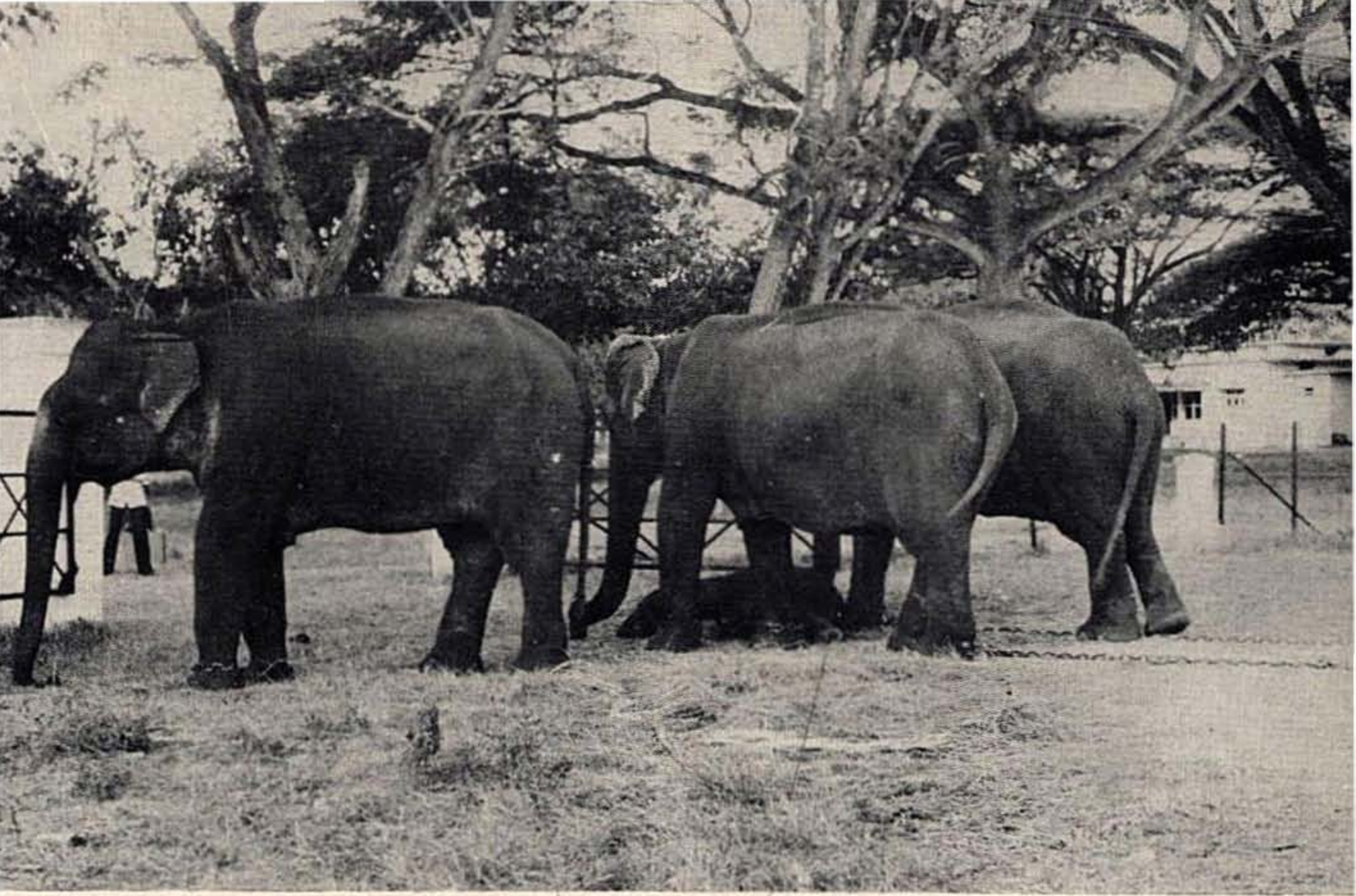
Photo: P. V. Nair





Elephant in protector attitude

Photo: H. C. Sharatchandra



Tame females standing guard over sleeping calf

Photo: P. V. K. Nair

Elephants live in matriarchal herds, whose primary function appears to be the co-operative care and protection of the calves. For adult elephants seem to be completely immune to all danger from predators, notwithstanding the poetic fancies of lions springing on the heads of elephants. The adult elephants are also grazers and browsers, and derive no advantage in feeding efficiency in being in a group. The elephant calves are however subject to predation by lions in Africa and tigers in Asia, and their female relatives seem to stick together for the sole purpose of their care and nurture.

