

HORNBILL

1981 (4)



BOMBAY NATURAL HISTORY SOCIETY



'Hark the herald angels sing'
Belated greetings from an urban crow's nest to all those who had a Merry Christmas
and have hopes of a bright New Year.

Photo: S. Szafranski

**Please remember to send us
your Subscription for 1982.**

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 78th 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/-.

Annual and other membership subscriptions

Entrance Fees	Rs	25.00
Ordinary individual membership	Rs	60.00
Ordinary corporate membership	Rs	135.00
Life membership	Rs	800.00
Compound corporate membership	Rs	1500.00
Students, Entrance	Rs	10.00
Subscription	Rs	15.00

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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 :

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Bombay Natural History Society
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Shahid Bhagat Singh Road
Bombay 400 023.

EDITED BY

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

EDITORIAL

Recently on a journey by road from Ahmedabad to Baroda or Vadora as it is now known, one of us had the pleasure of travelling in the company of Duleep Mathai and Kartikeya Sarabhai. The conversation turned to the preservation of the indigenous breeds of domestic stock, results of centuries of selective breeding. Mr. Mathai who is remarkably well informed on this subject gave us a most absorbing exposition of the breeds of cattle; the hovering pigeons, whose owners breed them to hover like "stars in the sky" and whose quality was maintained by the peregrine falcons which weeded out those which were not of the calibre to escape their talons. The game cocks, the Aseel finely honed to the needs of their calling. We wondered whether any of these will survive their 'improvement' through infusion of other more mundane blood to foster economic needs. Many of the breeds like for instance the Aseel is now being maintained in pure strains abroad and if they are to survive in India now is the time for action. We have not been able in this context to resist sharing with you EHA's exceedingly graphic and humorous description of the Aseel cock which shared his backyard with a mixed bag of poultry:

"...The master of the ceremonies is that red kullum cock, named

the Sergeant. The kullum, or game fowl, is the only breed—in this part of India at least—to which any attention has been paid; others grow,



EHA's Sergeant

(After EHA)

like Topsy; but cock-fighting Mus-sulmans have really brought the kullum to great perfection. And the Sergeant is a kullum of the kullum. He is commonly considered hideous, for he is 'caviare to the general', and it requires an educated eye to discern his beauties. He stands twenty-five inches high, and a plummet from his chin would drop on his toes. His head is very red, with a fleshy knob for a comb, legs are very pillars of Hercules, his covering is more like fishes' scales than the plumage of feathered fowls, and so scanty, that after dinner it parts in front and displays a patch of naked redness, but it shines with the richest purple gloss. I would make my fortune by betting on him but that he suffers, aristocratic bird that he is, from gout; for I do not believe he ever turned his back on a foe. Fear is a state with which he is not acquainted.

When he is pecking at a bone, the Hubshee looks on from a distance and breaks the Tenth Commandment, but dare not touch the bone. When the kid thrusts his impudent nose into the grain-dish the Sergeant smote him between the eyes. But the most striking feature of the noble bird is dignity, that inalienable dignity which is an inheritance. Being unable to compete at feeding-time with the more nimble chickens he comes to the back door for his special allowance, and waits like the chupprassie; only his martial figure is not to be mistaken for that slouching satellite, and he does not cough to attract my attention; he just stands and commands respect. If you offer him anything, he advances and accepts it like a gentleman. He seems to weigh about half a maund, weight of character included."

ACKNOWLEDGEMENT

We are grateful to Seth Purshotamdas Thakurdas & Divaliba Charitable Trust for Financial help for the publication of this issue.

GRASSES OF WESTERN INDIA

BY

Toby & Patricia Hodd

A limited edition of this book is being published by the Society, and copies will be shortly available. The book is an excellent field guide, and is illustrated with monochrome plates depicting 66 out of the 72 species dealt in the book. The price is Rs. 50/- (**members** Rs. 37.50) per copy. Please reserve your copies in advance.

A SYNOPSIS OF THE BIRDS OF INDIA & PAKISTAN

BY

S. Dillon Ripley II

A second edition of the **SYNOPSIS** is available for sale at the Society. The book is priced Rs. 80/- **for members** and Rs. 100/- **for non-members**. Our readers are requested to collect or order by post the copies they wish to buy at an early date, as the edition is limited and will soon go out of print.

PRESIDENT'S LETTER

To change or not to change? That is the question

Up to the time of our Independence in 1947 the major support for the Society in the way of membership as well as active interest in its objectives came from Britishers and other foreign nationals chiefly belonging to the Services, both civil and military, and from businessmen residing in the country. Many of these people were keenly interested in hunting and general natural history, and the Society despite being called Bombay was well known and recognised by all as the central institution catering to their interests in whatever part of India they happened to be stationed. The financial needs of the Society were modest and were covered, by and large, by the membership fees. With voluntary help from local members and a small staff of paid workers the Society was able to discharge its functions adequately. The coming of Independence after the Second World War brought about a sudden and radical change in the situation. Most Britishers and foreign nationals left the country and with it resigned their membership. For a time it looked gloomy as if the Society might have to be wound up. It was only through the timely intervention of Pandit Jawaharlal Nehru, who had become Prime Minister of India, that the catastrophe was averted. With characteristic vision and concern for scientific and cultural activities such as the Society had been

fostering, Pandit Nehru, on our appeal, committed his government's support to the Society until such time as it could build up an Indian membership to replace what had been lost in the political upheaval. It was in connection with the ensuing drive for the enrolment of Indian members that Dr. S. L. Hora, then Director of the Zoological Survey of India and an active member of the Society's Advisory Committee, first mooted the suggestion to change the name Bombay Natural History Society, which gave the wrong impression of its being a local parochial organisation, to something with a wider national connotation. He argued that most Indians, even if interested in the objects of the Society, had either never heard of its existence or were under the impression that its activities were restricted to the Bombay area. It would be an advantage to remove the misconception he argued since that would help materially in enrolling members from all parts of the country and also in obtaining financial assistance from the Central and State governments and donations from private benefactors and charitable institutions outside the limits of Bombay. At that time many of the old timers who had lived and grown up with the Society and sentimentally attached to the name were scandalized by the suggestion and opposed it vehemently; the idea was turned

down but not before generating considerable heat! The no-changers argued that the name Zoological Society of London does not make the institution the less cosmopolitan for that. Considering that our Society managed to maintain an even keel in the succeeding years even under the old name the matter was soon forgotten except for occasional pleas off and on for a reconsideration of the matter. However, during recent years conditions all round have altered drastically. The activities of the Society have also expanded in all directions to an extent totally unforeseen before. It is no longer merely a static repository for Indian natural history collections howsoever comprehensive, and a publishing house for the *Journal*, acknowledged as the foremost of its kind in the East. The Society has taken to the open, and by its dynamic field programmes of wildlife and Nature conservation it can now justly claim to be a force in the country for moulding both governmental and non-governmental thinking in these matters. However, all this coupled with unprecedented inflation and the ever-rising costs of goods and services—notwithstanding the enhanced grants

it is receiving from the Central and State governments—have made it imperative for the Society to at least double its membership if it is to continue to flourish, and additionally to seek donations from other sources—private individuals, charitable trusts, cultural foundations, or whatever—both national and international. In this context the question of a change in the Society's name from the parochial sounding Bombay to something with a wider connotation, such as for instance Indian Natural History Society, or Indian (or National) Institute of Natural History now becomes more relevant and pressing. It is thought that such a step would be of substantial help in raising funds. It is proposed therefore to hold a referendum among the members to seek their views on Change versus No-change for a decision to be taken on the occasion of the Society's centennial in September 1983. It is requested that readers, after due consideration of the pros and cons, will kindly communicate their views to the Honorary Secretary as early as possible.

Salim Ali

Rendezvous with a tiger

We were seated in conference on the veranda of the forest rest house at Kanha on a bracingly cold morning in December with the Chief Wildlife Warden at the head of the table. The conference dragged on as conferences do with a weedy luxuriance of words. Those of us who had not unburdened and were still brimming with words watched a jeep being driven speedily towards the rest house. A ranger jumped out as the vehicle stopped, ran up the steps, and whispered deferentially into the ear of his Chief that a tiger had been sighted. Immediately there was a brisk rush for the vehicles and we drove in convoy to our rendezvous with the tiger.

The tiger had been sighted amongst the bamboo on the banks of the nullah in which it had taken the bait. Three riding elephants were used to fix the tiger. It was an educative experience to see the working arrangement that had been evolved between the elephants and the tiger. He was checkmated on three sides but he could, if he wished, leave by the fourth. He did not, knowing that the whole drill would have to be gone through if he moved. He was satisfied as long as he could see the elephants. He and the elephants behaved as if the other was not there. He calmly rolled on to his back paying attention only to the sounds coming from the directions of his escape route. The



...camouflaged by the bamboo and undergrowth.



...snarled a warning.



The tiger sank back into slumber
Photos: Zafar Futehally

elephants equally unconcerned swept up swathes of grass with their trunks, dusted them against their knee and chewed them at leisure. Only our intrusion upset this balance, the elephants had to manoeuvre to give those on their back a more advantageous view of the tiger artfully camouflaged amongst the bamboo and undergrowth between the clumps. The tiger then sat up and snarled a warning at the elephants, which shuffled and occasionally showed their baggy backside towards him. We watched for some time and as the tiger sank back in to slumber returned to our conference table.

J. C. DANIEL

NOTES, NEWS AND COMMENTS

Sanctuary and Wildlifer

We welcome two new additions, both glossies, to popular wildlife literature in India, which we hope will survive the hazardous first footsteps of such commercial ventures in India. *Sanctuary* is very much the single handed effort of its editor Bhitu Saigal and its production and contents are a tribute to his enterprise and enthusiasm. *Wildlifer*, we would not like to comment on as we seem to have stepped on their corns if the editorial in one of their issues accusing us of professional jealousy is anything to go by. We had refused to give them our members' list. It is the policy of the Society not to give out its members' addresses as we do not wish our members to be pestered with toothpaste advertisements and such other trivia. We, however, loose-insert in the *Journal* approved fliers on matters of natural history interest and a notice about the *Wildlifer* would have been certainly in that category. *Wildlifer* left Hornbill House in a huff before conversation reached that stage.

Sanctuary, published from Bombay, will appear as a quarterly. *Wildlifer*, published from Delhi, is a bimonthly. We wish them both success.

XVth Pacific Science Congress, 1983

The XVth Pacific Science Congress will be held in Dunedin, New Zealand, 1-11th February 1983. Its theme is to be 'Conservation, development and utilization of the resources of the Pacific.'

A session is planned on the diversity, distribution, abundance and management of vertebrate populations in the Pacific region. Joint sessions will be arranged with related disciplines. Speakers are now invited to offer papers (with title and short summary) on such topics as:

- Biogeography
- Species diversity
- Habitat requirements
- Migration and movements
- Ecosystem studies
- Man-induced changes
- Endangered species
- Conservation and management
- Population ecology

For further information, please write to

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C/O. DEPT. OF ZOOLOGY
UNIVERSITY OF OTAGO,
P. O. BOX 56
DUNEDIN, NEW ZEALAND.

