SNAKE KEEPER

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INFORMATION

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CONTENTS

Demanding Beauty. The requirements of Elaphe situla in its natural habitat and in the vivarium 4

The Red-tailed Tree Racer 12

Bolton Snake Keepers - Gary and Karena Waddilove 14

Fifteen Years of Reptile Keeping 15

My Experiences with British Snakes 16

Book Review 18

Junior Snake Keeper 19

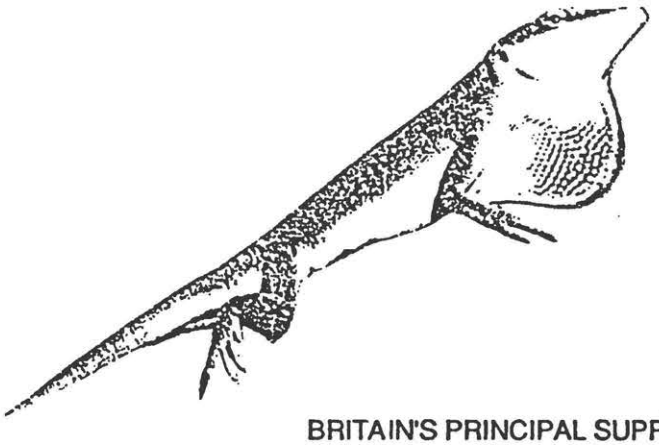
Classified Advertisements 20

Front cover: A striped Leopard Snake Elaphe situla by Harry Sigg

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Demanding Beauty - The requirements of Elaphe situla in its natural habitat and in the vivarium

by Harry Sigg

This article was originally published in the magazine 'Herpetofauna' No.29 as "Anspruchsvolle Schonheit - Anforderungen von Elaphe situla an Lebensraum und Terrarium" in 1984. It is published by kind permission of the author.

Translation by John Hackworth.

Introduction

This work is based on several long visits to the various habitats of Elaphe situla and on the captive maintenance of 24 Leopard Snakes over a total of five years. These animals can be subdivided as follows:

9,3 purchased or wild-caught Elaphe situla from the Yugoslavian mainland.
0,1 newly-imported wild-caught specimen from the island of Milos, bought privately.
2,1 captive-bred young hatched in 1980 by the author from eggs laid by a gravid female imported in spring 1980.
2 captive-bred semi-adults bought privately. The parents originated from the island of Milos.
4 captive-bred animals born in 1982 from the same female which laid eggs in the spring of 1980. The male was bought from Yugoslavia in spring 1979
2 captive-bred animals born in 1982. The mother was a captive-bred female hatched by the author in 1980 and the father was a male bought from Yugoslavia in spring 1979.

A female which had been caught in 1978 died in autumn 1979 as a result of a bacteriological liver infection. 4,1 animals died during hibernation 1979/80 at a temperature of 5 degrees C. This was caused by a severe lung infection. Of these, 1,1 animals were from autumn 1978, 3,0 animals from spring 1979. All other animals were still alive in autumn 1983. The Leopard snakes which have survived the longest were those imported in spring 1979 and which have been successfully kept in captivity for four and a half years.

Distribution and Biotopes.

The most detailed information regarding the distribution of Elaphe situla can be found in Bruno (1977). He cites: Malta, Italian peninsula and Sicily, the Dalmatian coast of Yugoslavia including the islands of Krk, Lissa and Corcula, Albania including the island of Ionio, Greece including the islands of Eubea, Kythera, Crete, Rhodes, Skopelos, Skiros, Chios. Samos, Kos, Andros, Kythnos, Siros and Milos, parts of Bulgaria, Crimean Peninsula, European Turkey, North and West Anatolia and The Caucasus (occasional occurrences).

In Honnegar's distribution lists for Elaphe situla (1978) Rumania is included. In addition, Broggi (1978) states that Elaphe situla occurs on the island of Lesbos.

Within the framework of the Red List of Endangered Species, Honnegar's investigations of Elaphe situla (1978) speak in clear language. Most populations have been damaged by environmental pollution, by systematic slaughter and by over collecting for the pet trade. Herpetologists can also be included here because at least one of these factors is no longer of any great significance.

The Leopard Snake prefers low-lying coastal habitats. It is seldom found inland or more than 600m above sea level. In current specialist literature, unfortunately, the habitats of Elaphe situla are only described rather inaccurately and in general. Trutnau (1979) states only that "they live in dry stony regions with low and scrubby vegetation". However, if the somewhat scanty literature regarding Elaphe situla is examined more closely, several other biotopes can be found. Arnold and Burton (1978) include marshes and river banks. Nikol'skii (1916) reports on steppeland and fertile coastal areas, whilst Pallas also found these animals in desert regions of the Crimean peninsula. In Turkey, the Leopard Snake is regarded as a house snake because it is often found in houses (Basoglu and Baran 1980). In this connection, Schreitmuller (1923) describes a Leopard Snake which was allowed the freedom of a studio for quite a time, which managed to feed itself regularly and which never attempted to leave this

'substitute biotope'.

On the Yugoslavian Adriatic coast, Elaphe situla lives in overgrown gardens with abundant vegetation. On the Turkish Aegean Sea coast the animals live on wildly overgrown rocky ridges which have built up around the borders of cornfields (Sevki).

It does not appear that there is an unalterable biotope type. In a distribution range extending over 10 degrees longitude and 27 degrees latitude which contains several climatic zones, it is no surprise that the biotope demands of a species living there are quite varied. The extent of the temperature and rainfall variation can be seen from the chart on the right.

We should not forget however that a snake which lives in a warm dry area also has the opportunity to enter into a damp and cool microclimate. In the planning of our vivaria we should take this factor into consideration in that not only should we provide various warm zones but the animals must also have access to areas of varying humidity. More detailed information concerning wild Leopard Snakes is contained in an interesting work by Pozio (1983).

Variations in Markings.

A detailed diagnosis will not be given in this article. It seems to me however worthy of mention that I and other leading herpetologists consider that the two distinctive forms of markings of Elaphe situla varieties should be described as subspecies. On the basis of results from earlier research these relationships are better understood. Striped specimens are rarer, do not occur in all populations, but always occur together with blotched animals. Since, however, a geographical co-existence of subspecies is always impossible apart from their contact or interbreeding zones, on the basis of this characteristic they cannot be described as subspecies.

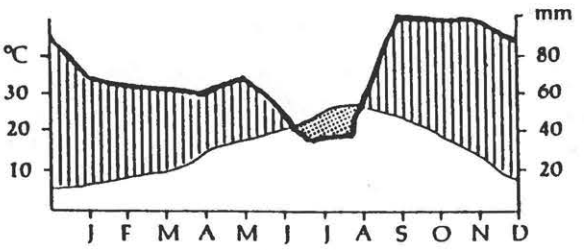
Obtaining Animals and Problems With Dealers

To a certain extent, the successful maintenance of Elaphe situla in captivity depends upon the condition in which these delicate animals reach their future keeper. Animals obtained commercially are usually sick and eventually succumb to a pre-programmed death.

Climatic conditions in various biotopes of Elaphe situla.
(According to H. Walter & H. Lieth 1967).

