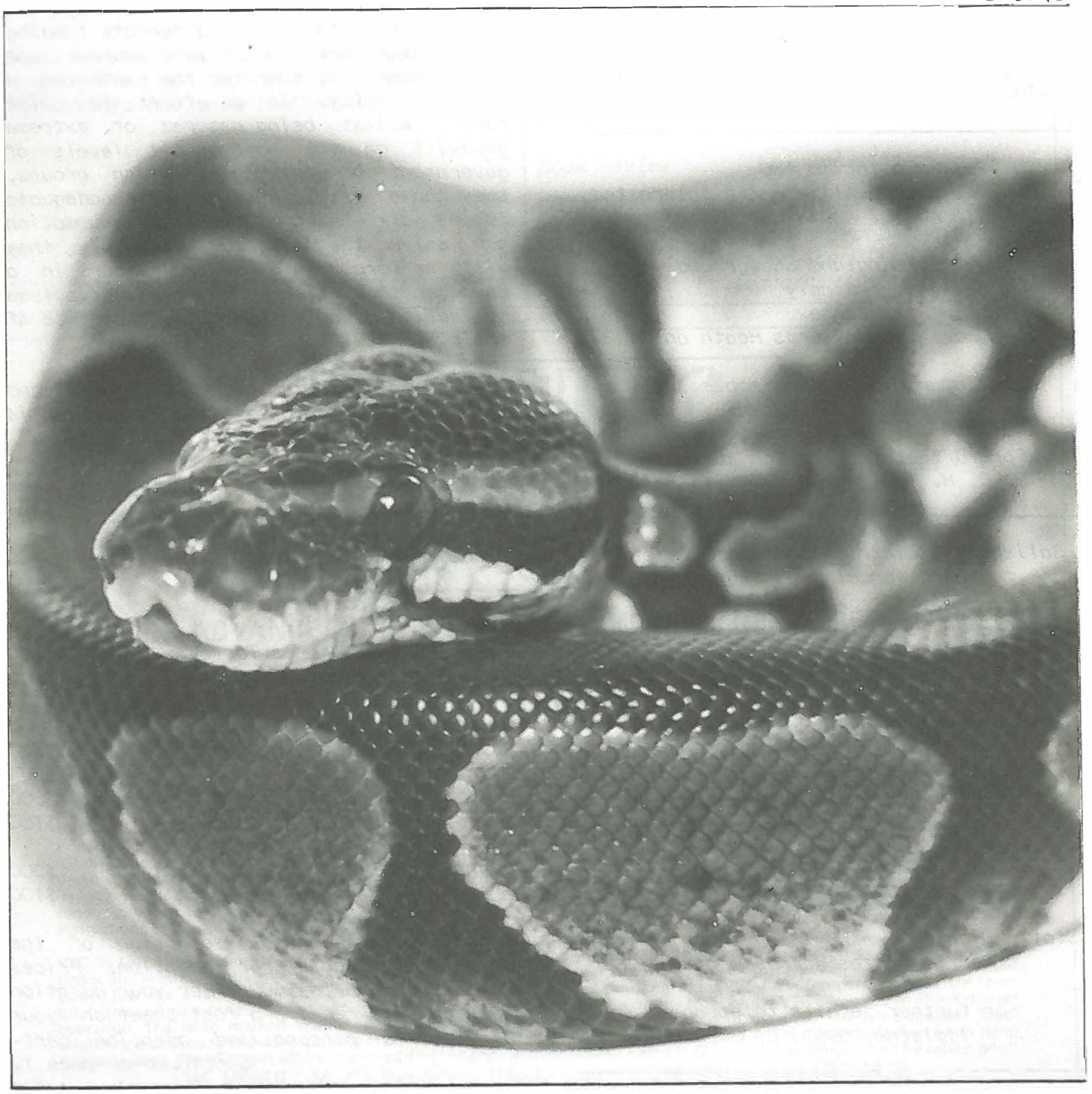
SNAKE KEEPER

Volume 2 Number 8 August 1988 £1.00p

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Financial Crisis at the Reptile Breeding Foundation

The Reptile Breeding Foundation of Picton, Ontario is suffering a crisis due to lack of funds. The President, Geoffrey Gaherty, has, during the Foundation's seventeen year existence, contributed almost a million dollars towards its development and operation. Dr. Gaherty now finds that his personal financial resources are unable to meet the demands of the Reptile Breeding Foundation. About a year ago the Foundation began to seek alternate funding from government and private sources and last summer they operated the Exotarium, a public display, in an effort to raise funds. Whilst being assured of extreme goodwill on the part of all levels of government and other conservation groups, they have yet to come up with adequate sorces of funding. Unless the Foundation can solve the problem immediately they will be forced to close their doors in a few months' time and the priceless collection of animals and the expertise of their staff will be dispersed.

One of the ways in which individuals and groups can help to save the Foundation is by adopting animals in their collection.

A list of animals for adoption has been prepared and includes:

Turtles	*Giant Hill Turtle*	*$150*
	Snakeneck Turtle	*$100*
	Spotted Turtle	*$60*
Tortoises	*Galapagos Tortoise*	*$600*
	Aldabra Tortoise	*$600*
Gecko Lizards	*Namib Desert Gecko*	*$60*
	Russian Gecko	*$30*
Boas	*Madagascar Boa*	*$300*
	Puerto Rican Boa	*$150*
Pythons	*Blood Python*	*$300*
	Children's Python	*$100*

This is just a small selection of the animals available for adoption. Prices range from $30 to $600. For your adoption fee you will receive a fact sheet on your adoptee, a personalised adoption cert-

Continued on page 19

SNAKE KEEPER

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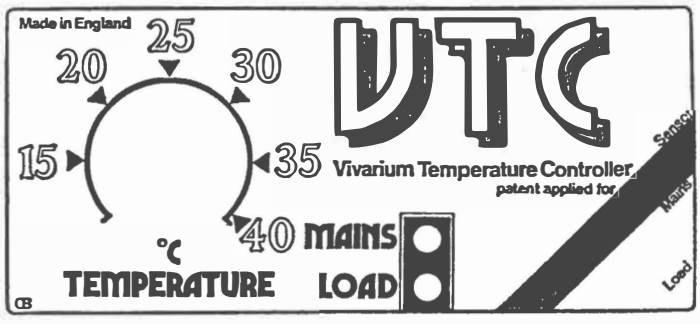
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Hatched in captivity
by Roger Grenville, June '88.
Photograph: Michael Connolley



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THE VIVARIUM, 55 Boundary Road, London E17 8NQ 01-520 2072

The Breeding of *Python regius* in the Vivarium

by Nickolai L. Orlov

This article has been adapted from the original which was published in the magazine 'herpetofauna' 19 (August 1982) under the title 'Die Fortpflanzung der Pythons P. regius und Liasis macklotі und der Kletternattern Elaphe climacophora und E. quadrivirgata im Terrarium'. It is reproduced here by kind permission of the author.

Translation by John Hackworth.

The further development of the available experience in the breeding of snakes under vivarium conditions is important for the following reasons:

1. *Establishing a stock of captive-bred animals of the species which are rapidly disappearing in the wild.*

2. *The study of important questions regarding embryology, behavioural science and genetics which is only possible under artificial conditions.*

3. *Aesthetic reasons which for the herpetologist are of considerable significance.*

The sub-species Pythoninae are among the most popular snakes kept in vivaria and there have been a number of publications dealing with the breeding of these species (e.g. Murphy and others 1978, Ross 1978, 1980a, 1980b).

In May 1977, two individual vivaria (100 x 60 x 50cm) were occupied by two male and one female Royal Python. The sexes were kept separately. The males measured some 120cm and the female around 150cm. A thermostat kept the temperature between 27 and 31 degrees C and the relative atmospheric humidity varied between 80% and 90%. The daylight time was kept at 14 hours. From May to August, the snakes were placed outside to sunbathe naturally for 40 - 50 minutes every five days. From August until October they were irradiated with artificial ultra-violet light at a distance of 80cm for 5 minutes each day. During the day the pythons remained in their hide boxes but they also enjoyed lying in water. Feeding usually took place at night and the following were all accepted: house mice (Mus musculus), wild rats (Ratus rattus), gerbils (Microtus sp.), hamsters (Mesocricetus auratus), House Sparrows (Passer domesticus) and Great Tits (Parus major). The vitamin preparation 'Trifit' (A,D2,E) was added to the food. The animals were in perfect condition by August. Their elastic skin had a wonderful metallic sheen and they were all feeding well. During this time the night temperature in the vivaria was reduced to 22 degrees C.

On the 20th of August one of the males was introduced to the female and mating resulted on the first evening. The copulations lasted from two to six hours with one to three day breaks. In the middle of September, the other male was placed with the pair. Supremacy fights began immediately and these were especially vicious at night. The males tried to press one another onto the ground or against the sides of the vivarium and beat one another with their tails and the foreparts of their bodies. During this time both of them stopped eating, whilst the female continued to eat regularly and mated alternately with each of her partners. Around the 10th of October the female stopped eating and became noticeably more aggressive. She was then housed separately and the ultra-violet irradiation was stopped.

