HORNBILL

BOMBAY NATURAL HISTORY SOCIETY

No. 12 July-September 1979

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.

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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Life membership	Rs	750.00
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The first annual subscription of members elected in October, November, or 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.

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EDITED BY

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Natural History Society,

Edited by

E. H. AITKEN AND R. A. STERNDALE.

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1886.

Cover page of the second issue of the *Journal* Vol. 1(2) for April 1886

EDITORIAL

This issue of *Hornbill* would reach you with or slightly ahead of the Diamond Jubilee issue of the Society's *Journal*, which is the last issue of the 75th volume of the journal. The first volume of the Society's *Journal* appeared in January 1886; the last issue of the 75th volume is the issue for December 1979. The difference in period between the calendar year and the journal year is because the *Journal* had up to volume 55 four issues per volume with a gap of four months between issues.

The Jubilee issue is a blend of the old and the new. Contributions include an article on the history of the Society by Salim Ali (joined 1918), on moths of Mombassa by D. G. Sevastopulo (joined 1926), on keelback snakes by Thomas Gay (joined 1930), on the changing wildlife in Kathiawar by K. S. Dharmakumarsinhji (joined 1939) and on forest days by Tom Norman (joined 1948). Charles McCann, the former Assistant Curator and Joint Curator of the Society who joined the Society in 1921 and retired in 1946 reports on the Tassel-Pondweed (genus *Ruppia*). McCann is still considered the best all round field naturalist the Society produced. The younger generation of field naturalists from the Society is represented by articles on the Gir vultures by Robert Grubh, the Black-and-Orange Flycatcher by M. A. Reza Khan, and the Parambikulam Sanctuary by V. S. Vijayan. The *Journal* also includes invited articles from specialists in various fields.

The *Journal* is indeed a praiseworthy achievement for a private Society published as it was purely out of revenues derived from its membership subscriptions with practically no financial aid either from Government or extraneous sources.

The four issues of the *Journal* cost Rs. 4316/- in 1891. The cost of three issues in 1978 is Rs. 69,000/-.

This is perhaps the place to apologize for the printer's error in the last issue (No. 11) which inserted the letter 'v' on p. 25 and changed the frog's wooing into *wooving*.

PRESIDENT'S LETTER

CONSERVATION IN EVOLUTION—THE SILENT VALLEY PROJECT

Although Silent Valley was the subject of our editorial in the previous issue of *Hornbill*, its importance as a live conservation issue merits a reappearance.

As we go to press, the implementation of the proposed hydro-electric dam at the Silent Valley Reserve Forest has been stayed by a court order. So far only the approach road has been constructed. The Valley proper remains untouched by the executioners! Thanks to the legal stay this near pristine wilderness has been given a brief but invaluable lease of life. In the meantime we must await the next decision.

While one wonders gloomily about the ultimate fate of the Valley there is a less apparent but positive by-product of the protest that gives us reason to be hopeful of the future. Ironically the proponents of the dam have provided conservationists with a metaphorical wolf at the door, that has evoked a vocal and united call for help. The spread of conservation consciousness as a result of the campaign is certainly unprecedented. In Kerala itself, dedicated conservationists have carried the ecological issues involved to small villages and towns apart from the urban centres. Several 'Save Silent Valley Committees' have been formed at the 'grass roots' level in Kerala. These local efforts have prompted similar groups to be set up in other parts of the country such as Bombay, Delhi, Madras, Ahmedabad and Hyderabad. The national press has thought the issue important enough to give it wide coverage.

As lately as the beginning of this decade resistance of this kind to a project from a conservationists lobby, would have been inconcievable. Indeed there was no conservationist lobby worth speaking of. The efforts to save Silent Valley have crystallized the cause into a very definite movement—something that has not been witnessed before.

Of equal historical import will be its contribution—to coin a phrase—to ecological jurisprudence. We are sorely lacking in laws that safeguard our natural heritage from the complicated and often elusive and remote planning and executing mechanisms of the state. In the prevailing absence of the political will and consciousness to enact such legislation, legal precedents could either enhance or retard the creation of urgently required laws to fall more in tune with scientific and empirical experiences of ecological disasters. Silent Valley—and a few

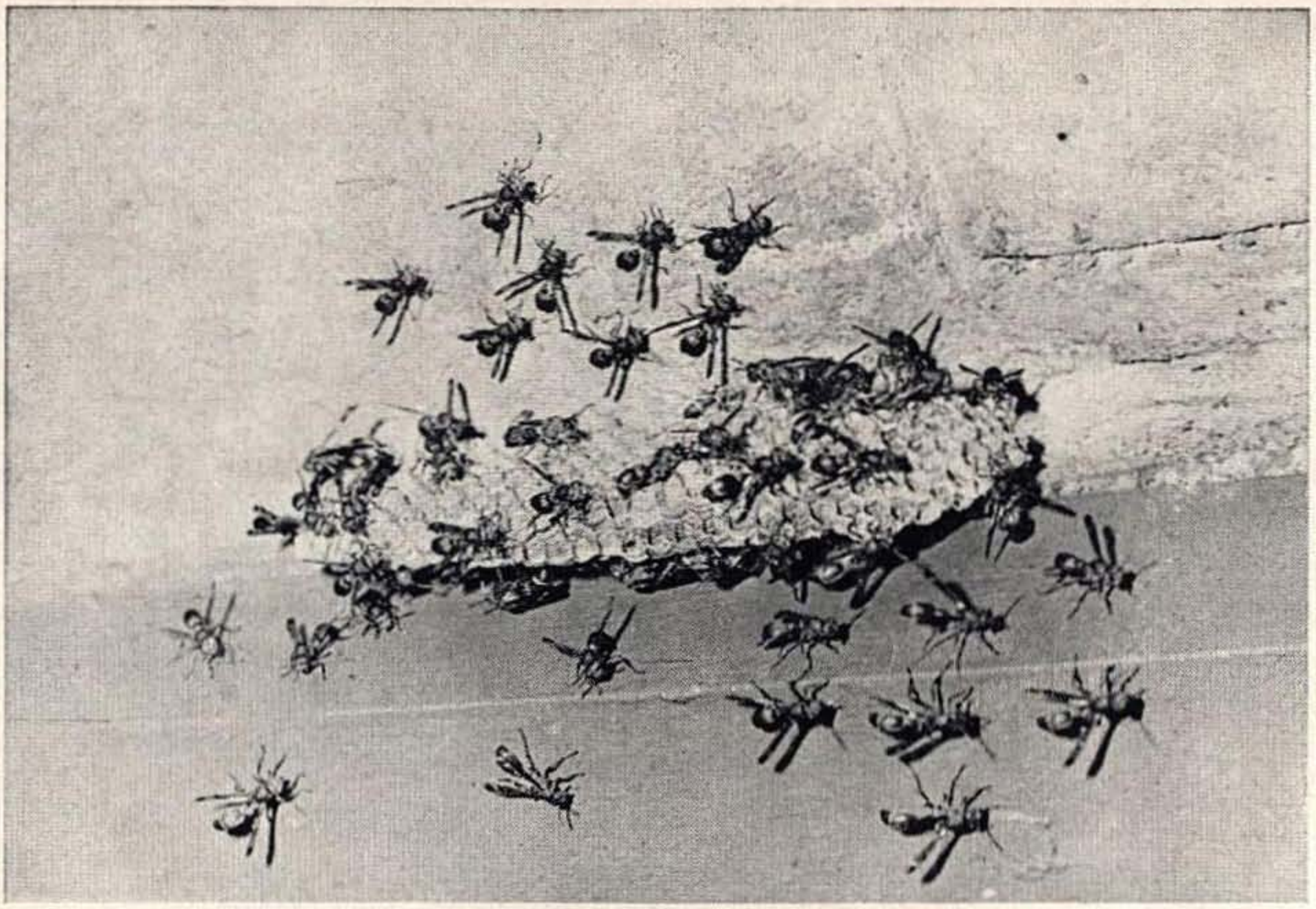
(*Contd. on p.* 22)

