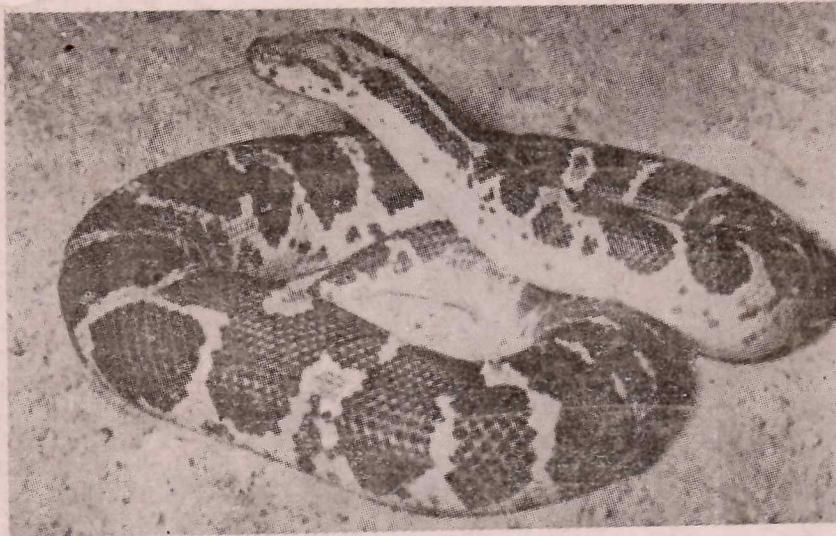


Cobra

Number 9

Quarterly Newsletter

July-Sep. 92



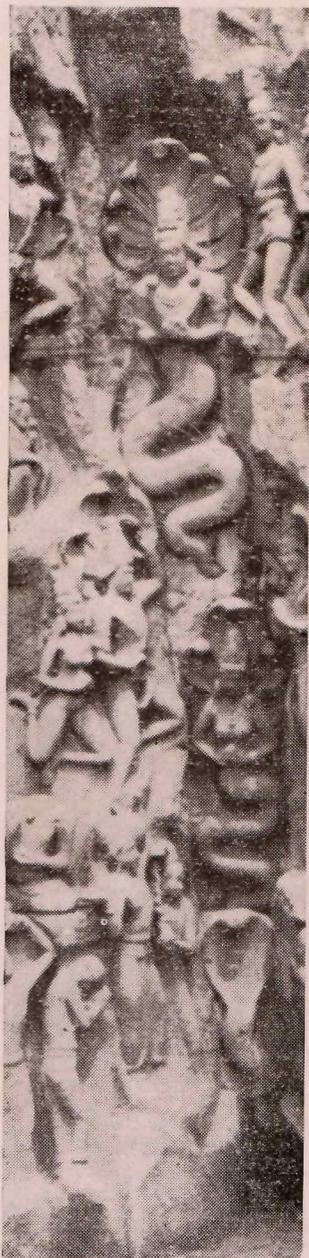
The Sand boa
(*Eryx conicus*)

Courtesy : Reptiles of the World by C. Gans, A Bantom Nature Guide.

Madras Snake Park Trust
Guindy National Park - Guindy
Madras - 600 022. - India

Handwritten signature in blue ink.

WELCOME TO MADRAS SNAKE PARK TRUST



- * The Madras Snake Park Trust was established in 1971 on a one-acre plot of forest land leased by the Govt. of Tamil Nadu at Guindy, Madras. Managed by a Trust, the MSPT is a centre for Education, Tourism, Conservation, Service and Research on Reptiles.
- * A variety of live Reptiles, both Indigenous and Exotic are displayed which include Marsh Crocodile, Giant Tortoise, Reticulated Python, South American Iguana and other species of Snakes, Lizards and Turtles. Besides, a Snake Lore Centre and a Museum of Reptile specimens are maintained.
- * The Park is open from 8.30 a.m. to 5.30 p.m. on all days of the year.
- * **Entrance fee :** Adult Re. 1/- and Child Re. 0.50.
- * Photography charges are—free for still cameras and Rs. 100/- for Video Cameras. For commercial Video contact office.
- * Hourly Demonstration of a few kinds of live Reptiles with commentaries is conducted.
- * Nearly 12 lakhs persons visit MSPT a year.

COBRA

Quarterly Newsletter of the Madras Snake Park Trust

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Annual Subscription for 4 issues
of COBRA commencing from
the date of Subscription

Rs. 75/- Inland
US \$ 10/- Overseas
(including postage)

**MADRAS SNAKE PARK TRUST PROGRAMME FOR
"INDIA TOURISM YEAR - 1991-1992"**

1. Special pamphlets on common poisonous snakes and non-poisonous snakes with special legends about them to be issued at Rs. 3/- and Rs. 5/-.
2. The regular hourly reptiles demonstration now being conducted in Hindi / Tamil / English will also be extended with special tapes in several Indian languages like Kannada, Telugu, Malayalam, Bengali, Oriya, Marathi, Punjabi, Gujarati, Goanese, Urdu etc and Foreign languages like Russian, Japanese, Spanish, German, French, Chinese, Italian etc.

Tourist groups could avail of these special demonstration at Rs. 50/- Indian and Rs. 100 or US \$ 5 for Foreign languages.

3. Opening of the Exhibition Building displaying—
—Reptile lore around the world.

—Myth, Mythology, Worship and other interesting facets of Reptile-lore in our Indian Culture to commemorate the India Tourism year 1991 - 1992.

ANTICHOLINESTERASE IN NEUROTOXIC SNAKEBITE

DR. INDRAMANI JENA, 271 Sahidnagar, Bhubaneswar, Orissa-751 007.

One hundred cases of bites by Indian Cobra and common Indian krait with demonstrable neurotoxicity were graded as mild, moderate and severe based on clinical findings. Each victim received one or repeated doses of antivenom as baseline therapy. Every alternate case of each grade received anticholinesterase (neostigmine) in addition. Recovery time from the neurotoxic state was noted in each case. The time to recovery and mortality in the anticholinesterase group were significantly reduced compared with controls in both cobra and krait bites. It is worth considering the use of anticholinesterase in all cases of neurotoxic snake-bites.

Introduction

Neurotoxic envenomation is responsible for more than 70% of snakebite deaths in India, out of 10,000 snakebite deaths, 5,000 are due to bites by cobras with 50% mortality and 1,700 are due to bites by kraits with a 40% mortality. Russell's viper bites in South India and Sri Lanka have been attributed to serious neurotoxicity in addition to coagulo-pathy (warrell, 1987). Table-1 shows the species of snakes important for producing neurotoxic signs in snakebite victims in different areas of the world, (Commonwealth Serum Laboratories, 1984; Minton, 1938; Sewai, 1980).

Table—1

Neurotoxic snakes of medical importance in different parts of the world.

REGION	BITING	SPECIES
ASIA	Asiatic Cobra	— Spectacled cobra (<i>Naja naja naja</i>) Monocled cobra (<i>Naja naja kaouthia</i>)
	Kraits	— Common Indian Krait (<i>Bungarus caeruleus</i>) Many banded krait (<i>B. multicinctus</i>) Banded krait (<i>B. fasciatus</i>)
	Viper	— Russell's viper (<i>Vipera russellii</i>)
AFRICA	Mambas	— (<i>Dendroaspis</i> sp.)
	Egyptian cobra	— (<i>Naja haje</i>)
SOUTH, CENTRAL AND NORTH AMERICA	Tropical rattle snake	(<i>Crotalus durissus terrificus</i>)
AUSTRALIA AND PAPUA NEW GUINEA	Coral snakes	(<i>Micrurus</i> sp.)
	Taipan	(<i>Oxyuranus scutellatus</i>)
	Brown snake	(<i>Pseudonaja</i>)
	Tiger snake	(<i>Notechis</i>)
	Death adder	(<i>Acanthophis antarcticus</i>)

Onset of death may be rapid following bites by cobras and kraits. Low molecular weight neurotoxic polypeptides are absorbed quickly and bind promptly to the (target) acetylcholine receptor sites at the neuromuscular junction. The benefits of antivenom seem doubtful once neurotoxic signs have developed. The neutralizing capacity of antivenom is confined to the circulation and it is possible that it can only neutralize venom present in the circulation.

Snake venom neurotoxin has been used as a tool for identification of defects in acetylcholine receptor in myasthenia gravis. The similar clinical picture in myasthenia gravis and neurotoxic envenomation point to specific defects in neuromuscular conduction. It is, therefore, considered that anticholinesterase may exert some beneficial effect in cases of neurotoxic envenoming.