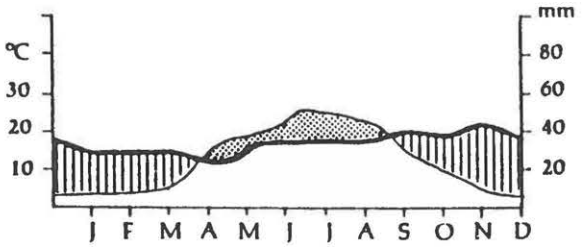
Dalmatian Coast (Yugoslavia)

Zadar a) 15m b) 15.1 c) 889



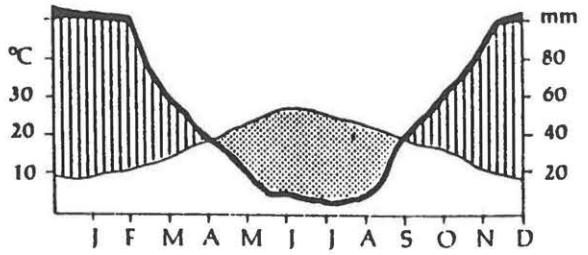
Crimean Peninsula (U.S.S.R.)

Sevastopol a) 23m b) 12.3 c) 361



Aegean Coast (Turkey)

Izmir a) 3m b) 17.4 c) 719



Humid season

Dry season

Mean monthly rainfall exceeding 100mm

a) Height above sea level
b) Mean annual temperature
c) Mean annual rainfall

(Scale reduced to 1/10)

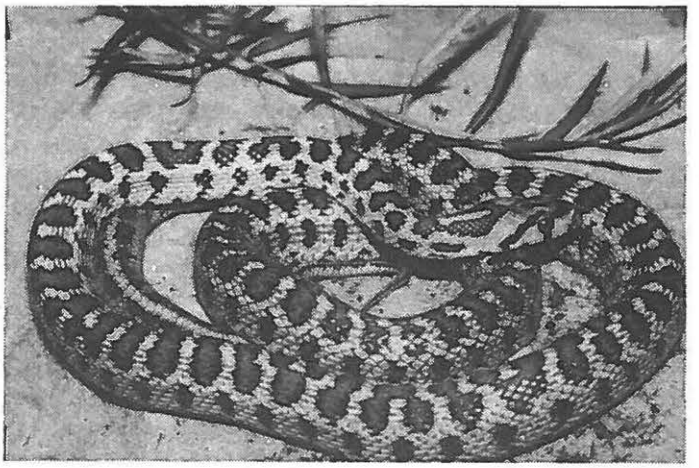
Curve of the mean monthly temperature.

Curve of the mean monthly rainfall.

For some time I attempted to obtain captive-bred animals; it is, however, difficult to obtain viable captive-bred animals. They are usually sold privately to the large numbers of interested parties. It was equally difficult to find



Typical biotope of Elaphe situla, a part of the Dalmatian Coast (Yugoslavia) which is rich in vegetation.



A Yugoslavian Leopard Snake bred by the author in 1980.

Elaphe situla in the wild.

In summer 1978 I obtained the addresses of several Yugoslavian snake-catchers in the area of Zadar. After a short advance notification, we visited some of these people at the end of September 1978. At the home of the first of these reptile catchers we received two Leopard Snakes as well as some other animals. Each of the snakes was kept seperately, according to species, in sacks and under optimum conditions. It was, however, a different situation at the home of the second catcher. He drew an old steel tank from a hole in the ground. This contained about 15 Vipera ammodytes. Most of the animals were in a deplorable condition, totally starved and between two partial sloughs. The explanation of the condition of these animals was equally as simple as it was disgraceful. A Swiss dealer had ordered the animals, but by early summer had still not collected them. Some of the animals had spent five or even six months in this metal box without any kind of food. We should realise the consequences of such occurrences. The local small-time animal catchers are not animal tormentors in the usual sense of the word. It is more a case of them being turned into snake-catchers by enquiries from dealers, without having the slightest knowledge of how to feed and care for the animals they catch. The real fault here lies in West Germany, Switzerland and other Western European countries with a high density of herpetologists.

In the following spring I spent a further week in this area, during which I had a considerable insight into the snake-catching organisation. There are large areas in Yugoslavia and Turkey which are totally covered by a well-organised snake-catching group. There is hardly a farmer who does not catch snakes and does not have the best knowledge of how to look after his charges. In some areas, entire school classes go out snake hunting. In 'fat' years up to 30 Leopard Snakes can be found in the homes of middle-aged men. Usually these animals are kept according to size in wire mesh cages similar to rabbit hutches. As well as Leopard Snakes, Coluber gemonensis, young Elaphe quatuorlineata and Telescopus fallax can often be found in the same cage. Naturally they are never fed. The rumour has obviously not spread that snakes also require water.

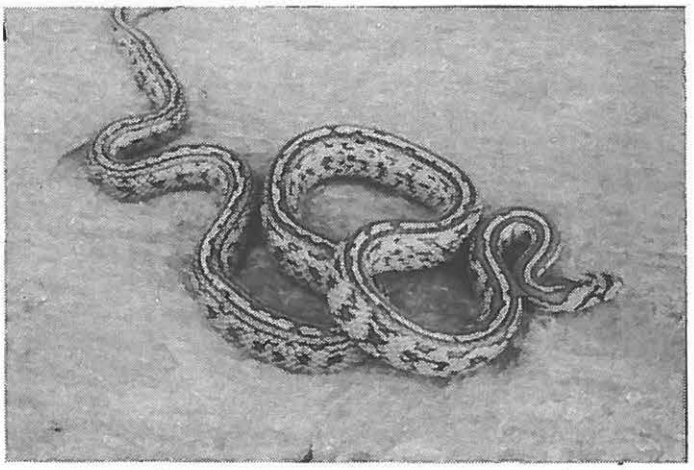
Normally the Leopard Snakes are caught from March onwards and collected by the buyers in June. Many animals have to survive a three-month storage period under the most abysmal hygiene conditions and even have to go without food after their hibernation. The general weakening of the animals and the unhygienic mass storage leads to all sorts of diseases. The extended transport to their final destination is an additional burden for the animals. If the beautiful Leopard Snakes eventually reach their destination after considerable hardship, then their destiny is usually already decided and their death is irrevocably pre-programmed. As long as the pet trade is not concerned with revolutionary improvements every purchaser should be aware that not only is he accepting the problems and cruelty, but also actively supporting it.

There are also dramatic consequences for the Elaphe situla populations in question.

The regular collection of many animals from the same areas drastically reduces populations and sometimes can even have a catastrophic effect (see also Honnegar 1978). After the enactment of Federal laws regarding nature conservancy, the survival chances for animals have been improved because the dealers in Yugoslavia had previously supplied mainly to German customers who were prepared to pay well. The problem for the serious herpetologist is, therefore, to continue to strive towards captive breeding.

Quarantine

Newly obtained animals should be kept in quarantine for quite some time. Healthy Leopard Snakes are not normally very demanding. Perspex containers measuring 40 x 20 x 25cm (LxHxD) are adequate. As substrate I use newspaper at first and then a mixture of leaf-mould and peat. The fitting and furnishing of such a small vivarium is simple and purposeful. An upturned flower pot serves as a hiding place, but a sufficiently large water container in which the snake could totally and comfortably immerse itself proved to be more important. The vivaria are only heated from above using the heat from an incandescent light bulb. Animals which are not to be hibernated receive additional heating from below during the cold period. In my experience, Leopard Snakes are not in need of great heat. According to the time of year, the temperature should be 22 to 26 degrees C and the night temperature around 18 to 22 degrees C. Animals which are to be kept in the cooler parts of these temperature ranges present fewer problems and develop especially well. Above 28 degrees C the animals begin to feel uncomfortable and, to cool off, they like to lie in the water container. Above all, Elaphe situla is especially sensitive. The slightest disturbance leads to a condition of over excitement which generally manifests itself in long, self-imposed fasting. That which appears advisable for most snakes is especially valid for the Leopard Snake. Never handle the animals unnecessarily. In 1923 Schreitmuller wrote in his essay: "After my considerable experience, Coluber leopardinus (= Elaphe situla) is not in any way weak or sensitive (provided it has been given an adequate settling-in period). This snake must have peace, peace and still more peace. It should not be handled too much or needlessly annoyed. If these criteria are adhered to the animals will accept food quickly and willingly."



