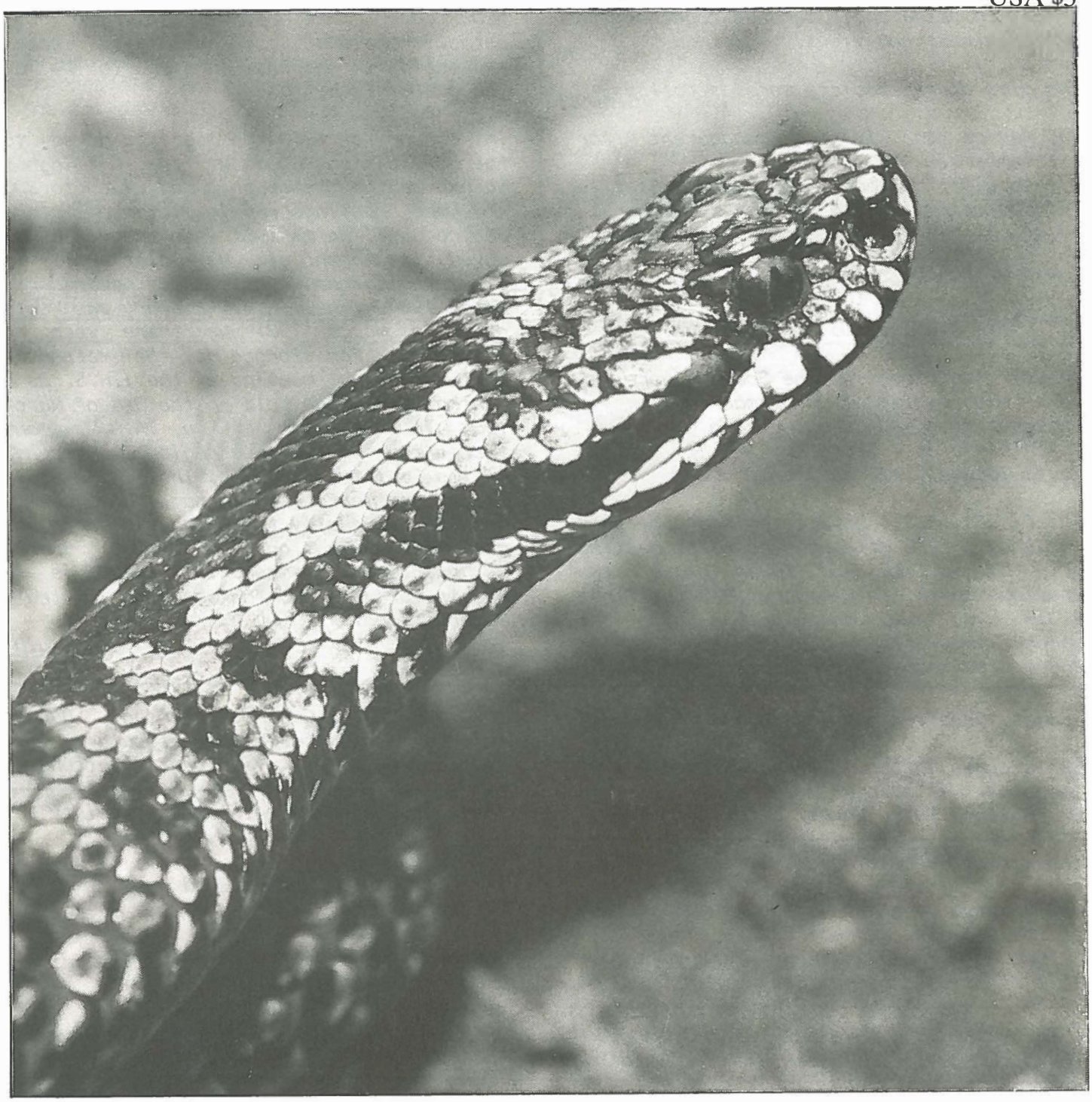
SNAKE KEEPER

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INFORMATION

The International Herpetological Society

A short history

The Society was founded in 1969 by David Turnbull, the Curator of Drayton Manor Park Zoo at the time, and some of his friends who were also interested in herpetology. The British Herpetological Society was already in existence but was London based. They decided to form a Midland based society in order to hold regular meetings as often as possible in order to bring their members together to exchange news and views.

The aims of the Society were as follows;

1) *Advice on vivarium management for members.*
2) *Acquisition of specimens - Reptile dealers' lists to be sent to members.*
3) *A record of specimens in members' collections.*
4) *Projects - with a view to publishing articles.*
5) *Field studies and conservation.*

The first officers of the Society were;
John Foden - Midlands Chairman
Tony Phelps - Southern Chairman
Valerie Phelps - Secretary
David Turnbull - Treasurer

The first I.H.S. Newsletter was published in January 1970 although the first meeting of the Society had taken place the previous month. In February 1970 the first A.G.M. was held and, by the time the second Newsletter had been published in March, the membership had reached 32.

The Society gradually progressed and by 1974 the membership figures had risen to 111 and, in February, the first 'Herptile' was published. Meetings were being held at Fazeley Parish Hall, having been transferred there from Drayton Manor in 1971 when membership figures had reached 120. In 1976 the venue for the meetings moved once more (to the New Hall in Sedgley, near Dudley in the West Midlands) with membership still hovering around the 120 mark. The I.H.S. Library was established and the number of 'books available to members had risen to 74 by the end of 1976.

In January of 1979 the meetings moved to the Exhibition Room at the Birmingham Nature Centre. Membership had risen to 300 and the meetings remained at the Nature Centre until March 1981 when the venue was moved to Northfield Methodist Hall in Birmingham from April 1981 onwards to March 1984. The I.H.S. Library was sold off in March 1981 as there were no facilities for storage at the Methodist Hall. The final meeting of the I.H.S. as a central body was held on the 3rd of March 1984 in the form of an A.G.M. and thereafter the various regional Branches of the Society sprang up. The I.H.S. still holds one meeting per annum, an A.G.M., and these usually take place in March and are held at one of the Branch Headquarters. Membership today is in excess of 700 and the Society is truly International.

K.J.H

Snakes, Reptiles and Amphibians Club

Christopher Carter is the new Secretary of the club. His address is;
67, Holland Walk, Vange, Essex SS16 4QB.

The Wirral Herpetological Society

Mrs Evelyn Cavanagh is the new Secretary of the society. Her address is;
4, Elm Park Road, Wallesey, Merseyside.
Eric Street has become Chairman.

The Thames and Chiltern Herpetological Group are holding their 1988 Exhibition of Reptiles and Amphibians on July 16th at the Community Centre, Amersham, Bucks. This display is extremely popular; last year approximately 1500 people attended.

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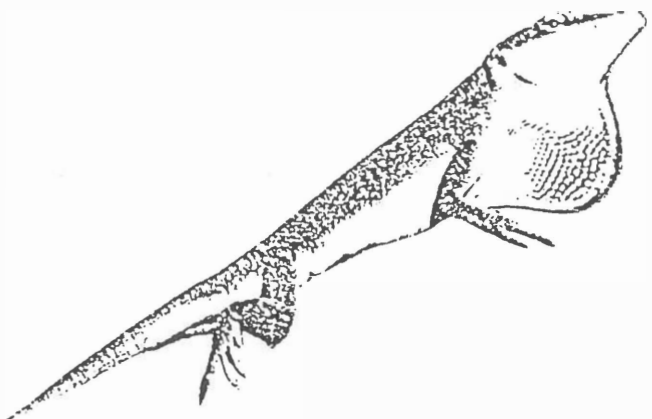
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Front cover: Male Vipera berus
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Unusual Behaviour of an Indian Python

by Peter Kirk

I obtained a young Indian Python (Python molurus bivittatus) on 2nd January 1987 after eventually persuading but not totally convincing my wife that we did have room for another large tank in our small house. The snake was bought from a London dealer who told me that it originated from Edinburgh Zoo.

Kali, as he was named, was housed in a 1.2 metre cage which was heated by a thermostatically controlled ceramic heater. The floor of the cage was covered with bark chippings and the snake was also provided with a large water dish for drinking/bathing, a cork bark retreat and a sturdy branch for climbing on.

The first thing I discovered about his character was that when his eyes had clouded over prior to a moult he did not like being disturbed. Any attempt to touch him was greeted with a loud hiss, though he never made any effort to bite. This 'aggressive' behaviour was not that surprising really, as moulting must be a particularly traumatic time for most (but by no means all) snakes and also, especially in the wild, a vulnerable one. Kali did not feed when he was coming up to a slough, though I know that many snakes do feed right up to sloughing. Generally he had an extremely quiet disposition and I had no worries when allowing other people to hold him. The only other thing I noticed about him was that he had an occasional twitch of the head. I know of at least two other people whose Indian Pythons did this (one was told that the snake's brain was rotten and that it would be dead within a couple of weeks; needless to say it wasn't).