Neostigmine has been claimed to be a valuable adjunct to management of neurotoxic bites (Ghosh and Mandal, 1964) Kumar and Usgaonkar (1967), Banerjee (1972), Ramakrishnan et al (1975) and Dash et al (1976) have also reported therapeutic benefits following the administration of neostigmine. Intravenous edrophonium, a rapid and short-acting anticholinesterase was

shown to be beneficial following neurotoxic envenoming by the Philippine cobra (*Naja philippinensis*) as shown by a placebo-controlled, double blind cross-over trial (Watt et al, 1986).

Material and Method

The patients in the present study comprise all cases of neurotoxic envenoming between April, 1976 and October, 1989. Patients were admitted and treated at different health institutions in rural areas (S.C.B. Medical College, Cuttack; Primary Health Centre, Pottangi, Koraput; Rural Health Centre, Jagatsinghpur, Cuttack and Capital Hospital, Bhubaneswar, Orissa, India).

Only patients with neurotoxic features (e.g. ptosis, glossopharyngeal and palatal palsy or respiratory failure) were selected for the study. Determination of the biting species was carried out by reliable identification of the killed snake or by direct witness identification by showing photographs of the offending species. If available, circumstantial and clinical confirmation was also used.

The neurotoxic grading used in this study is shown in Table-2.

Table—2
Neurotoxic grading of cobra and krait bites

Grade	Description	Clinical picture
I	Mild	Ptosis
II	Moderate	Ptosis Glossopharyngeal and palatal palsy
III	Severe	Ptosis Glossopharyngeal and palatal palsy, respiratory failure (Delirium may be associated)
	Very severe	Clinical features of severe type may develop in quick succession within 2 to 3 hours.

This arbitrary grading is based on the observation that in some patients the clinical features are limited to ptosis only, in some cases there is ptosis together with IXth and Xth cranial nerve palsy. These cases do not develop respiratory failure even if no treatment is given. Severe cases develop respiratory failure as well as these features.

Treatment of Cases :

Each patient received polyvalent antivenom prepared by Central Research Institute, Kasauli, India. According to the manufacturer this antivenom neutralizes 0.6 mg. each of Indian cobra and common Indian krait venom (also Russell's Viper and *Echis carinatus* venoms) per ml. of antivenom. Considering the amount of venom reserves in glands of cobra and krait and fatal dose for a 60kg. victim as 15mg. of cobra venom and 10mg. of krait venom (Chatterjee, 1965), initial antivenom dose was as follows : for cobrabites—10 vials (100 ml.) of liquid antivenom in half litre of dextrose saline by i.v. drip; for krait-bites—4 vials (40 ml.) of liquid antivenom in half litre of dextrose saline by i.v. drip. Further dose of 100 ml. of antivenom for

bites by cobra and 20 ml. of antivenom for kraits was given if clinical neurotoxicity worsened.

Each alternate case of grade I, II or III was given neostigmine. If any patient during treatment developed a higher grade of neurotoxicity, he or she was enrolled in that grade. Neostigmine (0.5 mg. i.v.) was given with a pre-medication of atropine (0.6 mg. i.v.) in grade-I and grade-II case. This was continued until full neurological recovery occurred.

In grade-II cases, neostigmine (1 mg. i.v.) was given hourly with atropine premedication until respiratory failure resolved, subsequent treatment was as for Grade-I and grade-II cases. Respiratory management was carried out by an anaesthetist.

Assessment of Neurological Recovery :

Ptosis was observed at 6 hour intervals : the time taken until full recovery from the start of treatment was termed ptosis recovery time (PRT). Similarly time for recovery from dysphagia and respiratory failure was recorded in hours.

Results :

All 100 cases of bite were identified as victims of cobra or krait envenoming. Cobrabites occurred mainly during the day (diurnal bites—45, nocturnal bites—11) and krait bites occurred predominantly at night (nocturnal bites—42, diurnal bites—2).

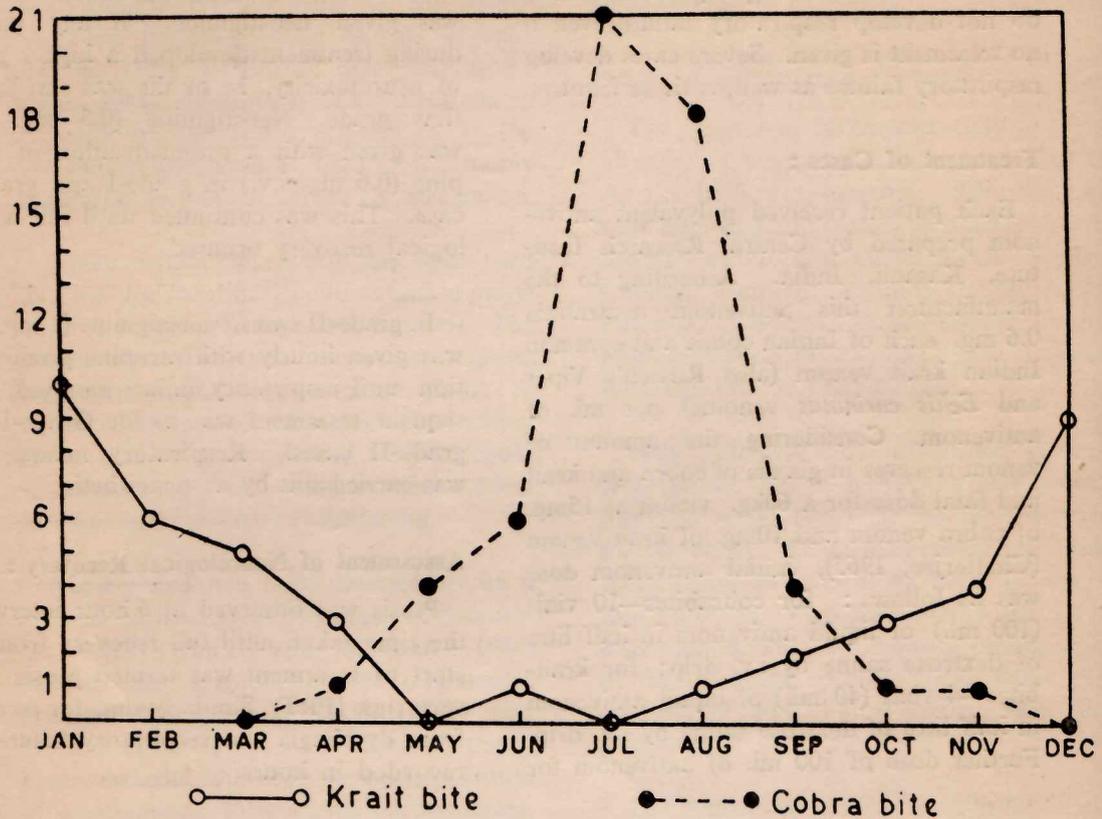
Table—3 : Species responsible for evenoming

Snake	Number	Reliably Identified	Circumstantially Identified	Clinically confirmed
INDIAN COBRA	56	45	11	56
COMMON INDIAN KRAIT	44	26	18	44

The monthly distribution of cases is shown in Figure 1. Most bites by cobras occur in late summer and during the rainy season when agricultural activity is at its highest level. Bites by kraits occur during the winter.

(Fig. 1)

MONTHLY VARIATION OF NEUROTOXIC SNAKE BITES (100 Cases)



All cases were graded as mild or grade I (36 cobrabites and 28 kraitbites) moderate or grade II (12 cobrabites and 12 kraitbites) and severe or grade III (8 cobrabites and 4 kraitbites). The age and sex distribution is shown in Table-4.

Table—4
Age and sex of neurotoxic victims

AGE GROUP	COBRA BITES		KRAIT BITES	
	MALES	FEMALES	MALES	FEMALES
Upto 10 years	1	0	2	2
11 to 20 years	6	1	1	2
21 to 30 years	10	3	8	5
31 to 40 years	15	3	7	3
41 to 50 years	12	2	5	2
51 to 60 years	2	0	3	1
61 years & above	1	0	2	1
TOTAL	47	9	28	16

The results of the neostigmine trial in relation to neurological recovery is shown in Table-5 for bites by cobras and in Table-6 for bites by kraits.

Table—5

Recovery in patients bitten by cobra with (N) and without (W) anticholinesterase treatment.

