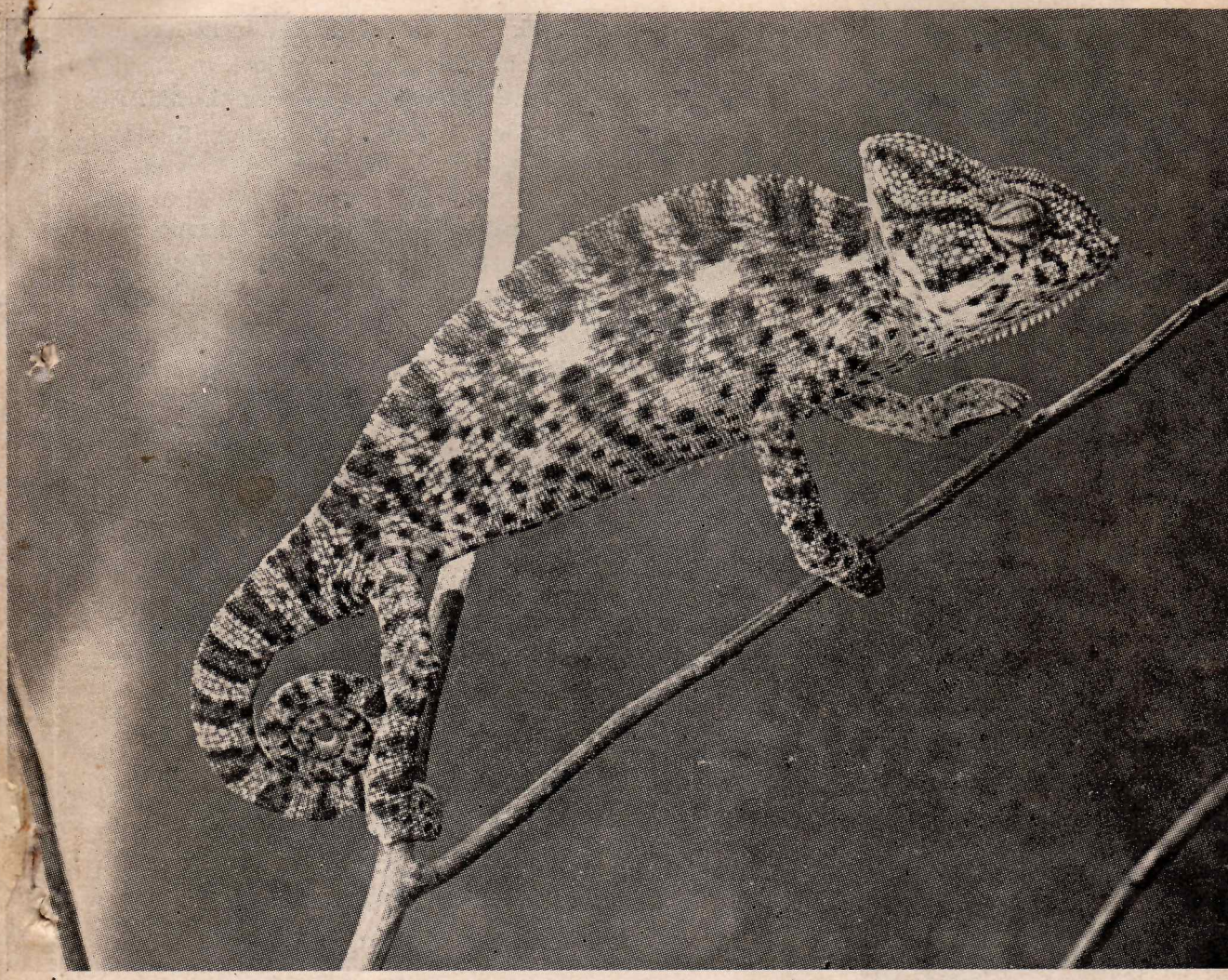
Cobra

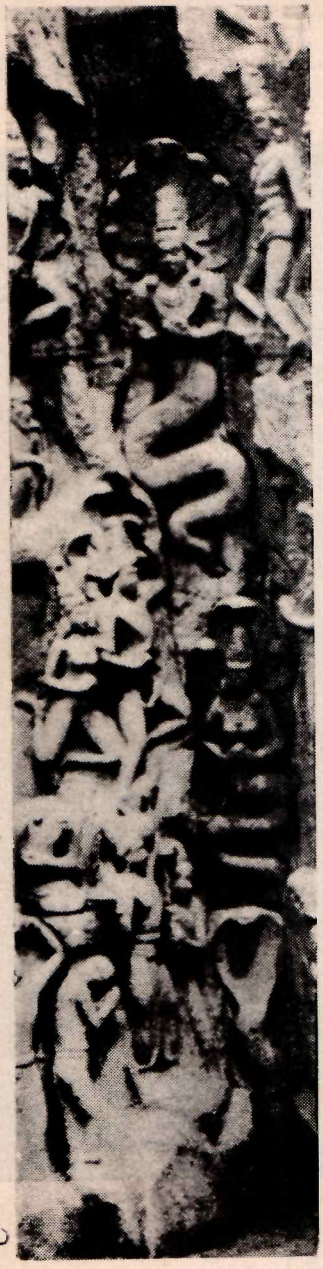
Number 2 — Quarterly Newsletter — Oct.-Dec. 90



Chamaeleon Zeylanicus

Photo : M. Krishnan, Founder Trustee M.S.P.T.

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



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

CONTENTS

Annual Subscription for 4 issues of COBRA commencing from 1—1—91	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 will be issued at Rs. 3/- and Rs. 5/-.

2. The regular hourly reptile 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."

EDITOR'S NOTE

The first issue of COBRA was well received by herpetologists and Research Institutions both in India and abroad. A number of letters of commendation and many subscription orders have since been received.

The release of this number has been delayed due to certain unavoidable reasons. Efforts are being made to bring out the next number shortly.

Dr. R.S. PILLAI
Editor

GENETIC FINGERPRINTING

(A brief report on the work on Snakes carried out by Centre for Cellular and Molecular Biology, Hyderabad, dated 20th Nov. 1990.

Recently Dr. Lalji Singh and his colleagues at the Centre for Cellular and Molecular Biology, Hyderabad developed a new probe and DNA fingerprinting technique for establishing individual identity beyond any doubt. The technique makes use of the genetic uniqueness of an individual and offers its use in establishing paternity, maternity,family relationship and solving rape and murder cases etc.

The technique developed at CCMB is based on a class of repetitive DNA, Bkm (banded krait minor satellite DNA) isolated from a poisonous species of Indian snake, Banded krait *Bungarus fasciatus.* Bkm, which is predominantly associated with DNA sequences that are involved in making a male, a male and a female, a female is also found scattered in other parts of the genome, which is highly variable from individual to individual. These differences can be visualised through appropriate sophisticated technique of molecular Biology—as unique bands on an X-ray film.

