

THE BRITISH  
HERPETOLOGICAL SOCIETY

**BULLETIN**

No.3 June 1981

## BRITISH HERPETOLOGICAL SOCIETY

*c/o Zoological Society of London  
Regent's Park, London NW1*

*Correspondence, membership applications, subscription renewals and purchase orders for the British Journal of Herpetology should be sent to the above address.*

The British Herpetological Society was founded in 1947 with the broad aim of catering for all aspects of interest in reptiles and amphibians. Initiated by a small number of enthusiastic and well-known naturalists, including the first President and author of the standard textbook on British herpetofauna Dr Malcolm Smith, the Society expanded rapidly and today enjoys national status with many international connections.

Activities of members range over a number of interrelated fields. In many cases the prime interest is in maintaining, breeding and observing various species in captivity and the Society acts as a forum for the interchange of experiences in this area. Others are concerned with the observation of animals in the wild state. There are active sub-committees which help to cater for these various tastes, notably the Captive Breeding Committee and the Conservation Committee. The former encourages the development of effective breeding techniques for captive specimens, thus providing animals for observation and study in vivaria, and for conservation purposes, while simultaneously reducing the need to take fresh stock from wild and possibly declining populations. The Conservation Committee is actively engaged in field study, conservation management and political lobbying with a view to improving the status and future prospects for our native British species. It is the accepted authority on reptile and amphibian conservation in the U.K. and has an advisory role to the Nature Conservancy Council (the statutory Government body). There are also professional scientists within the ranks of the Society engaged in increasing our understanding of all aspects of reptile and amphibian biology.

### **Publications**

**British Journal of Herpetology**, published each June and December, contains papers or original research in herpetology.

**British Herpetological Society Bulletin**, also published each June and December, contains notices, news items, articles and original papers on all aspects of herpetology.

**The Care and Breeding of Captive Reptiles**, a new book containing a collection of papers on recent developments in breeding reptiles in captivity. This publication is not included in members' subscriptions, but is available to members at a price of £3.00. Applications to purchase should be made to the Chairman of the Captive Breeding Committee.

### **Meetings**

About ten meetings covering a broad sphere of interests are held each year.

### **Subscriptions**

Ordinary members £10. Junior members £1.50 (Junior members do not receive the British Journal of Herpetology). Institution rate £17.

All subscriptions become due on the first day of January each year.

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The Bulletin is edited and produced by  
Simon Townson and John Pickett

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Contributions and correspondence arising from the Bulletin should be sent to:

John Pickett, 84 Pyrles Lane, Loughton, Essex IG10 2NW

## REMAINING EVENING MEETINGS 1981

All meetings start at 7 pm and are held in the Lecture Theatre of the Linnean Society of London, Burlington House, Piccadilly, London, W1., unless otherwise stated.

- JUNE 24th                      Care and breeding of amphibians and reptiles from the New World. An open meeting and discussion to which members are encouraged to contribute. Live animals and slides welcome.
- JULY 8th                        Visit to the London Zoo. An informal meeting organised by the Captive Breeding Committee, held during a Members' Evening Meeting of the Zoological Society of London. BHS members should meet at the Fellows' Entrance in the Outer Circle of Regents Park at 7 pm. If the party has already entered the Gardens, please tell the gateman that you are with Mr Simon Townson or Mr Peter Bennett.
- SEPTEMBER 23rd              Care and breeding of amphibians and reptiles of the Old World. An open meeting and discussion to which members are encouraged to contribute. Live animals and slides welcome.
- OCTOBER 27th                A joint meeting with the Jersey Wildlife Preservation Trust. It is hoped that Mr Gerald Durrell, the Trust's Chairman, will give an introductory talk on the Trust's work, followed by Mr J. Hartley (Assistant to Gerald Durrell) on the captive breeding of rare reptiles and their conservation on Round Island (Mauritius), Indian Ocean.
- NOVEMBER 25th              Dr S.P.A. Gittins (Dept. of Applied Biology, University of Wales I.S.T., Cardiff) Migration of the Common Toad (*Bufo bufo*) in Wales.

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## EXTRAORDINARY GENERAL MEETING

An Extraordinary General Meeting of the British Herpetological Society will be held before the business of the Evening Meeting at 7.00 pm on Wednesday, 23rd September, 1981.

### AGENDA

1. Three Committee resignations have been received since the A.G.M. Notice was circulated: Dr J.F.D. Frazer (President), Dr M. Peaker (Editor, *British Journal of Herpetology*) and Dr A.S. Cooke (Ordinary Committee Member). The Committee have pleasure in recommending the election of the following replacements:—

President:	The Earl of Cranbrook
Editor,	Dr R. A. Avery, (Department of Zoology,
<i>British Journal of Herpetology</i> :	University of Bristol)
Ordinary Committee Member:	Mr J. Coborn (Director, Dudley Zoo)
2. Revised BHS Rules
3. Formation of BHS Secretariat (Administration Committee)

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## RESIGNATION OF BHS OFFICERS 1980/81

During the last twelve months, three Officers have resigned from the Committee.

**President:** Dr J.F.D. Frazer, our inimitable President for 26 years, announced at this year's A.G.M. that he would be resigning during 1981. Elected to the Presidency at the 1955 A.G.M., replacing the founding President, Dr Malcolm Smith, author of *The British amphibians and reptiles* (No. 20 of the Collins New Naturalist Series), Dr Frazer worked for many years at the Nature Conservancy Council. The Conservation Committee now plays an advisory role to this statutory government body, and just recently Dr Frazer has revised Malcolm Smith's book. He saw the Society through thick and thin during the 60s and 70s. Members will be grateful for his services to the Society over a long period and wish him well in his retirement.

**Joint Secretary:** Mr Peter Bennett resigned as Joint Secretary at the end of 1980. He took on the arduous responsibilities of this post from Mrs Monica Green in 1976. The Society expressed its indebtedness to Monica Green a few years ago and we would like to thank Peter Bennett for organising the Society's administrative side during his four years of office and 'keeping the ship steady'. Members will be grateful for his services to the Society.

**Editor, *British Journal of Herpetology*:** Dr Malcolm Peaker, on becoming Director of the Hannah Research Institute in April, felt unable to continue his responsibilities as Editor. He took over the editing of the Journal from Dr Harold Fox in 1977, since when several changes have been seen in the Journal's production. The printing was taken over by Spottiswoode Ballantyne Ltd. and Volume 6 saw the printing of the Journal in an A4 format, which allows a larger number of papers to be published each issue. This seems to have been well received, judging by the increased orders and sales from libraries and scientific organisations throughout the World — a trend which it is very much hoped will be continued. Members will be indebted to Malcom for his services to the Society and will want to congratulate him and wish him well in his new appointment.

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## TREASURER'S REPORT: FINANCIAL YEAR 1980

The accounts for 1980 are presented in this issue of the Bulletin. The Income and Expenditure Account shows an excess of expenditure over income of £1,080 against a surplus of £94 in 1979 and the Balance Sheet has an excess of liabilities over assets of £1,228 (1979 : £148). Although there was an increase in income during the year, this was more than offset by the increases in expenditure, mainly by the costs of printing and postage which rose by £1,536, an increase of 50% on 1979. In addition the cost of hiring meeting rooms increased by over £100, which includes a provision of £40 for the hire of the Zoological Society's Lecture Hall for the well-attended Saturday meeting organised by the Captive Breeding Committee last September.

If the Society was to remain solvent this year there were only two alternatives, an increase in the subscription or a drastic cut-back in the cost of the Journal and Bulletin. As these publications are in many instances the only contact that many members — particularly those living overseas — have with the Society, we felt certain that any reduction in quality would be unacceptable and indeed we hope that in the future the Society will be able to improve this even further. Therefore, a substantial increase in subscription rates became the only option although the decision was taken with much reluctance.

Changes made for 1981 include the following:—

Ordinary Membership:	£10	Sale of back issues — Journal	£3
Library and Institutional Membership:	£17	Bulletin	£1
+ 30p postage.			

# INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR TO 31st DECEMBER 1980

1979		1980	
£		£	£
2,925	Subscriptions		2,815
528	Sales of Journal		1,038
52	Deposit Account Interest		60
30	Collections, Donations and Advertising		87
69	Tax reclaimed on Deeds of Covenant		57
<u>3,604</u>			<u>4,057</u>
	Less: Expenses		
2,632	Printing of Journal and Bulletin	3,680	
409	Postage and Stationery	897	
125	Hire of Meeting Rooms	226	
200	Conservation Grant	200	
100	Captive Breeding Grant	100	
19	General Expenses	9	
25	Secretarial Expenses	25	
<u>3,510</u>			<u>5,137</u>
£94	Excess of Expenditure over Income		(£1,080)

## BALANCE SHEET AS AT 31st DECEMBER 1980

1979		£	£
£			
	Assets		
69	Debtors — Income Tax Refund		—
—	— Subscriptions		5
30	— Sales of Journal		—
521	Cash at Bank — Deposit Account	376	
756	— Current Account	<u>829</u>	
			1,205
—	Cash in hand		<u>15</u>
<u>1,376</u>			<u>1,225</u>
	Less Liabilities		
1,222	Creditors — Printing	1,970	
—	Rent	89	
40	— Library Administration	40	
82	— Prepaid Subscriptions	62	
180	— Postage and Stationery	287	
—	Captive Breeding Committee	5	
<u>1,254</u>		<u></u>	<u>2,453</u>
(£148)	Net current liabilities		(£1,228)
	Represented by		
(242)	Excess of Expenditure over Income at 1.1.80		(148)
94	Loss for the year		<u>(1,080)</u>
<u>(£148)</u>	Adverse balance carried forward		<u>(£1,228)</u>

## AUDITORS REPORT

*The attached accounts have been prepared from the records maintained by the Society and are in accordance therewith.*

The costs of publishing are expected to rise by 40% in 1981 and postage and stationery may well double. This means that to print and distribute the Journal and Bulletin, with other postage and stationery costs, will cost in the order of £6,950. In addition grants of £500 have already been made to both the Conservation and Captive Breeding Committees with further finance proposed for the Conservation Committee as already noted in the "Society Finance and Membership" circular distributed when the subscription increase was announced last year. To cover these expenses, together with the normal costs of running the Society, an income of approximately £9,300 is required during 1981, based on the trends shown by 1980's increases.

At the end of February, approximately 300 ordinary members had paid subscriptions together with 40 Library and Institutional members and although the number is rising steadily, it is essential we obtain more members. The Society has advertised for members in the "New Scientist" in March 1981 and further advertisements will be placed in other publications. Considerable help can be given by existing members who are requested to introduce prospective members to the Society. The BHS needs your help and a questionnaire on the methods by which the Society can meet members' requirements is to be circulated.

D.G.D. Lucas – Hon. Treasurer

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## CONSERVATION COMMITTEE ANNUAL REPORT – 1980

Progress is described under the same sub-headings as used in 1979.

### 1. Reptile Management

Several weekend clearance tasks were undertaken at key sand lizard/smooth snake sites in Surrey, Hants and Dorset during January-April 1980 by Conservation Committee members. In the summer a grant from World Wildlife of £2,500 was obtained for heath clearance and the work thus continued in autumn 1980 with the added help of various Conservation Volunteers. These funds will also provide for more work in 1981. Between early September and late April the Conservation Committee is now usually involved in about 2 clearance weekends per month, a considerable commitment in terms of time, effort and money. The Conservation Committee is also engaged in negotiation with landowners to try and secure management agreements for as many sites as possible, another time-consuming process, as well as drawing up an overall strategy for our future involvement in dry heath conservation.

Apart from scrub clearance, a small amount of bracken spraying on Surrey heathland was carried out in August and it is intended to expand this programme in future.

The Conservation Committee continues to be involved with the NCC in sand lizard conservation on Merseyside. The breeding of captive animals and release of progeny into areas of suitable habitat on the dunes ("restocking") is now underway, and the Conservation Committee has begun construction of a second "dune vivarium" for the project.

Conservation Committee activities were supported in March by a grant of £870 from Vincent Wildlife Trust for the purchase of equipment. This included new billhooks and bow saws, back-packs for bracken spraying, a power (chain) saw, scrub-clearer and rotovator.

Heathland sites continue to be lost or damaged at a frightening rate and we are continuing to press NCC to take a stronger line in defense of this habitat by scheduling as SSSIs etc. Motorcycle scrambling is proving an especially serious problem on several sites now. However, on a brighter note some more progress has been achieved with regard to release of heathland blocks within Forestry Commission plantations in SW England for conservation purposes though there is still some way to go in this area.

## **2. Amphibian Management**

Further scrub clearance (1 day) has been carried out at the Hampshire natterjack site and more than 1,000 young toads were reared in captivity to about 15mm long and released there as part 2 of a 3-year booster plan. The Ministry of Defense has also begun construction of a second breeding pond on the site. Problems still remain with birch recoppicing and high tadpole mortality but a large effort will continue to be put into this last remaining southern England site for the natterjack.

The Conservation Committee contributed a small amount towards the cost of a firebreak at the Norfolk heathland natterjack site, now managed as a reserve by the Norfolk Naturalists Trust with BHS as advisors. Scrub clearance has also been started there.

An introduction of natterjacks to a small patch of heathland owned by RSPB in Bedfordshire got underway in 1980. The equivalent of 1 whole spawn string was introduced to a pond specially created for the project, and there was considerable metamorphic success. Another (larger) batch of spawn will be "seeded" in 1981.

World Wildlife provided a grant of £1,500 for natterjack pond excavation at 2 important sand-dune sites in Cumbria and the work was carried out by heavy machinery, under Conservation Committee direction, during August. 10 large ponds have been created, 4 at Ravenglass and 6 near Barrow-in-Furness. Scrub clearance at another natterjack site in north Cumbria has also been organised, and an overall strategy for natterjack conservation in the county drawn up for discussion.

## **3. Monitoring and research**

Fieldwork on heathland sites to monitor breeding success of the rare species has continued in spring and early autumn. One notable feature was the discovery of a smooth snake at one of our sand-lizard reintroduction sites in NE Hants, the first to be recorded there.

Dune surveys in Dorset revealed numerous sand lizards but increased public pressure since the last one carried out 10 years ago, and in Merseyside (Birkdale) very low numbers of lizards were seen during a similar survey.

Brian Banks toured many of the Cumbria sites and produced a report on current status and likely conservation needs for natterjacks.

A study of agricultural lowland ponds in the Sussex Weald was undertaken. Frogs and toads proved extremely rare but all 3 species of newt were fairly widespread. In general a pattern has emerged in Sussex from work carried out over the last 4 years showing that frogs and toads are abundant in gardens but scarce in other habitats; common newts are widespread in gardens, marsh dykes, chalk hills (dewponds) and agricultural ponds; whereas palmate and crested newts are essentially restricted to the latter 2 habitats.

Keith Corbett (at his own expense) visited Holland during the summer to liaise with Dutch herpetologists engaged in research and conservation on sand lizards and natterjacks (among other species). Much valuable information was gained, e.g. with regard to types of habitat occupied by our endangered species in mainland Europe.

John Buckley continued his investigations into odd natterjack records in Norfolk (no new sites yet confirmed) as well as monitoring known colonies.

The Conservation Committee became more involved with potential introduction sites for our rare species during 1980. Following the several successful sand lizard translocations on heathland during the 1970s, 2 potential dune sites in SW England were investigated in December to survey habitat potential. Both look as if they may be suitable, and it is hoped to try using lizards rescued from "doomed" sites in the near future. Since dune habitat is inherently less endangered than heath, this scheme is considered important to the long term future of sand lizards in the U.K.



