

**THE BRITISH
HERPETOLOGICAL SOCIETY**

BULLETIN

No. 4 December 1981

BRITISH HERPETOLOGICAL SOCIETY

*c/o Zoological Society of London
Regent's park, London NW1 4RY*

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 £3.00 (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.

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

Contributions and correspondence arising from the Bulletin should be sent to:
John Pickett, 84 Pyrles Lane, Loughton, Essex IG10 2NW

EVENING MEETINGS 1982

All meetings start at 7.00 pm and are held in the Lecture Theatre of the Linnean Society of London, Burlington House, Piccadilly, London W1, unless otherwise indicated.

- FEBRUARY 23rd** Mr. S. Spawls: Structure and ecology of a savannah population of snakes in northern Ghana (West Africa).
- MARCH 23rd** A.G.M. followed by Dr H.R. Bustard (FAO Crocodile Breeding Project, India): Conservation of the Indian gharial.
- APRIL 22nd** Dr. I.R. Swingland, Chairman, IUCN/SSC Tortoise Group, on the Inaugural Meeting at Oxford, 1-2 October 1981; Dr M.R.K. Lambert (IUCN/SSC Tortoise Group — W Palearctic species) on the 2nd European Chelonian Symposium, Oxford, 3-4 October 1981, and Mr M.L. Hine: *Testudo marginata* in the Peloponnese (S Greece) and their captive management in Britain.
- MAY 19th** Prof. G.A.D. Haslewood: Free-living lizards in a Sussex garden.
- JUNE 15th** **Amphibians and reptiles of the Old World*. A discussion on care and breeding with the Captive Breeding Committee.
- JULY 7th** *A visit to the London Zoo*. A meeting organised by the Captive Breeding Committee during a Members' Evening of the Zoological Society of London. BHS members should meet at the Fellows' Entrance in the Outer Circle of Regent's Park, at 7 pm. If late, please tell the Gateman you are with Mr S. Townson.
- SEPTEMBER 22nd** **Amphibians and reptiles of the New World*. Details as for June 15th.
- OCTOBER 26th** Prof. J.I. Menzies (BHS Secretary 1952-7, lately Dept. Zoology, Univ. Papua New Guinea): Trouble with frogs, a taxonomist's problems in New Guinea.
- NOVEMBER 24th** Dr B. Groombridge (Editor, IUCN Red Data Book: Amphibia & Reptilia, SCMU, Cambridge): Compiling information on threatened amphibians and reptiles (provisional).

*Members should bring live animals, preserved specimens and 35 mm colour slides for display and to illustrate discussions.

SOCIETY DONORS

The Committee would like to thank the following for donations contributing to Society finances:—

Miss R.J. Bannister, A.P. Bell, J.B. Blossom, J.R. Brock, D.G. Brownlee, R. Claypole, M.E. Dewar, A.R. Frohlich, J.C. Hoofien, E. Ibbetson, C.T. Janes, R.L. Johnson, D.G. Lawrence, J.T. McGregor, G. Maxwell, P.J. Merrin, Dr L.A. Moffat, Dr L.D. Ober, J.D. Romer, A. Shephard, C. Simms, M.E. Smith, W. Walston (for Conservation Fund), Dr B. Weatherhead.

A NEW BHS TREASURER

Due to outside commitments, Mr D.G.D. Lucas feels unable to continue as the Society's Treasurer during 1982. The Committee would like to express their gratitude to Mr Lucas for his three-year period of services for which there has been a great need and the Committee feels indebted. Mr J. Webster, already with a heavy commitment for the Conservation Committee, has kindly agreed to be acting Treasurer until a suitable new volunteer can be found. As an Officer of the BHS Committee, the new Treasurer would also be a member of the Secretariat (BHS administration committee) together with the Membership Secretary, with whom there would be close communication in liaising over the Society's membership and financial affairs. The Committee appeals to a BHS member to volunteer and newly undertake this important responsibility. Please write to the Secretary at the Society's address.

M.R.K.L.

DRAFT REVISION OF BHS RULES

After an initial draft was drawn-up and commented on by the Committee, the following draft revision of the BHS Rules (last revised, 1956) has been proposed by a rules sub-committee (Prof. Haslewood, Dr Lambert, Dr Beebee, Mr Townson, Mr Pickett and Mr Taylor) and approved by the main Committee. The comments of BHS members are invited by 15th March 1982, before the next A.G.M., prior to final approval by the Charity Commission.

British Herpetological Society (Founded 1947)

RULES (Revised 1982)

1. **TITLE.** The Society shall be called the BRITISH HERPETOLOGICAL SOCIETY (BHS).
2. **OBJECTS.** The promotion of the study and protection (including conservation through education and captive breeding) of amphibians and reptiles, particularly the European species.
3. **MEMBERSHIP.** Membership of the Society is open to all interested in the different aspects of herpetology.
4. **SUBSCRIPTION.** The annual subscription, due on 1st January, shall be determined by the Council, which may alter it at any time, normally making any proposed change known to Members at the Annual General Meeting previous to the change. Institutional and Library Subscription Membership fees will also be determined by the Council.

The subscription will include Society publications and should be paid before the end of the taxation year (6th April) at which time thereafter, otherwise, a reminder will be sent. Publications will be forwarded upon receipt of the subscription. A Member who fails to pay the subscription by 30th June shall cease to be a Member, but will receive a final reminder stating that his or her name will be restored to the Members' List by payment of the subscription.

5. CONSTITUTION

(a) **Ordinary Membership.** The Society shall consist of an unlimited number of Ordinary Members resident in any country. Every Ordinary Member shall pay an annual subscription unless joining after October, in which case the sum for that year will be halved. Payment of the subscription implies acceptance of the Society's Rules. Membership for persons over the age of 65 shall, on application, be half the Ordinary Membership fee.

If a Member, in the opinion of the Council, acts in a manner injurious to the interests or good name of the Society, the Chairman or his deputy will be directed to contact that Member, stating the nature of the alleged offence and asking for an explanation. The Council shall then allow 28 days for a reply or for a request from the member to appear before Council. If the Council decides that the Member's explanation made in writing or verbally is unsatisfactory, it shall have the power to remove his or her name from the Society's list.

(b) **Honorary Membership.** Persons who have rendered outstanding service to the Society or to herpetology are eligible for election as Honorary Members on the nomination of Council. Such Members shall not exceed 10 in number; they will receive all privileges of Ordinary Members and will be able to purchase Society publications at rates determined by Council.

(c) **Junior Membership.** Schoolchildren up to the age of 17 are eligible to join the Junior Section of the Society on payment of an annual subscription determined by the Council. Council may require proof of age.

Junior Members will receive the *J. Herps. Newsletter* plus the *Bulletin* and are eligible to participate in any Junior Section meetings or projects that may from time to time be organised by the Education Officer. Junior Members do not receive the *Journal*, but can purchase this at a subscription rate decided by Council.

Junior Members may attend ordinary Society meetings.

Junior Members may be expelled from the Junior Section if, in the opinion of Council, they act in a manner likely to be injurious to the good name, interests or aims of the Society.

(d) **Institutional and Library Subscription Membership.** Institutional and Library Subscription Members may be unlimited in number and their annual subscription should normally be four times the Ordinary Membership subscription, but will be determined by the Council.

(e) **Council.** The business of the Society shall be conducted by a Council consisting of Officers of the Society and other Members. The Officers will be the President, Vice-President (immediately retiring President for the period of one year), Chairman, Membership Secretary, Treasurer, Editor of the *Journal*, Librarian, Editor or co-editors of the *Bulletin* and Education Officer. Other Members of the Council shall be: Chairman of Committees and Sections, regional Branches and Associations, and Specialist Groups, a representative of the British Museum (Natural History) Amphibian and Reptile Section (if none is already on the Council) and six elected or co-opted Ordinary Members. Ordinary Members shall not serve on the Council for more than three consecutive years. The Council shall meet not less than three times yearly as and when necessary. A quorum shall be nine Council Members. The Council shall have the power to terminate the period of service of any Officer by majority voting. In the event of a vacancy occurring between two Annual General Meetings, Council shall have the power to appoint a substitute to serve until a new election can be made at an Annual General Meeting or at an Extraordinary General Meeting. The Council shall also have the power to co-opt extra members to perform special functions or in exceptional circumstances.

(f) **The President.** The President shall be elected by the Council and will serve for a period of five years. He may stand for re-election against other candidates proposed by Council or by Ordinary Members.

(g) **Other Council Members.** Other Officers and ordinary Council Members shall be elected at an Annual General Meeting (AGM). The names of nominees of the Council for election or re-election shall be circulated not less than 45 days beforehand. Ordinary Members may put forward other candidates whose nominations, signed by at least two members and the candidate, must reach the Chairman 30 days before the AGM. In default of other proposals, Members recommended by the Council shall be deemed to have been elected. Only members who have been subscribers to the Society at the time ballot papers are circulated are entitled to vote. If alternative proposals have been submitted, the names of all candidates shall be circulated to all Members and an election held at an AGM. A Member unable to be present at the AGM may record his or her vote by sending it in a sealed envelope to the Chairman, signed and marked "Ballot paper". Such envelopes are to be opened by the AGM Chairman and the ballot paper handed to the scrutineers.

(h) **Deputies.** The Council may appoint a deputy or assistant to act for any Officer for an unspecified period.

6. DUTIES OF COUNCIL OFFICERS.

(a) **Chairman.** The Chairman will be the Society's chairman in the absence of the President and will be responsible for co-ordinating the Society's activities with the assistance of other Council Members to whom he may turn. He will organise the talks to be given at Evening Meetings and will appoint Deputy Chairmen, as necessary, who will be responsible for ensuring a vote of thanks is proposed for speakers on behalf of the Society and that minutes are taken for each Evening Meeting, chairing the meeting themselves in the absence or instead of the President or Chairman. The Chairman will liaise between Officers of the Council, ordinary Council Members, Ordinary Members and representatives of other Societies, being involved with the Society's external relationships with other Bodies.

(b) **Membership Secretary.** The Membership Secretary will be responsible for receiving the Society's mail. He or she will keep an up-to-date list of Members and their addresses, recording the date when they first joined the Society and providing outline information on their interests. He or she will deal with enquiries, passing them to deputies as necessary, and will co-ordinate the Society's administration, including booking dates for the Evening Meetings, liaising closely with the Treasurer and taking minutes at Council meeting, should the Chairman be in the chair, and at the AGM. He or she should seek the assistance of Members outside the Council for the administrative duties involved, especially in connection with the distribution of the Society's publications, organising sub-committees as necessary. He or she will be a Member of the Society's Secretariat (administration committee).

(c) **Treasurer.** The Treasurer's duties will be to maintain books of accounts, control the receipt and payment of cash, liaise with the Society's Bank, ensure annual accounts are prepared, maintain an up-to-date list of fully paid-up Members, prepare lists of subscriptions due and send reminders to Members as specified in Rule 4, budget for future expenditure, present up-to-date financial returns at Council meetings or, after notice, when required and confirm the Annual Accounts Statement with two Auditors, who are Members of the Society but not Members of the Council. He will be a member of the Society's Secretariat.

(d) **Editors of the *Journal* and *Bulletin*.** On behalf of the Council, the Editors will be responsible for all matters connected with the publishing of the *Journal* and *Bulletin*, appointing editorial assistants or editorial sub-committees as appropriate.

(e) **Librarian.** The Librarian will be responsible for all matters connected with the Society's Library and publications. He or she can seek the assistance of other Members for the duties involved, especially for the sales of the Society's publications. He or she will draw-up a separate set of rules for the use of the Society's Library, liaising with the Librarian of the Linnean Society of London, where the Library is housed, as necessary.

(f) **Education Officer.** The principal duty of the Education Officer shall be to take responsibility for the running of the Junior Section of the Society. This responsibility entails the production and distribution of the *J. Herps. Newsletter* three times a year, the distribution of the *Bulletin* to Members of the Junior Section, the running of the stamped-addressed-envelope Advisory Service for *J. Herps.* and the organisation, if possible, of occasional meetings for Junior Members.

The Education Officer shall also undertake the organisation of or assist with any BHS exhibits at public exhibitions, conferences, shows etc., the handling of any letters from schools, colleges or private individuals on educational aspects of herpetology or herpetological conservation education and the provision, whenever possible, of BHS speakers for meetings of other societies and organisations.

The Education Officer shall prepare an annual report of his or her activities and expenditure which will be presented at each AGM and published in the *Bulletin* following.

The Education Officer may solicit the aid of other Members when needed.

7. **EVENING MEETINGS.** The Society shall normally hold eight Meetings during the year which will include talks on a wide range of subjects of herpetology.

8. **ANNUAL GENERAL MEETING.** The Annual General Meeting shall take place before the end of the taxation year in late March or early April. The business transacted shall be the passing of the accounts for the previous year, the adoption of the Annual Report of the Council, including the regulation of the editing of the *Journal* and *Bulletin*, the election of the Officers and Members of Council, reports of the work of the Committees and sub-committees, Sections, Regional Branches, Associations and Specialist Groups, and any business for which due notice has been given to the Chairman, including a change in the Rules of the Society.

9. **EXTRAORDINARY GENERAL MEETING.** An Extraordinary General Meeting may be summoned by the Council or by not less than five members of the Society on a written request addressed to the Chairman. During this meeting, the business for which it was convened shall alone be discussed. When calling a special general meeting on any application, the Chairman shall allow at least 14 days to intervene between the date of issue of the notices and the date fixed for the meeting. Should the date selected, upon agreement, coincide with an Evening Meeting of the Society, the subject matter of that meeting will follow the business for which the Extraordinary General Meeting was called. Otherwise, the meeting shall be held in London within 30 days of the receipt of the original request by the Chairman.

10. **COMMITTEES AND SUB-COMMITTEES.** The Council shall have the power to appoint Committees and Sub-Committees for special purposes. Membership of such Committees and Sub-Committees shall normally be restricted to Members of the Society. The period of office for all Members of Committees and Sub-Committees shall expire at the Annual General Meeting, but may be renewed by the Council then elected. Any Member of Council may attend a meeting of a Committee or a Sub-Committee, but shall not have a vote unless he has

been appointed a Member of that Committee or Sub-Committee.

11. REGIONAL BRANCHES AND ASSOCIATIONS, SPECIALIST GROUPS. Regional Branches and Associations, and Specialist Groups, collectively considered as Branches, can be approved by the Council; any person being permitted to join any Branch wherever he or she may reside. The British Herpetological Society is a National Society and recognises a regional herpetological need.

A Branch shall accept, in general, the objects of the Society.

A Branch shall become self-supporting financially, organise its own programme and select its own body of Officers. Meeting fixtures should not coincide with those of the main Society, but may be held on behalf of the Society.

Branch membership shall normally be restricted to those already Members of the Society.

Any major changes in policy of a Branch shall be subject to approval of the Council.

12. ALTERATIONS TO THE RULES. Any alterations or changes in the Rules may be adopted by two-thirds of the Members present at an Annual General Meeting or at an Extraordinary General Meeting convened for the purpose. The proposed change(s) must be stated in the circular convening the meeting.

M.R.K.L.

BHS MEMBERSHIP OF IUCN

The 15th General Assembly of IUCN (the International Union for the Conservation of Nature and Natural Resources) was held in Christchurch, New Zealand, 11-23 October 1981. The BHS was invited to send a delegate. Mr R.S.R. Fitter (Vice-Chairman, Fauna & Flora Preservation Society, London), a member of the UK Committee for IUCN, agreed to act as a proxy voter for the BHS. The BHS application for membership to IUCN as a national Non-Governmental Organisation was considered by the IUCN Council at its meeting in Christchurch prior to the General Assembly. Mr Fitter has informed the BHS unofficially (24 November 1981) that its application was approved unanimously.

This implies that the work of the BHS on the protection of amphibians and reptiles in Britain and elsewhere now has the official sanction of IUCN. The Conservation Committee and other BHS Members should be congratulated for achieving this recognition of their contribution in Britain. The BHS will now be in a position to advise the Council of Europe Conservation Section on matters relating to the conservation of British Herpetofauna. BHS Members will already be aware that Dr Ian Swingland, presently a Member of the main Committee and carrying out ecological research on tortoises at the University of Kent, is already the Chairman of the IUCN/SSC (Species Survival Commission) Tortoise Group, which had its Inaugural Meeting in Oxford, 1-2 October 1981.

NEW PRESIDENT A TRUSTEE OF THE BRITISH MUSEUM (Natural History)

It was announced in *The Times* on 25 November 1981 that the BHS's new President, the Earl of Cranbrook, has been appointed a Trustee of the British Museum (Natural History) in the place of Sir Hugh Elliott. The Society will wish to congratulate him and send their best wishes for this new appointment.

NEW SOCIETAS EUROPAEA HERPETOLOGICA CONSERVATION AND MAPPING COMMITTEE

Mr Keith Corbett has informed the BHS informally that he has been elected the Chairman of a new conservation and mapping committee of the European herpetological society, Societas Europaea Herpetologica, proposed during the Plenary Session of the First Ordinary General Meeting in Vienna, Austria, 13-15 September 1981.