ECOLOGICAL IMBALANCE AND ENDEMISM IN UROPELTID SNAKES

Dr. M.V. RAJENDRAN, M.A., Ph.D.
Founder Trustee, Madras Snake Park Trust

Uropeltid snakes form a group of fossorial snakes, little known to regular zoologists and much less to naturalists. The reasons for this poor knowledge is due to (1) their restricted distribution in South India and Ceylon (2) their secretive behaviour avoiding sunlight (3) their burrowing habits, forming tunnels that often go deep (4) the common farmer who encounters them during ploughing their garden shun them as creatures of causative agents for spreading serious skin ailments like leprosy and hence difficulty in collection for study, (5) extreme dehydration when exposed to wind or sun, and (6) very poor salinity tolerance even when transplanted in soil with the kind of earthworms on which they live and feed.

My study of nearly 800 specimens belonging to 22 species in Tamil Nadu and Kerala on snakes obtained from altitudes ranging from 100 metres to 6000 metres from the hills of Madurai, Tirunelveli, Kanyakumari districts of Tamil Nadu, South Kerala (South Western Ghats) Shevaroy hills of Salem, Munnar high range of Kerala, High wavy mountain of Madurai district, Sirumalai near Dindigal, and Alagar Hills of Madurai district (from 1968 to 1990) Javathu hills, Tirupathoor and Kavalcor in Javathu hills near planetorium (North Arcot district) revealed many interesting points of ecological imbalance and endemism. I have made repeated visits to some places within short intervals and every time the observations were different. With great care some hardy types like *Uropeltis phipsoni* and *Uropeltis ellioti* were brought alive and they were kept under ceiling fans in aquarium tanks of large size in soil brought from their own native locality along with earthworm from those soils. It was difficult to maintain them for more than a fortnight. Tunnel formation and feeding in the tunnels were noticed by periodic removal of the pasted black paper. Photographs were taken of new tunnels and adult snakes moving about inside.

Distribution and range shown by Smith's Fauna Volume (1943) does not give details of locality. One thing is clear. Hills which were covered by thick, tall vegetation are now exposed due to deforestation and removal of ground flora which protects the moisture of the soil. Spraying of cultivated tea, coffee and coco plants against insect pests, by pesticides have definitely damaged the shelter and fecundity rate of Uropeltid snakes.

Yet one redeeming factor for preserving them from total annihilation is the peculiar nature of all these snakes bearing young alive in the oviduct (One oviduct gets atrophied). The maximum number of young ones claimed so far is 8. But *Uropeltis phipsoni* which grows up to $1\frac{1}{2}$ feet and which often gets drifted by heavy rain in the Ambadi and Vannanparai rubber plantation near Pechiparai dam of the Kanyakumari district border of Travancore and got settled in coconut and plantain groves of Marthandam almost at sea level were bringing forth 9 colourful and active

young ones. I was able to dissect three gravid females in 1971 and 1974. But later I could not get even one female animal so far. This shows that condition at low elevation is not suitable for their existence.

Endemism :

Many new subspecific variations occur in these snakes. Except a few such as *Uropeltis ceylonicus*, *Uropeltis ellioti* and *Uropeltis ocellatus*, individual hill area within a very small radius harbour one or two species. Careful observation show that individual species exhibit variation from Smith's descriptions of ventral count, length and belly colour (which is a prominent nonadaptive feature). Subspecies are incipient species which ultimatly become good species. Thus, further new species of Uropeltis are clearly in the making.

CURRENT AND PROPOSED RESEARCH PROJECTS AT MADRAS SNAKE PARK TRUST

1. Status, distribution and Ecology of Reptiles pertaining to Tamil Nadu by Mr. V. Kalaiarasan M.Sc., M.Phil. for his Ph.D Programme under the guidance of Dr. R. Kanakasabai, M.Sc., M.Phil, Ph.D. Prof. and Head, Dept. of Zoology A.V.C. College Mayiladuthurai and field guidance of Dr. M.V. Rajendran M.A. Ph.D.

This project is being co-ordinated by Mr. A.N. Jagannatha Rao, Hony. Secretary of Madras Snake Park Trust, and Dr. R. S. Pillai Research Officer MSPT.

2. Studies on chamaeleon by R. Aengals M.Sc., Mr. B. Rathinasabapathy M.Sc., M.Phil and Mr. P. Tamilarasan, M.Sc., Under the guidance of Dr. R.S. Pillai M.Sc., Ph.D., Dr. M.V. Rajendran M.A. Ph.D. Dr. G. Durairaj. M.Sc., Ph.D., Dr. R. Kanakasabai M.Sc., Ph.D, Mr. M. Krishnan M.A., B.L., and Mr. P. Kannan M.Sc. Mr. A.N. Jagannatha Rao is the co-ordinator of the project.

3. A research project on "Rodent control using harmless Reptiles" is being undertaken by Shri. T. Raveendra Babu M.Sc., M.Phil. B.Ed. at MSPT under the guidance of Dr. P. Vivek Raja M.Sc. Ph.D. Senior lecturer of Zoology Govt. Arts College, Madras-35. coordinated by Shri. A.N. Jagannatha Rao Hony. Secretary and Dr. R.S. Pillai Research officer, MSPT

4. Relationship between Morphology and habits of Reptiles will be proposed soon, by Miss R. Chitra B.Sc.

MANAGEMENT OF SNAKE BITES WITH SPECIAL STRESS IN DESERTS

By

DR. BANSI SINGH CHOUHAN,

Director, Laxmi Clinic, Jodhpur.

Introduction :

Snake bite is an acute medical emergency. Its management in desert environment calls for special attention, to be more effective and rational.

Here the 'environment factor', is grossly different in disease producing complex (Host factor — Causative factor — Environment) than in other situations. Moreover, causative factor (Snake) and host (Human beings) are also considerably influenced by environment (Desert).

As management has to be done in a peculiar environment than has been usually thought and written, hence needs special stress with respect to local and regional needs, felt, and practised by the author.

Vast number of Snake bites, are not reported. The available estimates suggest 20,000 deaths every year in India due to snake bites.

Population of poisonous snakes and incidence of bites in deserts, is high.

In India it is rural and agriculture workers' main problem, causing considerable mortality and morbidity leading to economic loss to the country.

Poisonous snakes found in India mainly belong to families—Elapids are—*Naja naja* (Indian Cobra) and *Bungarus caeruleus* (Indian Krait), *Vipera russelli* (Russell's viper) and *Echis carinatus* (saw-scaled Viper).

Elapids produce mainly neurotoxic (Ptosis, glossopharyngeal palsy, flacid paralysis drowsiness, coma and respiratory failure). And Viperids—haemato—Vascular, toxic (local swelling, blood stained sputum, haematuria, non-clotting blood, hypotension, peripheral failure) effects.

Quick, rational and close medical care, markedly reduce mortality and morbidity in these cases.

Management of Snake Bites

Preliminary — till the patient reaches the hospital Acertain. it is snake bite and not insect or rat bite.

— It is a poisonous snake bite.

First Aid :

1. Allay fears—by words of consolation, and re-assurance.

2. Apply tourniquet—immediately

   i) Around a single boned portion of limb between the bite and the heart—it should be few centimetres proximal to the bite on a single bone structure, anatomically feasible.

   ii) It should not be too tight, too light, too long (The idea is to

obstruct the lymphatic drainage and not venous return).

iii) One finger should pass with some difficulty between the tourniquet and the limb (55 mm hg pressure)

iv) Keep it for 20 to 30 minutes and. relieve for 10 minutes.

v) In case of much oedema and pain it can be moved upwards.