The Paper Wasps

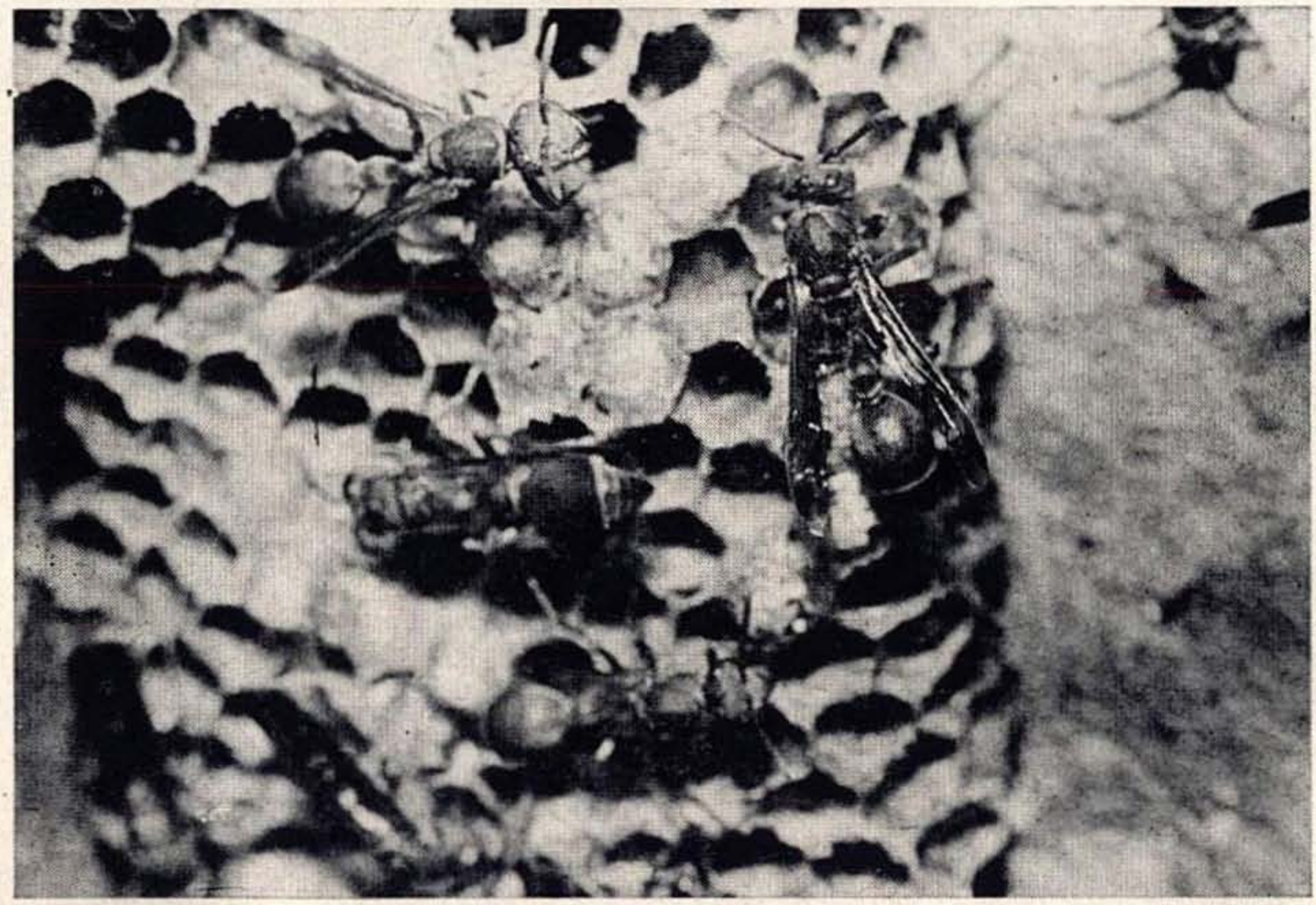
Wasps are the *prime donne* of the insect world, graceful little creatures with a long, streamlined abdomen that begins with a slender waist line and ends in a vicious sting. Many of them are solitary creatures, the most familiar being the mud wasps and potter wasps which build their mud nests all over our houses. But wasps are remarkable for one thing. They have closer blood ties with their sisters than with their daughters. Scientists have a measure for the closeness of blood ties between any two relatives known as kinship coefficient. We receive half of our hereditary material from our father and half from our mother. Hence our kinship coefficient with either of them is one-half. We also share one-half of our hereditary material with our full-brothers or sisters, one-fourth with our grandparents, one-fourth with our father's full brother, one-eighth with our first cousins and so on. The kinship coefficients are correspondingly one-half, one-fourth, and one-eighth. Now wasps are remarkable in that the kinship coefficient between full-sisters is three-fourths, whereas that between mother and daughter is only one-half. This genetic quirk, as we shall see later, has been responsible for the tremendous development of sociality in wasps, and their relatives ants and bees.

Vespa tropica, *a predatory social wasp, devouring the brood of* Ropalidia marginata
Photo: R. Gadagkar

Paper wasps are amongst the most fascinating of wasps. They build their combs all over our buildings wherever there is a little shelter; under the eaves, inside little used cupboards, in electric meter boxes. They also suspend their combs from leaves and twigs



Ropalidia marginata, *Paper wasps*



Photos: H. C. Sharatchandra

in our gardens. The combs are fabricated out of cellulosic plant material chewed to a paper-like consistency. The combs are made up of a number of hexagonal cells which are arranged in a long string or on a flat surface. The wasps lay their eggs in these cells; the larvae hatching out of these eggs are brought up in the same cell where they finally pupate. The adult wasp emerging out of the pupa then joins the labour force of the colony.

All paper wasps are social creatures. Over a hundred adults may live in the same colony and share the colony life. The males do very little constructive work. Most of the females serve as workers, constructing the combs, feeding and taking care of the larvae. The workers also bring in food which is shared amongst all the adults on the colony. One or a few of the adult females do all the egg-laying, while the rest of the females take care of the brood.

A majority of the paper wasp females thus totally dedicate their own life in the service of the colony, in the cause of bringing up the offspring of another female wasp. Could this behaviour have evolved under the operation of the same forces of natural selection which favoured infant-killing by a hanuman langur who had newly taken over a troop? We explained the rationale of the infanticide as enabling the langur male to propagate his own genes more effectively (*Hornbill*, No. 10, pp. 7-9). Does the altruistic behaviour of the paper wasps also enable them to propagate their own genes more effectively?

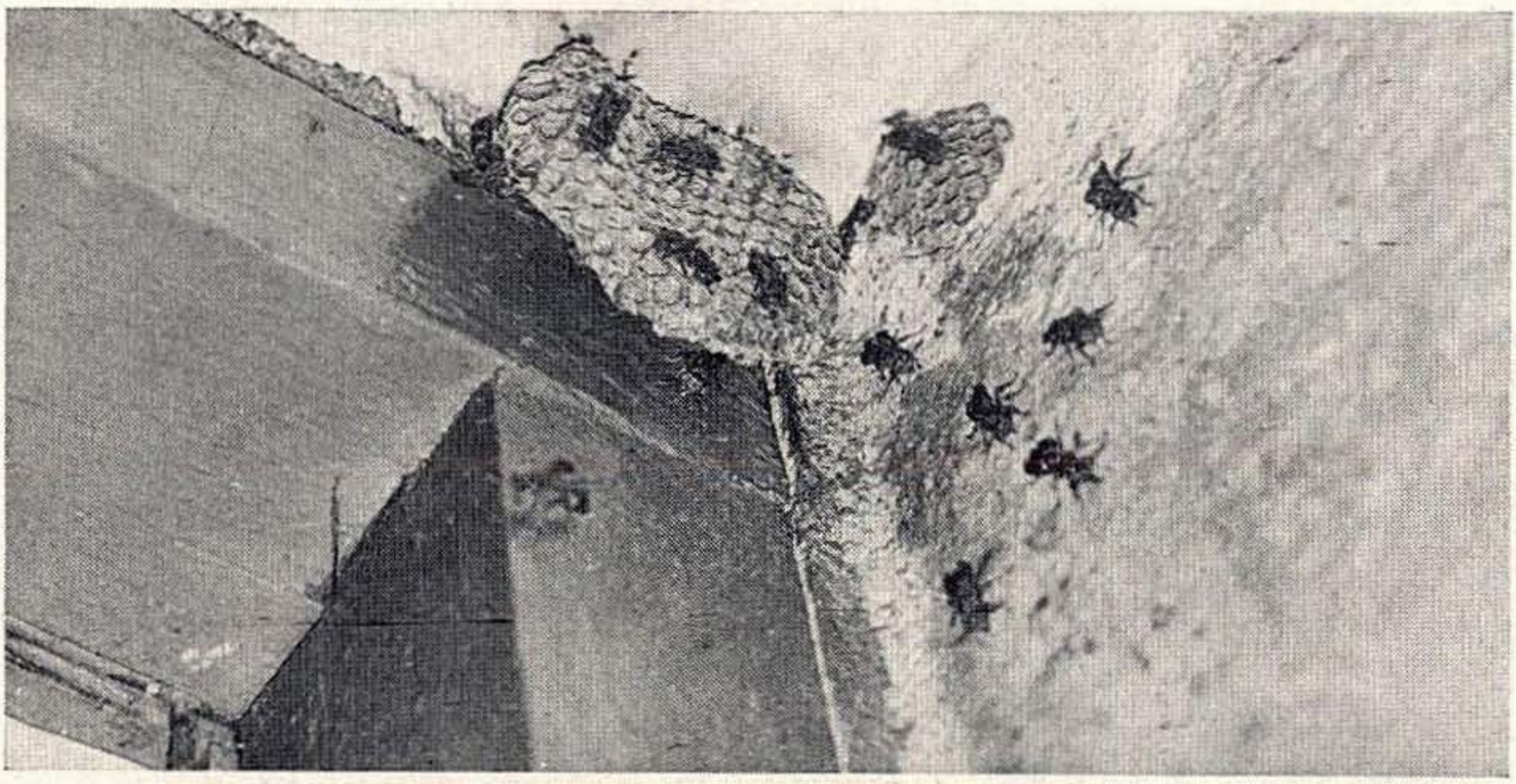
The answer is in the affirmative, and the clue lies in the sister-daughter inequality mentioned above. The worker wasps are most of the time helping their egg-laying mother in bringing up their own sisters. Now natural selection favours certain hereditary traits when the genes coding for those traits spread more rapidly than other genes in the population. Any individual may propagate the genes it is carrying by either producing its own offspring, or by helping its blood relatives to produce their offspring. Since the blood relatives will also be carrying many genes in common with the individual, its helping the blood relatives will help in the propagation of its own genes. This aspect of natural selection favouring social behaviour involving self-sacrifice to promote the well-being of blood relatives or kin is known as kin-selection.