A group of related females is the basic unit of elephant society. These adult females are related to each

other by ties of blood—as grandmothers, granddaughters, mothers—daughters, sisters, aunts, nieces, grandaunts—grandnieces and so on. Such a core group of 5-10 adult females with their calves always stays together, never separating from each other. Several such female groups may, from time to time, come together to form bigger herds; but even within such big herds the constituent units remain close together and do not lose their identity. The males are expelled from this matriarchy on approach of maturity. Adult males then remain peripheral, attaching now to this group and now to that largely on the lookout for females in heat. They often live solitarily or in small all-male bands, but the females never leave their clan.



Above: Calf with mother and 'aunt' below: Mother prompting calf to walk
(Photo: A. Sharatchandra)

(Photo: P. V. K. Nair)



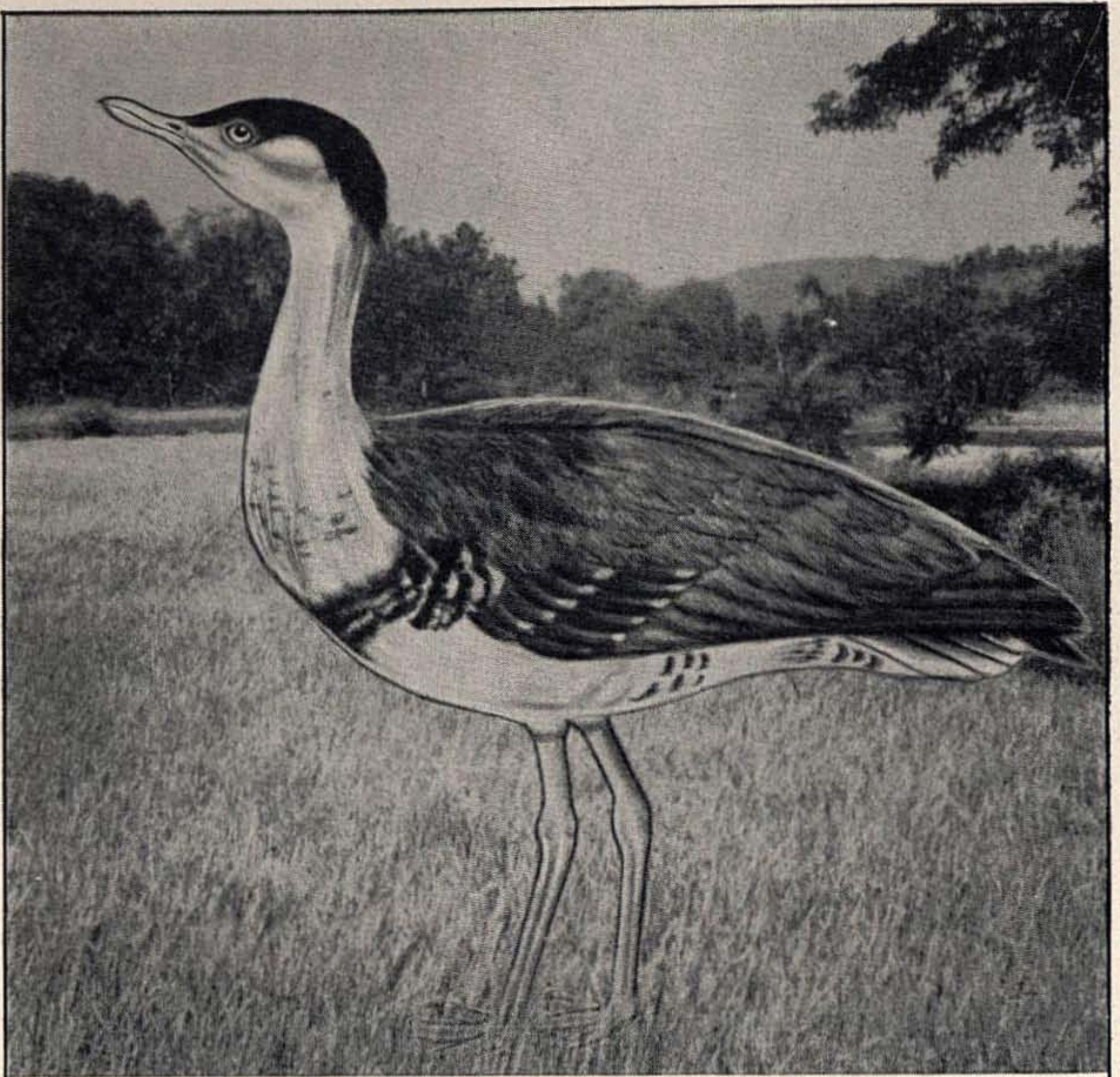
The matriarchal group of females is obviously a kin-group, with coefficients of kinship ranging from one-eighth to one-half among the different individuals. Natural selection obviously favours genes, which act to enhance the survival and reproduction of blood relatives, even though it may be at some sacrifice of an individual's interest. This is the kin selection explained in the last article in connection with the paper wasps. The paper wasp workers sacrifice their own interest to the extent of accepting complete sterility to help in the upbringing of sisters related to them by three-fourth. The elephant females help each other in bringing up calves with whom they are related by much less — perhaps only one-eighth. Therefore, they are not expected to make such serious individual sacrifice as acceptance of total sterility, and all the mature females do breed. Nonetheless, they do exert considerably in the care of each others calves. Vijayakumaran Nair and I have looked at this in some detail. We find that the aunts are as vigilant as the mothers in defence of the calf, protect it by guarding it when it sleeps, and if the aunt does not have a calf of her own, she will regularly suckle her nephews and nieces.