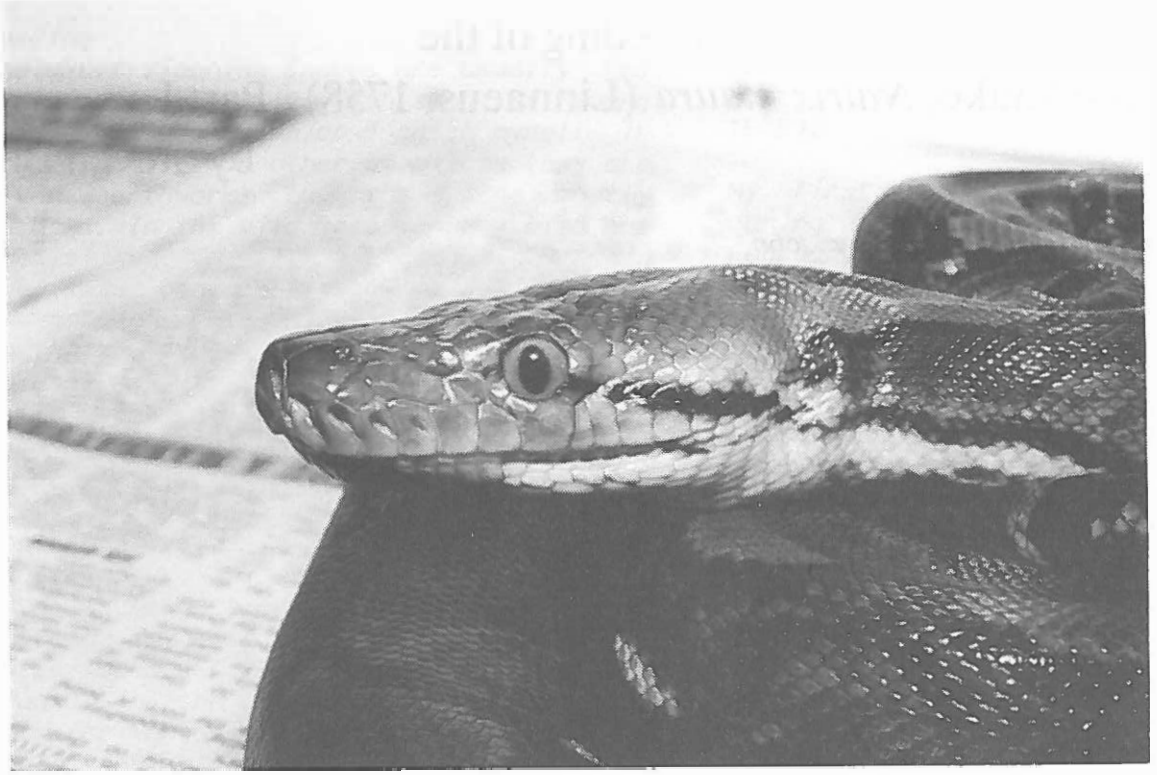
I had few problems with Kali along the way, the only one of note being a mild attack of mites. I first noticed the problem when the snake became restless and spent long periods of time in his water dish. Upon close inspection I could see the mites running over the scales on the snake's back. This was cured by hanging a Vapona strip inside the tank overnight, removing it the following day and then repeating the procedure after seven days.

The snake's growth rate was fairly steady, about 7.5 to 10cm per month, and I fed him on mice as often as he would take them; he did refuse them if he was full). As he grew larger I changed his diet to small or medium sized rats. All the time I had Kali he was fed on dead food only. Although I didn't like to make a habit of it, Kali would frequently take the food out of my hand. It was quite a shock when it first happened but I soon got used to it.

The first sign of his unusual behaviour was one time when he was curled up on the dining room table and I moved my hand a little too quickly near his face. He sank his teeth into my hand and I held my hand where it was until he released his grip. I did this so that I didn't make the bite any worse or pull any of Kali's teeth out! His teeth were like tiny needles and, although the bite itself was not very painful, it throbbed for a few hours. It was shortly after this that he became very restless in his tank and by now he was about 1.5m long. He was constantly on the move inside his tank and even when I opened the door he (unusually) would still not settle.

Initially, I assumed that the conditions in the tank were somehow wrong. I altered the temperature both up and down along with the humidity. This made no difference so I removed the bark chippings and replaced them with newspaper. Still no change and his attempts to escape were becoming quite frantic. He would constantly be rubbing his snout along the edge of the tank (fortunately he did not damage himself) and would do so with such force that both he and the tank would shake. On one occasion I came back from work to find that he had managed to slide open the cage door and he was stretched out along a bookshelf.

Eventually I decided that Kali's activities were causing too much stress both to him and me! It was with great reluctance that I parted with him. The only explanation I have heard for this behaviour is that the snake was actually a female who was merely hungry. At the time the snake was being fed a large rat each week but it is still possible that this was not enough. I would be interested to hear from anyone who has had a similar experience or who has any idea of the cause of the behaviour. I would add that this snake was probed and found to be male



'Fester' the Reticulated Python

Photo Peter Kirk

(though I realise that probing is not a foolproof method of sexing).

I exchanged my Indian Python for a young Reticulated Python (Python reticulatus) - some people have said, "out of the frying pan..." The Reticulated Python was an extremely aggressive snake and handling him without gloves proved impossible at first. I am sure that this was only partly due to the snake's naturally irascible temperament. Overcrowded conditions and rough handling must also have been partly to blame. I eventually 'tamed' Fester, as we call him, by wearing leather motorcycle gloves with suede on the fingers whenever I attempted to pick him up. When he tried to bite, he invariably bit the suede and, as they dislike the taste of dry suede in their mouths (or so I have been told and it certainly seemed to work in this case), he soon ceased his snappy habit. I handled him as often as possible and, to date, I have not been bitten.

Within a couple of weeks I was quite able to handle him without gloves though, if ever I am unsure of his temperament, a gloved hand goes in first. As far as feeding is concerned he is a little nervous (unlike Kali) but is becoming less so each time he is fed. Again, unlike Kali, Fester does not mind being disturbed when coming up to a moult.

The only problem I have had with Fester since I got him was that he managed to burn himself a couple of times on his ceramic heater. The conical shape of the heater meant that he could curl around it quite comfortably and, when the heater came on, he was unable to get off rapidly enough to prevent being burned. Fortunately only one of the burns caused any sort of blister and this was treated with an antiseptic cream and a fungicidal spray. There was no permanent scarring and after two sloughs the marks had completely disappeared. My thanks to the editor for suggesting the placing of a mesh screen of fine gauze around the heater to effectively prevent the snake climbing onto it in the first place.

Although I was sorry to lose my Indian Python (he was in superb condition), Fester is proving to be a remarkably pleasant snake to keep and seems to be growing daily. Perhaps when he reaches the 4 metre mark his temperament will become a little less predictable - I hope not.

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The Care and Breeding of the Viperine Snake, *Natrix maura* (Linnaeus, 1758) Part I

by Steven Bol

Translated from the original Dutch by John Hackworth.

Introduction

I have kept Viperine Snakes since 1982 and, over the last three years, have had considerable success in breeding them. This snake is easy to keep and reproduces well in the vivarium. The Viperine Snake gets its common name basically from its close relationship to the Grass Snake (Natrix natrix) and because its markings closely resemble those of the Common Adder (Vipera berus). According to Musters (1982), this is a case of mimicry.

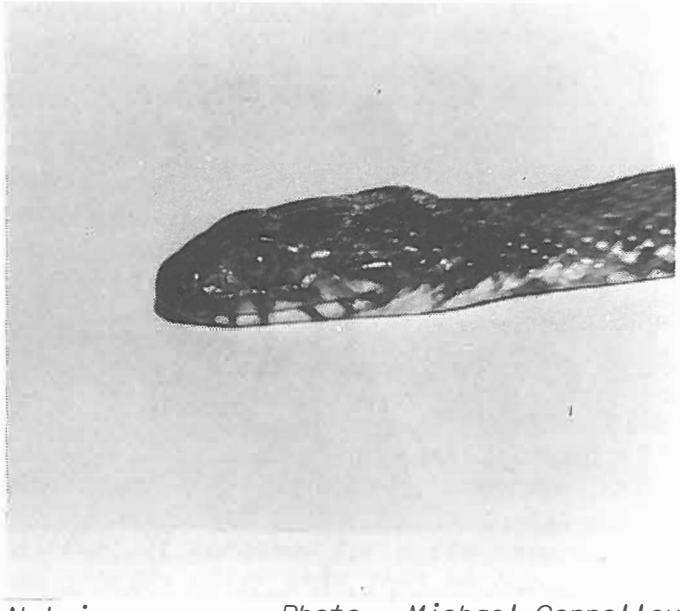
The range of distribution of Natrix maura extends in Europe through Spain, Portugal, Central France, S.W. Switzerland and N.W. Italy (Arnold et. al. 1978, Steward, 1971). In Africa it occurs in the north of Morocco, Algeria and Tunisia.