At the end of December a significant swelling of the lower half of her body was noticeable and during the next two weeks an increased secretion of saliva was noticed. At the end of December the female sloughed and on the 7th of January she finally laid a clutch of eight soft-shelled white eggs (55-60 x 75-80mm) which were laid in the rough shape of a pyramid. The eggs were laid at night and the process lasted 9.5 hours. To lay the eggs the female chose a part of the vivarium with a daytime temperature of 30 degrees C and she coiled herself around the clutch. Occasionally the top coil was loosened to reach the water container to drink. The gestation period can thus be estimated at between 120 and 140 days.

The vivarium was prepared especially for the incubation of the eggs. The base was covered with a 2cm layer of boiled, sterilised peat upon which a 15cm layer of sphagnum moss was placed. The daytime

temperature varied between 29 and 32 degrees C and the night temperature between 28 and 29 degrees C. The relative atmospheric humidity was never below 90% and was more usually around 100%. The vivarium was regularly sprayed with water to which a small amount of iodine or 'Tripaflavin' was added.

The body temperature of the female was checked using an electronic thermometer. During the day it measured around 31 to 32 degrees C. Under the same conditions the body temperatures of the males fluctuated between 27 and 29 degrees C. On the 53rd day of incubation the body temperature of the female dropped about one degree and this corresponded with the surface temperature of the eggs. On the 67th day the female became increasingly restless and released her coils from the eggs, with the exception of the base of the 'pyramid'. On the 68th day the first hatchling finally split the egg shell at 1.00 pm. On the 18th of March the other hatchlings split their shells and all eight babies left the eggs. The female was now removed from the vivarium and immediately started to eat again.

After first splitting the shell, the hatchlings did not leave the eggs until 24 hours later. The average weight of the hatchlings was 46g and the average length 425mm. Ten days after hatching the young all sloughed and began feeding. They took young mice weighing around 10g. At the age of one month the young had already increased to an average weight of 115 (90 - 130)g.

Conclusions

To prepare pythons for breeding in captivity, the methods described in this article can be used successfully for several species, namely housing the sexes separately and reducing the temperatures towards the end of the preparation period. The latter is of special significance for sperm generation. It is also important that ultra violet light is available either artificially or from natural sunbathing, and that vitamins, especially vitamin E, are given regularly. Other authors have also given specific recommendations (e.g. Ross 1978, 1980a).

To prepare reptiles from specific regions for breeding it is especially important to adapt the hours of daylight to those prevalent in their natural habitat since this is a decisive ecological factor which governs all aspects of sexual activity. The temperature is regarded as the second most important factor since a complete hibernation is not always a prerequisite for successful breeding. Experiments with Elaphe dione, Elaphe schrenckii and Vipera lebatina turanica have proven that a temperature reduction to between 16 and 18 degrees C for a period of two to four weeks acts as a stimulus to trigger reproductive activity.

Literature

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Porter K.R. (1972) Herpetology Philadelphia, London, Toronto (Saunders Comp.), pp 524 S.

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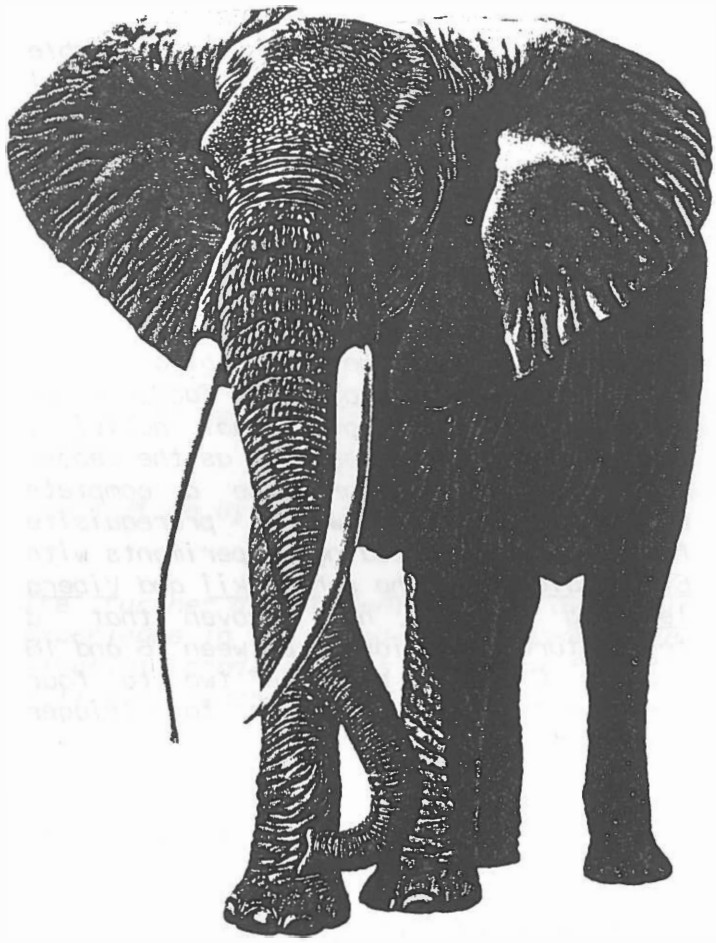
WANTED (contd. from page 20)

One male Grey Rat Snake (Elaphe obsoleta spiloides) suitable for 1989 breeding. Will collect. Please phone Mark (021) 326 7495 after 6pm.

Xanthic Royal Python or information pertaining to the above. All replies answered. Write to Lee Bowler, Box No. 8, Snake Keeper Magazine, 159 Stanley Hill, Amersham, Bucks HP7 9EY.

0,1 Lampropeltis triangulum campbelli (sub adult), 0,1 Elaphe oxycephala, Drymarchon corais couperi. Holger Bartz, Cyriaksring 54, 3300 Braunschweig, West Germany. Tel (0531) 81841.

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Zoologica '88 by C.H.Keeling

Years ago I visited Southport Flower Show and was duly impressed. I'm interested in plant life - in fact I'm the best botanist in the world, if you don't count the other two hundred thousand or so - and here was everything for the enthusiast: trees, shrubs, flowers, grasses, seeds, bulbs, corms, tools, accessories, greenhouses, sheds, books, talks, displays, demonstrations, trade stands. I'm not easily impressed, but I was in this instance.

On the way home I began thinking words to the effect of "There are nearly as many people interested in animals and keeping them as there are those whose prime interest is plants and gardens, so what a pity there isn't something comparable to Southport or Chelsea Shows for the zoologically-minded. All right, there are Horse and Dog and Cat and Bird and Rabbit and Aquarists' Shows but no general one, embracing a really wide range of species where enthusiasts can gather to meet old friends and make new ones and the casual visitor can see a wide range of species, some of which he probably never even dreamt existed. Hmmmm, well worth thinking about ...". Then I began enlarging on the idea and rapidly came to the conclusion that if it were to have a real raison d'etre its prime aim should be an information and teaching medium - education its prime aim, if you want to be trendy - where each exhibitor displayed a great deal of written information about his or her stock, and was only too pleased to be of real assistance to the serious seeker-after-knowledge. Things are really getting moving now ...

The first Zoologica took place in September 1985, and has been held annually since then, each one becoming better, more varied and more enthusiastically supported than the last. It is the only event of its kind in the world, and is now visited by people from all over the country, who are delighted with what they see and experience all around them - wild species, rare domestic varieties, parades with commentaries in the main ring, trade stands, displays, exhibitions, talks, competitions and, above all, kindred spirits in their hundreds!

Take as an example Zoologica '87 last year, when exhibits ranged from a Butterfly Farm to an African Elephant, a bird of prey flying display to an exhibition of rare domestic Cats (ever heard of a Somali or a Rag-doll, for example?). Visitors found they could ride a Horse or examine what might be the only albino Bull Snake in the country, stroke a Llama or shudder deliciously at Tarantulas, admire a handsome display of Parrots or seek marine invertebrates in a man-made rockpool. They could buy a potted plant (I never tire of pointing out that if there wasn't any botany there wouldn't be any zoology either, so there are some good botanical exhibits too), a book on any aspect of natural history, a pot of home-made jam, a specialised nestbox such as for an owl or Bat, an animal painting or a carving. They found their questions were welcomed and expertly answered (even the daft ones): the catering was good, and the car parking free.



Zoologica '88 is on Saturday 10th September 1988, at its usual venue, the South of England Showground (although it's nothing to do with the South of England Agricultural Society) at Ardingly, Sussex, just four miles north of Haywards Heath,

on the B2028. It's open from 9.30am until 5.30 pm, and the admission is £2.50p for adults, £1 for children. There's no other exhibition like it, even in America! Why not rendezvous at the Snake Keeper Stand there? Most of the exhibits are under cover so, whatever the weather, Zoologica '88 will be enjoyable!

Telephone me (Guildford 37547) if you require any further information.

Remember - if you like animals you'll love Zoologica.