3. Immobilization of part—to reduce lymphatic drainage—by splinting the part with crepe bandage.

4. Cold water compress can be applied on the bitten site, cooling with ice (cryotherapy) is not recommended.

5. Wound should be cleaned—with normal saline or mild antiseptic lotion.

6. Local infiltration—5 to 10 cc of anti-venom around the wound, to the depth of not more than $\frac{1}{2}$ inch.

7. Take the patient as quickly as possible to the nearest hospital, ideally the patient should be transported by motor vehicle, stretcher or on the carrier of a bicycle.

8. Avoid wasting time in other treatments.

9. If possible—killed snake should be taken to the hospital.

Injection : Tet / Vac / Ad's, $\frac{1}{2}$ cc, Intra-Muscular

In case there is likely delay of more than two hours in reaching hospital —

Intramuscular antivenom 20 cc should be administered in the gluteal region, preferably on the lateral aspect of the thigh, and massaged.

In case of further delay 20 cc of antivenom should be repeated intra-muscularly, after two hours. (In such situation one should not wait for sensitivity test nor till the patient reaches hospital after much delay).

Controversial first aid methods—

1. Incision—on the site and letting out blood.
2. Suction
3. Refrigeration
4. Cauterization
5. Excision, amputation—all these have been rejected.

Preliminary Treatment—where all facilities are not available—and distressing poisoning has appeared before the patient reaches hospital—like local pain—oral paracetamol is preferred to asprin—to escape gastric bleeding. Severe pain—Pethedine 100 mgs is administered. Vomiting—Patient should be given chloropromazine 25 to 50 mg, preferably intravenous; if not orally.

Syncopal attacks and anaphylactic shock—

1. Antihistamine — Chloropheniramine maleate 10 mg, preferably intravenous, if not, orally.
2. Hypotension and broncho—constriction—Injection Adrenalin 1 in 1000, $\frac{1}{2}$ cc subcutaneously.
3. Respiratory distress—Patient laid on the side, airway cleared by suction, mouth to mouth respiration and external cardiac massage should be instituted. In hospital, endotracheal institution and oxygen be administered.

Hospital Treatment —

If diagnosis of poisonous snake bite is not certain the patient should be kept for observation in the ward for 24 hours. But when signs and symptoms reveal envenomation (spontanous bleeding from gingival sulci is the first sign of bleeding) bleeding from recent wounds and echemotic skin lesions suggest blood coagulation defect, in haemato-toxic envenomation, Neurotoxic—(blurred vision, feeling of heaviness in eye lids and drowsness, raised eyebrows, even before ptosis can be demonstrated—'puckered forehead', dyspnoea, abdominal respiration and cynosis) in an endemic area, benefit of doubt should be given to the patient, and treatment to be started on the lines of venomous bite, and continued/modified according to the response and appearance of signs and symptoms.

If there is history of reaction to antivenom but there is danger to life—revealed by systemic manifestations, antivenom treatment can be given preceded by the pretreatment with—Adrenalin, antihistamine, corticosteriod (Rapid de-sensitization is not recommended).

Administration of Antivenom —

Poly-specific antivenom against four common poisonous snakes is available, well stored, retain their activity for five or more years.

Antivenom should be given as soon as as indicated; but it is never too late to give in the presence of envenoming systemic manifestation.

Intravenous route is the most effective and convenient, should be continued for 48 hours, without taking out needle, after once inserted. All medication, partial nutrition, can be given through I.V. tube, without making any more puncture, which otherwise bleed and cause big haematoma. Moreover patient lies in bed without any risk of slight trauma and haematoma formation.

Else antivenom diluted in isotonic fluid—injected over a period of 30 to 60 minutes, even un-diluted antivenom can be given in rural areas.

In the absence of someone who can give Injection, I.M. can be given in the lateral aspect of thigh.

Initial large dose of antivenom may not prevent later toxic symptoms, hence with initial loading dose it has to be continued with the maintenance dose as required by the systemic manifestations.

Neurotoxic signs show improvement within 30 minutes of antivenom therapy. Spontaneous bleeding respond with 6 hours.

A second dose of antivenom should be given if cardio-respiratory symptoms persist more than 30 minutes and incoagulable blood persists for more than six hours.

Large dose of antivenom may be required if bitten by species capable of injecting large amount/extremely potent venom.

Children require more antivenom.

Antivenom reaction develops—
Early reaction—within 10 to 180 minutes of administration.

Late reaction—(Serum sickness)—within 5 to 24 days—average 7 days.

Supportive Treatment —

Anticholinesterase drugs are useful — It is worth trying Tensilon (endophonicum chloride similar in action to neostigmine)—when given 10 mg I.V. response is instantaneous, but is short lived.

Atropine sulphate 0.6 mg is given, first I.V. to block unpleasent parasympathetic

effects (increased secretions, abdominal colic etc). followed by neostigimine 0.5 mg. I.V. half hourly for first five doses and thereafter, interval is increased, depending upon the clinical response.

Hypotension and Shock—combated with, fresh whole blood, preferred to plasma expanders, Methyl prednisolone 30 mg/kg may be useful.

Renal failure—should be suspected when urine output drops to 400 cc in 24 hours, and treated accordingly. In case of disseminated intravascular coagulation, heparin is the anticoagulant of choice, in a dose 100—150 units/kg I.V. repeated, 6 to 8 hourly if required.

Diet—some venoms can cause nausea, vomiting and diarrhoea, so keep on I.V. fluids, or bland liquid diet for first 24 hours following snake bite.

Local infection—should be dealt with by Penicillin and Gentamycin.

Snake venom ophthalmia—caused by venom sprayed by spitting snakes on the face from a distance of 6' to 8' with marked accuracy, causing—conjunctivitis, corneal ulcer, opacities. Absorption of venom from eyes is not much to cause systemic effects. Venom of these snakes is irritant and destructive on contact with conjunctiva and mucous membrane of nose.

Treatment is—immediately wash and irrigate eyes; with water, milk, bland fluids, if nothing is available, as in remote deserts, with urine, other entities to be treated as usual.

Preventive—long trousers, long boots, socks, light, stick, diminish chances of bites. Repellents and flash lights—keep snakes away.

Prophylactic—Immunization against snake venoms—venom toxoids have been used to immunize farmers at high risk, in Japan; tempting for our country as well.

Need for special stress on the management of snake bites in desert environment—is rational and justified—

As said, "desert is a land of sand, sun, snakes and sorrow".

It is observed that population of snakes is high in deserts, and many of them are poisonous—chances of biting are also more because of nocturnal activities of both (man & snake) in this environment.

Epidemics of snake bite have resulted from a sudden increase in population of snakes after flash floods, invasion of snake habitats, by men for developmental activities —roads, buildings, and moving farmers to newly irrigated areas in former dry zones.

During floods—snake pits are filled with water, they move floating to nearby high and dry areas for shelter, where human beings and cattle have also shifted. The area is congested with little space for men, animals and snakes to move, the nights are dark, cloudy, absence or insufficient light in rural settings, hence chances of snake bites are more. The management becomes more difficult as the means of transport and communication are disrupted—victim can neither easily reach medical centre nor medical man reach the victim. So sufficient antivenom should be made available at the nearest medical centre before the onset of monsoon i.e. April/May.