Natrix maura is a semi-aquatic snake which is dependent upon water for its food. It is therefore seldom found far from water. Its biotopes are rivers, lakes, marshes, irrigation canals and, in some places, it is even found in brackish water near the sea (Steward, 1971).

The ground colour of the Viperine Snake can be green, brown, reddish-brown, yellow, grey or a combination of any of these. Along its back it has two rows of spots which form a loose zig-zag pattern or a loose block-like pattern. The spots along the sides sometimes have a light centre. A more detailed description of its very variable appearance is given, amongst others, by Steward (1971).

Vivarium

The vivarium in which the adults are housed measures 120 x 75 x 75cm (l x b x h). The side and rear walls are made of wood which is covered with cork tiles. The front is a sliding glass panel. The top of the vivarium is covered with a large wooden cover containing two large ventilation panels. The vivarium is heated by an Elstein Infra-red lamp (60 watt) which is suspended in the top left hand corner and which gives a localised temperature of 40-50 degrees C. At the other end the temperature in the rear corner is around 20-25 degrees C (on warm summer days up to 30 degrees C). The vivarium is lit by a day-light tube and a 60 watt incandescent lamp.



Natrix maura Photo - Michael Connolley

In the vivarium there is a water container measuring 60 x 40 x 10cm (l x b x h). This takes up around a quarter of the total ground area. For the land area, which is kept as dry as possible to prevent diseases and blisters, I use gravel. A layer of sand can also be used for this purpose. Several branches are placed in the vivarium, including below the heat lamp, so that the snakes may seek out the optimum temperature. Stacked flat rocks and hollow tree stumps (nesting boxes for wild birds) provide hiding places. Much use is made of the latter. Eighteen young snakes which I bred are housed in an aquarium of 100 x 40 x 40cm (l x b x h). The bottom of the aquarium is filled with water to a depth of 15cm. Several centimetres above the surface of the water there is a resting platform some 40 x 40cm standing on 'piles'. This platform is made of cork bark. The land part of the aquarium is made of gravel with a few flat rocks under which the snakes like to hide. There is a 60 watt lamp suspended above the land part. This serves for heating and lighting. The water is kept clean by a pump. The aquarium is covered with a wooden lid which has a large ventilation panel.

Feeding

The adult Viperine Snakes are usually fed exclusively on live fish such as young Rudd and Gudgeon which I catch myself in local canals. On other occasions they are given earthworms but these are mostly refused. In the wild these snakes also eat amphibians. The fish are always placed in the water container with the addition of 'Nektonrep' (a multi-vitamin preparation) so that the snakes have to catch the fish themselves. This is a spectacle quite worth watching. There are always live fish in the water container so that the snakes can eat whenever they wish.

For the first few months of their lives the young are fed exclusively on live food such as young sticklebacks, guppies, worms and, by way of a change, tadpoles. All of these foods, including the earthworms, are placed in the water container together with the Nektonrep. After a few months the young snakes are also offered deep frozen smelt (a small fish of the salmon family). This is offered in both the water container and on land but, in each case, with the addition of Nektonrep. Some specimens eat only from the water whilst others also eat on land. After their first hibernation the juveniles are fed almost exclusively on smelt. It has never been necessary to force feed any of the young because they all took to food voluntarily. At first they are fed 2 or 3 days per week but later (at around 5-6 months) they are fed every 4-5 days. During the active period, which in the vivarium lasts 7-8 months, the adult specimens are given on average 2-6 fish per month. The females usually eat more than the males. The females eat particularly voraciously after hibernation and after laying their eggs. During times of intense mating activity the males eat very little. The females stop eating 4-5 weeks before the eggs are laid. It can also occur that a snake will stop eating for several weeks without this having any adverse effect. This is also true of very young snakes.

The adults usually stop eating around the end of August or early September which, to me, is a sign that the snakes are ready to hibernate.

Hibernation

In the wild, Viperine Snakes usually hibernate from October to March. This however can be shorter in the more southern parts of their distribution range. This enables them to get over what, for a reptile, is the most unfavourable part of the year (Steward, 1971: Fretey, 1975).

My first Viperine Snakes were kept warm during the winter but they died during February and March. They had not eaten since September and an autopsy showed that the snakes had no subcutaneous fat from which I concluded that they had simply starved to death.

After coming into possession of some new Viperine Snakes in 1984, I hibernated them over the winter and after a three month hibernation they did not appear to have lost any weight. They immediately began to eat greedily and matings were also observed. Trutnau (1981) also states that hibernation is essential to encourage these snakes to eat.

Musters (1982) does not hibernate his snakes in the true sense of the word but rather he keeps them awake and continues to feed them. It could be that his tank is in a cold place (15-18 degrees C) so that the animals can hide and thus have a sort of rest period whereby they do not starve. He mentions that during the winter his animals are less hungry but now and again they will eat. I, however, prefer each Viperine Snake to hibernate because this approximates, as far as possible, the natural conditions in the wild. After hibernation they are again very hungry and it is essential to feed them well.

Natrix maura is well able to withstand the cold. According to Fretey (1975) this species survived temperatures of -15 degrees C during hibernation.

I always use the following hibernation procedure:

The high temperature must always be maintained for at least a week after the snakes have eaten their last meal so that the digestive tract can be completely emptied; any residual food may decompose and the snakes will not survive until the following Spring.

The heating and lighting are then switched off simultaneously. The animals then remain in the cold tank for one or more weeks as a sort of acclimatisation period.

The snakes are then removed from their vivarium and placed in a box of slightly

moist sawdust or leaves. This box is then placed in a refrigerator at 4-8 degrees C for 2-4 months. It is possible to leave the snakes in their vivarium if the temperature is low enough (between 0-10 degrees C).

After 2-4 months the snakes are removed from the refrigerator and are left standing for a week at around 20 degrees C so that they may acclimatise after which they are replaced in their vivarium. The temperature is then gradually increased over a few days to the desired level.

After one to two weeks the snakes should again be eating well. Mating may also take place immediately after the hibernation. During hibernation the snakes are not totally inactive. When checking (after around 2 weeks) the snakes can be seen moving and sensing the air when the box is opened.

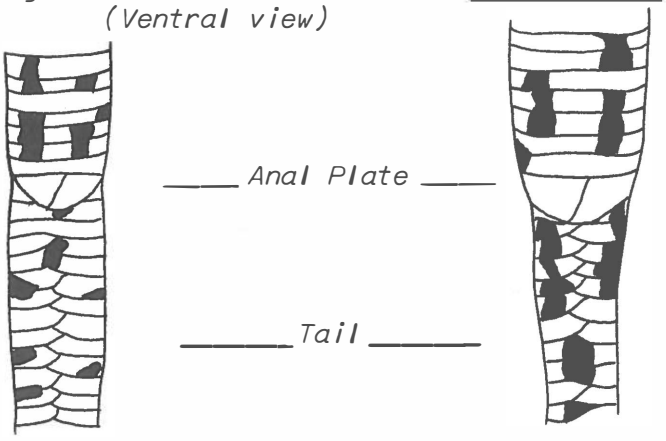
Adult Animals

In July 1984 I brought back three specimens from a holiday in Southern France (Ardèche-en-Camargue). They were a female (65cm) and two males (47 and 49cm). In August 1985 a further four snakes from Southern France (de Cévennen) were added to my collection. These were three females (79, 66 and 65cm) and a male (52cm). Since then most of these animals have grown well. The smallest male (of 47cm) now measures, after three years, 51cm.

Sexual Differences

In Natrix maura the sexual differences in adults (and in the young) can easily be seen by looking at the undersides. In males the body is straight in the direction of the tail and the tail is always slightly thicker just behind the cloaca. In females the base of the tail is always thinner behind the cloaca than the body is before the cloaca. In males the hemipenes lie 'in storage' at the base of the tail. At the same time the relative length of the tail of the male (tail length ÷ total length x 100 = %) is greater than that of the female, on average 22.8% against 19.3% (personal observation on 33 specimens from a French population of Natrix maura). The males are also much bigger and more robustly built.