The Conservation Committee has given support to a plan by the Norfolk Naturalists Trust to create natterjack habitat (ponds) and then introduce the species to a dune reserve in Norfolk, and has also proposed a reintroduction of natterjacks to North Wales; a potentially suitable site is currently under consideration by the NCC. Finally, following an approach from the local authority and habitat examination by the Conservation Committee an introduction of natterjacks to a heath/sandpit site in the West Midlands seems likely to be attempted in 1981.

It is perhaps worth stressing that this sudden increase of interest in introductions is to some extent fortuitous but accidental (in terms of the numbers of sites coming forward during 1980) and is still thought of as secondary to the main task of conserving existing sites.

Finally, the Conservation Committee continues to run 2 heath-type vivaria for the maintenance and breeding of captive sand lizards and natterjacks.

#### 4. Education

The Conservation Committee produced displays at 2 events during 1980; an exhibition at Winchester (Queen Elizabeth Country Park) and another at the second Wildlife Fair at Marwell in September. Our stand again proved very popular.

We were also well represented at the European Herpetological Symposium organised by ASRA at Oxford in the spring; several Conservation Committee members gave talks on work being carried out in the U.K. and many valuable contacts were made.

A grant of £150 from Vincent Wildlife Trust allowed the Conservation Committee to produce and print a leaflet on our activities and this has been distributed through various channels during 1980. Any member who would like a copy should write to me, and one will be sent free of charge. Because of the success of this leaflet we are currently involved in the production of 3 more: one will be on identification of British species, a second on British snakes and a third on the value of garden ponds to the conservation of British amphibians. In this latter context we have during 1980 also advised Friends of the Earth on a small circular being produced by them on the same subject.

#### 5. Politics

The usual rounds of meetings with County Trusts, Ministry of Defense and NCC etc. continued through 1980. Some particular problems have been: (1) relations with the Cumbria and Dorset Naturalists Trusts have not been as satisfactory as we would like, for various reasons, and attempts are being made to improve matters. (2) Continuing problems with the NCC NW region resulted in a meeting at NCC HQ in March. This region now has a new senior officer and an improvement in relations seems likely. (3) The National Policy for Herpetofauna Conservation: yet another year has passed with no positive developments, though the Conservation Committee has continued to press NCC for action. In response to pressure from all participants in the 1977/8 meetings, organised as a protest by the Conservation Committee, some movement was evident in December but at the time of writing we are still trying to deal with an attempt by NCC to downgrade the policy to a "review document". Just what the future of all this policy work will be remains uncertain.

The BHS Conservation Committee became a member of a new association of voluntary bodies concerned with wildlife conservation, "Wildlife Link", at its inception in 1980. Other members include RSPB, FPS, FoE etc., and the idea is to promote an effective large lobby for wildlife protection independent of government.

Finally, we have had to deal with the government's "Wildlife & Countryside Bill" which started its career through parliament in November 1980. This large Bill will replace and add to several previous Acts (including the Conservation of Wild Creatures and Wild Plants Act of 1975) and with the backing of the BHS Main Committee we have pressed for 2 amendments:

- (1) The removal of a number of amphibians and reptiles from a schedule of creatures



listed as "already introduced to the U.K., but further introduction of which would be illegal". This list includes edible, marsh and European tree frogs, alpine newt, yellow-bellied, midwife and clawed toads, wall lizard, European Pond tortoise. We are pressing for all but clawed toad to be exempt, since legislation to prevent or license casual release of these harmless species into garden ponds, etc. seems both unnecessary and unenforceable. Members should note, however, that even if this amendment is carried it will still require a license to release into the wild species which do not happen to be listed as "already introduced", e.g. fire salamanders. There seems to be no way of getting this changed, unworkable though it will certainly be in practise.

(2) The "reverse listing" of all our native herpetofauna. This would make commercial sale (*not* private collection) of our 9 native species not totally protected, unless there were specific exceptions, illegal and bring us into line with most countries in Europe (and herps. would also then become similarly protected to birds in the U.K.). At time of writing NCC is not supporting either of these amendments.

The fate of this Bill, and our amendments, should be clear by summer 1981.

## 6. Internal matters

Firstly, a revised membership list of the Conservation Committee. Particular specialist interests are given in brackets.

Dr T Beebee (Chairman) (Amphibians/natterjack)  
Mrs M. Beebee (Secretary)  
Mr S Bolwell (Photography)  
Mr V Taylor (Education)  
Dr H Arnold (Records)  
Mr K Corbett (Reptiles/sand lizard)  
Mr J Webster (Reptiles)  
Mr D Dolton  
Prof. G. Haslewood (Lacertids)  
Dr E. Haslewood (Lacertids)  
Dr M Lambert (Testudines)  
Mr T Langton  
Mr M Preston  
Mr B Banks (Natterjack/marsh frog)  
Mr J Buckley (Natterjack)  
Mr E Wade (Reptiles/smooth snake)  
Mr D Street (Reptiles/smooth snake)

Northern Branch: Dr R. Dutton  
Mr. M. Brown  
Mr K. Marshall  
Mr A. Quayle

Advisors: Dr E. Arnold (British Museum, Natural History)  
Mr J. Burton (Friends of the Earth/TRAFFIC)  
Dr A Cooke (Nature Conservancy Council)  
Mr H. Ginn (Nature Conservancy Council)  
Mr J Griffin (Xenopus Ltd.)  
Dr R Stebbings (Institute of Terrestrial Ecology)  
Mr J White (Nature Conservancy Council)  
Dr D Yalden (Manchester University)  
Dr C Tydeman (World Wildlife Fund)

Secondly, financial matters. As will be evident from earlier section of this report, the Conservation Committee obtained more than £5,000 in external grants during 1980 but since all of this was earmarked for specific projects, it is not included below.

The Committee entered 1980 with £3.60, to which was added the annual contribution of £200 from the Main Society, i.e. a total of £203.60.

Expenditure has been as follows:

Subscription to Wildlife Link:	£35.00*
Attendance etc. at Marwell W/L Fair (inc. tables, chairs, etc.)	£41.40
Contribution to Norfolk firebreak	£15.00
Peat for heather planting	£ 4.00
Letraset etc. for display posters	£25.90
Repair to chain saw	£22.06
Mileage remuneration to members	£93.60**

Total Expenditure	£236.96
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Balance	£33.36
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However, residual grant money of £33.76  
was also available, so true balance =

+40p

\* Normal subscription to Wildlife Link is £100, but the balance was (and will be) made up for us by the People's Trust for Endangered Species.

\*\* This worked out at only 0.63p per mile, i.e. an even lower rate of remuneration than last year and only about 10% of the cost of petrol alone.

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## INTERNATIONAL HERPETOLOGICAL CONGRESS

### 3rd – 9th OCTOBER 1981

*To be held in the large Lecture Theatre, Department of Zoology, University of Oxford*

*Organised by Cotswold Wild Life Park and Dudley and West Midlands Zoological Society,  
in collaboration with ASRA and the British Herpetological Society.*

#### PROVISIONAL PROGRAMME

- |       |   |   |
|-------|---|---|
| Day 1 | } | Captive husbandry and breeding (World Wide), and Second European      |
| Day 2 |   |   |
| Day 3 | } | Chelonian Symposium with IUCN/SSC Tortoise Group (Palearctic Species) |
| Day 4 |   |   |
| Day 5 | } | Conservation and Field Research in Europe                             |
| Day 6 |   |   |
| Day 7 |   | General Herpetology (World Wide)                                      |
| Day 7 |   | Visit to Cotswold Wild Life Park · Lunch · Discussion and Dispersal   |

Offers of papers for the various sections of this congress are now requested. Papers read should be of no more than 30 minutes duration and manuscripts for publication should be limited to 5,000 words and not more than five figures or tables.

Suggested titles should be sent without delay to:

J Coborn, Zoo Director,  
Dudley and West Midlands Zoological Society,  
2 The Broadway,  
Dudley,  
West Midlands, DY1 4QB  
England

## LIST OF PAPERS TO DATE (11th April 1981)

- Boos, H. (Trinidad) "Austral-Asian Pythons with some records of breeding in captivity"
- Cooper, J. (G.B.) "Investigation of abnormalities in captive bred reptiles, with particular reference to the possible role of in-breeding"
- Cooper, M. (G.B.) "New British legislation relating to the conservation and welfare of reptiles and amphibians"
- Collins, P.W.P. (G.B.) "Growth and behaviour of Mediterranean tortoises"
- Coborn, J. (G.B.) "Breeding the Nile Crocodile at Dudley Zoo"
- Stubbs, D. and Hailey, A. (G.B.) "Population ecology of the Mediterranean tortoise with reference to the effects of fire and conservation in Greece"
- Davies, P.M.C. (G.B.) "Allometry, lifestyle and the cost of living in snakes"
- Greig, J.C. (South Africa) "Notes on the rare tortoise *Psammobates geometricus*" (provisional title)
- Greig, J.C. (South Africa) "The Frog *Cacosternum capense*" (provisional title)
- Griffin, J. (G.B.) "Benefits of Commercial ranching of reptiles and amphibians to conservation of species and their habitat"
- Herman, D.W. (U.S.A.) "Ecology and distribution of the Bog Turtle *Clemmys muhlenbergii* in the wild and notes on captive propagation"
- McNease, L., Tarver, J., Behler, J. and Joanen, T. (U.S.A.) "Captive propagation of alligators in Louisiana"
- Cortes, J. (Gibraltar) "The herpetofauna of Gibraltar; status and current research"
- Banks, C. (Australia) "Breeding of Australian Chelids at the Royal Melbourne Zoo"
- Hagstrom, T. (Sweden) "Winter ecology of amphibia in Northern Europe"
- Terhivuo, J. (Finland) "The distribution and population status of Finnish amphibians and reptiles"
- Huff, T. (Canada) "The husbandry and propagation of the Madagascar ground Boa, *Acrantophis dumerili*, in captivity"
- Huff, T. (Canada) "Reptile and amphibian husbandry and propagation in North American collections — the state of the art"
- Sims, J. (G.B.) "Outdoor enclosures for terrapins in Great Britain"
- Wilhoft, D.C. (U.S.A.) "Temperature-dependent sex determination in the snapping turtle, *Chelydra serpentina*"
- Bruce, R.C. (U.S.A.) "salamanders" (full title to follow)
- Lambert, M.R.K. (G.B.) "The conservation of Mediterranean (West Palaearctic) tortoises: some problems posed"
- Swingland, I. (G.B.) "A morphometric confirmation of a behavioural polymorphism in a giant tortoise population" (a.m. day 5)
- Blanc, C. (France) "Malagasy iguanids" (full title to follow)
- Jackson, O.F. (G.B.) "Veterinary" (title to follow)
- Lawrence, K. (G.B.) "Veterinary" (title to follow)
- Moll, D. (U.S.A.) "The Trophic Ecology of Aquatic Turtles"
- Curry, P. (G.B.) "Provision of Live Foods for Amphibians and Reptiles"
- Townson, S. (G.B.) "The Captive Reproduction and Growth of the Yellow Anaconda, *Eunectes notaeus*"

## SCALE OF CHARGES

Complete Congress (6 days) ... ..	£30
Reception on 3rd (Cheese and Wine) ... ..	£ 3
Daily Charge (for those unable to attend the complete Congress) ...	£ 6

The complete Congress charge includes:

1. Morning coffee and afternoon tea and biscuits
2. Congress proceedings when published

Further details, complete programme and registration forms will be available after 30th June.

Send a stamped, addressed envelope to: J Coborn, Director,  
Dudley and West Midlands Zoological Society,  
2 The Broadway,  
DUDLEY,  
West Midlands, DY1 4QB.

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## EAST EUROPEAN SYMPOSIUM 1981

The First Herpetological Conference of Specialists of the Socialist Countries will take place in Hungary, 25-29th August, 1981. It will be held in Budapest VIII, Muzeum körút 14-16. The participation fee is U.S. \$ 25.00.

The languages of the Conference are English, German, French and Russian.

The subjects to be considered are systematics, faunistics, zoogeography, ecology, anatomy, physiology, in addition to economic importance, new methods of research and of museum preparation, and conservation.

Communications will be of 10-25 minutes and the proceedings will be published in *Vertebrata Hungarica*.

The President of the Organisation Committee is Dr O. Gy. Dely, Termesztudományi Museum Allattara (Zoological Department, Hungarian Natural History Museum), H-1088 Budapest, Baross u. 13, Hungary.

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## SYMPOSIUM ON INTRODUCTIONS, 1982

A joint symposium between the Mammal Society, British Herpetological Society and Fauna & Flora Preservation Society has been proposed for November 1982. The organiser is the Conference Secretary of the Mammal Society, Dr John Gurnell (Westfield College, University of London). Three or four speakers are invited to contribute from the BHS. These will probably cover such topics as the introduction of the marsh frog (*Rana ridibunda*) to Britain, the BHS Conservation Committee's re-introduction of rare British herpetofauna to key sites in southern England and the problems posed by the introduction of the South American giant toad, *Bufo marinus*, to various parts of the tropical and semi-tropical World as a pest control agent. The meeting will be held in the Lecture Hall of the Zoological Society of London.

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## FIRST GENERAL MEETING OF SOCIETAS EUROPAEA HERPETOLOGICA (SEH)

The first Ordinary General Meeting of SEH will be held on 13-16th September 1981 in Vienna, Austria. The meeting will be in close collaboration with the Naturhistorisches Museum, where all sessions will take place. Dues for SEH members are DM 20, for non-members DM 40 and for accompanying family members DM 10. Please contact Dr F. Tiedemann (Herpetologische Abteilung, Naturhistorisches Museum, Postfach 417, A-1014 Wien, Austria), who will be responsible for local events and accommodation.

### PROGRAMME

13th September	:	Arrival
14th September (Day 1)	:	'Free' papers on various herpetological subjects
15th September (Day 2)	:	Mini-symposium on 'Biogeography of European reptiles and amphibians'
16th September (Day 3)	:	General meeting of SEH (see Statutes)

For the mini-symposium, papers on mapping projects of European herpetofauna are to be presented. Contributions are requested. It is hoped to bring about a closer collaboration and greater co-ordination of European mapping projects, both on a national and local basis.

The language of the Congress will be English. In exceptional cases, French and German papers will be accepted, provided a written summary in English is available for distribution. Prospective speakers are requested to send the title of their paper and a summary in English to the SEH Vice-Secretary, Dr A. Salvador (Catedra de Zoologia, Universidad de Leon, Leon, Spain) for both 'free' and mini-symposium contributions. The time required for the paper should also be indicated and whether slides and films are to be shown. Titles and summaries of papers should reach the Vice-Secretary by 1st June 1981. Upon the papers' acceptance, participants will be informed.

BHS members are reminded about the appeal made in Bulletin No. 2 (December 1980) for locality records of herpetofaunal species observed during visits to the Continent, especially during Spring and Summer holidays to southern European Countries where most species occur and for which there is the least information. The information will contribute to a distribution atlas for the European species. Proper identification is facilitated by reference to *A field guide to the reptiles and amphibians of Britain and Europe* (1978) by E.N. Arnold, J.A. Burton and D.W. Oviden and published by Collins, London. The subject of the mini-symposium at the SEH General Meeting is relevant to this.

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## UNIVERSITY OF LONDON UNION NATURAL HISTORY SOCIETY EXPEDITION TO GREECE 1980

DAVID STUBBS

In July and August 1980, four students from the ULU Natural History Society visited northern Greece, with the intention of studying the population ecology of the tortoise species *Testudo hermanni*.

