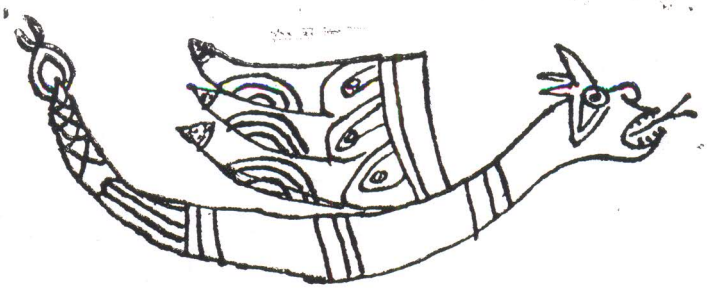

Editor's Note

We are pleased with the response to the first issue of the Newsletter. In fact the resultant correspondence revealed several persons working with reptiles in India and convinced us that there is a place for a small journal for information and communication of herpetological work. This is what the Newsletter will be, and will cover India, Sri Lanka, Nepal, Bhutan, Burma, Pakistan and Bangla Desh.

For the moment this newsletter will be an occasional publication and no subscription will be charged.

We would be happy if readers will help us by sending in relevant contributions and put us in touch with persons involved in herpetological work.

AT THE

Madras Snake Park

MUGGER BREEDING

An undetected nest of mugger eggs at the Crocodile Bank hatched on 24th June in the early morning. All the eight eggs hatched but one hatchling died during the day. This nest was two metres away from the first one, which hatched on 7th May and was laid by a young female in her first year of nesting. She is 2 metres long and 6 or 7 years old.

BIRTHS

A female water monitor lizard (*Varanus salvator*) laid four eggs on the 16th of June at intervals of two to three hours. They were transferred to hatching boxes but failed to hatch.

A green pit viper (*Trimeresurus gramineus*) gave birth to seven babies on 12th June. They are bright jewel-like replicas of the adult, and on 1st July measured 25 cms.

SNAKE BITE

Name : P.K. Antony
Age & Condition : 25 years, healthy
Snake : Cobra, one metre
Bite : Scratch from two fangs on toe, bitten through bag. (28-6-76).
Symptoms & treatment : Slight local pain. Received one ampule of polyvalent antivenom serum half an hour after bite, in hospital. Discharged next day.

Name : Chockalingam
Age and Condition : 30 years, healthy
Snake : Cobra, 1/2 metre
Bite : Two fangs, on hand, while handling snakes (21–7–76).
Symptoms and Treatment : Nil. No envenomation.
Remarks : Chockalingam insists that venom was injected and he "treated" and "cured" the bite by squeezing the hand and rubbing with herbs. This was his tenth Cobra bite.

Name : Annamalai
Age and Condition : 30 years, healthy
Snake : Russels Viper, 1/2 metre.
Bite : One fang, upper arm
Symptoms and Treatment : Local pain and slight swelling. Tied tournequet, taken to hospital. One ampule of antivenom given intravenously. Discharged after two days.

Projects

1. The Director of the Madras Snake Park was fortunate in being able to spend May and June in the Andaman Islands. The main areas of his visit were Middle and North Andaman.

2. A survey of dugong status on the Tamilnadu coast was undertaken for us by S. Bhaskar, a keen student of marine life. This is a preliminary exploration; hopefully it will be followed by a more detailed study to determine the life history, status and necessary conservation measures of *Dugon dugon*.

3. The Project for a crocodile bank outside Madras (aiming to breed the endangered crocodilians of India) has been in the offing for some time now. It will now be possible to develop the project, with the recent grant of Rs. 30,000 from the World Wildlife Fund.

We take this opportunity of recording our warmest gratitude to the Imperial Tobacco Company and particularly to its manager, Mr. T.V.S. Manian, for spending time, money and effort on producing the booklet "Endangered Reptiles of India" for us. ITC formally launched the booklet on October 7th. We are also grateful to the Director of Tourism, Tamilnadu, for having associated himself with the project by agreeing to be the Chief Guest on the occasion. We feel that this is an exemplary instance of the way in which industrial houses can assist conservation.