The wasps, ants and bees furnish a particularly favourable opportunity for kin selection to operate. For in these insects sisters are related to each other by three-fourths and mother-daughter only by one-half. Thus a female wasp can propagate her genes even more effectively by helping her mother in the production of her sisters, than by attempting to produce her

own daughters. And this is what all female worker wasps, ants and bees do! They help the queen who is their own mother in raising the brood which is their own sisters. Thus the same natural selection that favours a hanuman langur male killing infants which are genetically unrelated to him, favours wasp workers dedicating themselves, even at the acceptance of sterility, in raising the colony brood which is their own sisters.

Paper wasps have yet more interesting features over and above this basic colony organization which is common to all social ants, bees and wasps. For paper wasps are amongst the most primitive social insects. Unlike in the ants and honeybees, there is no clear distinction between the queen and worker castes in the paper wasps. In these creatures the queen and the workers look alike and any worker has the potential of becoming a queen. They are however differentiated behaviourally and workers have their ovarian development suppressed in consequence. The paper wasps are also notable for the fact their colonies are founded by several sisters who initially fight it out amongst themselves.

This fascinating group in fact holds many clues to the early origins of social life in wasps, ants and bees. Paper wasps are largely confined to the tropics and we have in India a great opportunity to work on them. It is an opportunity largely unexploited except for some work by Helen Spurway, Jayakar, Mahabal, Gadagkar and myself. It is to be hoped that some readers of *Hornbill* will be tempted to seize it!



Ropalidia marginata *Paper wasps* *Photo*: H. C. Sharatchandra

MADHAV GADGIL

Notes, News and Comments

Cattle rescue a gazelle

At Gura-Bishoia village, gazelle and blackbuck occur in large numbers as the Bishnoi community protect wild ungulates.

During heavy rains and subsequent floods in the Luni river, the soil of the area gets water-logged and under such conditions antelopes and gazelles get bogged and stray dogs which can move easily over the slushy surface take advantage of rainy days to hunt such stranded gazelle and blackbuck.

On a rainy day recently, a dog attacked a gazelle close to the hut of a Mr. Surjaram Bishnoi. The gazelle bleated and on hearing it, a cow grazing nearby rushed to the rescue of the gazelle, and chased the dog away. Other cows grazing close by gathered around the gazelle and prevented the dog from making further attacks.

The cows around the gazelle licked it for a considerable time, and the cowherds later took the gazelle to their hut and gave it first aid and food. The gazelle recovered in one day and was released back into the nearby jungle.

INDRA KUMAR SHARMA

In the Society's Journal Vol. 51 (2), 1953, *Dr. F. R. Goldschmidt reports an almost similar incident, when a cow actively interfered in a fight between two dogs and tossed and chased away the larger animal.*—EDS.

The Chinkara is becoming rare throughout its range *Photo*: Indra Kumar Sharma

Household remedies—An Appeal

It is common knowledge that large sections of our people still depend on household remedies and folk-medicines. Household remedies are often tested effective prescriptions based on simple inexpensive and usually easily available plants and plant products. Much of this information remains as personal knowledge and is passed on by word of mouth from person to person or generation to generation. For various reasons, much of this knowledge is now getting lost.

It is advisable and urgent that this knowledge is recorded and brought together for proper study and wider application. The Economic Botany Section of the Botanical Survey of India is undertaking this task.

It is realised that some of this information may be very common knowledge and even recorded in published literature. But all may not be so. And this search is intended to screen the information and locate such new knowledge for scientific scrutiny. Many plants used in household remedies will be known by their local names. The communications should include the aliment(s), names and particulars of the plants or plant-parts used, method of preparation and administration of the medicines.

Readers are requested to write about the household remedies for common diseases or ailments known to them to

THE ECONOMIC BOTANIST
BOTANICAL SURVEY OF INDIA
P.O. BOTANIC GARDEN
HOWRAH 711 103, W. BENGAL.

All communications will be gratefully acknowledged.

Wildlife Studies

Recently a specialised course on 'wild life' at the M.Sc. level in Zoology of Utkal University, Bhubaneswar, has been started from the session 1978-79. The course covers 200 marks in Semester III and IV.

The wildlife wing of the State Forest Department specially the Nandankanan Biological Park is providing all possible facilities to the Post-Graduate students of this course.

The mark of Cain

The Chimpanzees of the Gombe National Park which have been under observation since 1960 have changed from the peaceful community they were in the first decade. In 1970, a group splintered and started moving south. In two years when the split was complete relations became strained between the two groups and mass murder, infanticide and cannibalism started. In the next three years all the males in the southern group were killed

off. The internecine fighting is probably territorial according to Miss Jane Goodall as there is considerable strain from encroachment by man into the already circumscribed Gombe National Park. Chimpanzees are apparently no better than man as far as aggressiveness is concerned. (The Economist, July 7, 1979).

Smithsonian programmes of higher Education & Research Training

The Smithsonian Institution announces its programmes of higher education and research training for 1980-1981 in the fields of Anthropology, Biological Sciences, Earth Sciences, and the History of Technology and Sicence.

Smithsonian Fellowships are awarded to support independent research in residence at the Smithsonian Institution using the collections, facilities, and laboratories and pertaining to research interests of the Smithsonian research staff. Proposals for research may be offered in the fields in which the Institution has research strength.

Biological Sciences. Systematics of fossil and recent vertebrates, invertebrates, and plants, radiation biology, animal behaviour, plant and animal physiology, animal pathology, tropical biology, ecology, and field biology.

Smithsonian Fellowships may be granted to post-doctoral and predoctoral scholars to pursue further training in research. Applications are due by January 15, 1980.

Awards are based on merit. Smithsonian Fellowships are open to all qualified individuals, without reference to race, colour, religion, sex, national origin or age of any applicant. For more information and application forms please write:

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WASHINGTON, D.C. 20560.

Please indicate the particular area in which you propose to conduct research and give the dates of degrees received or expected.

Aphidological Society

At the plenary session of 'Symposium on Recent trends in aphidological studies' held under the auspices of the Utkal University, Bhubaneswar and sponsored by University Grants Commission at Bhubaneswar (June 9-12, 1979) a society named 'The Aphidological Society, India' has been formed to cater to the needs of scientists working on problems concerning aphids. The society presently intends to publish a newsletter and to hold periodical symposia.