Fig.1 Sexual differences in Natrix maura (Ventral view)



To be continued.

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Breeding the Rainbow Boa (Epicrates cenchria crassus) in a Home Vivarium

by Janusz Cygal

This article originally appeared in the magazine 'Akwarium' (1/88) and is reproduced here by kind permission of the author.

Translated from the original Polish by John Hackworth.

The Rainbow Boa (Epicrates cenchria crassus) is a small constrictor belonging to the family of large Boidae. It can reach a length of 2-3 metres. Epicrates c. crassus is one of the nine varieties of Epicrates found in South America and occurs mainly in Argentina, Paraguay and Brazil. The principal colour of the body is brown which can vary in shade. Along the centre of the body and down the centre of the back there are darker oval spots. These spots are very prominent in the young but, with increasing age, they fade considerably.

It is difficult to differentiate the sexes. The females are usually larger and more solidly built. In the males, however, the base of the tail is thicker and at each side of the cloaca there is a small spur. This proves that all snakes, and in particular, Boas which are the oldest



Epicrates cenchria Photo - Lesley Close

species of reptiles, have all evolved from reptiles with legs.

In the females the spurs can almost not be seen since they are only 1-2mm long and have a blunt end. The male's spurs are longer, 2-6mm, and end in sharp points. These are seen particularly well during mating when they are brought into play to stimulate the female and excite her ready for copulation.

I started keeping *E.c. crassus* in 1980 but only in 1986 did I manage to collect together breeding pairs. At present I have 5 specimens, two males and three females. Each of the specimens is around two and half years old and therefore sexually mature.

Generally my snakes eat once each week but there are times when they refuse food for long periods. These snakes usually have a very voracious appetite so care should be taken not to overfeed them. As principal food I use mice but these Boas are also partial to young guinea pigs, sparrows, young rats and young pigeons. Day-old chicks are also avidly taken. A fully grown Rainbow Boa can easily consume 15 chicks, 10 mice or 3 rats. The prey is usually seized by the neck or head and is quickly constricted by the body coils or is killed by pressing it against other objects in the vivarium. Once the prey has been caught, death usually follows in 1-3 minutes. The prey is always swallowed head first and this process can take from a few minutes to a few hours depending upon the size of the prey. It sometimes happens that the prey animal is too big in which case it is simply disgorged.

The vivarium in which I achieved my breeding success measures 90 x 70 x 70cm. As a substrate I used large sea gravel on which I placed a large clump of moist moss, pieces of bark and a tree root under which the Boas spend most of the daylight hours. The heat source is a 60 watt bulb suspended directly above the tree root and in direct proximity to the water bowl. To maintain the correct humidity the moss is sprayed two or three times each week. The water container should be cleaned and disinfected regularly. When the humidity is low the Boas tend to lie in the water container for prolonged periods. During the day the temperature fluctuated between 28-32 degrees C and at night dropped to around 20 degrees C.

The first signs of breeding activity were seen last year and most interest was shown by the males. Copulation lasted on occasions from a few minutes to several hours and went on until December (3.10 - 14.12). During this prolonged mating season both the males and females refused food. This however is not always the rule. Older, more mature, females generally do not eat during the entire pregnancy but younger females take food during the first few weeks after copulation.

On average the pregnancy lasts 148 (+/- 10) days after which, usually at night, the female gives birth to live young (ovoviviparity) usually between 7 and 20 but occasionally more. The birth lasts for several hours and is interspersed with short resting spells. The young are born in a transparent sac which breaks after a few seconds when the young are totally self sufficient. They weigh 23-25 grammes and are usually 35-40cm long. In contrast to fully grown Rainbow Boas, they are very aggressive, biting everything which moves, sometimes even one another. My two females, each 115cm in length gave birth to 10 live young, 1 dead baby and several infertile eggs.

Immediately after birth the young were transferred to individual containers (50 x 25 x 25cm). After a few days their eyes became cloudy and they shed their skins for the first time. After this they sloughed at approximately the same intervals as the adults ie. every 3-8 weeks. These Boas do not accept food for at least a week before sloughing. As in most other snakes the skin comes off in one piece. If, however, it comes off in several pieces, this is a sign that the snake is ill or the humidity is

insufficient.

The first food accepted by young Rainbow Boas is 2-4 week old mice or newly-born rats. The young Rainbow Boas take food twice each week. From the 18 live young I have bred from two females, 15 of them fed voluntarily, generally during the second week after birth but four of them took food when only two days old. The remainder had to be fed for 1-2 months during which period one of them died. When force feeding I used lean beef, horse meat and beef heart. The two young which were fed in this manner soon caught up with the rest and once they began to feed voluntarily I was unable to distinguish them from the rest.

Care should be taken when live food is given to baby Rainbow Boas in case two of them seize the same prey and begin to swallow one another. Care should also be taken that the prey animal is not too large because this can lead to a torn stomach or suffocation caused by gases accumulated during the digestive process. Well fed Rainbow Boas grow very quickly and after around six months reach a length of 60-80cm. After one year they can reach one metre. Sexual maturity is attained at around two and half to three years of age.

If Rainbow Boas are kept under conditions which are not ideal, they tend to become susceptible to a disease called Ophionyssus natricis, in layman's terms, 'the illness of dry places'. This illness is caused by parasites (mites) which appear on the body between the scales. These parasites are quite small but they can be seen with the naked eye. The parasites, the largest of which is only about the size of a pin head, suck the blood of the snakes. They are very mobile and are best seen in the evening. If these parasites are not dealt with immediately they multiply quickly and considerably weaken the snake and occasionally they can even cause death. Fortunately these parasites are easy to get rid of. The snake's environment should first be improved by raising the humidity by spraying the vivarium with water. It is also advisable to raise the temperature. The snakes should be bathed in warm water with a 5% solution of Bioval. After bathing, the dead parasites can be seen on the bottom of the bath. To get rid of the remainder of the parasites which have survived bathing the snake should be smeared with castor oil or olive oil which should be well rubbed in. To ensure success, the treatment can be repeated because a number of the parasites will still be present in the vivarium and amongst the substrate. If not dealt with these will re-infest the snake.

In conclusion let me add that I have found Rainbow Boas to be an ideal species for the beginner. I have always found them to be extremely docile charges and a well planted vivarium can really enhance the appearance of a room.



Epicrates cenchria Photo - Lesley Close
(Snake supplied courtesy of John Owen)

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Asian Rat Snakes of the Elaphe Genus
Part V Elaphe bimaculata (Schmidt, 1925)

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.

Translated from the original German by John Hackworth.

It is sometimes very difficult to distinguish Elaphe bimaculata from the Dione Rat Snake because they have many things in common. Pope (1935) describes the following differentiating characteristics:

1) *Elaphe bimaculata has 8-10 (rarely 11) lower labials whilst E. dione normally has 11-12 (very rarely, 10-13) labial scales.*
2) *In E. bimaculata the head pattern takes the form of two narrow stripes extending well past the neck, whilst in E. dione the extensions at the back of the head are more widely separated and are always shorter than those of E. bimaculata.*
3) *In E. bimaculata the pairs of spots on the back are either joined together to form a dumb-bell shaped pattern or are lined in black and isolated. In E. dione the pattern down the centre of the back is generally embellished by narrow, dark transverse stripes which, as in other species, can also be broken. Here, however, the difference is not always great.*
4) *E. bimaculata has 18-20 teeth on each jaw whilst E. dione only has 15-17. Moreover, there are differences in the construction of the hemipenes.*

I am of the opinion that, even according to present day knowledge, one can still not say with any certainty whether subspecies of E. dione have developed in Central China or whether E. bimaculata exists as a single species which has developed various forms or even subspecies. In addition, one can also assume that, because of the presence of both species in Central China, natural hybrids have occurred. I come to this conclusion because I both own and have seen specimens which deviate strongly in both pattern and scale characteristics. To date I know of three forms of Elaphe bimaculata:

Form 1
Ground colour yellowish-brown with four dark brown stripes which begin at the neck. These stripes also contain chestnut brown spots outlined in black. The head markings change into the dorsal stripes in the neck region. In both males and females the scales on the front part of the body are smooth whilst those at the rear are lightly keeled. The head is narrow.

Form 2
Ground colour mostly yellow with four dark brown stripes which start at the neck. In the stripes there are reddish-brown to red spots which are outlined in black. On the back these spots can sometimes be joined together. The black outline of the spots is not always as distinct as in form 1. At the neck the head markings usually change into the dorsal stripes. The scales of the females are lightly keeled. The scales of the males at the front of the body are smooth whilst those at the rear are lightly keeled. This, however, is highly variable. The head of the males is quite narrow and the head of the females is somewhat wider.