I would recommend in the light of personal experience—areas and people likely to face such situation in future, may be educated, trained in giving at least I.M. anti-

venom, which should be made available to them quite in advance.

In deserts—monsoon is uncertain, agriculture is gamble, economy is fragile, droughts are frequent at times continuous, hence green vegetables and fresh fruit are at times absent or scarce, hence vitamin 'C' deficiency is severe and endemic; viperid bite induce in such areas profuse bleeding. so vitamin 'C' should be given in large doses along with other coagulants.

Proper care should be taken of water, electrolyte—potassium and sodium supplementation, which may be low or on the lower side of normalcy, and clinically manifest at slight increase in demand, after bleeding.

Blood pressure will drop low early in chronic voluntary dehydrated individuals, as is frequent in desert environment.

Capillary oozing will continue, due to hot atmosphere—as has been observed after surgical operations in this region.

Chances of hyper-pyrexia will increase due to hot environment, and of infection due to sand storms, low resistance,—due to Protein energy malnutrition; the same will be responsible for delayed wound healing.

A patient presenting with ascending type of motor paralysis, with or without coma—

With no local marks or history of snake bite should arouse strong suspicion of neurotoxic envenomation in desert environment and benefit of doubt be given to the patient; Tensilon test should be performed, and treated accordingly. Jammu Kashmir Medical College has reported such comatosed 22 cases out of which 20 had recovered in 1984. Potassium salts 25% aqueous solution 4 to 6 cc be given three times a day in such cases.

Illiteracy, superstition. scattered population, poor means of transport, long distances, with inadequate health facilities, delay in treatment all add insult to injury.

Opium addiction is highest in Rajasthan desert—when taken by a case of snake bite is dangerous and contra-indicated.

These are a few pecularities to be remembered while managing snake bites in deserts—equally important for defence personnel posted in this region.

Recommendation

A Committee should be formed to create new avenues for further promotion of studies on Snake and Human welfare—

i) making a snake farm—in Western Rajasthan—to study the local species

ii) — to study Medical, Zoological, Agricultural, Sociological, Anthropological, Cultural, Agronomical and Immunological aspects.

iii) Intensively study the myth or truth about "Peenu"

iv) Study physiology of parotid gland—which converts material reaching it to venom.

v) Prepare educative material about Snake—environment balance, Management after and their prevention, medicinal uses of different parts of Snakes, venom/fat scientifically supported and indigenously used to get scientific explanation for them.

vi) Vaccine preparation against known species in this region.

vii) Local and indigenous treatment given in this region and their value in the management of bites.

— A "snake farm" should be made in Western Rajasthan around Jodhpur for deep and extensive study, incorporating other disciplines, related to human welfare.

Reproduced from Paper presented at :

"Training Programme on Snakes and Human Welfare"

(March 5th to 9th, 1990)

Zoological Survey of India,

Desert Regional Station, JODHPUR.

Courtesy : Officer-in-charge

Desert Regional Station

Zoological Survey of India

Jodhpur.

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ADAPTIVE MODIFICATIONS IN SNAKES

P. TAMILARASAN and R. CHITRA,
Madras Snake Park Trust

Snakes come in various shapes and sizes—long and slender, thick and heavy; some have pointed heads, others have it broad or blunt, eyes may be rudimentary or conspicuosly large; girth of body may be uniform or different; tail may be long, short, pointed or flattened. Colour and markings are also so different in different species and sometimes even within what is considered as the same species (e.g. Indian Cobra, Black Cobra and White Cobra). Nevertheless one can see, within this apparent diversity, a purpose or mechanism evolved over millions of years for a particular mode of life, which is referred to as adaptive evolution. Without going into the physiological aspects, one can broadly group these as morphological adaptations for life in a specific environment.

These specialized habitats could be broadly grouped as arboreal, fossorial and aquatic habitats.

Adaptations for an arboreal life :

The adaptive modifications in the climbing and arboreal species of snakes are quite marked. The body is very long and they rely on their length to enable them to span the gaps from branch to branch. The fore part of the body is very light, the 'neck' being long and slender and the tail lengthened to provide a counterpoise. Tail constitutes often between 30 and 45 percent of the total length. To avoid slipping sideways off the narrow branches along which they have to creep, many species have developed anti-skid arrangements in the form of a pair of angular, keel-like ridges, one on each side of the belly. Eyes are well developed and often very conspicuously large since good vision with ability to judge distances accurately, is very essential. Binocular vision is common and the temporal fovea reported in the Vine snake, *Ahaetulla* probably allows it to judge distance accurately.

Many of the climbing snakes have the ability to ascend vertical surfaces, often as much as two-thirds of their own length. In doing so they balance on the looped last one-third of its body and make use of every tiny irregularity of the surface. Jumping from branch to branch is a desirable attribute in arboreal species. This is achieved by sudden straightening from a looped position. Some tree snakes can spring more than a metre from branch to branch, and even vertically upwards.

There are three main groups of tree snakes in India viz. the bronze backs, the vine snakes and the cat snakes. They are all thin and long. They have good eyesight and speed to hunt lizards, tree frogs and even birds.

The common bronze back lives mostly on bushes and trees. At rest it looks more like a branch than a snake, its bronze colour and stripe makes the resemblance stronger.

The vine snake or green whip snake with its long pointed head, exceedingly slender wiry body and bright leaf green colour merge

so well among foliage that it become "invisible". Its body sways with the wind, like leaves. Some species even drop dead to the ground when touched, remaining motionless like a green branch.

Cat snakes are equally long and thin and chase lizards that hide on plam leaf roofs at night. The most celebrated tree snake, however is the flying snake, which possesses a spectacular colouration. From a height of about 30 metres it glides down by flattening and hollowing its belly to sail down to the ground.

Adaptations for fossorial or burrowing life :

The burrowing line of specialization has some features in common with the aquatic. The head is narrow, pointed and hard. The body is short, neck muscles powerful, tail very short, which may be not more than 5-per cent of the total length. Eyes, being of little value underground are always reduced in size. They are unable to stand higher temperatures. They make their own burrows while some others depend on burrows made by rats, termites and crabs.

There are three groups of borrowing snakes in India viz. blind snakes, shield tails and sand boas which exhibit the above morphological adaptions.

Adaptations for life in water :

Snakes that live in water are usually average-sized, without a distinct neck and have short tails. They do not move fast on land, like the tree snakes but are swift swimmers. Their diet being either fish or frog, the teeth are unspecialized and range from 20 to 40. Valvular nostrils are also seen to excude water while submerged.

Water snakes have invaded fresh water, estuaries or brackish water and the sea. Most of the freshwater forms are keelbacks, meaning that each scale has a tiny fold in it. A typical brackish water snake is the dog-faced snake. They are nocturnal and are seen sometimes in large numbers. However the pinnacle of aquatic adaptation is demonstrated by the sea-snakes. To combat water current and waves they have a flattened, paddle-shaped tail.

There are some other habitats that snakes have colonised. Thus the rat snake and the pythons are typically land snakes. The sandy desert also has its complement of ophiofauna. Although they do not appear to have pronounced morphological modifications, there are adaptation for a life in this hostile environment. Water conservation in this hot and dry climate is a problem which is achieved by their ability to excrete waste in a semi-solid state. Locomotion in the loose shifting sand, with little or no vegetation does not provide footholds for the ventral plates. Many vipers have therefore developed a modified progression known as "side-winding" instead of the typical serpentine slithering. They also bury themselves under the sand to escape the intense heat of the midday sun. Sand boas bury themselves completely under the sand while some vipers keep their head above.