<i>Grade</i>	<i>No. of cases</i>	<i>With neostigmine (N) without neostigmine (W)</i>	<i>Ptosis Recovery in hours</i>	<i>Recovery from dysphagia</i>	<i>Relief from respiratory failure</i>	<i>Deaths</i>
I	36	18 N	48	—	—	—
		18 W	120	—	—	—
II	12	6 N	60	24	—	—
		6 W	132	48	—	—
III	8	4 N	72	24	12	2
		4 W	144	48	24	3

Table—6

Recovery in patients bitten by krait-with (N) and without (W) anticholinesterase treatment.

<i>Grade</i>	<i>No. of cases</i>	<i>With neostigmine (N) without neostigmine (W)</i>	<i>Ptosis Recovery in hours</i>	<i>Recovery from Dysphagia</i>	<i>Relief from respiratory failure</i>	<i>Deaths</i>
I	28	14 N	60	—	—	—
		14 W	144	—	—	—
II	12	6 N	72	36	—	—
		6 W	144	72	—	—
III	4	4 N	84	36	12	—
		4 W	144	72	24	1

When the time of appearance of neurotoxic features are taken into consideration and the time of administration of antivenon/and neostigmine is considered cases may be categorised into 3 groups : (i) Early reporters—who received treatment within 1 hour of the onset of neurotoxic features (not bite), (ii) Intermediate reporters—who reported for treatment within 1 to 3 hours of the appearance of neurotoxic features and (iii) Late reporters—who were admitted atleast 3 hours after the development of neurotoxicity.

The pattern of recovery in victims with or without neostigmine in relation to the promptness of treatment is shown in Table—7.

Table—7

Ptosis Recovery Time in hours and Mortality in reported cases.

n—100

Species	Grade	With Neostigmine-50			Without Neostigmine-50		
		EARLY	INTMED	LATE	EARLY	INTMED	LATE
COBRA BITES	I	24	36	72	96	120	144
	II	48	60	96	96	120	144*
	III	60	72	96**	96	132	144**
KRAIT BITES	I	24	36	96	96	120	144
	II	48	72	96	96	120	144
	III	72	84	108	96	132	168*

Each star () indicates one death.*

Side-effects of neostigmine

None of the patients on neostigmine on 6 hourly dosage (grade I and Grade II cases) had any side effects except for temporary bradycardia. Four out of 8 grade III patients had abdominal pain and bradycardia. These symptoms were not considered sufficiently severe to interfere with the regimen.

Analysis of results

Victims of grade I, II and III bites who received neostigmine had earlier recovery and fewer deaths following bites by cobras and kraits. Recovery from ptosis was more rapid when neostigmine was given (Figures 2, 3). The mortality was less in severe grades who were given neostigmine. The cases, who reported early with neurotoxic manifestation benefitted mostly from neostigmine treatment.

DISCUSSION

In all 100 cases of snakebites, snakes were reliably identified and confirmed. The snakes in the localities studied were predominantly Indian cobra (*Naja naja* and *Naja naja kaouthia*) and Indian krait (*Bungarus caeruleus*).

The results obtained following neostigmine administration were promising and appeared to be life saving. Electromyographic patterns in different studies on cobra (*N.n. kaouthia*) bites show pattern of myasthenia gravis (Aksaranugrah et al, 1980) but 3 cases of bites by Indian krait did not show a myasthenic pattern (Sethi and Rastogi, 1981).

The neurotoxic action of all cobra and some krait venoms (cobrotoxins and L. bungarotoxins, Lee, 1971) is post synaptic blockade when the active receptor density on the post synaptic membrane is reduced. Anticholinesterases increase the surface area over which acetylcholine molecules can exert influence. Limitation of hydrolysis exerts a positive role in recovery.

In B—bungarotoxin blockade, the site of the block is presynaptic. This type of blockade has a limited role in cases of clinical neurotoxicity. Pre-synaptic blocks take latest period for depleting axonal reserves of acetylcholine vesicles and depressing acetylcholine synthesis resulting in diminished quanta of acetylcholine release. Anticholinesterase quantitatively augments the junctional acetylcholine quantum by limiting acetylcholinesterase catalyzed hydrolysis (Taylor, 1990).

It is concluded that routine use of anticholinesterase is recommended in all cases of neurotoxic envenoming.

REFERENCES

1. Aksaranugrah, S., Penchart, C., Pipatnakul, V., (1980) Electro-diagnostic studies in cobrabite patients. *J. Med. Asso. Thailand* 63: 148-53.
2. Banerjee, R.N., Sahni, A.L., Chak, K.A., Vijay Kumar, (1972). Neostigmine in treatment of elapidac bites. *J. Asso. Phys. India*, 20 : 305.
3. Common-Wealth Serum Labs (1984) Treatment of Snakebite in Australia and Papua, New Guinea.
4. Dash S.C. Ghosh, S.K., Mathur, D.C., Jha, G.N., Prasad, U., Grewal, K.S., (1976) Neurotoxic Snakebite-Dramatic Recovery Following Neostigmine Therapy. *J. Asso. Phys. India*, 24: 535-7
5. Ghosh, B.N., Mandal, R.C., (1964) Role of Anticholinesterase in elapine-bites. *Armed Forces med. J. India*.
6. Kumar, S., Usgaonkar, P.S., (1968) Myasthenia gravis like picture resulting from snakebite. *J. Ind. M.d. Asso.* 50 : 428.
7. Lee, C.Y., (1971) Elapid Neurotoxins and their Mode of Action. *Snake Venoms and Envenomation*. P. 111-126 (S. Minton Ed), Marcel Dekker Inc. New York.
8. Minton, S.A., (1988) Personal Communication.
9. Ramakrishnan, M.R., Shankeran, K., Gupta, G.D., Chandrasekhar, S., (1975) External Ophthalmoplegia in Elapid

- bites and its response to Neostigmine. Neurology India, 23 (2) : 109-10.
10. Sawai, Y., (1980) Epidemiological study on Snakebites in the Asian Areas. The Snake, 12 : 115-8.
 11. Sethi, P.K., Rastogi, J.K., (1981) Neurologic aspects of ophitoxaemia. (Indian Krait)—a clinico myographic study. Ind. J. Med. Res. 73: 269-76.
 12. Taylor, P., (1990) Personal Communication.
 13. Warrel, D., (1987) Manson's Tropical Diseases. P. 555-598.
 14. Watt, G., Theakston, R.D.G., Hayes, C.G., Yambao, M.L. Ranoa, C.P., Alquilalas, L., Warrel, D., (1986) Positive Response to Edrophonium in Patients with Neurotoxic Envenoming by cobras. (*Naja naja philippinesis*) 315 : 23 : 1444-9.

MISCELLANEOUS NOTES

COBRA invites contributions under "Miscellaneous Notes". Short notes and interesting personal observations on Reptiles and Amphibians are invited for publication. Myths, lores and beliefs which highlight these animals from the cultural and traditional point of view are also welcome.

—Editor.

A SMALL COLLECTION OF AMPHIBIANS FROM AGUMBE, KARNATAKA

SURYA NARAYANA RAO ADDOOR,
Krishna Farms, Addoor PO, Gurpur, Mangalore-574 145

Agumbe is one of the wettest parts of India. Situated rather centrally on the Western Ghats, it receives an annual rainfall of over 7000 mm, making it ideal for a number of amphibian species. However, this area has not been carefully explored with regards amphibians. I therefore wish to present some details of amphibians that were collected or observed in Agumbe.

The localities that I have studied are between 600 and 700 m above sea level. The forest is lush, evergreen and little disturbed in patches despite the considerable human interference in this part of the Western Ghats. All the amphibians discussed in this paper were observed or collected between April and August 1992 in both the less disturbed and more disturbed forests. The specimens collected and/or photographed were identified by Mr. M. S. Ravichandran of the ZSI, Madras and Dr. R.J. Ranjit Daniels of the Madras Crocodile Bank. The specimens have been deposited at the ZSI museum, Madras.

***Bufo melanostictus* Schneider :**

The common Indian toad was observed only within the more disturbed forests.

***Nyctibatrachus major* Boulenger :**

This species was found in pools beside streams in the less disturbed forests in April. When in water, the frogs were blackish in colour. This is the northernmost record for this species (Daniels, in press).

***Nyctibatrachus humayuni* Bhaduri and Kripalani :**

Males were observed in April while it was raining heavily. The males were calling from edge of water along streams. The males were pale coloured while calling. This species was first reported from Goa and later collected from near Mangalore (Daniels, in press).

***Rana beddomi* (Gunther) :**

This species was common in leaf litter in both types of forests. Males observed in April were calling from within rock crevices. Males were also calling in July-August on the banks of streams.

***Rana semipalmata* Boulenger :**

This species was observed along with *R. beddomi* in wet leaf litter along streams and also in disturbed forests. The males collected in April were calling from bushes.