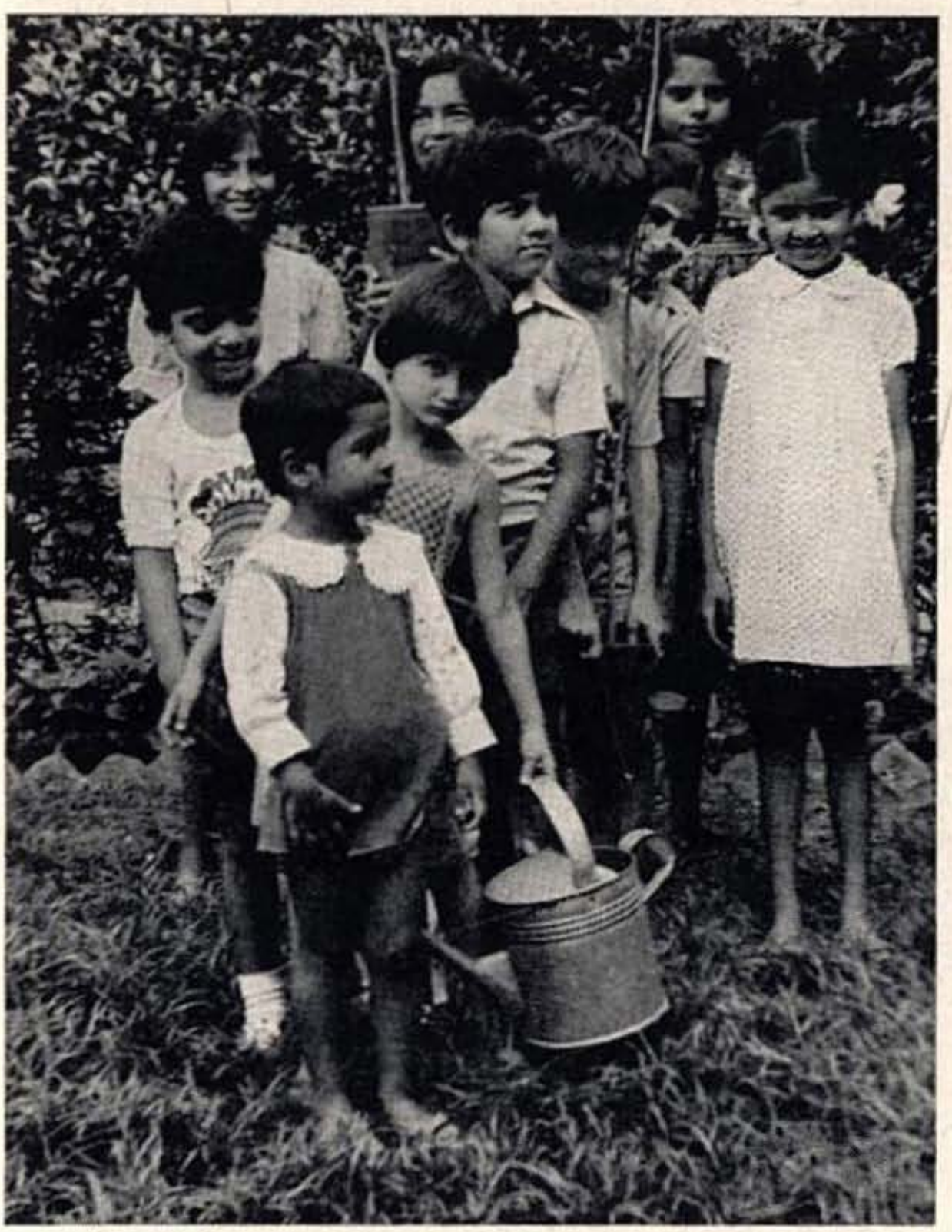
The office of the Society is located at the Entomology Laboratory, Department of Zoology, University of Calcutta, 35 Ballygunge Circular Road, Calcutta 19.

The galloping crocodile

Crocodiles, are superb swimmers and to achieve it have sacrificed mobility on land, slithering on their belly from a muddy bank or at best managing with a slow walk on land, with the body raised well above the ground. Galloping is hardly the gait one associates with a crocodile but young crocodiles do gallop, especially when escaping. George Zug of the Smithsonian Institution reports in the *Copeia* for 1974 (pp. 551-52) that young Estuarine Crocodiles less than 2 m in total length can gallop for short distances at speeds averaging 48.9 km/hr.

A galloping estuarine crocodile

A tree for a child



To grow up with your own tree
Photo: A. S. Kothari

Flame of the Forest

Siamese Cassia

In this, 'the International Year of the Child', I feel strongly that the children of Bombay have been given the role of 'onlookers', remaining in the background of all activity. For this reason a plan was conceived to give the children of Santa Cruz, Greater Bombay, some importance of their own.

Sixty-two saplings of various kinds were donated and planted on 8th July of this year in the Saraswat Colony, Santa Cruz West, and each of these saplings have now been adopted by a child, or in some cases by a brother and a sister, living in the vicinity.

To own the tree, each child paid

Rs 5/-, and this money is solely for replacing damaged saplings, buying mud and manure, or insecticides, and most important, to give the child a real sense of ownership.

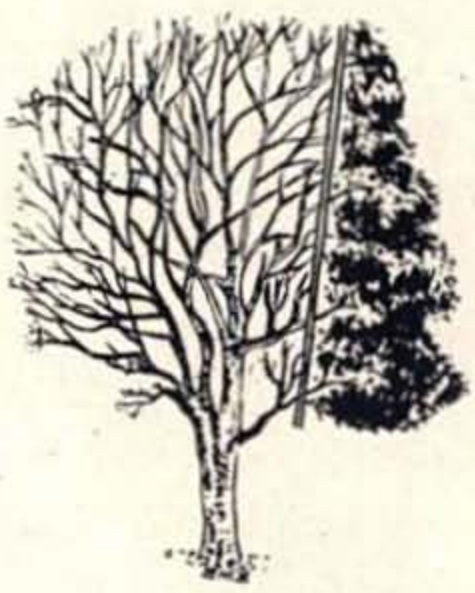
A prize is being offered at the end of September for the best maintained tree, and metal tags are being embossed for each child. The tags give the name of the tree, the date on which it was planted, and the child's name, and are to be attached to the saplings.

The enthusiasm and care each tree is being lavished with is very heartening, and we feel that other projects of similar kind could be initiated with success—bringing with them the added bonus of educating children and giving them a sense of social awareness and achievement, which sadly lacked in the past.

As well as involving the children of the area individually, a project has been given to the children of a large neighbouring school. Here a group of children have adopted some of the trees as a class. They will be able to study the growth, development and formation of leaves and flowers, and make notes accordingly. The school has been very cooperative, and we hope to encourage other schools to join this and other planting programmes in the near future.

While choosing the saplings, special consideration was given to the fact that there is a high salinity in the soil in the area, and often the high tide floods the low-lying ground, inundating many places where, through necessity, trees were to be planted. In other words, all these trees are relatively hardy, ornamental and fairly fast growing. They include *Saraca asoca* or Ashoka, *Spathodea campanulata* or Tulip tree, *Callistemon lanceolatus* or Bottle Brush, *Delonix regia* or Gulmohr, *Cassia fistula* or Indian Laburnum, *Caryota urens* or Fish-tail Palm, and many others.