Madhya Pradesh Gharial Survey

The Madras Snake Park carried out a one month gharial survey in Madhya Pradesh to determine the status of *Gavialis gangeticus* in this State

Field Investigator : E. Mahadev

Duration : February 12th to March 19th, 1976

Transport ; Train, motorcycle, local boats, foot

Grant : Rs 3,000/- (Sponsor : New York Zoological Society)

Breakdown : Travel Rs. 1,500/-
Food etc. Rs. 800/-
Boat, guide etc: Rs. 700/-

Itinerary :

Bhopal
Sehore—tributary of Chambal
Sagar—tributary of Ken
Damoh
Katni
Umria—Mahanadi
Shahdol – Son
Umria—Bandogarh National Park—Son
Rewa—Son, Tons
Sathna—Tons
Allahabad—Jamuna
Sathna—Mandla Sanctuary
Jhansi—Betwa
Madras

Bhopal (Parabati River)

Met P.C. Bhor, Chief Wildlife Warden, Madhya Pradesh, who informed all concerned Divisional Forest Officers of my arrival.

Sehore (Trib. of Chambal)

Mugger were abundant here till the late '60's, but have been killed off for their skins.

Habitat ideal for mugger, with deep pools and embankments though excessive disturbance from tourists. No gharial reported from here or from the Betwa River.

Sagar (Trib. of Ken River near Damoh)

River very shallow and deep pools regularly dynamited for fish. Gharial seen in the past but none left.

Katni (Trib. of Ken)

Very little water, no gharial.

Umria (Mahanadi River)

River runs through a gorge here, with deep pools and sand banks. There used to be a good gharial population but none left, due to excessive dynamiting and poaching. In a 22 km walk down-stream no signs of gharial were seen.

Chandia River :

Sangam Ghat, the confluence of the Mahanadi and Mahar Rivers, with a deep gorge, is ideal habitat for gharial, which were reported from here in the past.

Shahdol (Son River)

Waste matter from the local paper mill flows into the water which is black; no fish or gharial can survive.

Bandogarh National Park (Son River)

Artificial perennial lake inside the national park ideal for mugger breeding project; good protection in Park.

Rewa District (Son & Tons River)

Kerti (Tons River)

A good gharial population existed here a few years ago, and it is said that there are still a few left. However, none were seen.

Son River : There are a few gharial left on some parts of the river but not frequently sighted. Dynamiting for fish common.

Sathna (Tons)

Allahabad (Jamuna River)

Occasional gharial sightings during the rains. One fisherman from the river at Karalabagh captured a baby gharial three months ago, which died last month (January).

Mandla Sanctuary :

12 kms inside the Sanctuary the Ken River forms a deep gorge approximately 2 km long, 400 meters wide and 10–12 meters deep. Sighted one adult gharial (only sighting of the survey), approximately 5 meters long. There are a few more in the Gorge, according to local fishermen. This is the only undisturbed gharial habitat the investigator found in his 2,000 km. survey in Madhya Pradesh.

Recommendations :

1. Bandogarh is an ideal spot for re-introducing a mugger breeding population. The perennial pool which is situated next to the road from Umria to Rewa has a well built watch tower. Since it is a National Park there are strict laws against poaching.

2. Though dynamiting on the rivers is banned this practice continues and must be completely stopped.

3. The Mandla Sanctuary on the Ken River is well suited for a gharial conservation project (restocking, egg collection and hatching, release of hatchlings).

4. The strict protection afforded by the Wildlife (Protection) Act of 1972 to the mugger and gharial, has to be implet-mented by field staff. It appears that crocodilians are on the brink of extinction in Madhya Pradesh.

Frogging in Madras

Most amphibians are not readily seen due to their nocturnal habits. In a dry area like Madras they are even harder to observe as they emerge from aestivation only at the onset of the monsoon and retreat underground after the monsoon stops. This is not to say that amphibians are not abroad at other times. Some species like the skittering frog *Rana cyanophlyctis* may be seen throughout the year in permanent waters. But for the most part the total amphibian fauna are available for observation only in the monsoon.

Amphibians like all animals are affected by habitat destruction and need an area of their habitat conserved if any semblance of the original species diversity is to be maintained. This fact was illustrated on a visit to Madras last July during the initial monsoon rains. On four evenings I travelled around the city and suburbs of Madras with Mr. and Mrs. Whitaker observing amphibians. On two nights of collection we had identified 14 species. Distribution was sporadic and mostly the maximum number recorded in a single urban or suburban area was 7 species. The only exception to this distribution pattern was seen in the Guindy Deer Park, where all 14 species plus an unidentified one were found. Thus the Guindy Deer Park which consists mainly of the original scrub vegetation of Madras has the highest species diversity of amphibians. This observation illustrates further the unique character of this Park and the need to retain it in as original a condition as possible.