The principal site chosen was a strip of coastal heathland at Alyki on the S.W. corner of the Gulf of Thessaloniki, in Macedonia. The area was quite well known for its ornithological value, with large numbers of breeding gulls and terns and abundant passage birds, but not until an earlier expedition to the area in 1979 by the same society, was the herpetological importance realised.

The most recent expedition concentrated on an area of 75 hectares, of flat, grassy and open scrubland, sandwiched between the sea and a shallow, saline lake. This area, known as the Alyki heaths, held five species of amphibians and twelve species of reptiles, including two tortoises, *Testudo hermanni* and *T. graeca*.

Within the study area the population of *T. hermanni* was estimated to be about 5000, with an average density of about 55 per hectare. Optimal habitat conditions were areas of dry sandy heath, with a ground cover of lichens and herbs, numerous clumps of *Artemisia* and the prickly *Ruscus aculeatus* and scattered hawthorn scrub. Such areas held tortoise densities in excess of 150 per hectare.

A month was spent at Alyki, during which time 791 *T. hermanni* were captured, marked, measured and released. Recapture data were used to estimate the population size, while linear size measurements gave an indication of population structure. The adult sex ratio was approximately equal, although the actual sample comprised 75% males. Random walking sampling methods seemed to bias against finding females and certainly produced too few juveniles. The three main problems raised by the project were those of adequately sampling juveniles in relation to their proportion in the population, sexing juveniles and ageing adults.

Tortoises can be aged successfully up to the age of 15, after which scute annuli become indistinct and the margin of error increases. Growth is proportional to age until 15 years old, but females were found to grow faster than males and juveniles were fastest of all groups.

It was not possible to provide definite figures for mortality, but between the ages of 10 and 15 years, the annual death rate was 5%, with a probably average adult death rate of 10% per annum. Maximum longevity, estimated from extrapolated mortality data, was about 50 years.

Most animals became sexually mature by the age of 11, (minimum carapace length of 120mm), but details of mating systems were not observed. In fifteen cases of successful mating, two thirds involved a smaller male partner.

On a more general note both *T. hermanni* and *T. graeca* are widely distributed throughout northern Greece. Where they occur in the same locality, separation is usually based on habitat preferences, but they do also coexist and niche separation factors are unclear.

The work at Alyki was tragically interrupted when local people first burnt and then ploughed the entire heaths in preparation for an application to build holiday homes. Studies on the effects of scrub fires on tortoise populations were initiated, but the long term trends were obliterated by the further destruction of the former heaths by plough. Altogether an area of 150 hectares was destroyed, causing the deaths of an estimated 10,000 tortoises and numerous other reptiles and amphibians.

Although the pet trade may be a serious threat to local populations of tortoises in Mediterranean Europe, the principal threat to wildlife is habitat loss, as amply illustrated by the conservation tragedy at Alyki in 1980. Further research on the ecology of Mediterranean tortoises is urged, and if immediate action is not taken, the future survival of these species cannot be predicted.

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For the interest of readers a full report on the work of this expedition has been published. The report describes the habitats and wildlife of Alyki, the project work on tortoises and the conservation issues involved with the destruction of such a valuable wildlife refuge. Other chapters deal with different sites in N.E. Greece, the niche relationships of the herpetofauna of the Alyki heaths and full descriptions of all species found during the expedition are provided. These include annotated checklists of birds and mammals.

The report is 136 pages in A4 format, illustrated with 17 tables and 27 figures, including 11 black and white photographs. Copies are available from: The University of London Union, Natural History Society, U.L.U., Malet Street, London WC1E 7HY.

Price £3 plus 50p postage (surface), or plus £1.50 (airmail to Europe), or plus £3 (airmail outside Europe).

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## WAU ECOLOGY INSTITUTE New Guinea Natural History Handbooks

W.E.I. is an independent, but government supported, research institute situated in the central mountains of Papua New Guinea. Laboratory and hostel facilities are available for visiting scientists and the institute itself has an active programme of education and conservation. A series of natural history handbooks commenced publication in 1976 and seven titles, listed below, are now available. These books vary in size from 70 to 150 pages and are all (except No. 3) illustrated in colour. Prices (which include postage) are in US dollars.

No. 1 Common New Guinea Frogs by J.I. Menzies (\$ 5.30): No. 2 Common New Guinea Beetles by J.L. Gressitt & R.W. Hornabrook (\$ 5.30): No. 3 Biological terms in Melanesian Pigin by Martin Simon (\$ 4.80): No. 4 Montane Birds of North-east New Guinea by Bruce Beehler (\$ 9.30): No. 5 Guide to Mt. Kaindi (montane ecology) by J.L. Gressitt and Nalini Nadkarni (\$ 5.80): No. 6 New Guinea Rodents by J.I. Menzies and Elizabeth Dennis (\$ 5.80): No. 7 Reptiles of the Solomon Islands by Michael McCoy (\$ 5.80): No. 8 Birds of the North Solomon Islands by Don Hadden (in press).

Enquiries about facilities at the Institute should be sent to the Director, WEI, Box 77, Wau, Papua New Guinea. Publications may be ordered from the Institute at this address or from the Publications Department of the Bishop Museum, Box 19000-A, Honolulu, Hawaii 96819, U.S.A. However, to avoid long delays in postage from overseas, a small stock of publications is being held in Britain. Send enquiries to J.I. Menzies, 5 Oatlands Drive, Paignton, Devon, TQ4 5JL.

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## ASSOCIATION FOR THE STUDY OF REPTILIA AND AMPHIBIA

*Headquarters: The ASRA Rooms, Reptile House,  
Cotswold Wild Life Park, Burford, Oxon. Telephone: Burford 3006*

### ASRA MONTHLY MEETINGS FOR THE LAST SIX MONTHS OF 1981

All ASRA Monthly Meetings start at 7.30 pm for 8.00 pm in the Reptile House of the Cotswold Wildlife Park, Burford, Oxon. The illustrated lecture takes place in the ASRA Rooms above the Reptile House.

#### JULY:

Saturday 11th "The Natterjack Toad" by Anthony Arak, Department of Zoology, University of Cambridge

#### AUGUST:

Saturday 8th "Diseases of Tortoises" by Peter Holt, MRCVS, University of Bristol

#### SEPTEMBER:

Saturday 12th "Reptiles and Amphibians of Portugal by Mike Linley, Anglia TV.

#### OCTOBER:

Saturday 10th "Geckos – their care and breeding in captivity" by Tony Mobbs

#### NOVEMBER

Saturday 14th "Captive Husbandry of Venomous Snakes" by Tony Phelps

#### DECEMBER

Saturday 12th "Captive Reproduction of Snakes" by Jon Coote

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## HABITAT RESTORATION IN EPPING FOREST

Members of the British Herpetological Society, in collaboration with the Epping Forest Conservation Centre and Conservation Group, have obtained permission to carry out a long term programme of scrub clearance and pond maintenance in Epping Forest. The Forest formerly contained extensive populations of reptiles and amphibians, but these have decreased to a relict level as a result of dense tree regeneration on the open plains during the past 20 years. As much of South Essex is now urbanised, and the remainder intensively farmed, the Forest is now an important refuge for wildlife, encompassing a rich variety of habitats. Work was started late in the winter of 1980-81, to clear birch, thorn and oak scrub from the most important remaining sites, in an attempt to restore them to their original condition. After a summer break, work will recommence in October.

At present, there are only two or three active volunteers, which is a severe limit on the tasks that can be undertaken. If anyone living in the Epping Forest area would like to help, please contact Graham Walters, 01-521 0134 or John Pickett, 01-508 6624.

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## CRESTED NEWT BANK

A Crested Newt (*Triturus cristatus*) "bank" is being formed by John Pickett to provide a source of captive bred Crested Newts, for distribution to members who wish to establish colonies in their garden ponds. Ponds on agricultural land or wasteland ("natural" ponds) are being filled in rapidly or, through neglect, being filled by sedimentation and vegetation growth. Garden ponds are becoming the only safe and widespread refuges for amphibians. Many members who are digging ponds and who want to establish colonies of amphibians may find it difficult to obtain Crested Newts for this purpose, and if the Countryside and Wildlife Bill is passed by Parliament, it will be illegal to catch wild Crested Newts for this purpose; it will then be impossible to obtain animals to stock new ponds unless they are captive bred. The first newts will probably not be available to members until 1983; details will be announced in the Bulletin. In the meantime, anyone wishing to help in the scheme should write to John Pickett, 84 Pyrles Lane, Loughton, Essex IG10 2NW.

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## MEETING IN HONOUR OF DR ELKAN

A special meeting in honour of Dr Edward Elkan, on the diseases of Lower Vertebrates, will be held in 1982. Details of this meeting will be announced in the December issue of the Bulletin. A bibliography of Dr Elkan's work will also be published by the British Herpetological Society, as a separate and supplementary publication.

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# NEW INTERNATIONAL LEGISLATION: THE BERNE CONVENTION

JOHN PICKETT and SIMON TOWNSON

*c/o British Herpetological Society, Zoological Society of London,  
Regent's Park, London NW1 4RY*

We have only recently become aware of the full nature of the Convention on the Conservation of European Wildlife and Natural Habitats, Berne 19 September 1979. This Convention has such serious implications for our members and for the future conservation of reptiles and amphibians that we consider urgent and detailed comment is necessary on certain parts of the Convention.

With the General Provisions of the Convention as set down in Chapter I, and with the provisions for the Protection of Habitats, as set down in Chapter II, we are in complete agreement. These oblige the Contracting Parties to take measures to "maintain the population of wild Flora and Fauna at, or adapt it to, a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements and the needs of subspecies, varieties or forms at risk locally." The Contracting Parties are bound to take "appropriate and necessary legislative and administrative measures to ensure the conservation of the habitats of the wild flora and fauna species, especially those specified in the Appendices I and II, and the conservation of endangered natural habitats", and so on. These are good, balanced policies.

The Provisions for the Protection of Species in Chapter II, Articles 6-9, are highly contentious and require close examination:

Article 6 (a) prohibits "all forms of deliberate capture and keeping and deliberate killing of species listed in Appendix II". We are concerned that this could be interpreted as prohibiting the keeping of these species alive in captivity, as numbers of these species are at present kept and bred in captivity. The Article should make allowance for such animals as are already held and being bred in captivity.

Article 6 (e) prohibits the "possession of and internal trade in these animals, alive or dead". Again, there is no provision here, or in any article of the Convention, for the exception of those animals bred in captivity. We believe strongly that the possession of and trade in animals which are bred in captivity should be freely permitted, as has been established by the Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington 1973. Prohibition of this would contribute nothing to conservation and would, in our view, be an infringement of the civil liberties of those who already possess and breed these animals. We also propose that there should be provision for the issuing of licences for the collection of species listed in Appendix II for the purpose of breeding these species in captivity.

We are in general agreement with the provisions of Articles 7-9 for the protection of species on Appendix III, where a species is regarded as vulnerable and in some need of protection, but disagree with such complicated controls for all species of reptiles and amphibians, as is currently proposed.

Appendix II comprises species which are to be strictly protected, and Appendix III those which are to be protected, but with provision for licensing for the collection for research and education, etc., and, "under strictly supervised conditions, on a selective basis and to a limited extent, the taking, keeping or other judicious exploitation of certain wild animals and plants in small numbers".

## Comments on the species listed in Appendix II

In general, we would say that most of the species listed in Appendix II would be more

appropriate to Appendix III, which affords the necessary protection while at the same time allowing flexibility in the granting of licences for collection for different purposes. Appendix II, on the other hand, is so strict and inflexible, with no provision for the granting of licences for the taking of animals even for conservation purposes that, if it is not amended, it should be reserved only for species in the most critical need of protection.

#### **List of species on Appendix II (remarks are those of the authors)**

##### *Testudines*

##### *Testudinidae*

*Testudo hermanni*, *graeca* and *marginata*. These species are not endangered except in local populations, and therefore these species should be listed in Appendix III, which gives adequate powers for their protection and the control of collection.

##### *Emydidae*

*Emys orbicularis* and *Mauremys caspica*. Remarks as for *Testudo* sp.

##### *Dermochelyidae* and *Cheloniidae*

*Dermochelys coriacea*, *Caretta caretta*, *Lepidochelys kempii*, *Chelonia mydas* and *Eretmochelys imbricata*. All marine Turtles are in need of special protection. There should, however, be provision for licensing for farming purposes.

##### *Sauria*

##### *Gekkonidae*

*Cyrtodactylus kotschy*. This is an abundant and widespread species in the Balkans and S.W. Asia, in no need of protection. It rarely enters trade.

##### *Chamaeleontidae*

*Chamaeleo chamaeleon*. Rare and localised in Iberia where it has been introduced, there is no evidence that it is in need of special protection within the limits of its natural range; it rarely enters trade. Protection by listing in Appendix III would be adequate.

##### *Lacertidae*

*Algyroides marchi*. A species with a limited range in the mountains of S.E. Spain, there seems to be little information on its status.

*Lacerta lepida*. This remains a common animal in Iberia and North Africa; it has declined in parts of France (where it is protected by national law), and has only a very small range in Italy. It is not endangered, and should therefore be listed on Appendix III. The North African form is now bred in captivity in large numbers.

*Lacerta viridis*. This species remains common or abundant in the main parts of its range in Italy and the Balkans, and in most regions of France, and is threatened only on the edges of its range. It should be listed in Appendix III. It is bred in captivity in moderate numbers.

*Podarcis muralis* and *Podarcis sicula*. These are almost certainly the most abundant reptiles of Europe within their ranges. The mainland species require no protective measures. The subspecies inhabiting the numerous rocky islets in the Mediterranean are in some instances threatened because of erosion by the sea, introduced predators, etc., and where necessary these should be listed separately as subspecies.

*Podarcis filfolensis*. Common and in no danger on Malta and Gozo, but endangered on the Filfola Rock. Should be listed in Appendix III.

*Podarcis lilfordi*. This species occurs only on isolated rocky islands around the coasts of Majorca and Minorca. However, the populations are in most cases surprisingly large, and for this reason this species would be more sensibly protected by listing in Appendix III.

*Lacerta parva*. Insufficient information is available on the status of this species for any remarks to be made.

*Lacerta simonyi*. This species is regarded by most authorities as being extinct.

*Lacerta princeps*. A species with a limited natural range, very little is known about its status. Inclusion on Appendix III would seem appropriate. There is no reason to believe it is endangered.

#### Scincidae

*Ablepharus kitaibelii*. The type form *kitaibelii* is common over most of its range, is under no threat by trade, and is in no need of protection. The subspecies *fitzingeri* and *stepaniki* are localised forms under some threat from changes in land use: these could be listed in Appendix III.

#### Ophidia

##### Colubridae

*Coluber hippocrepis*. This species is not endangered within its natural range. Only the introduced populations on the Italian islands of Sardinia and Pantelleria are vulnerable; this should not warrant strict protection of the species throughout its range.

*Elaphe situla*. While not naturally found in great numbers, and secretive in habits, it cannot be said to be endangered. If necessary, it can be protected by inclusion on Appendix III.

*Elaphe quatuorlineata*. Like *Elaphe situla*, this is a secretive animal, but it is not rare and does not require strict protection. It could be included on Appendix III.

*Elaphe longissima*. As for *Elaphe quatuorlineata*, but more widespread.

*Coronella austriaca*. Rare, naturally, on the northern limits of its range, it is not uncommon elsewhere. It should be listed in Appendix III.