Travel Fellowship Grant

The Indian National Science Academy invites applications for travel fellowship grants from young research scientists (below 35 years of age) under the INSA-COSTED (Indian National Science Academy-Committee on Science and Technology in Developing Countries) Programme. Applicants intending to participate in International Conferences/Symposia/Short-term Training Programme and Workshops should send their formal requests at least three months prior to the date of the commencement of the Conference. Applications will be considered twice a year received before June 30 or before December 31. Candidates selected will be supported fully for their travel cost jointly by COSTED and INSA. Intending applicants may write to

INDIAN NATIONAL SCIENCE

ACADEMY

BAHADUR SHAH ZAFAR MARG

NEW DELHI 110 002

for application forms.

Smithsonian programmes of Higher Education & Research Training

The Smithsonian Institution announces its programmes of higher education and research training for 1982-1983 in the fields of Anthropology, Biological Sciences, Earth Sciences, and the History of Technology and Science.

Smithsonian Fellowships are awarded to support independent research in residence at the Smithso-

nian 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. In addition to pre- and postdoctoral fellowship awards, a limited number of 10-week appointments are made to graduate students. Applications have the same deadline as pre- and postdoctoral awards.

Smithsonian Fellowships may be granted to postdoctoral and predoctoral scholars to pursue further training in research. Applications are due by January 15, 1982. Stipends supporting these awards are: \$17,000 plus allowances for postdoctoral fellows and \$9,500 plus expenses for predoctoral fellows. Ten-week graduate students receive \$1,500.

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

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SMITHSONIAN INSTITUTION

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.

A tortoise in the house

Nearly half of the Bombay's pet-lovers atleast once must have had and may still be having Star Tortoises (*Geochelone elegans*) as pets which they had bought before the ban was clamped on tortoise sale. Being hardy, silent and undemanding with no special diet and housing requirement, tortoise makes an ideal pet. This popularity has taken toll of the wild tortoise populations due to heavy demand of the pet trade.

A group of star tortoises (2 males and 3 females) is with me for the last six years. These were given to me by my 'pet-lover' friends who could not take them along on a vacation or they just switched over to a more 'interesting' pet. To make the tortoises feel a bit at home, year before last I built a 6' x 4' x 5' cement-walled enclosure in the garden. Till then I was keeping them in the balcony of my house. As for the enclosure props, it has

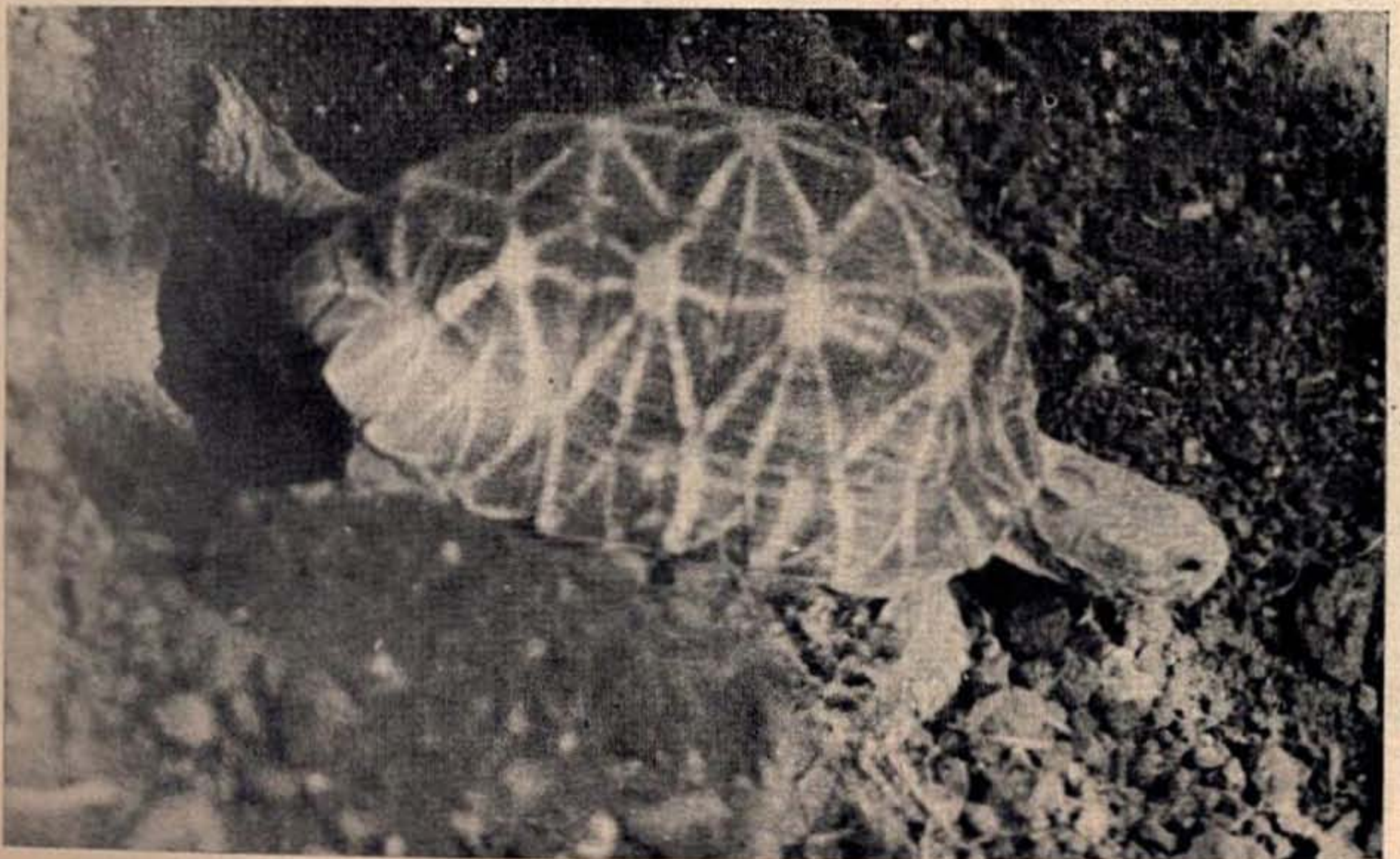
a clump of keora (*Pandanus*), a sunken flat earthen vessel for water and an inverted wooden box with a hole as the entrance.

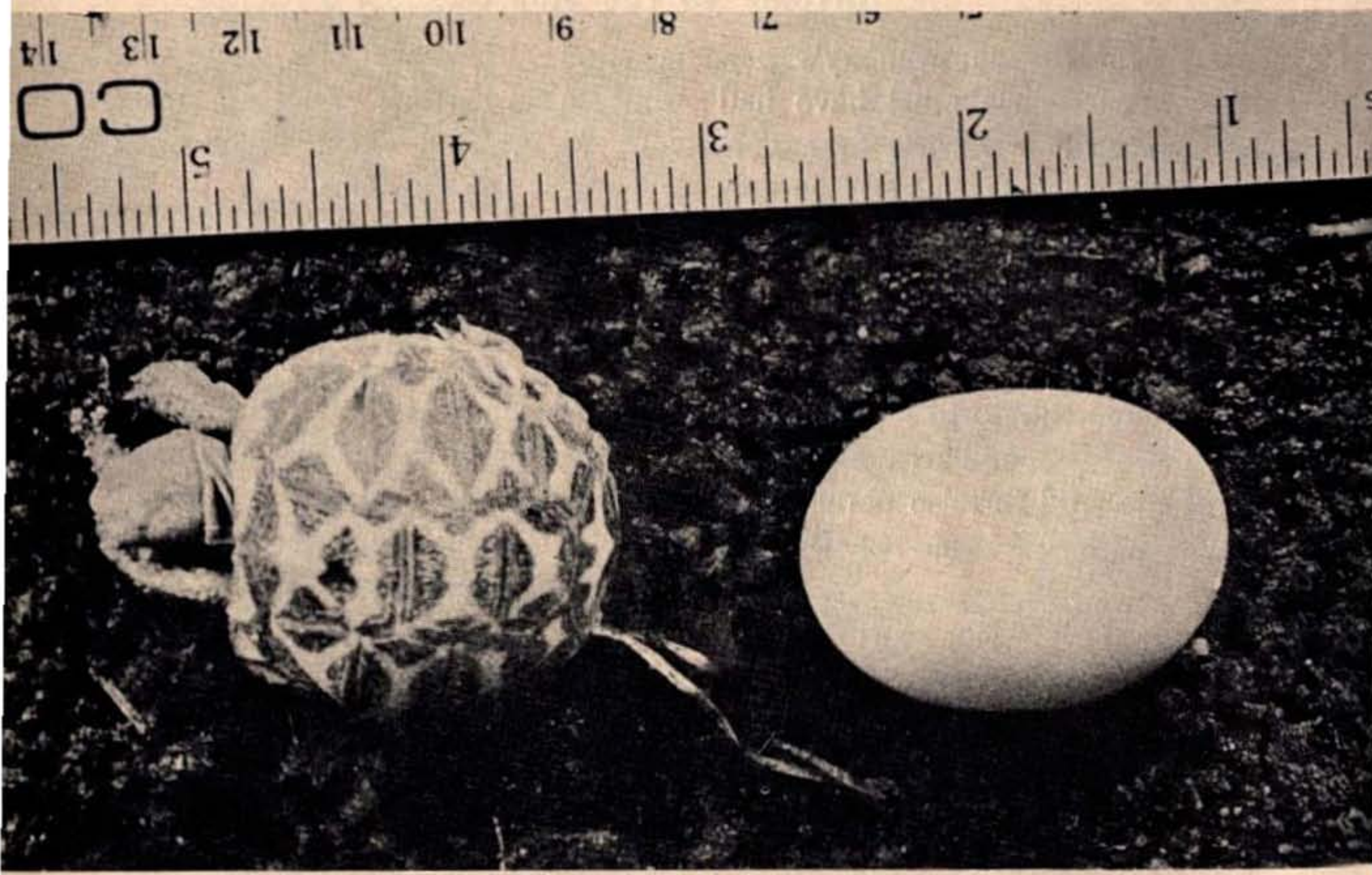
Tortoises begin their day an hour after sunrise except on chilly mornings, when they emerge quite late from the box and bask in the morning sun a lot. After the morning helpings of cauliflower and mulberry leaves, tomatoes, bhendi (*Hibiscus esculentus*) and sprouted channa (Bengal gram) they retreat as the sun climbs and siesta until about 4 p.m., huddled in the box or under the keora clump. Then as the sun begins to dip behind the buildings they march out again and await for the evening feeding session to begin. Usually, the evening menu is mulberry leaves which not only serve as roughage but are nutritious too.