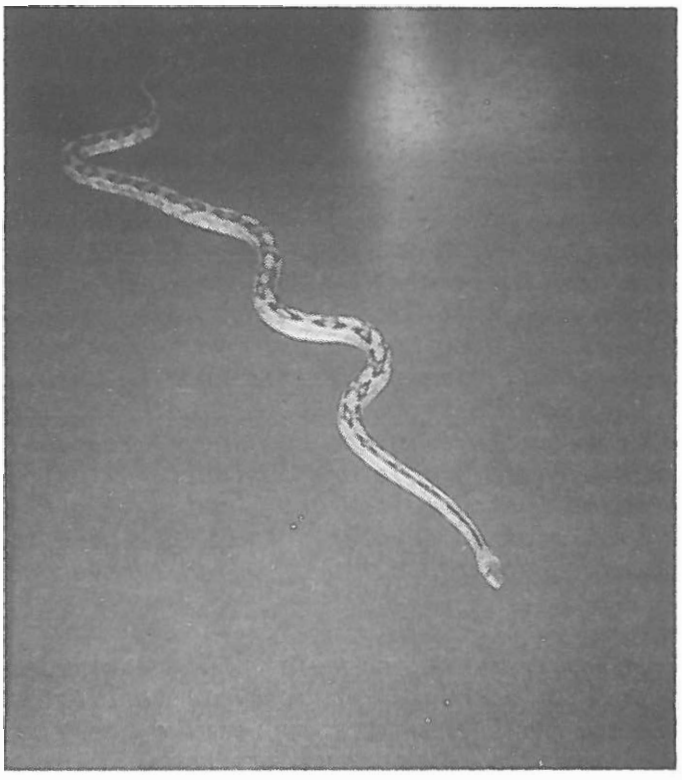


The Care and Breeding of *Elaphe subocularis*

by Holger Bartz

Translated from the original German by John Hackworth

The Trans-Pecos Rat Snake is a striking example of the snakes of the "Elaphe" genus. It has a muscular body and an almost heart-shaped head. A special peculiarity are the very prominent eyes which are particularly noticeable in both the young and adult animals. The colour varies from beige to light brown. The two dark stripes which begin just behind the head, continue over the whole body in the form of an uninterrupted "H"-pattern. The ventral surface is uniformly white. There are, in addition, several variants including, for example, blonde and pale phases.



Male Elaphe subocularis

Photo:Holger Bartz

The distribution range of Elaphe subocularis includes the South of New Mexico, Western Texas and Northern Mexico. It lives in the Chihuahua Desert along the Rio Grande and in the Trans-Pecos Region.

Elaphe subocularis specimens have very individual personalities. Irrespective of whether they are wild-caught or captive-bred, some specimens are very wild and belligerent. My animals, which I obtained in March 1986, are however very calm and peaceful. It is a matter of breeding.

In July 1986, the female was some 100cm long and the male around 130cm. They weighed 279g and 520g respectively. Between 1.12.86 and 1.3.87 both animals were hibernated in semi-darkness at 12 to 16 degrees C. After this they were kept separately for about a month. Their vivarium measured 100x50x60cm. The animals were kept under dry conditions and were only sprayed when sloughing was imminent. During the day the temperature fluctuated between 24 and 30 degrees C. Quartz sand was used as a substrate. Medium-sized mice, small rats and the occasional chick formed the diet. When the snakes were placed together again they mated several times around mid-July. On 27.8.86 the female laid four individual eggs which were placed on foam rubber in a polystyrene incubator. Because the eggs did not develop very well, they were

placed on quartz sand but dried out in September.

In 1987, after being kept under identical conditions, a single mating was observed on the 29th of June and seven individual eggs were laid on the 4th of August. They measured around 40-50mm x 20-25mm.

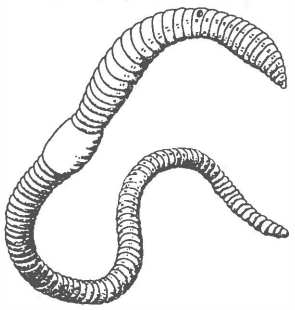
This time vermiculite was used as an incubation medium. The temperature fluctuated between 27.5 degrees C and 29 degrees C and the relative humidity was around 90-100%. Six young hatched after 70-71 days. They measured around 35cm and weighed some 15g. They sloughed after two weeks. The young "Subocs" immediately began to take baby mice. They ate up to eight per week and grew very quickly. They are easy to rear if kept under dry conditions.

Literature:

Tenant, A. 1984 The Snakes of Texas; Texas Monthly Press

Stebbins, R.C. A Field Guide to Western Reptiles and Amphibians; Houghton Mifflin Company, Boston

Correspondence to: Holger Bartz
Cyriaksring 54
3300 Braunschweig
West Germany



Small Scale Earthworm Breeding

by D.J. Silvester

For some time now I have been feeding and breeding earthworms. There are about 1800 species of earthworms in the world and about 28 different species living in Britain. Among the largest earthworms in the world is the Australian earthworm (Megascolides australis) which can attain lengths of 2.4m (8 feet) and is completely helpless outside its burrow. They are extremely difficult to catch, and it takes a strong man to pull one out of its lair. The aborigines consider them a great delicacy.

My original stock came from an exposed site 305m (1,000 feet) up in the Pennines. Earthworms, like humans, go through three stages as they develop from infancy, through youth to adult.

To breed earthworms successfully, we need to recognise these three stages and adapt our breeding procedure to them. Earthworms procreate by laying eggs contained in skins called cocoons, so a cocoon can be regarded as a safe packaging for one or more earthworm eggs.

But now you can breed earthworms easily and save money doing it! You will always have fresh worms of all sizes at hand, even when the ground is rock hard! Moreover, you will need very little space, a small corner in your shed, garage or even your living room will do.

They only require a small amount of bench space and stack up to six high. Earthworms can be cultured in stackable boxes, suitable brands are 'Curver' Unibox size 43x35x25cm (17"x14"x10").

You will need to buy two of these boxes, one for breeding and the other to catch water dripping from the breeding box stacked on it. You will need to drill the breeding box with 3mm (1/8") holes so that excess water can drip out and prevent the bedding from becoming waterlogged.

The bedding to use is best quality peat moss to which you add 225g (1/2lb) of Calcium Carbonate (CaCO3) per .0283 cubic metre (cubic ft.) of bedding. Give a good mix-up to open any lumps; you must make sure at all times that this bedding stays loose and moist. Take particular notice of the moisture in the bedding. You must maintain this moisture content! If the bedding starts to dry out, lightly sprinkle on some water. You will have to obtain a starter culture, which I have for sale.

Breeding sets contain 50 earthworm capsules (cocoons), a special ventilated breeding dish and soft protective bedding for the young worms to live in. Also included is a bag of selected "Growth Food" sufficient to make them grow for three months and a bag of Calcium

Carbonate, plus instructions. Earthworm breeding sets are not at all expensive, only £4 including postage.

GOOD WORMING!

Keepers of worm-eating snakes will find an advertisement for David's products in the classified section.

SNAKE KEEPER
CAR WINDOW STICKERS

I'm a Snake Keeper reader (0494) 722769

30cm x 6cm Red on white

50p each including postage

Pugsley's Progress

by Peter Kirk

Pugsley is an Indian Python (Python molurus bivittatus) owned by my next door neighbours. The snake is still quite young and about three feet in length. Previously he had been feeding well and was a healthy specimen. Pugsley had his last meal on the 24th of November 1987; a medium sized mouse.

For some reason, which we still do not know, Pugsley developed a mouth infection. This manifested itself as a red inflammation around the tongue, some tissue discolouration also around the tongue, a swollen throat and his breathing was a little wheezy.

The first course of action was to get Pugsley to a veterinary surgeon. On examining the snake the vet said that the necrosis in the mouth had completely destroyed the tongue, and he stressed that the problem was not mouthrot. This would, of course, mean that the snake would have no sense of smell or taste, and would therefore have difficulty feeding in the future.

The snake underwent a course of three injections of an antibiotic called Oxytetracycline, and on the third visit we were given an iodine-based solution with which to swab the infected area in the snake's mouth. This was done every day whenever possible.

Even though the vet had said that Pugsley had actually lost his tongue, at this stage I was not convinced that this was the case.

By the 6th January 1988, Pugsley had still not fed, nor was there any sign of his tongue, and by now he was beginning to look a little thin. We decided that the only option open to us was to try force-feeding the snake. We used a much smaller mouse than usual, as I believe a larger mouse may have been too much of a shock to his system. The snake may have regurgitated the food; it may even have killed him.