(Guindy Deer Park has recently become Tamilnadu's first National Park.—Ed.)

AMPHIBIANS OBSERVED IN GUINDY DEER PARK

Bufonidae :

Bufo melanostictus—Common toad
Bufo fergusonii—Ferguson's dwarf toad

Ranidae :

Rana cyanophlyctis—Skittering frog
Rana tigrina—Indian bull frog
Rana hexadactyla—Green frog
Rana limnocharis—Paddy frog
Rana (tomopterna) breviceps-Burrowing frog
Rana spp.

Rhacophoridae :

Rhacophorus maculatus—Common tree frog

Microhylidae :

Kaloula pulchra taprobanica—Painted frog
Uperodon systoma—Marbled balloon frog
Uperodon globosum—Common balloon frog
Microhyla rubra—Red narrow mouthed frog
Microhyla ornata
—Ornate narrow mouthed frog
Ramanella variegata—Grey ramanella

Ranil Senanayake,
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University of California,
Davis, Calif., 95616,
U. S. A.

(Ranil Senanayake has been doing ecological studies in the rain forests of Sri Lanka and is the founder—director of the Lanka Snake Park in Gampaha, near Colombo.)

A python I should not advise,
It needs a doctor for its eyes,
And has the measles yearly.
However, if you feel inclined
To get one, (to improve your mind,
And not from fashion merely),
Allow no music near its cage
And when it flies into a rage
Chastise it, most severely.
I had an aunt in Yucatan
Who bought a python from a man
and kept it for a pet.
She died, because she never knew
These simple rules and few;
The snake is living yet.
—**Hillaire Belloc**

Introducing the Irulas

A tall, sturdy Irula tribal who has been supplying rats to the Snake Park since it started, Annamalai lives in Ottiambakkam village 10 kms. out of Madras city. Before working for us at the Snake Park he was in the skin business and supplied skins to a local tannery. "It was a good business, lots of money" he says. Now, apart from catching rats for us and for eating ("rat curries are delicious") he hunts small animals like hares, collects and sells honey and occasionally does "coolie" work (unskilled labour).

Annamalai's family eat rats 2—3 times a week. The species found around Madras are :

TAMIL	ENGLISH	SCIENTIFIC
Varappu yeli	Mole rat	Bandicota bengalensis
Pillu yeli	Grass rat	Rattus meltada
Sundu yeli	Field mouse	Mus buduga
Kallu yeli	Spiny-tailed mouse	Mus platythirx
Vallu yeli	Jerbil	Tatera indica
Veetu yeli	House rat	Rattus rattus
Persu yeli	Bandicoot	Bandicota indica
Kattu yeli	Long-tailed tree mouse	Vandeleriria cleracea

Apart from Veetu yeli, Persu yeli and Kattu yeli all these are eaten. During the harvest season, the Varappu yeli is extensively hunted by Irulas as it stores large amounts of unhusked rice. Upto 10 kgs can be obtained from one burrow alone. "The burrows of the Varappu yeli are like people's houses with sleeping rooms, corridors and storage rooms. The storage and sleeping rooms are sometimes 5—6 ft. deep."

Annamalai also smokes out rats from their holes by lighting dry leaves in an earthen pot and blowing smoke into the rat holes The rats suffocate inside and are dug out or run out and are killed by a blow on the head.

With India losing about 30% of her grain to rodents every year it would be worthwhile to involve the Irulas in our rat eradiction programs. Annamalai suggests that a "company" of Irula rat catchers be set up, which would get rat catching contracts from individual farmers or local panchayats (village governments). Payment could be made for each rat tail produced. "That way we would also get a lot of food," he concludes.

Rearing Gharial in Captivity

In April 75 under the guidance of FAO Expert, Dr. H.R. Bustard, an attempt was made to incubate wild laid gharial eggs in a hatchery at Tikerpada, Satkoshia Gorge, Mahanadi River, Orissa. 53% of the eggs hatched. The young averaged 374 mm. in length and 97 gms. in weight. The incubation period was nine weeks at 30° C.