Most of the behaviour is associated with breeding as mating is nearly all round the year, but they

A star tortoise laying

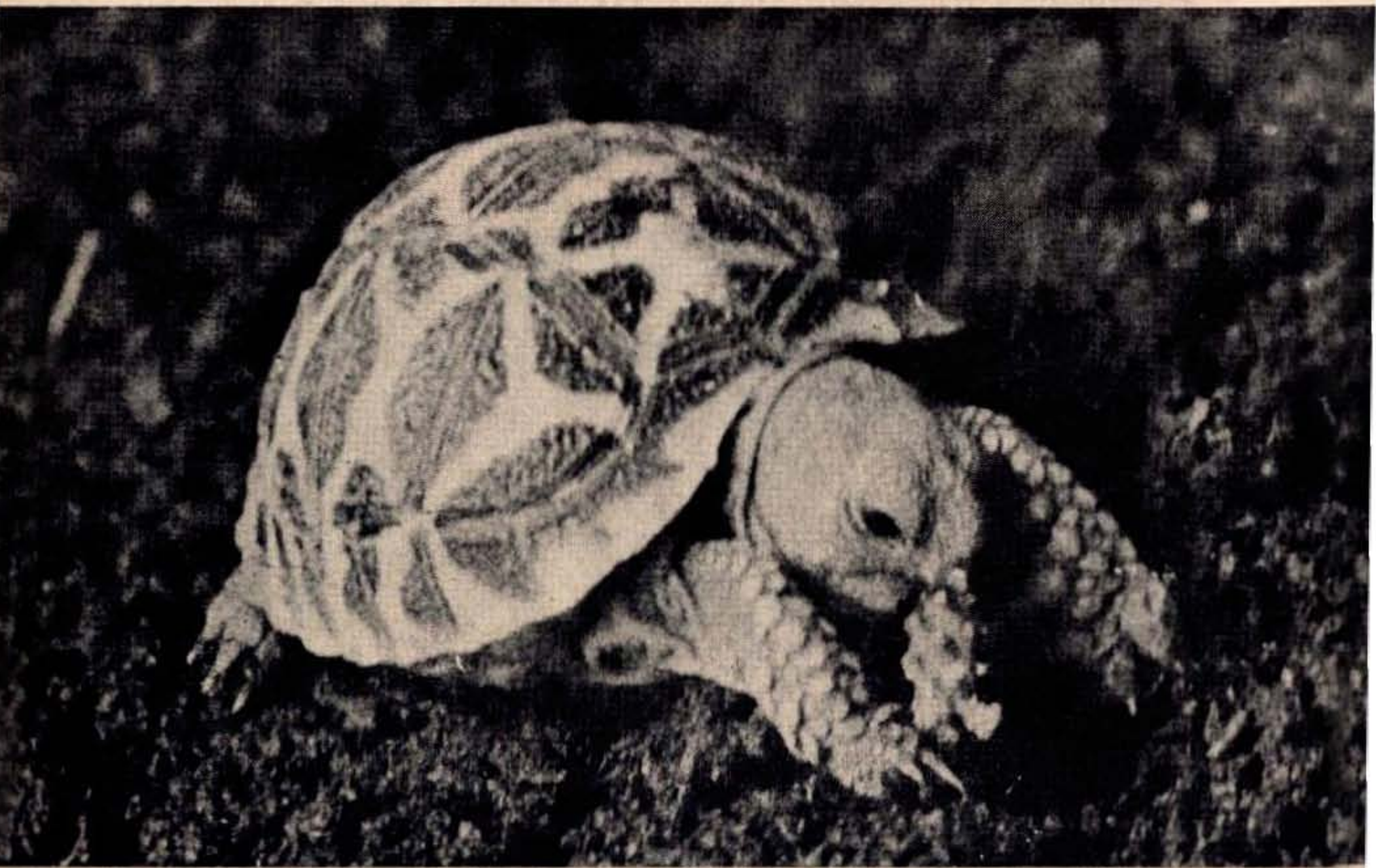
Photo: Author

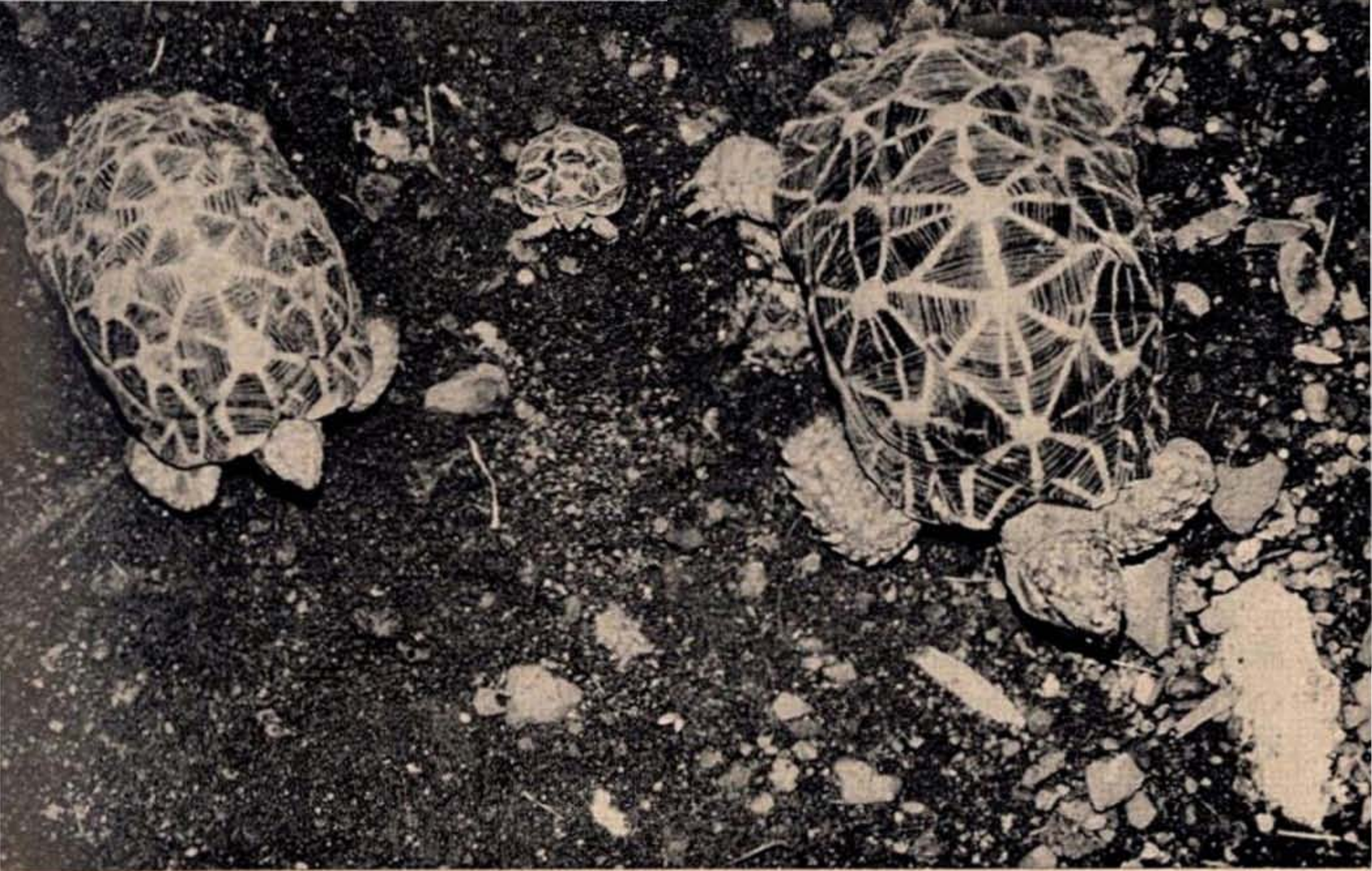




Above, *the egg and its product*; below, *the first feed*.

Photos: Author





Family portrait

Photo: Author

are most active from mid September onwards till mid November. Males are distinguished by their concave plastron (belly shell) and longer pointed tails. Females are bulkier with flat plastron and short stumpy tails. Prior to mounting the male makes head bobbing movements with rhythmic pulsation of the throat. During mating the male utters fairly audible grunts with every thrusting action. This lasts from a few to several minutes, during which the female surprisingly appears quite placid and indifferent or may even go to sleep if she is basking. Only sometimes she responds by making similar head movements with throat pulsation. Often the female may clamp her carapace (upper shell) into the ground at the back to frustrate the

whole exercise or wander off to trip the male off his balance. The male may continue to pursue the same female or sulk away to rest by himself.

Many times males have been observed to mount each other and also the females mounting other females, often from the head-side or sideways. They also butt against each other with heads withdrawn, usually over food or for a favourite resting place or prior to mounting. The tortoise which gets a better leverage succeeds in displacing its opponent. Barring these minor frictions, tortoises live a peaceful life with no pecking order or aggression between them.

This year February 24th turned out to be an eventful day in the lives of these five tortoises and

mine. One of the females was seen scraping the ground with her hind feet around 11.30 a.m. It appeared slow and laborious as she dug alternately with her hind feet and while digging she urinated, possibly, to loosen the soil and make it adhere to the club-like feet for easy removal. This went on till at 6.30 p.m. when three eggs were laid in a four inch deep hole which was soon filled in firmly and forgotten.

Then began the anxious waiting for the D-day. Soon it was June. Dark clouds hovered in the skies a little longer than usual and finally showers later, one morning during the daily clean-up of uneaten food, a brightly coloured miniature tortoise was seen trotting in the enclosure. It was 121st day since the female had dug up the hole to lay eggs.

The hatchling did not eat for a

week but later it took minced mulberry leaves, sprouted channa, miniature opuntia and chicken liver. After waiting for a few more days I carefully dug the nest site to remove the remaining two eggs. The contents of one had turned putrid, probably being an infertile one and the other had fully developed but had a dead tortoise in it. Something must have gone wrong; either the temperature or the humidity or an infection that prevented its hatching. Nature has its own way to regulate its produce.

With a steady gain in weight and size, the hatchling now joins the elders during feeding but at other times keeps by itself to avoid being runover. By the time it matures to an adult, it will be along with its seniors in the wild where they all belong.

I. D. KEHIMKAR

ATTENTION DONORS

The Bombay Natural History Society is approved for section 10(2)(xiii) of the Indian Income Tax Act, 1922. Donations made to the Society for specific purposes are totally exempted from payment of Income Tax under this section.

Mr. M. G. Pratt, one of our members, desires to buy *urgently* a copy of M. A. Wynter-Blyth's BUTTERFLIES OF THE INDIAN REGION. Prospective sellers among our readers are requested to contact him at

No. 10, EDWARD ROAD
BANGALORE 560 052

CONSERVATION NOTES

Captive breeding of Siberian Crane

According to the *World Wildlife Fund Monthly Report* for November 1981 there are fewer than 300 Siberian Cranes *Grus leucogeranus* left in the world and their continued survival is at risk each year as they make the hazardous journey from their breeding grounds in Siberia to winter on the plains of India or China.

In order to ensure survival of the species, a joint conservation programme by the United States and Soviet scientists was started which

led to the building up of a captive crane breeding nucleus at the International Crane Foundation (ICF) at Baraboo, Wisconsin, U.S.A. Soviet ornithologists collected eggs from the Yakutsk region of Siberia in 1977-78 which were flown to Baraboo where 6 young birds hatched out. The Foundation already had two adult males and an adult female, named Hirakawa.