A PROPOSED EUROPEAN COORDINATING COMMITTEE

(based on an SHF document, Jaca, 28 May 1981, see *Bull. Soc. Herp. Fr.* 18, 46-47, 1981)

When the Franco-Spanish Herpetological Colloquium took place on 25-29 May 1981 at Jaca (Huesca), Spain (see later), representatives of several European countries took the opportunity to discuss the formation of a European committee to coordinate combined activities of the different national herpetological societies. Previous efforts have demonstrated the need for mutual consultation. It was therefore decided at Jaca to put forward a proposal for consideration by the societies.

Aim and function of the European Committee. The extending of herpetological activities amongst the different countries of Europe make contact among the different national societies necessary. But this spread of interest tends to initiate meetings in several countries so that in 1981 there were at least the Franco-Spanish Colloquium at Jaca (25-29 May), the Congress of Herpetologists of the Socialist Countries at Budapest (25-29 August), the Symposia of Societas Europaea Herpetologica (SEH) (13-16 September) and the German Society (DGHT) (16-20 September) at Vienna, and the International Herpetological Congress with 2nd European Chelonian Symposium (3-8 October) at Oxford.

For reasons of effectiveness and to avoid the scattering of herpetological information, it is desirable that a committee comprising representatives of different national interests be responsible for coordinating and appraising meeting proposals. Such information about European meetings would be transmitted by the committee through existing publications of the various national societies and groups, which ought to reserve a space for 'Activities of other European Societies'. The SEH proposes to include communiqués from the different societies in *Amphibia-Reptilia*. It should be mentioned that a Congress bringing together the Members of all the national societies may come against the difficulty of communication among participants speaking different languages with too many to be effective. It is therefore proposed that multinational congresses or colloquia should concentrate on a particular topic of herpetology. More frequent symposia relating to up-to-date scientific research of a specialised nature could with advantage be organised by SEH.

In no case would the European Committee interfere with the normal activities of the national societies, which would probably cater for local interests, but only in the matter of coordinating proposals by these societies for multinational meetings.

Attending:— J. Eiselt (President, SEH), Sr. Ortiz, E. Balcells R., J.P. Martinez-Rica, A. Salvador, J.P. Gasc (President SHF), J. Lescure, H. Saint-Girons, K. Klemmer (President, DGHT), W. Bohme, K. Grossenbacher, M. Pillet, M.H. Caetano, C. de Haan, I.R. Swingland (BHS Representative — apologies for absence).

In a letter (9 July 1981) from the President, Société herpétologique de France (SHF), the BHS was asked to designate one or two members to become part of the Committee and attend its meetings. Mr K. Grossenbacher (Naturhistorisches Museum, Bernastrasse 15, CH-3005 Bern, Switzerland) has provisionally accepted the position of Secretary of the Committee and any reply should be sent to him. Details of the date and place of the next meeting will be sent at a later date. Subsequently, M G. Matz (Secretary, SHF) proposed at the 1981 AGM of the SHF that a Common European Meeting of the different European national herpetological societies be organised in early September 1983 at Strasbourg in conjunction with the Council of Europe.

A REPORT ON THE FRANCO-SPANISH HERPETOLOGICAL COLLOQUIUM, JACA, 25-30 May 1981

(based on reports in *Bull. Soc. Herp. Fr.* 18, 42-45, 1981)

The Franco-Spanish Herpetological Colloquium held at Jaca (Huesca), Spain, was attended by 120 participants from 10 countries (Spain, France, Portugal, Yugoslavia, F.R. Germany, Switzerland, Austria, Belgium, Netherlands and Great Britain), 43 of whom were members of the Société herpétologique de France (SHF). Forty-four papers were read, some of which will be published in the review of the Centro Pirenaico de Biología experimental of Jaca and some in the *SHF Bulletin*, and will be sent to all participants. A 'Chronique abrégée du colloque et aspects d'intérêt' was sent to the British Herpetological Society by one of the co-organisers, Dr E. Balcells R., a long standing BHS Member. During the Colloquium, a session of popular French scientific films attracted nearly 400 people to the Congress Hall.

The document putting forward a proposal to form a European Coordination Committee of the different national herpetological societies (see earlier) was read out during the plenary session at the end of the Colloquium. SHF Members expressed their gratitude to the co-organisers of the Colloquium, Dr Balcells and J.P. Martinez Rica of the Centro Pirenaico de Biología experimental for the meeting had proceeded in an excellent cooperative atmosphere.

General conclusions. The herpetologists from the 11 countries, five of which were Mediterranean, suggested that other colloquia on Mediterranean herpetofauna should be organised in the future. It was requested that future colloquium organisers should invite representatives of non-European countries to attend which are situated in the Mediterranean climatic zone. Naturally, herpetologists from non-Mediterranean countries studying herpetofauna from throughout the Mediterranean range would be welcomed also. A scientific plan of investigation is required which will allow a constant exchange of information among herpetologists of different specialised fields. It was apparent at the Jaca Colloquium that:—

1. practical observations by non-professional herpetologists can be of the greatest value to specialists
2. understanding often occurs interdisciplinarily between, say, morphometric and systematic studies, anatomical and ecological, and behavioural field studies. Such understanding becomes ever more important in relation to the effective protection of Mediterranean species.

Herpetologists will need the means and authorisation to work on threatened species when protected by legislation. Such investigations must take into account species fragility and conform to a code of practice restricting the number of specimens taken and maximum utilisation of such material by the largest number of investigators. It must be pointed out that the disappearance of species of amphibians and reptiles is more often than not due to the destruction of their habitats, caused notably by building development and road works involved in the construction of motorways.

Herpetologists breeding from their own countries should be encouraged in order to improve their knowledge of these animals and contribute thereby to the education and appreciation of the general public to amphibians and reptiles and so increase their chances of receiving protection. It is to be hoped that Public Authorities and all herpetologists will become concerned about the survival of indigenous species in the greater Mediterranean region, particularly island species, which are all very sensitive to disturbance and threatened by massive touristic interests sprawling along the Mediterranean coasts.

A special plea is made to Public Authorities to take all appropriate measures for the conservation of such living fossils as the discoglossid toad on Mallorca, *Baleaphryne cf. muletensis*, and the Canary lizard *Gallotia s. simonyii*.

M.R.K.L.

REPORT TO THE BRITISH HERPETOLOGICAL SOCIETY'S
CONSERVATION COMMITTEE
Natterjack Toads (*Bufo calamita*) in Norfolk

Observations made at known colonies

Inland Site 1

The 1981 season was marked by high water levels throughout the spring and summer and successful breeding at both ends of the common. In early May the equivalent of two spawn strings were collected and transferred to the reintroduction site at Sandy. Some of the apparently normal eggs developed into pallid tadpoles. A total of 17 or 18 spawn strings was located during the first two weeks of May and there was no evidence of later spawning. The season was probably the best one for natterjacks since 1977.

The threat to wildlife from a truck track to be developed beside the common subsided during the year with a lack of support for the scheme in some quarters and strong objections from others.

Although the most important part of the common from the point of view of the toads is being managed by the Norfolk Naturalists Trust, the northern part would benefit from management and legal protection. The whole common has yet to be notified as an SSSI. In 1975 an area of the common almost as large as the existing piece was ploughed to the detriment of the natterjacks. With the increased use of marginal land for agriculture the area of suitable habitat for the toad in this district could easily become very small.

Several areas of scrub on the common were burned during the year but no heather was lost.

This year observations have been made by David Billings, John Goldsmith, Malcolm White and myself.

On 3rd January the ponds in the north of the common were completely dry and there was little water in those in the southern part. The main NNT scrape had just two small patches of water in the deepened parts.

By the weekend of 21/22 February the water table had risen to produce a single body of water in the main scrape. The SW margin of this scrape had been recently regraded by the Conservation Corps. The position of secondary fire breaks was discussed and finalised. Some scrub was removed from beside the main track to improve its effectiveness as a fire break.

Natterjack toads were first seen on 5th April between ponds 13 and 14. On 9th April males were heard calling near pond 11. No activity was recorded in the morning of 12th April but by 11pm males were calling again.

During the afternoon of 18 April no natterjacks were encountered. The water level was noticeably higher than in February. Wicken pond was spilling across the road and the main track on the common was flooded at the bottom end. The scrapes were full with water. Although pond 5 was dry pond 4 had about one foot of water in it. The water draining through the pipe at the southern end of the common had a pH of 7.0. The pH at other sites was as follows:— main scrape, west side 6.6; main scrape, east side 7.4; small scrape, 7.6; track, 7.0-7.6. Common toads had spawned in the same area of the main scrape as in 1980.

The water table was even higher on 2 May with pond 13 encompassing part of the track, ponds 6 and 7 full to their brims, and ponds 4 and 5 flooding out across the track. Eight or nine spawn strings were located, four in the south and four or five in the north. Some information was collected from the strings and it is given below. On 3 May three more strings were found at the southern end of the common. In pond 4 a dead male natterjack was found (body length 54mm, weight 14.5g). One string of spawn could not be relocated. Thus 11 or 12 strings had been found over the weekend.

Natterjacks were calling on the mild evening of 8 May and in pond 14 a large gravid female was found in amplexus with a male common toad. The pair were separated and the female released where the males had been calling.

Date	Water Depth	Length of String†
2/5	41-56mm	135cm
2/5	46-76mm	144cm
2/5	33-40mm	192cm
2/5	43-66mm	Not measured
3/5	36-46mm	145cm
3/5	56-66mm	Not measured
3/5	56-66mm	Not measured

Mean 44-59mm (n=7) 154cm(n=4) †all strings were double total length of spawn = length x 2.

Three strings of spawn were found near pond 13 and five (at least three new ones) near pond 14 on 10 May. No more spawn was found during the season, thus the minimum number of 17 strings had been found during 1981. On over-cast days with a breeze to ripple the water surface it was difficult to see spawn strings and tadpoles.

Several hundred natterjack tadpoles were transferred to deeper water from wheel ruts filled with water on 17 May. This operation was repeated with more tadpoles on 30 May. No adults were seen on 30 May but a few adults were found wandering about on 31 May.

During the afternoon of 20 June no adult toads were seen but tadpoles of about the same age were found in pond 4, pond 14 and the flooded area near the main scrape. Newly emerged common toadlets were noticed.

Large numbers of natterjack toadlets were seen on 12 July at the southern end and where they were found, they outnumbered common toadlets. On 23 July natterjack toadlets were found by pond 4 where the water pH was 6.5-6.8. Large numbers of natterjack toadlets were encountered on the flooded track between ponds 10 and 13 and also further down the track. Vast numbers of common toadlets were also observed. An estimated 1,500 natterjack toadlets and many thousands of common toadlets were seen. The pH of the water at the southern end was recorded as 6.5. Good numbers of natterjack toadlets were recorded again on 26 July with smaller numbers of common toadlets in the same area.

By 16 August water levels had dropped throughout the common, by about two feet at the northern end and one foot at the south. Toadlets were again recorded in good numbers. A similar situation was recorded on 30 August with the toadlets seeming to favour the area of rush which runs parallel to the main track and incorporates pond 11.

Coastal Site 2

This site was visited on 2 May during the afternoon. The pH values of the water in the breeding pools were as follows:— Area A not tested; Area B (northern edge) 8.1-8.2; Area C (N.E. corner) 7.7-7.8; Area D, D1 8.2-8.4, D2 8.2-8.4, D3 8.0-8.4, D4 8.4, D5 not tested.

In a search for spawn strings Area A revealed none during a brief search; Area B a minimum of 19 strings; Area C 6-7 strings and a pair spawning in water with a temperature of 17-19°C and a depth of 8 cm; Area D, D1 6-7 strings, D2 2-3 strings, D3 1 string, D4 and D5 no spawn. Thirty four to thirty seven strings were found during the visit.

Coastal Site 1

The pH of the pools was tested on 17 April and the following results obtained: pool in dune heath near boundary fence 3.8-3.9; main scrape, landward end 7.4-7.7, seaward end 7.8-8.2; new scrape 6.6-7.1. An estimated 17-21 string of spawn had been laid around the edge of the main scrape. No development was visible to the naked eye and there was no fungal infection. The new scrape held only two hatched clumps of frog spawn.

On 20 June only 3 natterjack tadpoles were seen in the new scrape and one tadpole was found in the main scrape after a careful search. No adult natterjacks were encountered on either visit.

No records of natterjacks were received from any other site in Norfolk.

A REPORT ON THE 2nd EUROPEAN CHELONIAN SYMPOSIUM, 3-4 October 1981

A Symposium, following-on from the Inaugural Meeting of the IUCN/SSC Tortoise Group (1-2 October 1981), was held in the Department of Zoology, University of Oxford, in conjunction with the International Herpetological Congress (3-8 October 1981). The 1st European Symposium on Tortoises, organised by M J.-P. Risch (Laboratoire des Reptiles et Amphibiens, Museum National d'Histoire Naturelle, Paris), was held in conjunction with the Annual Meeting of the Société Herpétologique de France (SHF) at Nancy on 16th May 1980. Copies of the Proceedings, in French, some papers with English abstracts, are available from M Risch; price 10Ff. The Symposia aim to bring together European and other specialists working on the biology, especially the ecology, relating to the conservation of Mediterranean tortoises, and also fresh-water forms. Since tortoises were specifically considered by the IUCN/SSC specialist group, investigations on terrestrial forms were primarily considered at the 2nd Symposium.

The language of the Symposium was English, following the principle laid down by Societas Europaea Herpetologica for their First Ordinary General Meeting in Vienna (13-16 September 1981). Exceptionally and in deference to the 1st Symposium, a paper in French was presented with a written summary available for circulation. Papers were not considered unless written summaries were submitted. Such information on the subject matter facilitated the organisation of the papers' order of presentation. A weekend was chosen in order that non-professional zoologists from the Continent and Britain could also attend. A programme was prepared as follows:—

Saturday, October 3.

Morning session.

Introductory remarks. Dr I.R. Swingland, Chairman of the IUCN/SSC Tortoise Group.

LAMBERT, M.R.K. (GB). The conservation of Mediterranean (West Palaearctic) tortoises: an overview.

Conservation. Chairman: Dr M.R.K. Lambert.

CHEYLAN, M. (F). Actual status and future of Hermann's tortoise in Western Europe. (In French).

MENDELSSOHN, H. (IL). The biology and conservation problems for *Testudo kleinmanni* and *Testudo graeca* in Israel.

BBC 1978 'Wildtrack' film (GB) on the Yugoslav tortoise trade.

Afternoon session.

Conservation and welfare. Chairman: Prof. C.P. Blanc (F).

WINDOLF, R. (D). Some remarks on *Testudo hermanni hermanni* in Yugoslavia, especially Montenegro.

VODDEN, P.H. (GB). The R.S.P.C.A. and the tortoise trade.

EVANS, Mrs P. (GB). A film (1978). "Year of the tortoise".

KIRSCH, W. (DDR). A note on the breeding of Mediterranean tortoises on an East German farm in 1981. Read by M.R.K. Lambert.

KRAMER, T. (NL) & VICKERS, B. (GB). *Testudo hermanni robertmertensi* on Mallorca.

Sunday, October 4.

Morning session.

Ecology. Chairman: Dr I.R. Swingland.

STUBBS, D., HAILEY, A., PULFORD, Elizabeth & TYLER, Wendy (GB). Population ecology of European tortoises — a review of field techniques.

HAILEY, A., PULFORD, Elizabeth & STUBBS, D. (GB). Comparative activity patterns of *Testudo hermanni* in Greece and France.

PULFORD, Elizabeth, HAILEY, A. & STUBBS, D. (GB). Thermal relations of *Testudo hermanni robertmertensi* in France.

VROOM, A.V. (NL). The habitat of *Testudo hermanni robertmertensi* and *Mauremys caspica leprosa* in the Monts Albérès, N.E. Spain.

TURNER, F.B. & MEDICA, P. (USA). Cattle grazing and desert tortoises. Read by Kristin H. Berry.

Afternoon session.

Conservation and ecology of non-West Palaearctic tortoises.

BERRY, Kristin H. (USA). The status of the desert tortoise (*Gopherus agassizii*) in the United States.

Chairman: Dr Kristin H. Berry.

GREIG, J.C. (SA). The conservation status of South African land tortoises. Read by I.R. Swingland.

BRANCH, W.R. (SA). Aspects of the biology of the angulate tortoise (*Chersina angulata*) in the Eastern Cape, South Africa. Read by M.R.K. Lambert.

SWINGLAND, I.R. (GB). A morphometric confirmation of behavioural polymorphism in a giant tortoise population.

Final remarks. Dr M.R.K. Lambert, Symposium organiser and member, IUCN/SSC Tortoise Group (West Palaearctic) species. In summary, the final remarks were as follows:—

As organiser of the symposium, please may I thank all the speakers for contributing and presenting papers, for many of you, I know, have come from long distances away. May I remind you that any outstanding manuscripts, and summaries with references if published elsewhere, should be forwarded to me by 30th October 1981. Perhaps my concluding remarks could include the following observations.