A striped Elaphe situla from Milos

According to their size these snakes will accept new-born to half-grown mice. Adult mice will rarely be taken. Food is frequently refused during the first two years in captivity. They often undergo a two-month summer fast. A Leopard Snake should never be force-fed unless its life is in danger from starvation. Stress is coped with very badly. Those animals which persistently refuse food can sometimes be tempted with young hamsters, rats, gerbils or wild mice.

After the first slough the animals must be carefully examined for parasites. Nearly all Leopard Snakes carry parasites. Of the 13 Leopard Snakes I have kept, 12 of them were infected with lung nematodes. These parasites can quickly spread in the vivarium without an intermediate host-animal. This does not only present a danger to the healthy animals, but the infected animal becomes constantly reinfected; the results are a severe lung infection which usually leads to death. Treatment with Panacur from Hoechst (Fenbendazol) proved ineffective, even after being used several times. In addition, after administering the medication orally using a throat tube, many animals reacted by refusing food. The most effective medication proved to be Citarin or Citarin L from Bayer. For the animals this is relatively stress-free, quick and painless and is administered by injection below the skin of 50mg/kg body weight (Frank 1978). The medication is administered only once and is practically always successful. Care must be taken when calculating the dosage because overdosing, or even an error in placing the comma, can lead to death. This treatment should never be given shortly before hibernation. The lungs need time to regenerate and the organs must rid themselves of the medication.

Maintenance in the vivarium

After a quarantine period of at least six months and after repeated inspection for parasites, the animals can be transferred to a larger community vivarium. Although reports of captive breeding with large groups are available (Boost 1981), I prefer ideally a lesser density of one male to one female because Leopard Snakes are individualists which usually keep away from one another in the vivarium. When several animals are housed together this usually leads to disturbances. Naturally only perfect snakes which feed regularly should be placed together. A transfer to a larger vivarium can often cause a bad feeder to eat but, conversely, can cause a good feeder to stop eating. The dimensions and furnishings of the vivarium are only limited by one's imagination. Below are given details of two vivaria in which captive breeding was successful.

Vivarium No. 1 95 x 80 x 45cm (L x H x D) made from plastic covered chipboard, back wall perforated aluminium sheet. Lighting from a 20W fluorescent tube. A third of the base was heated by a heating pad. The substrate was of red Mediterranean earth and several hiding places were made from large and small rocks. A large water container and a climbing branch with many twigs was provided and a flower pot with Ficus repens was placed in an unheated corner.

Vivarium No. 2 80 x 45 x 40cm (L x H x D) glass and steel aquarium, lighting from a 20W fluorescent tube, no additional heating. Substrate a mixture of leaf-mould and peat. Other furnishings as in vivarium No. 1.

Important common factors between the two vivaria are as follows:

- *adequate ventilation to prevent condensation and bad air.*
- *a large water container in which the snakes can lie comfortably.*
- *at least three hiding places in three heat zones to prevent social conflicts among the animals and which give the animals necessary cover from humans!*
- *the flower pot (no hydroculture) serves as a cool damp corner which is appreciated when the temperature is high and which is often used as an egg-laying site.*
- *the light source is a qualitative fluorescent tube which approximates the colour spectrum of natural daylight and which is also suitable to allow the plants to flourish.*

The year in the vivarium

After a cooling-off period from the middle to the end of March the animals are placed in an unlit vivarium. In a cellar without a natural photoperiod, the amount of light is gradually increased and later the lighting is matched to the natural photoperiod throughout the whole year, i.e. the lights are switched on after sunrise and switched off before sunset. Thanks to modern electronics this is easy for the D.I.Y. enthusiast to arrange.

The animals usually feed for the first time around six weeks after the cooling-off period. They are fed weekly with two to four young furred mice. Animals which are bad feeders should be given as much food as they will eat. Many animals, especially wild-caught ones, will often refuse food during the hottest summer months. These interruptions in feeding show clearly that the life of wild caught animals is determined by natural rhythms which cannot often be influenced. Interference with such rythms is dangerous and only serves to damage the animals.

At the end of September most Leopard Snakes stop feeding voluntarily. Within three weeks the lighting is reduced to six hours and at the end of October the lights are switched off completely. I must, however, stress that the hibernation phases should be adapted to the prevalent conditions (e.g. climatic conditions, feeding conditions). In such special cases one should be governed by the conditions for a healthy human being. Because the temperature in the vivarium depends upon how long the lights are on and also upon the outside temperature, the desired temperature reduction results automatically. Because I do not keep any tropical snakes and all animals, apart from those newly hatched, are hibernated I can allow the room temperature to drop to the level needed for hibernation. Most animals are hibernated in their vivaria. Ventilated polystyrene boxes are equally suitable for hibernation. The hibernation temperature is of great significance. If the temperature drops below 10 degrees C it can be dangerous for the animals. Many herpetologists have suffered losses at temperatures between 5 and 10 degrees C. I myself lost five Leopard Snakes during a winter at these temperatures. For three years I have hibernated all my animals (European and Turkish Elaphe species) at

10 -15 degrees C. The loss of no animals and the increased breeding successes prove the expedience of this measure. Sufficient fresh water and absolutely no disturbances are obvious prerequisites for successful hibernation.

Reproduction in captivity

Taking into account the most important factors of maintenance, the breeding can be left to a large extent to the animals themselves. Triggering factors for a mating such as a longer photoperiod and higher temperatures result automatically in my snake room in the manner already described. Limiting factors are the fact that females are seldom found or offered for sale and possibly the assumption that many females only develop eggs every two years. The main prerequisite for captive breeding is a healthy, well-fed pair. Sexual characteristics such as a marked difference in tail length can be seen quite easily in Elaphe situla when the animals are compared. It does not appear necessary to hibernate the animals seperately. A test with two breeding pairs was carried out during the winter of 1981/82 (one separate and one paired hibernation) and led in both cases to mating and fertility. The first activity was noticed about a month after hibernation. The mating is preceded by a chase. The female darts around the vivarium with the male in hot pursuit biting her neck. When the male has managed to grasp the female by the neck and calm her down by enveloping her in his coils he attempts to copulate. If the female is receptive she soon calms down so that copulation (which can take several hours) can take place. Unreceptive females twist and turn until they shake off the male, after which the entire chasing process begins again. After a short time however the male runs out of energy and loses interest in the female. I was unable to observe further matings as reported by Boost (1981) mainly because I usually go on holiday in May. However, I was able to make an interesting observation in the spring of 1981. After placing a Yugoslav female in the vivarium of two Yugoslav males, they both attempted immediately, but unsuccessfully, to mate, but the same two males showed no interest whatsoever in a female from Milos, an observation which at this point cannot be evaluated.