The hatchlings were released in concrete pools (2m×2m×0.3m) each of which has a concrete basking area 0. 3m wide, skirted on three sides by sand banks. The sandy area is thickly vegetated to provide protection. On one side of the pool is a slope running down to the middle of the water, and this is the most favoured hunting ground of the juveniles. Favoured basking spots are where the plants, specially the *Cycas*, droop over the basking area and into the water.

The hatchlings are nervous and at the approach of a human or even dog near the enclosure they slip into the water and hide under the *Salix* weeds. These weeds are used for safety and protection and if any alteration in the arrangemement of the weeds is made they come out of the water. When the weeds are arranged again as before they return, taking about 24 hours to settle back in. This kind of fussiness lasts for about six months.

After hatching gharial take about a week to learn successful fish catching. During the first four months they were fed on tadpoles

and 4-5 cm. fish. In future we plan to give them freshly born rats. Feeding is more in response to tango reception than vision.

Maintenance of strict hygenic conditions plays an important role in successful rearing. This includes avoiding crowding in pools, prevention of inter-changing of pools, disinfecting materials entering a pool set, disinfecting hands before and after handling gharial, and disposal of dead fish at least twice a day.

Being exothermic, growth, feeding and other activities are greatly dependent on temperature. In the small concrete pools temperature changes are quick. Therefore in summer shade is provided and in winter the tops of the pool sets are covered with thick transparent polythene to intensify the heat of the sun. After sunset a thick gunny cloth covers the top, and sides are covered with straw-polythene boards.

We have completed eleven months of rearing with a 90.4% survival success. There are 41 young gharial destined for release in the newly formed Satkoshia Sanctuary on the Mahanadi River.

Lala A.K. Singh,
Research Scholar,
Gharial Research & Conservation Unit,
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Dhenkanal District,
Orissa.-759122.

Mugger (*Crocodylus palustris*) Hatching Data For 1976

Site	No.	Eggs	Hatched	Date of hatching	Remarks
Amaravathi	1	30			Badly handled during collection
	2	30			,, ,,
	3	29	22	31—5—76 to 2—9—76	
	4	30	—	23—5—76	
	5	34	11	31—5—76	
	6	35	19	31—5—76	162 eggs—49 8%
	7	33	20	31—5—76	
	8	33	—		
	9	31	8	4—6—76	
	10	29	—		
Sathanur	1	33	8	9—6—76	
	2	35	20	26—5—76	
	3	17	13	18—6—76	133 eggs—45.2%
	4	24	10	9—6—76	
	5	24	16	26—5—76	
Killikudu	1	21	5	10—6—76	21 eggs—24%
Natural nests at					
Madras Crocodile Bank	1	23	22	7—5—76	30 eggs—97%
	2	8	8	24—6—76	
			6		

Some Notes on the Spiny-tailed Lizard

(*Uromastix hardwickii*) Gray

The spiny-tailed lizard is common in North India.

Habits : Larger and heavier than other lizards of the Agamidae family, this lizard is gentle and sluggish and can be easily tamed. It digs and lives in burrows into which it retreats at the approach of danger. The whorls of spines on the tail are its principal means of defence; when attacked by a snake or mammal the lizard shoots into the burrow, with a portion of the tail protruding out. Should the enemy continue the attack, the tail is swung from side to side, landing blows on the enemy.

The Kunjars of the north-western region collect these lizards for the meat (that of the tail is considered a great delicacy); and the fat fetches a good price in the market. To entice the lizard out of its hole the Kunjars make a hissing sound by sweeping the surrounding area with dry leaves and twigs. The lizard, assuming this to be the approach of a snake, projects its tail out of the hole as a defensive measure. The tail is grabbed and the animal pulled out Other methods used are : digging, fumigating, or flooding of the burrows.

Habitat : *Uromastix hardwickii* is found in the soft yellow soil of the plains and desert. The burrows are as much as 1.5 meters deep and are used for protection as well as temperature fluctuations.

Food : Though commonly known as a herbivore and frugivore, there is a recent report of this lizard eating insects. The young have the usual sharp agamid teeth but with age the two front incisors drop out to be replaced by a broad downward projection of the upper jaw bone. The two lower incisors gradually fuse, resulting in two broad blade-like teeth used for nipping off bits of vegetation. The rear rows of teeth, with broad crowned grinding surfaces are used for chewing. Adults feed on grass, flowers, fruits and leaves. During hibernation the fat bodies in the tail are absorbed, leaving behind practically no trace. In the summer months when food is plentiful, they form again.