Colour, also is an adaptation for concealment. Some, like the vine snake has a body that is leaf-green to merge with foliage or other tree snakes with the colour of bark. Others have disruptive colour which helps to break the outline of the animal.

To sum up, snakes do exhibit such adaptations that, one can, by looking at the morphological features, often decide its mode of life and the habitat where it lives.

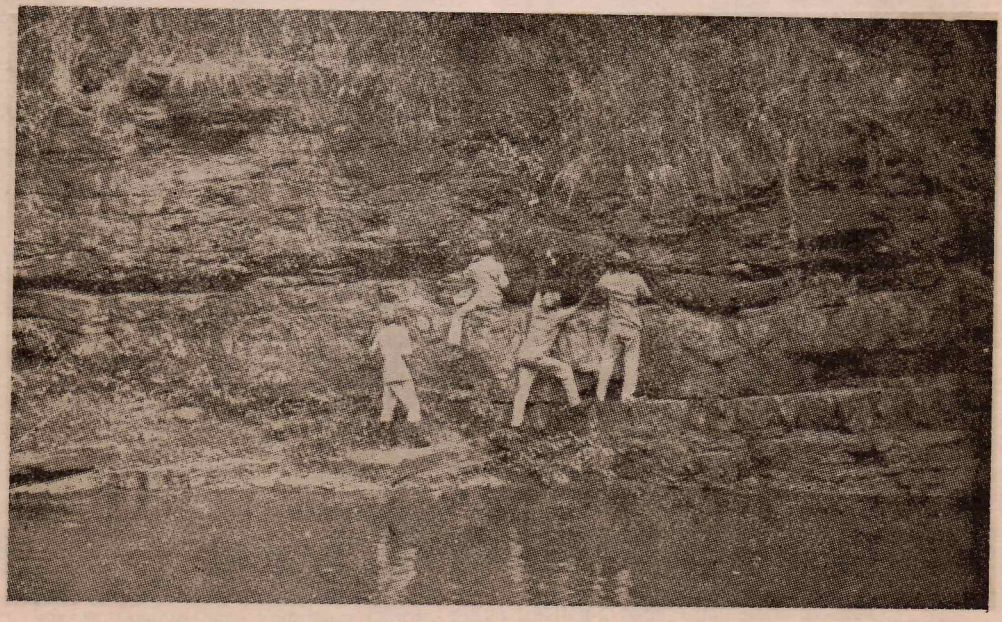
The authors are indebted to Dr. R.S. Pillai, Research Officer and Shri A.N. Jagannatha Rao, Hony-Secretary of the Madras Snake Park Trust.

REPTILE LORE

Lord Krishna is appraised of the presence of the deadly Kalinga Snake in the Yamuna River, who had spewed venom and caused the death of cows of the gopalas. Everyone is frightened. So Lord Krishna jumps into the river and siezes Kalinga, of five hoods and after a duel overpowers and subdues him. He catches the tail and dances on the hood. This is popularly known as Kaliya or Kalinga nartana. Philosophically the five hoods are symbolic of the pancha indriyas or five organs of sense and control over these is supposed to make one a Yogi or Superhuman. Small bronze pieces are popular items of sale of the cult of Kaliya nartana.

Krishna Murari Rao

The Narmada Project visited bv the M.S.P.T. team for the 23 days' Survey of herpetofauna. Nov. '90

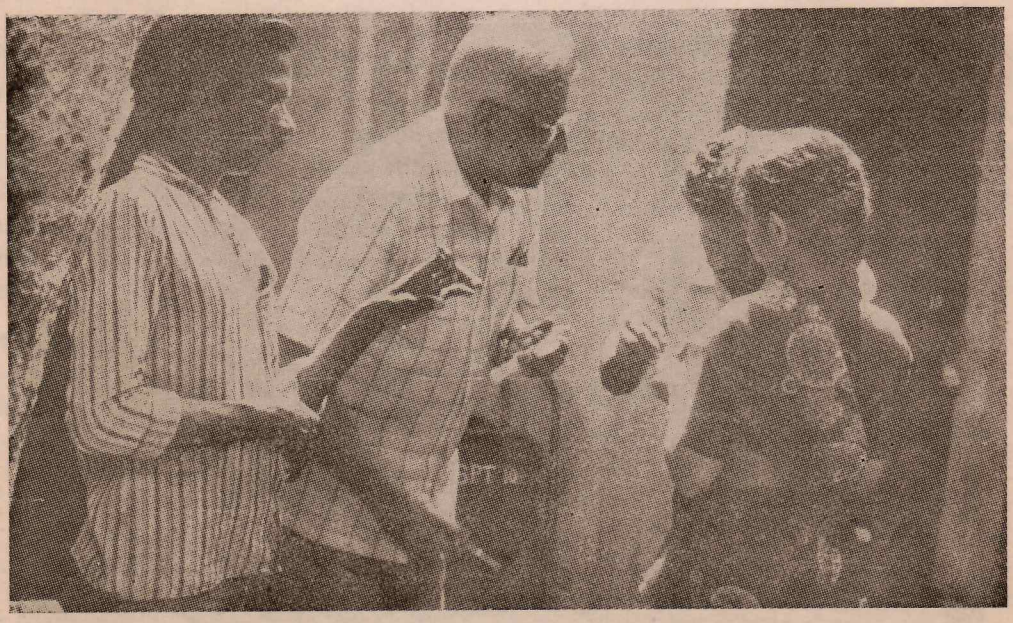


The four Snake catching experts: Mani, Subbiah, Kollapuri and Rajendran on the reptile search Nov.'90 at Narmada Sagar M.P.

The Narmada Reptile Expedition team of the MSPT at Pamakhedi FRH Nov. '90

Aengals, Research Scholar MSPT studying Chameleon in the field.

Prof. Dr. M.V. Rajendran—Trustee-MSPT guiding a *Post mortem* on a Python. at M.S.P.T.



Dr. P. Jagannathan, Veterinary Officer, MSPT treating a baby Chameleon assisted by Researchers Aengals and Chitra and Asst. Selvaraj

A.N. Jagannatha Rao, Hon. Secy. & Founder Trustee MSPT conducting an Audio Visual Educational talk at Presidency College (Zoology Dept) Madras

Reptile products ablaze! (See report on page 22) Chief W L. Warden K Viswanathan. (TN) in the picture

REPTILE NEWS IN PRESS

NEW SPECIES OF TORTOISE REPORTED

—*Voice of the Turtle* (*USA*) *October* 1990.

The Tortoise Survival Project—Tortoise Trust, London, reports the discovery of a new tortoise species in Tunisia. The adults are typically 12 centimeters and weigh 360 grams close to Testudo Kelimanni in overall size. Their clutch size ranges from 8—12, the smallest eggs for any land tortoise—only 13 × 15 millimeters.

They differ from all other currently recognized Mediterranean land tortoises in having a unique suprapygal structure (median carapacial bone between the posterior-most neural and the pygal), which is closer to that of Hompous or Geochelone than the Testudo.