##### Viperidae

*Vipera ursinii*. The lowland form, *rakosiensis*, is threatened by the ploughing of natural grassland and drainage of marshland. The montane forms, *ursinii* and *wettsteini*, are restricted to fairly small areas of high limestone mountains and in places have suffered from the establishment of ski resorts. The French population is quite small, but in Italy there are some extensive colonies. The remote and inhospitable nature of the mountains where they live will serve to protect them indefinitely. Listing on Appendix III should be adequate.

*Vipera ammodytes*, *latasti* and *xanthina*. These species are moderately common where they occur, and are in no need of special protection.

*Vipera lebetina*. The only population of this viper which is in any sense threatened is the form *schweizeri* from the island of Milos in the Cyclades, for the killing of which a bounty is said to be paid by the Greek Government. It is, nevertheless, not immediately threatened, and the other subspecies are in no danger. The Cyclades race would be adequately protected by inclusion in Appendix III.

*Vipera kaznakovi*. This species has a restricted range in the Caucasus and N.E. Anatolia. As with *V. lebetina schweizeri*, it would be adequately protected by inclusion in Appendix III.

#### Caudata

##### Salamandridae

*Salamandra* (= *Mertensiella*) *luschani*. This species has presumably been included because of its small natural range on islands in the S.E. Aegean and S.W. Turkey. We are not aware of any indication that it is endangered. It could safely be listed in Appendix III if there is evidence that it is vulnerable.

*Salamandrina terdigitata*. Little information is available on this species. There is no reason to believe that it is endangered. It has a fairly wide distribution in the Western Appenines of Italy, and is not collected for the pet trade.

*Chioglossa lusitanica*. This species occurs in small and local populations in N.W. Iberia; it has suffered from the destruction of its habitat. It is one of the few species which could with justification be given strict protection.

*Triturus cristatus*. The populations of this species have decreased markedly in some areas of northern Europe as a result of pond-filling, but it is neither a rare nor endangered species, and should be included on Appendix III rather than II.

#### *Proteidae*

*Proteus anguinus*. The Olm has long been totally protected in Yugoslavia, and is listed on Appendix I of the Washington Convention. With *Chioglossa*, it is one of the few species for which its proposed listing in the Berne Convention may be appropriate.

#### *Discoglossidae*

*Bombina variegata*. The Yellow Bellied Toad has localised populations in some countries, but remains common over most of its range; it does not require protection throughout Europe.

*Bombina bombina*. On account of its lowland habitat, vulnerable to destruction by land reclamation, this species has become more localised than *B. variegata*, especially in the north, though over most of its range it is not threatened.

*Alytes obstetricans*. The Midwife Toad is uncommon only in the north European countries on the edge of its range. In most other places it remains common and is not in need of protection.

*Alytes cisternasii*. The Iberian Midwife Toad is a rare species and one of the few which could be considered for Appendix II.

#### *Pelobatidae*

*Pelobates cultripes*. Though not often seen because of its burrowing habits, there is no reason to believe it sufficiently endangered as to be given strict protection.

*Pelobates fuscus*. As for *P. cultripes*. The Italian subspecies, *insubricus*, has been almost exterminated by habitat destruction (pond filling and pollution) and should be listed on Appendix II as a subspecies.

#### *Bufo*

*Bufo calamita*. Rare and localised in the northern extremes of its range, it remains common in the south. Listing on Appendix III may be appropriate.

*Bufo viridis*. Local on the edge of its range in the north, this species is common over the major part of its range, and abundant in North Africa. It does not require protection.

#### *Hylidae*

*Hyla arborea*. As with *Bufo viridis*, this species is common over most of its range in southern and central Europe, and does not need special protection.

#### *Ranidae*

*Rana arvalis*. We are not aware of any threat to this widespread species.

*Rana dalmatina*. This species has small local populations on the northern edge of its range, but over the bulk of its range there is no reason to believe it is under special threat.

*Rana latastei*. The Italian Agile Frog is now a rare and localised species as a result of the destruction of habitat and water pollution. One of the few species appropriately listed on Appendix II.

### **Comments on Appendix III**

All species of reptiles and amphibians not listed on Appendix II are included on Appendix III, which affords strict protection with provision for licensing under certain circumstances. It is our view that Appendix III should be selective and restricted to those species in need of protection, or where it is desirable to control or monitor trade. Exclusion from Appendix III does not prevent national protection of small populations of common species on the edge of their range, where this is necessary. There are many common species which are not in need of protection.

### **Signatories to the Convention**

Austria, Belgium, Denmark, EEC, Finland, France, Germany (Federal Republic of), Greece, Ireland (Republic of), Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom.

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## CAPTIVE BREEDING OF *ELAPHE RUFODORSATA* AND *RHABDOPHIS TIGRINUS* FROM THE KOREAN PEOPLE'S DEMOCRATIC REPUBLIC

PIOTR SURA

Department of Biology, Medical Academy,  
Kopernika 7, 31-034 Krakow, Poland

Several specimens of living snakes were collected on 9th June, 1980, by Zbigniew Szyndlar about 50 km SW of Pyongyang in the vicinity of Taesong-ho Lake. They belong to the commonest species from this region — *Elaphe rufodorsata* and *Rhabdophis tigrinus*. Rice fields are their typical habitat and they spend majority of time laying in the water.

Three females of *E. rufodorsata* (Plate 1) were placed in the terrarium of size 70 x 45 x 63 cm. The snakes got used to new conditions very quickly and began to eat frogs almost immediately thereafter. A month later they were bold enough to approach my hands searching for food and sometimes all three tried to swallow the same frog. This species constricts larger prey and swallows it as a rule from the head (Plate 2). Only smaller frogs can be eaten from behind. In the middle of July they began to refuse offered frogs, only occasionally eating young specimens. The snakes were however very thick and it was clear they were pregnant. It is quite possible that during constriction of prey the embryos could be damaged. This species is especially remarkable in being ovoviviparous, but there is not much information about this (Fitch 1970). Bannikov *et al.* (1977) state that this species gives birth to 8-20 young of size 165-180 mm at the end of October, whereas Terentiev and Chernov (1949) report about 8-10 young at the end of September, and up to 21 according to data of Pope (1935). Each of my females of size 50-60 cm produced 7 young on 2nd September, 29th September and 7th October respectively. The babies hatched in the oviducts of the female and the egg membranes emerged after the hatchlings. In the first two broods there was one embryo dead though fully developed, length 182 mm and 158 mm respectively. Freshly born snakes were shedding within 1-2 hours and they started to feed on small frogs after 2-3 days, constricting their prey in the same way as adult specimens. When disturbed they vomited a frog even when almost completely swallowed. Although this species is specialized in feeding on fish and amphibians, one of my females, however, eats weaned mice from tweezers even just before shedding. Also, a juvenile *Natrix natrix* kept in the same terrarium once was swallowed and then vomited. The preferred temperature of these snakes is 25-28°C in my terrarium.

*R. tigrinus* has been much more studied, especially in Japan. It is one of the several members of the aglyphic colubrids being potentially venomous and there is one report on human death caused by this snake (Mittleman and Goris 1978; see also Minton and Mebs, 1978). Two specimens were brought to Poland. The female of about 1 m long laid 2 eggs on 13th June in the bag during the journey back to Poland and were destroyed, then 13 eggs on 1st July which were incubated and 12 eggs on 18th July in the water pot which were also lost. In total it laid 27 eggs. Bannikov *et al.* (1977) report about 18-22 eggs depending on the size of female (see also review by Fitch). Fitch writes that at room temperature (20-30°C) incubation averages 37.6 (29 to 45) days. Trutnau (1979) refers to Emilianov that incubation is about 46-47 days. According to my records the first snake hatched on 3rd August (after 34 days) and two others the day later (Plate 4). Unfortunately some eggs dried when I was out of Krakow and others were killed during checking the stages of the embryos' development. Their size was within the average size of hatchlings (150-170 mm) known from the literature. The eggs were incubated in a big jar with earth and Sphagnum moss at about 20°C at night and about 30°C during the day. Such changes seem to be very important for the embryos. With eggs of *Chelydra serpentina* incubation at constant temperatures of 20°C and 30°C resulted in females, whereas 26°C produces males; between these temperatures a mixture of males and





Plate 1. Adult female *Elaphe rufodorsata*

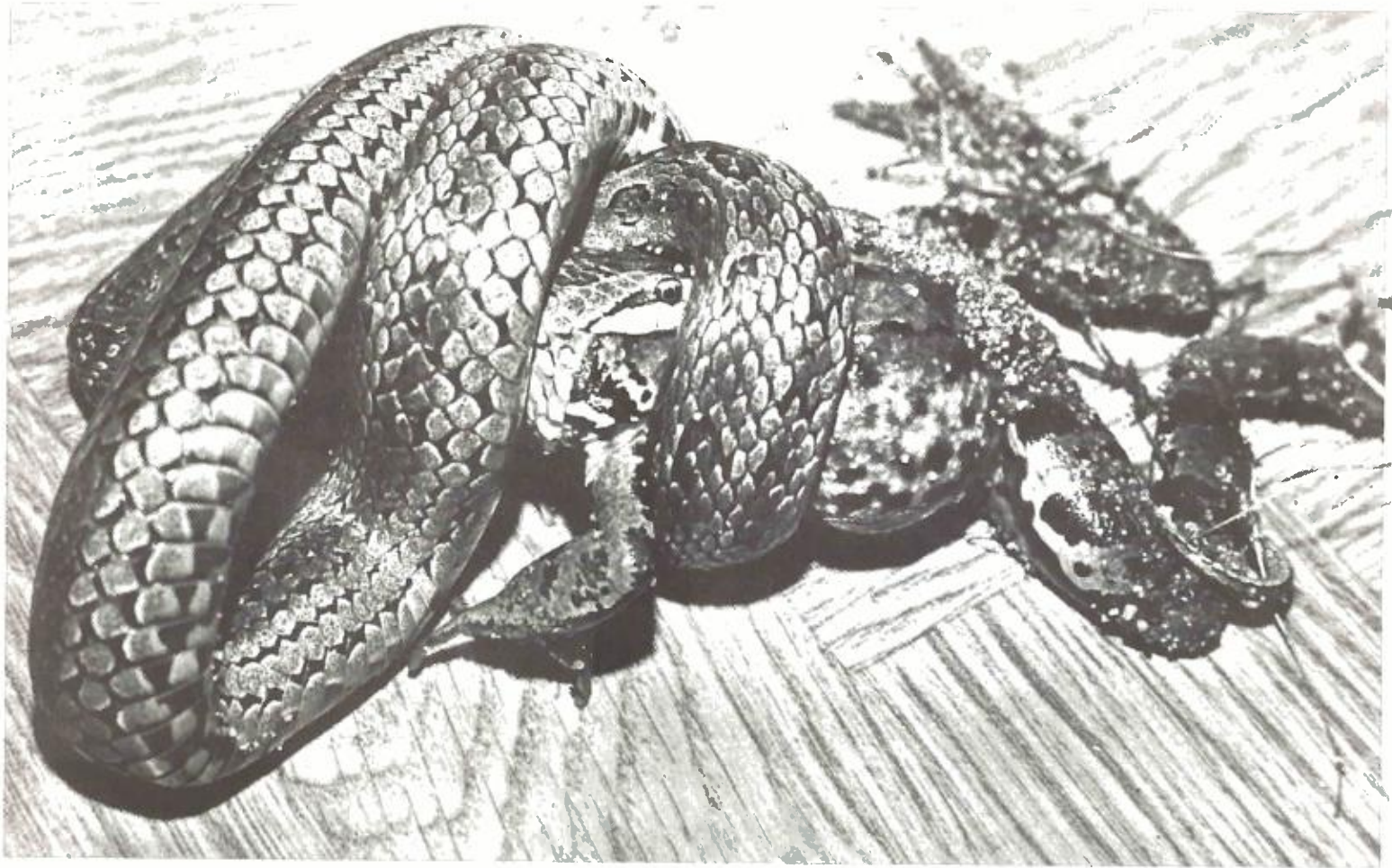


Plate 2. *Elaphe rufodorsata* swallowing adult frog, *Rana temporaria*





**Plate 3.** *Elaphe rufodorsata*, juvenile aged 10 days



**Plate 4.** *Rhabdophis tigrinus* hatching from egg.

females will be produced (Yntema 1979; see also Limpus and Miller, 1980). Hatchlings began to feed on tadpoles of *Bufo viridis* 2 days later, catching them in a dish of water. The first shedding occurred on 10th August. They became used to captive conditions quickly and it is very exciting to see animals with such an excellent appetite. It was impossible to put one frog in terrarium, I had to give them all food at the same time; they also took frogs from my hands. Sometimes serious biting during competition for food took place, and they were so keen to feed that they would do so with milky eyes just before shedding. This species usually eats frogs from behind and when the prey is too large it is left. When this happens the frog dies quickly, suggesting that the venom is quite strong. These snakes also eat small fish and newts.

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## NOTES ON THE REPTILES OF BULGARIA

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There has been significant progress in investigations of the herpetofauna of Europe in recent times, and numbers of publications appear every year dealing with all aspects of the distribution, natural history, ecology and systematics of amphibians and reptiles. But some parts of Europe have not been studied in detail until now. Bulgaria is one of the countries most poorly known; the distribution of reptile species there has been investigated only superficially. The greatest paradox is that many localities where rare species are found are kept secret: Bulgaria has become the main country for collecting reptiles by East European terrarium enthusiasts, and none of them want to betray their own localities. These people collect many specimens of rare snakes every spring to keep for themselves or, more often now, for trade. Also, local people understand a good business and sometimes sell reptiles to foreigners. Horned vipers, *Vipera ammodytes*, are collected in great numbers in some parts of Bulgaria for medical purposes (antivenin production), and I know places where some years ago it was possible to catch hundreds of specimens, but now the population has decreased drastically and it is difficult to find several. Tortoises, *Testudo graeca*, and *T. hermanni*, are eaten in many parts of the country, though they are protected (the author had an opportunity to taste the meat). I do not expect that even the Red Data Book for Bulgarian reptiles which is now in preparation will change this situation.

Fortunately, there are still ideal areas for investigation and there is much to be done, starting with the basic preliminary of making an inventory of species. In 1979 a new snake, *Coluber rubriceps* (plate 1), collected by M. Bartosik from Poland was described (Bartosik and Beskov – the detailed article is in press). Generally speaking the specimens found previously in the vicinity of Ropotamo River mouth and described as *Coluber najadum dahlui* in fact belong to *C. rubriceps*, according to these authors. As *C. rubriceps* was noted in European Turkey (Baran 1976) its distribution may also extend to the north. Whether this taxonomic discovery is of any value we will see after examining specimens from other possible localities on the southern coast of the Black Sea. Bartosik, during the course of his investigation of this region last year, found *Malpolon monspessulanus insignitus* and *Ablepharus kitaibelii kitaibelii* which have not been recorded from Bulgaria until now. These results will also be published elsewhere and they should stimulate further studies in this area. As can be seen, other reptile species may extend their range to the north. This may also apply to the Leopard Snake, *Elaphe situla* (plate 2), extremely rare in south-eastern Bulgaria. Its distribution is very poorly known, too.