Form 3
Ground colour grey, yellowish-brown or olive. Along the back there are brown or reddish-brown, mostly dumb-bell shaped spots which separate towards the tail and continue as narrow stripes. On the sides there are also spots which, like the dorsal spots, are outlined in black. The markings on the head change into the dorsal markings in the neck region. Scales in both males and females are smooth with some individual scales being very lightly keeled. The head of both sexes is narrow. This form corresponds to the descriptions given by both Schmidt (1927) and Pope (1935).

In all three forms the lips and belly are yellowish with scattered dark spots. In all forms there is a dark stripe running from each eye to the corner of the mouth and a connecting stripe running from eye to eye through the prefrontal scales. In a comparison I noticed that in E. bimaculata the eye band always runs to the corner of the mouth but in E. dione it often stops short of the mouth. Sometimes dark

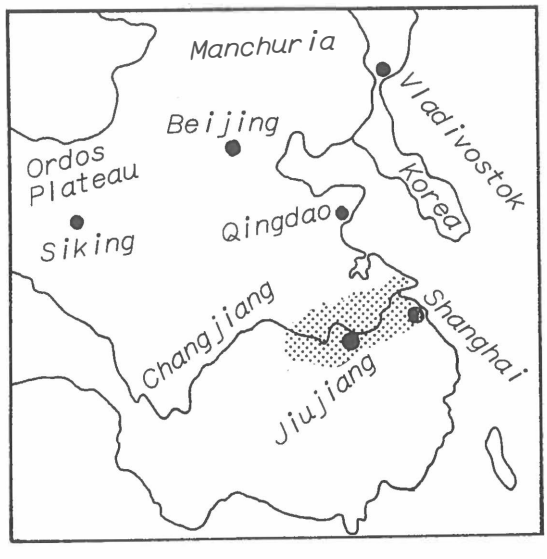
specimens occur in which the markings are barely visible and can only be recognised as stripes.

Length: Females 92cm. Males around 80cm. Larger specimens have, however, been found.

In this species the females are also much more sturdily built than the males. The males have very prominent hemipenes so that adult animals can easily be sexed by their turnip-shaped tails. E. rufodorsata is often confused with E. bimaculata. E. bimaculata can, however, always be distinguished by the blunter and shorter tip to its snout and by the nostrils which are situated higher. Individual characteristics of Elaphe rufordasata are described in Part 1 of this series of articles.

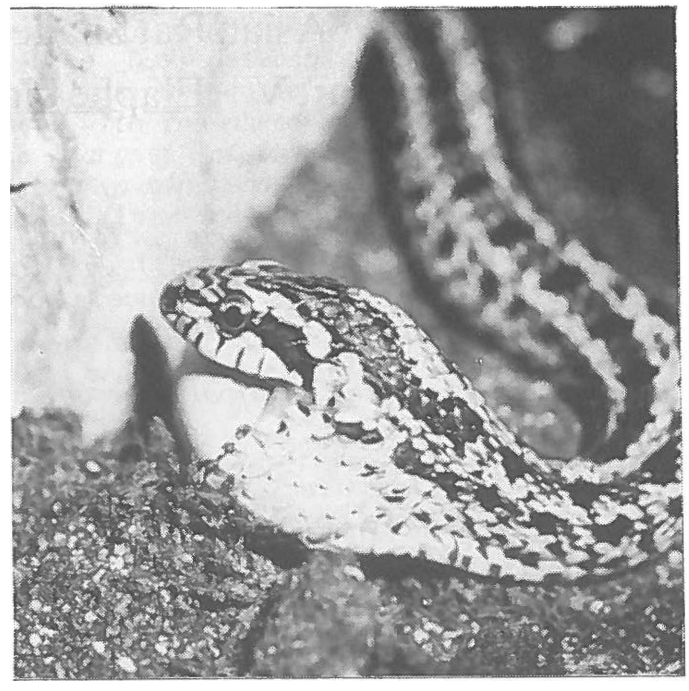
Distribution
According to Pope (1935), E. bimaculata has isolated occurrences in the following Chinese provinces: Jiangsu, Zhejiang, Anhui, Jiangxi and Hubei. It is reputed to inhabit the higher reaches of the Lower Chang-Jiang from Hangzhou to Tchinkiang and to avoid the flatlands. In isolated places it occurs together with Elaphe dione.

Maslin (1950) found E. bimaculata in the Central Hills of the Lushan Region in the vicinity of Lien-Wha-Tung.



Food: Mammals, reptiles, birds and their eggs.

Maintenance in the Vivarium
For several years I have kept these small Rat Snakes in the vivarium and can truly say that they are pleasing and interesting animals. Because of their colourful markings and especially because they are so easy to care for, they can easily compete with the highly prized European Leopard Snake (Elaphe situla).



Elaphe bimaculata (striped variant) eating a quail's egg. Photo: K-D Schulz

The vivarium for Elaphe bimaculata should be of medium size. The lighting in my tank comes from an 18 watt white fluorescent tube and localised heat is provided by the choke of the tubes. During the day the temperature is between 25 and 28 degrees C and night between 20 and 22 degrees C.

The substrate is a mixture of peat and gravel. Also in the vivarium are a number of climbing branches, a flower pot as a hiding place and a water bowl which is only used for drinking. The vivarium should occasionally be sprayed with water because, if they are kept in surroundings which are too dry, they have difficulty sloughing. The snakes either lie in their hiding places with only their heads protruding or else they are constantly on the move. They also appear to enjoy climbing. These snakes are especially active after the lights have been switched off. Elaphe bimaculata moves very quickly. When trying to escape they can develop an amazing turn of speed. When startled or extremely angry these snakes vibrate their tails very rapidly. In addition, their cloacal glands are particularly well developed; they usually discharge an evil smelling fluid when handled. I have noticed that many Asian Rat Snakes discharge this secretion when in danger.

If they feel threatened they will not hesitate to strike and inflict a severe and painful bite. Wild-caught snakes are especially belligerent. I have seen with some animals that when they are disturbed they coil up and hide the head beneath the body coils.

The snakes are fed on half-grown mice which are readily accepted. Care must be taken when feeding that several snakes do not seize the same mouse. The mice are quickly bitten and constricted by the body coils. E. bimaculata (Form 2) shows a marked preference for the eggs of small birds e.g. canaries. Pieces of day-old chicks are also eaten with relish by some specimens. It is curiously interesting how, in the vivarium, snakes will soon become accustomed to certain objects. When a second flower pot was placed in the vivarium it was completely ignored by the snakes. When the old flower pot was removed and only the new one left in the vivarium it took more than a day before the new flower pot was used as a hiding place. When the customary hiding place was slowly removed the snakes still tried to get into the pot through the drainage hole even though the pot was hanging suspended in the air.

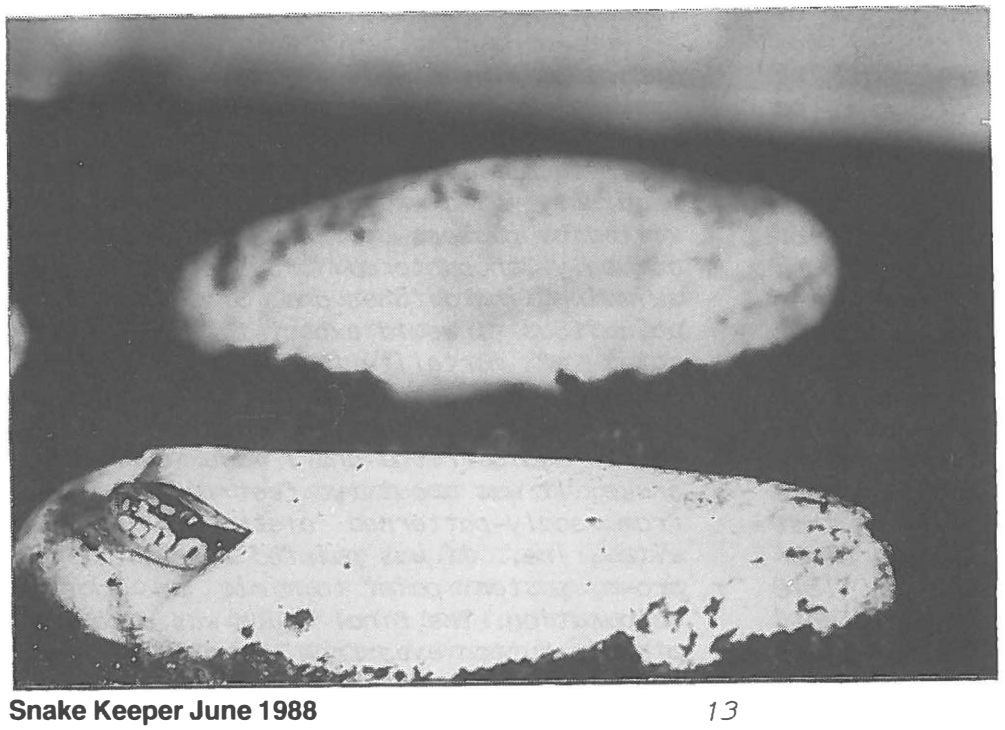
At the beginning of November my snakes are placed in a cellar for three months for a winter rest at around 15 degrees C.