The elephant bulls on the other hand are on the loose. Since females in any given herd will come into heat only rarely, it is not advantageous for the males to stick to one herd. The bulls move from herd to

herd, on the look-out for a mate. The males therefore quickly lose track of their blood relatives, and never participate in any care of calves. Rather their reproductive success depends on their ability to gain access to females in heat in strong competition with other adult males. Natural selection would therefore favour traits of males which would gain them success in such competition. These traits are essentially aggressive ones, and lone tuskers are as famous for their aggressive tendencies as cows with young calves. There is therefore little development of sociable traits in adult males, in strong contrast to the adult females.

Elephants however differ from hanuman langur in being non-territorial. The group territoriality of the hanuman langur strongly favours an adult male's remaining attached to a group of adult females. No such advantage exists in elephants, where the males then keep moving from one female herd to another. Not being in permanent control of a group of females, an elephant tusker would gain nothing from a trait such as infant-killing, for the females that may thereby come into heat sooner may mate with some other male altogether. The elephant bull therefore, though aggressive and unsocial, has not developed into a bully and a murderer as the hanuman langur male has!

MADHAV GADGIL



The Great Indian Bustard. Ten years from today how great will it be?

Once, this bird inhabited almost the entire Indian Peninsula. Wherever there was open flat grassland, the Great Indian Bustard lived. But not any more.

Today, just a few of these shy, confiding, harmless creatures are alive. Almost on the brink of extinction. Like scores of other species—victims of indiscriminate poaching and unprecedented deforestation. If we do not save our wildlife now, our world will be without birds and animals in the future. Because extinct is forever.

It's your world. Help save it.



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Conservation Action

Periyar Tiger Reserve—a reconnaissance

The Kerala Forest Research Institute has been conducting an ecological reconnaissance of the Periyar Tiger Reserve in Kerala for the past two years as a part of their long-term project to help evolve a management plan for the reserve based on population dynamics, basic ecological requirements of major species, resource availability and the general ecological conditions prevailing in the reserve. An expert team headed by Dr. V. S. Vijayan of the Kerala Forest Research Institute has already submitted a preliminary report of the study done in the past two years. It contains,

among other things, a checklist of the mammals and birds of the reserve, distribution pattern of the major species of wildlife in the reserve and their preferred habitats. The report also deals with problems related to management and provides interim recommendations for future action. Areas for intensive studies are also identified.

The importance of a sound ecological insight of the system is often overlooked and management plans are often ill equipped to meet conditions that demand a scientific approach. It is in this context that this pioneering effort of the Kerala Forest Research Institute needs to be commended.



The lake in Periyar Tiger Reserve in summer

Photo: E. P. Gee

Himalayan Musk Deer

The World Wildlife Fund, in collaboration with the Indian Government, is supporting a one year study of the Himalayan Musk Deer. The status of this species is 'threatened' and so one aspect of the project concerns the collection of data on poaching and commercial trade in musk, as a means of aiding national control and protection measures. The project scientist would be grateful for information members may have on instances of poaching and trade. Please write to

WORLD WILDLIFE PROJECT 1328
2, AKBAR ROAD
NEW DELHI 11

if you have any information to offer.

The Hangul or Kashmir Stag

One of the major human intrusions into the habitat of the Hangul in Dachigam Sanctuary in Kashmir was the presence of a sheep farm in the Sanctuary. We are glad to report that the Forest Department's representations have been heeded and the sheep farm has been shifted elsewhere. We understand that the Hangul population is now between 300 to 500 animals.