The tortoise is fully described in "A Preliminary Report on the Taxonomic Biotypic, and Conservation Status of the Land Tortoises of Tunisia" by A.C. Highfield, Project Director of the Tortoise Survival Project (published by Tortoise Trust B M Tortoise London, WCIn 3 xx, England).

The Tortoise Survival Project is launching an international appeal for the further study and collation of data on these remarkable new tortoises.

From: Plastron papers March/April 90

ATTACK OF THE SNAPPING TURTLE :

—*Voice of the Turtle* (USA) October 1990.

A large 32 1b., one year old Trumpeter Swan was killed by a snapping turtle at Henry lake in Western Hennepin Country in Minnesota. On May 13, 1990 a local resident noticed a swan lying in the water. When the person paddled out the swan, a large snapper was found to be attached to the swan's neck. The dead bird was brought to the Hennepin Park office and was sent to the University of Minnesota for necropsy.

The necropsy report showed that there was food in the mouth and throat of the bird. There was also water and mud in its trachea and lungs. This indicates that the swan was drowned by the turtle and not that turtle was simply scavenging on the dead bird.

Why would a Snapping Turtle take a bird as large as a Trumpeter Swan ? It was really hungry—no. It made a mistake—Yes. Snapping Turtle normally feed on fish, frogs, carrion, vegetation etc. They will take swans that are less that two weeks old. In this case, the swan probably struck its head under water in front of the stationary turtle. The turtle saw the small head and did not realise what it was attached to!

From : Minnesota Herpetological Society Newsletter, June 1990.

SAFETY REMINDER

—*Voice of the Turtle* (USA) October 1990.

Be sure to make periodic safety checks of your turtle yard and surrounding area. Repair broken fencing, clear away tangled vines or bushes that could ensnare your animals and make sure there is adequate shade, water and burrowing space at all times. Clear away bits of paper debris, plastic coverings etc, that could cause intestinal blockage if your pet ingests them.

From: Shell-out (Turtle and Tortoise Club of Santa Barbara) 6/90.

COBRA EATS COBRA

—The Hindu 23.10.90 Chikmagalur, Oct. 22.

A cobra swallowing a frog is quite common. But a cobra swallowing another cobra is a rare event.

According to reports reaching here, the incident took place at Maller Shalli village in Tarikee taluk of Chikmagalur district.

The report said that two cobras over five-feet length fought each other in the cattleshed of Patel Chandrappa. In an hour-long struggle, one died, and was eaten up by the other. Several villagers witnessed this incident, the report added. A Kannada proverb rightly say "Konda Papa Tindu Parihara".—Our Correspondent.

IT IS A TYRANNOSAURUS

—The Hindu 6.11.90 Madras, Nov. 5.

A nine metre replica of the Tyrannosaurus, a prehistoric reptile will be a major attraction at the Children's Museum in Egmore.

Finishing touches are being given to the fibreglass model reinforced with a metallic skeleton. Its hind parts will be painted yellowish brown and its belly pale yellow according to Mr. Keshava Ram, Director of the Museum. The model is smaller than life size.

The animal with scaly body, big sturdy hind limbs, small forelimbs and large domed head, used to be herbivorous, feeding on the higher branches of tall trees. It became omnivorous when food supply became scarce.

"Although textbooks and relatively older scientific material placed the animal's existence in the Jurassic era (130-150 million years ago), advanced scientific thinking and practical experiments conducted in recent years by a number of persons on animal preservation has led to the belief that the animal could have lived even a few thousands of years ago", says Mr. Keshava Ram.

Another model of a Stegosaurus will also be placed by the side of the Tyrannosaurus replica. The cost of erecting the two models is around Rs. 3 lakhs.

SNAKE CATCHER DIES OF BITE

—"The Indian Express"—14.11.1990.

Tirupati, Nov, 13: 'Pamula' Ramaiah, an SV University employee who used to catch snakes, died on tuesday after a snake he had caught bit him.

The 60-year-old Ramaiah, who had caught hundreds of poisonous snakes from the university campus, died within minutes after he was bitten by the one-foot long snake. After catching the snake in the morning, Ramaiah had, as usual kept it in the pocket of his trousers. When he tried to take the snake out, it bit his finger and Ramaiah collapsed instantaneously. He was rushed to the university hospital but he had died before reaching there.

A LIZARD ON ONE'S HEAD

—Indian Express—22.12.90.

by

T.S. Sudhir

My scream broke the silence of the morning and brought my family scurrying to me. "What happened" ? they asked in chorus. I could feel my face going red and my knee going weak as I faltered for words. "Li...Liz... Lizard". I pointed to the ceiling "A lizard fell on me as I was entering the bathroom".

Their reactions ranged from horror, shock disgust and fright. I could feel my hair, standing on end. My grandmother came forward. "Where did the lizard fall"? she asked.

"On my head" I replied. She came a step closer and asked in a hushed tone "where on your head?" I thought that was a stupid question but pointed quietly to the centre of my head.

My grandmother muttered something as all of us looked in suspense. She broke the silence after a minute saying, "A lizard falling on head can be both auspicious and inauspicious. If it falls on the left side, the person stands to lose money. If it falls on the right side, he might gain money. But if it falls on the centre.." Her voice trailed off.

"What if it falls on the centre, grandma?" I asked quickly. I was most curious about the consequences of my hair-raising rendezuous with the little reptile. "It causes death", she muttered, shaking her head vigorously.

I simply couldn't digest the fact that the morning which had come as any other could carry such disastrous news for me.

My brother dismissed the superstition outright. "How could a lizard's fall cause a person's death ? It is most irrational, most incredible". I was inclined to believe him but a nagging fear remained. After all, it was my life which was at stake, not his.

I got more frightened. Grandma tried to console me by telling me that she wasn't quite sure if a lizard's fall on the centre of one's head while entering a bathroom could be fatal. Even so, one had to be careful and nothing could be ruled out.

Dakshinamoorthy, a self-professed savant was invited over. Delighted at the attention he was attracting, he ordered that the 'patient' be wrapped in a purple bedsheet (We had great problems procuring one). He advised complete rest in bed for two days and ordered neem and betal leaves to be strewn around the bed. A cluster of peacock feathers too was to be kept by the bedside. All this he felt, would be enough to ward off the evil effects of the terrible event.

I was practically tied to the bed for two days, and heaved a huge sigh of relief after 48 hours had elapsed; so did everybody else.

Dakshinamoorthy is a regular visitor to our house now. He instructs on what should be done if a mosquito sits on one's head without biting or if a cockroach comes out of the wardrobe on two legs instead of four.

TURTLE POACHERS NABBED

—The Indian Express. 7.12.90.

Madras, Dec. 6 : The joint operations by Coast Guard and wildlife officials has netted a group of poachers hunting Olive Riddley turtles which come in droves to the Orissa coast for nesting each year.

The Coast Guard ship "Ramadevi" patrolling the waters off Balasore, Cuttack, Puri and Ganjam caught the poaching trawler with three turtles alive in nets and some five on board. The trawler was handed over to the wildlife authorities for further action.

Commander, Coast Guard Region (East) Commodore J.P. Carneiro said each Riddley turtle weighs 30 to 59 kgs and the animals visit the Orissa coast between the months of November and February. The sand quality is conducive to the nesting.