PHILIPPA MUKHERJEE



Indian Coral

Indian Laburnum

Spin-fishing on the Kerala coast

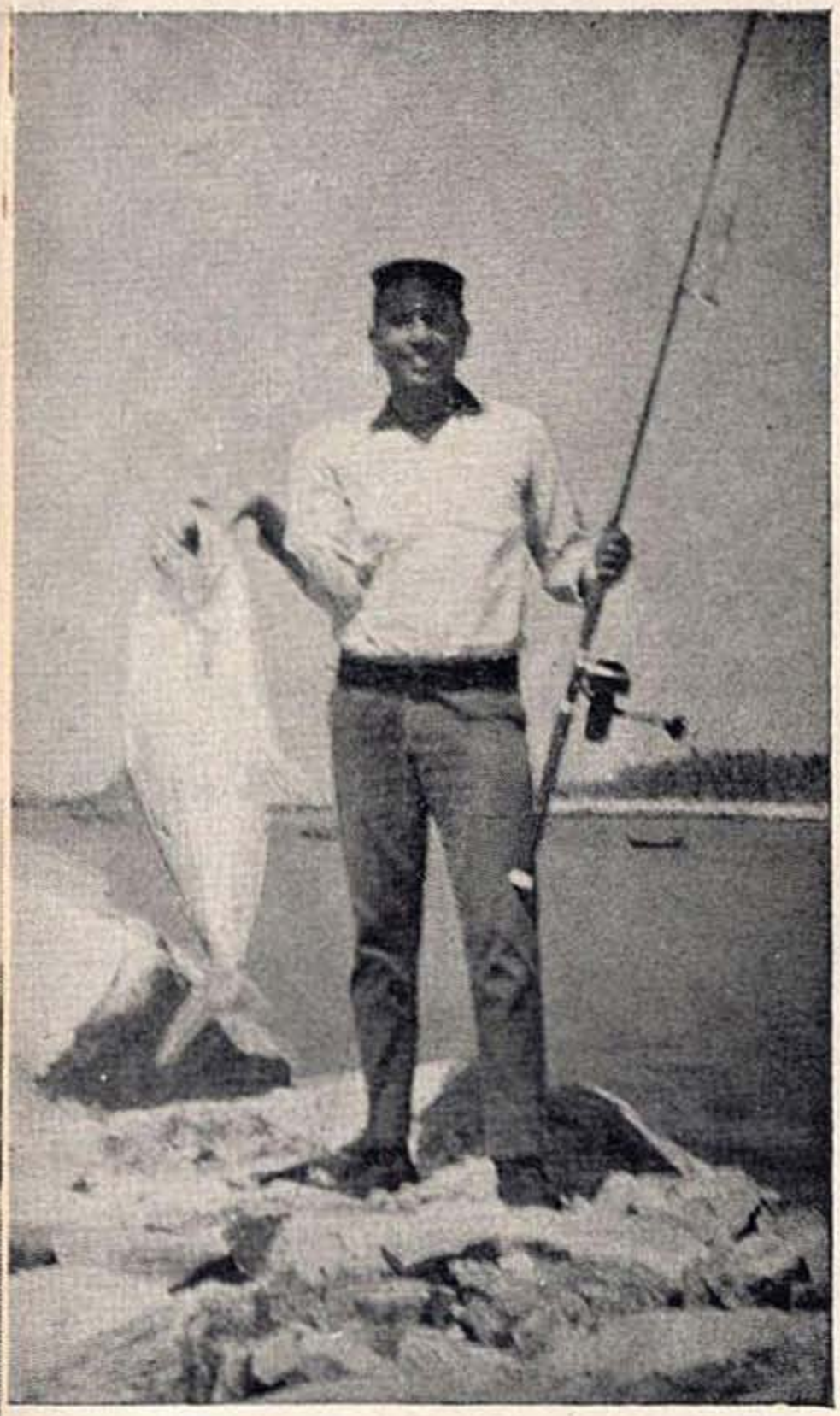
Four of us, sport fishermen, N. Sebastian (Sabby), his son, John, his son-in-law, Varghese, and I, were on January 4th 1974 on the southern prong of the two breakwater walls at the entrance of Ashtamudi Lake (backwater of the Arabian Sea) with Neendakara on the northern bank and Saktikulangara on the southern bank of Quilon district, Kerala State.

Against this backdrop, we did our spin-fishing (also called spinning as distinct from spin-casting). During the last decade, there has been a meteoric rise in spinning. We were equipped with 9 feet fibreglass spinning rods and fast-retrieve saltwater spinning reels.

We had made three previous attempts at this spot, all unsuccessful. The start of the fourth day was a sad repetition of what had happened before. Reluctantly, we agreed to ignore the jumping fish at our usual spot in the flow of the entrance. We worked our way back on the outer side of the breakwater wall, jagged with large white rocks. Facing the south, we had the beach to our left. There, a dozen professional fishermen stood at the ready, with casting nets in their hands, intently scanning the surf for sight of schools of grey mullets (*Mugil cephalus*)—known in Bombay as *Pilsa*. These *Pilsa* grow to surprisingly large sizes: at least, 6 kg to my knowledge (and reported to grow "to 100 lb in weight"). These schools consisted of grey mullets approximately $\frac{1}{4}$ to $\frac{1}{2}$ kg in weight, on which preyed the larger carnivorous fish.

Immediately on spotting a school, the professionals would rush into waist-deep water and fling out their cast nets over the mullets, trapping about 20-25 of them per net per cast. In deeper water, the predatory gamesters were patrolling the feed.

Into this deeper water, where the big 'uns were cruising up and down, we cast our lures. Sabby, John and Varghese were using spoons. These travel subsurface on the retrieve. I decided on a solid, turned, aluminium, silver-anodised plug that rippled the surface and moved more like one of those mullets. On my third cast, I saw a gamester surging across in frenzied abandon. He overtook my "Ripple" Plug and then I felt the jolt. I reacted by striking twice to make sure of embedding the barb in his mouth. After thrashing about for a while, he took off like a bat out of hell and I experienced once more the old familiar thrill of the scream of the reel: the thrill that money can't buy. He sped for a hundred yards in one glorious run and far away, he leaped a couple of feet in the air, in a flat sideways skim, still putting distance between us. He repeated this buck-jumping in his



Author with the catch

efforts to throw off the hook but only succeeded in tiring himself out. I had seen that he was a flat fish, laterally compressed.

Now he stopped, exhausted. Pumping all the while, I drew him to me till he came near to the rock-wall. I expected him to fight again in blind panic, as game fish usually do when brought in, close. But he was a spent force, ready for the gaff. John clambered down the breakwater wall of dangerous rocks —a fall here would undoubtedly result in a nasty injury—and with a single upward pull, had him impaled on the sharp gaff. We then identified him. He was a Queen. Suspended from the hook of my Salter Spring Balance, he registered 12 lb. (5.44 kg) only. We taped his length at 37 inches (94.00 cm) and his girth at 22½ inches (57.20 cm). The entire play had taken only 10 minutes: hooked at 12.15 and landed at 12.25 in the afternoon.

With the famous Neendakara as a background, Sabby photographed me with my Queenfish from the Saktikulangara breakwater wall. It is amazing how success can cut fatigue. Personally, I was floating on air, with the capture of this fish, my first Queen.

For this Queenfish (*Chorinemus lysan*), ABU, Sweden, awarded me the Record-fish Badge in Gold.

I. G. VALLES

The Tahr of Bison Hill

Bison Hill (600 m) would be unremarkable, except for the fact that a herd of Nilgiri Tahr have made it their home. It is shaped rather like an inverted bowl, flattened on top, and is located in the eastern foothills of the High Range at the head of the Amaravathi lake in Coimbatore district, Tamilnadu. It got its name not due to any existing association with the gaur (the Manjampatti valley at the bottom of which Bison Hill stands, is reputed for its 'white bison'), but apparently because a goddess once made an auspicious appearance in the form of a gaur and its calf on the banks of the Amaravathi river (before it was dammed), and disappeared up the hill.

It was early one April morning in 1979 that we took the trip to the hill. My father is currently doing a study of this tahr population with the aid of World Wildlife Fund—India. To save the long walk around the lake, we and our Vedar guide Mariappan were paddled across in a fishing coracle, against a stiff headwind. The coracle is perfectly round, made of a framework of bamboo, lined with hide. Between bouts of bailing out water we admired the beauty of our surroundings. The artificial lake was set amidst brown rocky hills and we were on the look out for chital, sambar and elephant.

We reached our destination safely (much to our surprise), and

A group of tahr in the High Range *Photo*: Priya Davidar

A waterfall in the Amaravathi river *Photo*: E. R. C. Davidar

when getting out disturbed some yellow wagtails near the shore. We planned to climb up the northern side of the hill, as the eastern face is sheer rock. The thorn forests at the base of the hill are composed

of trees such as *Zizyphus, Euphorbia antiquorum* and *Acacia,* and shrubs and stragglers like *Dichrostachys cinerea, Gmelina asiatica, Petrolobium indicum* and *Ehretia,* viciously armed with spines, thorns and other arsenal. Whitebrowed bulbuls burbled all around, while ring doves cooed and courted. The presence of elephants was evident from the broken branches and fresh dung. Once or twice I heard a crack, but tried not to think too much of it. My suspicions were confirmed when a shrill trumpet rent the air in front of us. I followed my instincts—turned and bolted with Mariappan close behind, till a crack across our path halted us. We were obviously in the midst of a herd of elephants. We had to give up our plans for an ascent on the northern side, and decided instead on the southern face. Silently dodging between elephants, at times only a bush away, we reached the Dhuvanum, the impressive waterfall which plunges into the lake.