The surroundings of Harmanli are one of the richest parts of the country, herpetologically. This area is the one most frequently visited by amateurs who search especially for *Elaphe quatuorlineata sauromates* (plate 3). The list of other reptiles consists of *Ophisaurus apodus*, *Lacerta viridis meridionalis* (I saw one melanistic specimen), *Lacerta trilineata dobrogica*, *Podarcis taurica*, *Natrix tessellata*, *Natrix natrix* (the striped form formerly known as *N. n. persa*), *Coluber jugularis caspius*, *Malpolon m. monspessulanus*, *Elaphe longissima*, *Typhlops vermicularis*, *Eryx jaculus turcicus*, *Vipera ammodytes meridionalis*, *Testudo graeca*, *T. hermanni* and *Emys orbicularis*. During some spring visits to this region I found all the above mentioned lizards and two *Natrix* species to be the most abundant. Young specimens of them born the previous year are also very common, e.g. *Lacerta trilineata* (plate 4). The largest European Lizard, *Ophisaurus apodus*, often reaches, in this area, a length of one metre and a weight of about 450g, but I have only caught two juveniles (total length 381 and 358mm respectively and about 13g). It is possible to find young specimens of *Coluber jugularis caspius*, both *Natrix*, and *Vipera ammodytes*. Juveniles of Grass and Dice snakes feed mainly on the tadpoles of *Rana ridibunda*. The Caspian Whip Snake is the most aggressive, known even to spring up to a height of as much as 1.5m,

every time ready to bite (plate 5). The largest specimen caught in this region was 2.4m.

Some local people are also engaged in snake hunting, and what is interesting is that they have a lot of beliefs about reptiles, and authentic observations. A man known to me, for example, was twice the victim of a Horned Viper's bite but nothing happened to him though he did not receive any medical attention. It is said that sheep bitten even on the snout by vipers also do not die. This man saw places where Caspian Whip Snakes, Horned Vipers and Grass Snakes hibernated together. Also, according to him, *C. jugularis* feeds occasionally on young vipers. But the most controversial belief is that vipers return to overwinter to the places where they were born (if it was in a human's house and juveniles were born there, they would return to this house).

This short note cannot, of course, be complete, and my purpose is to point out only some problems dealing with Bulgarian herpetology. It is to be hoped that in the years to come successful studies of every kind will be made in this poorly known country.

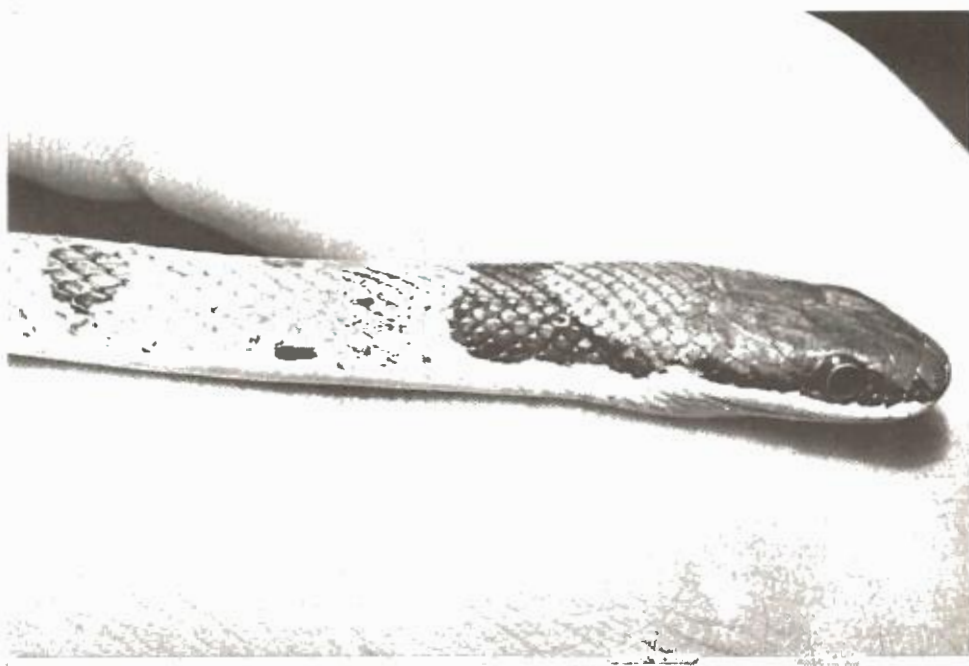
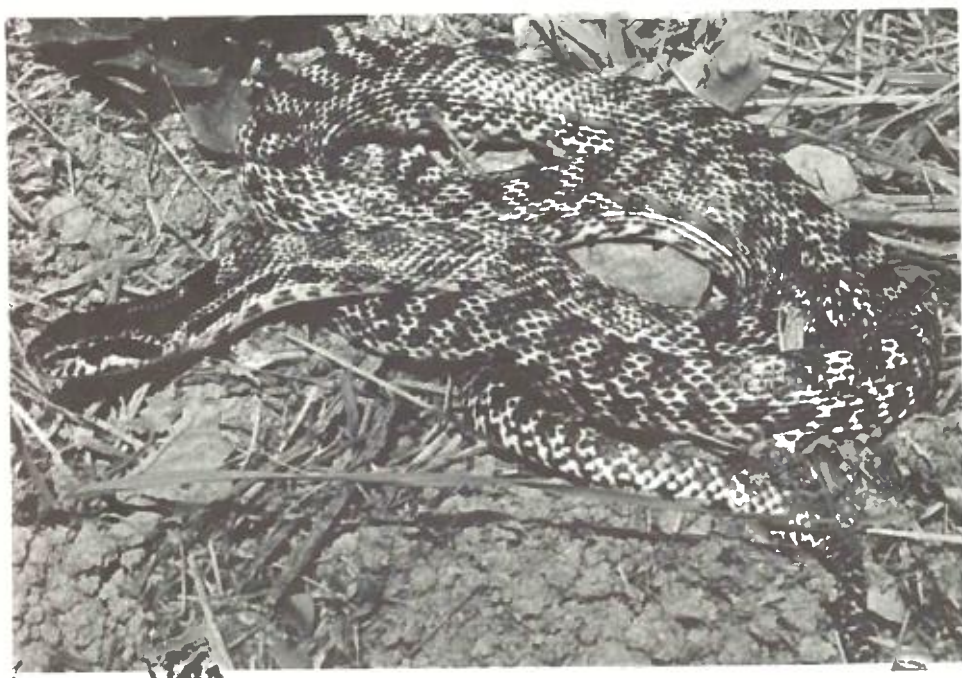


Plate 1. *Coluber rubriceps*



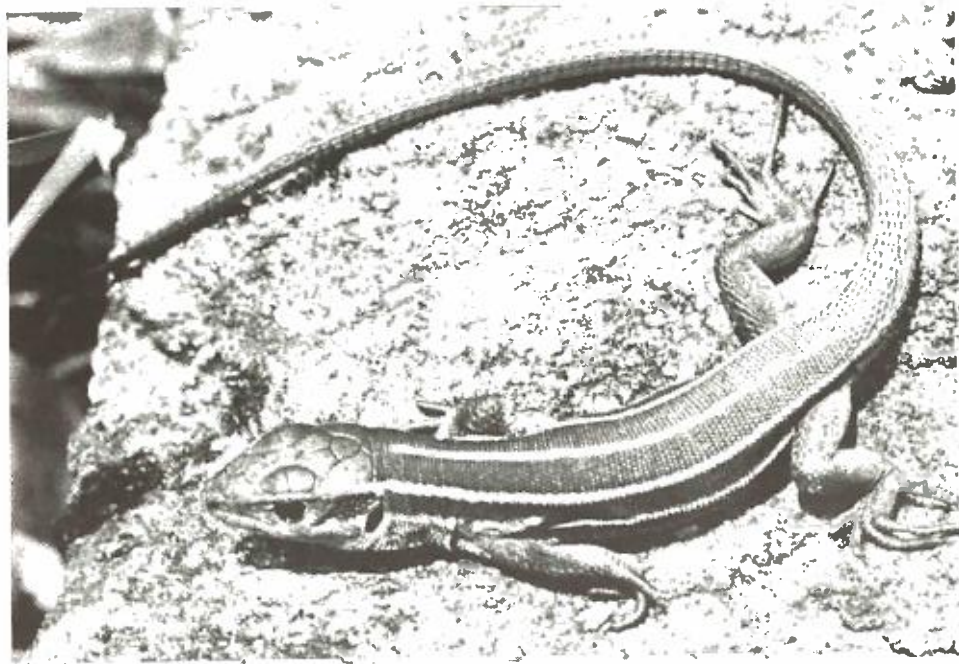


**Plate 2.** *Elaphe situla*

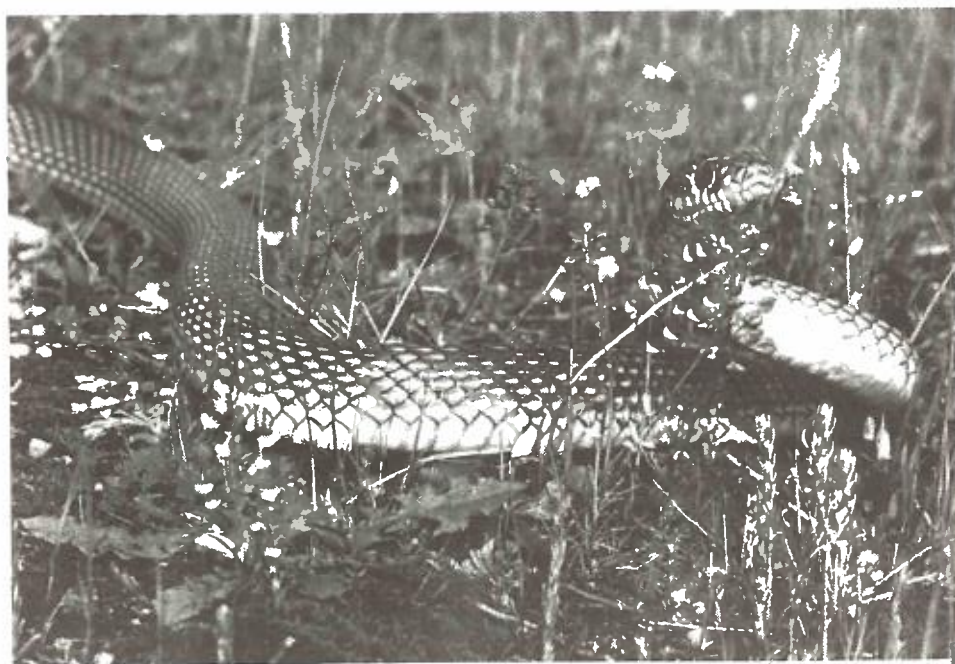


**Plate 3.** *Elaphe quatuorlineata sauromates*





**Plate 4.** *Lacerta trilineata*



**Plate 5.** *Coluber jugularis caspius*

# THE CARE AND BREEDING OF CAPTIVE REPTILES

Edited by: S. Townson, N.J. Millichamp, D.G.D. Lucas and A.J. Millwood



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## CONTENTS

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### The Captive Breeding of Mediterranean Tortoises in Britain

*P. W. P. Collins*

### The Successful Breeding of Lizards from Temperate Regions

*B.A.W.A. Langerwerf*

### Notes on the Maintenance and Breeding of the Common Iguana (*Iguana iguana*) at Twycross Zoo.

*C. J. Howard*

### Maintenance and Breeding of *Phelsuma guentheri* (Boulenger 1885)

*Quentin Bloxham and Simon Tonge*

### Breeding Gaboon Vipers, *Bitis gabonica gabonica*, in Captivity

*J. Akester*

### Keeping, Breeding and Raising Garter Snakes (*Thamnophis radix*)

*P. Zwart and B. Van Ham*

### Observations on the Reproduction of the Indian Python in Captivity, with Special Reference to the Interbreeding of the two Subspecies, *Python molurus molurus* and *Python molurus bivittatus*.

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## UNEXPECTED RESULT OF A POST MORTEM EXAMINATION

E. ELKAN

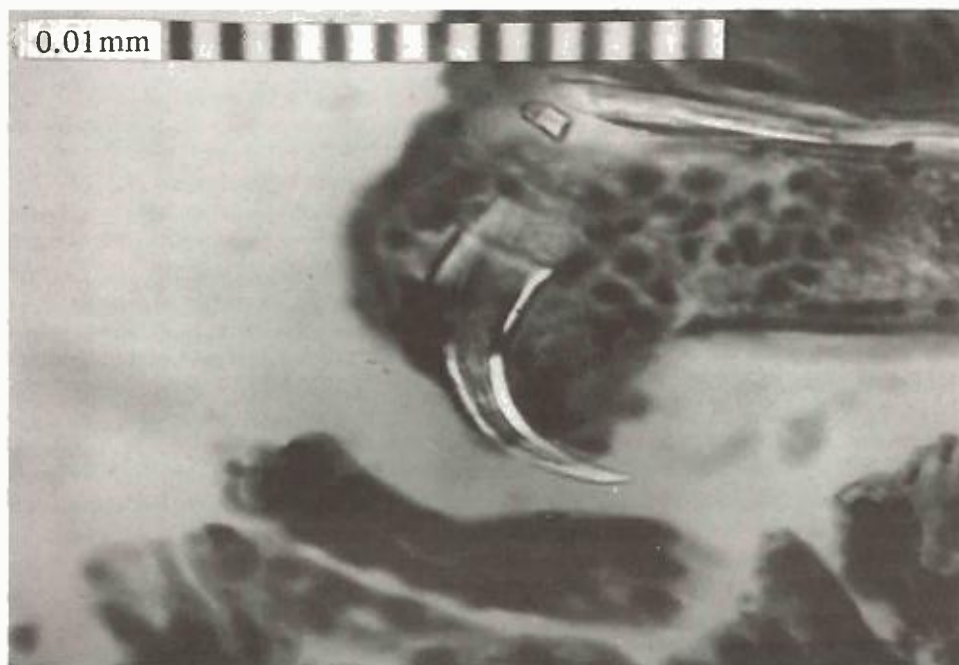
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Recently I received, nicely preserved in formaldehyde, a small specimen of a fairly common American gray tree frog, *Hyla versicolor*. The frog was probably imported by a dealer. No further details about its history were available. It had fed well at first and had then suddenly died without rhyme or reason. Since the whole froglet measured only 3 cm from mouth to anus I decided against macroscopic dissection, but processed instead the whole specimen and made serial sections in the coronal plane, starting at the ventral surface. The intestinal coils, which came into view first, contained a fair number of encysted trematodes (flatworms) in poor shape of preservation, and I would not have ventured to say anything about their identity if it had not been for the discovery next of a fully grown worm in the urinary bladder. The very location, quite apart from its unusual shape made it clear that this was a monogean trematode, *Polystoma integerrimum*. (*Polystoma* = 'with many openings'; *Integerrimum* = 'very perfect or complete'.) The openings are, in this case, one sucker in front and several more at the posterior end. To complete its armament the worm also has several sharp anchoring hooks between the posterior suckers. Monogean trematodes, which, in distinction from the Digenea, need no intermediate hosts but complete their development in the first suitable host they encounter, do not turn up frequently in my material. The sections showed clearly that this particular one had lived entirely by sucking blood from the delicate lining of the frog's urinary bladder. Furthermore, it seems likely that the many encysted metacercariae seen in the intestine, may be regarded as earlier stages of the same helminth. What is remarkable, however, is the fact that both the intestinal and the bladder lining looked perfectly normal and showed absolutely no sign of defence against the worm infestation.

Our pictures show plainly how the worm attached itself by sucking up a fold of the frog's mucosa. It is also shown how brilliantly the anchoring hooks showed up when polarized light was added to the illumination.