A hangul stag in Dachigam.
Photo: G. B. Schaller



A new home for the Rhinoceros

According to the Chief Conservator of Forests, the population of rhinoceros in Kaziranga, as estimated by the local staff, was 400 in 1962, and 960 at present. In addition to this, there are 400 to 500 rhinos in areas like Manas and isolated pockets outside the Government Forests. The Chief Conservator of Forests, Assam, considered that the rhino numbers would soon be beyond the carrying capacity of Kaziranga National Park and systematic reduction of population by translocation was essential.

The possible alternative habitats

suggested were Dudhwa National Park (U.P.), Jaldapara (W.B.), Champaran (Bihar), Intanki in Nagaland and Lalighabri Sanctuary of Arunachal Pradesh. In the case of Jaldapara, there was a decline in population of rhinos from 45 in 1972 to 23 in 1975 and 19 in 1979. Since the precise factors for the decline are not known a decision to introduce any new populations into this area is being kept pending. Dudhwa has been selected as the first choice as an alternate habitat.

A comprehensive ecological study of the alternative habitats suggested is being planned before translocation.



Confrontation

Photo: G. P. Gee

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The tiger in Gujarat State

The present State of Gujarat, situated on India's west coast between latitudes 21° to 24° N. and longitudes 69° to 75° E. was carved out of the erstwhile composite Bombay State which was bifurcated into the States of Gujarat and Maharashtra with effect from 1st May, 1960. Gujarat's forest area is 19,666 sq. km representing roughly 10% of its geographical area. The wide variations in the climate and topography of the State have resulted in various types of forests ranging from luxuriant moist deciduous teak forests in Dangs in the south to arid thorny scrub and saline desert conditions in north Gujarat and Kutch respectively. The major concentration of forests occurs all along the eastern border of the State from north to south, bordering on the States of Rajasthan, Madhya Pradesh and Maharashtra in that order. The Saurashtra Peninsula carries only a few small pockets of forest in the hilly portions, the largest and most compact being the Gir Forest of Junagadh district which is well known as the last stronghold of the Asiatic lion. The plain areas of the State are now generally devoid of forest cover and are mostly under cultivation or pastures.

Although deficient in terms of forest area, Gujarat possesses a relatively rich variety of wild fauna, including such species as the Asiatic lion, Indian wild ass, tiger, panther, sloth bear, wolf, hyaena, chital, sambar, barking deer; four-

horned antelope, blackbuck, chinkara, wild boar, bluebull and among birds, the great Indian bustard, flamingo, grey jungle and red spur fowls, peafowl, partridge (grey, painted and black) and numerous species of resident and migratory water birds. The more important animals (excluding the lion, wild ass and blackbuck) are mostly confined to the eastern forest belt referred to earlier. However, there has been an alarming depletion of their numbers in recent years, particularly after the attainment of Independence and the abolition of the princely states (of which the Gujarat region contained a sizeable number), in general conformity with the similar trend observed in the rest of the country also.

Although no authentic tiger population figures are available, I believe that there might have been not less than 50 tigers in Gujarat around 1960 when the State came into existence. The Wildlife Administration Reports of Gujarat State for the first 3 years show that 3 tigers were shot during 1960-61 and 2 in 1962-63. With effect from 1963-64, tiger was declared as a protected species in Gujarat. Thereafter, there is only one recorded instance of a tiger having been shot by a poacher near Waghai in Dangs district during 1969-70. Prior to 1960, I know of tigers having been observed in Vijaynagar area of Sabarkantha district and in Danta and Borian areas of



A pensive tiger. Is there a future for it in Gujarat?

Photo: E. P. Gee

Banaskantha district around 1951-52. A man-eating tiger was shot by Shri Kasimkhan J. Khan of Rajpipla in the Dediapada area around 1952. The erstwhile princely states of Danta, Rajpipla and Baroda (Satakashi area of Surat district) were particularly well known as tiger hunting grounds for the royal guests.

Gujarat has the unique distinction of possessing both the Asiatic lion as well as the tiger—though both have occupied entirely different habitats. In Gujarat the lion has stubbornly held his ground (if not actually flourished, at least during the current decade), whereas the tiger virtually stands at the threshold of extinction. This anomalous position could perhaps be explained by the fact that the tiger

lived in the eastern forest belt inhabited by meat-eating tribals who decimated the natural prey animals of the tiger, thereby compelling it to migrate to other relatively less disturbed and better hunting grounds across the State's borders; whereas the lion, apart from enjoying strict protection ever since the erstwhile Junagadh State regime, had to contend mainly with 'mal-dharis' (professional graziers) who are strict vegetarians and only posed a threat to the lions through occasional cases of poisoning carcasses of buffaloes or cows killed by the lions and through the steady degradation of the Gir forest habitat through excessive overgrazing by their large cattle herds at the cost of the local wild ungulates. The lions are also fortunate that



A lesson in camouflage. Can you spot the tiger?