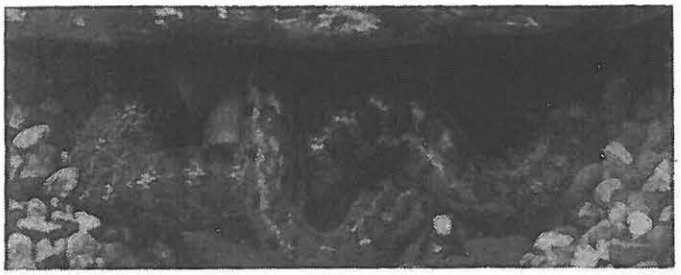


A gravid female in the vivarium, bred by the author in 1980.

A few weeks before the eggs are laid, the female stops feeding and increases significantly in girth. The animals slough 10 - 14 days before the eggs are laid, a certain sign that egg-laying is imminent. At this time the water container should be removed from the vivarium, a measure which is recommended because Leopard Snakes like to lay their eggs in water. Before the eggs are laid, the female becomes very restless, roaming around the vivarium and burrowing into the substrate trying to find a suitable place to lay her eggs. After lengthy searching the animals generally choose the planted flower pot or the moist substrate surrounding it. The egg-layings which I observed lasted two to three hours, presented no problems and took place on 3rd July 1980, 25th June 1982 and 7th July 1982.

As soon as the eggs have been laid they are transferred to the incubator. All twelve eggs from these three clutches were very large. They measured between 50 and 60mm, with a diameter of 15 to 20mm. The size of the clutches described in literature range between one and six eggs. On average from these three clutches, four eggs developed.

A detailed description of the method of incubation will not be given here because there is sufficient information on this subject to be found in existing literature (Gulder 1972, Nietzke 1972). The first clutch of eggs was incubated between layers of moss in the manner described by Marchetti (1968). The hatching rate was 75%. A fully developed animal died shortly before hatching. The second clutch was two-thirds covered with Vermiculite. This hatching rate was 50%. After eight days, one of the fertile eggs was becoming mouldy and, 41 days later, two eggs split for some unknown reason. The damaged eggs were kept in a warm dry place for 36 hours



Elaphe situla laying eggs. The eggs were laid in a place which had previously been well sprayed with water.

after which the splits closed up. After 10 days, the eggs had again reached their normal volume. One animal died shortly after hatching. The third clutch were three-quarters covered with a mixture of leaf mould and sand (3:1) during incubation. This time the hatching rate was 100%.

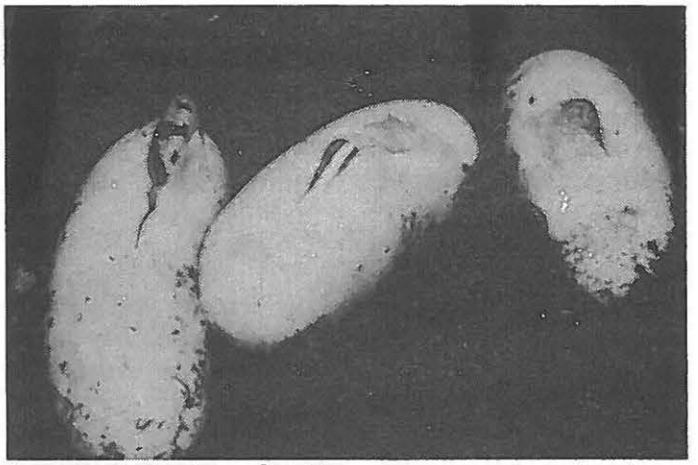
The environmental conditions were roughly the same for all three clutches. The relative humidity was 90 - 100% at temperatures of 25 degrees C up to a maximum of 28 degrees C and the substrate was kept slightly moist. Damp substrate and condensation can damage the eggs. The eggs took between 64 and 73 days to hatch. After splitting the eggs, the hatchlings remained inside for one or two days before they emerged completely. The sizes of the hatchlings from the 1982 clutches are given below.

Male from the second clutch: 10.5g in weight, 36cm long. Female from the third clutch: 10.2g in weight, 35cm long.

Hatchlings of Elaphe situla can be reared and kept without any problems. Shortly after birth, and sometimes even before the first slough at 10 to 14 days, the young animals usually take new born mice. Because newly hatched young have a great



A clutch of Elaphe situla eggs. Note the mouldy deformation of one egg.



Leopard Snakes in the process of hatching. After splitting the eggs, the hatchlings remain inside for 1 to 2 days.

need for security and react rather nervously to any disturbance it is advisable to keep young animals individually. The animals show their appreciation of this measure by eating regularly and growing without any problems. I keep the young in 6 litre plastic containers with a perforated cover. Lighting and heating are the same as in the quarantine containers. For the first two years the young are kept warm and fed throughout the winter. Only in their third winter are they allowed to hibernate.

Supplement

Because of a trip abroad, the two breeding pairs mentioned in the text were given to a herpetologist friend in Autumn 1982. In this way none of their maintenance conditions were changed. Vivarium No. 1 with the older breeding pair was integrated into an already existing vivarium complex. This complex was in a cellar and for various reasons the photoperiod was simulated at 12 hours. That means that day and night rhythms were alternated. They were hibernated in polystyrene boxes in another cellar. The Leopard Snakes soon became accustomed to their new conditions.

A positively identified mating was not observed but the female laid five infertile eggs on 30th May 1983. Both animals ate very little and very irregularly during the summer and autumn. Whether that was as a result of the excessively hot summer or the varied environmental conditions cannot be explained.

Vivarium No. 2 with the younger breeding

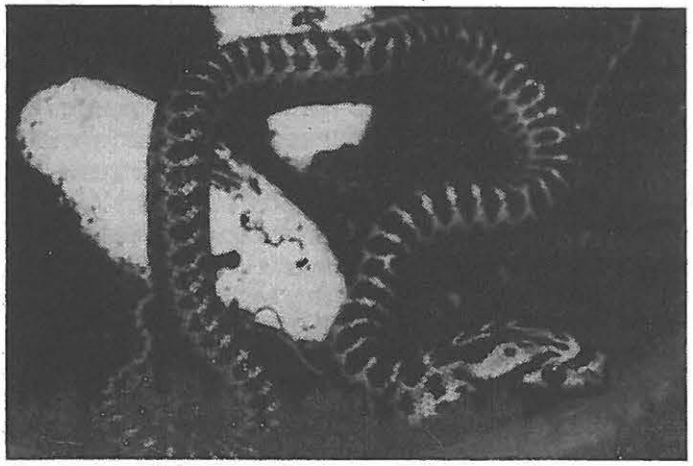


Leopard Snake hatching

pair was placed in a relatively cool study which was not used regularly and for hibernation the vivarium was placed in a cellar. On the 9th June the female laid four fertile eggs. Unfortunately these eggs became the victims of the summer 1983 heatwave. Both animals ate regularly well into the autumn despite the long hot period.

Conclusion

The keeping of Elaphe situla can be an exciting and interesting exercise. However it is always accompanied by problems and setbacks. I am therefore of the opinion that wild-caught animals should only be kept for longer periods by experienced herpetologists. Captive bred animals present far fewer problems and make far fewer demands on their keeper.



For some time after hatching, the young Leopard Snakes are extremely nervous and frequently adopt their defensive stance.