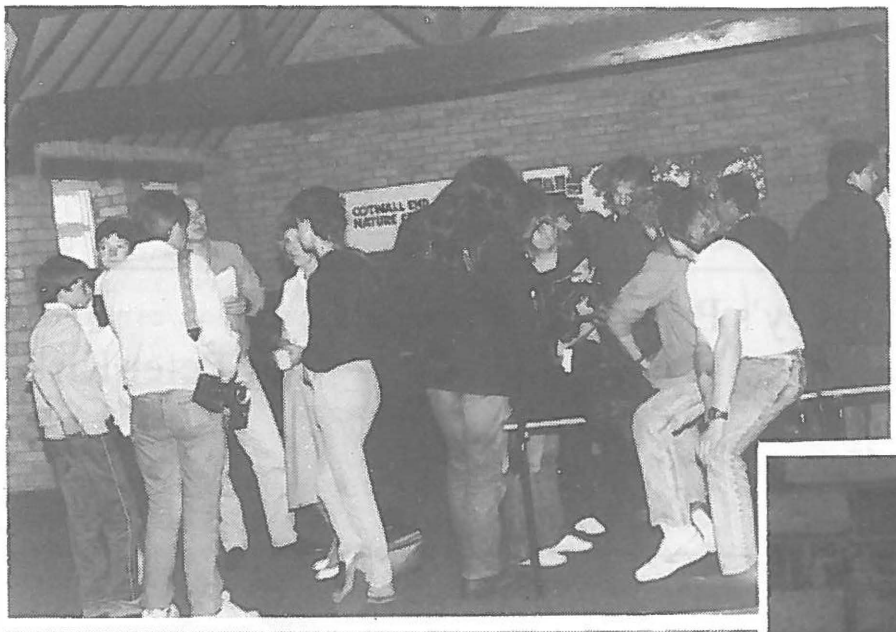
The method we used was to force the snake's mouth open with a piece of thin card folded in half to form a wedge. The mouse was moistened to assist the swallowing process and, with one person holding the body and neck of the snake whilst the other person forced the mouth open, the mouse was pushed as far back into the snake's throat as possible. With a little coaxing the snake swallowed the mouse, but it wasn't without some protest.

Pugsley kept this down, so the process was repeated one week later on 12th of January 1988 with a medium sized mouse and again the following day with a slightly smaller one. Pugsley remained fairly inactive until the 17th of January 1988 when I was cleaning his vivarium in my neighbour's absence. It was a pleasant surprise when he began to use his tongue again for the first time since his illness began.

He took food of his own accord about one week later and has now made a full recovery. At the moment he appears to be coming up to a slough which I think is fairly normal in a snake which has recently recovered from an illness.

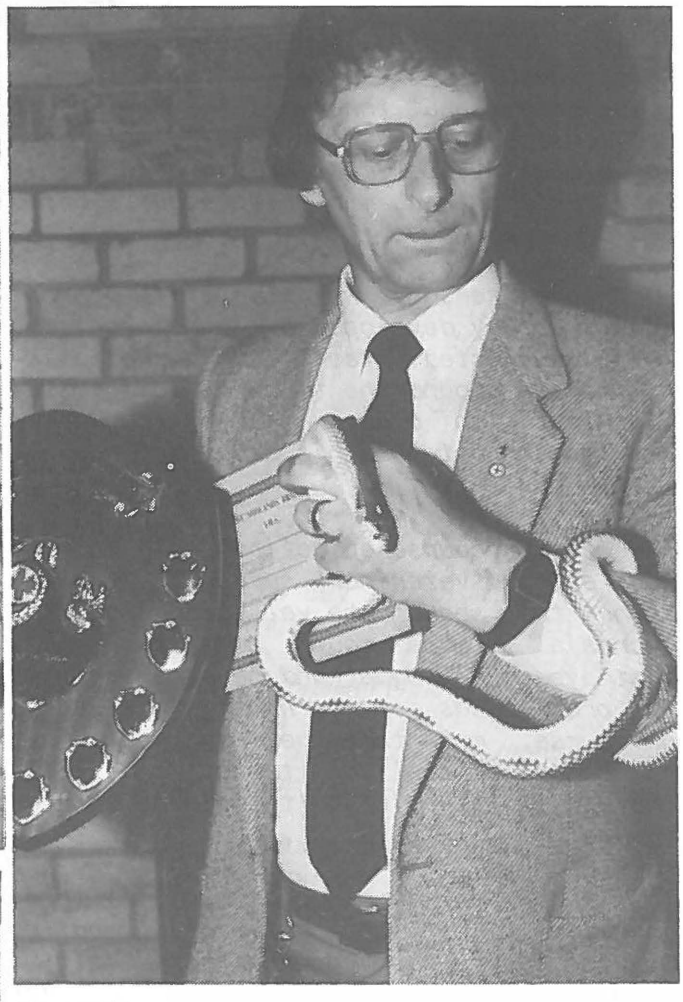
In my opinion, although the vet's diagnosis may not have been accurate, I believe that the treatment he administered was correct. I do feel, however, that it is a shame that there are so few vets around who do have a specialist knowledge of reptiles and the treatment of their ailments. Perhaps as more and more people take an interest in keeping snakes, more vets will become experienced in treating them.

The I.H.S. West Midlands Branch Show



On the 18th June the West Midlands Branch of the I.H.S. held their annual show at the Cotwall End Nature Reserve, Sedgley. The evening was well attended and the judges spent a considerable amount of time examining the animals entered for the show.

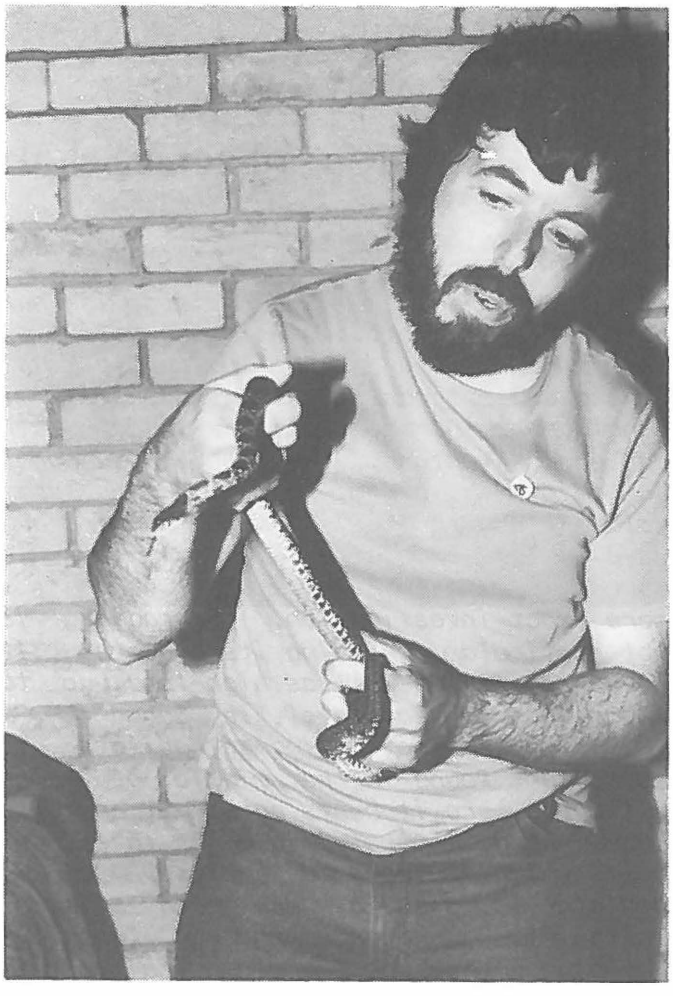




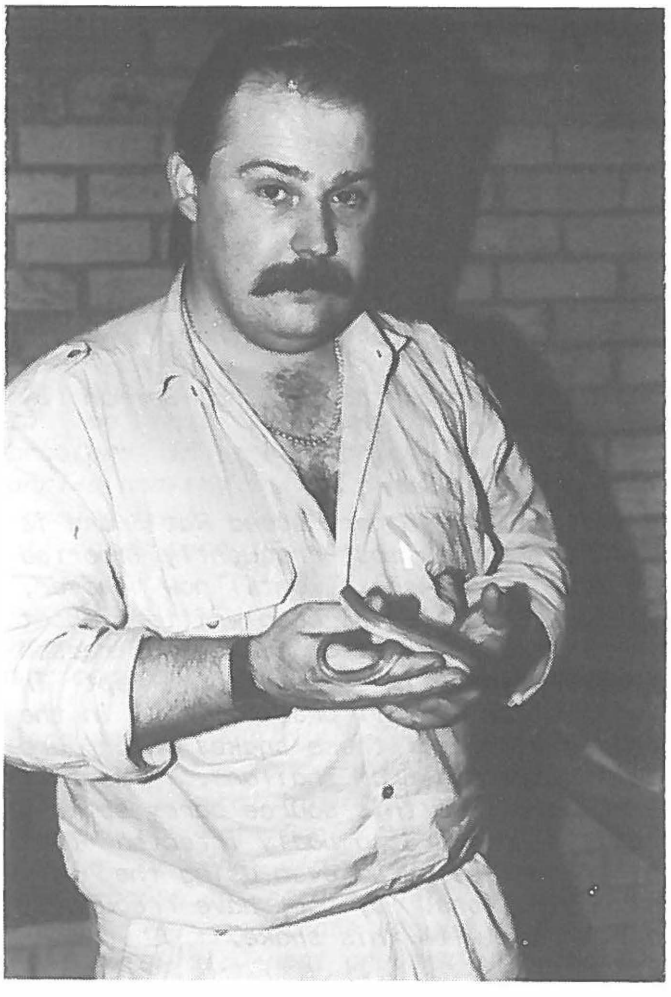


The first prize was awarded to Milton Holdcroft by the I.H.S. President, Roger Butler (above left). Milton (above) exhibited a superb striped California Kingsnake, Lampropeltis getulus californiae.