In 1981 spring after artificial insemination Hirakawa laid a fertile egg which was placed under a foster-parent pair of Sandhill Cranes



Siberian Cranes at Bharatpur

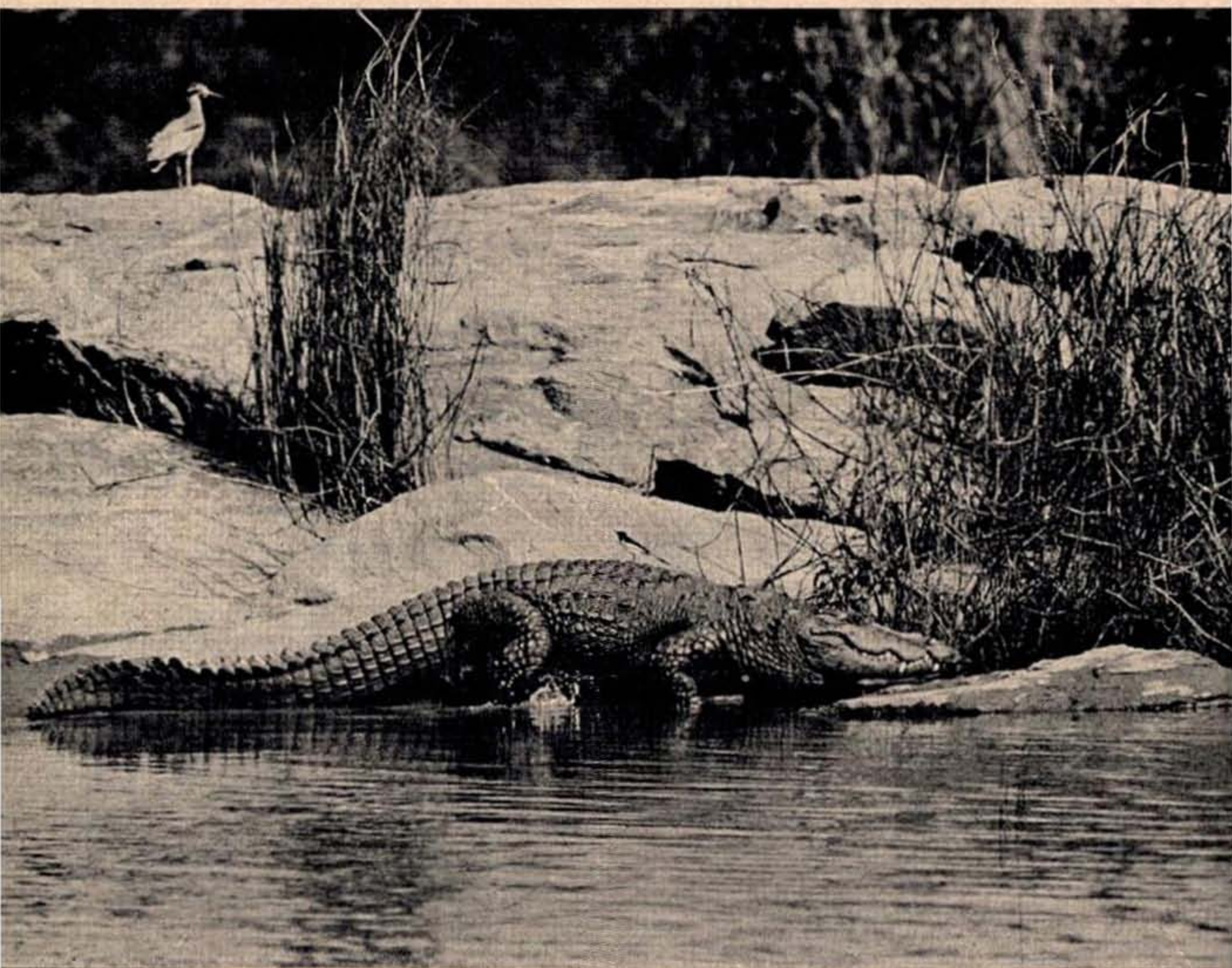
Photo: E. Hanumantha Rao/WWF Photo Library

and later hatched in an incubator. It was the first Siberian Crane to be bred in captivity. The young crane named Dushenka thrived and took its first flight in August. However, another chick died after 12 hours from *E. coli* infection.

The lessons learned from this breeding success have raised hopes that captive bred cranes may eventually provide sufficient numbers to allow their reintroduction into the

wild.

Dr. George Archibald, Director of the ICF says "eggs incubated under crane parents stand a better chance of hatching. The introduction of cold air at intervals during artificial incubation may also be a useful technique, stimulating the embryo to increase activity and thereby strengthening it. It has proved successful in the hatch of both Whitenaped- and Redcrowned cranes. Controlled fumigation start-



Marsh Crocodile with a Pied Wagtail on its back and a Great Stone Plover in the background

Photo: T. N. A. Perumal

ed after the loss of the second Siberian chick, may reduce embryo deaths...A combination of these various strategies along with an increased number of fertile eggs expected as the young Siberian cranes reach breeding age, hold promise for the future."

Wildlife shopping in Tokyo, 1981

Tom Milliken in *Traffic Bulletin* makes use of the data unearthed by a survey sponsored by Chikyu NO Tomo and Hirake of Japan to give us some indication of the wildlife products featured at Tokyo department stores.

(1) *Himalayan Musk Deer*. Musk is the most expensive animal product imported in Japan. The Japanese use of musk for the cosmetic and perfumery industry is substantial. *The current ruling price is US \$5000 a gm. or \$50,000 a kilo.* Jovan Japan Inc. has an entire range of musk oil for men. Musk is an important ingredient in colognes, soaps, hair tonics etc. manufactured by this company. However, the labels on these products rarely indicate the percentage of musk used in the mixtures. Data indicates that most musk comes from Nepal which would clearly represent the Himalayan population. The dramatic increase in importation rates could well represent a stockpiling effort, given the uncertainty for future trade prospects.

Import figures of musk are as under:

Year	Nepalese	Total imports
1980 (Jan.-May)	112 kg	239 kg
1979	196 kg	334 kg
1978	—	256 kg

Musk in its pure form is rarely available.

(2) *Crocodile*. Of all reptilian products crocodilian derived merchandise is the costliest. Italian and French imports are substantial with Japan following close behind. The French and the Japanese continue to trade in these endangered species because of the huge profits they can reap. A single handbag by Collin of Paris can bring \$6250 in Tokyo. Men's belts range from \$100 to \$225. One belt was priced as high as \$500. Handbags range from \$260 to over \$6000. An Italian made keyholder costs \$125. With such incredible profits in the offing the Japanese will not voluntarily remove the reservation as long as the French and Italians continue to trade in the commodity. Between 1976 and 1979 alligator and crocodile skin imports increased six-fold from 27,206 kg to 162,737 kg. Imports of these skins reached an all time high of 21,078 kg in 1979, and production levels are expanding in a large way.

(3) *Snakes*. Italian, West German and Japanese companies are



Leopard Cat worth nearly \$3000 to the fur trade



Tiger Cub — when it grows up the price on its head will be \$72,000

Photos: E. P. Gee

all involved in the snake skin trade. The survey points out that snake skin items occurred less frequently than the other reptile species, because it is a less desirable leather. While bags by Medell Londor of W. Germany cost between \$340-390, Japanese made products are priced in the \$100-300 range. Japanese trade in 1979 was thus consistent with the 1970 levels of over 20,000 kg of skins, which came from Thailand, Indonesia, and Singapore.

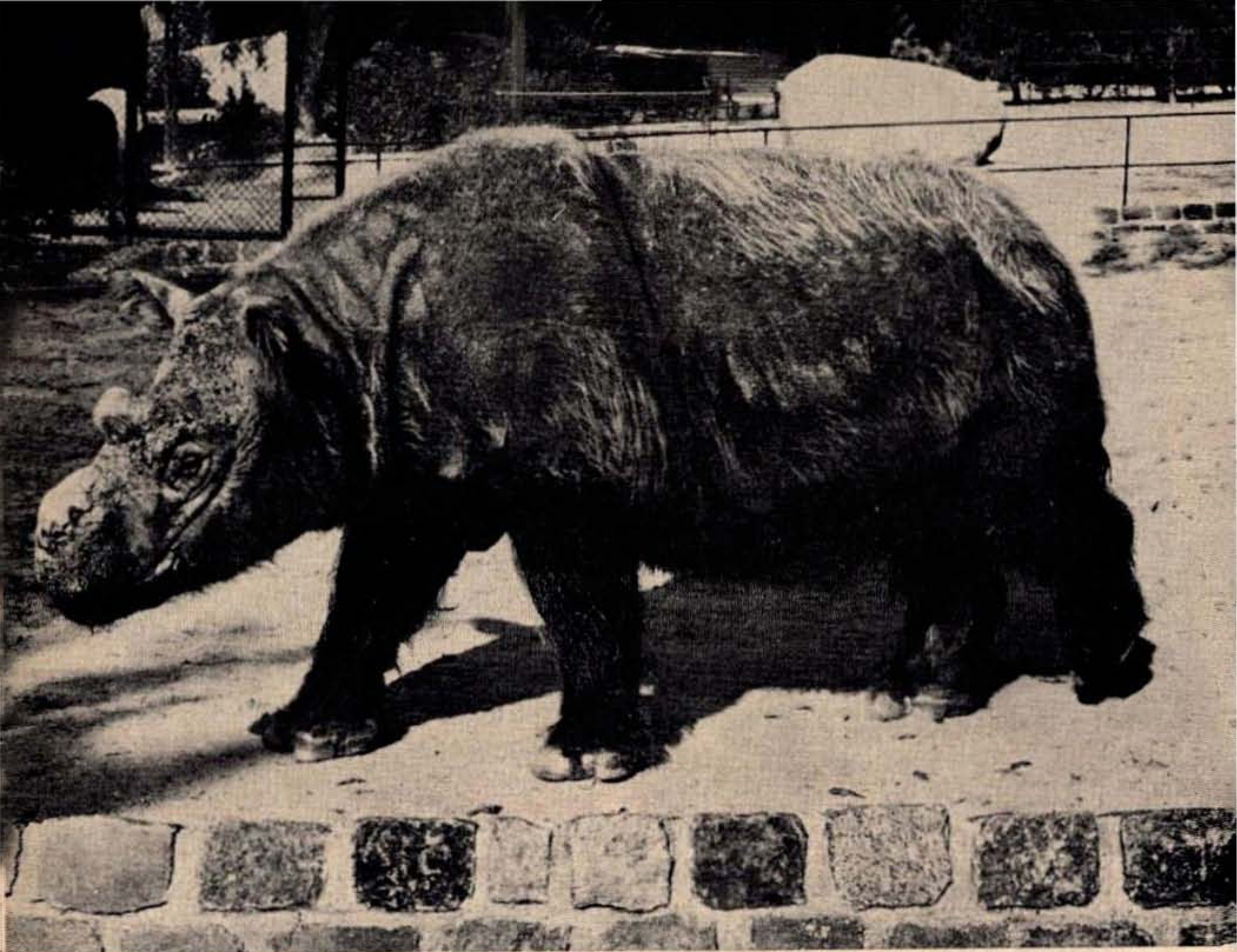
(4) *Spotted Cats*. At least 20% of any fur collection, be it a department store or a fur boutique, is composed of spotted cats. The fashion industry is pushing these cats. Recently some stores have been offering 'last chance' sales to clear out cat stocks in what seems to be a direct response to CITES. However, exclusive furriers maintain a very low profile vis-a-vis CITES. In general all furs are promoted from a purely fashion standpoint, and the Japanese consumer is affluent, sophisticated and status conscious, but unfortunately environmentally unaware.

The rarest species are found at fantastic prices: clouded leopard \$25,750 to \$124,270, tiger \$94,750, snow leopard \$33,000, ocelot \$23,795 to \$32,400, Bengal tiger \$72,000 to mention a few. Cheaper furs include those of leopard cats \$1500 to \$2950, mountain civet \$1140, civet cat \$1740, wild cat \$2900, tiger cat (full length) \$3750, and mountain cat \$4400.

Pangolin trade increasing. TRAFFIC (USA) recently issued a Pangolin 'alert' as it appears that U.S. imports of pangolin skins have been increasing considerably. It is believed that only three Southeast Asian species, *Manis crassicaudata*, *M. javanica* and *M. pentadactyla* are involved; all three species are listed on CITES Appendix II. In spite of being totally protected in Indonesia, Singapore, West Malaysia and Thailand (although *M. javanica* may be exported under quota in Thailand) there is little doubt that the majority of pangolin skins in international trade originate from these countries.