Reproduction

The crowning achievement of every herpetologist is successful reproduction. I was especially pleased to be able to breed Elaphe bimaculata (Form 2). I obtained my five specimens as babies and after 15 months they were sexually mature. I observed the first mating in October and the second in March of the following year, after their winter rest. During the mating process the female is chased wildly and harassed by the male. The male tries repeatedly to copulate by gliding around over the female's back. Of the three males, the longest and strongest was always at an advantage. The weaker specimens were forced away by him so that only the one male mated with both females. At this time the male measured 60cm and the females 65-70cm.

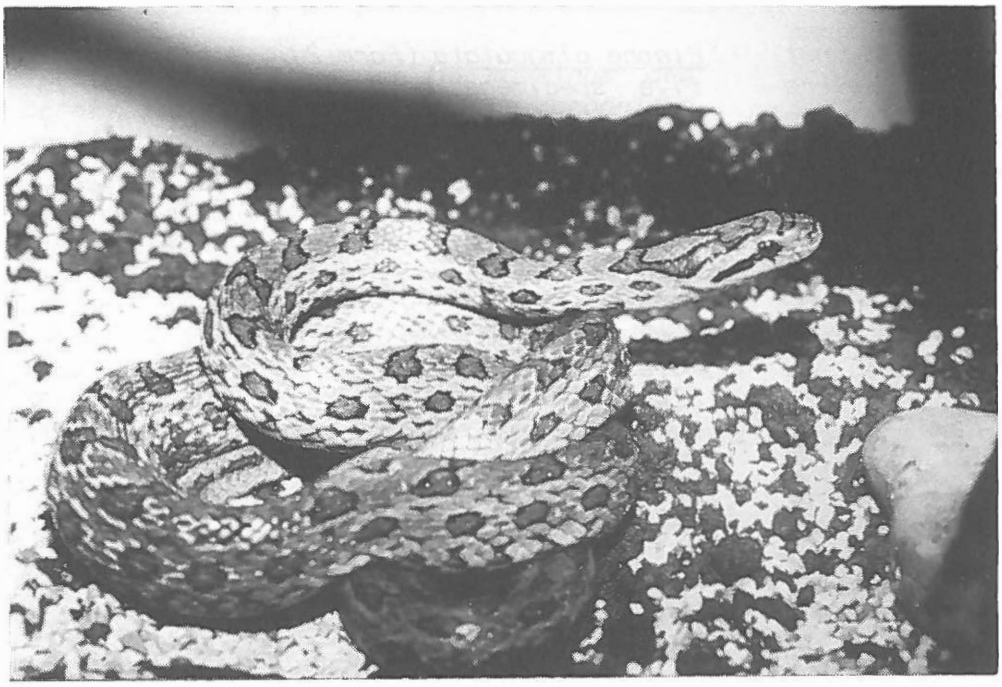
On 4th July at around the same time the females laid 3 and 4 elongated eggs. The eggs were quite large compared with the size of the snakes. They were carefully separated and placed in moist peat to incubate at a daytime temperature of approximately 25-28 degrees C with a nightly cooling by 4-5 degrees C. The first two young emerged on 3rd August at around 10 p.m. and the remainder hatched during the following two days. Thus E. bimaculata bears not only a striking resemblance to the Dione Rat Snake but also has almost identical reproductive biology which further speaks for the close relationship between the two species. Of course, exact conclusions could only be drawn if the other two forms were also available to be studied and recorded.

I was able to observe a third mating of Form 2 on the 5th of October 1985. During this the snakes lay coiled together



Elaphe bimaculata (striped variant) hatching.

Photo: K-D Schulz



Elaphe bimaculata, spotted variety.

Photo: K-D Schulz

for several hours inside the flower pot.

At birth the hatchlings measure, on average, 20 to 25cm and are identical to the adults in colouring.

After the first slough pink mice are usually taken quite readily. Rearing the young presents no problems. Only occasionally did a young snake refuse food. In the wild young E. bimaculata probably prefer young lizards as food.

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

Adders in Captivity

by Paul E. Hopwood

Adders (Vipera berus) are one of my favourite species of snake. One of the best sights for a snake lover must be to come across a wild female Adder basking with her recently-born brood fidgeting on and around her. On sensing your presence they all raise their heads in unison and slither clumsily into the undergrowth. The nine fat babies thrash and struggle to hide themselves accompanied by loud hisses from the irate mother.

I am lucky because there are lots of Adders where I live and they can be found basking in the early morning on any summer day. The best times of year for watching them in the wild are early spring and late summer. In the spring male Adders can be found basking lazily wherever you look and, on warm days a couple of weeks later, challenging each other; two snakes charge side by side in such tight formation that they appear to be helping each other around obstacles in their path. In late summer gravid female Adders are prevalent. Every hour that they bask in the sun gives vital nourishment to their unborn young.

Once a large male Adder I was photographing in the spring time crawled up my shirt sleeve and coiled up contentedly under my forearm. This proved to me that they do not entirely deserve their reputation for irascibility.

Unfortunately, Adders seem to enjoy basking in somewhat more exposed places than our other two species of snake. This is frequently their downfall and I quite regularly find Adders that have been killed by passers-by. As Grass Snakes are commonly encountered crossing paths and swimming in ditches and Slow-worms are ubiquitous I would expect to find higher rates of mortality than I do in these species. Perhaps people are discerning in their choice of reptile to batter. Three years ago a friend and I made a replica snake. It was about two feet long and made from scaly-patterned cloth and stuffed with rice. It was painted with black and brown poster paint to mimic an Adder's colouration. The final touch was a pair of plastic button eyes from a small soft toy. When rolled up, it bore an uncanny



Vipera berus Photo: Paul E. Hopwood

resemblance to a basking Adder. We placed our dummy, arranged in a realistic pose, next to a small bridge over the Wylye River. Near the snake we put a large stick; then we sat concealed by reeds on the river bank with a video camera to record the reactions of the people who walked past. The snake was in an incredibly obvious place and was quite striking in appearance but, despite this, three or four people walked past without noticing it. The first people to see it were a middle-aged couple walking their dog. The man held his dog back when he saw the snake and cautioned his wife. They walked past giving the imitation snake a wide berth. Next came a local vicar and his young daughter, both pushing bicycles. On seeing the snake they put their bicycles down and stood watching from a safe distance. The young girl approached the snake and tapped it with her hand. Having ascertained that it was a fake, she picked it up and flexed it a few times then rearranged it on the ground after looking to see if anyone was watching.

My friend and I were hoping that people would pick up the stick and engage in spectacular battle with the toy snake but only one group of three teenagers used the stick. On finding they had been fooled they threw the offending forgery into the river. It is unlikely that people who regularly walk by this river would have seen Adders and the same experiment might yield more satisfactory results if performed in a habitat where Adders are more common and therefore more often encountered by dog walkers. It might be particularly interesting to try this after Adders have gained legal protection!

After a few years of watching and photographing Adders in the wild I decided to obtain a licence under the Dangerous Wild Animals Act 1976 to enable me to keep them captive. I felt that this would provide invaluable opportunities for studying, photographing and observing the species. I was particularly interested in filming Adders giving birth and also in the diet of baby Adders and the potency of their venom from the moment they break out of the pellicle.

None of my adult Adders are kept on a permanent basis but are released after a few weeks. Although it is possible to tame them to a degree I prefer not to in case this should lessen their chances of survival when they are released. I have found that wild-caught adult Adders always feel uneasy if they can see you moving about in front of their vivarium so I cover the front completely. I tried using 'Mirrorglass' (a thin tinfoil-like covering commonly used on car windows) but found that this was inadequate. Loud hisses would tell me that the snakes could see my shadow. I now use black cardboard with thin slits cut in it at strategic points for observation. I sometimes use this system to keep other captive species 'wild' especially when trying to keep natural behaviour patterns while breeding Grass Snakes etc.