Photo: Zafar Futehally

the Gir lion sanctuary project launched by the State Government in 1972 came to their rescue just in the nick of time through elimination of the unhealthy competition from the maldharis and their teeming livestock and their perpetuation is now assured.

The tiger in Gujarat, on the other hand, has unfortunately received no special attention or protection so far and has been partly decimated (being a far more prized and sought after trophy than the lion), and partly compelled to migrate across the State's borders due to lack of its natural prey on our side of the border.

Apart from the pre-"Project Tiger" census of tigers carried out in 1972, which indicated the presence of about 8 tigers in Gujarat no other systematic attempt to estimate the population of this species has been made so far. A tiger cen-

sus proposed to be undertaken during November 1978 could not unfortunately be conducted due to unavoidable reasons. This will now be taken up during the ensuing summer season, when the next lion census in Gir is also due. The indications, however, are that the existing tiger population in Gujarat could possibly be counted on the fingers of one hand—and that too in Dangs district only!

In an attempt to rehabilitate the tiger in Gujarat the State Government are actually considering the setting up of a new National Park near Bansda bordering the Dangs forest in the sanguine hope that this will encourage the tiger to return to its old favourite haunt where it will receive complete protection and be assured of adequate supply of its natural prey.

M. A. RASHID

LIONS ON A TREE

Asiatic lions (*Panthera leo persica*) do not usually climb trees as commonly as their African counterparts. African lionesses sometimes use the lower horizontal branches of a large tree to take a 'siesta' and probably use trees as a vantage point for observation of their prey. Unlike most of the African lion habitat, the Gir Forest, the last stand of the Asiatic lions, provides good cover and wide range of vegetation and also terrain. They have enough cover to rest without disturbance and also to hunt. These lions have no need to climb, excepting for the fun of it.

Asiatic lions do climb, mostly during late evenings, when their resting time is over and lions become more active. I have often observed this behaviour in young cubs below one year of age and in sub-adults. I once saw two cubs trying

to climb a slightly inclined *Wrightia* tree, placing their feet with great caution and trepidation. Once they learn to balance, their ascent and descent become fast. The cubs (mostly male) of 2 to 3 years age climb a small *Butea* tree. Adult female lions have also been observed on a tree on a river bank, jumping from the lower branch into the water. Adult members of the pride, while scratching with their claws on a tree trunk, often jump over the lower branches of the tree or climb and hide in the foliage. Young cubs tend to climb an inclined tree trunk (about 45° incline) which has furrowed and rough bark, while subadult animals either climb or even jump up to 8-10 feet onto the lower branches of a tree. The habit has no other purpose than play.