There was a large cave on the far side of the river where some tribals, Malasar cattlemen and Pulayars who had come to gather soapnut from the forests around, were camping. They showed a marked disinclination to discuss anything related to fish and fishing. Gajam, the pool at the foot of the Dhuvanum, was at one time famous for its outsized mahseer. We did not pursue the subject, and started the tortuous climb up the gravelly sides of the hill in the increasing heat, using a sambar trail, struggling up through thickets of *Petrolobium,* while a black eagle sailed midway up the hillside. Trees such as *Ficus, Anogeissus latifolia, Gardenia lucida,* and *Premna glaberrima* appeared together with clumps of fairly tall grass. An open dry savanna type of vegetation occurred on top, with significant increase of grass species, mostly dry and seeding. Common among them were *Panicum* sp., *Themeda triandra, Chloris* and conspicuously the highly variant *Apluda mutica,* with greener and larger clumps in moister situations. Trees like *Anogeissus latifolia, Tectona grandis, Ficus, Terminalia tomentosa, Givotia rottleriformis,* and *Hemicyclia separia* were interspersed. Common shrubs were *Grewia aspera, Dichrostachys cinerea, Gmelina asiatica.* Undershrubs such as *Grewia, Tephrosia hirta,* and *Crotalaria* showed indications of being nibbled at. A herd of about 30 tahr live in this unusual habitat, which certainly raises significant questions as to their supposed preference for the evergreen montane vegetation at 2000+ m. The nearest source of water in summer is the lake and the river, and there is as yet no evidence to suggest that they go down there to drink. I was helping my father in this study in my capacity as a botanist, and we wanted to know the type and species of plants these animals lived on, and other ecological factors that

enable them to survive here. Similar herds lived in the neighbouring hills in the not too distant past, and were wiped out. This herd is also in a rather precarious situation living in an area of about 500 m diameter with only the cliffs for shelter. The implementation of the Upper Amaravathi hydroelectric project in the area would also create disturbance and increase poaching. This would surely threaten the survival of this vulnerable herd. It would be interesting to know how they arrived here and have survived. If they put their minds to it they could easily make it to the High Range across the few kilometres of flat land. The effects of the supposedly long term isolation and inbreeding would also need study, and in comparison with the populations in the more normal habitat of this species.

I sat under a tree and watched two blackwinged kites hovering, hanging motionless in the air except for the scanning heads looking for potential prey. A wild boar broke cover from a nearby thicket, and a sound behind me gave away the presence of the tahr. After having watched them a few days earlier in the mist-blown Rajamallay slopes of the High Range, it was rather strange to see them peering at me through the branches of the shrub *Gmelina asiatica*. They looked browner than the ones at Rajamallay. The herd moved rather leisurely towards the skyline, and disappeared beyond.

We three met after some time and as we climbed down in the burning heat, noticed tahr droppings for about one-third of the way down. Our fisherman friend who had stayed back at the pool had become impatient and had gone away with our lunch. We tried to accept this disaster with as much philosophy as we could muster on an empty stomach.

The river was full of rapids and deep still pools flowing down to the waterfall in a deep gorge. A greyheaded fishing eagle flew across. Dead mahseer floated in Gajam, the deep pool below the fall, obviously dynamited the night before. We thought of the tribals whose naked children now leapt among the wet rocks. We also wondered about the tahrs' chances of survival.

A whitenecked stork we had seen that morning had walked its lonely way along the mudbanks, leaving large toe prints.

We walked back in the lengthening shades of the evening. Suddenly the water churned as two crocodiles fought rolling in the water with lashing tails and snapping jaws. A third swam impassively near by. They separated and swam off in opposite directions. An odd fisherman could be seen on the lake pulling in his net. It was an exhausting trip, but we had already planned to come back again to learn more of the enigmatic Bison Hill tahr.

PRIYA DAVIDAR

BIRDWATCHER

A Masked Booby or Gannet

On the morning of 2nd July 1979 between 0805 to 0810 hrs. after reporting for duty (Card punching), I was on my way to my office at the Naval Dockyard, Lion Gate, when I noticed a number of crows attacking a bird which from a distance of about 15 m looked like a duck. Its waddling gait, webbed feet and size convinced me that it was a duck. I wondered as to how a duck got into the dockyard and even if it did, why crows were being hostile towards it. I knew that crows do not attack domestic birds, specially ducks. I was therefore intrigued about the identity of the bird and advanced towards it as it waddled across the road. A closer look showed that its beak was not like that of a domestic duck as it was large, pointed, and more set into its skull. Even its tail was unlike that of a duck. These observations convinced me that it was not a duck. I was also certain that I had never seen a similar bird and decided to catch it.

When I was about 2 to 3 feet behind it I extended my hand to catch its neck, but it turned around with snapping beaks. I took the aid of a friend Milton D'Sa, who distracted its attention from front, and I threw a handkerchief over its head and caught it by its neck at the same time.

I took the bird to Hornbill House, across the road, where it was identified as a Gannet, usually occurring in regions to the west of India. I am of the opinion that this bird was blown off its course by the strong gales in the Arabian Sea due to the monsoon and it was either directly blown into Bombay by the force of the strong winds or it had perhaps perched and travelled into Bombay by the Indian Frigate *INS Dunagiri* which had then returned to port after being involved in the rescue operations of a tanker 500 miles off the Bombay coast.

ERASTO A. RODRIGUES

Banding and colour marking of sea birds

At the invitation of the Office of the Government Adviser for Conservation of the Environment, Sultanate of Oman, a programme of colour ringing and dyeing seabirds (mainly gulls and terns), and crab plovers was being carried on in July-August 1979 on the South Coast of Arabia, by Dr. C. J. Feare of Greenfields, The Street, Ecohurst, Surrey, England. The aim of this ringing and colour marking is to attempt to trace post-breeding, dispersal of seabirds and to relate this to the geographical distribution of ticks that parasitize the birds.

Readers are requested to keep a look-out for ringed and dyed sea-

birds and report any sightings to Dr. C. J. Feare at the above address. Please intimate this to your circle so that they could also watch out for these birds.

Pinkheaded Duck again ?

Saw Cushing Po, who was the Deputy Head of the State General Administration Department, Kachin State, Myitkyina from January 1974 to December 1976 while on a routine visit to Rangoon for consultation with the Central Government in September 1976 dropped in for a few minutes at Inya Myain and passed on the information about the sighting of the Pinkheaded Duck in his area. He also informed me that he had received reports of the sighting of the bird from trustworthy friends. As coloured plates prepared by the Bombay Natural History Society were widely circulated as well as an appeal for information on the existence of the bird in Burma, these sightings appear to be reliable. Confusion with the Whitewinged Wood Duck is absolutely unlikely.

U TUN YIN

(*Continued from p.* 4)

other cases of this kind—may, through sheer practical compulsions, push our legal system willy nilly into the realm of evolving laws for the protection of our wildernesses.

The direct credit for all this must go to the group of very dedicated naturalist and conservation-minded individuals in Kerala. Doggedly, at considerable personal sacrifice and with frugal monetary resources they have sustained the campaign against the hydro-electric project. They deserve our deepest appreciation for this exemplary effort.

On the other hand one of the severest lessons of Silent Valley, is that we can no longer look at conservation issues in isolation. After all we are part of the polity that utilises the resources that conventional development projects generate. We shall now have to do a great deal of thorough and systematic home work, involve specialists from various fields and present well documented, specific and viable alternatives to our objections. I do realise that to a cause that is lacking in resources this task becomes as difficult to undertake as it is essential if we are to get anywhere.

In the meantime we continue our efforts and hope that Silent Valley will be preserved for all time.

SALIM ALI

A garden on top of the World

Ever since I read Smythe's book VALLEY OF FLOWERS I had a craving to visit the valley. The dream came true, when the Society organized for its members a six-days expedition to the Valley of Flowers last July. The members who participated consisted of enthusiastic naturalists, botanists, entomologists, birdwatchers, wildlife lovers, nature photographers, and hikers.

The Valley of Flowers (3650 m) is just 19 km off the highway from Haridwar to Badrinath (3515 m), the famous pilgrimage centre. The journey from Rishikesh to Joshimath, a distance of 250 km is covered in a day by bus or taxi. After a over-night stay at Joshimath, Govindghat, a distance of 20 km, is covered the next day in an hour.

At Govindghat the Bhyundar Ganga (or Laxman Ganga) meets the Alaknanda river from the north. The trek is one of varied scenic beauty. The distance of 19 km is covered by trekking in two stages —a 15 km trek with a climb of 1220 m to Ghangaria (3413 m) and a 4 km trek with a climb of 300 m to the Valley of Flowers. As the path from Ghangaria gradually ascends to the Valley of Flowers one can have the new ex-

A bouquet of anemones *Photo*: C. H. Basappanavar

A snowbridge over the Pushpavati *Photo*: C. H. Basappanavar

perience of a walk on glaciers. Snow bridges, alpine flowers, wild-life, and hill birds appear at intervals along the route of these 4 km, and above, the witchery of soft blue sky and floating clouds. It was impossible to describe the magnificence of the chain of tall, white mountains that girded the horizon in the soft morning sunlight.