Hunting in Mongolia. Some of the world's rarest animals have been preserved in Mongolia. However, the future of these endangered species is bleak, because now the Mongolian government has included the snow leopard *Panthera uncia* (which is on Appendix I of CITES) in its hunting programme. For US \$50,000 one West German and two U.S. firms are offering the big-game hunter the chance to bring back the prestigious snow leopard trophy. Other attractive game for hunters include the Altai argali *Ovis ammon ammon*, and the Siberian ibex *Capra sibirica*, for which the price is only \$10,000 and \$6000 respectively.

Sumatran Rhino found dead in Sabah. The Sumatran rhinoceros (*Dicerorhinus sumatrensis*) has a total population of 300 and it is protected in Malaysia. However, a



Sumatran Rhino, a species on its last legs

Photo: E. P. Gee

recent killing in Sabah has come to light. It is believed that poaching is not effectively prevented because of the lack of trained manpower in the Silabukan area.

The rhino is now in double jeopardy as the area is scheduled to be cleared for timber over the next five years. Deforestation particularly affects the Sumatran rhino as

for intrinsic behavioural reasons, it has the lowest population density of any rhino—1 per 4000 hectares.

According to a *Traffic Bulletin* correspondent, the Malayan Nature Society in Singapore is to petition the government to sign CITES which would be a very welcome step.

ARZA BHATIA

The mad elephant of Mandla

The first part of Col. A. Bloomfield's encounters in Hornbill 1981(3) described the destruction caused by the elephant in Mandla district, the second part describes the hunt for the elephant. — Eds.

Having thus made my dispositions, I could do nothing but wait for information. Without it, to move at all might take me in the wrong direction.

I had not to wait long, for in the afternoon some of the Baigas of Deodongar Hill brought a message from my detachment of Baigas I had sent south, that 3 days before, the elephant had passed through the Baiga village of Jagla 9 miles south of Jatta.

Later in the day another report from the same direction came to the effect that the elephant had passed through the Baiga village of Limoti; and the following day had killed two men in the villages of Kudapahar and Mandar, 14 miles further south. This information was most satisfactory, for it left no doubt as to the direction the elephant had taken.

The next morning, early when the first sign of daylight appeared, I started in pursuit. The track we had to follow lay through the wildest country, rugged, stony hills covered with occasionally a small open valley that marked the site, where after the forest had been cut down by the Baigas, Gonds had settled and by their plough cultivation had broken up the land and

prevented the forest from recovering itself. However the overhanging trees had not prevented the lower growth of vegetation, the rank grass and reeds were about 7 feet high and were so wet from the heavy dews that always prevail at that time of the year, that although I was riding a fourteen-hand Arab I had not gone far before my clothes were wet through up to my waist. And as for my attendants who were on foot, the heavy grass that overhung our path drenched them from head to foot. I selected for this work the Bay Arab, Mozart, a horse that a few years before had carried off everything on the Kampti race course and was perfect in courage and steadiness, even though a gun were fired off between his ears.

All the way we followed the tracks of the huge monster. Wherever the ground was soft his foot prints were perfect, and ever and anon some one of my attendants would stop, and measuring the prints, enlarge upon the probably huge dimensions of the enemy. Eight or nine (*hath*) cubits (12 to 14 ft.) was the least they put him at for, had not the people of the villages he had already attacked, told he was as tall as the ridges of their houses, with tusks equal to a man's height in length.

On the way we learned that during Monday (30th October) and Tuesday (31st Oct.) the elephant had been in the Barwahi jungles, and then following on his way the little huts which the Baigas had erected on their clearings as watch houses and with one solitary exception had eaten all the grain in them.

Jagla was situated on the very highest point of a hill, about 2700 feet above the level of the sea. Rising abruptly some 800 feet from the expanse of almost trackless and impenetrable forest, it was itself densely covered with bamboo and tree forest except in a few places where the huge boulders of granite piled one above another defied the efforts of the hardiest shrub to obtain a footing.

As we approached no road or well-marked path showed that any human habitation was near, and no voice of man or animal, domesticated or otherwise, broke the stillness of the vast solitude. Our Baiga guide steadily followed the narrow track the elephant had followed. It appeared to be no more than a wild animal's track marked by the blazes on the trees that the Baigas always make to show the way to their newly formed settlement.

The top of the hill, not an acre in extent, had been cleared of all trees and undergrowth, and, in the middle of it stood the small square of Baiga houses, closed all round,

with merely a narrow passage between two of the houses in the northwest corner. In the centre was the usual "Mandwa", and close to it a stout pole about 10 feet high, surmounted by a bunch of peacock's feathers, and below this bunch, stuck into it, a small axe with a head only $3\frac{1}{2}$ inches long by $1\frac{1}{4}$ inches wide, and a hair rope and iron whip hung over it. The small axe is dedicated to Bhimsen, and the Gurz (iron whip) to Gansham Deo. These things showed that the Pujari of the village was a professed medicine man, who when possessed by his Deo could while flogging himself unharmed with the iron whip, effect miraculous cures of all ailments.

But his miraculous powers availed him nothing, when on that Tuesday (31st October) midnight the sleeping village was suddenly aroused by the lifting up of the roof and the crashing in of the gable end on the northeast of the square. The fame of the destroyer had come before him, so that even if the brilliant tropical moon had not rendered the elephant clearly visible, they would all have known the meaning of the crashing, tearing sound. So rapidly did he break into the first house, that the Baiga and his wife had barely time to make their escape into the Pujari's house on the south of the square, where the other inhabitants quickly collected in the hope that the holiest and strongest of the houses would escape or resist all attacks.

The elephant not finding anything in the first house, partly broke down and explored several others, and then walking into the middle of the square examined the pole and the things on it. All this time the trembling shivering Baigas, crowded into the Pujari's house, watched through the many crevices in the walls, the movements of the monster; and when they saw him leave the houses and go to the standard, they thought he had finished his work of destruction. But, to their horror he turned towards the Pujari's house and began tearing ("torrtarr" as they called it) and lifting up the roof of the house. The Baigas described to me the terrible state of fear they were in, as they crouched shivering at one end of the gradually crumpling hut. They fortunately uttered not a sound and as they described it "ceasing to breathe, their bodies dried up." Had they made any noise, the blood-thirsty brute would certainly have forced his way in and smashed up some of them. Certainly some of the people that had interviewed this elephant did seem literally dried up, for, as they told me their stories a few hours afterwards; they seemed absolutely terror-stricken and, with their hands clasped before them, shrank as if still overshadowed by the elephant. Their brown skins prevented their faces from looking pale, but their colour changed to a livid hue as if half way to death.

Just as the poor Baigas began almost to feel the breath of the ele-

phant as he moved his trunk about inside the house, the brute suddenly stopped his work of destruction, and turning out of the village stood on the edge of the plateau leisurely swinging about his trunk, tail, and one or other of his legs with that restlessness so universal with healthy elephants.

After standing in this way a few minutes, the elephant turned, and going in a southerly direction, disappeared in the forest. I have never ceased to wonder why, after 40 years of wildlife in the hills and forest in the north, this wonderful creature deliberately turned to the south and made his way towards those plains where he had spent his early days in captivity. Was it instinct or was it fate that thus led him back to his destruction?

A few hours after leaving Jagla, the elephant appeared at Limoti, another Baiga village a few miles further south; another small inhabited spot in this vast ocean of forest. There, three wayfaring Gonds were sleeping in the open "mandwa" in the village square. They were awakened by the approach of the elephant and immediately jumped up, fled in different directions into the jungle—one was pursued by the elephant, but escaped among the rocks and bushes. Before the elephant could return to the village, the Baigas had all collected together and with all their drums etc. made such a clamour that the brute turned off into

the jungle. I reached Limoti that evening, my men and animals thoroughly tired out by their scramble through rocks and forest tangle.

Here I held a consultation with all my Baiga friends among whom were some fine grey-bearded Pujaris who could read the jungles and the signs thereof better than most people. They all agreed that it was most probable that elephant when he reached the plains in the south, would feel out of his element and turn again north into the hills. I therefore sent out two strong detachments of Baigas, one to the east and the other to the west to prevent the elephant from doubling back north without my being aware of his movements. They were instructed to spread themselves in a long line through the forest so that he could not possibly pass north unnoticed.

On the morning of the 5th November, leaving behind all needless impediments and taking only a small "Sholdari" tent and other things that could be carried on men's shoulders, I moved on 23 miles via Kurajuri, Kudapahar, and Goderi, below the Ghats to Suswa in the plains of the Hutta Pegana. The first 18 miles were chiefly through absolutely trackless forest. The Baigas alone could possibly have guided me through. In many places there was absolutely no track or path but the trail of the elephant which the Baigas were following without a check kept us in

the right direction. Sometimes piles of granite rock through which it was impossible to pass a horse blocked the way and long detours had to be made to get round them. How the elephant managed to get through or over is a mystery. Soon after I started I met some men from the plains below and was not a little surprised to learn from them that the elephant had left the hills and killed 2 persons at the village of Goderi in the plains.

Up to this I had felt almost sure that the elephant would turn back as soon as he reached the passes leading into the plains and I expected soon to meet him.

At Kurajuri six miles south of Nimboti, some Gonds returning from their fields carrying a large round earthen vessel full of Kutki (*Panicum malicum*) suddenly caught sight of the elephant coming towards them. In an instant they had put down the vessel and disappeared in the long grass and undergrowth. The elephant heard the noise and looking round failed to see the fugitives. But perceiving the vessel which stood on the track the Gonds were following, he came to it and knocking it to pieces with his forefoot, ate as much as he liked and scattered the remainder. He must have eaten very little, for, when we passed by we found the grain scattered over a large surface and pieces of the vessel thrown to a considerable distance. Kurajuri was a village in

name only, for it consisted of nothing but a few small huts scattered among tall forest trees that had been left when the land was cleared. The lowest branches must have been some 30 feet from the ground, and the huts in consequence appeared unusually small. The whole scene reminded me of pictures of Central Africa.

Leaving the small clearing around Kurajuri we tracked the elephant through thick bamboo jungle with but few large forest trees. This showed that the country had not many years before been cleared by the Baigas and wilder classes of Gonds. Sufficient time had not elapsed for the forest trees to recover themselves, but the quick growing bamboos had quickly taken possession and covered the whole surface. Viewed from the top of some of the huge piles of granite that were met with in several places, the jungle appeared like a softly rippled surface covered with soft emerald green velvet. All the way we passed through beautiful bamboo arches of every shape and size. Where the soil was thin and stony they were so low that my men on foot could scarcely pass under and I had to dismount and by dint of cutting away in places, managed to get my horse through. But where the alluvial soil lay rich and thick, the large bamboos commonly called "Kattango" (pronounced kut-ung) rose up to more than 90 feet in height.

Note. At the Jabalpur Exhibition of 1866-67, two Kattango from this neighbourhood, more than 90 feet high, were used as flagstaffs. Those who have not watched the growth of the bamboos in their own country will hardly credit the fact that these large kinds of bamboos complete their growth upwards in about 2 months.

Emerging from the ground, like huge asparagus shoots in the beginning of August, they will by the end of September, tower out above the parent clump from which they sprung. Until they have finished their upward growth, they are smooth and perfectly tapering like giant fishing rods without a knot or branch of any kind; but, immediately afterwards they begin to throw out their tiny branches.

After going about 4 miles we came to the small Gond village of Kudapahar.