As to the cause of death, since all other tissues looked perfectly normal, one might hazard the guess that the presence and activity of the worm in the bladder, the consequent loss of blood and the intestinal infestation reduced the froglet's appetite and that it died from starvation. The helminth infestation may very well already have been acquired in the tadpole stage if live cercariae were present in the pond water.

Altogether a most interesting case.



**Plate 1.** Trematode with anchoring hook from the urinary bladder of *Rana versicolor*. ?*Polystoma integerrimum*. Semi-polarized light.



**Plate 2.** *Rana versicolor*  
Urinary bladder with Trematode ?*Polystomum integerrimum*



## AGAMA STELLIO, WITH OBSERVATIONS ON ITS CARE AND BREEDING IN CAPTIVITY

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### INTRODUCTION

The genus *Agama* are usually regarded as being very difficult to keep alive in captivity. This is probably because the species which are usually kept are the tropical African species, such as *Agama agama*, which are delicate. However, there is a group within this genus which is more hardy and much easier to keep; one could call this the *stellio* group, consisting of the following species:

*Agama stellio* from Turkey, Syria, Israel, Egypt and some of the Greek Islands.

*Agama caucasia* from the Caucasus and the mountains of N. Persia and Afghanistan.

*Agama himalayana* from the mountains of the Himalayas, southern Tibet, northern India, eastern Afghanistan.

*Agama erythrogastra* from N.E. Persia, N. Afghanistan and S. Turkmenia.

*Agama lehmanni* from the mountains of S.E. Turkmenia, E. Uzbekistan and S.W. Tadzhikistan.

These five species have several characteristics in common, such as their rough, ringed tails and their ability to survive hibernation in cold climates: all of them, except *Agama stellio*, experience winters more severe than those of Western Europe.

I have kept *Agama stellio*, *Agama lehmanni* and *Agama caucasia* for several years in outdoor enclosures, and have bred them all.

### DESCRIPTION OF AGAMA STELLIO

*Agama stellio* is a rather large lizard with a total length of up to 35 cm. The back, legs and tail are covered with spiny scales. The scales on the tail are arranged in rings. The body is rather flattened in appearance, but less so than in *Agama caucasia* and *Agama himalayana*. The males are easily distinguished by a longitudinal band of distinctly large scales along the belly; they also have larger anal scales than females.

The background colour is grey, varying from clear grey to almost black individuals. Males are often predominantly black, and may have blue spots on the head and body. Examples from western Turkey often have extensive blue spots, and are particularly beautiful. On individuals with a grey colouration there are black and white dots, and the throat has a reticulated pattern. The belly is greyish-white. Young individuals have clear black spots behind the head and 4-5 vertebral spots. Along the tail are about 6-8 smaller white vertebral spots or white rings.

*Agama stellio brachydactyla* from southern Israel and Sinai is more yellow or orange in colour and has shorter digits.

### AGAMA STELLIO IN CAPTIVITY

I keep this lizard in different types of terraria, but mostly glass-covered ones. Also, in the summer, I keep some individuals in my large open air enclosure of 600m<sup>2</sup>. Some of them are left in the enclosure over the winter. This year, the first *Agama* emerged from hibernation on 8 March, having survived without difficulty the mild winter of 1980-81. In this enclosure there is a south-facing slope with large basalt stones, beneath which roofing tiles penetrate up to 1.5m into the ground. It is here that the animals retreat to during frost periods.



**Plate 1.** Adult male *Agama stellio*



**Plate 2.** Newly hatched *Agama stellio*

Although the Agamas are beautiful to watch in the big enclosure, jumping from rock to rock, catching flies and butterflies in flight, climbing the tall ruin I built there, I really do have most success in a warmer terrarium. This is a terrarium of 4m x 4m. It has a rear wall built of bricks in an East-West direction; on the outer northern side of the wall earth is piled about a metre high; the southern inner side is painted black to absorb the heat of the sun. The terrarium (16<sup>2</sup>m) is covered by glass sloping down to the south.

From April to September only 10% is covered. Inside the terrarium is a slope to the south with numerous rocks, stones and logs. As in the larger enclosure, there are refuges made of roofing tiles entering the ground to afford protection from extreme heat and cold. In summer, the temperature can rise above 40°C, and in winter it can freeze. During very cold weather I cover the glass with such things as old carpets. In the autumn I spread some large plastic bags of dead leaves over and between the rocks and logs inside the terrarium which reproduces more natural conditions, gives added protection against frost, and offers warm basking sites in the early spring. Towards the end of January each year I plant one or two large curly Kale plants in the terrarium. These plants grow there and the Agamas like to eat the leaves and flowers through the spring and summer. It is a very easy way to feed them! The Agamas also eat crickets, and as I put quite large numbers of crickets in the terrarium each week, those which are not eaten immediately by the lizards can feed on the Kale plants; it is better for the lizards that they eat insects which have their stomachs full of plant material, as they do in nature.

In this terrarium the lizards may be active during any month of the year in sunny weather, but they usually remain dormant for a period of about two months from mid-December to mid-February. This past winter (1980-81) was not very cold, but it was long, and the first *Agama stellio* did not appear until 8 March, when the outside air temperature was 12°C, during a sunny interval of a quarter of an hour after rain. In 1980 the first *Agama stellio* appeared on the 9th February at an air temperature of 12°C in sunny weather.

In this terrarium, the *Agama stellio* have bred every year since 1973. Mating takes place in spring. I once observed copulation on 16th February, but usually it takes place in April-May. The eggs are laid in June and July. A female lays two, sometimes three clutches of eggs per season. There are normally 10-15 eggs in a clutch. I incubate the eggs in moist (not wet!) sand at 29-30°C; they hatch after 50 days.

As mentioned in my earlier articles, the Agamas must be given extra vitamin D<sub>3</sub> and calcium. Fortunately, some calcium is also obtained from the Kale.

### Rearing the Young

In past years I kept the young *Agama stellio* warm and active through the winter, but as there were many lizards and heating costs are high in winter, I was forced to keep the lizards in rather high densities. This had no, or almost no, bad results with *Lacerta* sp., but in *Agama* sp. it resulted in a sudden cessation of growth, usually in January; the lizards would then grow thin and show a deposit of white uric-acid under the tail. The Agamas then suffered from parasites – flagelates – which could be successfully treated with a solution of 250mg of Emtryl (Dimetrodizole 40%) per litre of drinking water for a period of 8 days. The problem would recur after one or two months.

It was clear that the flagelates were mostly a result of stress in the overcrowded terrarium: in summer the illness, in still rather young Agamas (10 months old) could often be cured without Emtryl simply by releasing them in the large enclosure of 600m<sup>2</sup>. For the past two winters I have let my young Agamas, born before the beginning of September, hibernate in the garden terraria, and in this way avoided the stress problem. The young lizards eat all kinds of small insects, such as small caterpillars, flies, cockroaches and crickets, and also the small leaves of several kinds of plants.

### SOME PROBLEMS IN KEEPING AGAMAS

I first found that I could keep this species in a terrarium of 2m<sup>2</sup>, but only one pair. In a larger terrarium of 16m<sup>2</sup> I was able to keep a maximum of 1 male and 3 females only.



If more individuals are kept together, they are no longer able to live in their own territory, creating stress which results in illnesses

The larger *Lacerta* sp. and *Gerrhonotus multicarinatus*, however, do not disturb the Agamas. Three females in a terrarium of this size is an absolute maximum, particularly during the egg-laying season, as the females always fight with one another in defence of egg-laying sites.

A very serious problem in keeping Agamas can be outbreaks of parasitic nematode worms in the intestines. To avoid this, I inject the Agamas with a dose of 10mg per kilogram body weight of Ripercol (Tetramisole).

### CONCLUSION

*Agama stellio* is a lizard which should be kept in a rather large terrarium in a sunny place in the garden. The terrarium does not need to be heated: it is only necessary to create a favourable micro-climate. They will not cause trouble, and give the terrarium keeper much fun: they jump from one high point to another, and will nod their heads constantly. Though exotic in appearance, they can be kept outside throughout the year. It can also be kept together with several non-agamid lizards such as *Lacerta strigata*, *Lacerta lepida*, *Lacerta viridis*, *Lacerta trilineata* and *Gerrhonotus multicarinatus*. Adult *Agama stellio* occasionally eat small lizards of the size of *Lacerta muralis*.

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## TURTLE FARMING AND CONSERVATION OF GREEN TURTLE (*CHELONIA MYDAS*)

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### INTRODUCTION

A controversy exists concerning the pros and cons of turtle farming, Cherfas (1979, 1980), Pickett and Townson (1980), Townson (1980) and differing views concerning utilisation of marine turtles (see, for instance, the Marine Turtle Newsletter No. 14 (1979)).

The purpose of this article is to try objectively to assess the implication of commercial sea turtle farming activities to conservation of the green turtle. Such an assessment might also assist in deciding on the desirability of other reptile farming ventures.

### THE PRESENT SITUATION

Certain forces in the name of conservation have been promoting a negative approach to turtle farming and a number of thinly disguised attacks have been launched on turtle farming (see Pickett and Townson 1980 for details). The IUCN Marine Turtle Newsletter has, however, recently taken a very positive approach to the whole question of sea turtle utilization (Issue No. 13, November 1979), a view which has also been developed by Bustard (1980) who stated,

"The international fraternity's 'protect everything' philosophy does *real* conservation — which surely includes sustained yield utilization — as opposed to mere preservation, a great disservice in that it makes the countries in the developing world feel that total protection alone represents advanced thinking. This results in blanket conservation laws being brought in — never mind that they may not be enforced — which prevent the operation of conservation through good utilization schemes which would substantially benefit the population. I have been preaching conservation through utilization since the IUCN Marine Turtle Group was formed. IUCN Groups which wish to advance their animals must be pragmatists, have access to good scientific data and contain within their midst people with extensive experience of the sheer enormity of problems in the developing world, especially the enormous pressure on all resources especially land — as a result of huge human population growth."

### THE POPULATION ECOLOGY OF THE GREEN SEA TURTLE

#### A BRIEF SYNOPSIS

What follows is a very brief account. For details the reader is referred to Carr (1967) and Bustard (1972, 1973, 1974).

1. Sea turtles are very fecund animals and the female green turtle lays a number of clutches of eggs in a breeding year at intervals of approximately 14 days. The mean clutch size is 110 eggs. The number of clutches is commonly four to five and may exceed eight. Hence potential productivity is enormous. Given individuals do not nest annually, but after several years at sea — two or three years in the Costa Rican population study by Carr & Carr (1970) and four to five years in the Great Barrier Reef populations studied by Bustard (1972). The nesting typically occurs at very high density on restricted nesting beaches, often small islands. Egg destruction by subsequent nesting turtles (due to physical limitations of space available for nesting on the beaches) may play an important role in population regulation, and is responsible for large-scale egg losses (Bustard & Tognetti, 1969).
2. Both the eggs and the newly hatched turtles have many enemies and losses at both stages of the life history are very high. It is unlikely that more than 1% of the eggs produce adult turtles in nature and the percentage survival may be lower. *Factors which reduce these losses would greatly assist recruitment (see below).*

3. Green turtles take a number of years to reach sexual maturity. This age is not known with certainty for any population and may be longer than the average of about five years suggested by Carr (1967) for Caribbean population and between four and six years suggested for Asian populations (Hendrickson, 1958).

## **TURTLE CONSERVATION USING POPULATION ECOLOGY PARAMETERS**

It follows from the above that any factors which would reduce the massive loss of eggs and hatchlings would potentiate population growth. Eggs can best be saved by protecting them from predators. This would involve transport of large numbers of eggs to hatcheries (Bustard, 1972). However, on small islands egg predators may be absent or unimportant obviating the need for hatcheries.

Equally, if not more important, is the protection of the newly hatched turtles. The only effective way to do this, apart from the natural approach of 'flooding' the area with hatchlings, is to keep the hatchlings in pens until they outgrow at least most of their predators. There are disadvantages to this, however. It is expensive, losses are likely to be high unless the rearing station is well operated, and there is the fear that it may interfere with the natural homing instinct of the turtles.

The normal European turtle fishery is clearly wasteful and doomed to destroy the nesting turtle population in anything but the short-term. This was obvious to the early turtle workers such as Hornell (1927) and Moorhouse (1933). It is based on slaughter of female turtles only — turned on the beach as they come ashore at the start of the nesting season to lay their eggs. Hence not only are the breeding females lost, but so is the egg production resulting from several years feeding at sea. Native methods using capture at sea and especially the use of decoys (which capture only the promiscuous male turtles) are much less harmful.

If adequate protection in captivity were given to the eggs and hatchlings, and if it were demonstrated that after release such juveniles homed to the island of their birth, populations would greatly increase and then it would be possible to set quotas for the taking of adult turtles of both sexes. Such quotas would be very much larger than would be possible in a natural (unassisted) population. Now it may be that it is desirable on aesthetic or other grounds to completely stop culling of wild turtles. However, as a turtle population ecologist, I certainly cannot say that such a drastic step is necessary for the future survival of sea turtles. In a scientifically-managed scheme, annual quotas could be set on a sustained yield basis and, by definition, the crop would be available indefinitely.

## **POACHING**

Poaching can be controlled, given the political will. This is much more easily achieved if there is an alternative to poaching such as management and culling of the wild population, or farming. There can, in my opinion, be no case for saying that sea turtle management or turtle farms will increase demand and lead to enhanced poaching (see also Pickett and Townson, 1980). If there were enough farms, the total demand could be met by farmed stock as occurs nowadays with certain fur-bearing animals, such as mink and chinchilla.

## **WHAT NEEDS TO BE DONE**

1. Develop sufficient turtle farms under adequate scientific supervision to meet the demand for turtle products.

Conservation effort, instead of being directed at decrying the remarkable achievements of the Cayman Turtle Farm should endeavour to provide scientific management to a crop of similar enterprises. It should be noted that even if these farms need access to wild-laid eggs for several years, this need not prove a conservation problem (see below). Hopefully, many of these farms can be sited in areas where they will assist local employment opportunities and be locally owned (the huge Thai crocodile farm provides an outstanding example of this).

## **2. Guarantee access for their products to the major North American and European markets**

Cayman Turtle Farm suffered greatly from denial of access of its products to the potentially very lucrative North American market under, in my view, wrongly placed pressure from conservationists. Clearly turtle farms on the required scale will not be developed on the basis of a gamble. It will be essential that decisions to enable them to operate commercially in the years ahead are taken now if viable farming units are to be developed.

Chabreck (1973) pin-pointed these problems as they have effected alligator farming:

“A major obstacle which has plagued the alligator farm industry in recent years has been the lack of legal security. A strong well-planned programme against the use of alligator skins has placed the future of alligator farms in jeopardy. Although the programme was aimed primarily at the use of skins from wild alligators, the threat that it could eventually influence the marketing of the farm-reared animals has made many farmers reluctant to put large capital investments into the operation.”

## **3. Management (sustained yield utilization) of existing large sea turtle populations**

Quite apart from actual farming of sea turtles, there is no reason why existing populations should not be cropped under scientific management on a sustained yield basis. Indeed such an approach — putting a commercial value on the population — may be the best way to ensure the future protection of the population and its rookery areas, since protection costs money. As pointed out by Hendrickson (1958) the “cheapest” stage in the life history in ecological terms is the eggs, sizeable numbers of which could be harvested with no effect on the population, especially if the remainder of the eggs are effectively protected. Bustard and Tognetti (1969) have taken this further and looked at egg losses at the rookeries caused by the nesting turtles themselves. I have also developed this work subsequently (Bustard, unpubl.) and know personally of a number of rookeries where most of the early-laid eggs could be removed with no effect on the population as they will be destroyed anyway by subsequently nesting turtles. Following the approach of Hendrickson (1958) these eggs would be used for food. If instead, they (or part of them) were used for farming purposes the total production could be enormous.