The range of papers presented highlight the importance of habitat for the conservation of tortoise species. In particular, the full range of habitats suitable for the survival of *Testudo hermanni robertmertensi* have been dwelt upon. This is plainly a threatened species in western Europe and the recent work of M. Cheylan is especially important in this context. Regrettably there were no papers presented on the status and ecology of *Testudo marginata*, the species largely restricted to southern Greece. No information, moreover, has been presented on the widely distributed Central Asian U.S.S.R. species, *Agrionemys (Testudo) horsfieldii*, which has been imported by Western European countries for the pet and food trades. Perhaps the future will see cooperation by the Soviet Union in relation to this species' conservation and information on the species' status from Soviet herpetologists in due course.

The value of consistency in field technique has also been stressed, bearing in mind particularly the large number of possible morphometric measurements relating to growth and population dynamics. This could be very relevant in the future with regard to training workshops for the instruction of non-professional zoologists making field observations on Mediterranean tortoises.

Kirstin Berry's work on the desert tortoise, *Gopherus agassizii*, in the south-western deserts of the U.S.A. has highlighted the problems of habitat change and disturbance from human leisure activities and, together with F.B. Turner and P. Medica, agricultural grazing in arid areas of low or erratic rainfall. Such problems also concern the Mediterranean coastal areas subjugated to development through the demands of commerce and mass tourism, increased population and the construction of motorways. Work on the species in the American deserts, moreover, could be

relevant to such Mediterranean desert species as *Testudo kleinmanni* and *Testudo graeca floweri* in southern Israel, and the factors limiting the range of distribution of *Testudo graeca terrestris* in the Near East and *Testudo g. graeca* in North Africa, especially Libya, through desertification in the northern Saharan encroachment zone. Such work may also be relevant, incidentally, to the Sahelian grooved tortoise, *Geochelone sulcata*, a little further south. It is also very encouraging to learn of the work on tortoises in South Africa for there, particularly in the case of such a species as *Chersina angulata* based on the solid work of W.R. Branch (Secretary of the Herpetological Association of Africa) at the Port Elizabeth Museum, a rather similar Mediterranean-type climate is experienced.

The R.S.P.C.A. has publicised the cruelty aspects and stress experienced by tortoises wild-collected for the bulk pet trade resulting in over 80% dying by the end of the year following import to north-western Europe. Plainly it is time this trade was halted completely both on ethical and conservation grounds, and on a world-wide level is a high priority statement of the IUCN/SSC Tortoise Group. W. Kirsche's work in East Germany has demonstrated that breeding of some West Palaearctic tortoises (*Testudo h. hermanni* especially, but also *Agrionemys (Testudo) horsfieldii*) is possible even in northern Europe, but ultimately breeding farms would need to be set up in the Mediterranean climatic range if the 'cut-flower' pet trade in tortoises is to continue at all. Mrs P. Evans's film on keeping tortoises in a British garden has a high educational potential and she should be congratulated for her home-breeding successes. The trade in tortoises for bulk export, however, still continues in Yugoslavia and Turkey. The Yugoslav coasts are also subject to tourism and R. Windolf described some of the problems facing the survival of *Testudo h. hermanni* in the wild.

From conservation to research the work of I.R. Swingland on Aldabran giant tortoises has demonstrated the research potential of Mediterranean (West Palaearctic) tortoises, applicable especially in an evolutionary context which has already been proposed, although unheeded, by G.E. Watson (USA) some years ago (1962) for the Balkans, Aegean region and Asia Minor. The ecological work of D. Stubbs and colleagues on *Testudo hermanni* will undoubtedly provide further information on the species' behaviour and habitat requirements which are essential for future conservation strategy.

It is hoped that Symposia such as this and discussions within the IUCN/SSC Tortoise Group will contribute towards and help in the formulation of future conservation strategy for Mediterranean and other threatened species of tortoises. My personal view is that a current status survey of tortoise populations and their habitats is still required for the Mediterranean region as a whole, especially outside Europe, and that the bulk pet trade in largely moribund tortoises should be halted completely if the species are to survive in their native haunts and continue to be part of the natural landscape of the Mediterranean lands.

M.R.K. Lambert
London, 30 October 1981

IUCN SPECIES SURVIVAL COMMISSION
Tortoise Group

ACTION PLAN-Summary (1 & 2 October 1981)

Highest Priority

MADAGASCAR *Geochelone yniphora*-Madagascar tortoise
 (*Pyxis planicauda*-Madagascar Flat-shelled tortoise)
 (*Pyxis arachnoides*-Spider tortoise)

Implementation of immediate conservation measures to save the rarest (< 20) tortoise on earth (and other species).

MEXICO *Gopherus flavomarginatus*-Bolson tortoise

Investigative conservation project of the most endangered species on that continent.

SE ASIA & INDIA *Geochelone forsteni*-Sulawesi tortoise
 Geochelone platynota-Burmese Starred tortoise
 (*Geochelone emys*-Burmese Brown tortoise)
 (*Geochelone impressa*-Impressed tortoise)

Survey of existing reserves, focussing on species within boundaries.

SOUTHERN AFRICA *Psammobates geometricus*-Geometric tortoise

Acquisition of further small reserves, staff, management implementation and monitoring.

SOUTH AMERICA

Species status of *Geochelone donosobarrosi*, anti-trade action on other species and miscellaneous actions.

High Priority

Status surveys: *Terrapene nelsoni*-Pedro Pablo Box Tortoise
 Testudo kleinmanni-Egyptian tortoise
 Testudo hermanni (Western populations)-Hermann's tortoise
 Malacochersus tornierei-Pancake tortoise
 Geochelone chilensis-Argentine tortoise

Priority

Pressure-group activities:

Geochelone polyphemus-Florida Gopher tortoise
Geochelone agassizii-Desert tortoise
Testudo sulcata-Spurred tortoise

Anti-trade
Habitat conservation
Education
Captive breeding

Policy and Position Statement on Captive Breeding

The IUCN tortoise specialist group urges all institutions or individuals having tortoises in their care to endeavour to breed them; successful captive reproduction being the best criterion of sound captive management and much behavioural and husbandry information resulting from well designed captive culture programs.

The group nonetheless cautions against acquisition of tortoises by institutions or individuals with the justification of the intention of captive breeding, especially when captive breeding is more of a fond hope than a confident expectation.

The group urges that in all cases preservation of tortoise populations and species by habitat maintenance and controls on collection be the preferred technique, and that captive reproduction is essentially an *in extremis* approach to be used when habitat has collapsed or when the species is so rare that natural reproduction is unlikely.

Wherever possible captive breeding should be undertaken within the natural range or appropriate climatic conditions.

If captive breeding and subsequent release of tortoises is undertaken, the following precautions should be followed:

- i) Genetic pollution should be vigorously avoided by utilizing stock of known origin and releasing subsequent generations in the same general area as that from which the stock was obtained; stock of unknown origin should only be used for extremely rare and localized forms.
- ii) Care should be taken to avoid introduction of parasites or bacteria to wild populations in the course of release of captive-bred individuals.
- iii) Care should be taken to avoid shell distortions caused by over-rapid growth or nutritional deficiencies in tortoises propagated for release.
- iv) Release of captive tortoises anywhere and by anyone should be coordinated with accepted scientific and conservation authorities, ideally the members of the IUCN tortoise Specialist Group.
- v) The releases should be timed to coincide with the onset of optimal conditions of temperature, light and rainfall.
- vi) Tortoises for release should be uniquely and permanently marked and full records maintained.

Policy and Position Statement on Trade

The Tortoise Specialist Group declares that the commercial trade in tortoises; for food, pets, luxury and gift products, is unjustified and harmful to the survival of most species. The Group condemns the pet trade because of the high mortality of imported animals, owing to the poor ability to adjust to climatic changes and captive conditions bearing in mind that tortoises are wild animals and not domestic pets.

The Group reminds Governments that the Convention on International Trade in Endangered Species of wild fauna and flora (C.I.T.E.S.) requires that exporting countries draw up management policies for tortoises involved in international trade for profit. Importing countries are likewise obliged to restrict the import of tortoises for which such management plans do not exist. Governments are urged to ratify and accede to the convention as a matter of priority.

The Group, therefore, recommends a total ban on the bulk trade in tortoises.

Policy and Position Statement on Museum Collection

The Group advocate an extremely conservative position in taking and killing series of wild tortoises for scientific collections, and urges that such collections not be random but be made with careful consideration of the population status of the species concerned and the real scientific need for the specimens taken.

The Group urges that dead tortoises found in the wild be collected and deposited in museum collections either as spirit or osteological specimens, with full locality and other data recorded.

The group recommends that tortoises that die in zoological or private collections or in captive breeding programs be preserved and offered to museums or for other scientific use, again with full data on the origin and history of the specimens recorded. Generally, very rare species or those with complete collection data are suitable for museum purposes, and others can be used for teaching purposes and anatomical, post-mortem and pathological studies.

IUCN SPECIES SURVIVAL COMMISSION: Formation of Snake Specialist Group

A Snake Group has been formed by the IUCN Species Survival Commission. The objectives of the group are to provide up to date information for the Red Data Book and to initiate, in order of priority, conservation action.

Information is required on the status of species considered to be endangered or under heavy pressure, in any part of the world. People who have information which they think may be of value should write to:

Romulus Whitaker,
Chairman,
SSC Snake Group,
c/o Madras Snake Park,
Guiudy Deer Park,
Madras 690 022,
South India.

1982 JOINT ANNUAL MEETING OF THE SOCIETY FOR THE STUDY OF AMPHIBIANS AND REPTILES (25th Anniversary Meeting) AND THE HERPETOLOGISTS' LEAGUE

This will be held at Raleigh, North Carolina, USA, State Museum of Natural History, 1-6 August 1982. Details are available from:

Ray E. Aston,
North Carolina Museum of Natural History,
P.O. Box 27647, Raleigh,
North Carolina 27611,
USA.

All interested persons are welcome to attend.

INTERNATIONAL TURTLE AND TORTOISE FOUNDATION

This is a new society which publishes the journal "Chelonologia" and "Turtle and Tortoise Review". Full details of membership are available from:

The Secretary,
I.T.T.F.,
P.O. Box 125,
8700 AC Bolsward,
The Netherlands.

ASSOCIATION FOR THE STUDY OF REPTILIA AND AMPHIBIA

Headquarters: The ASRA Rooms, Reptile House, Cotswold Wild Life Park, Buford, Oxon.

ASRA MONTHLY MEETINGS FOR THE FIRST HALF OF 1982

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

Saturday 13 February

The "Natterjack Toad" by Anthony Arak.

Saturday 6 March

Seventh Cotswold Herpetological Symposium, 10.00 am to 5.00 pm. Theme of the Symposium — Amphibians (their biology, conservation and husbandry).

Cost of a ticket £5.50 which includes a copy of symposium proceedings and entrance to the Cotswold Wildlife Park. Restaurant facilities are available. Further details from the ASRA Treasurer, at the above address.

Saturday 13 March

"Reptiles of the Galapagos" by Ian Swingland.

Saturday 10 April

"Captive Breeding and housing Amphibians" by Anthony Milwood.

Saturday 8 May

"Parasites of Reptiles and Amphibians" by Keith Lawrence.

Saturday 12 June

"Lizards of the genus *Podarcis*" by John Cortes.

SECOND NORDIC HERPETOLOGICAL SYMPOSIUM, 1982

The 2nd Nordic Herpetological Symposium will take place on Thursday and Friday, 28-29 January 1982 in the Department of Zoology, University of Gothenburg, Sweden. The organisers are Dr C. Andren, Dr T. Hagström and Dr G. Nilson and the Symposium is sponsored by the Nordisk Kollegium för Ekologi (Nordic Council for Ecology). The languages are Swedish, Danish and Norwegian, but abstracts in English will probably be published. The programme will be complete in December or January and can be ordered from the organisers. Address: Department of Zoology, University of Gothenburg, Box 25059, S-40031 Göteborg, Sweden.

Proceedings of the 1st Nordic Symposium on Herpetology, held in Gothenburg, Sweden, 20-21 November 1975, with 14 abstracts (edited by Torkel Hagström) were published in the *Norwegian Journal of Zoology*, 24, 231-240 (1976), in English. The abstracts include a summary by E. Wederkinch (Museum of Zoology, Copenhagen, Denmark) on the efforts of the NHF (Nordisk Herpetologisk Forening) to protect the amphibians and reptiles of Denmark. Cooperation with a society, 'Natur og Ungdom', in Denmark is taking place in 'atlas investigation'.

THE SIXTH REPTILE SYMPOSIUM ON CAPTIVE PROPAGATION & HUSBANDRY

The National Zoological Park, Washington, D.C. — July 28-31 1982

CALL FOR PAPERS

All herpetologists are invited to submit for consideration the titles of papers they wish to present at the 6th Reptile Symposium on Husbandry and Propagation. Paper lengths may range from 15 to 40 minutes. A preliminary program will be established by April, 1982. Speakers will be expected to submit a 100-150 word abstract of their talk by April 30, 1982; a completed copy-ready manuscript must be submitted prior to the Symposium. Submit all program information to:

Thomas A. Huff, Program Chairperson, Reptile Breeding Foundation, PO Box 1450, Picton, Ontario KOK 2T0 Canada; 613/476-3351, 476-3691.

Symposium Coordinator is: Dr. Martin J. Rosenburg, Department of Biology, Case Western Reserve University, Cleveland, OH 44106; 216/368-2755, 368-3558, 451-1081.

Host Committee Chairperson is: Béla Demetar, Department of Herpetology, the National Zoological Park, Washington, D.C. 20008; 202/357-1300.

Symposium Series Director is: Richard A. Hahn, Zoological Consortium, Inc., 13019 Catocin Furnace Road, Thurmont, MD 21788; 301/662-0328.

PROCEEDINGS OF THE MELBOURNE HERPETOLOGICAL SYMPOSIUM, held at The Royal Melbourne Zoological Gardens, Victoria, Australia, 19-21 May, 1980

Edited by Chris B. Banks and Angus A. Martin, and published by the Zoological Board of Victoria.

A collection of 35 papers and expanded abstracts covering Australian frogs and lizards, venom research, tortoises and turtles, and Australian crocodiles. Further papers discuss such topics as reptile diseases, herpetological communities, conservation and taxonomic studies. Many noted herpetologists are represented.

An important addition to any herpetologist's library.

Copies are available for \$12.00 (Australian) each, including postage and handling, from: Symposium Secretary, The Royal Melbourne Zoological Gardens, P.O. Box 74, Parkville, Victoria, 3052, Australia.

Please make cheques payable to: **Zoological Board of Victoria.**

**FIRST INTERNATIONAL COLLOQUIUM ON PATHOLOGY OF
REPTILES AND AMPHIBIANS
PREMIER COLLOQUE INTERNATIONAL DE PATHOLOGIE DES
REPTILES ET DES AMPHIBIENS
29.9.-2.10.1982 — Angers (France)**

From Prof. G. Matz (Secrétaire, Société herpétologique de France):—

This Colloquium will be held at the University of Angers. Every aspect of pathology will be examined: microbial and viral infections, parasitism, tumors, malformations, physiopathologic diseases, hybrid lethality, etc. Sessions will start with synthesis reports; communications will be done in the form of brief statements. Table meetings could be organised in relation with the various aspects of pathology according to the different proposals.

This Colloquium is co-organised by:

C. VAGO
Membre de l'Institut
Professeur à l'Université des
Sciences et Techniques du Languedoc
Laboratoire de Pathologie comparée
Place Eugène Bataillon
34060 MONTPELLIER Cedex
France

G. MATZ
Professeur à l'Université d'Angers
Laboratoire de Biologie animale
2 Boulevard Lavoisier
49045 ANGERS Cedex
France

Return pre-registration (if you plan to come please let us know as soon as you can for organisation purposes) and call for papers to G. MATZ. The registration form and program will be sent in March 1982.

**NEW GUIDE TO THE IDENTIFICATION OF BRITISH AMPHIBIANS
AND REPTILES**

John Buckley has prepared a new illustrated guide to the British amphibians and reptiles. The 17 page booklet is illustrated with line drawings, and there are descriptive notes on each species, including the eggs and larvae of the amphibians. Publication has been financed by the Society and the Conservation Committee. The booklets are priced at £0.35, plus £0.15 postage, and are available from:

John Buckley,
Conservation Committee,
British Herpetological Society,
c/o Zoological Society of London,
Regent's Park,
London NW1 4RY.

WILDLIFE AND COUNTRYSIDE ACT, 1981

The Wildlife and Countryside Act has now been passed by Parliament and has received Royal Assent. The provisions of the new Act will be fully implemented by the spring of 1982.

Species of reptiles and amphibians fully protected by the Act are the Natterjack, Crested Newt, Sand Lizard and Smooth Snake. It is an offence to collect, injure, kill or sell any of these species. There is power to grant licences for collection in certain circumstances (for scientific and educational purposes, for the purpose of conservation, etc.); the licensing authority is the Nature Conservancy Council.

All other species of reptile and amphibian are protected from commercial collection and resale. Licences for collection for the purpose of sale must be obtained from the Nature Conservancy Council; we understand these will generally be granted. The purpose of this form of protection is to enable the Nature Conservancy Council to monitor, and where necessary to control, trade. There are no restrictions on collection for non-commercial purposes.