***Rana aurantiaca* Boulenger :** The golden frog was found in leaf litter near pools of water. Calls were heard in April and were shriller than that of the closely resembling bronzed frog. This species occurs in both types of forests.

***Rana temporalis* (Gunther) :**

The bronzed frog was found along streams in the less disturbed forests. Males were calling in April and one amplexing pair was observed laying.

Rana curtipes Jerdon :

The bicoloured frog was often found away from water and in groups within the less disturbed forests. It prefers leaf litter and tolerates handling.

Rana linnocharis Boie :

The paddyfield frog was found on banks of streams within the less disturbed forests. Males were calling in April.

Rana cyanophlyctis Schneider :

The Indian skipper was found in the disturbed forests in water. Males were calling in April.

Rana hexadactyla Lesson :

The green frog generally considered a plain's species was found along streams in

pools in both the less disturbed and more disturbed forests.

Rana tigerina (Daudin) :

The bullfrog was found along the streams on grassy banks in both types of forests. Males were calling in April.

Rhacophorus malabaricus Jerdon :

The Malabar gliding frog was found in both types of forest. In April males were calling from branches with several females grouped around.

REFERENCE :

Daniels, R.J.R. (in press) Patterns of geographic distribution of amphibians in the Western Ghats, India(*J. Biogeography*).

PAPERS ON AMPHIBIA

In deference to the wishes of a number of herpetologists, it has been decided to enlarge the ambit of COBRA to incorporate articles and papers on Amphibia as well. Contributions on ecology, conservation, fauna, behaviour and other aspects on Amphibia may be sent to Dr. R.S. Pillai Editor, COBRA, Madras Snake Park Trust, Guindy, Madras-600 022.

CURRENT TECHNICAL NAMES FOR SOME INDIAN SNAKES

T.S.N. MURTHY, *Zoological Survey of India, Madras-600 028.*

Certain modifications in classification of snakes, which continue to remain a perplexing and controversial subject matter, have resulted in the changed names for some snakes mainly of the Family Colubridae. These names which are in current usage are listed below alongside the former names used by M.A. Smith (1943) in his volume on Serpentes in the *Fauna of British India* series. It need hardly be mentioned that only the non-marine snakes of India have been considered for this purpose. It is also beyond the scope of this paper to give detailed discussions of the recent revisionary works.

It is hoped that the list will help reduce the nomenclatural inconvenience experienced by the students of Indian ophiology to a minimum.

I wish to thank Dr. A.K. Ghosh, Director, Zoological Survey of India for encouragement and his continued interest in my work.

LIST OF CURRENT NAMES FOR SOME INDIAN SNAKES

<i>Formerly</i>	<i>Currently</i>
FAMILY TYPHLOPIDAE	
<i>Typhlops braminus</i>	<i>Ramphotyphlops braminus</i>
FAMILY UROPELTIDAE	
<i>Teretrurus rhodogaster</i>	<i>Brachyophidium rhodogaster</i>
<i>Uropeltis phipsoni</i>	<i>Uropeltis rubrolineatus</i>
<i>Uropeltis grandis</i>	<i>Uropeltis Smithi</i>
FAMILY COLUBRIDAE	
<i>Elophe oxycephala</i>	<i>Gonyosoma oxycephalum</i>
<i>Coluber ventromaculatus</i>	<i>Argyrogena ventromaculatus</i>
<i>Coluber rhodorhachis</i>	<i>Argyrogena rhodorhachis</i>
<i>Coluber fasciolatus</i>	<i>Argyrogena fasciolatus</i>
<i>Coluber gracilis</i>	<i>Argyrogena gracilis</i>
<i>Coluber diadema</i>	<i>Spalerosophis diadema</i>
<i>Coluber arenarius</i>	<i>Sphalerosophis arenarius</i>
<i>Ahaetulla ahaetulla</i>	<i>Deudrelaphis pictus</i>
<i>Ahaetulla cyanochloris</i>	<i>Dendrelaphis cyanochloris</i>

<i>Ahaetulla grandoculis</i>	<i>Dendrelaphis grandoculis</i>
<i>Ahaetulla gorei</i>	<i>Dendrelaphis gorei</i>
<i>Ahaetulla bifrenalis</i>	<i>Dandrelaphis bifrenalis</i>
<i>Ahaetulla caudolineata</i>	<i>Dendrelaphis caudolineatus</i>
<i>Ahaetulla tristis</i>	<i>Dendrelaphis tristis</i>
<i>Natrix piscator</i>	<i>Xenochrophis piscator</i>
<i>Natrix subminiata</i>	<i>Rhabdophis subminiata</i>
<i>Natrix stolata</i>	<i>Amphiesma stolata</i>
<i>Natrix platyceps</i>	<i>Amphiesma platyceps</i>
<i>Natrix beddomei</i>	<i>Amphiesma beddomei</i>
<i>Natrix trianguligera</i>	<i>Sinonatrix trianguligera</i>
<i>Dryophis perroteti</i>	<i>Ahaetulla perroteti</i>
<i>Dryophis dispar</i>	<i>Ahaetulla dispar</i>
<i>Dryophis fronticinctus</i>	<i>Ahaetulla fronticinctus</i>
<i>Dryophis nasutus</i>	<i>Ahaetulla nasuta</i>
<i>Dryophis pulverulentus</i>	<i>Ahaetulla pulverulenta</i>

FAMILY ELAPIDAE

Genus <i>Callophis</i> *	Genus <i>Calliophis</i>
<i>Naja hannah</i>	<i>Ophiophagus hannah</i>

FAMILY VIPERIDAE

<i>Ancistrodon himalayanus</i>	<i>Agkistrodon himalayanus</i>
<i>Ancistrodon hypnale</i>	<i>Hypnale hypnale</i>

*The typographical error (Smith, 1943; 418) has often been overlooked.

XEROXING A SNAKE

H.V. GHATE

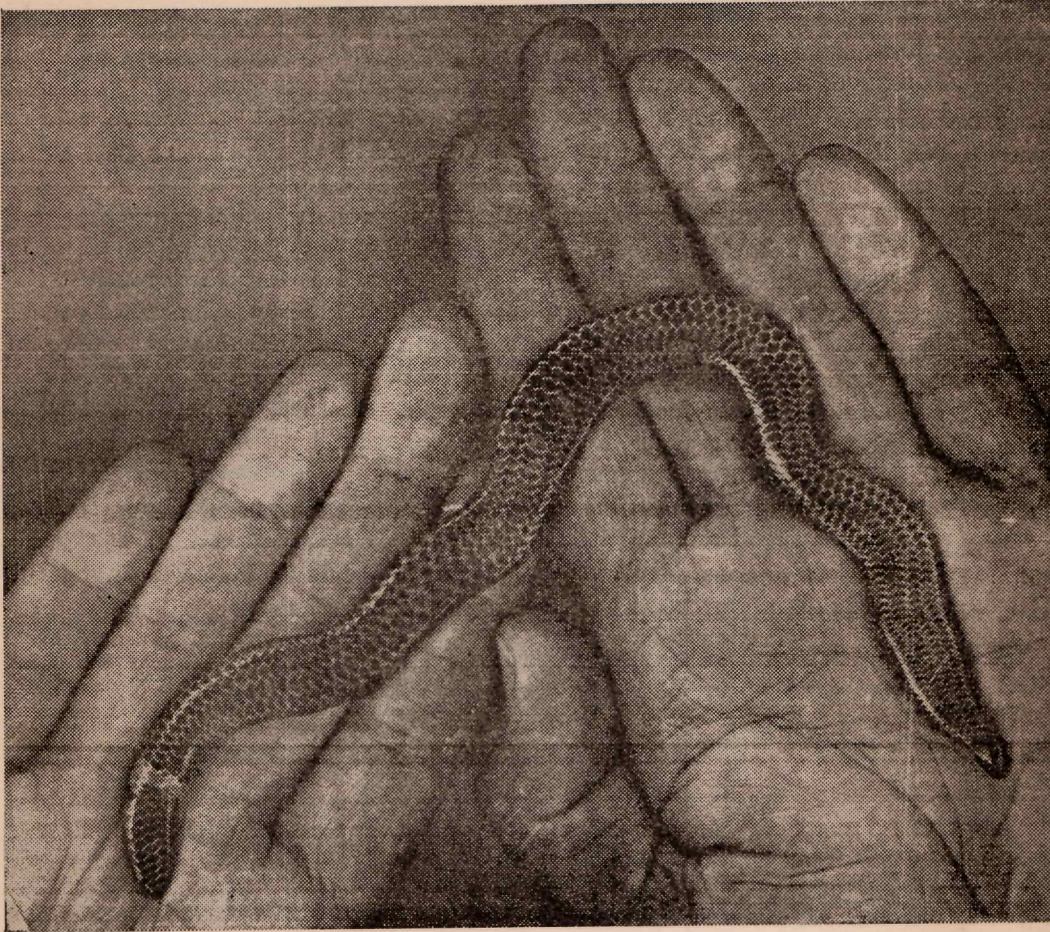
Modern College. Pune 411 005

Xerox machine has revolutionised copying process over the past two decades or so. One can also use this machine to produce a faithful copy of the arrangement of scales on an intact snake or a lizard. In some cases the associated colour pattern can be recorded very well. All this can be done without killing the snake or the lizard. Slight cooling is sufficient in most cases, specially for small animals but additional care must be taken while handling live venomous snakes. Skins of various reptiles can also be copied in this fashion. Such a 'copy' may prove useful in identifying the animal as well. When it is not possible to send the specimen itself to an expert for examination, a xerox copy may prove handy.