Destruction. Wednesday 1st November, the elephant visited this place at night and killed a cowherd who was warming himself by a fire. He jumped up and ran into the jungle where the elephant followed him and found and killed him.

The same night visited Mandar village knocked over a machan in the fields and trampled underfoot the Gond who was sleeping in it.

Leaving Kudapahar I soon came to a pass leading about 1000 feet

down into the plains below. I did not follow the elephant's track, but having reliable information as to his movements I took the shortest route—the so called pass was only fit for "Gonds and monkeys". There was nothing but a winding track over and between the boulders of granite of every shape and size. It was absolutely impossible to ride down and with great difficulty I was able to lead my horse down literally crawling, slipping and stumbling about without doing himself any serious damage.

Immediately at the foot of the hills I came to the village of Bhanpur, a small Gond village nearly hidden in the bamboos close to the foot of the hills. Here and there amongst the houses were a few large tamarind trees spreading their huge arms around like large pollarded oaks. These were no longer the abode of flying foxes and birds, but bore a plentiful crop of large platforms made of branches and leaves. The people told me that when the news of the invasion of Kudapahar by the mad elephant reached them, they at once made these machans for places of refuge at night or on the arrival of the elephant, and since then they had ceased to occupy their houses at night but always before darkness came on, mounted up into these places. Many civilized beings would have been unable to do so, for a single bamboo with its branches cut off short was the only possible way up, and a very rickety and shaky way it was too.

The elephant did not however, visit this village having evidently descended the hills further south, near village of Goderi.

Destruction at Goderi. He first came to the tola of Goderi and knocked down two houses. Killed a Marar girl 10 years old after chasing her mother and several other people who managed to hide in a deep water course while the rest fled to the jungle.

After the elephant turned towards the village (i.e. the main collection of houses) of Goderi, where many of the people had made their abode high up the trees. After tearing down part of a bamboo enclosure he turned towards the centre of the village, where the cowherd, who with his cattle had fled from Kudapahar was encamped under a large Kadam tree (*Nandea orientalis*) but, suddenly turning off went in an easterly direction towards the Deo river that flows under the scarp of the hills.,

There on the dry sand in the river bed 8 men, who had come from the neighbouring village of Bargaon for bamboos, were sleeping and a few paces from them were 5 (Dhimars) fishermen and a boy named Fogal. The moon was shining but these people being close under the hills, they were in comparative darkness. This boy happened to be awake. Hearing a noise he looked up and saw something coming towards them. At first he thought it was a tiger, but by the time he had awak-

ened the others, the huge outline of the elephant, was within a few yards of them. They all immediately jumped up and with the exception, one, Marar, fled into the thick jungle up the side of the overhanging hill. The elephant pursued them, but by separating in the thick scrub they prevented him from coming with them. He then turned to the bed of the river. The Marar had run about 400 yards down the right bank and slipping down the bank, hid in some thick tamarisk bushes. The footprints showed that the brute had traced this man step by step, and when he came to where he was hidden he put his forefeet together and slipped down the bank until he was within reach of the man who must have been completely hidden from view. He however pulled him out and smashed him to pieces. When I arrived I found the remains still lying there. The arms and legs looked as if there were no bones in them, for they pointed in all directions and the body and head besides being flattened, had been disfigured by jackals.

That morning, I had started before sunrise when there was barely sufficient light for the Baigas to take up the trail; and although I could not have come more than 18 miles it was 2 o'clock (afternoon) when I arrived at Goderi. While my men were resting and obtaining food, I rode round making enquiries. All around was thick jungle and no one had ventured into them since the elephant came. Owing to the hills, the south and west were

the only directions in which the elephant could have gone. As no one could give me any definite information of where the elephant was, I caused the Goderi headman to send out 2 search parties of 4 each to get information with instructions to return as soon as possible. At 4 p.m. no news had arrived and nothing had been heard of the search parties. I could wait no longer. I had several miles of jungle to pass through, and the evenings being very short at that time of the year. I had but little time to do it in. The people all said that the elephant was not far off, so shouldering my rifle loaded ready for action, I marched off preceded by 2 of my Baigas and followed by the remainder of my party. Rumour had it, that the elephant had killed several men in Mate and 7 in Suswa. So I followed the road west to the latter village. I had not proceeded a mile into the jungle, when I met all together the 8 men who had been sent out as scouts, 4 to the west and 4 to the south. I called out to them "Where is the elephant?" expecting to hear they had marked him down near by, "Where he is, we don't know! You had better be quick through the jungle, or you will meet him on the road." On we went, keeping a sharp look out, and a few minutes after darkness had come on, we arrived in Suswa in the open country beyond.

This night I pitched my tent and accommodated all my people inside a closed courtyard belonging to the village headman. My poor

naked Baigas felt the cold much, so I arranged for them an outhouse with a good wood fire in the middle; there with all the food they wanted, the doors closed and the place full of smoke, they were perfectly happy.

The Suswa people told me that the elephant had killed 10 men at the next village Mate, and gone on in an easterly direction to Kinhi.

I learnt that after killing the people at Goderi he had gone to the neighbouring jungles of Batkari, where he was seen by several people the next day.

At 4 p.m. that afternoon he walked into the little village of Mandora and began pulling down the houses. The inhabitants fled into the jungles on the north, except one old man who rushed down south towards the Deo river followed by the elephant. Before he reached the water the elephant had seized him and lifting him up in his trunk smashed him to pieces against his uplifted foot until the other people amongst them his son, who were looking on from the high ground on the otherside of the village, saw only a "Tempa" (splinter) left in the brute's trunk. At 7 p.m. that evening we returned to this village and then went towards Mate.

Leaving Suswa early in the morning (of 6th November) I came to Mate village. The whole village turned out to meet me, and as I rode through their fields, they told me the destruction the elephant had

caused, and that to propitiate him they had held grand ceremonies in honour of their God Ganesh and had freshly covered with brilliant vermilion paint all images of him. Since the elephant's visit they had all slept inside the village in the strongest houses.

Destruction at Mate. About 11 p.m. Friday 3rd November 1871 before the moon had risen the elephant was seen in the village coming towards a group who were warming themselves beside a fire. Knocked down a machan in which were Ramu Marar and his nephew, and the nephew was killed while Ramu remained quiet when he fell.

After this the elephant left Mate and turned west towards Kesa.

Destruction — Moonlight night. A man and a woman killed.

Thence (from Kesa) the elephant turned again westward towards Dhatta another small village in the plain and entered the fields in the early hours of Saturday, the 4th November 1871 and killed one man and a girl 6 years old.

Total people killed

Nandar village	— 1
Markapahar	— 1
Mate	— 4
Kesa	— 2
Dhatta	— 1
Dhaidi	— 1
	—————
Total	10
Wounded at Mate	2
	—————
	12
	—————

Thus in one night, the 3rd November Friday and Saturday, the 4th November 1871 did this unequalled savage brute kill and pound to pieces 10 human beings and wounded 2 others. A piece of butchery that has never before been anywhere approached by any man-eating tiger or any other brute. A record that is not likely to be surpassed or even equalled. It is a most extraordinary fact that though none of these villages were 10 miles away from Goderi, where 2 persons were killed the night before, yet no one had heard that he had killed some people at Kudapahar and Mandhar in the jungles above the hills but they could not believe that the brute would leave the forests and venture out into the open plain.

Note. During the whole of the forenoon of Saturday the 4th November 1871 the elephant was in a scrub jungle between the village of Sale and the Deo river. Hundreds of people collected on the high ground on either side and, from a good safe distance, watched the brute feeding on the bamboos in the ravines, and enjoying himself in the water (Deo river).

That day, there was the ordinary weekly market day (bazaar) in Dhaidi. About 3 p.m. some 14 or 15 people of Mate, headed by Ganpat Singh, the tall and stalwart Rajput, headman, and armed with 2 guns, swords, etc. etc. determined to make an effort to reach the Dhaidi market. They arranged that they would first reconnoitre from the high bank of the river, and then,

if necessary, having fired off a shot or two at him, to pass over to the market.

Accordingly they all walked down to a place where the river bank was very high and perpendicular with a large deep pool of water below. There 8 of them were standing all in a row vainly looking for their enemy, when suddenly one of those who had lagged behind, rushed up shouting "Run, run, the elephant has come." They turned round and there sure enough was the elephant with his ears up close upon them, entirely cutting off their escape by land. A moment's delay meant certain destruction to one or more of them. So sudden and terrifying was the surprise, that no one thought of their weapons, but dropping them into the water beneath, they all jumped in after them, and holding on to the long grass growing out of the bank, they hung there with only their heads above water. Looking up, they saw the elephant's head above them and his huge trunk moving backwards and forwards trying to reach them. The last man to take to the water was Faizu Pinjara, who almost felt the elephant's breath, as he dropped out of reach. He was so thoroughly terrified that the sight of the huge trunk stretching from above towards him, was too much for him. He let go the grass he was holding, and swam towards the opposite bank. Immediately, the elephant saw him he rushed along down stream until he came to a place where the bank was a little sloping, and there, put-

ting his forefeet together and going down on his hind knees, slid down into the water making two huge furrows as he went. Faizu saw this, just as he reached the sand on the other side.

Across this he rushed and scrambled up a perpendicular bank about 5 feet high, caused by the silt in a dry water course being cut away by the falling flood in the river. He had barely got up this and climbed a few feet into a tree, when the elephant breasted it and stretched out his trunk to seize him. "How far was his trunk from you then, Faizu?", I asked when I came up, and he with his face still showing his fear and his eyes staring from their sockets, held up his left arm and grasping it at the elbow with his right arm he replied (*itna bucha*) "so much". Not reaching his victim the elephant pulled down several boughs off the tree, but not being able to get up the steep bank, he turned down stream, found a way up the bank and came back to the tree. The tree was not large, and again the elephant failing to reach the man, broke down all the boughs

he could reach all around the tree and then after waiting for some time moved slowly away and disappeared.

Darkness had come on before Faizu ventured to go home, where his pursuit and destruction by the elephant had been duly reported by his companions, who had lost no time in getting out of the river and running home as soon as the elephant followed Faizu.

Their arms were in the river when I arrived on the 6th November, Monday.

When I heard of this performance of this elephant I began to think he was a more formidable adversary than I had anticipated. I had comforted myself that, although he might be bold and pursue people at night he would not show much fight in daylight, but I could no longer doubt that his courage was as good by day as it was at night, and when we did meet, the fight would not be one sided.

(To be continued)

SOME BEAUTIFUL INDIAN CLIMBERS AND SHRUBS

BY

N. L. Bor and M. B. Raizada

The second revised edition of this book will be ready soon, and will be available for Rs. 100/- (members Rs. 75/-). Please register your orders early.

And the gulls are flying...

Masunda Talao is a beautiful lake right in the heart of the city of Thane, headquarters of a district, some 40 km away from Bombay. On all sides of this somewhat roundish lake run city roads which are marked by the usual hustle of an urban population as also the sound of cars, buses and trucks from dusk to dawn. Just across these roads all around are seen residential flats and other modern structures, housing banks, hotels, hospitals, drama-theatre and a swimming pool. In short, the lake area is not a quiet place and ordinarily none would think of it as an ideal place for nature study. But Masunda of late, has become a unique place for

Indian Whiskered Tern

watching birds—water birds. I have been watching sea gulls and terns here since December 1980.