The Conservation of Wild Creatures and Wild Plants Act 1975, which previously protected the Sand Lizard, Smooth Snake and Natterjack, has been repealed.

The Act makes illegal the release into the wild of any species not ordinarily resident in Britain; this includes alien species already established in this country (eg *Rana esculenta*, *Rana ridibunda*, *Hyla arborea*, *Alytes obstetricans*, *Bombina variegata*, *Xenopus laevis*, *Triturus alpestris*, *Podarcis muralis*).

The Endangered Species (Import and Export) Act 1976 has been amended to give new powers to restrict the importation of species which appear to be "unlikely to survive for any appreciable time if they are kept in the United Kingdom".

A full report on the new provisions of the Act and how it will be implemented will appear in the June 1982 issue of the Bulletin, by which time full information will be available from the Department for the Environment and Nature Conservancy Council.

THE BERNE CONVENTION: A CONTROVERSY, AND NEW INFORMATION

Detailed information has been provided by the Department of the Environment on the Government's plans to implement the Convention on the Conservation of European Wildlife and Natural Habitats ("Berne Convention"); this information helpfully answers many of the queries raised in Pickett and Townson's article "New International legislation: the Berne Convention" which appeared in the Bulletin No. 3, June 1981.

A letter has also been received from members of the Conservation Committee expressing their full support for the Convention, and strongly criticising the views expressed by Pickett and Townson. As the subject is controversial and complex, publication of the correspondence and new material has been deferred to the next issue of the Bulletin, to allow all of the interested parties a fair opportunity to examine the correspondence and reply to it.

REMARKABLE BREEDING RESULTS

1981 has been Mr. Bert Langerwerf's most successful year so far for breeding lizards. At the time of going to press, 1464 lizards of 27 species (32 including sub-species) had hatched, which, with some eggs still to hatch, should bring the total for the year to about 1500.

The full results are as follows:

Lacerta monticola cyreni 51 F1, F2
Lacerta agilis agilis 34 F2-F4
Lacerta saxicola brauneri 166 F2-F4
Lacerta strigata 125 F2, F3
Lacerta caucasica caucasica 6 F1
Lacerta schreiberi 7 F2
Lacerta horvathi 9 F1
Lacerta laevis laevis 39 F2-F5
Lacerta laevis troodica 7 F1, F2
Podarcis erhardii 10 F1
Lacerta rudis obscura 13 F1
Lacerta rudis svanetica 11 F1
Lacerta trilineata trilineata 251 F2
Lacerta trilineata hansschweizeri 19 F1, F2
Podarcis peloponnesiaca 1 F2
Lacerta armeniaca 9 F2
Lacerta unisexualis 28 F1
Lacerta danfordi anatolica 37 F2, F3
Lacerta lepida lepida 44 F2
Lacerta lepida pater 365 F2-F4
Lacerta praticola pontica 12 F3, F4
Lacerta graeca 8 F2
Podarcis lilfordi lilfordi 4 F2
Lacerta bedriagae paessleri 11 F1
Lacerta viridis 24 F1-F5
Algyroides nigropunctatus 6 F1
Gerrhonotus multicarinatus 70 F2
Ophisaurus apodus 4 F1
Agama caucasia 44 F1
Agama stellio 15 F2
Agama lehmanni 5 F1

This must certainly be the largest number of lizards bred in captivity within one year, anywhere, whether privately or in a public institution. It is even more impressive because it is the achievement of a man who also has a full time job (as a teacher of Physics) and a family.

Apart from having an indirect conservation value, a further advantage is that many species which are normally difficult to obtain are made available. Original observations on the reproduction of these species have also been made.

THE SOUTHERN ALLIGATOR LIZARD, *GERRHONOTUS MULTICARINATUS* BLAINVILLE 1935: ITS CARE AND BREEDING IN CAPTIVITY

BERT LANGERWERF

Beneden Kerkstraat 36A, NL5165 CC Waspik, Netherlands

INTRODUCTION

The Alligator Lizard belongs to the family *Anguidae*, which is distributed over the Americas, Eurasia and Africa. There are three subfamilies:

1. *Diploglossinae*, to which belong the genera *Diploglossus*, *Sauresia*, *Wetmorena*, *Ophiodes*, and *Celestes*; these are all confined to the Americas.
2. *Gerrhonotinae*, to which belong the genera *Gerrhonotus*, *Abronia*, *Coloptychon* and *Ophisaurus*.
3. *Anguinae*, to which belongs *Anguis*.

Subspecies, their distribution and biotypes

1. *Gerrhonotus multicarinatus multicarinatus* occurs in central and west-central California.
2. *Gerrhonotus m. scincicauda* occurs in the north-west of California, through west-central Oregon into southern Washington about the latitude of Kennewick.
3. *Gerrhonotus m. webbi* is found to the south of *multicarinatus* in southern California, east-central California, and the north western part of Baja California.
4. *Gerrhonotus m. nanus* is restricted to the Los Coronados Islands, Mexico.

In nature they live in dry rocky areas, open grassland, chaparral, and woodland. In particular, they prefer oak woodland on the lower slopes of the coastal mountains. They climb very well, are frequently seen in trees, and will even rob birds' nests.

THE ALLIGATOR LIZARD IN CAPTIVITY

I have kept this lizard in captivity since 1975, in various kinds of terraria. My animals came directly from California. As the males were very intolerant of one another, I had to keep them isolated in different terraria. The males could be distinguished by their fighting and their relatively large, broad heads. Further, their hemipenes could be exposed rather easily by gently pressing the base of the tail.

One vivarium in which I keep the lizards is the one of 16m² which I described on page 34 of the BHS Bulletin No. 3, June 1981. In winter (October-March) this enclosure is totally covered with glass. In summer, 90% is glass-covered. By this means, the animals are provided with a microclimate similar to that of California. The Alligator Lizards live in this enclosure for the whole year. On the southern slope of the enclosure, between the Mediterranean shrubs planted in it, is a layer of dead leaves (easily collected in Autumn). In the middle of the enclosure is a trench or depression running from east to west, thereby creating a cooler north facing slope, also covered with leaves and hay. Throughout the enclosure, there are large pieces of logs. There is 1m² only of exposed sand, kept slightly moist, in the north-west corner. Here there are no leaves, but some flat stones. This is the area used for egg laying.

In these conditions, the lizards are most active in April-May, and copulation takes place during this period. Later in the summer the males climb less often in the bushes and stay hidden in the hay and leaves; they are active, but are mostly not directly visible. The females also are not seen at this time as they are protecting their eggs (see later). In September, they can be frequently seen again basking in the sun.

I have kept the Alligator lizard with other species of lizards without problems: *Podarcis lilfordi*, *Lacerta strigata*, *Lacerta lepida pater*, *Lacerta t. trilineata*, *Agama stellio*, *Agama caucasia*, *Agama lehmanni* and *Ophisaurus apodus*. To keep Alligator lizards with smaller species could be dangerous.

I have also kept this lizard successfully in other terraria, both larger and smaller. I released one male in my large open-air enclosure where it survived two Dutch winters and summers! In a large glass house of 50m² and 4m high I often observed the animals in the bushes at a height of 2-4m.

In the 16m² terrarium the Alligator lizards disappear into hibernation in October, beneath the piles of hay, and emerge again at the end of February. This year I saw the first one on February 23rd, and in 1977 on February 14th.

REPRODUCTION

I have bred this species from the beginning, but from 1976-1980 it was never very successful (see table 1).

As I have described in my earlier articles, I always give calcium and vitamin D₃ to my lizards in the drinking water. This had a clear effect on the reproduction of all species except the Alligator lizards. Each year there were 20-40 eggs, but the number of births declined to zero in 1980. This

Table 1. Details of captive breedings of *Gerrhonotus multicarinatus* over the past 6 years.

Year	date of copulation	date of egg-laying	number of eggs	date of hatching	number hatched	incubation temperature	length of incubation (days)
1976	Apr 8	Jun 6	23	Aug 10,11,12	6	28°C	50-52
	Apr 8	Jul 2	20	—	—	28°C	50-52
1977	Apr 4	Jul 11	24	Aug 20,21,22	13	30°C	40-42
1978	?	?	?	Sep 9	7	29°C	?
1979	Apr 13	} before Jul 1	?	Aug 8	3	29°C	about 40?
	May 5						
1980	Apr 17	} before Jul 7	22	—	—	29°C	—
	Apr 30						
	May 5						
1981	Apr 24	Jun 20	20	Aug 1,2,3	20	27°C	42-44
		Jul 9	55	Aug 18,19, 20,21	50	27°C	40-43

caused me to rethink my methods. I thought that the lizards, active climbers that they are, might drink condensation droplets from the glass, and so receive no intake of calcium and D₃. This year I added the calcium and vitamin D₃ directly to the food itself: on about 1kg of crickets (*Gryllus bimaculatus*) I dusted one spoonful of Calcium Lactate and about 10 drops of highly concentrated vitamin D₃ (1 million units per ml.). As a result, success was high = only 5 of 75 eggs died. This is the breakthrough necessary to be able to breed them in hundreds annually in the near future.

Copulation takes place mainly in the second half of April; the eggs are laid at the end of June or the beginning of July. Hatching takes place in August. Full information is given in Table 2. Alas, as I have over 1000 lizards of about 40 species, I cannot notice everything that happens in the 50 terraria.

From the table it is clear that incubation is rather short, between 40-45 days. One may think, when reading the table, that the higher incubation temperature of 20-30°C may be the cause of poorer results in earlier years, but this is very unlikely: there were traces of calcium deficiency in the hatchlings of the years prior to 1981, such as a short lower jaw, parietal up-vaulting, weak feet and curved tail.

From the table it can be seen that in the worst years the incubation period was significantly longer than in 1981, even though the temperature was higher. I have also noticed the same tendency in *Lacerta* and *Agama* species, where eggs deficient in calcium take noticeably longer to hatch than good eggs.

A female usually lays about 20 eggs; the highest number I observed was 24 in 1977. There is only one clutch per female per year.

In 1976, two hatchlings were measured. Both had a snout-vent length of 37mm and total lengths of 97mm and 102mm respectively. In 1977 one hatchling was measured, total length 96mm. In 1981 a single hatchling was measured, snout-vent 34mm, total 90mm. It is remarkable that the hatchlings of the best years were the smallest, as usually, in other lizards, I have observed the opposite: eggs from females in poorer conditions produce smaller hatchlings.

I measured a single egg just after laying in 1976; this measured 17 x 10mm.

I have observed very remarkable behaviour in the females in almost every year: they remain with their eggs after laying to protect them. This year (1981) I have been able to make the best observations of this behaviour. In one terrarium there was a large flat stone beneath which three females *together* made a chamber and passage to it (see plate 2). In the chamber and entrance to it I found 55 eggs on 9th July. When I tried to remove the eggs the females became very aggressive and constantly tried to bite me. This is contrary to the behaviour of the related *Ophisaurus apodus*, which never bites when I take away the eggs, though it also protects them in a chamber like *Gerrhonotus*. I removed 50 of the eggs and left 5 in the chamber for two reasons: to see if and for how long the females remain to protect them and, because of the poor results of previous years, I thought that this protection might be necessary for the successful incubation of the eggs. I examined the chamber again on July 30th; the three females were still defending the 5 eggs. These eggs were probably all from one female, as they were all close together. I made a second examination on August 14th (after the first 20 eggs, of those which had been removed earlier, had hatched), and found only one female still with the eggs. One of these had died already, and so I considered it best to transfer the other 4 into the incubator; none of them hatched. All 50 of those which I had removed on July 9th, however, hatched successfully. The eggs left in the chamber until August 14th could have died for the following reasons: the defending females may disturb the eggs too much, though this seems unlikely to me; the eggs may be more sensitive to mechanical and/or thermal changes/disturbance at a later stage of development.



Plate 1. Copulation of *Gerrhonotus multicarinatus*

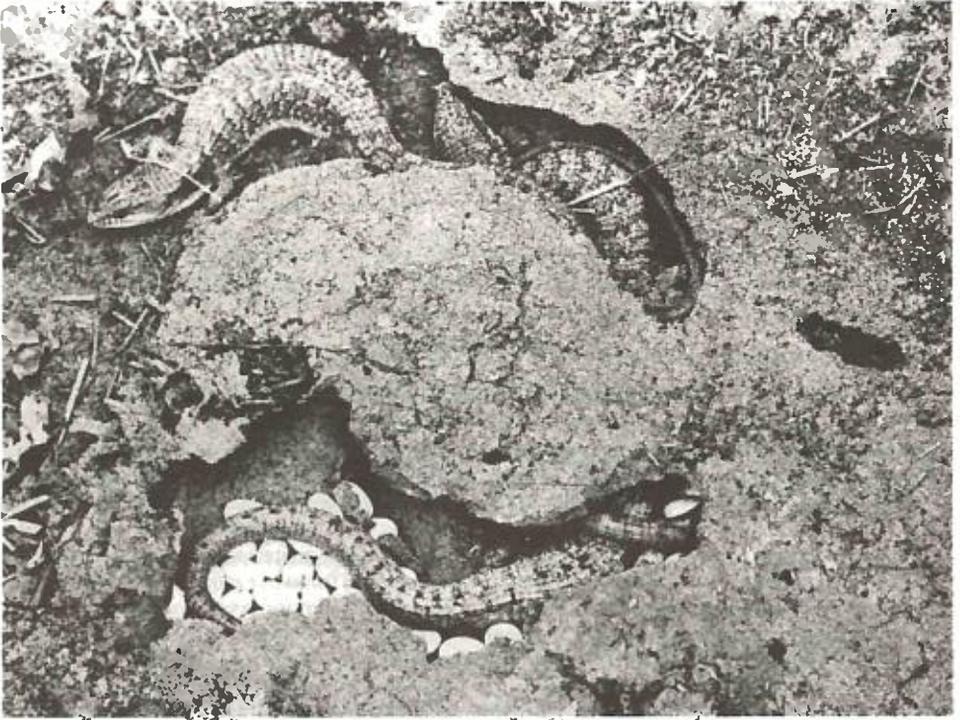


Plate 2. Three female *Gerrhonotus multicarinatus* protecting their eggs in a chamber beneath a flat stone.



Plate 3. *Gerrhonotus multicarinatus*: hatching time.

RAISING THE YOUNG

On the first six hatchlings — hatched on August 10th, 11th and 12th 1976 — I made notes on growth and behaviour as this was the first time that I bred this species.

At hatching, they had a total length of about 10cm (see above). They lived secretively, spending most of their time hidden in dead leaves and hay. They would bask in the hay, hardly visible. I noticed the same behaviour in *Ophisaurus apodus* hatchlings. They would feed on all kinds of small insects: fly larvae, small cockroaches, small crickets and so on. Water was given by spraying the hay daily, from which the lizards would drink. The water contained vitamin D₃ and calcium lactate (see my other articles for details). These lizards were not hibernated in their first year. By the following August (1977 — at one year of age), they measured 35.5cm, of which 23cm was tail. By this time the males were clearly distinguishable, as they had well developed hemipenes: there were 3 males and 3 females. In 1978, after their first hibernation during the winter of 1977-78, they copulated, but the resulting eggs were then bad.

From these observations, I expect to breed many *Gerrhonotus multicarinatus* from 1983 onwards, if I keep a good number of the 70 young of this year.

SOME GENERAL POINTS AND CONCLUSIONS

So far, I have lost none of these animals from disease; some only were lost because of accidents or fighting. It is an ideal lizard to keep in glass-covered garden terraria, where reproduction is possible if they are given enough food, minerals and vitamins.

Because of the ease of breeding this lizard, this is another species for which we will not depend on importation if we have a good population spread over terraria in Western Europe; it looks as though we may have achieved this already.

The Alligator Lizard does not tolerate great heat; at high temperatures it will die more quickly than, for example, *Lacerta* or *Agama* species. The critical upper temperature must be close to 40°C.

A favourable factor for many terrarium keepers may be the rather short incubation period of the eggs.

If the lizards are kept in an indoor terrarium, they may reproduce if they are kept a little cooler and darker (less daylight hours) in wintertime. But of this manner of keeping them, I have no experience.

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A FLOURISHING COLONY OF VIVIPAROUS LIZARDS (*LACERTA VIVIPARA*) IN SUSSEX

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At a recent meeting of the BHS Conservation Committee it was agreed that more should be done to discover the present status of and threats to the commoner herptiles, not yet regarded as endangered species in the U.K. One way of doing this is to put on record details of good concentrations of animals, apparently established over a long period. Such records, published by the BHS and thus made generally available, can be checked and augmented later, be passed on to other conservation societies and can be quoted when "development" threatens to destroy the sites.

As an example, what follows is a rather generalised description of a very good colony of Viviparous lizards, known to me for at least 28 years and to some of the local residents for much longer. A copy of this account with an appendix giving the exact location of the site has been deposited with the Chairman of the Conservation Committee and the Nature Conservancy Council as well as the Sussex Trust for Nature Conservation have been given these details. BHS members will appreciate that it might be risky to herptiles to publish complete geographical details of such colonies, for there are undoubtedly unscrupulous collectors of many forms of wildlife.