Courtship : Exact mating posture is unknown but only one hemipenis is inserted into the cloaca of the female. The eggs are 20-30 mm. long and are laid between end April and the first week of May.

Economic Importance : The skin of the spiny-tailed lizard is used in the skin industry for making hand bags, shoes and wallets, but the demand is not very high. Flesh from the tail region is considered a delicacy among some tribes. The fat is put in boiling water and oil collected. This is sold for its "medicinal value" and is supposed to cure impotency and is used for embrocation.

Prof. M.L Bhatia,
Retd. Prof. of Zoology,
Delhi University, and
Dr. Raj Tilak,
Zoological Survey of India,
Solan, Himachal Pradesh.

OBITUARY

Natesan, an Irula snake catcher who worked for us for the past five years died on August 15th. after a sickness which lasted two weeks. He is very much missed here for his great knowledge of reptiles, steadiness and sense of humour.

Snakes and Sunbirds

My father recalls that when he was young, he shot a Vine Snake (*Ahaetulla nasutus*) and found six sunbirds in its stomach The snake was shot on an **Acacia arabica** tree.

Some time later, in Trichy he shot another vine snake and found sunbirds in its stomach also.

Priya Davidar,
"Canowie", Coonoor,
Nilgiris.

Snakes of Jammu and Kashmir State

The rich and varied herpetofauna of Jammu and Kashmir is represented in literature by stray and incomplete reports. The following check-list is a summation of all known documented species, and incorporates new records. 30 species of 20 genera and 5 families are recorded below.

Snake	*Remarks*
Family : TYPHLOPIDAE	
1. **Typhlops porrectus** Stoliczka Slender Worm Snake	Found under logs and stones in Jammu (6), New record from Anant-nag, Kashmir.
2. **Typhlina bramina** (Daudin) Common Worm Snake	Known from Jammu (6), new record from Baramulla, Kashmir. Collected underground.
3. **Typhtoelps tenuicollis** Peters Peter's Worm Snake	Known only from Kashmir (2)
Family : BOIDAE	
4. **Eryx conicus** (Schneider) Common Sand Boa	Common in Jammu (6), new record from Uri and Baramulla, Kashmir. Found in gardens, brick piles, old buildings.
5. **Eryx johnii** (Russell) Red Sand Boa	Found in Jammu (6), no record from Kashmir. Collected from loose soil under boulders.
6. **Python molurus molurus** (Linn) Indian Python	Known from Jammu (7), inhabits rocky areas in thick forest.
Family : COLUBRIDAE*	
7. **Boiga trigonata** (Schneider) Cat Snake	Common in Jammu and uncommon in Kashmir (6). Found in gardens, some collected in scrub jungle around Jammu.
8. **Boiga multifasciatus** (Blyth) Himalayan Cat Snake	Known from Jammu and Kashmir (2, 5, 6).
9. **Amphiesma stolatus** (Schneider) Striped Keelback	Collected in and around ponds and lakes in both provinces (6)
10. **Argyrogena rhodorhachis** (Jan) Cliff Racer	Found in Jammu and Kashmir (2,5,6) in gardens and rocky areas.
11. **Ptyas mucosus** (Linn.) Rat Snake	Common in both provinces (2,5,6) in varied habitat from thick forest to residential compounds.

* Das et al (1964) documented the occurence of **Micrurus fulvius** (Coral Snake) and **Simotes coluber** (genus **Simotes** is synonomised with **Oligodon**) in Kashmir. This, however, needs further confirmation.

12. **Spalerosophis diadema** (Schlegel)
Royal Snake — Known from Kashmir (1, 5)

13. **Spalerosophis d. articeps** (Fisher)
Royal Snake — Occurs in both provinces (5, 6)

14. **Spalerosophis arenarius** (Boulenger)
Red spotted Royal Snake — Found in Jammu (6). Collected in old buildings and godowns

15. **Trachischium fuscum** (Blyth)
Oriental Worm Snake — Known only from Jammu (6) and collected from grassy fields.