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(Photographs - Harry Sigg)

Red-tailed Tree Racer (Gonyosoma oxycephalum)

by John Bennett

Introduction

The Red-tailed Tree Racer, Gonyosoma oxycephalum, is an extremely large tree snake from South-east Asia. The snake is said to reach lengths of up to 2.3 metres (7.5 feet). Its range covers Burma, Thailand, Cambodia, South Vietnam, Malaya and The Philippines. There is some controversy regarding its true genus. Some people list it as Elaphe oxycephalum but the majority seem to prefer Gonyosoma. There is one other sub-species, the Pale Tail Tree Racer about which I can find no information.

Description

This must be one of the most beautiful snakes to come from South-east Asia. It is a very glossy darkish green with a black line that runs from snout to jaw joint. The pupils carry dark pigments so as not to break the line. From this line downwards and underneath it is a lighter yellowish-green. This colour runs right down to the cloaca at which point it changes to orange and then to a dull red continuing to the tip of the tail. The skin between the scales is black but about a quarter of the way down the body the skin has white diagonal stripes, one scale wide, then black for three scale widths, then white for one scale width all the way to the cloaca. Half way down the snake's body it may have a blue tinge on a few scales but how common this is I don't know. The snake's nostrils are orange and its tongue is black with a vivid purple stripe down each side. The head is quite pointed.

Habits and habitats

Red-tailed Tree Racers need an extremely humid environment when kept in captivity. Their natural habitat is rain forest. It is said that when the snake rests in its usual manner in the wild, curled up on forked branches in bushes, it is almost impossible to detect. Its presence on the ground is quite rare. It prefers food of a feathered nature (chicks and sparrows) although it will occasionally accept rats. It has been known for the snake to catch flying prey and as this is a somewhat large and heavy snake this is an amazing feat. It tends to prefer licking water from leaves and its own body rather than drinking from a dish. Some people regard this snake as being an aggressive biter but, providing your movements are slow, there seems little chance of being bitten. Of course, a lot depends on the temperament of the individual animal.

Breeding

Little is known about this snake's breeding habits and I have been unable to find details of a successful captive breeding. There are accounts of successful hatching of eggs which have been laid by gravid-when-imported females. If a gravid female is acquired you can expect up to eight eggs which, once laid, should be removed and incubated at a temperature of 28 degrees C with a constant humidity of 80 to 100%. The eggs, which are oblong, approximately 5cm in length, 2.5cm in width and white in colour, take between 14 and 17 weeks to hatch. The new-born snakes are about 45-47cm in length and are identical to their parents. The young snakes should accept dead pink mice after their first slough.

Husbandry

As the Red-tailed Tree Racer is an arboreal snake it is best kept in a tall cage. Plenty of strong branches are essential and the vivarium humidity will be helped by the inclusion of sphagnum moss placed on top of bark chippings. The snake should have between 12 and 14 hours of daylight, with a temperature of between 27 and 32 degrees C during the day, dropping to 22 to 26 degrees C at night. Sphagnum moss can be draped over branches to give a natural looking effect. The tank should be saturated with water spray three times a day to help keep the humidity high. A good strong forked branch should be placed in a spotlight beam to create a 'heat spot'. Bottom heaters are of little use due to the snake's arboreal nature. When feeding these snakes it is better, for obvious reasons, to place their food among the branches rather than putting it on the vivarium floor. A good quality humidity gauge is a worthwhile investment as it may help to prevent some respiratory problems as mentioned by K.J. Hingley in Snake Keeper, Volume 1, issue 4.

I acquired my Red-tailed Tree Racer from Respectable Reptiles on the 10th October 1987 having seen her two days earlier. When I collected her I noticed that she was gravid and I could count seven eggs inside her body. She was suffering from what appeared to be cold symptoms. I did not think this would be a big problem. I increased the temperature in her tank but her condition started to worsen. I recognised the problem as being similar to a kind of mouth rot from which my Hog's Island Boa (Boa constrictor sigma) had suffered. On the 14th October I took the snake to my vet who had successfully treated my Boa. He diagnosed mouth rot (necrotic stomatitis) but because she was gravid an antibiotic injection could have proved dangerous. He prescribed Panalog ointment and told me to administer it every day.

On Saturday 17th October I was checking the temperature and humidity in the vivarium when I noticed two white objects within the snake's coils. To avoid stressing the snake I left her for a couple of hours. By the afternoon there were seven eggs. As I tried to remove them for incubation the snake started to flick me with her coils. I phoned Jan and Tom Burgess (who keep three G. oxycephalum) for some advice on egg removal. Tom told me they had to be removed so I donned gloves and set to work. I moved one coil off the eggs and, as the snake didn't seem concerned, I removed the gloves; it was much easier to work without them. I eventually managed to remove the snake from the eggs but found that they all stuck together in a semi-vertical position. I removed them as one lump and, having been warned about separating eggs beforehand, decided to leave them stuck together. My next problem was how to half bury them with the same amount of Vermiculite around each egg but this was eventually accomplished.

The incubator is an 45cm x 30cm x 30cm all glass fish tank. It has a pressed steel lid with a sliding glass door. Heating is provided with a 90 watt pad heater placed on the tank floor. The heater is controlled by an APT thermostat which is supported in mid-air in the middle of the tank. A 15 watt light bulb is used as an inspection light. The eggs are placed in the Vermiculite inside a plastic container with two temperature and two humidity gauges. At each corner of the tank is a bowl of water. As the heat from the pad rises the water evaporates and a humidity of 90 to 100% is easily maintained. The thermostat is set at a constant 28 degrees C. Of the seven eggs incubated, six have developed indentations.

On Monday the 19th October the female accepted one dead chick placed in the branches of her vivarium but she refused a small rat that was also offered. I returned the snake to the vet on the 21st October for a check-up on the mouth rot. He said that the Panalog was clearing the mouth rot so well that there was no need for an injection. I was told to continue applying the Panalog twice a week for one month.

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Thank you to Respectable Reptiles for holding the snake for two days with just my word as a deposit and to Mr Trevor Turner, my vet for his successful treatment. Thanks also to Tom and Jan Burgess for invaluable help on the telephone and lastly to my fiancee, Mez, who has to put up with twenty one snakes, seven eggs and myself all living in our bedroom.

Editor's note. At the time this article was prepared (mid December) the eggs were still in good condition after nine weeks incubation. They are due to hatch between the last week in January and the second week in February. Unfortunately John's snake has developed mouth rot again and is receiving veterinary treatment.

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Bolton Snake Keepers - Gary and Karena Waddilove

We have been keeping snakes for five years and we are still learning. We started off with a Boa Constrictor and a Reticulated Python, Python reticulatus. Many people advised us not to purchase the python as they have a bad reputation. The snake was 3m long and very tame. We also bought a Royal Python, Python regius which measured 1.2m in length. These snakes are known to be bad feeders but ours ate three mice a week.

Our main interest is 'Fred', our 4.2m Burmese Python, Python molurus bivittatus. He is 9 years old, captive bred and weighs 36.2kg. We have had him for three years and his previous owner had kept him from the time he was a hatchling. He had two successful matings before we purchased him.

Fred eats a 2.2kg rabbit or a piglet or chicken every 4 - 5 weeks throughout the summer. We reduce his food intake during the winter.

After reading about other people's experiences breeding Burmese Pythons we thought we would like to have a go. We read as many books on breeding as we could find and wrote to other Snake Keeper readers for information.