The lizard site is a steep bank about 2.5 metres high at no great distance from the sea. For about 300 metres of its length, this bank is not approached by buildings although the whole area is almost completely built-up and people frequently use the footpath running along the summit. The direction of this footpath is E-W, so that the S aspect of the bank receives all available sunshine. The bank is thickly covered with long grass that, even in winter, forms a dense mat that encroaches over the shallow ditch at the base. Wood and rubbish of various kinds are thrown into this ditch. A few brambles, small hawthorn, elder and other bushes together with herbaceous weeds complete the cover which is evidently well suited to the needs of the lizards.

Lizards can be seen in numbers on any suitable day. On July 25th 1981, a bright but not sunny day, I counted 34 lizards in 10 minutes: some of these were in groups of 3-5 on wood and other rubbish. In March in the last 4 years, numerous lizards born the previous summer could be seen as well as adults already paired for the coming season. The hot summer of 1976 was a poor one for viewing the animals. Viviparous lizards were quite common on adjacent areas up until about 1960: this is not the case today.

The continuing high concentration of Viviparous lizards might be due to some or all of the following factors: (a) the Southern aspect of the bank, ensuring maximum sunshine, (b) the generally temperate maritime climate, (c) the dense permanent cover of vegetation as well as rubbish which shelter abundant invertebrate prey and provide basking places and temporary and long-term refuges and (d) several (probably up to a dozen) cats which hunt and sometimes kill the lizards but are effective in deterring birds and wild animal predators. The site certainly holds hedgehogs and sometimes rats. The continual presence of people, including children playing on the bank, seems not to affect the lizards adversely and ensures that there are no snake predators and also no fires. Members of the BHS and others who care about our herptiles will resist proposals for development which would destroy this colony and may wish to let the Conservation Committee have details of other herptile concentrations known to them.

NOTES ON BREEDING LILFORD'S WALL LIZARD (*PODARCIS LILFORDI*) IN CAPTIVITY

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My first encounter with this stunning lizard was over 20 years ago. It was in a mixed collection of lacertids belonging to a school friend. The striking coal black and royal blue livery stood out amongst the usual green and brown of the other occupants. Not knowing, caring or being aware of the scientific name at the time, I and many others knew this beauty as the "Spanish Black".

A hardy ground dwelling lizard, it originates from the sparsely vegetated rocky islets around the coasts of Majorca and Minorca, Spanish Balearic Islands. Some forms of *lilfordi* are green or brown in colour, but most — and the more spectacular — are melanistic or partially melanistic.

Although not so large as some of its relatives, (its maximum length snout to vent is approximately 8cms) a fully grown male in full breeding trim is indeed an impressive sight. Raised up high on its forelegs, the deep blue throat puffed out to its maximum and the head cocked in the direction of a male adversary, it almost pins the subordinate into submission with its piercing stare. Only the slow side to side weaving of its tail (like a cat about to pounce on a mouse) gives a clue to the tension about to explode. It is this deep rooted territoriality that ensures that a mixed group of these lizards in spring and summer will rarely be at rest. Females also may be drawn into the day to day dramas.

Recently, space and time allowed me to re-live those early days spent engrossed in the antics of a vivarium full of lacertas, so I acquired a small group of "Spanish Blacks". It was early summer, so food from the garden was plentiful: worms, beetles, woodlice, caterpillars, flies, centipedes, moths, plus hostes of others were given in copious quantities. Fruits of various sorts were also given to them but apart from licking at the juice they did not seem too bothered. Growth was excellent. Males and females were obvious at a glance, the males being much heavier and generally larger in size. The tails grew very thick, almost seeming not to be in proportion to their bodies. The summer had now past and there had been no signs of aggression from the males.

During the winter the lights were turned off in the vivarium and the temperatures allowed to fall to 10°C. With the raising of spring temperatures came a raising of aggressive temperament, the dominant male keeping his rivals out of the limelight of the females.

Courting of the females by the males is a very rough and tumble affair; being merely a raising of the chest from the ground, expanding the throat, then a rapid chase. The female is usually gripped at the base of the tail or by a hind limb.

Mating attempts of this kind were seen on a number of occasions during April/May but only once was it seen completed. The male grasped the female's rear right leg after the customary chase, then brought his left hind leg over the female's tail and curved his body to come into contact with the female and complete copulation.

It became obvious after a while from their shape that the females were carrying eggs, and on the 22nd May the sudden loss of weight of one was an obvious sign that she had laid the eggs somewhere in the vivarium. The eggs were carefully buried in a damp spot but close to the heat of the overhead light bulb (the vivarium had a layer of sand and soil which had been deliberately kept damp in anticipation of egg laying). The three eggs were removed and incubated in vermiculite at 24-27°C. This procedure was again followed for a second clutch of eggs laid in July.

On the morning of the 57th day the first inquisitive snout protruded into the world and within an hour had completely emerged and was running about. The hatchlings were quite unlike the adults, being brown with dark brown streaks and dots, the flanks tending towards cream. The tails were a greenish blue. The heads seemed much more pointed and narrower than in the adults. Sloughing of their skins took place within the first 48-72 hours, and then the job of feeding began. In fact this was quite easy, due to their fairly large size of 3.2 cm snout to vent. Baby crickets, fruit fly, wax worm larvae, greenfly, etc., were all very eagerly accepted. As they increased in size they gradually began

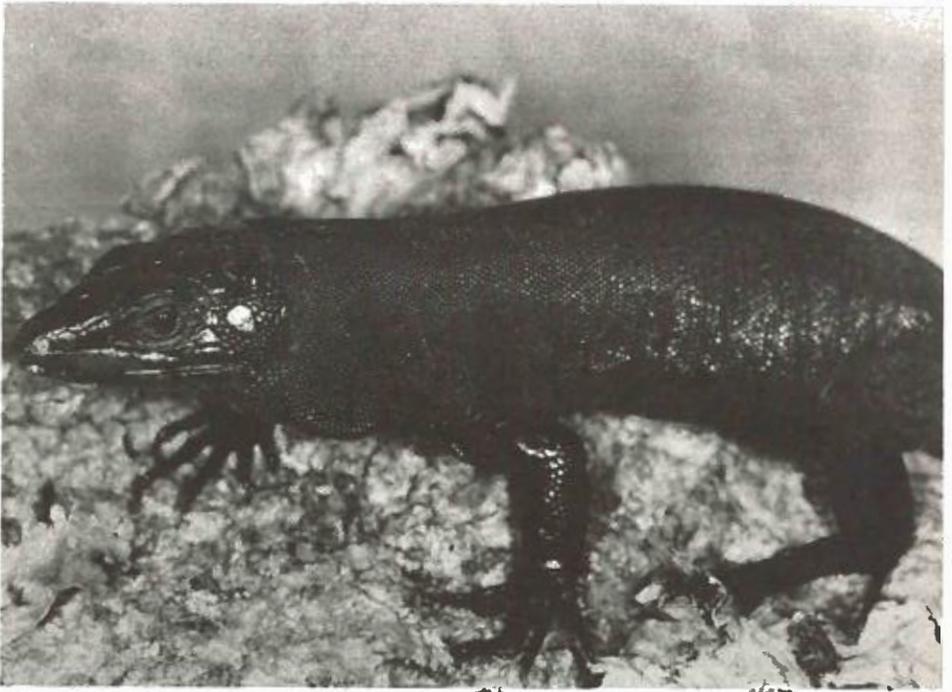


Plate 1. Adult female *Podarcis lilfordi*

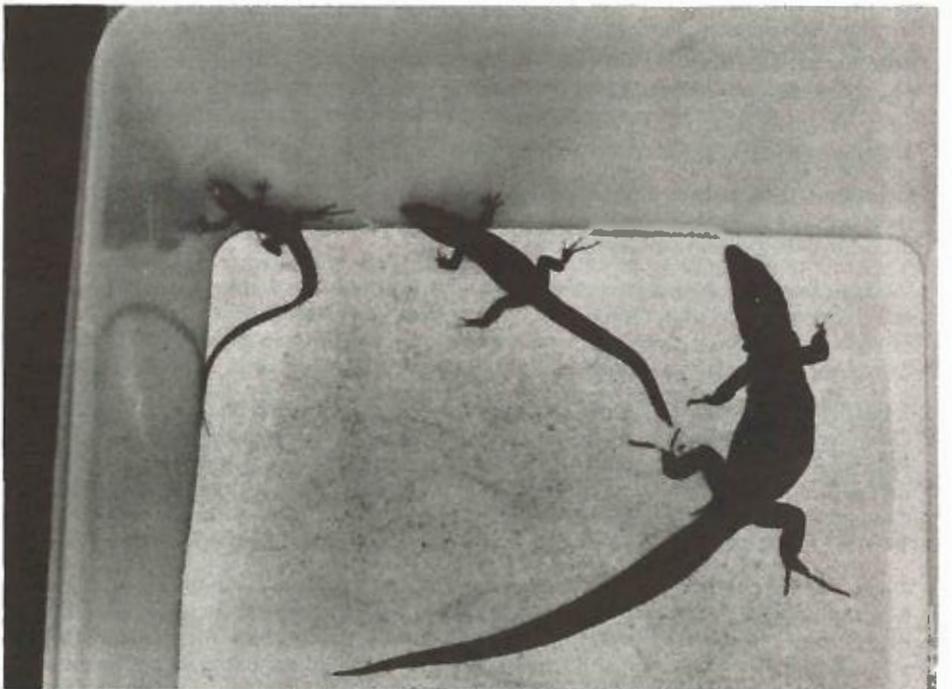


Plate 2. Three *Podarcis lilfordi* of different ages. 6 weeks old, 12 weeks old and adult male.

to darken in colour and by October they were dark brown, including the tail. Even at this small size they show signs of display similar to that described for the adults.

As a matter of interest, no "True-lite" has been used on either adults or young at any time, neither has the use of vitamin D₃ been necessary to maintain them in peak health. It may be possible that this species of wall lizard has a lower requirement for direct ultra-violet radiation than other species but it is my belief that it is the varied and naturally acquired garden food that ensures good healthy specimens.

Pardalis lilfordi is now a protected species as defined by the Berne Convention 1979, requiring a licence to remove it from its habitat. In addition, Spain is advising that licences in future will not be granted except in special circumstances, thus making it less available in the future than it has been in the past.

It would be a great shame if this fascinating and hardy little lizard were to become unavailable to herpetologists in this country. Who knows, it could spark an interest in reptiles to young or not so young as it did to me in my school days.

MISCELLANEOUS REMARKS ON SOME CAPTIVE REPTILES

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The purpose of this article is to present some of my observations dealing with different species of reptiles kept for longer or shorter periods in my terraria. The list comprises one tortoise, three lizards and three snakes.

Geochelone carbonaria

One juvenile specimen was brought from the Venezuelan Llanos at the end of 1975. The first measurement was made in February 1976 — it weighed 75 g and had plastron length of almost 8 cm. All tortoises seen in the vicinity of Turen (near Acarigua) had characteristic strong carapacial sculpturing where each central lamina had the appearance of a low pyramid (Pl. 1). However, young specimens do not show this feature, having a more smooth shell. Legler (1963) estimated the plastron length of hatchlings to be 50-58 mm (mean 52.6 mm). According to him the specimen measuring 63 mm was about 3 years old, based on the texture of the plastron and growth rings. Moll and Tucker (1976) calculated from this that the growth rate is about 4 mm/yr., so the tortoise reaches maturity after 32 years (180 mm). This would seem to be impossible. During their study of four *G. carbonaria*, Moll and Tucker indicated that the average plastral growth rate is 44.0 mm/yr. Thus, they determined that sexual maturity could have been reached after 2.8 years. The measurements of my tortoise made at the beginning of August 1981 are as follows:

weight	1900 g
length of carapace	240 mm
length of plastron	177 mm
width of shell	153 mm
height of shell	125 mm

The growth rates are presented on the Fig. 1 and are lower than those of Moll and Tucker (their measurements refer only to the plastron). Such difference may depend mainly on the diet. Moll and Tucker fed their tortoises at first on hamburger, earthworms, vegetables and fruits and then almost exclusively on moistened Purina Dog Chow. The greater quantity of meat the faster the growth. This species seems to be especially carnivorous and my specimen, when it was younger, after feeding on beef tried to eat the red scales on its forelegs! It is evident that its weight decreased very quickly after feeding on plants only. Now I complete its food with mice. Also, what is interesting, every kind of pill, e.g. Vit. A + D₃ or calcium, is eaten immediately from my hands.

Ablepharus kitaibelii

All specimens kept by me originated from Bulgaria. The record of longevity in my terrarium is 6 years and 5 months. One female collected in the field layed 2 eggs on 8 June 1978 (their length 9 mm). The first juvenile hatched on 4 September (after 88 days) and a day later ate *Drosophila*. Its total length was about 35 mm. The second one hatched on 7 September, but unfortunately was dead when found. Its total length was 39 mm (17 mm SVL). The first specimen survived 1 year 3 months and 24 days (38 mm SVL) and the first symptom of its disease was not hiding before night. I did not hibernate it.

Chamaeleo chamaeleon

These chameleons are difficult to maintain in captivity for longer than two years. My first specimen survived 2 years and 5 days. But the second one only 4.5 months. Both were bought in a Moroccan market and their precise origin was unknown. The second specimen was in very bad condition when it arrived in Kraków. People do not suspect that these animals are so delicate and that there are so many troubles with their husbandry. The third chameleon I have now was captured while studying the herpetofauna of Algeria in April and May 1981. This specimen was

also brought to Poland by my friend and after some time reached me, as I expected. The main problem is to provide enough food. A chameleon can eat a full jar of grasshoppers every day. So I decided to complement its food with weaned mice, which were readily swallowed. I keep it free on a tree branch indoors. The chameleon likes to climb the curtain and hunts every insect which appears nearby. I was successful with this manner of husbandry with my first specimen.

Ophisaurus ventralis

Three specimens were sent to me by a dealer in the USA on 21 September 1976. I decided to include this species in this list mainly because of a case of its longevity in my terrarium. Two specimens have survived so far (1 August 1981) 4 years 10 months 9 days and are in excellent condition. According to Bowler (1977) the maximum record for this species in the USA (Philadelphia Zoo Collection) was 3 years 9 months and 5 days. The glass lizards are fed mainly on newborn mice and insects and they remain on the best of terms with 2 *Ophisaurus apodus* and 1 *Anguis fragilis*. On 18-19 June 1980 the female laid 12 eggs of average size 17 x 10 mm. Though I suspected that I had also a male (Pl. 2), none of the eggs were fertile. Also, I never witnessed a copulation. They have not hibernated.

Elaphe rufodorsata and *Rhabdophis tigrinus*

Some observations on a young specimen of *E. rufodorsata* which may be added to my previous article (Sura, 1981) are presented below:

29 September 1980	birth and shedding
17 October	the first frog eaten
21 October	the second frog eaten
10 November	shedding
20 November	put into the refrigerator for hibernation
10 January 1981	removed from the refrigerator
14 February	two fish eaten

As can be seen the snake refused food for 116 days (including stay in the refrigerator). And, after I had given up hope of saving it I put into the water dish a dead fish. The snake ate it quickly and then a second one. Until the beginning of April it fed regularly. Then I went away for 1½ months and it refused food for this period, while in a friend's institute. The subsequent progress of the snake is shown below:

8 June 1981	attempted to swallow a <i>Lacerta vivipara</i> , but it was too big
9 June	a frog was eaten
14 June	the leg of a <i>R. temporaria</i> was eaten
2 July	two new-born mice were eaten
5 July	a frog was eaten

Since then the snake has been in fine condition and has started to grow at last. On 27 July it ate a lizard (Plate 3).

Rhabdophis tigrinus. All three snakes which were hatched a year ago now eat adult *Rana lessonae* and medium-sized *R. temporaria*, always hind legs first (Plate 4). They were not hibernated, and in winter were fed mainly on fishes. None of them attempt to bite when handled. Also, I have observed attempts at copulation by two of them.

Vipera lebetina mauritanica

This specimen, measuring about 40 cm. was collected at the same time in Algeria as the *Chamaeleo chamaeleon*. It was placed in a terrarium with three other species of snakes (Pl. 5). During the first days the viper hissed loudly whenever I approached, but after some time it got used to the new situation and started to eat weaned mice offered to it from tweezers. The first time, I assume the viper used its full quantity of venom to kill the mouse, as it died immediately. But now the viper eats such mice without killing them first, but fully grown mice die 2-4 mins. after being bitten. The viper is growing quickly and, though is very calm, it may become a problem in the future.