Photographs: Lesley Close

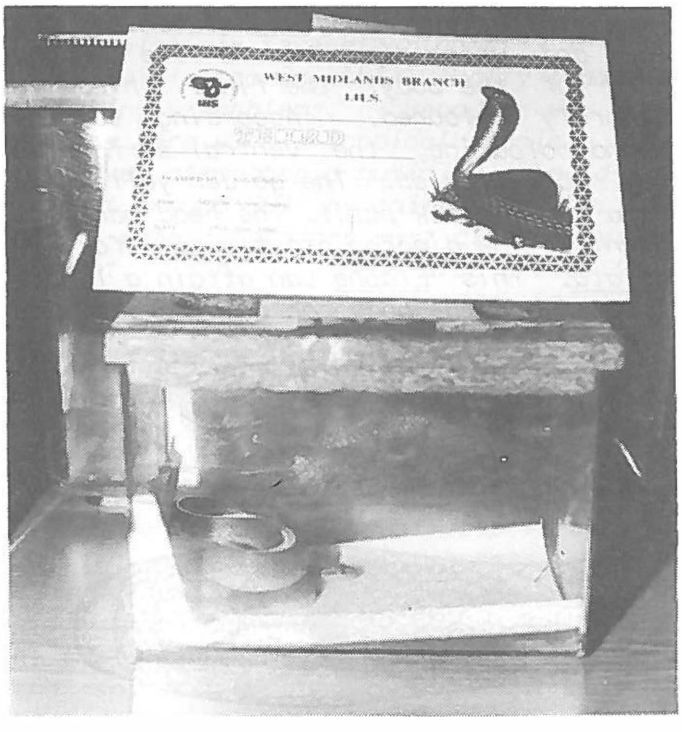


Above and below
Second prize was awarded to Dave Law who exhibited a very lively Horseshoe Whip-snake, Coluber hippocrepis.



Above and below
Third prize was collected by Kevin Hingley for his light phase African House Snake, Lamprophis fuliginosus. (Kevin has offered unending support to Snake Keeper from its very beginning and his name should be familiar to most readers.)





Asian Rat Snakes of the *Elaphe* Genus
Part VII *Elaphe radiata* (Schlegel, 1837)

by Klaus-Dieter Schulz

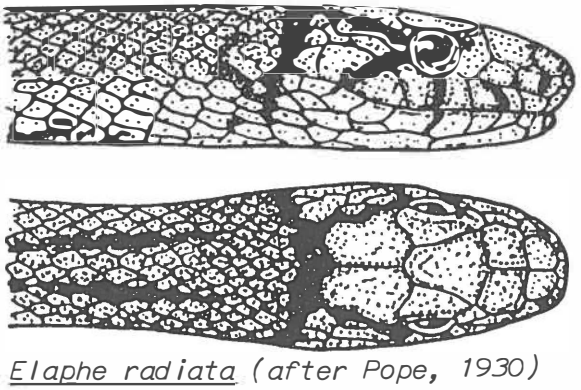
This series of articles was originally published (beginning in 1985) in the magazine 'Sauria' and is reproduced here by kind permission of the author.

Translation from the original German by John Hackworth.

The Radiated or Copper-Headed Rat Snake is one of the snakes most frequently imported from South East Asia. Until now however, relatively little has been written about this interesting Rat Snake. The reason why E. radiata is so seldom kept in vivaria lies, in all probability, in the high death rate of these snakes which are usually imported from Thailand. Most of the animals from this source carry so many parasites and are so badly infected that they cannot be cured even using the very best medications. I, too, have frequently had bad luck with this snake.

DESCRIPTION

The colouring of Elaphe radiata is quite variable throughout its vast range of distribution. The basic markings and patterns, however, do not change. Yellowish, orange, reddish, brown and olive-green animals occur. The markings consist of two broad and two narrow longitudinal black stripes which begin just behind the neck and which disappear in the second third of the body; the final third is uniformly coloured. According to the ground colouring, the ventral surface is grey to yellowish. The golden yellow eye has a round black pupil. The head markings shown in the diagram are typical for E. radiata. This Elaphe can attain a length of 200cm and the body can be described as slim.

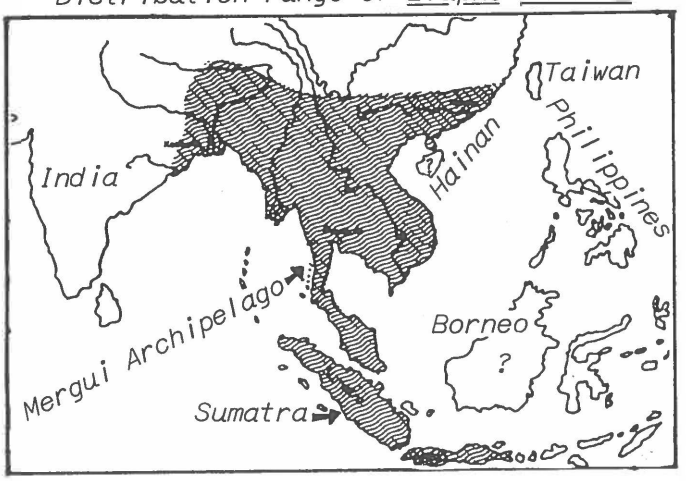


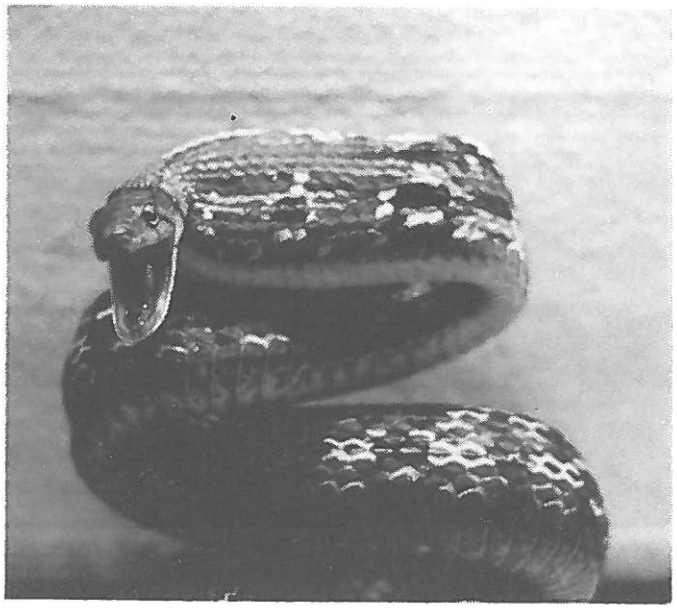
Elaphe radiata (after Pope, 1930)

DISTRIBUTION AND HABITS

In its habitat, Elaphe radiata is not rare. Their distribution range begins at the Mahandi River in the Indian state of Orissa and extends through Assam, Sikkim, Bangladesh, Burma, Southern China (South Fukyen, Kwantung, Kwangsei, Yunnan), Cambodia, Vietnam, Laos, Thailand, Malaysia and to the islands of Sumatra and Java. The existence of E. radiata in Borneo (Haile 1958) requires further and more exact investigation. E. radiata is not particular regarding its biotope. It lives on low as well as high land (up to 1500m above sea level in Burma (POPE 1935)) in the most varied of habitats. It is often found in the middle of large villages where it hunts rats. It has also been found in the vicinity of lakes and ponds which it seeks out (Mell 1929). E. radiata is also a very good swimmer. Frith (1977) reported that he found E. radiata on the coast of the Thai Island Phuket swimming some 50m out at sea. The species has probably reached several of the islands along the coast in this way. This was proved by Anderson (1989) when he found E. radiata on the Mergui Archipelago. Whilst climbing and on the ground, this snake is very agile and when fleeing can develop an amazing turn of speed. Because E. radiata is also very shy and secretive, I did not manage to spot one on either of my trips to Thailand although the locals told me that this snake is very common and can be found almost anywhere. Schafer and Grossman caught a specimen in Pak Chong (Thailand)

Distribution range of Elaphe radiata





E. radiata exhibiting warning behaviour

(1986 personal report). The snake lay under some old boards at the edge of a harvested maize field. Gruber (1985 personal report) observed E. radiata on the Marsyandi River in Central Nepal at an altitude of 500m.