Though this technique is inferior to photography, the latter is a very tedious process

except when you have an instant camera like Polaroid! Besides, xeroxing gives same-size copy, a distinctly advantageous fact. Therefore, despite limitations, I feel that this technique may prove to be useful in herpetology. This fact was brought to the notice of the author by an eminent herpetologist. Dr. Walter Auffenberg, of the Florida State Museum, University of Florida at Gainesville, Florida, USA, a couple of years ago when he was in India.

As an illustration to this note I have chosen a 'xerox copy' of a uropelt snake commonly found in Poona, during the rainy season. The uropeltid snakes are endemic to India and Sri Lanka and are a fascinating group of small and beautiful snakes.



Xerox copy of a Uropelt Life-size, Ventral view.

—H.V. G

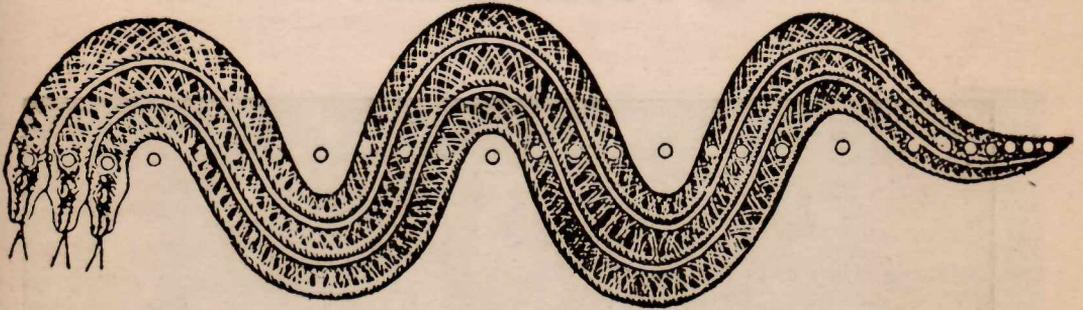
PAAMBU PANCHANGAM
(SNAKE ALMANAC OF TAMILNADU)

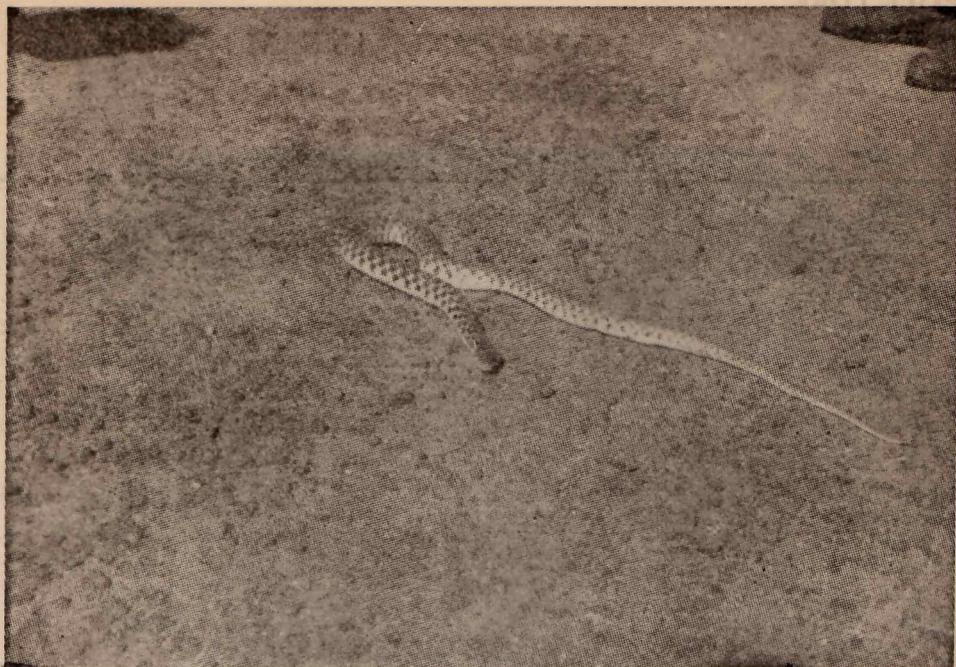
In this Rahu schedule there are 27 stars represented on a horizontal line passing thro the curved body of the SNAKE. The position of the star will guide the date for sowing of different varieties of seeds in the agriculture operations.

The line of stars should be located on the body of the snakes starting with the Rahu at the tail end and working forwards to-

wards the head. If 12 stars fall within the body portion, Paddy will grow well. In the neck and the face, if there are 6 stars, there is a likely chance of floods. In the tail portion if there are 4 stars, there will be poor output. If the star falls outside the curves of the snake, there is loss due to Eagles, Insects, Parrots, Rats, Rains and invasion.

A.N. JAGANNATHA RAO





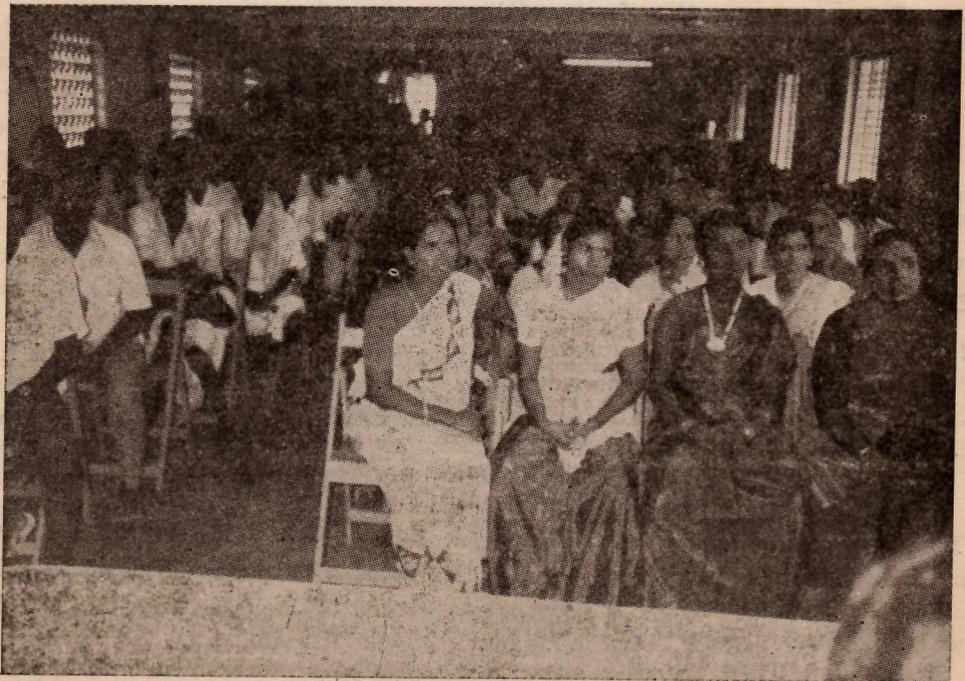
Checked Keelback



A Seasnake on the Madras Beach



Hony Secretary addressing the Farmers at Kundrathur, Madras.



A Section of the audience at the Farmers' meet at Kundrathur

REPTILE NEWS IN PRESS

*70 Vipers born in Iyengar home—
Indian Express 16.7.1992*

A Russels viper gave birth to 70 young ones on Monday at Bangalore's well-known mini zoo run by the Iyengar family in Padmanabhanagar. The viper was rescued by a member of the family from Whitefield near Bangalore three months ago. On Monday, the Iyengars discovered that the snake had decided to have a family of its own. The Iyengars aware that the viper's propensity for cannibalism could decimate the brood, have separated the little ones and are all set to release them in the wild soon.