About the second week of December, the gulls started coming in small numbers. Initially, the birds could be counted in tens. Gradually, however, their number grew and by the end of February, the tempo perhaps reached its peak when their number swelled to over seventy. The maximum number at a time I have counted was 73 on 24th February at 1.30 p.m. In the beginning, the gulls would be seen only around 8.30 a.m. but afterwards, a stray bird or two would be at the lake as early as 6.30 a.m.

Photo: Loke Wan Tho



BIRDWATCHER

A valiant oriole

Ornithologists have described the Golden Oriole as a very timid bird which builds its nest near that of the Black Drongo so that the latter may protect its eggs and nestlings from birds of prey and other enemies.

I however had an experience which was quite contrary to this general observation of birdwatchers. A Golden Oriole (*Oriolus o. kundoo*) and a Black Drongo had built their nests on a mango tree at Jogeshwari (Bombay) in 1978. I was watching them one evening when a crow flew along and started hovering around the oriole's nest. All of a sudden, the male oriole leapt up and chased the crow in an

aggressive manner uttering shrill war-cries. The crow gave combat to the oriole for a while, but the oriole did not withdraw. He attacked the crow with even greater fury. Finally the large and powerful crow had to accept defeat from the delicate but valiant little oriole; and it just bolted away. After that, I saw the oriole frequently chasing the crow angrily and the crow fleeing swiftly in great fear.

I have heard and read a lot about the timid and shy nature of the Golden Oriole. I, therefore, felt that its fearless and aggressive behaviour on this occasion deserves recording.

MANGESH KULKARNI



Golden Oriole at nest

Photo: Loke Wan Tho

When the birds were few, they were seen in a single flock. But as the 'migrants' increased, they formed three distinct flocks. There are blackheaded gulls, brownheaded gulls and river terns. Two or three gullbilled terns keep them company. Surprisingly, their number has remained constant. It is a treat to watch these birds either floating on the water, hovering in the air or occasionally diving down headlong.

The crows hanging around the lake seem to consider the gulls as intruders and they would now and again give them a chase. But the gulls have become adept in the art of dodging them and would certainly frustrate their black adversaries. After this short aerial battle or after their usual flights, the gulls would again alight on the water exposing in the process, the distinct 'mirrors' on the inside tips of their wings.

The gulls and the terns seem to have unbounded energy and they are never tired of flying. Their ceaseless activity continues all through the day. In the evening, however, after about 5, the gulls start disappearing one by one in a peculiar fashion. They start circling over the lake first. Slowly and steadily, they keep on spiralling and when they attain sufficient height, they leave in a southeastern direction, where there is a creek, and vanish out of sight only to appear at the lake the next day.

ARUN R. JOSHI

Record-breaking sponsored Birdwatch

The British record for bird species spotted in a single day was broken on May 11 by teams from Fauna and Flora Preservation Society (ffPS) and *Country Life* magazine, competing in a sponsored birdwatch. *Country Life* won 146-143, both scores exceeding the record of 133 set last year, also by *Country Life*. In all, 159 species were listed, and each bird had to be seen by all members of the team.

ffPS was represented by John Gooders, author of several books on birds; Cliff Waller, Warden of Walberswick National Nature Reserve; Tim Inskipp of the Wildlife Trade Monitoring Unit; and Bill Oddie, best known as one of BBC's *The Goodies* but also an experienced ornithologist. Between bird number one, a tawny owl at 2.25 a.m., and a barn owl at 10 p.m., the team covered about 300 miles of East Anglia, using an Aston-Martin donated by the manufacturer.

Country Life, led by David Tomlinson, the magazine's Assistant Editor, started at Bempton Cliff in Yorkshire and eventually drove 600 miles, but trailed for most of the day until reaching the RSPB reserve at Snettisham, where spoonbill, garganey, whimbrel, scaup and short-eared owl took the team well into the 140s and the lead. *Country Life* also saw the day's rarest species, two glossy ibis at Minsmere.

Butterflies of Bombay-8

In continuation from *Hornbill* 1981 (3), page 36 we are describing nine butterflies of Family Lycaenidae. The butterflies of this family are of small to medium size and due to predominating blue or copper colour are commonly known as Blues Coppers and Hairstreaks. The caterpillars of Lycaenidae are usually flat and many are associated with ants which they attract with sweet secretions, from their body. The eggs of these butterflies resemble pin cushions or turbans.

57. RED PIERROT *Talicauda nyseus* (Guerin). Common in May, October and November. Flies close to the ground and prefers shady places. Larvae feed inside the fleshy leaves of *Bryophyllum* sp. coming out to pupate.

58. COMMON PIERROT *Castalius rosimon* (Fabricius). A sunloving butterfly common from August to November. Larval food plants are *Zizyphus rugosa* and *Z. jujuba*.

59. ANGLED PIERROT *C. caleta* (Hewitson). A common butterfly of jungles. On the wing from September to December. Larvae feed on *Zizyphus rugosa*.

60. ZEBRA BLUE *Syntarucus plinius* (Fabricius) (a) ♂ (b) ♀. Common in December and March.

Larvae feed on *Albizia lebbek* and *Indigofera* sp.

61. FORGET-ME-NOT *Catochrysops strabo* (Fabricius). On the wing in October and November. Larvae feed on various leguminous plants.

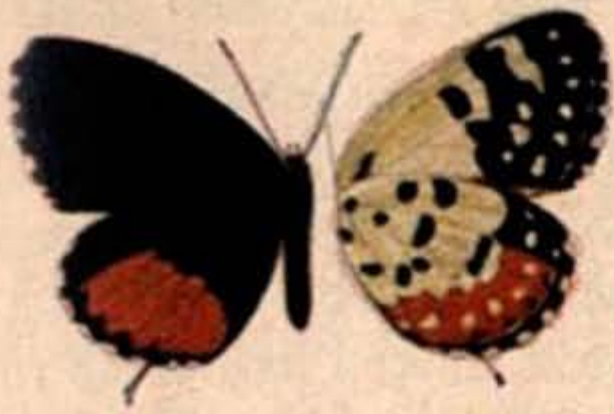
62. COMMON CERULEAN *Jamides celeno* Cramer. Very common on the wing from September to November. Larvae feed on *Pongamia*, Flame of the forest (*Butea frondosa*) *Saraca asoka*.

63. DARK CERULEAN *Jamides bochus* Cramer. A fast flier. Common from September to November. Males settle on damp patches but females fly higher among the trees. Larval food plants are *Pongamia*, *Crotalaria*, *Xylia* and *Tephrosia*.

64. INDIAN SUNBEAM *Curetis thetis* (Drury). Common on the wing in August and September. Unlike male, the female has white patch on the upperside of fore and hindwings. Larvae feed on *Pongamia glabra* and *Xylia*.

65. YAMFLY *Loxura atymnus* (Cramer). Common in August and September. Larvae feed on *Smilax* and *Dioscorea*.

NARESH CHATURVEDI
S. M. SATHESAN



57



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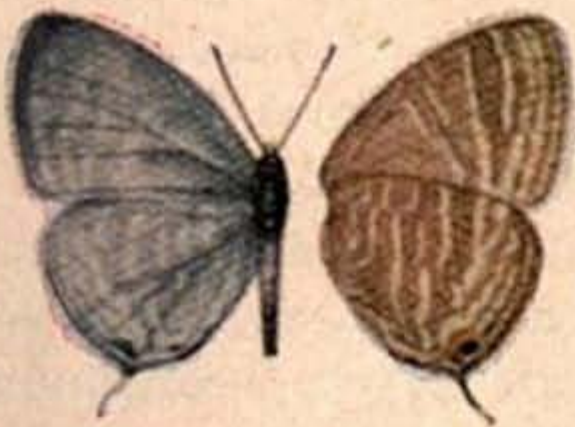
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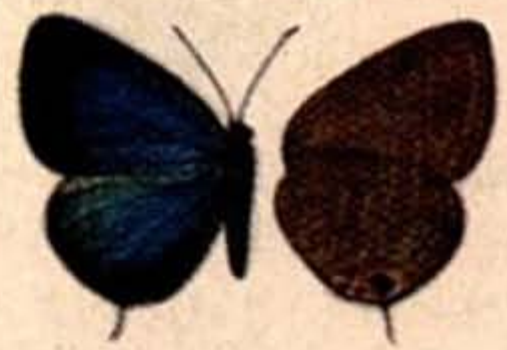
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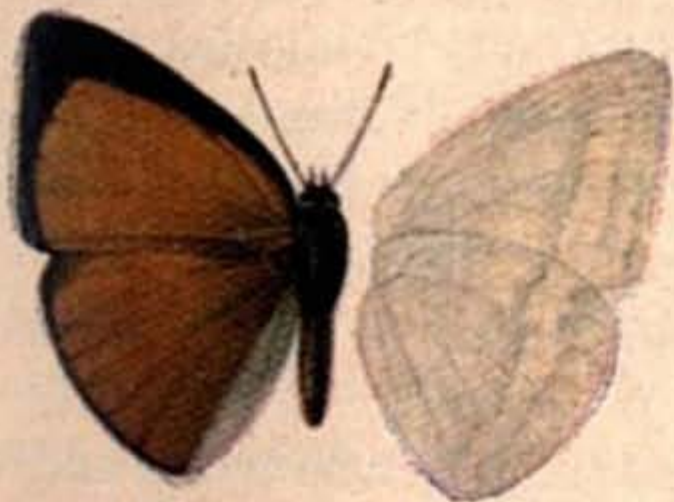
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A Shield making beetle

Here is a strange device. There seems to be no end to Nature's ingenuity when it comes to sheltering her creatures from attack. This is a shield manufactured of excreta, a kind of plate under which the insect hides. We find it on the larvae of the tortoise beetles. They are odd-shaped insects. As their name implies, they look like miniature tortoises. Some of them are brilliant beyond description, shining in a varied glow of colour that reminds us of precious stones.



Shield making beetle Adult, enlarged about 4 times

The one in question is *Sindia clathrata*. The rains is the time to look for its larvae. I found them at Jhansi towards the end of July. The central plain of India was then green and fresh; the dense thorny jungles dripped with moisture; all vegetation was rich and copious from the refreshing influence of the monsoon. What the larva liked was *Rivea hypocrateriformis*, a wild

creeper with heart-shaped leaves that roped itself around other trees. One morning I found this creeper covered with black blotches. At the first glance it looked like some fungus growth. On closer inspection I saw the fungus move. Then it was apparent that these larvae concealed in some extraordinary way.

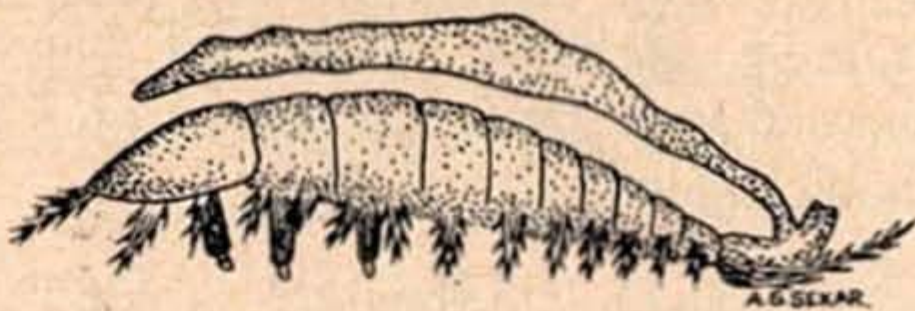
The problem was clearly worth investigation. Each larva was all but invisible; what one saw was a flat triangular plate, black and roughened, obviously composed of a multitude of particles moulded into a kind of dorsal shield. With the tip of a straw I tilt up the shield. It is freely moveable. Behind only is there a point of attachment. The shield lifts up and turns backward like a lid fixed on a posterior hinge. Underneath is the owner, the manufacturer of the shelter, a delicate tortoise-beetle grub.