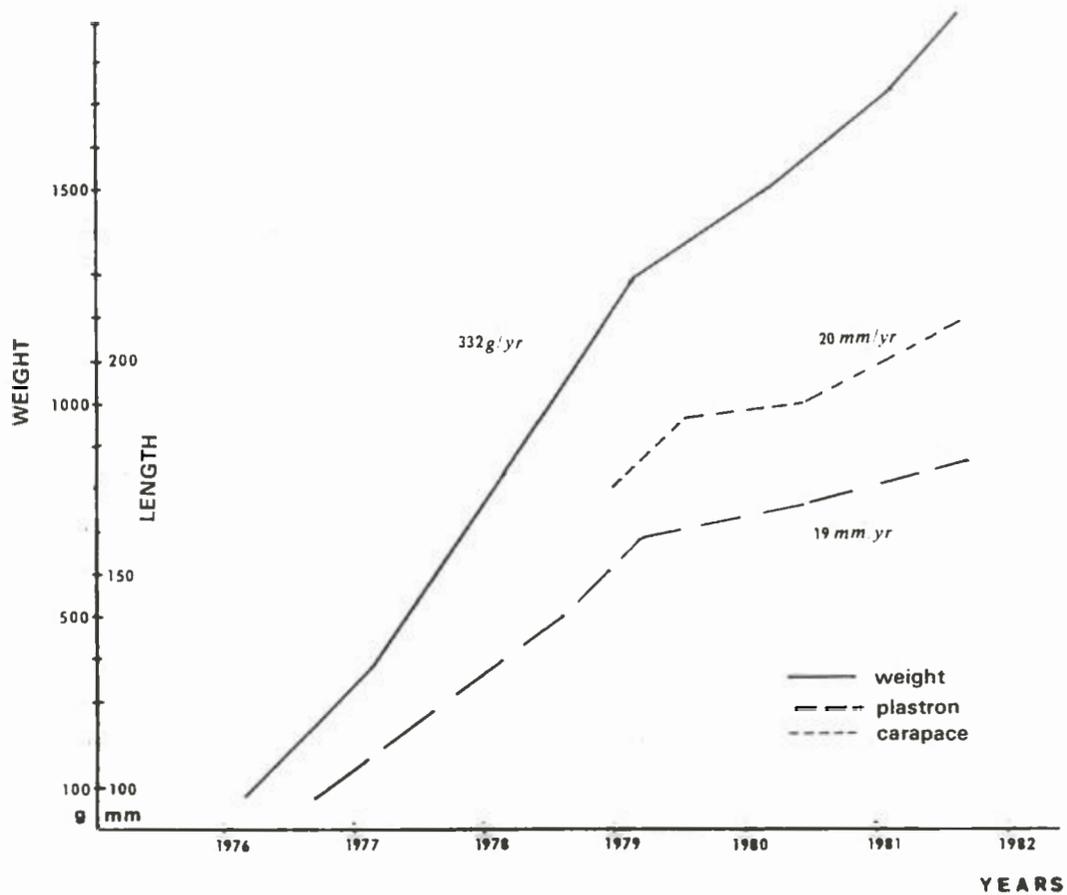


Fig. 1. Growth rate of *Geochelone carbonaria*.

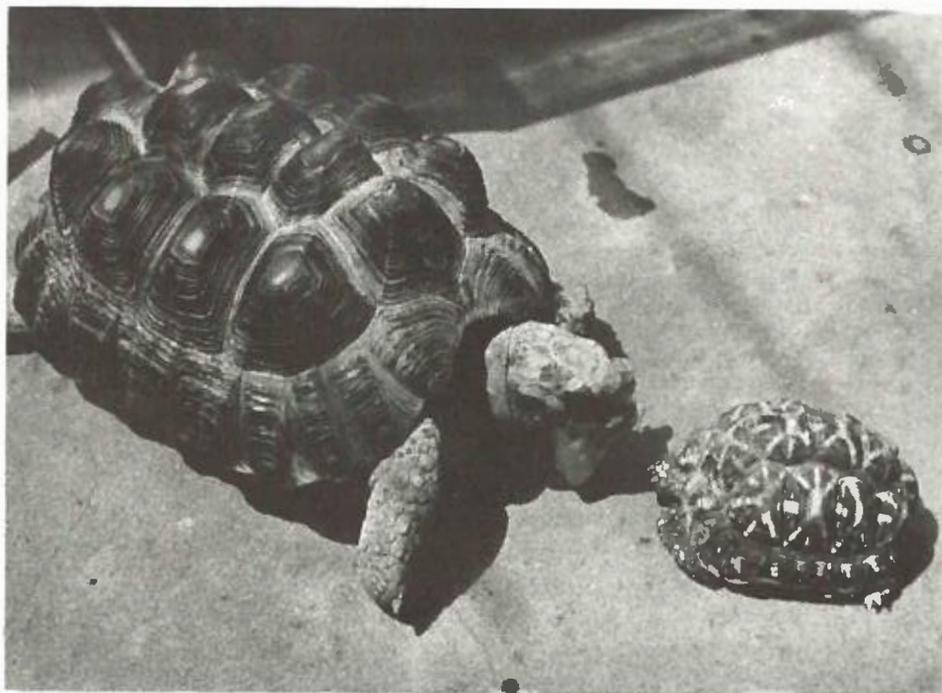


Plate 1. *Geochelone carbonaria* eating a piece of tomato. Its size at the end of 1975 was similar to that of *G. elegans* nearby.

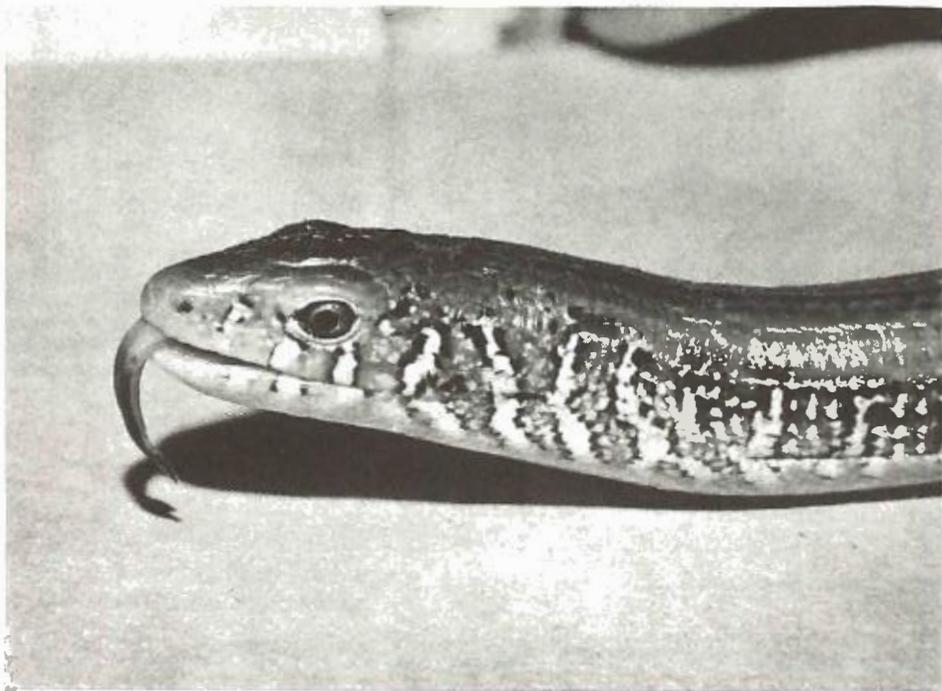


Plate 2. *Ophisaurus ventralis*.



Plate 3. Juvenile *Elaphe rufodorsata* swallowing a lizard.

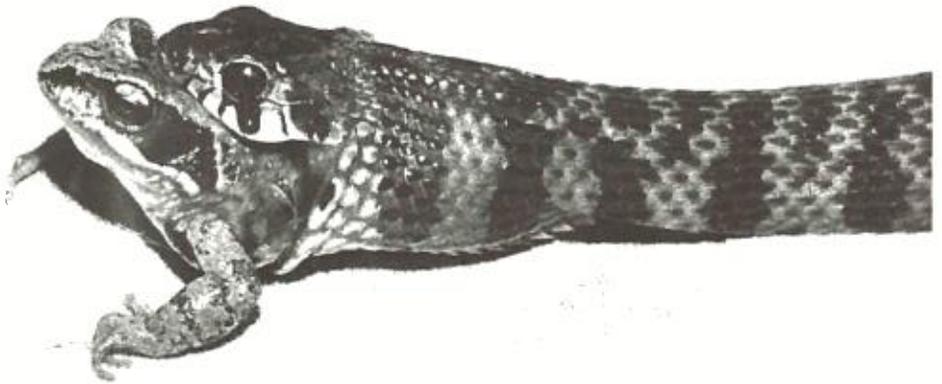
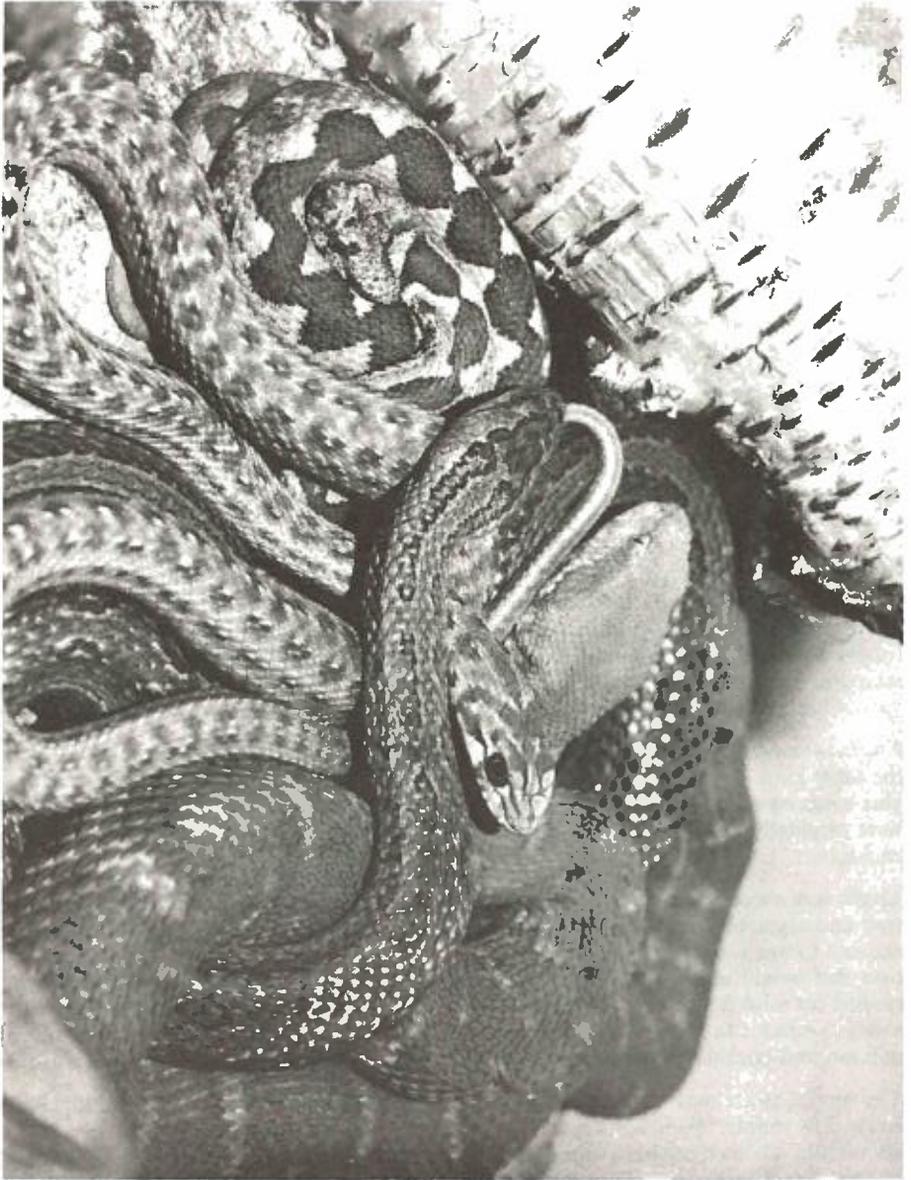


Plate 4. *Rhabdophis tigrinus* one year old, swallowing a frog.

Plate 5. *Vipera lebetina mauritanica* basking under the lamp in the company of *V. ammodytes*, *E. rufodorsata* and *Malpolon monspessulanus*.



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NOTES ON *EGERNIA CUNNINGHAMI KREFFTI*, AN AUSTRALIAN SKINK

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Of the basically continental Australian skink genus *Egernia*, few species were thought to be as completely understood as the ubiquitous form known commonly as Cunningham's skink. It was well known that it was among the most diverse in many external respects, but all things taken in sequence, the vast majority were able to be easily and conveniently relegated to a subspecific status, in which niche most still stand. But now, little by little, it is being realized that all may not be what it seems. With today's more sophisticated methods of determining classification, herpetologists are finding that rather than there being one very variable taxa, there is at least one, and probably several, undescribed species which have been considered as *cunninghami*, in addition to the "true form".

With all of this in mind, I will still utilize the currently recognized taxonomy here and call the animal that we are discussing *Egernia cunninghami krefftii*. Whether it will here remain when critically viewed by modern taxonomists will remain to be seen. *Krefftii* is one of the prettier of the Cunningham's races, being boldly patterned dorsally with light spots against a dark ground colour, the spots forming a series of broken bands. The head is considerably lighter than the remainder of the body, usually being a warm brown or russet. This colouration frequently continues down the neck and in some specimens may reach the shoulders. The creature is of robust build and reaches an adult length of slightly over 14 inches. With increasing age the temporal area of the males becomes greatly enlarged until some old specimens are positively "jowly" in appearance.

Krefftii is an active, aggressive, diurnal lizard, its aggressiveness not being restricted to others of the same kind. An adult male which is kept by me, while ignoring such companion species as blue-tongued skinks, would persistently do battle with any of a series of Timor monitors that were originally housed with him, eventually necessitating the removal of the latter from his enclosure.

Krefftii is of omnivorous feeding habit, those in my collection eagerly accepting many kinds of fruit and vegetables as well as most canned dog or cat foods and other forms of raw meat. They actively forage for insects and anoles as well, seldom missing their target. Particulars of their base diet would reveal that grated apples, bananas, tomatoes, pears and whatever brand of canned cat food is available are offered thrice weekly and grey crickets (*Acheta domesticus*) are always available to them. A powdered vitamin such as Vionate[®] is introduced into the food mixture and crickets are dusted with Osteoform[®]. Fresh water is available at all times.

The *krefftii*, as are most of my other lizards, permanently maintained in out-of-doors facilities. These are simple, open air structures formed by sinking a three foot high piece of sheet aluminium — which has been formed into a ring 10 feet in diameter — into the ground to a depth of 14 inches. The distance above the ground is sufficient to prevent the escape of the inhabitants and that below ground level prevents a similar possibility through burrowing.

Each ring is furnished with adequate cage materials in the form of rocks, logs and plantings to make the inhabitants feel at ease. In the case of *krefftii* such furnishings consist of substantial piles of boulders beneath and between which the lizards dart when frightened. Simply made, but effective, hibernacula are also designed. The actual effectiveness of these arrangements was tested during the past winter (1981), when southwestern Florida experienced several consecutive nights of sub-freezing weather. In spite of the adverse conditions all remained well in the pens. As a matter of fact, except for one overcast day that remained cruelly cold (for we Floridians, either native or transplanted, at least) the *krefftii* were seen basking for several hours daily. A test of the opposite extreme also proved successful this June when for more than a week the temperature

hovered at or above 38°C (100°F), and on two of those days reached a high of 40°C (104°F). During this the lizards basked and fed early in the morning and again late in the afternoon, retiring into the coolness of their hibernacula while the sun was at its zenith. Seclusion in the hibernacula or in the rock piles is also sought during heavy rains, there being an almost immediate cessation of whatever activity the lizards are indulged in. As may be surmised photo-period is entirely natural, albeit reversed from that of the lizards' southern hemisphere homeland. However, all seem to have adapted nicely.

Such "natural" caging facilities appear nearly ideal to me, and to the *krefftii* they must be almost equally acceptable for reproduction has already occurred. The parent lizards are barely 22 months of age and are, themselves, zoo born specimens. This early sexual maturity was unexpected since I had thought that although the animals were quick to reach adult size, the capability to reproduce occurred somewhat later (Bartlett 1981). However on June 27, 1981, two neonates were found in one of the rockpiles. Their measurements, which were identical, were: 124 mm total length; 61 mm snout-vent length; 15 mm head width. Upon discovery both were moved into temporary indoor facilities due to the predaceous attitudes of the adults. In a terrarium with both incandescent and flourescent (Vitalite ®) lighting they began to feed almost immediately and have shown a definite preference for insects as opposed to prepared foodstuffs.

In keeping with all other members of the genus, *krefftii* produces living young. These number from 2 to 6 under ordinary circumstances and it is thought that as a rule the number of young produced may increase with the age of the female.

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NOTES ON THE HUSBANDRY AND A FURTHER CAPTIVE SPAWNING OF THE EUROPEAN GREEN TOAD (*BUFO VIRIDIS*)

DAVID BILLINGS

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I wrote in the December 1980 Bulletin about a successful spawning of *Bufo viridis* in captivity, and the subsequent rearing of the tadpoles.

Metamorphosis was rapid, the first toadlets emerging barely five weeks after hatching. The average length on absorption of the tail was 11 mm from snout to vent.

During the first few days the young toads were fed on various types of aphid; these were placed in the vivarium attached to the food plant on which they were found. As the toadlets grew this diet was first supplemented with, and later replaced by, newly-hatched mealworms and a variety of small creatures obtained by hedge-beating.