The Iyengars have over the years rescued a number of injured and disabled animals and nursed them back to health and released them in their natural habitat. This earned them the sobriquet 'The Zoo Family'. Some months ago, the family founded the animal Rescue and Rehabilitation Trust and it is under this banner that they continue their service to the animal kingdom.

Snakebite, stress kill many Kashmiri Pandits
The Hindu 14.7.92

SRINAGAR-July 13.

Heat, snakebite and stress-related ailments have killed at least 460 Kashmiri pandit migrants to Jammu in the last two years, according to statistics made available by migrant organisations in Jammu.

The victims were among the estimated one lakh pandits who had left their homes in the valley in the wake of the violence since early 1990 and sought refuge in Jammu or at places outside the State.

Dr. Sushil Razdan, neurosurgeon, said in Jammu, many migrant pandits, especially women, had suicidal tendencies or were mentally disoriented because of psychological and other problems flowing from their displacement. There were also reports of many heatstroke deaths among the migrants.

Thousands of the migrants are huddled in tents in the surrounding areas of Jammu, winter capital of Jammu and Kashmir. They are exposed to serious hazards including excessive heat. Varieties of snakes and other poisonous reptiles and strains and stresses caused by the migration also take their toll.

MAN BITES PYTHON

The Hindu-20.9.92

MARITZBURG, South Africa, Sept. 19.

A farmworker battled a 11-foot python for a half-hour after it dropped on him from a tree, finally squeezing, biting, and beating the reptile to death, his employer said.

Edward Mkhize had gone to fetch cattle on Wednesday when the python fell from above and wrapped itself around him. Mkhize's employer, Suresh Maharaj, told local newspapers. They both fell to the ground in a tangle. Mkhize sank his teeth into the writhing python's throat, then twisted the thick body. The python's strength finally gave out, and Mkhize smashed its broad head with a rock.

Some Quick Notes—by Bill Schiefen
Voice of the Turtle—September 1992

The following is from the 16th International Herpetological Symposium held this past June.

The Asian spiny turtle (*Heosemys spinosa*) has been bred for the first time in captivity. Adults were 8 to 9 inches; 3 clutches of eggs were produced in a year with 1 to 2 eggs per clutch. A key to feeding was the use of tomatoes; they love 'em, and when mixed with other foods (vegetables, etc.) the other foods were eaten'.

From : Wisconsin Herpetological Society
July 1992.

WHERE HAVE ALL FROGS GONE?

The Hindu 21.10.92

Mitsuru Kuramoto, a professor of amphibian biology at the Fukuoka University of Education, found at a recent meeting in China that the world's researchers of amphibians shared the same question he has had in recent years. Why has there been such a sharp decline in the number of frogs?

Kuramoto said he has now given up trying to catch toads to use in class in the neighbourhood of the university campus in Fukuoka, in Japan's southernmost main island of Kyushu. More than 10 years ago there were many more toads than were needed, now their population is very small.

"It may be natural that they decrease in number where rice paddies and ponds are destroyed: but there is still a stretch of rice paddies in the area", Kuramoto said. "It is strange."

Frogs have been sharply decreasing in number across Japan as well as in other parts of the world, perhaps as a result of environmental changes, Japanese researchers say. And there are also cases in which changes in their living conditions do not explain everything about the decline, they say.

Drops in the frog population around the world were also reported at a meeting of

scientists held during the Earth Summit at Rio de Janeiro, Brazil in June this year.

An International Union for Conservation of Nature and Natural Resources team has confirmed that nearly 30 frog species have become extinct or are on the verge of extinction around the world, including a rare species in Australia that raises its tadpoles in the mother's stomach.

In Japan researchers say development and its resulting environmental destruction are mostly responsible for the decline. Changes in ways of rice cultivation and a decline of rice paddies have also made it difficult for frogs to breed they say.

"Weird is the word to describe the way large frogs, such as toads and Tokyo Daruma Gaeru (a kind of leopard frog), have been disappearing in recent years", said Kanai. He serves as the chairman of a local group of about 300 nature lovers.

According to Kanai, the number of places in which toads lay eggs has declined from 20 to 12 in Hachioji in the past 25 years. The frog population decreased by more than 80 per cent in that span.

Oddly, there has apparently been little change in the environment in five of the eight places where frogs have disappeared, he said.

At a pond in the city's Komiya Park, for example, at least 800 frogs gathered in the matting season 20 years ago; now there is none. The water of the pond looks clean, and no waste-water flows into it, he said. Komiya Park is still rich in nature.

Kanai supports the view held by some researchers that acid rain and other pollutants in water may be playing a part in the decrease of the frog population worldwide.

"Both eggs and tadpoles live in water, and adult frogs breathe through the skin," he said, "Pollutants in the water are directly absorbed through their skin."

But other researchers, including Kuramoto, do not think acid rain has much effect on frogs, at least in Japan. Kuramoto said he suspects global climatic changes may be one cause for the decline. He also suspects the use of agricultural pesticides has depleted the number of insects that large frogs feed on.

Another researcher of amphibians said changes in frogs living conditions have also led to an increase in crossbreeds, some of which are sterile.

The researchers agree that there is no established cause for the decrease in the number of frogs, the cause may be complex. "Many people may wonder why we care so much about frogs," Kanai said. "But I fear (their decline) may be a warning that something may happen to human beings, as well".
—Asahi News Service

WORLD RECORD BOA CONSTRICTOR "DE-DISCOVERED"

By WILLIAM D. JOY

Notes from NOAH XIX (10), 1992

While doing malaria research in Trinidad in the 1940s, Dr. Colin S. Pittendrigh, a zoologist, discovered the largest boa constrictor ever recorded. At 18 1/2 feet in length, it was several feet longer than any other reported in the literature. Since Dr. Pittendrigh was a respected scientist and the measurement was taken from a dead animal and not an inadvertently stretched skin, this seemed to be an unquestionable record. What more proof could one ask for?

Nevertheless, I was curious and wanted to know more details. The earliest mention

of this record-length boa was found in "Snakes in Fact and Fiction," by James Oliver. Although the book has a bibliography, there is no reference to an article on the discovery by Dr. Pittendrigh.

After a long search with many dead ends, I finally located Dr. Pittendrigh's address and wrote him a letter.

In his reply, Dr. Pittendrigh states that the snake in question was 18 1/2 feet long, but it was a young anaconda, not a boa constrictor! He says he never published anything on it and has no idea how it ever got into the literature as a boa constrictor. Furthermore, no photos of the animal exist.

One can speculate that the confusion may have been caused by the fact that at that time the correct scientific name was Constrictor constrictor and the term 'boa constrictor' was used as a generic term for any large python or boa.

The question now becomes, what really is the largest boa constrictor on record? A quick search of the literature revealed a report of a 15 foot boa constrictor in "Giant Reptiles," by Sherman and Madge Minton, but details are lacking. It is always nice to know "who, what, where, when, and how" because one can always find unattributed "reports" of 131 foot anacondas and other flights of fancy. Many measurements are really estimates or they were taken from skins that stretched when they were being removed.

One can only wonder how many 16 foot boa constrictors did not get reported in the literature because they fell so far short of the record. If anyone has any photographs or anecdotes regarding unusually large boas, could they send them to me at the address below? Photographs can be returned upon request.

NEWS FROM THE MADRAS SNAKE PARK TRUST

16th July '92.

Mr. Jacob V. Cheeran, Member, Zoo Authority of India, visited to Madras Snake Park Trust. He had a discussion with Hony Secretary and Research Department about Management problems and further developmental activities to promote, tourism, Education and Research.

15th July '92.

Mr. Sanjay Jayachandran, University of Texas, U.S.A. visiting Research Scholar, has done some preliminary studies about home range, movements of snakes by using Radio telemetry equipment. The experiments were carried out over a period of three months at the Madras Snake Park compound, Old Mahabalipuram Road, Madras.

30th July '92

Madras Snake Park Trust, participated and demonstrated the use of Radio tele-

metry equipment, in the control of Rodent by Reptiles at Kundrathur Farmer's meet. A few species of snakes were exhibited. Hundreds of farmers visited the stall.

22nd August '92.

A seminar on "Socio-Economic Research on Reptiles" was organised by the Madras Snake Park Trust at the auditorium of the Zoological Survey of India, Madras.

Dr. T. N. Anantakrishnan, Director, Entomological Research Institute, Loyola College, Madras, inaugurated the seminar and Dr. K.V. Lakshminarayana, Officer in-charge, Zoological Survey of India, Southern Regional Station, Madras, delivered key note address. Dr. A.N.T. Joseph, Officer incharge, Marine Biological Research Station, Madras, gave the valedictory address. About 20 papers on various aspects were presented by distinguished delegates from various institutions.