If E. radiata is unable to escape, it immediately exhibits the warning behaviour so typical of this species. The front of the body is coiled into an 'S' shape and raised up. At the same time the entire body, and especially the throat, is inflated. In this position the eye-spot markings can be clearly seen. With widely open mouth the snake then begins to strike at anything which moves in the vicinity, moving almost the entire body. If this play-acting serves no purpose then the snake simply plays dead. Once, whilst injecting a 180 cm snake with (CITARIN), I was fooled by this behaviour. At first I thought the dosage had been too high as the snake lay limply in my hand with its tongue hanging out. After a few minutes it was again confronting me with its widely-open mouth. Their easy irritability is further illustrated by the number of snakes bought commercially which have damaged snouts!

According to Gunter (1864) E. radiata is equally diurnal and nocturnal. Their food consists mainly of small mammals but birds, frogs and small lizards also form part of their diet.

It is probable that E. radiata reproduces the whole year round. Wall (1914) found gravid females from April to July. In March I obtained gravid females in Thailand; Kopstein (1938) reports a clutch of eggs in October from a Javanese animal. Normally 8-12 eggs are laid from which the hatchlings emerge after 80-90 days.

I have only been in possession of a true and healthy pair of this interesting Rat Snake since March. The male was wild-caught by Schafer and Grossman and the female was bought commercially in Thailand. These individuals have proven to me that this species present no problems in the vivarium provided they arrive healthy in the first instance. De-worming must, however, be carried out in all cases because, as already stated, E. radiata is the carrier of innumerable parasites which are easy to remove provided they are treated promptly with the correct medications.

Because of their size and shyness, E. radiata need a large and spacious vivarium offering several hiding places. If these snakes do not feel secure, they will strike at the glass at the slightest disturbance and refuse to take any kind of food. The substrate should consist of a soft material; peat or bark chippings are ideal especially during the first months of captivity during which they are particularly active and can easily be injured.

The furnishings of the vivarium should consist of strong climbing branches, a potted Dwarf Bamboo and flat and layered rocks to form a hiding place. If the substrate is of pure peat it should be kept moist in several places; if the vivarium is too dry this usually leads to sloughing problems. Because we are dealing here with a tropical species, the relative atmospheric humidity should be kept at around 80% by daily spraying. A large water container must also always be present. Schmidt (1983) also proved that animals which are kept under very dry conditions usually have trouble in sloughing. In addition, the snakes must be protected from large temperature variations because these can quickly cause colds.

Even after long periods of captivity, E. radiata never lose their shyness. These snakes spend most of their time in their hiding places or rolled up under cover. At the slightest disturbance in their tank the snakes flee into hiding. To date I have only been able to observe my snakes



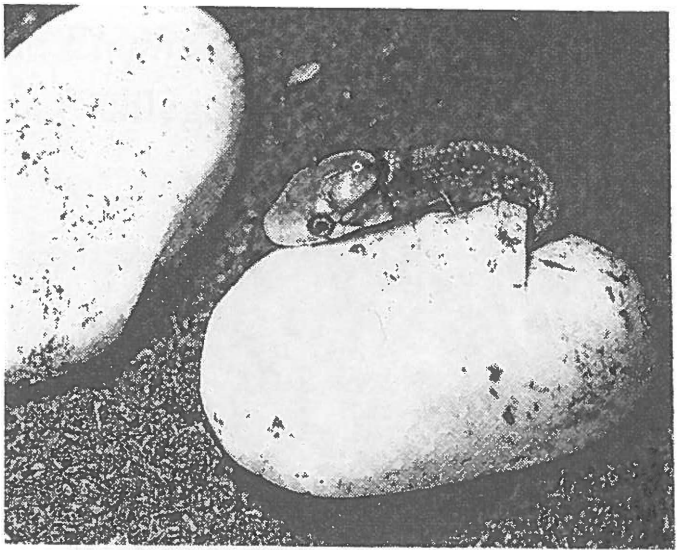
Elaphe radiata

gliding around in their tank in the early hours of the morning. At the slightest movement the animals first stop and, when further movement is observed, they flee into cover with almost lightning speed. As food I offer laboratory mice which are taken willingly but only under cover; these snakes never feed in the open. Newborn rats are especially favoured. Because they are so belligerent E. radiata can only safely be handled using stout leather gloves. In addition, in most cases the anal glands are also rapidly emptied.

My observations agree totally with those of Schmidt (unpublished) who has kept these snakes for a number of years. The peculiar resting position of these snakes is also worthy of mention. Just as they lie, their spinal column is also bent in the same way. This peculiarity has also been observed several times in other Rat Snakes such as E. climacophora, E. taeniura and E. helena, especially when the snakes are suddenly startled.

REPRODUCTION

According to my information, true captive breeding has to date only been achieved by Schmidt in 1983 (personal report). From a clutch of nine eggs which were hatched in a simple incubator on moist foam rubber at temperatures of 27 to 30 degrees C and a relative atmospheric humidity of around 100% only one 24cm long hatchling emerged after 85 days. Two eggs each contained a prematurely dead foetus several weeks old



Elaphe radiata hatching

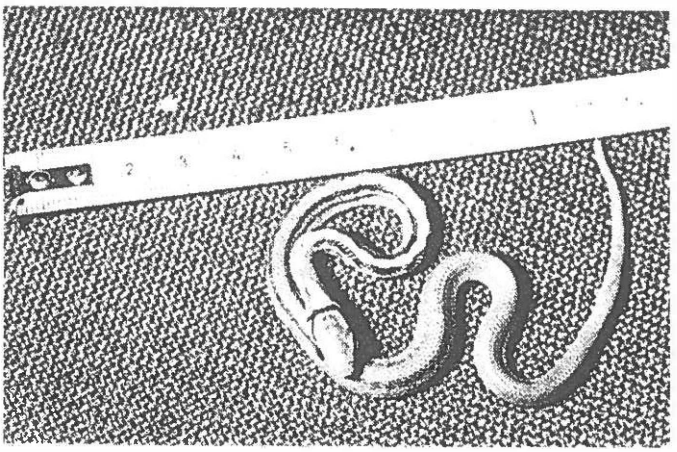
and 15.5cm long. The young animal which hatched had misshapen eyes but still appeared capable of survival. Because the hatchling refused to feed voluntarily it was force-fed with pink mice. After ten months the young Elaphe radiata died unexpectedly.

I had similar problems with two clutches of eggs from this species. In March I brought home two gravid females which had been bought commercially in Thailand. These laid 9 and 11 eggs at almost the same time. The eggs were placed in slightly moist peat and incubated in a container similar to that described earlier (Schulz, 1985). The temperature in the incubator varied between 25 and 30 degrees C, cooling at night to around 22 C. The relative humidity was a constant 95%. Most of the eggs collapsed totally after two weeks. Finally only six eggs remained and some of these were partially mouldy. Only three remained white and relatively well-rounded. On the 30th of June 1986 after 86 days, a 26cm long hatchling emerged. Two eggs contained well-developed but dead foetuses which were considerably misshapen. One of the hatchlings split its egg but died shortly afterwards whilst still inside. This animal had a very badly deformed eye. The snake which did hatch appeared to be well if a little thin and was very similar in pattern and colour to the adult animals. At first it also exhibited similar defence reactions. After a few weeks the snake became calmer and rarely attempted to bite. At first food was not taken voluntarily so I had to force-feed it with pieces of pink mice which were digested very well. After a while the snake began to take pink mice voluntarily and, at

present, remains in the best of health.

The reasons for the almost identical incubation problems in both Schmidt's case and mine are unclear. A possible solution could be to hatch the eggs without nightly cooling in the incubator because in their tropical habitat there are probably no great fluctuations. At some time no doubt this snake will also be bred as successfully as other members of the genus who earlier presented similar problems.

Asian Rat Snakes of the Elaphe Genus, Part VIII, Elaphe taeniura, will appear in next month's issue.



Newly hatched Elaphe radiata
All photographs by Klaus-Dieter Schulz

Some Comments on the Health of Newly Imported Reptiles in Recent Years

by Kevin J. Hingley

A few years ago I noticed, along with many others I'm sure, the increase in unhealthy reptiles being imported into the United Kingdom. There are several reasons that spring to mind, and the purpose of this article is to discuss these reasons and hopefully suggest some answers that may help to alleviate the situation. Some dealers have already started to tackle the problem by either restricting their dealings to reputable exporters, or by establishing quarantine areas on their premises so that newly imported animals can be monitored closely prior to being offered for sale. The other alternative is, of course, to adhere to purchasing only captive bred reptiles, and this is almost certainly the surest way of obtaining healthy animals, although even this cannot be guaranteed 100%.