The onset of winter presented the problem of how best to overwinter the toadlets which, by the beginning of November 1980, were between 20-24 mm in overall length and still feeding voraciously. I had retained nine individuals only, the remainder having been sold/exchanged to other BHS members or released in the garden.

It would have been difficult to provide the young toads with enough live food through the winter months as I was at the time working away from home, returning only at weekends. I therefore decided to hibernate the toadlets, placing their vivarium in a frostproof outbuilding.

This proved unsuccessful because whenever there was a mild period of weather the toadlets would become active, emerging from hibernation and moving about the vivarium seeking food. Towards the end of February several were observed to be in an emaciated condition, so I consequently brought the vivarium indoors, where the toadlets soon commenced feeding. Within a few days all nine had regained their usual rotundity, remaining healthy until late March.

About this time I noticed two toadlets wandering aimlessly about the vivarium; they could not be induced to feed and within 48 hours both had died. Within another week the same fate had befallen the remainder.

Two months after the occurrence of the 1980 *Bufo viridis* spawning, the male involved in the spawning died suddenly with no prior illness. The loss of this individual was particularly acute as it had been in my possession for more than eleven years. It was fully grown when first obtained in May 1969.

Another male *Bufo viridis* was purchased towards the end of May 1981 and released in a newly-constructed outdoor reptiliary (measuring 3 metres x 2.7 metres) for quarantine. This reptiliary was arranged as a rockery in the form of a central mound, sloping towards the walls of the enclosure. Various rockery plants, ferns and heathers were planted among the rocks, ordinary garden loam mixed with sand and peat was used for bedding.

On one side of the mound an area of earth was levelled to accommodate a pond of butyl rubber lining, the overall dimensions of which were 120 cm x 45 cm. One end of the pond contained a shallow ledge of about 5 cm depth.

The new male *Bufo viridis*, when released into the above enclosure, promptly disappeared and did not reappear until the afternoon of 5th July when it was observed sitting half-submerged in the shallowest part of the pond. Shortly afterwards it commenced calling, inflating and deflating its enormous vocal sac to produce a rather pleasant "trill". There had been very little change in the weather, which although remaining bright was not particularly warm. It is therefore difficult to ascertain what had stimulated the breeding responses of this male.

As soon as the male was observed calling, two gravid females and two more males were transferred to the reptiliary from the greenhouse in which my *Bufo viridis* are normally housed. Both these males were in breeding condition, having well developed nuptial pads. They had not, however, shown any desire to breed as yet.

On being released into the reptiliary the two females immediately entered the pond where the original male was still calling. The nearest female was immediately seized by this male, but amplexus lasted only for about four hours, after which time the pair separated without spawning.

Both the females left the pond that evening (5th July) and neither were seen in or near it until the evening of 16th July when the original pair were seen in amplexus again. The male had continued calling during the whole of the intervening period, mostly at night but often during the day. Meanwhile the other two males took no part in the proceedings; neither were heard calling or seen to take the slightest interest in the females.

Several strings of spawn were discovered in the pond wound around submerged *Elodea crispata* on the morning of 17th July. I could not determine whether both females had spawned as neither looked any slimmer afterwards.

The circumstances in which the spawning took place were different from those described for the previous spawning, although on both occasions only one male was involved despite the presence of others. The male Green Toad has a very large vocal sac which, when fully distended, is much larger than the head of the creature. In order to inflate the sac fully, the toad is obliged to thrust its head upwards, lifting itself up on its sturdy forelimbs. Being partially submerged in the water would lessen the strain on the forelimbs and make calling less effort.

I now hope to raise this year's *Bufo viridis* progeny to maturity with the aim of eventually breeding from my own captive bred specimens.

MEMBERS ADVERTISEMENTS

- **Wanted in Exchange:** Dr. O. Gy. Dely, Chairman of the Organisation Committee for the first Herpetological Conference of Specialists of the Socialist Countries, (25-29 August 1981), wishes to exchange a complete set of *Vertebrata Hungarica* (20 volumes to date, two issues each) for a complete set of *British Journal of Herpetology*. The Proceedings of the Herpetological Conference will be published in *Vertebrata Hungarica* in 1982 (April or May) in English, French, German and Russian. Address: Termesztudományi Múzeum Allattára, H-1088 Budapest, Baross u. 13, Hungary.
- "Inventory of live reptiles and amphibians in North American collections, current January 1, 1981" by Frank L. Slavens (P.O. Box 30744, Seattle, Washington 98103, U.S.A.). Paper cover \$15.50; hard cover \$22.50 + \$1.00 postage.
- **For Sale:** Captive bred Fire Salamanders (*Salamandra salamandra*) and Green Toads (*Bufo viridis*). Also a young adult pair of Sinaloan Milkshakes. Simon Townson, tel: 01-989 9570.
- **Wanted:** Adult female Carpet Python. Denis Lee, 130 Sebert Road, London, E7. Tel: 01-555 3548.
- **For Exchange:** 1 Reticulated Python, 11 ft.; 1 female Indian Python (*P. m. bivittatus*) of 6 ft. and 2 Royal Pythons. All long term captives in good condition.
Wanted: Boa Constrictors and rats/mice
Barry Mellors, Higher Boskerris, St. Ives, Cornwall.
- **Wanted:** Adult female *Agama stellio* to buy or loan on a progeny-sharing basis, for purposes of captive breeding.
For Sale or Exchange: 2 pairs of Japanese Fire-Bellied Newt, *Cynops pyrrhogaster*. Do any members know of instances of captive breeding of Spiny Lizards, *Sceloporus* spp? Andrew Quayle, 54 Joyce Street, Moston, Manchester M10 8HA. Tel: 061-681 7500.
- I would be willing to offer assistance to BHS members visiting the United Arab Emirates. Correspondence should be addressed to: J.N.B. Brown, Emirates Natural History Group (Abu Dhabi), P.O. Box 2687, Abu Dhabi, United Arab Emirates.

NOTES ON THE CARE AND CAPTIVE BREEDING OF THE SINALOAN MILK SNAKE (*LAMPROPELTIS TRIANGULUM SINALOAE*)

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INTRODUCTION

Lampropeltis triangulum with its twenty-three subspecies has one of the most extensive geographical ranges of any species of snake. In fact a distance of 3,600 miles, from Canada down throughout most of the United States and Central America to Colombia, Venezuela and Ecuador in South America. The subspecies range in size from the pretty and diminutive Scarlet King Snake (*L. t. elapsoides*) with a maximum recorded length of 686 mm (Conant 1975) to the relatively gargantuan *L. t. micropholis* which can reach a length of nearly 2 metres. The Sinaloan Milk (*L. t. sinaloae*) is one of the Mexican geographical races.

Description

The Sinaloan Milk reaches a maximum length of about 1220 mm with an average adult size of between 600 mm and 1000 mm long. With its classic red, black and white bands it is one of the tricoloured King snakes. The pattern consists of between 10 and 16 dark red to orange broad body rings which are separated by black rings which in turn are split by fine white rings.

The head, which is indistinct from the neck, is black with variable amounts of white flecking on the snout. The subspecies most likely to be confused with the Sinaloan Milk is Nelson's King (*L. t. nelsoni*) with a range adjacent to the Sinaloan Milk. The chief difference being on the Sinaloan Milk, the first black ring which crosses the throat midventrally is usually unbroken forming a V, whereby in the Nelson's King it is usually broken or narrowly connected in a straight line.

Range

Williams (1978) gives the range as: the southwestern corner of Sonora, southeastward through the broad coastal plain and foothills of Sinaloa to near the southern border of Nayarit and up the Rio Fuerte into southwestern Chihuahua.

HUSBANDRY

Housing

The main bank of cages I keep my *Lampropeltis* spp in consists of twelve units in four rows of three, each one measuring 610 mm x 380 mm x 380 mm, with access by sliding glass fronts. They are made of contiplas and all the seams inside the cages are silicon sealed, which makes for easy cage cleaning and good hygiene. Substrate is white newsprint and each cage is furnished with a water bowl, a length of terracotta half piping (which I use instead of hide boxes) and odd pieces of driftwood and green plastic plants for aesthetic reasons.

Heating and lighting is by means of a 15 watt pygmy light bulb in each cage, which in my room is more than sufficient to bring temperatures up to the required levels. The light bulbs are connected to a timeswitch and a dimmer switch, which gives me control, not only of how long the bulbs are on, but the amount of heat and light given off by them.

The lights are on for 16 hours a day during summer and reduced to 8 hours during winter, with a simultaneous dimming of the bulbs to reduce temperatures. In fact the lights are turned off completely for about six weeks during the midwinter, though temperatures in the cages never drop below 15°C. As most of my *Lampropeltis* spp stop feeding during the winter period the lowering of temperatures helps to reduce loss of body weight. Temperatures in summer vary between 22-30°C, and in winter 16-24°C.

For incubating eggs and to keep hatchling snakes feeding through the winter period, I use an environmental chamber. This is a purpose built cupboard made of contiplas with a glass panelled door and shelves inside to take the various sizes of plastic boxes I use. It is 2000 mm tall

and 610 mm square. Heating is by means of two 50 watt heater pads attached to a thermostat to give an average temperature of 28°C; it is lit by a five foot "True-Light" fluorescent tube which is on a time-switch to give a 16 hour day light period all the year through. During summer this tube often has to be turned off because of excessive heat build-up. The Chamber is ventilated by means of one 13 cm² vent in the top, and four smaller vents, one in each side, at the base.

Feeding

Bogert and Oliver (1945) mention two wild specimens, one containing two unidentified reptile eggs and the other an unidentifiable juvenile mammal. I think I can safely add lizards, small snakes and fledgling birds, with probably lizards and rodents forming the bulk of the diet in the wild.

In captivity they will feed on "pink" and DEAD adult mice. I emphasise the word dead as they are not true constrictors in the normal sense, but kill prey (too large to be swallowed live) by getting a firm grip with their jaws and bracing themselves and applying pressure, with the prey being sandwiched between the snake's body and the ground or some solid object. Now, with an adult mouse in the close confines of a rodent burrow, where they probably spend a lot of their nocturnal prowling, this is obviously a very efficient method. But given the comparatively open spaces and unnatural smooth surfaces of the usual captive conditions, this can become a hair-raising experience for all concerned, with the snake in danger of being badly bitten!

CARE AND CAPTIVE BREEDING

In the autumn of 1979 I purchased four wild caught adult Sinaloan Milk Snakes from a dealer. They consisted of two males and two females, their lengths varying between 620 mm and 850 mm, one pair being slightly larger than the other.

They were rather thin and so I decided to house them in a different room from the rest of my collection for a quarantine period which I do with all new stock of questionable health.

My suspicions were founded, as having fed avidly on "pink" mice they subsequently regurgitated.

Flagellated protozoa were suspected as the cause (Wagner 1979); they were all given Flagyl via a stomach tube, at the single dose rate of 250 mg per kg of body weight, after which there were no more regurgitation problems.

After about six weeks it was felt safe to introduce them into the room in which I keep the rest of my collection. Though gaining weight steadily, they were not up to full bodyweight, and as the main bank of cages were now on a decreasing light period and the occupants rapidly going off feed, it was decided to forgo any breeding attempts with the Sinaloans the following spring and concentrate on getting them into good condition. I separated them into four large plastic freezer boxes, which I put in my environmental chamber to encourage optimum feeding through the coming winter.

The following late spring the light cycle was back to 16 hours in my main bank of cages and the Sinaloans were then introduced into what was to be their permanent homes. The two females were put into one cage together and each of the two males given a cage of its own.

They were now in beautiful condition and feeding on an average of one freshly killed adult mouse a week each, having been weaned off the "pinks" which they were consuming at an alarming rate.

They continued to do well during the summer, and in late autumn were cooled down with the rest of the snakes. As a point of interest, though the other *Lampropeltis* spp in my collection stop feeding during the winter period, the Sinaloans continued to feed right through, though infrequently.

About the end of February the light cycle was increased weekly in hourly stages back to the summer levels by the end of April. With my *Lampropeltis* spp the sexes are usually housed separately and the females introduced to the males at four or five day intervals until mating activity is observed.

With the other species of *Lampropeltis* mating activity was at its highest levels during April, but there was still no sign of anything happening with the Sinaloans despite alternating the females between the males. Then on the 18th May during late evening time the large female was put in with the large male for the umpteenth time, when this time his response was immediate; with short jerky movements he started to follow the newly sloughed female around the cage trying to pin her down. In fact for the first half hour he couldn't seem to work out which end was which and was trying to mate her in a head to tail position. Eventually after about one and a half hours of some frantic chasing round the cage, copulation was seen to be successful.

Mating activity was seen on various occasions over the following three or four weeks, with both males having successfully mated both females. As a point of interest, any sort of disturbance to the Sinaloans would trigger off mating activity (e.g. cage cleaning, feeding, etc.), in fact just removing them from their cages and putting them straight back in again was sometimes enough to get them started.

The larger of the two females was the first to show signs of being gravid with the typical pear shaped cross-section appearance, and the ventral surface, being normally flat, had a convex shape around the rear third of the body. On the 29th June she completed her pre-laying slough (Wagner, 1979) and a couple of days later a plastic box half filled with damp spagnum moss and with an entry hole in the lid, was put in the cage in readiness for egg laying.

Over the next few days she was encouraged to use the box and on the night of the 5th July she was discovered in the box in the act of egg laying. Having laid three already and in the middle of laying a fourth she was left alone for an hour. On returning she had five eggs and was examined to ensure there were no more left inside her. Though the eggs were adhering together, they were still moist enough for me to very gently separate them. The measurements of the eggs were as follows: 58 mm x 23 mm, 60 mm x 20 mm, 60 mm x 23 mm, 63 mm x 24 mm, 70 mm x 20 mm.

My preferred incubation medium being vermiculite, I mixed 8 oz of this with 8 fluid oz of water, which had been previously boiled and allowed to cool down. This only slightly damp mixture was put in the four litre size ice-cream containers, which are rather tall plastic boxes measuring 200 mm x 150 mm and 155 mm high.

With the amount of vermiculite only occupying 25% of the box this left 75% for airspace. The eggs were half buried in the vermiculite and the tight fitting lid was put on (no air holes were made).

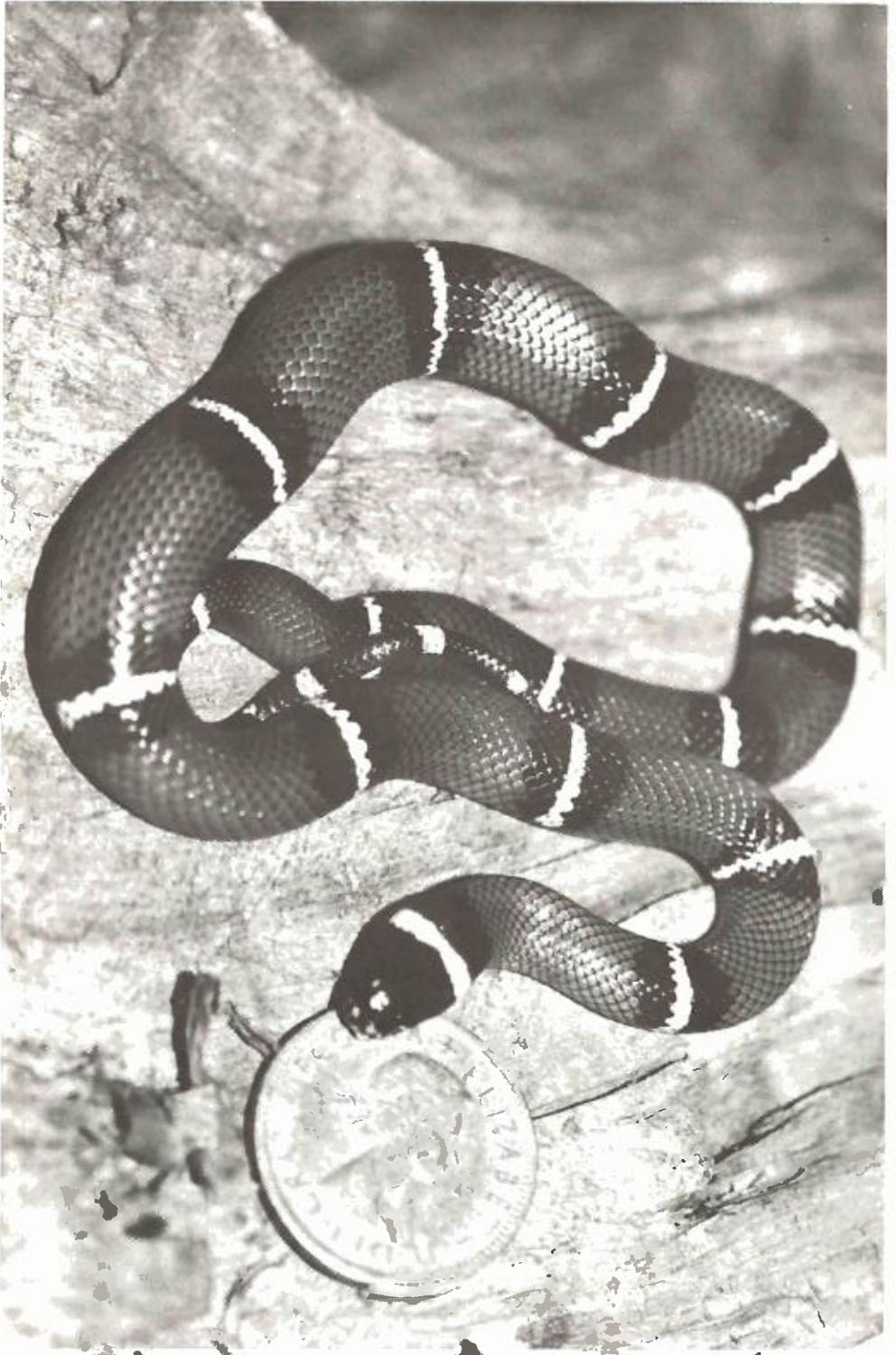
The box was put in my environmental chamber and twice weekly the lid removed to check the eggs and, in the process of doing so, they were gently fanned with the lid to exchange the air in the box. With this method, no extra water needed to be added and no fungal growth problems occurred throughout the incubation period.