It is very often futile to try to get semi-tame and, as often as not, insecure feeling Adders to feed. Adders are renowned for their unwillingness to eat in captivity. I have had some success in this respect through using a combination of various heaters and lights to emulate natural conditions. At first I tried underfloor heating and True-lite. Then, later, I tried á ceramic infra-red heater. However, the most successful system I have tried so far is a 65 watt carbon filament heater bulb to give light and heat on the basking spot. There is no need for any additional heating as my 'snakery' is heated to 22 degrees C during the day. I



Vipera berus Photo: Paul E. Hopwood

also use True-lite for natural background lighting and a UV tube (filtered through 2mm glass) every couple of days for a few hours. The temperature in their tank is approximately 22 to 26 degrees C during the day dropping to 16 to 19 degrees C at night. Most of the above equipment was supplied (and in one case kindly modified) by Chris Martin.

This system, in conjunction with covering the vivarium and filling it with a few aesthetic touches such as sprigs of heather and cork bark, seems to work admirably and the feeding problems are more or less solved. My only reservation is that the mice that I am breeding at the moment are piebald and therefore the results obtained when photographing a supposedly wild-caught Adder devouring its prey are, to say the least, unconventional.

After acquiring my licence I went out and caught some Adders. I felt that the three very gravid females and one rather unusually marked male that I brought home would give ample opportunity to observe the birth of baby Adders and give scope for interesting photographs. Unfortunately, two of the snakes gave birth the next day and I was unprepared for this and missed the happy event. I released these two and their twelve collective offspring. A couple of days later the third female gave birth to five babies while I was at work. I was loath to disturb them so I left them to their own devices for a few days. Soon after this I released the mother and the male.

After the five babies had sloughed I put them in hibernation. They were left in the fridge for six weeks. The temperature was six to eight degrees C for the first two weeks, three degrees C for a week then gradually raised to ten degrees C. The snakes showed no interest whatsoever in food and seemed remarkably tame. They had no inclination to bite, even if prodded or picked up with bare hands but would merely struggle to escape.

This made the inevitable job of force feeding them rather more straightforward than I had anticipated. I resorted to force feeding them after four or five weeks of trying various food items. Small grasshoppers were tried (I remember seeing a picture of a *Vipera ursinii* eating a grasshopper) but were ignored as were worms, beetle larvae, froglets, lizards and baby mice. I decided to feed small sections of young rats' tails as these are very easy to push down small snakes' throats. The tails were about 3mm in diameter and about 1.5cm long and came from not-quite-weaned rats. I force fed them every fortnight until at last one of them started feeding itself. Once it had started there was no stopping it. The snake edges towards its unmoving pinkie prey with very slow, jerky movements. Suddenly it darts forwards and strikes the dead animal as many as five times in quick succession from different angles. It then swallows the mouse immediately without any pause. After eating three pinkies baby Adders are so fat that they look almost barrel-shaped and they move in a ridiculous, slightly rolling caterpillar motion as they are unable to flex enough to move in their conventional manner.

There is now only one baby which still refuses to feed. As I have no adult Adders at present, I have removed the covers of the vivarium and the tame babies are proving to be very interesting little pets, never retreating, even when I change their water. They also do not mind if I move about whilst they are feeding which saves the terrible cramp one often gets when trying to keep dead still and watch a nervous snake eating. I hope to embark on

much more organised captive Adder breeding this year. You could say that I have been bitten by the Adder bug!

Paul (21) started keeping snakes in 1982 and his special interest is in the conservation of British reptiles and amphibians and photography. In 1984 he made a one hour film about British reptiles. In 1987 he helped with conservation work on a Smooth Snake habitat. He keeps Boa Constrictors, a Burmese Python, Rat Snakes, Corn Snakes, Grass Snakes, Adders, Slow-worms, various lacertid lizards, geckos, tortoises and a large common snapper.



Vipera berus Photo: Paul E. Hopwood

Creating an Attractive Vivarium

by Chris Hunt

If you keep relatively small snakes (up to 1.2m) then why not transform their vivarium into a breathtaking centrepiece? Of course it would be impossible to do it for large boids etc. because they have a total disregard for anything in the vivarium but, with a little imagination, the smaller snake vivarium can be made to look very attractive indeed.

The Cage

Of the several different types of vivarium available, I think that the best kind for this particular set-up would be the wooden variety with a sliding glass front. These have several advantages over the all-glass aquarium type. Firstly, the back and sides are blank thus giving an impression of space and depth. With an all-glass aquarium you inevitably have all the wires trailing down the back which looks rather unsightly. Secondly, it is a lot easier to attach things to a wooden vivarium; if you want to have climbing branches, it is easy to screw the brackets into a wooden cage. It also has the advantage that trailing wires can simply be tacked to the top of the cage which rules out the need for lots of Sellotape.

Substrate

We now come to one of the most controversial subjects in snake keeping. I think that if you only have a small collection of snakes it does no harm to have a substrate of gravel or bark chippings, but this subject will probably be dealt with by someone else at a later date. I will just say which substrate I think is best for this set-up.

a) Gravel

This is fine as it has the advantages of being easy to clean and readily available. One problem I find is that some of the smaller snakes have difficulty burrowing down into it because it is very dense. Avoid coloured gravels at all cost because they look so garish and artificial. There is nothing worse than seeing a snake on bright orange gravel.

b) Bark Chippings

For me this is the best type of substrate and the most attractive. Before they are put into the vivarium, the chippings should be dried out throughly as they are often very damp. A little bit more care is needed when cleaning out because it is sometimes more difficult to see the faeces. However, this is a small price to pay for such a natural looking and attractive substrate.

Furnishings

When furnishing the vivarium, simplicity is the key. Avoid cluttering up the vivarium with lots of rocks etc. Just a few well-placed items will make all the difference. Always try to include an eye catching centrepiece. Bogwood makes a very nice display and is available in many strange shapes and sizes. Simply screw it to a wooden base and position it accordingly. Alternatively, you could have several rocks positioned to make lots of caves. Vivarium decoration is a very personal thing and you can let your imagination run riot. Plants also help to enhance the display but, unfortunately, very few will do well long-term in the

vivarium because of the heat. Try to choose tough, sturdy-looking plants such as Yucca and Spider plants. One of the plants that does do well and looks extremely nice is the air plant. These plants do not need any food and very little water. They do not need to be planted, just attached to something, as they draw their nutrients from the air. Their one drawback is that they are expensive but if you can afford them they are worth investing in.

Summary
For those with smaller snakes a little bit of time and care can pay great dividends. We must not forget that the most important role of the vivarium is to house the snake so bear that in mind when furnishing. There is no reason why we shouldn't try to make the vivarium attractive to us as well as to the occupant. It is always a great compliment when someone says to me "Oh! that looks lovely" when there isn't a snake in sight. When the snakes are hiding, it is nice to have a well set-out vivarium to look at. Stick to the basic rules and, most of all, be imaginative and have fun!

BOOK REVIEW

'Handbuch Der Terrarienkunde'
('Handbook of Vivarium Science')
by Paul Heinrich Stettler
Hardback. Price DM 48. ISBN 3-440-049299
Published by:
Kosmos Verlag, W. Keller & Co.,
7000 Stuttgart, West Germany.

In a vivarium, whether moist or dry, cold or heated, we should always ensure that the best possible conditions prevail for the animals and plants which we keep. In order to keep them under optimum conditions we should know something about their origin and the conditions which prevail in their natural habitat.

Paul Heinrich Stettler, a renowned Swiss herpetologist, has written his 'Handbook of Vivarium Science' in an entirely new way. He lists the animals and plants which are suitable for a vivarium according to bio-geographical regions. For each region there is a climate and vegetation map whereby one can easily determine the requirements of the animals and plants according to their region of origin.

From his long and extensive experience, the author describes animals and plants which the herpetologist can really keep and care for, which do not grow too large and the correct conditions which are easily attained in the vivarium. In this book Stettler gives tips on easy vivarium construction and possible types of vivaria and makes suggestions for the furnishings. He explains the factors which are so vital to our charges such as climate, feeding, diseases, breeding etc. and also explains in simple terms how to breed the various types of food animals.

Excellent technical drawings simplify the construction of vivaria and throughout the book there are over 100 colour photographs of the reptiles and amphibians described.