16. **Xenochropis piscator** (Schnieder)
Checkered Keelback — Known from both provinces, found in and near water (2, 5, 6)

17. **Amphiesma platyceps** (Shaw)
Mountain Keelback — Only record from Kashmir (1, 2, 5)

18. **Lycodon striatus bicolor** (Nikolsky)
Barred Wolf Snake — Collected from gardens and scrubby areas in Jammu (6).

19. **Lycodon travancoricus** (Beddome)
Travancore Wolf Snake — Known only from Jammu (6). Collected from fields near water sources.

20. **Dinodon septentrionalis** (Boulenger)
Gunther's False Wolf Snake — Known from Kashmir (2, 5)

21. **Elaphe hodgsonii** (Gunther)
Himalayan Tinket Snake — Known from Kashmir (1, 2, 5)

22. **Psammophis schokari** (Boulenger)
Desert Sand Snake — Known from Kashmir (1, 2, 5)

23. **Psammophis leithei** (Gunther)
Leith's Sand Snake — Known from Kashmir (1, 2, 5)

Family: ELAPIDAE

24. **Bungarus caeruleus** (Schneider)
Common Indian Krait — Common in Jammu (6), New record from Uri and Baramulla ranges (Kashmir). Collected in gardens and construction sites.

25. **Naia naia oxiana** (Eichwald)
Black Cobra — Known from Jammu and Kashmir (3, 6)

Family: VIPERIDAE

26. **Echis carinatus** (Schneider)
Saw-scaled Viper — Common in Jammu (6) in gardens and around human habitation. New record from Uri and Baramulla (Kashmir).

27. **Vipera russelli** (Shaw)
Russells Viper — Common in Jammu (6), new record from Uri and Baramulla (Kashmir). Lives in forested and cultivated areas.

28. **Vipera lebetina** (Linn.)
Mountain Viper — Known in Kashmir (1, 2)

29. **Ankistrodon himalayanus** (Gunther) Himalayan Pit Viper

B.D. Sharma and Taj Sharma,
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Jammu and Kashmir,

Recorded from Kashmir (5). However one of us (BDS) collected one specimen from Poonch Valley; this probably reflects the ingression of this species from the Kashmir Himalayas.

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Common Rock Lizard (*Agama tuberculata*) Gray

Oriental agamids are well known for their ornamental appendages (gular folds, crests), colour display and behaviour. Most of these being insectivorous have an important role in the eco-system as natural agents of biological control of insect pests. However several agamas and spiny-tailed lizards can subsist on vegetarian diets also. This is a useful feature; in the paucity or absence of insects they can survive and resume their role as insect controllers.

Agamas are differentiable from other agamids in not having femoral pores. The tympanum is exposed; has callose preanal scales except in *A. minor*. Represented by 60 species in S. W. Asia, S. E. Europe and Africa, 11 species are found on the Indian sub-continent, of which all but *A. minor* occur in hilly regions from the North-west to the North-east from the foot-hills to about 16,000 feet.

Agama tuberculata was described by G. E. Gray in 1827. The tail is longer than the head plus body with 30-50 scales at the base forming 2 or more distinct *annulii*; Dorsal scales are equal to the ventials with a few large ones on the flanks.

Normally they are dull grey black with bright yellow or orange spots on fore parts and flanks, with pale underparts. This colour scheme helps in comoflage and heat absorption. On bright days adult males and females dorsally develop a bright ultramarine hue which serves in display tactics.

They invariably live in rock crevices. Often in the same ecological niche and distributed in a somewhat contiguous manner are *A. argorenis* and *A. himalayana*. In the Doon Valley where a study was undertaken a colony is present in Rajaji Sanctuary and another 11 kms away, although conditions in between are favourable. Common in the Himalayas, *A. tuberculata* has a scarce, localised distribution in the Siwaliks.

In rock crevices where they live, the number of occupants and the sex ratios do not appear definitive. An adult male may be a sole occupant or 5 males or even 4 females may be present. These colonies have permanent homes except when in danger, when they move into other abodes. The ratio of males appears higher than females. This competition perhaps explains why males acquire a territory which ceases once mating has taken place.

The common rock lizard is very receptive to sunlight and retires to crevices on the approach of even a passing cloud, or peeps from holes till warming up temperature is attained.

Breeding commences with the males acquiring a territory, involving fighting. In the process the tail is often nipped and the individual may develop a stumpy or bifid tail. Courting individuals (usually males) may develop a bright ultramarine hue, raise head, bow and chirp (often heard in March). Copulation lasts 3-7 minutes, generally between March and August in the Doon Valley. However, breeding is irregular throughout the year. Eggs are laid on soft, generally moist surfaces and incubation lasts about 31 days. The young start feeding on insects and softs shoots.