CONTRIBUTIONS ON REPTILES INVITED

COBRA solicits papers on snakes, lizards, turtles and crocodiles for *quick* publication.

Papers may be on any aspect : Ecology, Biology, Natural History or Conservation. Faunal and Behavioural aspects are also welcome.

Snake-lore, Myths and interesting personal observations are also accepted for publication under Miscellaneous Notes.

Contributions not exceeding 8 typed pages may be sent to Dr. R. S. Pillai Editor, COBRA, Madras Snake Park Trust, Guindy National Park, Madras-600 022.

**COMMENTS BY SOME IMPORTANT VISITORS TO
MADRAS SNAKE PARK TRUST**

I am very happy that I could visit the Snake Park and see the working. The no. of Research papers, reference collection and other research materials are really good. A number of research scholars doing research on different topics adds to the Scientific literature of the institution. I wish all the best for the Park.

Sd.....
JACOB V. CHEERAN 16.7.92
Member, Zoo Authority of India.

It is a unique experience to see the reptile Park and be shown around by Dr. Jagannathan.

Very Educative.

Sd.....
LEILA BETT 3.8.92
Chief Justice of Himachal Pradesh, Simla.

I visited the Park and found very educative to young children to know about reptiles. This field is not much explored in comparison to others like birds and animals. The Park is really impressive.

Sd.....
DR. S.P. GOYAL
Wildlife Institute of India, Dehra Dun.

I have visited the Snake Park. It is quite educative.

Sd.....
K. SAI PRASAD 31.10.92
Sr. Asst. A.P. Forest Department.

CURRENT RESEARCH PROJECTS AT MADRAS SNAKE PARK TRUST

1. "Ecology of Reptiles of scrub jungles of Tamil Nadu" by Mr. V. Kalaiarasan for his Ph.D. Programme under the guidance of Dr. R. Kanakasabai, Prof. and Head, Dept. of Zoology A.V.C. College Mayiladuthurai. This project is being co-ordinated by Mr. A.N. Jagannatha Rao, Hony. Secretary and Dr. R.S. Pillai, Research Officer, Madras Snake Park Trust.

2. A research project on "Rodent control using harmless Reptiles" is being undertaken by Mr. T. Raveendra Babu for his Ph.D. Programme under the guidance of Dr. P. Vivek Raja, Lecturer in Zoology, Govt. Arts College, Madras-35, co-ordinated by Shri A.N. Jagannatha Rao, Hony. Secretary and Dr. R.S. Pillai, Research Officer, Madras Snake Park Trust.

3. Mr. R. Aengals is working for his Ph.,D on "Studies on Iso-enzymes of Snakes"

under the guidance of Dr. E. Prabhakaran Selection Grade Lecturer in Zoology, Presidency College (Autonomous) Madras-600 005. This project is being co-ordinated by Shri A.N. Jagannatha Rao, Hony Secretary and Dr. R.S. Pillai, Research Officer, Madras Snake Park Trust.

4. The following Research programmes on captivity studies are being undertaken:

- a) Studies on Chamaeleon—R. Rajarathinam and R. Aengals.
- b) Studies on Turtles and Tortoises—R. Rajarathinam and V. Kalaiarasam
- c) Captive breeding in Green Iguana (*Iguana iguana*)—R. Rajarathinam and T. Raveendra Babu
- d) Correlation between morphology and habits of Snakes—Mrs. R. Chitra,

CURRENTLY RESEARCH PROJECTS

**SURPLUS REPTILES AVAILABLE AT
MADRAS SNAKE PARK TRUST IN EXCHANGE**

(Subject to approval by the Government)

WE OFFER

Snakes

1. Indian Python (*Python molurus*)
(Babies and Sub-adults)
2. Reticulated Python (*Python reticulatus*)
(Single specimen, not pair)

Turtles, tortoises and Crocodiles

3. Pond turtle (*Melanochelys trijuga*)
4. Star Tortoise (*Geochelone elegans*)
5. Marsh Crocodile (*Crocodylus palustris*)
(4 year old)

WE ARE LOOKING FOR

Snakes

1. Black Cobra (*Naja naja oxiana*)
2. King Cobra (*Ophiophagus hannah*)
3. Banded Krait (*Bungarus fasciatus*)
4. The Indian Egg-Eating Snake
(*Elachistodon westermanni*)
5. Flying Snake (*Chrysopelea ornata*)

Monitor Lizards

5. Desert Monitor (*Varanus griseus*)
6. Yellow Monitor (*Varanus flavescens*)
7. Water Monitor (*Varanus salvator*)
8. Common Indian Monitor (*Varanus bengalensis*)

Turtle

9. Fresh water turtles-any species.

Crocodile

10. Estuarine Crocodile (*Crocodylus porosus*) (Juveniles and sub adults)
11. Preserved specimens of 5 species of Sea turtles
 - a) Leather back turtle (*Dermochelys coriacea*)
 - b) Green turtle (*Chelonia mydas*).
 - c) Logger Head turtle (*Caretta caretta*)
 - d) Olive Ridley turtle
(*Lepidochelys olivacea*)
 - e) Hawksbill (*Eretmochelys imbricata*)

An Appeal

The Madras Snake Park Trust has obtained, with the help of the Govt. of Tamil Nadu, 2.5 acres of land on the old Mahabalipuram Road on the outskirts of the city of Madras to establish an elaborate Reptilium on modern scientific lines to promote Tourism, Conservation, Education, Service and Research on Reptiles.

The proposed layout and estimates of the various units are shown on the next page. The total cost of the project is estimated around Rs. 125 lakhs or 60,000 \$ (US).

The MSPT now seeks financial contributions from various organisations and individuals to fulfil this ambitious future programme unit/block-wise.

Grants and donations are exempted by the Income tax authorities under 80G vide Ref No. DITE/1146(34)/78 dated 1-4-89 to 31-3-92.

Generous contributions are solicited. Contributions may be sent to "The Madras Snake Park Trust" Guindy National Park—Guindy, Madras-600 022 India.

Trustees of the Madras Snake Park Trust, Madras-600 022.

DETAILS OF COST OF CONSTRUCTION AND DISPLAY

Building 1 and 2 (3 floor)

Each floor has 40' × 40' area and will house Rooms, Mess, Recreational area for Research students, each building 12 students.

Cost per floor Rs. 4 lakhs or \$ 20000.
Total cost of building 12 lakhs or \$ 60000.

Building No. 3 and 4 (3 floor)

Each floor has 70' × 40' area and will house Research Division, i.e. Library, Laboratory etc.

Cost per floor Rs. 7 lakhs or \$ 35000.
Total cost of each building Rs. 21 lakhs or \$ 105000.

Pit No. 5 and 6 (1000 sq.ft.)

Specially designed, natural setting with pond etc., to house 3 species of Indian Crocodiles.

Cost Rs. 1,00,000 or \$ 5000.

Pit No. 7

This will house exotic reptiles like Iguanas, etc., in 500 sq. ft. area.

Cost Rs. 50 000 or \$ 2,500.

Pit No. 8 and 9 (area 1000 sq. ft.)

Skunks, Chamaeleons, Monitors etc., will be exhibited in these enclosures in specially designed habitats.

Cost Rs. 1,00,000 or \$ 5000.

Pit No. 10 and 11 (area 1000 sq. ft.)

Specially landscaped to display land tortoises, marine turtles and fresh water terrapins.

Cost Rs. 1,00,000 or \$ 5000.

Pit No. 12 (Area 500 sq.ft.)

Giant tortoise of Seychelles, Komodo dragon etc., will be displayed.

Cost Rs. 50,000 or \$ 2500.

Building No. 13 and 14 (area 1000 sq.ft.)

Different poisonous and non-poisonous snakes of India will be exhibited in specially designed habitats. King Cobra will find a special habitat cooled by air cooler.

Cost Rs. 1,00,000 or \$ 5000

Building No. 15 and 16.

Indian snake lore and myths which are in plenty will be elegantly brought out and made interesting and attractive for tourists. Simple hall 40' × 40' with a sloping roof.

Cost Rs. 4 lakhs or \$ 20,000 — each building.

Building No. 17 (Demonstration shed—3000 sq.ft.)

To educate the public on reptiles. Hourly display of live reptiles with commentaries in English, Tamil and Hindi. Tapes in 10 Indian languages and choice of 6 Foreign languages will be available for large groups for a special fee.