The turtle population has been depleted by human consumption of eggs, non-human consumption by egg predators like wild boar, dogs, birds, poaching of adult turtles, and trade in turtle products like leather and shell.

NEWS FROM MADRAS SNAKE PARK TRUST

Educational Programmes

MSPT continued its educational programmes on reptiles by giving talks and video presentations at:-

1. Womens Christian College, Nungambakkam, Madras on August 90.
2. Madras Christian College, Tambaram, Madras on 9th October 90.
3. Presidency College, Madras on 11th October 1990.
4. Stella Mautina College of Education, K.K. Nagar, Madras on 12th October 1990.

Snake Survey at BEL, Nandambakkam, Madras

As requested by BEL management, MSPT did a one day snake menace consultancy at their premises on 20.11.90. The team consisted of Mr. A.N. Jagannatha Rao, Hony Secretary, Mr. V. Kalaiarasan, Mr. R. Aengals and Mr. B. Rathinsabapathy, Research scholars and three snake catchers.

Herpetological Survey of Narmada Valley (M.P.)

As desired by the Narmada Valley Development Authority and financed by the World Bank, the Friends of Nature Society (FONS), Bhopal has requested the MSPT to undertake a herpetological survey of the Narmada Valley from 21st November to 11 December, 1990. The party led by Shri. A.N. Jagannatha Rao comprised Dr. M.V. Rajendran, Dr. R.S. Pillai and Five Research Scholars viz. Sarvashri V. Kalaiarasan, A.J. Ganesh, B. Rathinasabapathy, R. Aengals, and P. Tamilarasan. There were 4 expert snake catchers of the MSPT (M. Mani, Subbiah, Kollapuri & Rajendran) The study, carried out from three camps was aimed at identifying the herpetological fauna (Reptiles and Amphibia) of the area, examining the impact of clear-felling and submersion on the herpetofauna in the wake of the proposed Narmadasagar Dam and making suitable recommendations for their conservation/translocation etc. The team was also requested to examine the Island Ecology in the proposed submersion area.

Thriveni Academy Snake Survey

A team consisting of Mr. V. Kalaiarasan and Mr. B. Rathinasabapathy and a snake catcher visited Thriveni Academy, Vadakkupet, Chinglepet District on 14.12.90.

To minimize occurrence of snakes, clearing of shrubs, grass and garbage was recommended. MSPT was requested to continue survey to minimize the snake problem in their premises.

Snake skins consigned to flames :

Over 6.5 lakhs Snake skins were consigned to flames on 17.12.90 at the depot of the Bharat Leather Corporation in the TALCO Industrial complex in Madhavaram, Madras. Madras Snake Park Trust was represented by Mr. A.N. Jagannatha Rao. Hony, Secretary, Mr. R. Aengals, Miss. R. Chitra, Mr. B. Rathinasabapathy Mr. P. Tamilarasan and Mr. T. Raveendra Babu. Besides snake skins, 70,500 skins of monitor lizards, 761 articles such as handbags, wallets and belts made out of snake skin, 2,350 jungle and desert cat skins and 15 stuffed mongooses and Cobra were also destroyed.

Mr. P. Kannan, Regional Deputy Director. Wildlife Preservation, Government of India and Trustee, Madras Snake Park Trust, who organised the programme in collaboration with the Madras Snake Park Trust and Office of the Bharat leather Corporation hoped that the symbolic incineration would help to curb the demand for Snake skins and other Wildlife trophies and create an awareness on the need to preserve the ecological balance. Mr. K. Viswanathan, Chief Wildlife Warden, Tamilnadu set the contraband skins and articles afire. Among those present were Mr. Panna Lall Mundhra, Chairman, Animal Welfare Board of India, Mr. V.J. Rajan, Secretary, Madras Naturalists' Society, Mr. Preston Ahimaz, State Organiser W.W.F. for Nature India, Mrs. Manonmani of C.P.R. Foundation and Mrs. Saraswathi of Blue Cross Society.

Ronex '90

Rotary Environmental Exhibition was conducted by the Rotary Club of Madras, South and Anna University, Madras at Anna University between 7th to 10th December 1990.

The Tamil Nadu Ex-Chief Secretary, Shri M.M. Rajendran, I.A.S. inaugurated the function and opened the exhibition on 7th December 1990. MSPT participated by presenting hourly video shows on Environmental conservation and pollution control. Besides, a stall exhibiting live reptiles like Star Tortoise, Flapshell turtle, Crocodile, Ratsnake, Indian Python, Reticulated Python Chamaeleon, Cobra and water snake was set up. Panels displaying Forest Resources, Wildlife, Rural and Urban industrial pollution were also exhibited.

Environmental Seminar on "Our Eroding Ecosystem" conducted by Rotary Club of Madras, Central and Madras Naturalists' Society of Madras on 23.12.1990.

Dr. M.S. Swaminathan's paper was presented. He felt that NGO's and mass media should launch a concerted and sustained programme of awareness generation during 1991. Dr. R. Pitchai, Anna University, Madras talked on Pollution Control. Dr. T.N.Ananthakrishnan, Director, Entomological Institute, Loyolla College, delivered a talk on Biological diversity. Mr. A.N. Jagannatha Rao, Hony Secretary MSPT gave a talk on "Eroding Ecosystem and the role of Governmental and Non-Governmental organisations and conservation measures". He emphasised the urgent need to start a EPA (India) Environmental Protective agency, on the lines of USA. This is a very powerful and effective body in the USA.

Blood analysis studies in Reptiles

Shri S. Meganathan submitted M. Phil dissertation entitled" "Haematological Studies in Reptiles" under the guidance of Prof. S. Venkatachalam, M.Sc., M. Phil., Department of Zoology, A.V.C. College, Myladuthirai in December, 1990. The study was undertaken at MSPT and coordinated by Shri A.N. Jagannatha Rao, Hony. Secretary and Dr. R.S. Pillai, Research Officer, MSPT.

COMMENTS BY SOME IMPORTANT VISITORS TO MADRAS SNAKE PARK TRUST DURING 1990

I have visited this institution today. I have visited this before also. Sometimes I feel that snakes love more than human beings. I am very happy that this snake park is maintained well.

P.K. RAMAKRISHNAN,
Minister for Co-operative
and Fisheries
Kerala.
20-8-90

Visited the Snake Park and seen the all types of snakes. They are well and healthy and give good education to people as to which type of snake is poisonous and non-poisonous. We felt happy and enjoyed the Snake Park.

Yours faithfully,
Dr. B. BALAN,
A.P. Hyderabad,
11-8-90.

I am very impressed to see the collection and the knowledge given is so useful and new to me. I didn't have that closer look before.

Thanks for your administration.

MANISH CHATURVEDI,
L-37 Bhadwar Posh,
Coloba
Bombay

The reptiles we saw are well kept here.

The setup is very natural. This should be kept up. Very much impressed.

T.G. KANGAI,
High Commissioner for Zimbabwe,
26-10-90

It is always a very nice experience and perpetual joy to visit the animals in their natural habitat. This kind of education and information must be made availble to the young and old not only to make them learn but also to make them knowledge-able. A great and useful service is being done, especially to the urban population. This needs a lot of support and full encouragement from one and all. I wish the trust very best in the coming years.