SANAT CHAVAN

Photo: Sanat A. Chavan

A young lion cub climbing a tree



BIRDWATCHER

Keoladeo Ghana Waterbird Sanctuary

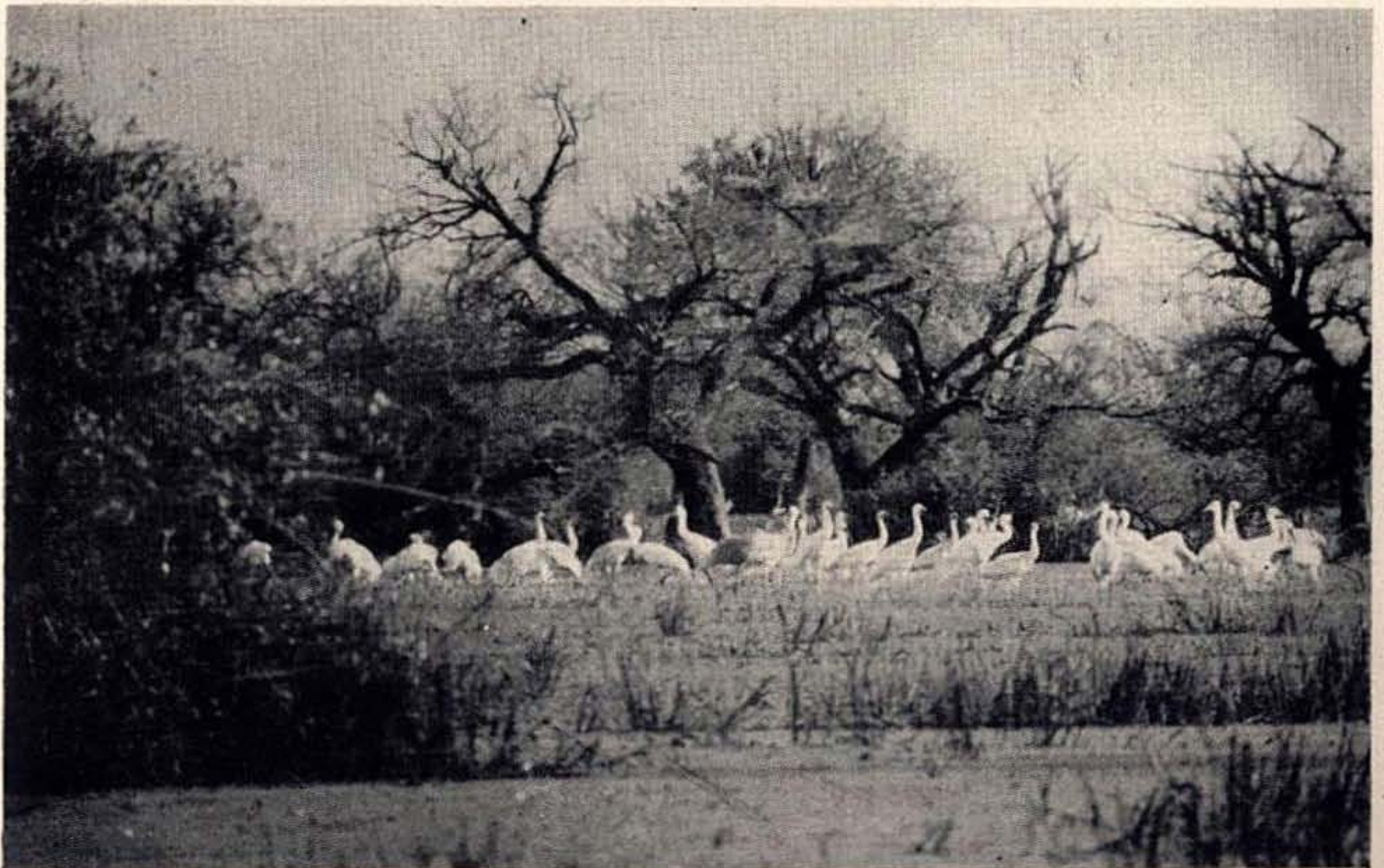
There is considerable unfounded anxiety about the future of the drought-hit Keoladeo Ghana Waterbird Sanctuary at Bharatpur among the birdwatching fraternity both in India and abroad. To allay such fears we reproduce below Dr. Sálim Ali's comments on the Sanctuary which followed his visit there in December 1979, Dr. Sálim Ali writes:

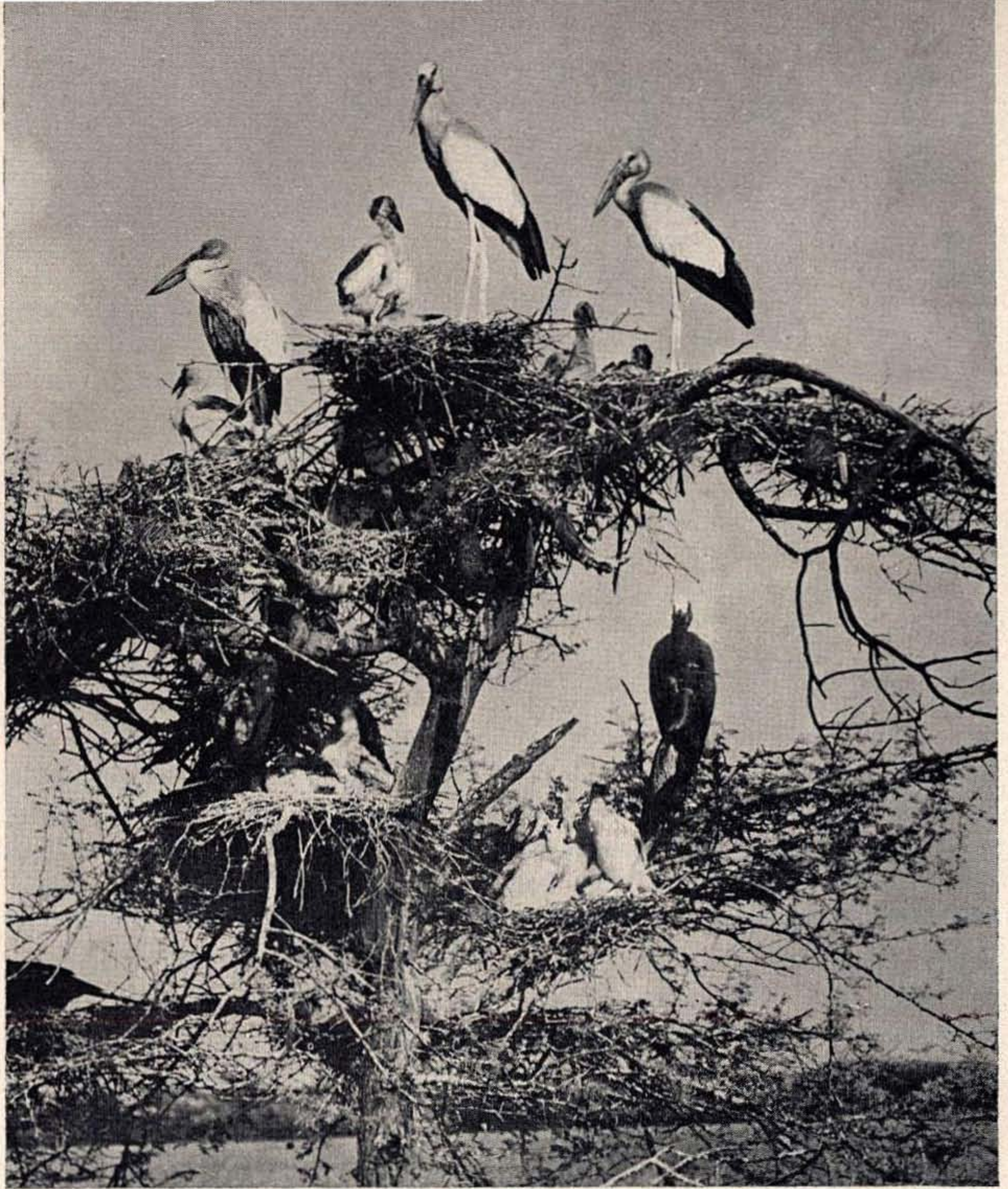
'I have just returned from a visit to the Keoladeo Ghana Waterbird Sanctuary, regarding which a great deal of misplaced concern has been aired by visitors to the area, within recent months, in the newspapers and otherwise. It is true that the near failure of the SW. monsoon this year in that part of the country has caused a severe drought. The water table has gone down alarmingly. The major part of the Ghana

is bone dry and in the rest the water is vanishing fast.

'However this is not a novel phenomenon. A drought of varying severity is known to occur every few years with all the alarmist public concern as expressed today. It is also true that there has been practically no nesting of storks, egrets, cormorants, ibises, spoonbills and other waterbirds that in normal years is such a spectacular feature of the Lake. Till mid December the migrant ducks were also comparatively few with a small number of Greylag Geese, but plenty of Barheads, 12 Siberian Cranes (adults and one young in golden brown plumage) are reported to have arrived between 4th and 7th December but no more since. By this time in a normal year there are usually

Siberian Cranes during a normal year





A mixed heronry in a normal year

Photo: E. P. Gee

over 40. Some concern was felt by the sanctuary staff at the non-sighting of 4 of the birds in the last 2 or 3 days, but it is hoped that they will turn up again and with them will also come at least some of the others that should normally be there.

'While it is a disappointing year for birdwatchers I feel that the drought is a blessing in disguise for

the sanctuary itself. Under the new water management plan the Ghana had remained inundated throughout the year, contrary to the conditions obtained previously. As a result many of the trees that afforded nesting sites to the birds were killed off by water logging. The drying of the lake bed this year will enable the older trees to recuperate and the

seedlings and saplings to grow up above the normal water level before the next monsoon. The freedom from smothering by the birds' nests and excreta will give a further breathing space to the trees and provided next year's monsoon is normal, I think there will on the whole be cause for the Ghana to be thankful to the drought rather than the other way round, and there is no need to worry about its future or about its bird populations.

'The other point in favour of the drought is the opportunity it has provided for an all out assault on the water hyacinth which had become a menace to the sanctuary. Operations are in progress to gather the bulbs in heaps and burn them so that resurgence of the weed will be minimised since complete eradication is unlikely. A yet further advantage of the drought is the chance it gives to the management to raise the earthen mounds and plant saplings on them which will prevent them getting water logged when the water level is high as in years of normal monsoon. Moreover since there is no arboreal nesting of water birds this year, the young babul trees planted on mounds in previous years are safe from the mauling they receive from

the birds especially painted storks tugging at and wrenching the tender plant branches as nest material, thereby seriously retarding growth and often killing the trees.

'All in all, therefore, the Ghana has reason to be thankful to the drought than otherwise as a tactic or Nature's management plan.