Most of the problems we encounter with newly imported reptiles (injury, infection, disease), begin in the country of origin. From my own experience whilst on holiday abroad, I am well aware of just how difficult it is to catch even a dozen or so lizards within a two week period simply to photograph and examine them. It is almost impossible to witness the entire herpetofauna recorded for even a small region during such a short period of time and, by taking these facts into account, it is easy to conclude that the exporters of reptiles and amphibians would take even longer to accumulate sufficient animals to fulfil an order. Another point to consider is that it is highly unlikely that such an exporter only receives one order at a time. It is more likely that an exporter receives orders from several dealers in a number of different countries within a short space of time, thus putting pressure upon the exporter to fulfil these orders as quickly as possible if he or she is to stay in business. This pressure on the exporter is handed on to his catchers, and this must inevitably lead to the required species being hunted by unfavourable methods and so inducing injuries. It is also quite likely that a large percentage of the specimens caught are already sick or injured, which is why they allowed themselves to be caught in the first place. Healthy reptiles are far harder to catch than sick ones, as anyone who has attempted to catch them will testify. In addition to this, the various species that may be required will not be found in one particular type of habitat, and some of the species required may inhabit regions hundreds of miles apart. Should the exporter despatch his catchers at the same time, those species that are caught 'on the doorstep' may be kept under totally unsuitable conditions whilst the exporter awaits the delivery of species from further afield. In instances of required species only being found in rather inaccessible or inhospitable regions then it may be that the more locally caught species will have to undergo several weeks of distressing conditions, such as overcrowding, no food and no water. If this is the case then it is little wonder that some of the newly imported reptiles

we see are ill or injured.

Heavy collecting of reptiles and amphibians over the years must have taken its toll, and the depletion of healthy animals in the wild could be one of the reasons for an increase in unhealthy animals being offered for sale in the U.K., and the situation may be similar abroad. The growing loss of natural habitat in order to accommodate man's needs for more housing and to grow crops must surely mean that more and more animals, and not just the herpetofauna, are forced into smaller areas of suitable habitat, thereby placing enormous pressures on the various animals within a region to compete for survival. The loss of habitat may also be responsible for the bringing together of species that would not normally inhabit the same area, and this alone will result in heavier competition for food. Small, delicate species may not be able to withstand the competition, or even become prey to animals that they would not normally encounter, but for the lack of suitable habitat. If this is the case, then the prospect is quite frightening.

Tropical species appear to be more susceptible to disease than temperate forms, especially when removed from their natural habitat. Whilst they appear to be capable of enduring infestations of endo- and ectoparasites in the wild state, once removed from their chosen habitat they seem unable to cope. The reasons for this would appear to be the stress of capture followed by unsuitable conditions whilst awaiting export resulting in loss of appetite. This then leads to a decline in general health and in the ability of the animals' natural resistance to combat such infestations, injury and other ailments. I am not the first to report on the plight of reptiles, in particular in the case of Asian Elaphe. Schulz (1985), mentions recent reports of such snakes being exported from Hong Kong minus the gall bladder. Smith (1987), also refers to the various factors which may be the cause of poor successes in keeping and breeding the Asian ratsnakes. But it isn't only Asian reptiles that are at risk, many south American forms also find their way to U.K. dealers in a sad state. Some snakes, such as Spilotes spp. and Pseustes spp. were often considered delicate and unsuitable for captivity, but as with the various Asian forms it would appear that this need not be the case if the animals are captured and maintained correctly prior to export from the country of origin. The question arises ... "How do you educate the exporters?"

The problem hasn't stopped at the Tropical forms though. A few years ago I was very surprised to see an increase in the number of what were once considered to be hardy, temperate species, in particular North American 'favourites' such as Kingsnakes, Lampropeltis spp., Rat and Corn snakes, Elaphe spp., as well as the humble Garter snakes, Thamnophis spp., being imported by British dealers in a very sorry state. The main problems with these snakes was emaciation, reluctancy to feed, and regurgitation if they did feed. The most likely explanation for all of this seems to be that the rise in demand for reptiles has led to an increase in people wishing to profit from what appears to be a very lucrative business, especially for those in countries with a poor economy who can earn more in a week than they could in several months, simply by catching and then exporting their local herpetofauna. Fortunately, the importers quickly stop trading with the more unscrupulous exporters upon receipt of a bad shipment; unfortunately, there is usually another importer waiting in the wings.

Sigg (1984) reported on the plight of European colubrid snakes in the hands of Yugoslavian and Turkish snake catchers. His article deals quite extensively with the terrible conditions that the snakes, in particular the Leopard snake, Elaphe situla, are subjected to once captured and awaiting sale to collectors in W. Germany and Switzerland, and other western European countries with a high density of herpetologists. The snakes are neither fed or given water for periods of up to six months, so it is little wonder that they live only a short while following exportation. He also points out that

TRANSLATIONS

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John Hackworth
84, Mitford Gardens
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there are large areas in Yugoslavia and Turkey that are covered by a well organised snake catching group. If this has been allowed to happen in so-called civilised countries, then the extent of this practice in the Third World doesn't bear thinking about. There is legislation to protect these animals, but is it enforced efficiently? I don't see how it can be when the authorities have to concern themselves with more important matters such as drug smuggling and illegal immigration.

Summary: It would appear that the initial problem lies with the exporters, due either to ignorance or greed, but probably both in the case of the more unscrupulous. Not all exporters fall into this category; most reputable dealers have more than a passing interest in the animals in which they trade, and therefore they try to ensure that their stocks are carefully collected and maintained prior to export. Even reliable traders come unstuck now and again, possibly due to airport delays or a mix-up over licences and then, of course, the awaiting importer begins to question his source when a shipment arrives late and the majority of its contents are well below par. I get the impression that most U.K. importers nowadays are trying to rectify past wrongs by initially quarantining newly imported reptiles, and some have even gone to the lengths of asking a vet to check over a new shipment upon its arrival. This is good news for the prospective purchaser, but is it enough? I personally feel that there is some way to go before both the collector and animal welfare groups are entirely satisfied with the trade in reptiles, and by that time it may well be too late as it now seems widely accepted that the trade in wild, exotic animals is doomed.

References:

Schulz, K-D., 1985. Die hinterasiatischen Kletternattern der Gattung Elaphe. Teil 1. Elaphe rufodorsata. Originally published in "Sauria", reproduced in "Snake Keeper" (Vol. 2. No.2) by permission of the author. Translation by J. Hackworth

Sigg, H., 1984. Anspruchsvolle Schonheit - Anforderungen von Elaphe situla an Lebersraum und Terrarium. Originally published in "herpetofauna", No.29, reproduced by permission of the author in "Snake Keeper" (Vol. 2. No.1.). Translation by J. Hackworth,

Smith, T., 1987. Asiatic Colubrids - Part 1. The Herptile, Journal of the I.H.S., Vol.12. No.4. pp. 149-160.

LETTERS

Snake Keeper
159 Stanley Hill
Amersham
Bucks HP7 9EY

Dear Sir,

In reply to the article by Peter Kirk in Snake Keeper, June 1988, I find it hard to understand how the behaviour of his Indian Python (Python molurus bivittatus) could cause stress, when the poor thing was just acting normally.

My own Indian Python reacts in the same way as Peter's. He is also a male and the twitching of the head is one thing that mine does a lot. After watching him for a long time, I decided to find the reason for this. The only thing I can come up with is that the scales under the chin must be extra sensitive - if they get folded foward it makes the snake twitch. If you want to prove my theory, all you have to do is put your finger under the snake's chin then push your nail up a little, very gently, and you should find it will make the snake twitch.

I have carpet tiles on the floor of my vivarium, the pile of which is looped, and this makes him twitch like mad. It's the same when he's out on the carpet, the sheepskin rug has the same effect. A little trick I like to do to mine is tickle his throat for a few minutes. When I stop he stays in this position for quite a while, as though he's been paralysed.

Now a word about the 'aggressive' behaviour. I find that if you put your hand near the nose first so that your scent is registered before you touch the snake, you should have no trouble with hissing or biting (at least, I have no

problems by doing it this way). Personally, if I was blind and deaf and someone tried to grab me by the scruff of the neck, I think I would prefer to thump them rather than hiss.

Now to the final part of this unusual behaviour, the snout rubbing. I think every Indian Python does this, at least the ones I know do.

The only time that Ballo (that's the name of my lovable monster) is still is when he's been fed and for about three days after; the rest of the time is spent trying to open the door of his cage. Once he is let out he wanders about for a couple of hours causing havoc then, when he's put back, he remains quiet for the rest of the night until the following morning when the whole process starts again. Sometimes I think I should be in the cage and he should live in the rest of the house; the amount of time he spends out of his cage is unbelievable.

So, Peter, all I can say is that it seems like you have just got rid of a very normal, friendly Indian python.

W. Muzzioli
Co. Durham

BOOK REVIEW

Hong Kong Amphibians and Reptiles
by Stephen J Karsen, Michael Wai-neng Lau & Anthony Bogadek.
Published by The Urban Council, Hong Kong, 1986.
Price 25 USD.*

This colourful little book was first brought to my attention by a Danish pen pal of mine who asked me to obtain a copy for him, which I duly did. Upon receipt of the book, and prior to posting it to Denmark, I couldn't resist 'checking it over' and decided there and then that I would have to obtain a copy for my own library.