### **THE CAYMAN TURTLE FARM**

A pioneer green sea turtle farm was initiated by Mariculture Limited on Grand Cayman Island in 1968. A recent account of the subsequent Cayman Turtle Farm Ltd., has been given by Townson (1980). Pickett and Townson (1980) discuss certain problems facing this farm at the present time. It seems strange that a farming venture which has done so much over more than a decade to pioneer turtle farming at a practical level and has succeeded in breeding the green turtle in captivity (Simon, Ulrich and Parkes, 1975) should be under concerted attacks from certain quarters. Conservationists should be assisting development of this and similar turtle farming ventures. Part of the problem lies in the past. The Survival Services Commission of IUCN (The International Union for the Conservation of Nature and Natural Resources) set up a Marine Turtle Specialist Group, the first meeting of which was held in Morges, Switzerland in March 1969. Turtle farming was discussed, but no representative of Mariculture Limited had been invited to attend the meeting. The attitude of most Group members towards turtle farming was ambivalent. The lack of invitation was remedied at the next (1971) meeting of the Group but a very similar ambivalent attitude prevailed.

What is needed now is a firm commitment on the behalf of sea turtle scientists to the concept of turtle farming and *management* of sea turtle resources.

## OTHER CONSIDERATIONS

It requires to be stated repeatedly that not only is turtle farming (in the IUCN sense of producing all the farm products from eggs laid by captive breeding herd) a perfectly legitimate enterprise, but that so also is exploiting natural populations provided this is done on a sustained yield basis. It is perfectly *legitimate* conservation and it is regrettable that people who believe in scientific conservation should find that they have their backs to the wall and that the completely unscientific preservationist attitude should prevail. Perhaps IUCN has been half-hearted in promoting the concept of sustained yield utilization, partly no doubt, as a result of the preservationist attitude held by many of the supporters of its fund raising body, the World Wildlife Fund.

I agree with Pickett and Townson (1980) that there is no evidence to suggest that turtle farming would provide a demand for vital products which the farms could not meet. Instead, I feel that the presence of farms would provide the required product legitimately, thus making it easier, especially in countries actively farming turtles to:

- a) crack down on poaching of the wild populations, and
- b) to protect natural rookery areas from all other forms of disturbances, including development.

It is on these two aspects that the future of sea turtle species ultimately depends. Politically, it is always easier to close illicit operations when there is a legitimate alternative.

One should not be against a commercial enterprise just because it is commercial — a view commonly found among conservation-orientated scientists. For instance, Ehrenfeld (1974) wrote:

"Commercial mariculture of sea turtles is occasionally acceptable, but only when the operations are small and under government supervision, and when the markets are relatively local. The turtle ranches established in Queensland, Australia by Dr Robert Bustard (Bustard, 1972) are an excellent example: they serve the dual function of interesting the native population in turtle conservation and reducing the local hunting pressure on wild stocks (because the hunters are involved in the ranching). In this case the advantages appear to outweigh the usual/negative side effects of turtle mariculture, but periodic re-evaluation will be advisable."

I would wish to differ with three statements in the above quotation:—

1. I would *not* accept that the enterprises should necessarily be small — the most viable ones may be large — especially if they are to have available to them the best scientific advice.
2. I would *not* accept that utilization should necessarily be local. This smacks of the non-commercialism espoused by Carr (1972).
3. I would *not* accept that there are usually negative side effects to turtle farming.

Hirth (1971) writing in an FAO publication wisely stated:

"initial attempts at turtle aquaculture should be on a small scale and should be conducted only if scientific expertise is available."

I cannot totally accept the view expressed by Carr (1972):

"the only effort to be encouraged should be a non-profit government-sponsored campaign in which many small, widespread, purely experimental projects simultaneously attack the problem of nutrition, disease control, and captive breeding on procedure and results."

This is because we all know that non-profit, government-sponsored schemes are often abject failures! I can see no reason why we should be against *commercial* motives and using these to get work done which would not be done, or cannot be done, on a sufficiently large scale as a research project. I have throughout my professional career



worked very closely with governments and carried out large-scale research projects in which a future potential profit was a strong or motivating force in government making the necessary research funds available. The onus then rests on the scientist to ensure that the best scientific advice is proffered so that the necessary safeguards are built into the system.

If I may end on a philosophical note it would be to say too many quasi-scientists have climbed on to the conservation band-wagon, and that unfortunately a sizeable proportion of both these and the remainder are anti-profit and anti-business — a strange approach when it is business (industry) which ultimately provides the funds which allows research scientists to continue to carry out their (often esoteric) research!

#### ACKNOWLEDGEMENT

I thank Dr J.B. Sale for critical reading of the manuscript.

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## BATTLE FOR WASTE GROUND IN SOUTH EAST LONDON: ECOLOGICAL PARK OR INDUSTRIAL PARK?

CHARLES SNELL

76 Birdbrook Road, Kidbrooke, London SE3 9QP

A plot of about 21 acres has fallen vacant in the London Borough of Greenwich. The Council proposes to turn the site partly into an orthodox 'lollipop tree' urban park, and partly into an industrial park. The Greenwich Wildlife Society and local schools would like to see it become a wildlife park/ecological study area/nature reserve (public), on the lines of the Dutch nature parks and the William Curtiss Ecological Park (Tower Bridge, S.E. London). The London Wildlife Trust would also like to see ponds, open-air vivaria, and indoor reptile and amphibian breeding facilities constructed on the site.

The site already has some open water and marsh, with all three native newt species, Common Frogs, Toads, Slow Worms and introduced colonies of Tree Frogs (*Hyla arborea*) and the Wall Lizard (*Podarcis muralis*).

The site also has 2½ acres of concrete which is becoming slowly overgrown with vegetation. Shallow, quick-warming ponds could easily be constructed here for breeding amphibians.

The London Wildlife Trust (and the author) would like to see the area as a focus of interest for everyone involved in Natural History, and for local people. It could be managed to support a great variety of native plants and animals, producing an area of natural beauty and scientific interest of great use, particularly to local schools. Other smaller "parks" of this kind are being built in other parts of the country. Greenwich has not yet provided such an amenity, but has built on over 30 acres of open land recently, 16 of which were Common Land. A new road is proposed, taking up another 5 acres of Common Land and two parks. It is hoped that the breeding facilities for reptiles and amphibians proposed by the Wildlife Society would enable fauna from this site to form a pool from which other sites could be populated.

The Council also wants to build industrial units on the site. Local industrial buildings fall empty with increasing frequency owing to the decline of industry nationwide; as there are already many industrial premises available and unoccupied, building new ones would seem a waste of rate-payers' money.

The borough planning department have given until the 1st July this year for objections to their proposals to reach them. If you feel you could support the Greenwich Wildlife Society's proposal for a Wildlife/Ecological Park on sites "A" and "H" on the "Plan for Kidbrooke" (a London Borough of Greenwich leaflet), then please write to them. The address is: Borough Planning Officer,  
45-53 Wellington Street,  
Woolwich,  
London SE18 6RA

The Ecological Parks Trust, the London Wildlife Trust and the Nature Conservancy have expressed interest and backing for the proposal, but, of course, it is the interest of the public in such a scheme that counts. Most of the land is GLC owned. Could someone give Ken Livingstone a tap on the shoulder please!

For further details please contact Charles Snell, Tel: 01-856 9852.

## CONSERVATION OF MEDITERRANEAN AMPHIBIANS AND REPTILES, AND THEIR HABITATS

\*M. R. K. LAMBERT

*British Herpetological Society, c/o Zoological Society of London,  
Regent's Park, London NW1 4RY*

There are 18 Mediterranean coastal States, which in alphabetical order are:—  
Albania, Algeria, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libyan Arab Republic, Malta, Monaco, Morocco, Spain, Syrian Arab Republic, Tunisia, Turkey and Yugoslavia.

### Background

In accordance with resolution 2997 (XXVII) of the United Nations General Assembly, the United Nations Environment Programme (UNEP), based in Nairobi, was established "as a focal point for environmental action and co-ordination within the United Nations system". The UNEP Governing Council defined this environmental action as encompassing a comprehensive, transectoral approach to environmental problems which deal not only with the consequences, but also with the causes of environmental degradation. 'Oceans' have been designated as a priority area and a Regional Seas Programme has been adopted.

There are at present ten Seas where action plans are operative or under development and the Mediterranean is the first region in which UNEP has attempted to assist the coastal States to adopt and apply measures for the protection and development of the marine and coastal environment.

### The Mediterranean Sea

In collaboration with several United Nations bodies, UNEP convened as Intergovernmental Meeting on the Protection of the Mediterranean in Barcelona, 28 January – 4 February 1975. Sixteen of the 18 coastal States attended the meeting and an Action Plan was approved. One year later at the Conference of the Plenipotentiaries of the Coastal States of the Mediterranean Region for the Protection of the Mediterranean Sea, convened by UNEP in Barcelona, 2 – 16 February 1976, the Mediterranean Governments and EEC approved the texts of three legal instruments:—

- i) Convention for the Protection of the Mediterranean Sea against Pollution,
- ii) Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft, and
- iii) Protocol concerning Co-operation in Combatting Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency.

These came into force on 12 February 1978 and had been ratified by the end of June 1980 by 15 Mediterranean States and the EEC.

In January 1977, a consultation of experts was convened in Tunis to discuss problems related to the management of areas requiring special protection, and recommended that:—

- i) Mediterranean protected areas, in particular the aquatic parks, reserves and wetlands, should be organised into an Association of Protected Mediterranean areas, one member acting as the co-ordinator.
- ii) Regular, periodic meetings should be organised for representatives of Mediterranean protected areas to exchange views on their experience and problems.
- iii) Research on ecological problems of protected areas should be intensified and should be related to the ongoing UNEP co-ordinated Mediterranean Pollution Monitoring and Research Programme.

\* *Present address: Centre for Overseas Pest Research, Foreign & Commonwealth Office (Overseas Development Administration), College House, Wrights Lane, London W8 5SJ.*

- iv) An intergovernmental meeting should be convened to consider and adopt guidelines and technical principles for the establishment and management of Mediterranean protected areas. The report of the Tunis Expert Consultation should be used in the preparatory work of the recommended intergovernmental meeting.
- v) A directory of Mediterranean protected areas should be prepared and kept under constant review.

Activities in support of the protection and rational management of marine parks, wetlands and other protected areas were adopted at the first meeting of the Contracting Parties to the Convention for the Protection of the Mediterranean Sea against Pollution and its related protocols in Geneva, 5 – 10 February 1979. UNEP, among other things, was requested, “..... in co-operation with UNESCO, FAO and IUCN, (to) convene an intergovernmental meeting to consider, with a view to adoption, guidelines and technical principles for the selection, establishment and management of Mediterranean specially protected areas and other related matters. The meeting should also consider the development of a protocol concerning Mediterranean protected areas.”

### **The Athens Conference, October 1980**

An Intergovernmental Meeting on Mediterranean Specially Protected Areas was organised by UNEP, in co-operation with the other UN Agencies, at Athens, 13 – 17 October 1980. The preceding paragraphs above are extracted from the Foreword to the ‘Principles, Criteria and Guidelines for the Selection, Establishment and Management of Mediterranean Marine and Coastal Protected Areas’, prepared by IUCN for the meeting. More recently, a new draft of this paper was accepted at a further meeting of the 18 Mediterranean Coastal States on an Action Plan at Cannes, 2 – 7 March 1981.

### **The Mediterranean Habitat**

The Mediterranean Sea is nearly enclosed and has coasts which have been populated for thousands of years and which have been largely cleared and deforested. They are now the subject of touristic development without precedent, industrialisation and urban development, and as a consequence the sea is polluted. One could describe the Mediterranean as being a ‘sick sea’ and the natural environment which it contains is being destroyed rapidly. The quality of life for the coastal inhabitants and that of millions of tourists (200 million yearly at present is likely to be 400 million by the end of the 20th century) who frequent the beaches is bound to be affected. Besides the objectives of the World Conservation Strategy (IUCN, UNEP and World Wildlife Fund 1980, Gland and Nairobi, in collaboration with FAO and UNESCO), a network of marine and coastal protected areas should be created within the framework of a concerted effort on the part of the Mediterranean Coastal States. Before this can be undertaken, the natural habitats of the Mediterranean and the species they contain must be established in order that they can be protected by the establishment of reserves. Moreover, the influence of the various pesticides and insecticides used in agriculture on Mediterranean amphibians and reptiles generally is little understood. (Applied research is also required for a better understanding of the obvious decline of some insectivorous lizard species).

### **Problems concerning the herpetofauna**

#### **Marine turtles**

There are seven species of marine turtles in the World and all, except one, are threatened by over-exploitation and destruction of their coastal breeding sites. Three species are known to lay their eggs on Mediterranean coasts. *Dermochelys coriacea* has bred in Sicily, *Chelonia mydas* on the southern Turkish coast and *Caretta caretta* on some beaches on the Greek islands, and in Italy and Turkey. *Eretmochelys imbricata* and *Lepidochelys kempfi* have been recorded in the sea.

#### **Coastal land species**

Species of amphibians and reptiles occur within marshy coastal areas, dunes and rocky cliffs, and several endemic species on some of the isolated Mediterranean islands. The

Mediterranean herpetofauna is more diverse than in northern Europe and several are restricted there. Although some information is available on the status of species in the northern part of the Mediterranean Basin, there is very little for parts of North Africa and the Near East. Species are threatened by the abuse of collection, water pollution, pesticide usage and habitat destruction. The protection of certain coastal regions would contribute significantly to their conservation, since they have poor powers of dispersal and are limited by their habitat. The threatened species fall into two groups.

i) **Island species:** numerous forms of lizards isolated on Mediterranean islands or islets have evolved separately and become separate sub-species. Many are now threatened by excessive collection by private collectors or dealers and by the destruction of their habitat. Introduced predators, such as rats, have equally contributed to their decline. Such lizards occur in Malta, where *Podarcis filfolensis filfolensis* exists on Filfera I., in the Balearics with *Podarcis lilfordi lilfordi* on the island of Ayre and *Podarcis lilfordi rodriguezi* on Ratas Island in the Bay of Mahon in Menorca. In the Tuscan Archipelago, with *Podarcis muralis muellerlorenzi* on Scuola and *Podarcis sicula cerbolensis* on Cerboli near Elba, *Podarcis sicula caerulea* is found on the rocks of Faraglione near Capri. *Podarcis sicula sanctistephani* is now extinct on San Stephano in the Tyrrhenian Sea. Others still exist on islands in the Aegean Sea and the Adriatic, and on the Balearics. All are threatened with extinction to some extent through only occurring in very small numbers. These examples of the continuing evolutionary process will disappear.

The Filfera Island lizard and other species are listed either in the IUCN Red Data Book Vol.III – Amphibia & Reptilia, or on the list of threatened amphibians and reptiles in Europe established by the Council of Europe.

Of the snakes also listed is the Cyclades viper, *Vipera lebetina schweizeri*, whose total population does not exceed 5000.