After our arrival at the valley the weather became thick and heavy. Our camp was surrounded by flowers, and flowers, and flowers only. It was impossible to cut a sod of turf from the ground, where we had pitched our tents without destroying a primula. After a quick bite we set out to have a look at the flower-valley and among other flowers we came across the Blue Poppy (*Neela-kamal*), the Queen of the Himalayan flowers. Even on that dull noon they glittered as though they had retained the sunshine and blue of the skies.

To our disappointment, torrential rain fell in the afternoon and continued until after nightfall as enormous cloud bursts descended. Never in my life had I camped in such rain, and I lay in my sleeping bag wondering whether that high altitude tent would be flattened beneath an apparently solid waterfall. To sleep was impossible in that biting cold, the mercury had dropped to –10°C. My air-matress was completely submerged under water in the tent and I felt I was actually floating on water. But shortly after midnight the rain ceased, leaving a calm atmosphere in which the roar of swollen torrents sounded a deep chorus broken by a peculiar rushing and tearing sound coming from a high waterfall over one of the rock peaks to the northern side of the valley.

The next day was tranquil with glorious sunshine. It was a scene to make a photographer's mouth water—the high peaks dazzlingly white with ice above the emerald green valley, the green of an Irish landscape in springtime and wet-leafed silver birch (*Betula utilis*) forest quivering and dancing with reflected light on the southern slopes of the valley. Flowers looked more beautiful after the rains and I strolled up and down the valley enchanted by the drifts of blue cynoglossum and regiments of pink polygonum, balsam, potentillas, ground orchids, ferns and lichens, pausing every few minutes to photograph some new and intriguing composition of flowers, forest, hillside, and peak, river and snow-bridges. The whole day had a special charm; the air was full of the scent of flowers and melody of bird song. The meadow before us gleamed with golden buttercups. I felt I could see the plants grow and the buds open. To have a bird's eye view of the entire valley, one has to climb to Hanuman Chatti pass at a height of 4250 m, whence the view is most commanding.

The Valley of Flowers, known

A buckweed flowerhead *Photo*: C. H. Basappanavar

Slipper Orchids from the Valley *Photo*: C. H. Basappanavar

locally as *Nandan Kanan* (garden where the gods play) is nearly 10 km in length, 2 km in width and concave in shape. It is divided by a stream called the Pushpawati or Pushpa Ganga and several tiny streams and waterfalls rush down the glacial deposits to merge with it. The Pushpa Ganga joins with the Laxman Ganga flowing from Hemkund at Ghangaria. A sober, massive mountain, mantled with snow, called Rataban or Ghoradhungi blocks the head of the valley, majestic in its mighty power.

The third day was as exquisitely lovely, as was the blue arch of the mid day sky, with its inexhaustible variety of clouds. We roamed about the lower valley near a moraine where there were androsaces, saxifrages, sedums, yellow and red potentillas, geums, geraniums, asters, gentians, to mention but a few plants and it was impossible to take a step without crushing a flower. To my attentive eye each moment of our stay in the valley brought its own beauty and I beheld every hour a picture that was never seen before and could never be seen again. The heavenly meadow changed every moment.

Next day we descended to some lush meadows where we enjoyed snow white drifts of anemones, golden lily like nomocharis, marigolds, wild roses, clematis, corydalis, erysimum, valeriana dancing in the breeze. The entire valley was a beautiful pasture with clear fast running streams.

On the penultimate day, a batch of nature lovers visited Margaret's tomb. Joan Margaret Legg enamoured by reading Smythe's book VALLEY OF FLOWERS is said to have visited the valley, but unfortunately lost her life when she fell down a steep hillside. A marble tablet is placed over her tomb with the inscription

> 'I will lift up mine eyes unto the mountains whence cometh my help.'

The trip to the valley is not complete unless one pays a visit to Hemkund Lokpal (4640 m). There is no direct access to Hemkund from the Valley of Flowers. One has to return to Ghangaria, and then trek 7.2 km to the beautiful lake surrounded by high mountains. Those mountains seemed to me as if they have been built for human peace. The Laxman Ganga river takes its birth in this lake. On the bank of the lake there is a tiny shrine of Laxmanji which is in a dilapidated condition. There is also a Sikh shrine where a huge structure is coming up changing the whole environment into a concrete jungle. The surrounding area is being polluted and the eternal beauty of the lake is marred. The surrounding slopes are full of rare multi-coloured flowers like famous *Brahmakamal, Hemakamal, Neelakamal* and the like.

Photography in the Valley of Flowers is a difficult task since the photographer has to work against many odds, mainly unfavourable

(*Contd. on p.* 32)

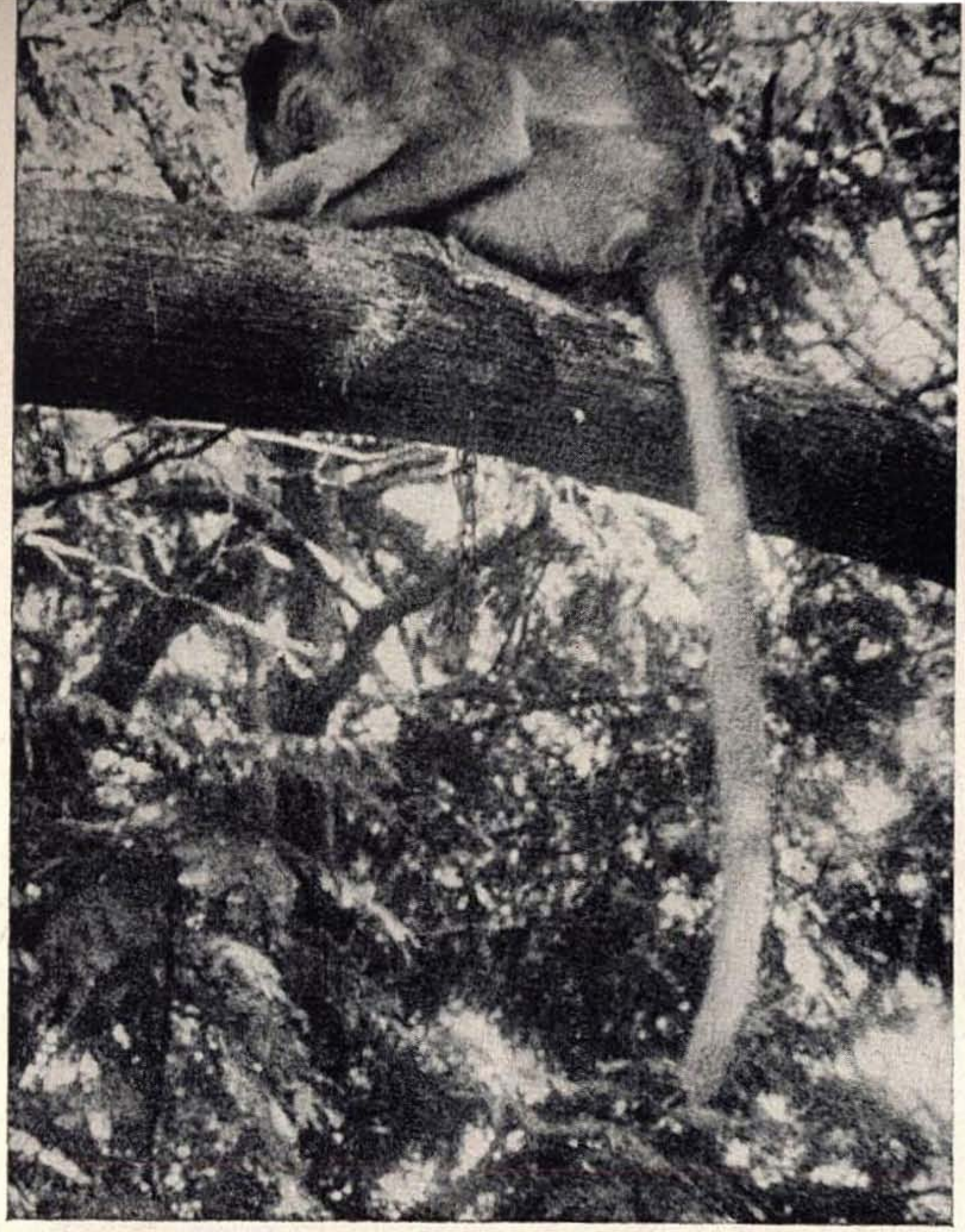
Of macaques—Bonnet and Rhesus

Reports from visitors, both members of the Society and others, to the Borivili National Park, Bombay, suggest that troops of Bonnet and Rhesus macaques intermingle. In our rambles we have often seen these macaque troops, but have always failed to come by evidence supporting these reports.