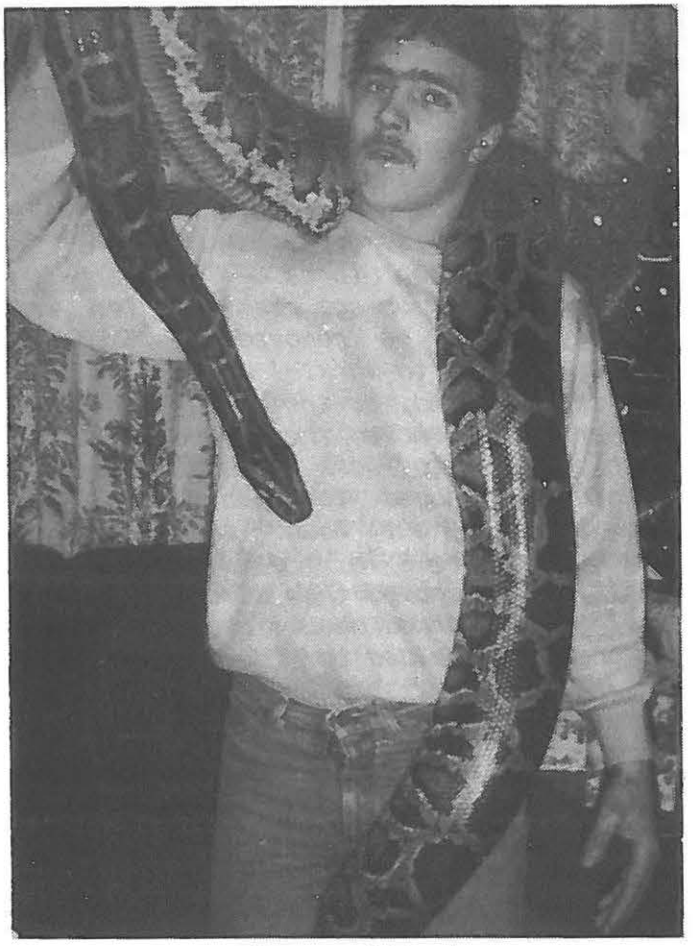
In July 1987 we purchased 'Abigale', a female Python m. bivittatus. Abigale is 3.6m long, captive bred and 6 years old. She has already bred this year having laid a clutch of 36 eggs, of which 34 hatched. We are building her up on a 1.3kg chicken every week and she is gaining weight rapidly. When we bought her she would urinate every time we handled her and she would also hiss a lot. Now, after handling her in the cage, she no longer urinates when handled out of the cage but she still hisses. The pythons' vivarium measures 1.8m x 1.2m x 60cm and can be partitioned. This design was chosen so that the snakes can be separated after egg-laying thereby avoiding problems when the female incubates her eggs.

Vivarium heating is supplied by two 240W thermotubes that give out heat but no light. This heater is made by Phillips and is intended for greenhouses. It comes with a one year guarantee. Lighting is supplied by a 1.5m Tru-lite which is connected to a time switch enabling photoperiod control.

The snakes are kept on a substrate of newspaper as it enables the cages to be kept clean and it is cheap to replace.

If we are successful in breeding next year we hope to purchase another breeding pair of Burmese Pythons and pairs of breeding Red-tailed Boa Constrictors and Corn Snakes.

We have recently treated a mouth infection in our male python. The infection was caused by a tooth breaking off and sticking in his upper jaw whilst he fed on a large rabbit. We did not notice this until a week later. We treated him with Pannamycin twice a day and sprayed his mouth with a hydrogen peroxide solution four times a day. The infection was successfully dealt with within two weeks.



Gary and Fred

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Snake Keeper Volume 1, Numbers 1 - 12

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Fifteen Years of Reptile Keeping

by Chris Roberts

I've been interested in snakes since my early childhood when, to my parents' disgust, I would frequently bring home tadpoles, newts, Slow Worms and the occasional Grass Snake.

I began to keep snakes seriously at the age of eighteen when I kept a pair of Dice Snakes, Natrix tessellata. A few years later I part exchanged them for a Green Iguana which I kept for about four years. After this time my passion for snakes overcame me once more and I swapped the Iguana for an Indian Python hatchling.

Two years later this hatchling was seven and a half feet long and quite a handful. One of my clearest memories of him was one particular very hot day in summer. I decided to let him wander about on the lawn. I watched him for a long time as he moved gracefully through the grass. He seemed to enjoy his brief moment in the open air. My concentration was distracted for some reason and, when I looked back at the snake, he was poised in a striking posture facing the hedge. To my horror I saw my next door neighbour's cat lying asleep in the shade. I grabbed a stone and shouted loudly whilst throwing the stone in the cat's direction. The cat disappeared just in time; I feel that a few seconds delay would have resulted in the end of the cat.

Although the snake was frequently handled he became somewhat bad tempered about this time and couldn't be picked up safely unless his head was covered with a sack. Reluctantly, I sold him and acquired a pair of baby Boa Constrictors. By this time I was married and, with my wife's blessing, I built a large vivarium in our hall. The vivarium measured 1.6m x 1.5m x 60cm (h x l x d). The Boas were my favourites and grew to about 1.8m in length. My wife, Bernadette, had our second baby boy at about this time and I decided it would be safest to sell the snakes as we had two toddlers roaming around the house. No matter how tame and docile the snakes seemed they were still potentially dangerous animals.

Since then I have kept two more Iguanas and a young Corn Snake, Elaphe guttata. Early in 1987 I sold the Iguanas and I now have three Corn Snakes and a pair of Pine Snakes. The large vivarium was taken apart and I made a tier of three vivaria with sliding doors. I believe that two of my Corn Snakes are male.

The smallest snake, called Bilbo, my first purchase, escaped at the beginning of June on the very morning that we were due to go away for a long weekend. I was unable to find him in the short time available before we left. On our return I turned the house upside down in an effort to find him, but without any luck. I began to think that he had managed to get outside into the garden.

One day, two months later, I found a sloughed skin on one of our house plants. Once again I turned the house upside down but, again, there was no sign of the snake. I sat on the staircase and wondered where I hadn't searched. My eyes searched our hallway and settled on a set of shelves on the wall. On one of these shelves was a small ornamental jug, no more than 20cm high, with a small opening at the top. Almost in desperation I picked up the jug and peered inside. There was the snake, coiled up at the bottom. I managed to get him out with much difficulty and he seemed none the worse for his experience. After placing him back in his vivarium, by now escape-proofed, he immediately took a mouse.

The photoperiod in my vivaria is controlled by time switches but, despite this, I believe that my female Corn Snake, 'Precious', is gravid at completely the wrong time of year, so before I start to shorten the day length I will have to wait for her. The snake measures about 1.3m in length and is certainly over two years old. My other Corn Snake, 'Frodo', is 1.5m in length and, if the female is pregnant, he is certainly the father.

My other snakes are Pine Snakes and I will always remember going to buy them from a local dealer. They were coiled up under some newspaper and I asked the shop assistant if I could look at them. As he lifted the newspaper, I heard the loudest hiss that I have ever heard come from a snake. One of the animals coiled up and tried to strike at us. Apparently the Pituophis species (Pine, Gopher and Bull Snakes) have a cavity in the roof of their

mouths that enables them to produce this extra loud hiss.

Despite this display of aggression I was immediately taken by the bold black and white patterns and the decidedly angry looking faces. They were very impressive animals and I decided to purchase them. I soon found out that the hissing and threatening behaviour was just bluff and the snakes are now quite docile and tame and, indeed, my favourites. I will hibernate them during the winter as they refuse all food then. When they are awake they are the most inquisitive of snakes and show no fear. When first acquired they would only take live food but now, after a long period of try and try again, they will both accept dead food.