'The only point of serious concern is the fate of the Siberian Cranes under these inhospitable conditions. The Keoladeo Ghana is the only place in the Indian subcontinent known in recent years as the winter refuge of this rare and endangered migrant. The few other areas in North India whence the bird was recorded 40 or 50 years ago have apparently altered their ecology or for some other reasons the birds have ceased to visit them. The real danger now is that if the cranes are forced to move outside the sanctuary zone in search of food, they may be killed by poachers or rarity-seeking sportsman. A letter is being published by the Bombay Natural History Society in various newspapers especially in North India to elicit information regarding the sighting of these birds anywhere outside the Bharatpur area.'

SALIM ALI

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A Grey Pelican beginning a nest on a palmyra palm holding Baya weaver bird nests.

Photo: E. P. Gee

Pelican enquiry

Dr. A. Crivelli of the Station Biologique de la Tour du Valat, Camargue and Co-ordinator for the International Waterfowl Research Bureau writes that the IWRB Pelican Research Group would appreciate any observation of the Grey Pelican, *Pelecanus philippensis*, of the Dalmatian Pelican, *P. crispus*,

and of the White Pelican, *P. onocrotalus* in Asia. Reports should be sent to him to the following address:

STATION BIOLOGIQUE DE LA TOUR
DU VALAT
LE-SAMBUC
13200 ARIES, FRANCE.

Point Calimere, Tamil Nadu

1979 Nature Camp

In October and November the Society arranged a nature camp at Point Calimere. I was one among the 60 members who participated. We spent five days in groups of twenty to observe and study from close quarters the birds and butterflies, and the herds of chital, blackbuck, sounders of wild boar and predators such as the jackal.

Point Calimere, a low promontory on the Coromandel coast, 30 miles from Jaffna Peninsula of Sri Lanka across Palk Strait, lies in the Tiruturaipundi taluk of Tanjavur (Tanjore) district of Tamil Nadu, about 200 miles south of Madras City. Two small villages, Kodikarai village near the tip of the promontory and Kodaikkadu village further inland are the only human habitations. A long approach road and a tiresome train journey have saved

this abode of migratory wading birds and the endangered blackbuck from the attention of the holiday picknickers. As one nears the sanctuary the majestic *gopurams* (towers) of the old Hindu temple at Kodiakkadu loom over the palms and can be seen from a long distance. The temple was built by Chola Kings more than a thousand years ago and with the remains of an old lighthouse on the seashore reveal the importance of Kodikarai village in the ancient times. The present lighthouse was built in 1890 and re-commissioned in 1933.

The blue sea, the sparkling white sands of the long beaches with their variety of shell and coral remnants and the jumping and diving dolphins offshore, fill one with peace and tranquility while walking along the sea front. Point Calimere is sur-

Spoonhills, Painted Storks and kites in flight.

Photo: Ashok S. Kothari



rounded by a number of tidal mud-flats, salt marshes and lagoons, the habitat of countless migrant waders.

The sanctuary includes 4250 acres of scrub jungle, 550 acres of secondary scrub and 1180 acres of coastal strip and has probably the second largest population of blackbuck in India, which numbers nearly one thousand; chital, wild boar and jackal are wildlife in the sanctuary.

The migrant waders for which Point Calimere is justly famous arrive in their thousands from central Asia between late August and early November. Many of them continue southwards after a brief stop-over across the Palk Strait towards Sri Lanka. Sálím Ali noted that large numbers of Indian Pitta (*Pitta brachyura*) pass through Point Calimere on their way to Sri Lanka every October. In fact the movement of resident species like koel etc. through Point Calimere to Sri

Lanka is one of the fascinating features of the sanctuary.

During our short but fruitful stay we travelled on foot, bullock carts and countrycraft to lone beaches, far corners of the jungle and tiny islets and saw a wide variety of migratory and resident birds from the majestic flamingo to spoonbills, egrets, grey herons, various duck and gulls, curlews, drongos, pigeons, bulbuls, kingfishers, bee-eaters, etc.

One early morning we caught seven birds in our mist nets. Some of them were migrants from the Himalayas and some from far off Siberia. These were ringed and released. Flamingos kept a 'respectable' and tantalising distance from us and disappointed the nature photographers amongst us. But all in all it was a most satisfying experience.

ASHOK S. KOTHARI

In quest of flamingo.

Photo: Ashok S. Kothari



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In short, the Society offers a range of activities and interests for the scientist, the amateur naturalist, the sportsman, and the lover of nature. Even if you are none of these the Society deserves your support because it is struggling to preserve our natural heritage and to safeguard it for our children.

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