I have observed *Agama tuberculata* biting and nipping at flower petals of dahlias and zenias. In my study area at Dehra Dun nothing but vegetable matter was found in the guts of specimens dissected. Hairs and bits of cloth were also found and were probably accidental ingestions. This lizard also eats earth worms, millipedes, centipedes, grass flies, some lepidopterans, hunting spiders, flower petals and soft plants. *A. melanura* has been reported to feed solely on vegetable matter and I have observed *A. himalayana* eating plants.

Human activity has influenced the distribution of, *A. tuberculata*. Observations in Sahasdhara, Dehra Dun revealed that the present population status is far lower than it was a decade ago. This is primarily due to quarrying and building activties.

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Indian Agricultural Research Institute,
New Delhi,

It is unjust that when we have done
All that a serpant should
You gather our poisons, one by one
And break them down to your good.—**Rudyard Kipling**

Fourth Gharial Sanctuary in India

On the recommendation of the Government of India/FAO/UNDP Crocodile Project, for which Dr. H.R. Bustard is Chief Technical Adviser, and prompted by the WWF India, the Government of Uttar Pradesh in August 1976 declared a new - India's fourth - sanctuary for the gharial. This is an area of 400 sq. km, in the Bahraich Division in the north of the State adjacent to the border with Nepal.

This Sanctuary, which includes 19km. of the Girwa River, contains the largest single surviving population of the gharial in India, numbering about 20 individuals. To restock the newly created sanctuary the Government of Uttar Pradesh organised egg collection for captive rearing of hatchlings for subsequent release. This operation has had on outstanding success and no less than 345 hatchlings have been produced in 1976—which is twice the total Indian gharial population estimate.

World Gharial Population

(This is a rough estimate of the Gharial population of the World)

Captive : INDIA—1976

a) Madras Crocodile Bank :
1 male, 1 female—subadults
b) Ahmedabad Zoo : 4 adults
c) Mysore Zoo : 3 adults, 1 subadult
d) Hyderabad Zoo : 2 adults
e) Calcutta Zoo : 1 subadult
f) Bannerghatta (Bangalore) :
1 male, 1 female – adults
g) Nandankannan Zoo (Orissa) :
1 male, 1 female—adults
h) Baroda (Private Zoo) : 4 adults
i) Orissa State Project :
Approx. 140 juveniles
j) Uttar Pradesh Project :
Approx. 368 juveniles
k) Rajasthan State Project :
Approx. 30 juveniles

Total Approx. 559

Captive : INTERNATIONAL—1975

(from Zoo Year book and personal correspondence)

a) Buena Park Zoo, California : 1 specimen
b) Silver Springs, Florida : 1 specimen
c) Atlanta Zoo, Georgia : 1 specimen
d) Cincinnati Zoo, Ohio : 1 specimen
e) Berlin Tierpark (East Germany) : 2 specimens
f) Berlin Zoo (West Germany) : 2 specimens
g) Darmstadt : 1 subadult
h) Frankfurt/main : 1 specimen
i) Paris (Menagerie) : 3 specimens
j) Vienna : 1 specimen
k) Munich : 1 subadult

Total : 15

Wild : INDIA—1976
(Estimates)

a) Kataranian Ghat, Girwa River, Uttar Pradesh 22
b) Chambal River—Rajasthan, M.P., U.P. 50
c) Assam Rivers Max. 10
d) Madhya Pradesh Rivers (other than Chambal) Max. 10
e) Gandak and Kosi Rivers, Bihar Max. 6
f) Ramganga River, Uttar Pradesh 4
g) Mahanadi River, Orissa 7
h) Others Max. 20

Total : Maximum 129

Wild : NEPAL—1976
(Estimates)

a) Karnali River 8
b) Babai River 6
c) Rapti Doon and Narayani Rivers (Chitawan area) 17
d) Makali, Rapti, Kosi Max. 20

PAKISTAN—1976

a) All Rivers Max. 20

BANGLADESH—1976

a) All Rivers Probably extinct

BURMA—1976

a) All Rivers Extinct

BHUTAN—1976

a) All Rivers Probably extinct