The first thing that strikes you when you read through this book is the variety of local herpetofauna that Hong Kong possesses. Most people's impression of Hong Kong is one of skyscrapers, over-population and a harbour full of junks, yet there are 22 species of frogs and toads, 11 species of Chelonians, 18 species of lizards and 47 species of snakes recorded to date. The only Newt found in Hong Kong, aptly named the Hong Kong Newt, Paramesotriton hongkongensis, brings the total checklist for the region to 99 species.

With the exception of 5 drawings, all of the remaining 140 plus plates are in colour, and all of them take up the top half of the page. Many of the large plates have smaller inset photographs showing detail of the head, underside, colour variants or eggs that a particular species lays. These plates are found on 98 of the book's 136 numbered pages. The text beneath the plates gives a description, habitat and habits, with reproductive data and diet where possible. Apart from the obvious necessity of scientific names, the common names are given in English and Chinese.

The book starts with a dedication from the authors to the late J D Romer, a man renowned for his work with the herpetofauna of the region. There is also a small preface by the Chairman of the Urban Council, the usual acknowledgements, information on Endangered Species, a Preface and a description of the various forms of amphibians and reptiles of Hong Kong. Following the plates and individual descriptions, etc., the book is nicely rounded off with a section on Classification and Checklist, a list of the species recorded in Hong Kong since 1950, a thorough Glossary, plus an Index of Chinese names and a General Index. The reference list is restricted to selected references.

All in all, this is a worthwhile publication that has something in it for everyone. The descriptions, photographs and various data are all adequate, and I think anyone who buys this book will not be disappointed. The price in the U.K. is variable, between £6 and £8, but worth every penny. The glossy soft cover shows the Asian Common Toad, Bufo melanostictus, on the front, with a super photograph of the Copperhead Racer, Elaphe radiata, in the threat posture on the back cover. Look out for Elaphe porphyracea nigrofasciata, the Red Mountain Racer and Natrix aequifasciata, the Banded Water Snake.

K.J.H.

Product Review

Described by the manufacturers, Novatech, as the most advanced thermostat available for vivarium use, the VTC (Vivarium Temperature Controller) has been designed to use low cost filament lamps as heaters but will work equally well with non-lamp heaters.

Whereas conventional thermostats turn the heat source on and off (claimed by some reptile keepers to cause stress to the vivarium occupants) the VTC turns the heat source up and down in a similar way to a dimmer switch.

Some of the advantages claimed for the VTC include optimal use of electricity resulting in reduced running costs, longer lamp life and less stress for the animals.

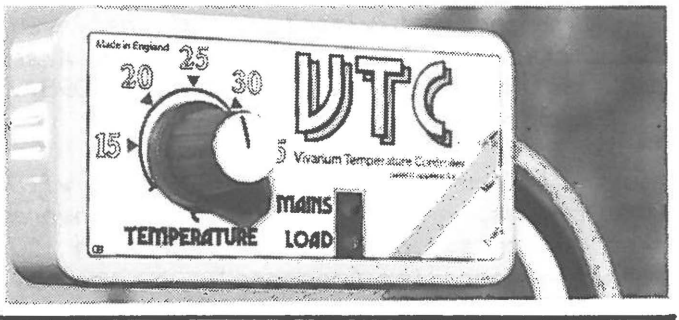
The VTC runs on 220/240 volts (50Hz) and can handle a maximum load up to 500 watts. Temperature operation is between 15 and 40 degrees C (60 to 140 degrees F) with an accuracy of 0.1 of a degree. It is not suitable for use with fluorescent lamps, low voltage lamps or discharge lamps and requires a minimum load of 15 watts.

The unit is attractively designed and comes with connecting leads of a generous length. The accompanying instruction leaflet is well written, very comprehensive (other manufacturers please note) and should contain sufficient information to enable the absolute beginner to set up the equipment. Further information sheets on specific applications are available at a cost of 75p per sheet.

Novatech (a company primarily engaged in electronic engineering consultancy to industry) are developing further products for the herpetologist.

Our review unit has only been connected for five days but early impressions are that it is working well. My only complaints so far are that I would have preferred the option of screw holes in the case rather than the sticky pad (pads supplied) method of attaching it to the vivarium and that the temperature dial can be slightly misleading until you understand how the thermostat works. It isn't simply a question of dialling a temperature; if your heat source is not powerful enough your vivarium won't reach the dialled temperature. I feel that a scale marked low to high would be less confusing. However, this is just a minor criticism and, as mentioned above, a full explanation is provided in the instruction booklet. The cost of the unit would mean a deep dig into the pockets of many reptile keepers but, if it meets the manufacturer's claims, it should be a worthwhile investment for those 'special' reptiles.

For further information about the VTC (recommended retail price £44-95p) contact Novatech Limited, 23A Thurlow Park Road, London SE21 8JP. Telephone 01-761-5241. Fax 01-761-7466. *MC*



The Reptile Breeding Foundation Crisis
Continued from page 2.

ificate, a photograph of your adoptee and the Reptile Breeding Foundation's quarterly newsletter 'Scales and Tales'. In addition, your name will be placed on their recognition board and, if your adoptee is on public display, it will be identified as yours. You will also receive an updated report on your adoptee at renewal time.

If you would like to help the Foundation in their time of crisis write to them at;

The Reptile Breeding Foundation,
P.O. Box 1450,
Picton,
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or send an sae to us for a copy of the full adoption list and further information.

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Very attractive Grey Rat Snake hatchlings. Elaphe obsoleta spiloides. £17 each. Telephone Roger Grenville on Princes Risborough 6867.

Royal Python. 4' good feeder, £40 o.n.o. or will consider exchange. Phone (051) 327 5463 Sundays only or write to B. Forshaw, 629 Borough Road, Birkenhead, Merseyside L42 9QA.

Female Boa Constrictor (Boa constrictor constrictor). 5' excellent feeder and very tame. £145. Adult male Corn Snake (Elaphe guttata guttata). 4' good feeder and healthy; £45. Telephone Wolverhampton (0902) 784805.

Python molurus bivittatus. 3' believed male. Friendly, eats anything. £50. Also some new, unused accessories. Phone (0989) 67918 (Ross-on-Wye).

Fruit fly cultures, large £1.50p with instructions. Small-scale earthworm breeding sets. Breeding sets contain 50 earthworm capsules (cocoons), a special ventilated breeding dish, soft protective bedding for the young worms to live in, a bag of specially selected 'Growth Food' to make them grow for up to three months and a bag of calcium carbonate plus instructions. Price £4 inclusive of postage and packing. D.J. Silvester, 188 Wren's Hill Road, Wren's Nest Estate, Dudley, West Midlands DY1 3SF.

One pair Carolina Corn Snakes (adult), female laid 33 eggs this year, £140 pair. One male adult Corn Snake, £70. Three Iguana Lizards £30 each. All healthy and feeding well. Telephone Crowthorne (0344) 771498.

Offspring '88: Elaphe bimaculata, E. obsoleta bairdi, E. taeniura friesei, E. subocularis, E. guttata. Lampropeltis getulus holbrooki/californiae/nigritus. Offspring '87: Elaphe o. obsoleta, 1,1 E. t. friesei, L.g. nigritus, 1,0 E.o. rossalleni 160cm. Holger Bartz, Cyriaksring 54, 3300 Braunschweig, West Germany. Telephone (0531) 81841.

Captive bred hatchling snakes: Kings, Corns, Rats, Pines and Gophers (15 species) - available from August onwards, most in unrelated pairs. For full list send an sae to: Anne Clegg and Kim Loader, Clay Hill House, Clay Hill, Enfield EN2 9JA.

Reptiles: Boas, Royals, Retics, Indian Pythons, Rats, Corns, Garter Snakes, Racers, Indigos, Lizards, Spiders etc. Stock or supplied to order. Telephone Newton Abbot (0626) 64481 (Devon).

Viperine Snakes (Natrix maura), 1987 hatchlings, captive bred in Holland. Superb specimens, feeding well. For sale or exchange for hatchling Black or Yellow Rat Snakes (w.h.y.?). Favourable prices for interested herpetologists. John Hackworth, 84 Mitford Gardens, High Howdon/ Wallsend, North Tyneside NE28 0QR.

Captive born Elaphe rufodorsata (Chinese ratsnake). All feeding on chopped freshwater fish or freshwater fish fry. Captive care as for Garter Snakes, Thamnophis sp. £15 each or £35 for three. Contact Kevin J. Hingley, 22 Busheyfields Road, Russells Hall, Dudley, West Midlands DY1 2LP.

WANTED

Does anyone know of a snake/reptile keeper's club in or near Reading? If one does not exist then I will start one if I can drum up enough enthusiasm. It would be run in an informal manner, possibly meeting in a pub once a month but, if a lot of people enquire, it may have to be more formal. I wait anxiously for any information on existing clubs or enquiries to start a new one. Replies to Jeff Smith, 20 Wood Lane, Sonning Common, Reading, Berks RG4 9SL. Telephone (0734) 723353 (after 9pm).

One hatchling or young blue, black Florida Indigo Snake. Phone Peter Hughes on (0494) 25345.

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