We first look to the larva. It is oval, distinctly flattened, the head somewhat more rounded than the tail. When fully grown, its length is about half an inch. Its colour is dark brown, almost to black; three pairs of legs support it underneath: its back is raised into a longitudinal ridge suitable for bearing the saddle-like shield. Particularly conspicuous is its sharp margin. This bristles all round with spines, not just simple processes, but complicated daggers, each consisting of a central spike ringed about with shorter points. They jut out in a line along either flank, thus forming an armamentarium all round the body that pro-

jects from beneath the edge of the shield. The two at the head end are strongly bifurcated. All are acutely sharp. Each spine looks as if fitted with a special poisonous tip. Obviously they are of defensive value. The shield protects the larva's back: the spines guard the flanks.

Now turn to the shield. It is a kind of adjustable backplate, a hard flat lamina of fragmentary debris, slightly concave underneath so as to fit over the body and almost flat above. Roughly triangular, with the base behind, on either side it is prolonged a little outward something like a pair of wings. Black in colour like its owner, it is of a toughish consistency, but somewhat friable as one might expect from its source. As a shield it fulfils the function excellently. The larva's back is completely covered. Scarcely a chink is open to invasion. Just the head peeps from under the front of the investment and some spines project from either side. As we have seen, the shield possesses mobility, being attached to the larva at one point only, the extreme tip of the tail. It can be raised and lowered at will. Ordinarily the tail is bent over the back, and then the shield is in its natural position. A straightening of the tail means an elevation of the shield; a bending forward of the organ brings it back into place again. What an excellent device, an adjustable armour under voluntary control.

The purpose of this shield is scarcely open to question. It must be a protective device. What are the



Shield making beetle-larva, enlarged about 8 times

enemies? No doubt parasitic diptera and hymenoptera, minute foes but none the less dangerous, capable of perforating a delicate skin but unable to get through the shield. Also the backplate must be a disguise, so altering the shape and appearance of the insect that no one would imagine that the roughened flakes concealed a living creature underneath. Numbers of black ants haunt the creeper. I never see them molest these larvae. They run about in the vicinity but make no attempt to capture them; these dried up flakes with their hidden owners show so little indication of being alive.

But the wonderful thing is the manufacture of the shield. It consists of a mixture of skins and excrement, the outside and inside refuse of the larva cemented into a solid mass. Under the microscope we see its constituents, pieces of dried skin, old coverings of spines, fragmentary material which the larva has cast off. All are cemented together with excrement ejected from the larva's gut. What an excellent use to make of exuviae! Economy is a rigid principle in Nature. Certain spiders eat their disintegrated webs: some newly-born caterpillars devour their egg-shells; grasshoppers gobble up

their moults. This is another good example. Rejected skins and undigested food are welded into a protective plate.

The shield is sometimes a kind of garden. Springing from it is a growth of fungus. There are delicate stems and leaf-like processes which often give it a woolly appearance making it still more like a patch of mould. Of course it is minute, a microscopic vegetation. It grows thick when the larva is imprisoned. A heap of white wool springs up luxuriantly, favoured by the damp air and fertilized by rich manure. What an odd protective combination, a garden on a plate of excrement and skins!

A pair of spines holds the shield in position. They project from the tail, are stiff and pointed, equal in length to the larva's body, and firmly embedded in the plate. The skins, on being shed, are passed back to the tail, then out along these caudal spines. There they accumulate, become spread out into the groundwork of the shield. The sheddings fit the shape of the backplate. The earlier, being small, makes an apex to the structure; the others, being successively larger, give it the triangular shape. Thus it grows by repeated addition of exuviae, keeping pace with its owner's development and protecting them from the very start.

The spines of course move with the tail. Hence the mobile plate. I touch the larva beneath the edge of its shelter. Down comes the shield

tighter on its back. I find one with the shield raised. A gentle stroke on its exposed area brings the structure back into place.

Now a word as to manufacture. How is the excrement applied to the skins? This is best observed when the larva is quite young. I collect a batch of eggs. They have been layed upon the food-plant, minute ovals, somewhat flattened, one-sixteenth of an inch long and one-thirtieth in width. The shell is smooth, pale yellow in colour; its margin is fringed all round with spicules that probably help to hold the egg in place. Over it lies a translucent covering, a waterproof film like dried-up varnish, that protects it from wet and binds it to the leaf.

The surface of the egg darkens with age. On the sixth day hatching occurs. A larva slips out from the interior leaving the shell to all appearances intact. I happen to catch it in the act of emergence. The aperture of exit is at the pole of the egg. Head first it pushes out of the prison. Ventral surface upward, back against the leaf, it clutches the outside of the eggshell and pulls itself into the world. It is minute, exquisitely delicate, almost transparent, faintly tinged with green, broad at the head, tapering to the tail which ends in a pair of spines. Around it is a fringe of spicules. The tail is erect, bent over the back as when employed in carrying the shield. Of course there is no trace of the backplate; the larva is quite naked on its entrance

to the world. Its length is scarcely one-sixteenth of an inch exclusive of the caudal spines.

From the moment of birth it displays activity. What protection does it need? Scarcely any at this stage. It is so minute that no enemy would notice it. Moreover, being faintly tinged with green, it does not make even a spot upon the leaf. Life becomes now a chewing at the foliage, for the first few days just a nibble at the epidermis, later on boring through and through the leaf. Growth is slow. By ten days its length is one-fifth of an inch: after eighteen days it is the size of a pea.

Our best time to observe it is when quite young. We can then discover its shield-making machinery, how the excreta is applied to the plate. I place a young larva beneath the microscope. It is feeding on a leaf, just moving quietly from side to side. Its hind extremity is the point of interest. There the termination of the gut is visible, not an orifice flush with the surface, but a cylindrical projection looking like a tail, a tube with an upwardly directed mouth. This protuberance sticks outward and upward. It is mobile, under the control of the larva, can be held erect or bent downward until its tip touches the leaf. I focus the tip of this protuberance. Nothing happens for a time. Then I see a strange thing, an apparition which immediately discloses how the backplate is made. The rectal protuberance begins to lengthen. A finger-like dilatation comes out from its interior. Slowly

but quite perceptibly, the elongation develops, the protuberance unrolling itself something like a telescope until it is almost the larva's length. This is really a wonderful transformation, a huge voluntary prolapse of the rectum; the gut is being turned inside out. The prolapsed part is pale, almost transparent, just a little tinged with green owing to excrement showing through the wall.

Now observe the purpose of this extraordinary telescope. I see it carried forward over the larva's back. Its tip is then applied to the triangular shield and a drop of excrement squeezed out. What a purpose! It is the organ of manufacturing the backplate. The shield is made with a telescopic gut. I continue to watch. At intervals of a few minutes, as fresh supplies of faecal matter accumulate, this remarkable rectal protrusion takes place. Drop after drop is added to the shield. The additions are fluid, soon they harden, in fact the excrement is a mortar which binds the skins into a solid plate. A few hours after birth the larva attaches its first drop. The excrement is then a thin liquid: later it exudes in small lumps which materially thicken and strengthen the shield. At all times it is dense black. Can this colour be a special modification? Insects and larvae that eat green food as a rule excrete green waste. Here is an unexpected change in pigment. What goes in bright green comes out dense black. The machinery for protection is not merely superficial.

Changes take place in the larva's interior; pigments are elaborated and mixed with the excreta in order that the backplate may resemble mould.

Nature, indeed, produces wonderful contrivances. This is one of the oddest and most elaborate: a framework of spines, a plate of excrement and skins, a protrusive telescopic rectum to serve as a manipulating hand. And all this for one purpose, to supply a protective device.

Just a few words to complete the larva's development. When full grown it becomes a pupa, an odd-looking spiculated lump. Flattened, raised dorsally into a hump, scales and thorns enclose it, the larva's shield is still fixed to its back. The pupa too has protective armour. In front is a barricade of spines, along the sides is a line of scale-like protuberances, the hind extremity ends in a telson something like a lobster's tail. There is one weak point in the middle of the back. There the integument is thin and vulnerable. But over it is the old shield that protected the larva, now a saddle across the pupa, hard and black and rigid as ever, still serving as a plate of armour even in this quiescent stage.

From the pupa comes the beetle, the miniature tortoise. Weak and soft on first emergence, it takes a day or two to stiffen its integument, also to develop that pattern of spots which adds such adornment to its glistening dress. Oval, half an inch

in length, bright yellow with a metallic sheen, its back is carved into pits and ridges and decorated with an elegant pattern of spots. Its reptilian-like investment covers it completely. Only the antennae and the tips of the legs appear beneath the edge of the carapace. All in all it is a curious insect, in itself almost as strangely fashioned as is the larva in its mode of defence.

Conspicuous, undesirous of concealment, it keeps to the exposed leaves. Patches of excrement tell us of its whereabouts. No longer required for defensive architecture, the ejections now stain the green vegetation with blotches of black tar. Very sensitive to intrusion, the slightest touch disturbs it. Down it tumbles from its seat on the creeper and is lost in the undergrowth beneath.

So much for *Sindia*. Like a snail it carries a roof on its back. The construction of tenements is common amongst larvae. We meet with some remarkable instances. Psychid caterpillars cut stems, bind them with silk, and shape the edifice into a cone. Chrysopa larvae collect empty skins, usually aphids sucked dry of juice, and pile this refuse on their backs. Caddis larvae make cylindrical cases from leaves or stones woven with silk. The tortoise beetles equal any of these. They have not even to collect materials; they just accumulate their skins.

MAJOR R. W. G. HINGSTON, I.M.S.
(From *J. Bombay nat. Hist. Soc.*
Vol. 33: 60-64).

On cover: The leopard at ease. Photo by Belinda Breeden

Lt. Col. A. H. E. Mosse, who wrote a detailed article on the panther or leopard entitled 'The panther as I have known him' in the *Society's Journal*, Vol. 34, pp. 350-66 makes the following remarks on the character of the panther.

"Writers on big game have not always done him justice. Granted that, alongside the magnificent tiger, he is comparatively small beer; yet see him in an open glade in his native jungle, observe the muscular but agile symmetry of his form and the beauty of his chequered coat in the rays of a declining sun; he deserves more than a second glance. Granted too, perhaps, that you may fairly, as one writer has done, describe the tiger as a gentleman, the panther as a bounder—though I question whether the difference in their respective characters is really such as to justify the distinction. To call the panther an arrant coward, as another writer has done, may be merely an instance of the folly of generalizing from a single case. No tiger hunter of experience will deny that the tiger himself can sometimes be a cur. Otherwise, to use the above-mentioned writer's own adjective, to label the panther a coward is arrant nonsense. The courage of the normal panther cannot be gainsaid. Of course, the panther, like any other wild animal, will seek to escape unobserved from the pursuit of men, whose superior powers he recognizes. Does not the tiger do the same? But wound him or get him in a corner and he is as ready to fight, and fight to some purpose, as is the tiger; perhaps more so. All said and done it is but his greater size that makes the tiger more to be feared. The panther displays at times a cool daring that the tiger will rarely rival. Make no mistake about it, he is a formidable foe and, if you begin by despising him, sooner or later he will give you cause to change your opinion and earn your respect".

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