This is an excellent book which, although written in German, is well worth buying for the photographs and technical drawings. I feel that for those of our 'fraternity' who speak German it will rapidly become the 'bible' of herpetology, whilst those of us who do not speak German will still glean an enormous amount of information from this work. If it were ever to appear in an English version it would most certainly race to the top of the herpetological best-sellers lists in the English-speaking world; publishers please note! In short, every herpetologist should have this book on their library shelf in a prominent position.

John Hackworth

BOOK REVIEW

'Das Neue Schlangenbuch In Farbe'
('The New Snake Book in Colour')
by Fred Kundert
40 pp of text. 132 pp of colour photos
Price: S Fr 79,00 or DM 88,00
Published by:
Albrecht Muller Verlag,
Ruschlikon - Zurich, Switzerland.

Every so often a book comes along which stops one in one's tracks. This book is certainly one of those! The sheer magnificence of the photography defies description and the quality of the book is superb. The snakes are described by their German common names but, because the Latin names are also given, it is a simple matter to cross-reference to identify the snakes with which one is unfamiliar. Fred Kundert is a renowned Swiss herpetologist and in this book he deals with every

continued on page 20

Stowaway Snake

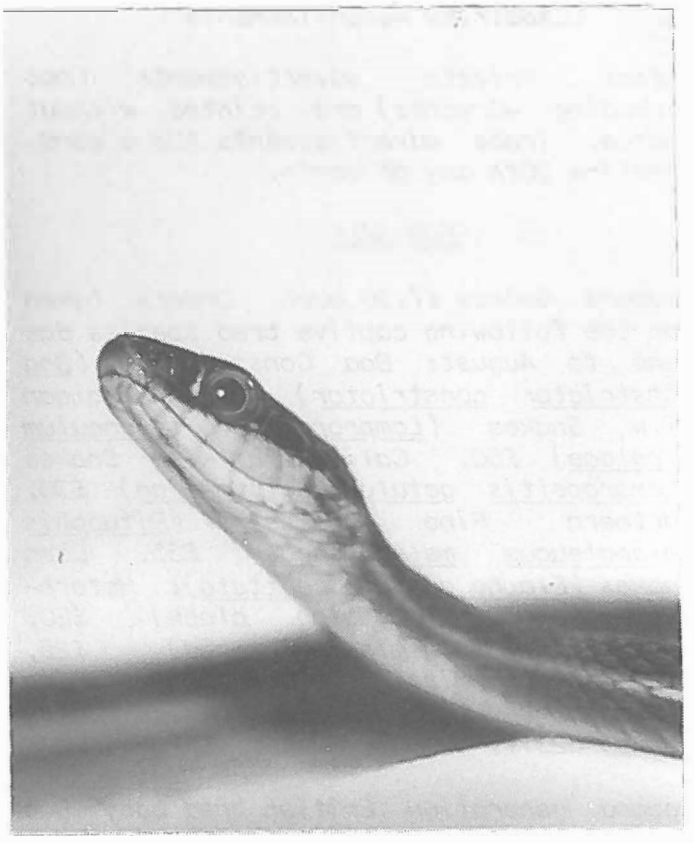
The snake shown here recently arrived in Britain after being accidently transported from the U.S.A.

Identified as a Peninsular Ribbon Snake, Thamnophis sauritis sackeni, by B.H.S. member Nick Bessant, the snake survived a four month journey, three and half months of which were spent in a ship's hold.

It appears that the snake, which was sealed up with a botanical specimen in a plastic sheet, started its trans-Atlantic journey in Florida.

Although reluctant to eat at first, the snake has now settled down on a diet of small fish, tadpoles and, occasionally, a worm.

Right:
Thamnophis sauritis sackeni
Photo: Michael Connolley



JUNIOR SNAKE KEEPER

The Fast by Lee Bowler

Many people worry for no reason about the feeding or, to be more exact, the non-feeding of the Royal Python (Python regius). The majority of articles on this subject state that these snakes can go without food for periods of up to six months without any ill effects. In my experience, that's hardly any time at all; I say this because one of my Royal Pythons, a male called Guyon (featured in Snake Keeper, Volume 1 Nos. 1 & 2), decided he would break his normal feeding pattern.

In 1985, between the 10th of June and the 27th of October, Guyon consumed 21 gerbils and then entered his natural winter fast until the 9th of May 1986. Between the 9th of May and the 14th of September he ate anything that was put in front of him, as if he was trying to gain as much weight as possible for the following winter fast. During this time he consumed 42 rats and gerbils and put on 336 grams (12ozs) in weight, bringing him up to 1,960 grams (4lb 3ozs). His meal on the 14th September proved to be his last for quite some time.

By May 1987 I was expecting him to come back to his normal feeding pattern. Food items such as gerbils, rats and chicks were offered but no interest whatsoever was shown. This carried on for an amazing 18 months and 23 days. Apart from being surprised at the time he went without food, I was also intrigued by the small weight loss involved; only 168 grams (6ozs) in total, equivalent to 8.95 grams per month. Guyon remained in excellent health throughout this period.

On the 4th of April 1988 a female Royal Python, Cleopatra, was housed in Guyon's vivarium. Two days later the female was offered a medium-sized rat but she showed no interest in eating it. Guyon was then offered the same rat and he took it immediately and consumed it in under 10 minutes.

Since then Guyon has continued eating and, up to the time of writing (8/5/88), he has eaten eight medium to large sized rats. After two meals he shed his skin and weighed in at 2,044 grams (4lb 5ozs), a weight gain of 252 grams (9ozs). Cleopatra has still not started eating. Will she fast for the rest of this year? No one knows; time alone will tell.

CLASSIFIED ADVERTISEMENTS

Rates: Private advertisements (not exceeding 40 words) are printed without charge. Trade advertisements 10p a word. Deadline 20th day of month.

FOR SALE

Leopard Geckos £7.50 each. Orders taken for the following captive bred species due June to August: Boa Constrictors (Boa constrictor constrictor) £65, Sinaloan Milk Snakes (Lampropeltis triangulum sinaloae) £50, California King Snakes (Lampropeltis getulus californiae) £30, Northern Pine Snakes (Pituophis melanoleucus melanoleucus) £35. Corn Snakes (Elaphe guttata guttata): Heterozygous (for missing black) £20, Anerythristic (missing red) £25, Amelanistic (missing black) £30. Fire Salamanders (S.s.g.) £2. Phone Jerry (0305) 62311.

Second generation British bred baby Boa Constrictors (Boa c. constrictor), £55. Chris and Marcia Martin, 18 Balinode Close, Cheltenham, Glos GL50 4SQ. Tel: Cheltenham 573477.

The Peterson Field Guides. (1) Western Reptiles and Amphibians. (2) Eastern/Northern Reptiles and Amphibians. Very good condition, £9 each or £16 the pair. D.J.A. Davies, 52, Birchgrove Road, Birchgrove, Swansea, West Glamorgan.

Corn Snakes. One male, 5.5', £70. One male 'Carolina phase', 4.5', £60. One female 3' £45. All three for £160. All feeding well. Healthy specimens. Phone Chris on Chirk 778395 (Clwyd).

Yellow Rat Snake, 7'. Royal Python, 5'. Six foot tank with thermostat and heater. Three foot tank, thermostat controlled, lighting. Spare heating element. £200 the lot. Telephone Sheerness, Kent (0795) 664231 days. Buyer to collect.

Boa constrictor. Male, 5.5', 2 years old. Very tame and eats well. Tel: Stamford (0780) 782148.

Female Indian Python. Captive bred, 6.5', tame and feeding well. House move forces sale. Any reasonable offer. Phone (0924) 824532 (Yorks).

Northern Water Snake, Nerodia sipedon. Approximately 13" long. If interested call Stuart on (0621) 741374 (Essex).

Superb Lampropeltis pyromelana hatchlings. £90 each. Zoo Shed, Roger Grenville. Tel: (08444) 6867 (Bucks).

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).

Female Indian Python, 8.5', £130. Tel: 01-385-0686.

BOOK REVIEW

(continued from page 18)
family of snakes from the harmless colubrids through the venomous species to the giant snakes, including some of the rarer Caribbean boas in the most breathtaking colours. This is a book which, although rather expensive, truly belongs on the bookshelf of anyone who has any interest in snakes, whether in an amateur or professional capacity. Because of the unique photography (192 sensational colour photographs) it is a collectors piece in its own right, and well worth the price!

My only regret is that the 40 pages of what are obviously very informative text are in German. I feel that should this book be published in an English edition it would immediately turn into a No. 1 best seller.

John Spence

SNAKE KEEPER NEWS

Leicestershire reader Colin Booker has had six eggs laid by his recently-imported Royal Python (Python regius). They are presently being incubated by the snake and are due to hatch on the 22nd June.

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