*Discoglossus sardus*, the painted frog only found on Corsica, Sardinia, and on the island of Monte Cristo and on the Iles d'Hyeres off France, is also listed.

ii) **Coastal species:** Land and inland water species within the coastal proximity include terrestrial and fresh-water chelonians, lizards, snakes and Amphibia. Their habitats are not necessarily limited to coastal regions, but where they are, their survival would be enhanced in protected areas and it is useful to give mention of some of the species concerned.

#### **Chelonians.**

*Emys orbicularis* has declined in Europe on account of habitat destruction, water pollution, and collection, but it still survives in the coastal zones of Tuscany (Italy), Spain and France. It also occurs in the Balkans and the Near East. *Trionyx euphraticus* occurs in eastern Turkey and as far as the Mediterranean coast in the Syrian Arab Republic and Lebanon. All of the land tortoises, normally frequenting the coastal strips, are threatened by trade collection and habitat destruction. There are various forms of *Testudo graeca* in southern Spain, the Balkans, North Africa and the Near East, and of *Testudo hermanni* in the Balkans, the Midi of France, Italy, Corsica and Sardinia, which are more often than not the victims of fires in forests and scrubland. *Testudo marginata* is restricted to southern Greece and Sardinia, and *Testudo kleinmanni* to the Sinai Peninsula and north-east Africa, very little being known about the latter species.

#### **Snakes and lizards.**

Among the threatened Mediterranean lizards which would benefit from the establishment of protected areas, because their habitats extend to the vicinity of the coast, are the Sardinian lizard, *Lacerta bedriagae ferreriae*, two quite large and spectacular southern European and North African species, *Lacerta lepida pater* and *Lacerta viridis*, which are disappearing on account of habitat destruction, collection and, perhaps less importantly, their excessive use in the production of parasitic antidotes, and *Chameleo chameleo* in the south of Spain, Crete, North Africa and the Near East. In Spain, this last species is only represented by two isolated and declining populations which still survive in the coastal pinewoods of the Provinces of Cadiz and Malaga.



Several threatened or vulnerable snake species would also benefit from the creation of protected coastal areas. *Coluber hippocrepis* of north-west Africa, the Iberian Peninsula, Sardinia and the island of Pantelleria, generally lives in marshy areas which are becoming rarer, *Natrix natrix cetti*, the Sardinian hill snake, is threatened by the drainage of marshes and the spread of insecticides, *Coluber monspessulanus*, whose distribution extends from North Africa, through the Iberian Peninsula and the Midi of France to the Balkans, is often found on coastal marshes and sand dune belts, a blind burrowing snake of the Family Typhlopidae, only represented in Europe by *Typhlops vermicularis*, occurs in the Balkans, certain Greek islands, south-west Asia and Egypt, and is often seen in the neighbourhood of the sand boa, *Eryx jaculus*, with a similar distribution and also extending into North Africa.

#### Amphibians

Many Amphibia breed in the wet coastal zones and are threatened by drainage of their habitat and pesticide usage. *Bufo calamita* frequents dunes often near the sea and can reproduce in brackish water, several *Pelobates* spp. occur in the Mediterranean region and are sometimes common still in sandy coastal regions, and the tree frogs, *Hyla arborea* and *H. meridionalis*, the latter restricted to the Midi of France, the south of the Iberian Peninsula, the Balearics and north-west Africa, together with several other species of frogs, salamanders and newts, are restricted to Mediterranean coastal regions. *Discoglossus nigriventer* may nearly be extinct in Israel.

There also exist underwater caves in the Karst limestone formation of the north-west Adriatic coast, near Trieste and Istria. Surviving underground in the waters is a remarkable species, *Proteus anguinus*. It is the sole representative in Europe of the Family Proteidae, which includes four other species in the eastern USA. The tadpoles do not metamorphose and the species breeds neotenuously. It is threatened by the pollution of its underground streams and by collection for scientific and other reasons.

#### Conclusions

This somewhat scanty survey highlights the problems concerning the conservation of Mediterranean species of amphibians and reptiles. Since the information available is mainly for species in southern Europe, especially for France, Spain and Italy, there is a tendency for this account to have concentrated on the plight of these species. There is very little information to date for most of North Africa and the Near East. In particular, information is required for Albania, Algeria, Cyprus, Egypt, Greece, Lebanon, Libyan Arab Republic, Malta, Monaco, Syrian Arab Republic, Tunisia, Turkey and Yugoslavia.

### APPENDIX

#### A Preliminary List of Amphibians and Reptiles of the Mediterranean Region known or considered to be threatened

(compiled by R. E. Honegger,  
former Editor, IUCN Red Data Book. Vol. III, Amphibia & Reptilia)

#### Species threatened throughout their range:—

*Salamandrina terdigitata*, *Mertensiella luschani*, *Proteus anguinus*,  
*Discoglossus nigriventer*, *Alytes obstetricans boscai*, *Pelobates fuscus insubricus*,  
*Pelobates syriacus*, *Testudo hermanni hermanni*, *Testudo hermanni robertmertensi*,  
*Testudo marginata*, *Testudo graeca graeca*, *Caretta caretta*, *Chelonia mydas mydas*,  
*Eretmochelys imbricata*, *Lepidochelys kempfi*, *Dermochelys coriacea*,  
*Podarcis filfolensis filfolensis*, *Podarcis lilfordi lilfordi*, *Podarcis lilfordi rodriguezi*,  
*Podarcis muralis muellerlorenzi*, *Podarcis sicula coerulea*, *Podarcis sicula sanctistephani*,  
*Natrix natrix cetti*, *Vipera lebetina schweiseri*, *Vipera ursinii*.

#### Species threatened within the Mediterranean part of their range:—

*Rana esculenta-lessonae* complex, *Mauremys caspica leprosa*, *Mauremys caspica rivulata*, *Emys orbicularis*, *Testudo graeca iberica*, *Trionyx euphraticus*,  
*Chamaeleo chamaeleon*, *Lacerta lepida pater*, *Coluber hippocrepis*, *Coronella austriaca*.

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## MEMBERS' ADVERTISEMENTS

- \* Mrs V. Brown, 6 Osmond Gardens, Wallington, Surrey. Tel: 01-647 6466, has numbers of old editions of "Aquarist", 1934-1979; "Country Fair", 1951-1970; "Amateur Aquarist" Vol. 1, 1924-26; and "La Aquariums et Les Poissons", 1954-57, available.
- \* **For Sale:** Plastic/chrome laboratory mouse breeding cages, and mice. Simon Townson, Tel: 01-989 9570.
- \* **For Sale:** the following captive bred snakes:  
Prairie Kings, Black Kings, California Kings (desert phase), Florida Kings, Northern Pines and Sinaloa Milks.  
Tel: Mike Nolan, 01-942 0177.
- \* **For Sale:** Juvenile Leopard Tortoises (captive bred), length 2½", born January 1981, £8 each. Two Geochelone denticulata 6-7", males, £20. Carriage extra. Mike Hine, York Lodge, The Street, Stow Langtoft, Suffolk. Tel: Pakenham (0359) 31609.
- \* **Wanted:** Giant Zonures (*Cordylus giganteus*) to increase breeding stock. Will pay good price. John Pickett, 84 Pyrles Lane, Loughton, Essex IG10 2NW. Tel: 01-508 6624.
- \* Dr E. Elkan, Department of Histopathology, Mt. Vernon Hospital, Northwood is anxious to obtain observations from members on the reaction of tadpoles (any tadpoles) to *Hydra*. Can anyone who has a garden pool of *hydra* and some tadpoles, put these together in an aquarium and study the reaction of the tadpoles when they come in touch with *Hydra* while browsing on algae. Should the tadpoles be found to swallow the *Hydra*, they should be immediately killed in Chloroform-water and fixed in 5% formaldehyde for further investigation. Examples of both tadpoles and *Hydra* should be sent in. Collaborators in this enquiry would be extremely welcome!
- \* **For Sale or Exchange:** 9' male intergrade Indian python (*Python m. molurus* x *P. m. bivittatus*), tame. Also male Yellow Ratsnake 5½'.  
**Wanted:** pair of Boa Constrictors about 4' long. Tel: 01-730 3175 or 0273 834620, ask for Peter Gadd.

# COMMENTS ON WINTER FASTING IN CAPTIVE EUROPEAN SNAKES OF THE GENUS *ELAPHE*

KEITH WERB

17 Drury Road, Colchester, Essex, England

Compared with the vast amount of literature published on the maintenance etc. of nearly all of the various North American snakes in captivity, corresponding information on many of the European snakes is sadly lacking. This is hardly surprising since very few European snakes, particularly of the genus *Elaphe*, have been imported into this country.

Over the past few years, I have been building up a collection of European *Elaphe*, primarily with a view to breeding them in captivity and also in the hope that I can enlarge upon the scant literature already published regarding the maintenance of these attractive snakes under captive conditions.

The opportunity is now taken to publish a table of the dates between which some of the snakes in my collection have fasted during the last three 'winters'. Dates given are those of the last and first feeds of each year, regardless of the fact that these feeds may have been preceded or followed by another much shorter fast. All of the snakes in my collection are kept on a light-cycle equivalent to latitude 37.5°N (Jones 1978)

TABLE TO ILLUSTRATE FASTING OF EUROPEAN *ELAPHE*

Species	Sex	Country of origin	1978-1979			1979-1980			1980-1981		
			From	To	Days	From	To	Days	From	To	Days
<i>Elaphe scalaris</i>	♂ juv	France	Dec 23	Feb 19	58	Aug 23	Mar 27	217	Aug 30	Mar 23	205
	♀	Spain	—	—	—	Aug 14	Feb 19	189	Oct 10	Feb 14	127
<i>E. viridis</i>	♀	Yugoslavia	Aug 12	Apr 26	257	Oct 8	Mar 24	168	Aug 5	Feb 6	185
	♀	Yugoslavia	—	—	—	—	—	—	Sept 7	Feb 5	151
	♀ juv	Yugoslavia	—	—	—	—	—	—	Sept 28	Feb 6	131
<i>E. longissima</i>	♀	France	Aug 12	Feb 26	198	July 29	Mar 2	217	Aug 17	Mar 18	213
	♀	cap-bred	—	—	—	—	—	—	Sept 6	Mar 28	203
	♀ juv	Yugoslavia	Dec 11	Feb 3	54	Sept 12	escaped Nov 79	—	—	—	—
<i>E. q. quatuorlineata</i>	♀	?	—	—	—	Sept 9	Mar 2	175	Aug 24	Mar 12	200
	♀	Yugoslavia	—	—	—	—	—	—	June 14	Feb 17	248
	♀	Yugoslavia	—	—	—	—	—	—	July 24	Mar 12	231
<i>E. q. muensteri</i>	♂	Greece	—	—	—	obtained Feb 80	Mar 18	—	Aug 28	Mar 14	198

It can be seen from the table that, with the exception of juveniles, a fast of six or seven months commencing around the end of August and finishing in February or March is quite normal with all species. Juveniles, as expected, tend to carry on feeding much longer, especially in their first year.

Though it is probable that many experienced herpetologists would disagree with me, I am now of the opinion that it is not possible to overfeed any of the above species and I feel that it is best to offer the various individuals as much food as they will readily accept during the short period of avid feeding, i.e. from March to June. A marked decline in appetite is noticeable throughout July and August, especially in adult specimens.

In summary, I would like to suggest that the feeding pattern followed by my captive European *Elaphe* closely resembles the one followed by wild specimens and that offering a fixed amount of food on a regular basis, e.g. one mouse/rat per week/fortnight is undoubtedly an unnatural way of maintaining them in captivity.

## REFERENCE

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## LETTERS TO THE EDITORS

### BREEDING THE EUROPEAN TREE FROG, *HYLA ARBOREA*, AND A NOTE ON A WILD BREEDING OF *PODARCIS MURALIS* IN ENGLAND

Dear Sirs,

After reading the "Captive Breeding Committee Report 1980" in the last Bulletin, I would like to add *Hyla arborea* to the list of those species successfully bred in captivity.

I bought a pair of European Tree Frogs in May 1980; they proved to be regular breeding machines thereafter. Spawn was produced four weeks after purchase and from then on at 2½–3 week intervals. Four batches were laid altogether, producing a succession of tadpoles. The first batch was about 25% fertile, the second about 75% and the fourth batch over 90% fertile. Each batch was approximately twice the size of the female frog, but laid in scattered clumps around the pond weed (*Elodea*). A few of the last batch failed to metamorphose before late September and died in October in outside ponds. Those which metamorphosed have hibernated in the garden (many hundreds), and at the time of writing the first few are emerging.

As a further breeding success note, I released 29 *Podarcis muralis* (Wall lizard, N. Italian origin) into wasteland in 1978. Last year I noticed a young specimen about 2½" long, obviously the result of a wild breeding. This took up a territory near the end of my garden and has grown into a predominantly green male about 6" long, seen for the first time this year on April 18th.

Charles A Snell, Portrait Artist, 76 Birdbrook Road,  
Portrait Artist,  
76 Birdbrook Road,  
London SE3 9QP

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### MORE COMMENTS ON TURTLE FARMING

I am quite delighted to see your Bulletin taking such a positive approach to a controversy which has sadly split the turtle conservation world — all to little purpose really. Whilst our American colleagues are attacking the existence of the farm, turtle populations are quietly dwindling away in the far corners of the world ignored by governments who can offer their people no alternatives to the protein provided by turtle meat.

Let us emphasise, if we can, the CITES concept and control access to the markets of products from undesirable sources but when we have a legal source let us not hinder but encourage as an example of what can be achieved.

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# CONTENTS

	Page
Remaining Evening Meetings 1981 ... ..	1
Extraordinary General Meeting ... ..	1
Resignation of BHS Officers 1980/81 ... ..	2
Treasurer's Report: Financial Year 1980 ... ..	2
Conservation Committee Annual Report - 1980 ... ..	4
International Herpetological Congress, 3rd - 9th October 1981 ... ..	8
East European Symposium 1981 ... ..	10
Symposium on Introductions, 1982 ... ..	10
First General Meeting of Societas Europaea Herpetologica (SEH) ... ..	11
University of London Union Natural History Society Expedition to Greece 1980 ... ..	11
WAU Ecology Institute ... ..	13
Association for the Study of Reptilia and Amphibia ... ..	13
Habitat Restoration in Epping Forest ... ..	14
Crested Newt Bank ... ..	14
Meeting in Honour of Dr Elkan ... ..	14
New International Legislation: The Berne Convention John Pickett and Simon Townson ... ..	15
Captive Breeding of <i>Elaphe rufodorsata</i> and <i>Rhabdophis tigrinus</i> from the Korean People's Democratic Republic Piotr Sura ... ..	20
Notes on the Reptiles of Bulgaria ... .. Piotr Sura	25
Unexpected Result of a Post Mortem Examination E. Elkan ... ..	30
<i>Agama stellio</i> , with Observations on its Care and Breeding in Captivity Bert Langerwerf ... ..	32
Turtle Farming and Conservation of Green Turtle ( <i>Chelonia mydas</i> ) H. R. Bustard ... ..	36
Battle for Waste Ground in South East London: Ecological Park or Industrial Park? ... .. Charles Snell	41
Conservation of Mediterranean Amphibians and Reptiles, and their Habitats M. R. K. Lambert ... ..	42
Members' Advertisements ... ..	46
Comments on Winter Fasting in Captive European Snakes of the Genus <i>Elaphe</i> Keith Werb ... ..	47
Letters to the Editors ... ..	48
<i>Breeding the European Tree Frog, Hyla Arborea, and a Note on a Wild Breeding of Podarcis Muralis in England</i>	
<i>More Comments on Turtle Farming</i>	