Cost Rs. 7,00,000 or \$ 35,000.

Building No. 18 and 19.

40' × 40' to house preserved specimens of Indian and exotic reptiles for Research purposes. Sloping roof.

Cost Rs. 4 lakhs or \$ 20,000 each building.

Building No. 20.

This is a -storyed building. The ground floorto be used by visitors as a Rest-shed. The second floor for the Administrative Office of the Madras Snake Park Trust. 3rd floor for Guest house.

Each floor is 70' × 40'. Cost Rs. 7 lakhs or \$ 35000. Total cost of the building would be 21 lakhs or \$ 105000.

Building No. 21.

3 floors each of 70' × 40'. To house an auditorium, a conference hall and a records room.

Each floor costs Rs. 7 lakhs or \$35000 and the total cost of building Rs. 21 lakhs or \$ 105000.

Building No. 22 and 23.

These are quarters for watchman, on either side with 300 sq. ft area.

Cost Rs. 75,000/- or \$ 3500. The 2 units cost Rs. 1,50,000 or \$ 7,000.

Building No. 24 and 26

Open wells of 6' diameter each costing Rs. 25,000/- or \$ 1250. Together they cost Rs. 50,000/- or \$ 2500.

Building No. 25

General store Room of 20' × 10'.

Costing Rs. 50,000 or \$2500.

Building No. 27 and 31

Large underground storage tanks to hold water, each 15,000 litres capacity.

Cost Rs. 50,000/- or \$2500/ each. 2 sumps together would be Rs. 1,00,000 or \$5000.

Building No. 28 and 30

10' × 10' rooms for electric meters and water pumps, each room Rs. 25,000/- or \$1250.

Cost of 2 rooms Rs. 50,000 or \$2500.

Building No. 29

10' × 10' Security room. Cost Rs. 25,000/- or \$1250.

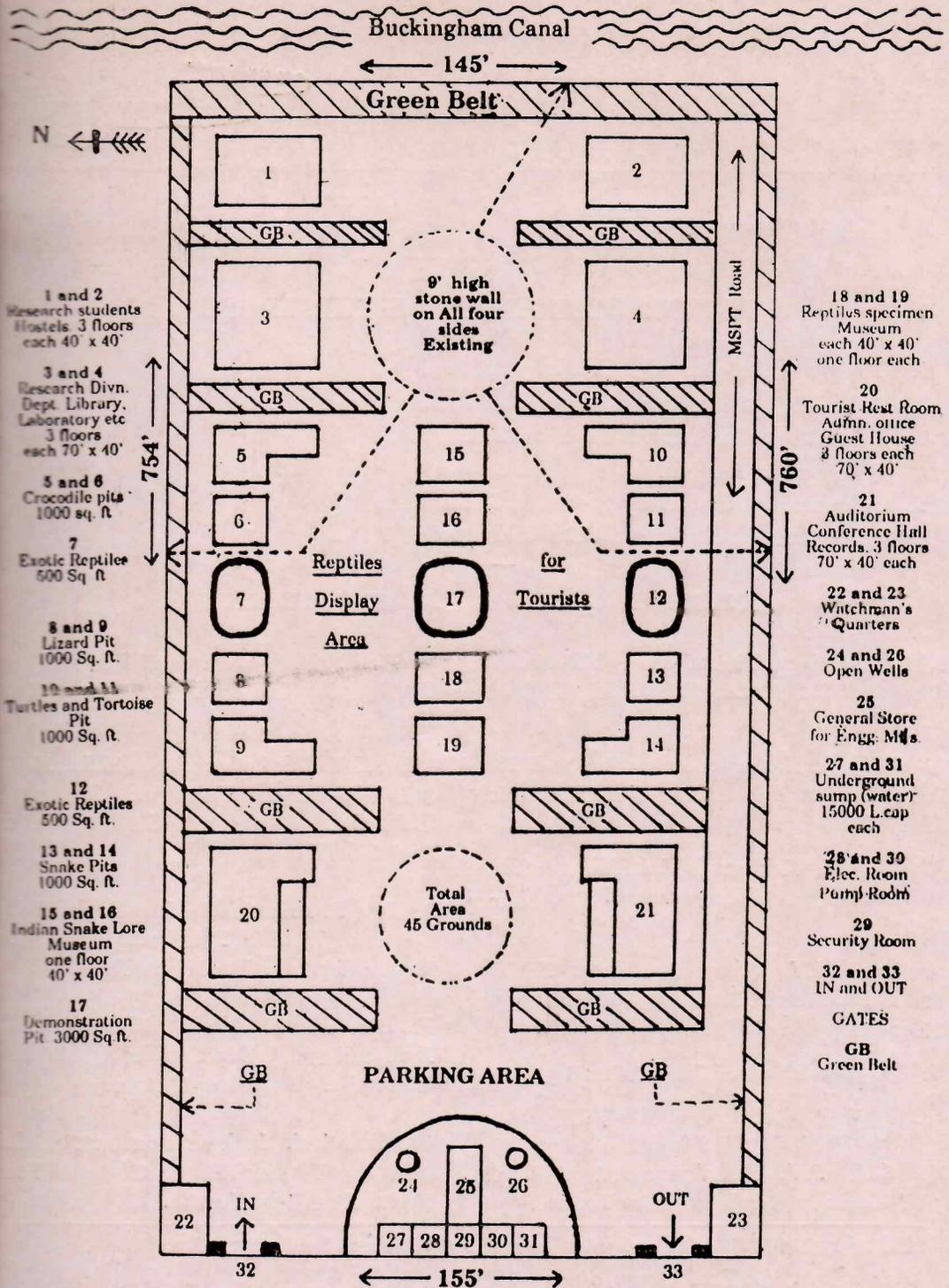
No. 32 and 33

IN and OUT gates Each cost Rs. 10,000/- or \$500. Cost of 2 gates Rs. 20,000/- or \$1,000.

All costs are worked out on present exchange rate of US \$ = 18.50 as on date 1.9.1900.

ALL GRANTS WILL BE DISPLAYED ON A MARBLE SLAB ON THE RESPECTIVE FLOOR/BUILDING.

Proposed Layout of Madras Snake Park Trust at Kottivakkam, Madras



- 1 and 2 Research students Hostels 3 floors each 40' x 40'
- 3 and 4 Research Divn. Dept. Library, Laboratory etc 3 floors each 70' x 40'
- 5 and 6 Crocodile pits 1000 sq. ft.
- 7 Exotic Reptiles 500 Sq. ft.
- 8 and 9 Lizard Pit 1000 Sq. ft.
- 10 and 11 Turtles and Tortoise Pit 1000 Sq. ft.
- 12 Exotic Reptiles 500 Sq. ft.
- 13 and 14 Snake Pits 1000 Sq. ft.
- 15 and 16 Indian Snake Lore Museum one floor 40' x 40'
- 17 Demonstration Pit 3000 Sq. ft.

- 18 and 19 Reptiles specimen Museum each 40' x 40' one floor each
- 20 Tourist Rest Room Admn. office Guest House 3 floors each 70' x 40'
- 21 Auditorium Conference Hall Records. 3 floors 70' x 40' each
- 22 and 23 Watchman's Quarters
- 24 and 26 Open Wells
- 25 General Store for Engg. Mf's.
- 27 and 31 Underground sump (water) 15000 L. cap each
- 28 and 30 Elec. Room Pump-Room
- 29 Security Room
- 32 and 33 IN and OUT



MAJOR OBJECTIVES OF THE TRUST

1. To dispel blind fear of snakes in people
2. To highlight the usefulness of reptiles in controlling rodents and pests.
3. Efforts towards conservation of reptiles.
4. To promote Tourism.
5. To promote scientific Treatment of Snake bites.
6. To conduct Research on the Eco-biology of Reptiles.

TRUSTEES OF MADRAS SNAKE PARK TRUST

1. Shri S. Meenakshisundaram, M.A.,B.L., Advocate, Labour Law Consultant, Trustee & Chairman.
2. Shri A. N. Jagannatha Rao, B.E., Industrialist and Retd. Engineer, Trustee & Hony Secretary.
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11. Shri S.M. Sankaralingam, B.Sc., B.L. Director, Tourism Dept., Govt, of Tamil Nadu, Ex-Officio Trustee.

Edited by Dr. R.S. Pillai and printed on behalf of Madras Snake Park Trust.

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Editorial Board: Dr. R.S. Pillai, Dr. M.V. Rajendran, Dr. G. Durairaj, Mr. M. Krishnan, Dr. K.V. Lakshminarayana, Mr. Sankaralingam and Mr. A. N. Jagannatha Rao