R. NATARAJAN,
Director,
Centre for Water Resources,
Anna University,
Madras-25,
28-12-90

SURPLUS REPTILES AVAILABLE AT MADRAS SNAKE PARK TRUST IN EXCHANGE

(Subject to Approval by The Government)

Lizard

1. South American Iguana (*Iguana iguana*)

Snakes

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

Turtles, tortoises and Crocodiles

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

WANTED IN EXCHANGE

Snakes

1. Black Cobra (*Naja naja* Oxiana [redacted])
2. King Cobra (*Ophiophagus hannah*)
3. Banded Krait (*Bungarus fasciatus*)
4. The Indian Egg-Eating Snake '*Elachistodon westermanni*)

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. River turtle (Hardella thurgi) and

   Fresh water turtle—any species.

Crcoodile

10. Gharial-(*Gavialis gangeticus*) (Juveniles and sub adults)

11. Preserved specimens of 5 species of Sea turtles

    1. Leatherback turtle (*Dermochelys coriacea*)
    2. Green turtle (*Chelonia mydas*)
    3. Logger Head turtle (*Caretta caretta*)
    4. Olive Ridley turtle (*Lepidochelys olivacea*)
    5. Hawksbill (*Eretmochelys imbricata*)

An Appeal

The Madras Snake Park Trust has obtained, with the help of the Govt. of Tamil Nadu, an extent of 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, Madras 600 022.

DETAILS OF COST OF CONSTRUCTION AND DISPLAY

Building 1 and 2 (3 floor)

Each floor has 40' X 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' X 40' area and will house Research Division, ie. 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)

Skinks, 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 (areas 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 procured and 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 attactive for tourists. Simple hall 40' X 40' with a sloping roof.

Cost Rs. 4 lakhs or $ 29,000—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' X 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 3-storyed building. The ground floor to 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' X 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' X 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.

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' X 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' X 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' X 10' Security room. Cost Rs. 25,000/ or $1250.

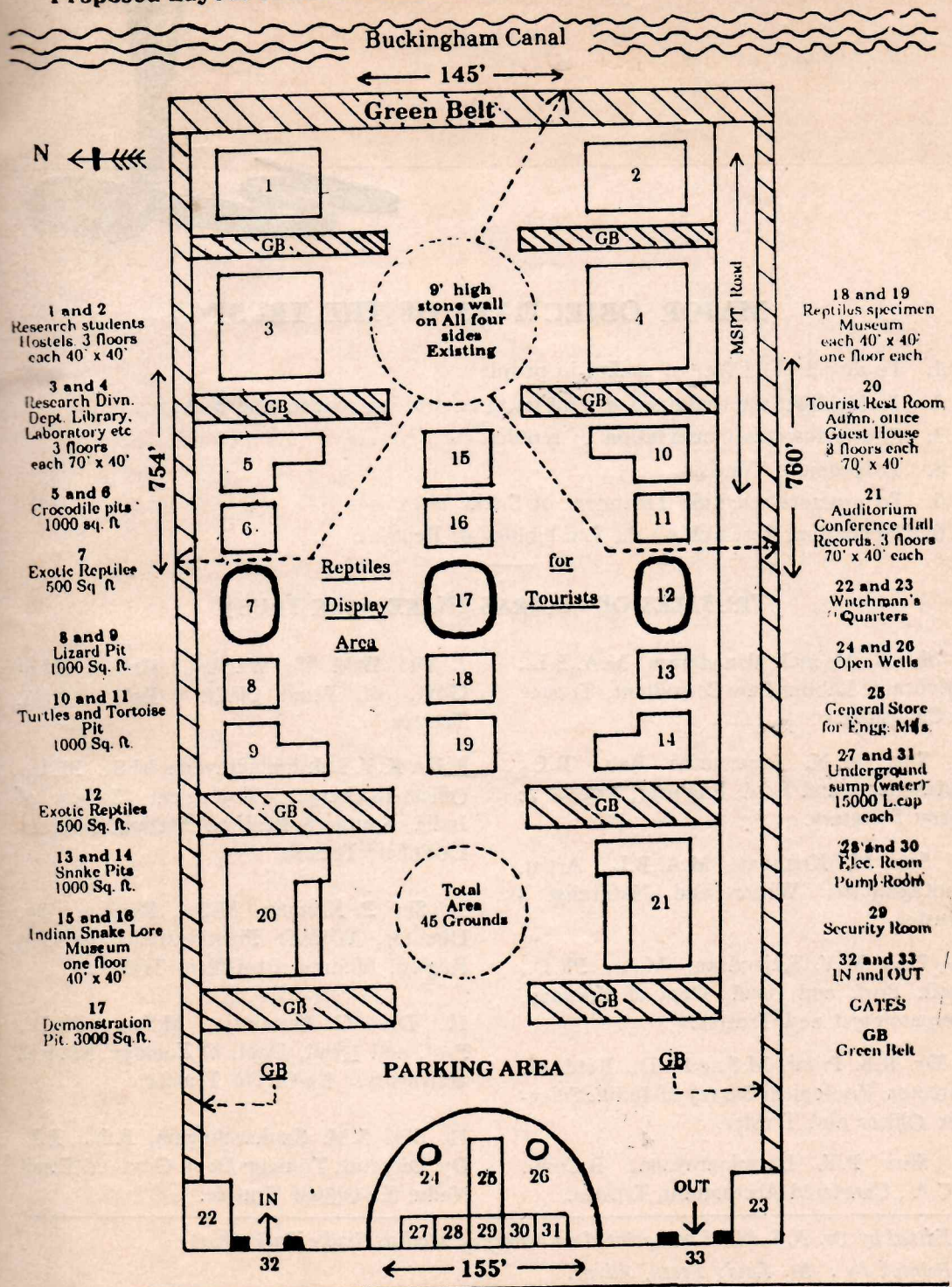
No. 32 and 33

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 1.9.1990.

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

Proposed Layout of Madras Snake Park Trust at Kottivakkam, Madras



To Adyar Madras ← Old Mahabalipuram Road → To Mahabalipuram

(NOT TO SCALE) SEP 1990

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.

3. Shri M. Krishnan, M.A.,B.L., Artist, Photographer, Writer and Naturalist - Trustee

4. Dr. M.V. Rajendran, M.A., Ph.D., Retd. Prof. and Head, Dept of Zoology, Herpetologist and Trustee.

5. Dr. R.S. Pillai, M.Sc., Ph.D., Retd. Jt. Director, Zoological Survey of India, Scientific Officer and Trustee.

6. Shri P.V. Laxminarayana, B.Com., F.C.A., Chartered Accountant, Trustee.

7. The Wild life Warden, Forest Dept Govt. of Tamil Nadu, Ex. Officio. Trustee.

8. Dr. K.V. Lakshminarayana, M.Sc., Ph.D., Officer-In-charge, Zoological Survey of India, Southern Regional Station, Madras. Ex-Officio Trustee

9. Shri P. Kannan, M.Sc., Regional Dy. Director, Wildlife Preservation, Southern Region, Madras. Ex-Officio Trustee.

10. Dr. G. Durairaj, M.Sc., Ph.D., Prof. and Head, Dept. of Zoology, Madras University. Ex-Officio Trustee.

11. Shri S.M. Sankaralingam, B.Sc., B.L. Dy. Director, Tourism Dept. Govt, of Tamil Nadu, Ex-Officio Trustee.

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