However, during a walk in the Park on 16th September 1979 we saw a troop of 12 Bonnet macaques (*Maccaca radiata*) on trees just off the road. As we watched them we saw a Rhesus (*Maccaca mulatta*) shadowing the troop on its periphery and meekly trying to concert with the Bonnet troop. One of us (SRA) entered the forest to follow the troop and observe them closely with a pair of binoculars to make sure if any more Rhesus were involved. However, the individual we first saw happened to be the only one with the troop.

The Rhesus was a fat and plump male, about one-and-half times the size of the dominant Bonnet. The Bonnets seemed to be indifferent to the Rhesus's presence—the females and the subadult males scarcely took notice of him and never gave him the right of way. The Rhesus himself was docile and submissive to the Bonnet leader, clearing out of his way whenever the latter happened to move in his direction. The Rhesus had apparently been severely mauled. The upper jaw was dented for a goodly portion in front. His right elbow carried the scar

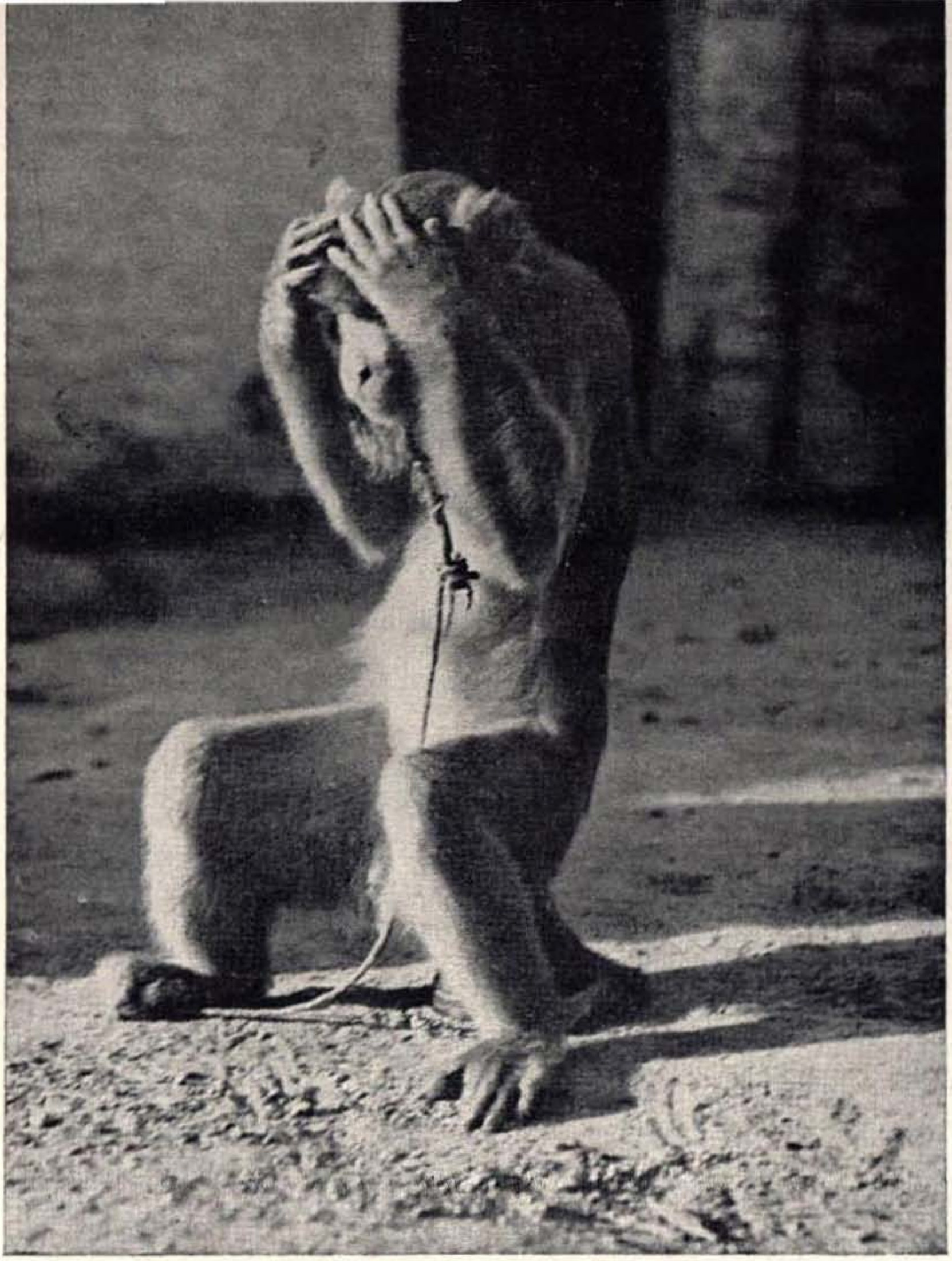
A young Bonnet looks out *Photo*: S. R. Nayak



A Bonnet — siesta *Photo*: Michael Rodrigues
Courtesy: Evening News of India

of a dried-up wound, and the left thigh had three deep vertical gashes still red with blood and clotting in parts—a momento perhaps of a recent encounter. The Rhesus was seen picking up the clots off the gash and eating them. His whole demeanour suggested a fallen angel —a vanquished individual, once a proud leader of his troop, now dispossessed by a more virile rival.

The history of the Rhesus troops one comes across in the Salsette and other parts of Greater Bombay may interest the reader. The distributional range of this species is restricted to the north of a line drawn on India's map. from the mouth of the Tapti river to the mouth of the Godavari. Bombay



Rhesus — rejected and dejected

is thus extralimital to the normal range of the Rhesus. Its introduction in our area goes back to about 40 years. In the mid and late 1930s Rhesus macaques were being exported to the European and American markets. Consignments of the animals were brought into Bombay from upcountry for shipment. With the outbreak of the Second World War, and its escalation with the entry of Japan on the side of the Axis, movement of essential cargo took preference and freight space for the macaques became impossible. Consignments of the animals thus accumulated in the shipping yards with dim prospects of being ever lifted onboard. This prompted authorities to release the animals

in the wooded portions of Bombay suburbs and the Salsette. A troop used to move in the 1940s in the Bhoiwada and Parsee Colony area of Dadar. It was gradually liquidated and disappeared. A big male Rhesus which solitarily roamed during those years in the Bhoiwada area was reported in the local papers as having entered the magistrate's court located there and to have got onto the magistrate's table when the court was in session, and to have 'rung' the bell on the table. The descendents of animals released in the Raj Bhavan precincts still live in the area, and are often reported to be a nuisance to the residents—entering houses, pilfering food, and biting people. The troops found in the Borivli National Park and the Powai lake environs are descendents of those released there in the forties. Incidentally in the experience of one of us (Serrao) the Rhesus macaque is never found further north of Culvert 20 in the Park. The individual which is being reported on was located between Culverts 38 and 39.

Observations of visitors to the Park on these macaques will be interesting.

J. S. SERRAO
S. R. AMLADI

(*Contd. from p.* 28)

weather most of the time. A man accustomed to life in the lowlands suffers at high altitudes from a characteristic discomfort syndrome, associated particularly with the cold and the lack of oxygen, and physical symptoms such as a rise in haemoglobin concentration and arterial pressure in the lungs. Added to this the batteries of electronic cameras fail to oblige us at higher altitudes. Though the entire Valley of Flowers which is created, destroyed and recreated by Mother Nature is captured by me in the form of movie films and stills, those forms remain useful only to those who have not visited the valley. But to me the Valley of Flowers is the most beautiful spot I had ever seen, a memory of joy and an experience that will remain with me throughout my life.

C. H. BASAPPANAVAR

Cover picture

Phaius tankervilliae, *a large sized terrestrial orchid, with bold leaves about 2 feet long, and handsome flowers borne on a scape which rises from the base of the stem. The picture is from the collection of the late E. P. Gee.*—EDS.

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