I noticed that they used 'tail luring' when they would only accept live food. They would lie in their cages with their heads about 15cm above the ground looking for any movement. When a mouse was placed in the cage, the snake would bring its tail around and flick it in much the same way as a worm on a fisherman's hook. Whether this actually interested the mouse or not was hard to determine but I found these powerful snakes extremely fast and efficient at killing their prey.

I was told when I purchased them that they were male and female. They presently measure 1.2m in length. The male is called 'Gandalf' and the female 'Lady'. I intend to hibernate them from December to February and I hope they will breed when spring arrives.

I keep all my snakes on a substrate of bark chippings which I find pleasing to the eye, especially if the vivaria are part of the decor of the house. It is a rather expensive substrate as you have to replace it regularly and the bottom needs examining every day. I find it worthwhile as newspaper looks so unappealing. In addition, the snakes spend a lot of time hiding under the paper and they defecate on the bottom of the vivarium where the faeces remain unseen. As an added bonus the chippings can be used in the garden afterwards. They look nice when placed around trees and plants.

My Experiences with British Snakes

by Peter Kirk

My first experiences with keeping reptiles were with Slow Worms (Anguis fragilis) and, although we all know that Slow Worms are actually legless lizards, they were the animals responsible for sparking off my interest in reptiles and, therefore, I think, worthy of a mention. I kept Slow Worms successfully for a number of years and the area of Buckinghamshire in which I lived produced the less common blue-spotted variety of Slow Worm.

All this aside, the first British snake I encountered was a Grass Snake (Natrix natrix). It had been transported back from the New Forest in a binocular case by my brother who had been to the area on a school trip. I remember the occasion vividly. When the snake was brought in I was half way through eating a 'Crunchie' but nonetheless I insisted on holding the snake. In true textbook form, the snake's defensive mechanism was triggered and it proceeded to defecate all over my hands. To me, the stench was quite unbearable and, needless to say, I didn't pick the snake up for a couple of days afterwards. I didn't eat a Crunchie for considerably longer.

The Grass Snake was kept in a 60cm x 30cm x 30cm vivarium, furnished with plenty of grass and vegetation. A large piece of bark was also provided for the snake to shelter under. It was fed almost exclusively on frogs and, although I never actually saw it eat, I was always fascinated by the fact that a frog could be put in at night and would be gone by the morning.

We kept the Grass Snake for a few months

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but, shortly after moving from Buckinghamshire to Yorkshire, the snake escaped when the window over its favourite basking window sill was inadvertently left open.

A gap of several years followed during which time I came across few, if any, wild reptiles and much of my time was taken up with breeding and rearing hawk-moths and tropical silk-moths.

After a number of years of living in a small village north of York, I discovered an area called Strensall Common. This particular area was apparently very good for Common Lizards (Lacerta vivipara) and so I decided to pay it a visit. I soon found out that half of the common was used by the Army for target practice and I was somewhat amused to see little signs all over stating

DANGER
BEWARE OF SNAKES!

presumably for the benefit of the soldiers.

The first few visits produced little in the way of snakes; I assume that I was searching in the wrong places or in the wrong way. On one of these early visits I found a number of sloughed Adder (Vipera berus) skins. I was relieved that Adders were there somewhere and all my searching had not been in vain, even if I couldn't find them.

After several initial visits I eventually caught sight of an Adder basking on a tussock of grass. By the time I had calmed down the Adder was aware of my presence and glided off into the undergrowth. For the next one I was prepared. I kept my leather motor cycle gauntlets on all the time, despite the hot weather and, when I eventually came across another basking Adder, I gently persuaded it to slither into the large butterfly net I always carried with me. I then put it into a secure box. I had heard that Adders were sometimes reluctant to feed in captivity due to the rough handling (sticks across the neck) they often receive on capture and I was, therefore, particularly careful. I did not, however, have any success persuading this particular individual to feed and it was returned the following weekend to the area where it was captured.

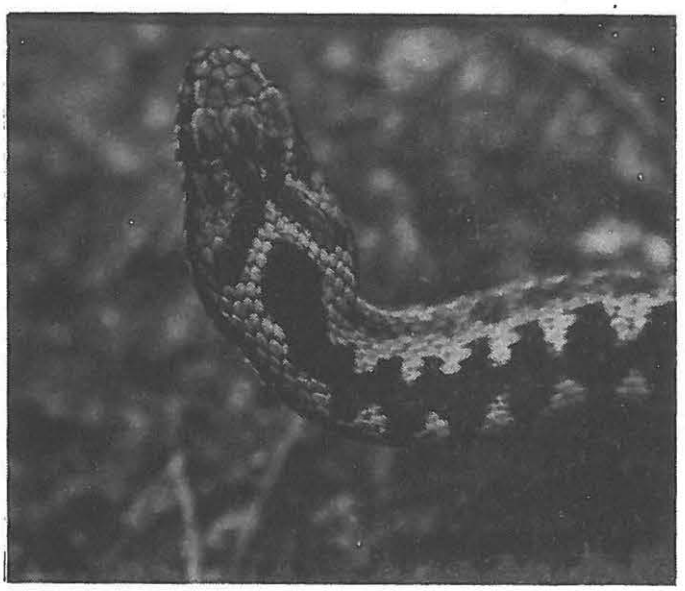
Several subsequent visits provided several more captures though I never kept any more than one snake at a time, one being quite enough to cope with.

I attempted to feed the Adders on frogs a number of times but without success. It was largely for this reason that I never kept any snake for more than two weeks. Perhaps I would have had more success if I had tried to feed them on mice.

I noticed that the Adders were considerably more abundant on warm sunny days; sometimes as many as 12 - 15 were seen within a couple of hours. On days which were very hot, however, the Adders were more elusive and, when they were disturbed, they tended to be quite aggresive thus making close-up photography a little tricky.

I was never bitten in all the time I kept the Adders although I do recall having one particularly aggressive individual which recoiled and struck at the vivarium glass whenever anyone approached. On more than one occasion this snake left a double trail of yellowish, clear venom down the glass. Needless to say, this Adder was kept for the shortest possible time.

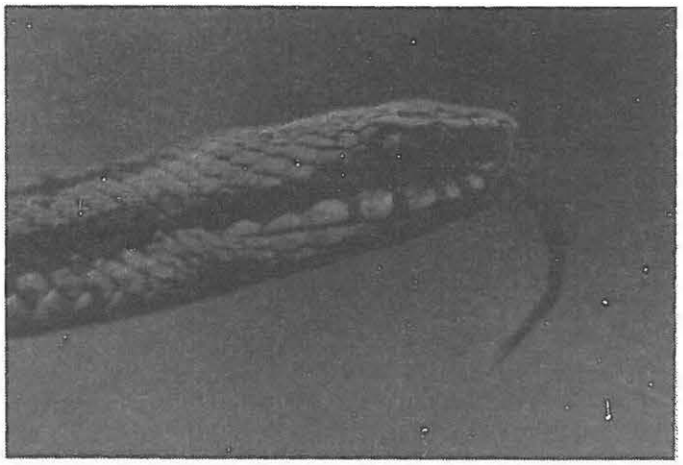
The last Adder I kept was a large female, which, on being introduced to its new home, regurgitated its last meal, a frog. Unfortunately this particular Adder was adept at escaping, despite a large rock being used to secure the vivarium lid. One evening I went to check the snake but could not see it in the vivarium at all. After initial panic (understandable), the family set about searching for the escapee, but without success. As luck would have it, the Adder was found the



The Adder, Vipera berus, viewed from above

following morning under my bedside locker. It was then released back onto the common.

Although the Adders were fascinating snakes to keep (I found their eyes particularly attractive) I could never recommend them as 'pets'. The Adders I kept were always treated with respect and were handled as little as possible. When it was necessary to handle them I always wore leather gauntlets. In retrospect, a little more knowledge of the Adders' lifestyle and habits would have been useful, along with a more secure vivarium.



Vipera berus. (Photographs - Peter Kirk)

REPTILE-AID RETURNS

The Reptile-Aid Journal, published between 1985 and 1986, is returning in a new form.

The first issue of International Reptile-Aid Magazine will be produced in January 1988. I.R.A.M. will contain members advertisements, overseas members stock lists, details of herpetological societies, groups and clubs (both world-wide and local), news, views, conservation reports, captive breeding reports, equipment and cage designs, book reports, events and meetings and zoo news and reports.

Brian Howard, the producer of I.R.A.M., feels that the magazine's contents will be of interest to most herpetologists, wherever their interests lie.

Membership runs from the 1st January each year and costs £12.00p in the United Kingdom and £18.00 if you live overseas. Members will also be entitled to a discount on goods purchased from Brian's retail shop. A nationwide mail order service is available.

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BOOK REVIEW

"Living Snakes of the World"
by John M. Mehrtens
Published by Sterling Publishing, New York
Distributed in Britain by Blandford Press.
480 pages. Over 540 colour photos. £35.
ISBN 0-8069-6460-X

If you got money for Christmas resist the temptation to buy just one more snake; buy Mehrtens' book instead and have superb pictures of lots of snakes. You will then also have access to accurate and up to date information on 164 genera, 413 species and 454 subspecies of snakes.

The two indices (by Latin and Common names) are very useful, as is the short but interesting glossary.

Information is given on habitat, range and natural history as well as care in the vivarium, making this an invaluable reference book for anyone interested in understanding their charges' particular needs.

The author is an eminent zoologist and herpetologist and has been the reptile curator at several American zoological parks. LMC

Junior Snake Keeper

Snakes

by Jessica Davies (Age 10)

In our classroom we have some snakes. They are called Red-sided Garter Snakes and Chequered Garter Snakes. We keep them in a desk. It is an old desk with shelves in it. We have got glass sliding doors which enable us to get to the snakes. We have put a light in there which provides the snakes with light and heat. There is a vent which provides them with oxygen.

We have put a stone in the desk for the snakes to crawl over and bask on. A piece of bark enables them to shed their skin and gives them something to hide under. Sawdust is put in the cage for the snakes to sleep in and hide under. A dish is put in for drinking water. We feed the snakes on worms, which we dig up ourselves, and fish.

The snakes are not ours, they belong to Mr Davies. Sir has got a lot of snakes, like Corn Snakes, baby King Snakes and African House Snakes. I like looking after the male Red-sided Garter Snake and my friend, Katy, likes looking after the female Red-sided Garter Snake.

We have also got two Chequered Garter Snakes in our tank. They are black with yellow stripes down them and a few dark patches on the black lines and that's how the Checkered Garter Snakes got their name. There are three other girls looking after different snakes. I think snakes are lovely pets to keep.

The Gaboon Viper by Lee Bowler

The Gaboon Viper, Bitis gabonica, is a large viper, common on farms over most of Africa. This viper holds the world record for possessing the largest venomous fangs which can be up to 5cm long. This snake inhabits the rain forest regions in west and central Africa, western parts of east Africa and southern Tanzania. It is also distributed in patches in Zambia, northern Zimbabwe and northern Natal.

Prey consists of cane rats, ground-feeding birds such as doves, Royal antelope and most small mammals. The prey is killed by the strong venom injected by the snake's large powerful fangs. The venom is mostly blood-destroying but it also has a high neuro-toxic content. It is fast acting and, as it is injected deep into the tissues of its victim, first aid is difficult to administer. The snake injects between 350 and 600mg of venom; the lethal dose for a man is about 60mg. A high percentage of the bites occur when locals walk barefoot and tread on the viper, causing it to strike in self-defence. However, most cases are not fatal if treated promptly and correctly.

If bitten, one should stay calm and not consume any alcohol. Water or black coffee may be taken and the affected limb should be rested, preferably hanging down to slow down the spread of the venom. Asprin or a similar drug may be taken to ease the pain until medical attention is available, whereupon an antivenom can be injected.

The Gaboon Viper is probably Africa's largest (but not longest) venomous snake. It averages 1.5 to 1.8m in length and weighs between 4.5 and 6.8kg, mainly due to its large build and bone structure. One of the largest Gaboon Vipers recorded was in Sierra Leone. This snake measured over 2m in length and weighed over 9kg.

The Gaboon Viper is not easily confused with any other snake as it has very distinctive markings. It has various geometrical blotches, cream/brown in colour, on a mauve/brown background. Another noticeable feature is its small eyes.

Although this snake is kept by some experienced herpetologists, great caution is necessary. It should be kept in a well furnished, large, escape-proof and, most importantly, lockable vivarium. In captivity the snake will accept black rats and other small mammals. Handling should be kept to a minimum. When cleaning cages, grabsticks should be used. The juvenile vipers are born live and measure about 30cm in length and are about a thumb thick. The Gaboon Viper has been bred in captivity at, amongst other places, the famous Poole Serpentarium, Dorset.

Personally, I have no experience of this snake but, from what I have observed, I find it a very interesting and beautifully marked animal, but then, beauty is in the eye of the beholder.

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CONTACT

I would like to hear from other snake keepers about their experiences (breeding, feeding, housing). Anything to do with snakes. Col G Pywell-Fox, 24 George Street Driffield, YO25 7RA.

SNAKE KEEPER NEWS

Snake Keeper in North America

Zoo Med Laboratories of California have been given sole distribution rights for Snake Keeper in the U.S.A. and Canada. Enquiries to Zoo Med Laboratories, 1420, South Ritchey, Unit D, Santa Ana, California 92705, U.S.A.

Snake Keeper in The Observer

Observer readers may have been slightly worried by the report in The Observer colour supplement (29th November) about Snake Keeper. Don't panic folks - yet! On a serious note, as a result of the mention in the colour supplement, The Observer journalist was contacted by a lady who had relatives in Pakistan. Her relatives were constantly plagued by venomous snakes entering their house and sought a solution. Contact Mark Edmonds of Loosetalk (The Observer) if you can help.

SNAKE KEEPER INTERNATIONAL

Snake Keeper now has 212 subscribers including readers in France, Holland, Belgium, Italy, Ireland, U.S.A., Canada and Botswana.

Approximately 550 copies will have been distributed during December

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Snake Keeper is constantly searching for items of interest relating to snakes. Whatever you've written, seen, drawn, photographed, discovered, invented, bred, constructed, lost or cured... WE ARE INTERESTED!

If you would like your name and address printed at the end of your article, please add a note to that effect.

Several readers have asked to be put in touch with the authors of articles that have appeared in Snake Keeper. If you would like to make contact with anyone, we will forward your letter if it is addressed as follows:

Please forward

(Author's name)
c/o Snake Keeper
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Don't forget to enclose an s.a.e. It should ensure a prompt reply.

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The Sand Snake by Kevin J. Hingley
The Rainbow Water Snake by Carol Hindley
Treating Mouthrot by Michael Kelly
Our New Vivarium Set-up by Lee Evans

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