The first sign of hatching was observed on the 7th September (64 days) when one of the eggs had split with a baby peering out, and by the 9th, all five youngsters had emerged from the eggs.

They were absolutely beautiful replicas of the adults, the only difference being the colour of the bands, which were bright yellow instead of the normal white of adults. Their lengths were as follows: 300 mm, 310 mm, 311 mm, 320 mm, 322 mm.

They were separated into two litre capacity plastic boxes of the type the eggs had been incubated in, which had the same dimensions but were only half as tall. (The keeping of hatchling snakes in relatively small containers may be important to encourage optimum feeding levels). The boxes were vented, lined with newsprint and furnished with a small water bowl and a piece of cork bark for them to hide under. The hatchlings sloughed on the 16th September and within hours of doing so they all accepted their first meal of newborn pink mice.

The second female laid eight slightly smaller eggs on the 26th July. By the time they were discovered they were stuck firmly together in a cluster and could not be safely separated. They were buried in the vermiculite, with those at the bottom of the cluster completely buried and some at the top not touching the vermiculite at all.



Hatchling *L. t. sinaloae* at 62 days old.

Incubation procedure was exactly the same as for the first clutch, and they hatched on the 28th September (64 days) with another 100% hatch rate. The hatchlings were slightly smaller than the first.

After they had settled down to feeding regularly all the hatchlings were probed to determine the sexes. The first clutch comprised one male and four females, and the second clutch six males and two females, so overall the sexes were evenly matched and to date all are doing well.

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MARGINAL HERPETOLOGY

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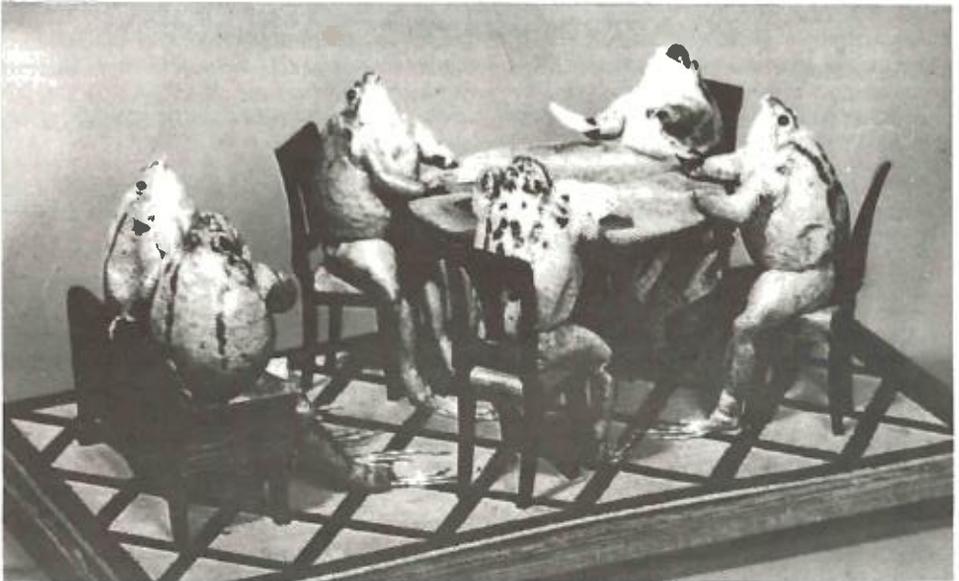
The Pope, as well all know, has an army of his own. These mercenaries are recruited from all the Swiss cantons, and their bravery has been much appreciated since the days when they also acted as a bodyguard to the king of France.

In 1813 a man called François Perrier was born in the small town of Estavayer-le-Lac in the French speaking part of Switzerland, not far from Neuchâtel. We know little enough of him but that he joined the Pope's Swiss Guards, became in due course a Captain and that, around 1850, he retired and returned to his place of birth.

From that time onwards the world would certainly have taken no notice of him if, for the last years of his life, he had not devoted his time to the unusual pastime of preserving frogs. He faced no shortage of raw material because the town of Estavayer lies at one end of the lake of Neuchâtel and frogs, probably *Rana esculenta*, abounded in the intervening swamp.

Thus, when he died in 1860, François Perrier left behind a legacy of over a hundred frogs, not only beautifully preserved, but also arranged in the form of actors in every form of activity commonly pursued by citizens of the town, whether they go to school, go to the barbers, have a family dinner or an electoral meeting; the various scenes fill a whole glass show-case in the municipal museum.

Perrier did not unfortunately reveal the secret of his technique before he died. All we know is that the frogs are filled with sand and held in their postures by means of wires inserted into their bodies. How he achieved to preserve the entirely life-like appearance of the skin, complete with the normal markings of these frogs, remains a mystery. The museum, which is open to visitors during the tourist season (July-August), boasts, probably rightly, that their exhibit has no equal in Europe. The municipality, in answer to an enquiry, produced pictures, some in colour which are indeed most amusing to look at and bear witness to the unique taxidermal skill of Mr. Perrier.



"A game of cards". Exhibit at the communal museum of Estavayer-le-Lac, Switzerland, prepared by François Perrier 1853. Photo from coloured postcard.

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EDITORIAL FROM THE MARINE TURTLE NEWSLETTER NO. 18, JULY 1981, ON LEATHERBACK TURTLES

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With characteristic flair and good luck, Peter Pritchard and his colleagues have discovered vast aggregations of leatherbacks along the west coast of Mexico. Although it was known before that leatherbacks nested there (Marquez, R. 1976, Ser. Informacion INP/SI i83, Instituto Nacional de Pesca, Mexico; Marquez, R., Villanueva, A. and Peñaflores C., ms), the extent of this population was only revealed by Pritchard's aerial survey, Oct. 31-Nov. 1, 1980. According to his estimates (ms submitted) about 30,000 females come ashore each year between Maruata in Michoacan and Ixtepec in Oaxaca. These estimates involve guesswork and should be debated when the details are available but even if revised downward, they still mean that more than double the number of leatherbacks exist in the world today than was thought previously.

This is wonderful news. But it has a darker side: many nesting leatherbacks are being killed. Some 50 carcasses were seen on the beach at Bahia Potosi alone. There were 18 at Piedra de Tlacoyunque. Killing leatherbacks there has been going on for some time: in 1978 I found 9 carcasses on part of the beach at Tlacoyunque and 4 were noted by Pritchard in 1971 (IUCN Monograph, No. 1, 1971). This slaughter is probably already making an impact because in the aerial survey track density was less on beaches where there were most carcasses.

Killing breeding female leatherbacks is poor biology and poor economics. The reason is simple: the leatherback takes a long time to mature but once mature lays many eggs. The value of the meat and eggs can be compared directly in monetary terms in places where they are both eaten. At Piedra de Tlacoyunque in 1978 I was told that meat sold for around 60 pesos per kilo and the eggs for 8 pesos each. From these figures one can calculate how many times a turtle must lay for the value of the eggs to exceed that of the meat:

DATA — BASIS FOR ASSUMPTIONS AND COMMENTS

Value of Meat

Carapace length = 147 cm. Mean over the curve measure for Tierra Colorada (n = 13, Mrosovsky and Marquez, unpublished).

Weight = 295 kg. Pritchard (1971, IUCN Monograph No. 1) reported that a leatherback with a 149 cm carapace weighted 295 kg. Since his measure was straight line, it is not likely a 147 cm over the curve leatherback would weigh more.

Weight of meat = 103.2 kg. Rebel (1974, Sea Turtles, University of Miami Press) states that the "flesh of a green turtle, including the muscles, constitutes about 40% of the body weight." At the Cayman Turtle Farm a 100-150 kg green turtle yields about 20% steak (Wood, J. pers. comm.). The latter figure may be more accurate but a leatherback with a less bony carapace and plastron and on a less rich diet probably has more of its weight as meat — at a guess 35%.

Price of meat = 60 pesos/kg. As reported by people at Tlacoyunque, 1978.

Value of meat = 6192 pesos.

Value of Eggs

Clutch size = 70. Mean for Tierra Colorada (n = 11, Mrosovsky, unpublished).

Cost per egg = 8 pesos. As reported by people at Tlacoyunque, 1978.

Value of 1 clutch = 560 pesos.

Number of times a leatherback has to lay for the value of the eggs to exceed the value of the meat (assuming 1 clutch is collected when turtle is killed for meat)

$$= \frac{6192 + 560}{560} = 12.06$$

Number of breeding seasons a leatherback has to stay alive for the value of the eggs to exceed that of the meat (assuming the average leatherback lays 6 times in a season. Even if it lays only 5 clutches/season, the figure is still close to 2) = 2.

There are reasons for thinking that most leatherbacks breed in more than one season. From 1970-1973 38.1-42.5% of females coming ashore at Trengganu, Malaysia, had been tagged in previous years (Hiew, W.P. ms. c. 1974). This figure is surely very conservative. It makes no allowance for shedding of tags, thought to be especially high by leatherbacks with their soft easily torn flippers. It does not do justice to multiple remigrations. Both the data from Trengganu, and the implausibility of an animal taking so many years to mature and then nesting in only one or two seasons, suggest that leatherbacks in Mexico would generate more revenue if left to lay their eggs rather than taken for their meat.

But for an individual on the beach a better strategy might be to take the meat while he can; he might not be the person who collected the eggs later on. For the community as a whole it would be better to harvest the eggs. Killing the adults is another case of the "tragedy of the commons" (Hardin, 1968, *Science*, 162, 1243), even more so when only a small part of the meat is taken as happens not infrequently (Pritchard, pers. comm.).

There are assumptions, of course, underlying these contentions. The calculations above should be refined in the light of additional data, redone in terms of protein values of meat and eggs, (cf. Hendrickson, 1958, *Proc. Zol. Soc. Lond.* 130, 455-535 for calculations for green turtles) adjusted to make allowances for interest earned if money from the meat was put into the bank and modified if the oil was used. Undoubtedly they can be improved. But what is remarkable is that such calculations are so seldom made, that so little thought is given to problems of resource use. Even some of the most basic facts are lacking. For instance, there are no figures on the amount of meat in a leatherback or its protein content. Such gaps in part reflect the preoccupation of conservationists with creating reserves rather than becoming involved in use of turtles as a valid conservation technique (Hughes, 1979), *Marine Turtle Newsletter*, No. 13, 13-14; Mrosovsky, 1979, *Marine Turtle Newsletter*, No. 13, 1-4; see also *World Conservation Strategy*, 1980, IUCN/WWF). It is not likely that 1000 kms of rugged coastline along the west of Mexico is about to become an effective sanctuary for the leatherback turtle. It is just conceivable that if people found they could earn more by collecting eggs than killing adults, and could be given a stake in the resource, then a community controlled harvesting scheme, combined with protection of the remaining eggs and tourism, might be feasible. Regulated but legal taking of leatherback eggs would be better than uncontrolled poaching of breeding females. Everyone, together, would be richer.

A UNIQUE CASE OF MALFORMATIONS IN A NATURAL POPULATION OF THE GREEN TOAD (*BUFO VIRIDIS*) AND ITS MEANING FOR ENVIRONMENTAL POLITICS

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In September 1980 Rimpp and Henle surveyed a quarry near Vaihingen (about 25 km NW of Stuttgart) for habitat monitoring and distribution mapping of amphibians and reptiles (Rimpp, 1981).

In the closed down part of the quarry there was a pond (approximately 100 x 25 m, 0.5-1 m deep). In the shallow part of the pond which was bordered by a huge deposit of earth many tadpoles of the Green Toad were found. As immediately was evident some of them were abnormal. Having a closer look we recognised that between 35 and 55% (of more than 1000 tadpoles) were abnormal. We found giant individuals up to 8.5 cm as well as underdeveloped specimens. Furthermore albinistic individuals and individuals with torsions of the tail, asymmetrical bodies and other malformations were present.

Because of these malformations we searched for metamorphosed toads in the vicinity of the pond. We found more than 100 individuals of which about 50% were malformed. Some individuals had 5 or 6 legs. In others arms or legs were missing or ill-developed. In one individual for example the fingers grew out of the shoulder, while in others the legs were stiff or showed a torsion. Malformation of the jaws was quite frequent. In one specimen a part of the lower jaw together with the tongue was missing. Others showed colour aberrations, oedemas or tumours. A detailed account of the malformations together with a review of known anomalies in anurans will be given elsewhere (Dubois and Henle, in prep.).

Because it clearly was evident that our findings were very unusual we took a water sample for chemical examination. To be thorough, we decided to take measurements, with the appropriate instruments, for radioactivity in the quarry. We were very surprised to find high levels of radioactivity in cracks of the huge deposit of earth reaching into the pond at the side where the tadpoles stayed.

We immediately told our findings to the relevant authorities asking them to come to the quarry with us to make more controlled measurements. They went to the quarry without telling me, and after their measurements they told the press that there was no radioactivity in the quarry and that my measurements were wrong. Therefore I went back three days later for continuing field work, which I had to announce to the Manager of the quarry. Two days later he asked for a permit to destroy the habitat, and was granted it the very same day by the same authorities, despite the fact that the chemical analysis of the water was not yet completed. The water of the pond was pumped into a nearby river, and the deposits of earth where I could measure high levels of radioactivity were buried under 5 m of earth. Therefore our first measurements could not be verified.

Later on the Institut für Energie — und Umweltfragen, Heidelberg, undertook long term measurements which resulted in a high possibility of a source of artificial radioactivity buried in the deposit of earth. Details about this are given elsewhere (Henle and Kovacsics, in press). Nevertheless the authorities refused to take these findings seriously. Instead of this they tried to gloss over our findings which included telling deliberate lies. Only with luck and the help of many friends and the great assistance of the "Grüne" — a political party caring especially about environmental problems — after exhausting work it was possible to force the authorities — including the state government — to organise a hearing. Details of the events up to this time can be found elsewhere (Rimpp, 1981; Henle and Kovacsics, in press).

Apart from the discoverers and the authorities, 6 biologists and 3 radiation physicists were invited to the hearing. Two topics had to be discussed during the hearing: the biological aspects of the malformations, and the radioactivity measurements. The government argued that there was a natural explanation for the malformations. They invited Prof. Sander, Institute of Zoology, University of Friburg, who suggested that hybridization could be to blame for the malformations. However, he clearly showed that he did not understand much about toads. The discussions on the radioactivity ended in: it could not be shown definitely that there was artificial radioactivity beneath the deposit, nor could it be excluded.

So the cause of the malformations is still not clear. There were no indications of chemical pollution (Henle in press), and as the Ministry could not give a satisfactory explanation, under public pressure it had to support funds for research work on the malformations for 1982. However, of all the experts on the subject they had to choose Prof. Sander for the job, the same man who was invited to the hearings by them to argue that hybridization was to blame. Meanwhile, neither the discoverers nor the experts suggested by them have been included or even informed about the proposed research.

ACKNOWLEDGEMENTS

Too many people participated in the research work and the political work to list all their names. So I wish to thank them all together.

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*Title may change slightly.

LETTERS TO THE EDITORS

ANTIBODIES TO ADDER (*VIPERA BERUS*) VENOM 15 YEARS AFTER BITE

Dear Sirs,

Fifteen years ago I received a full bite on my left little finger from an adult male Adder. The resulting envenomation had surprisingly severe effects, which included vomiting a few hours later and the sensation of an arching spine, followed by a large blister at the site of the bite, extensive swelling of the left hand, arm, and upper left trunk, ECG irregularities, and local tissue necrosis. After 14 days in hospital I was allowed to go home without losing the finger.

Recently a small sample of my blood was examined for antibodies to *Vipera berus* venom using a sensitive and relatively sophisticated immunodiagnostic test, the enzyme-linked immunosorbent assay (ELISA). The results were positive, showing a very low titre of antibody — this was unexpected after such a long period. The presence of memory cells in my immune system which are specifically sensitized to *Vipera berus* venom, should enable the synthesis of large amounts of antibody relatively quickly after a secondary envenomation. Hopefully this will offer some protection if I am bitten again!

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AN EXCEPTIONALLY LARGE LITTER OF CAPTIVE-BORN SLOW WORMS

On 9th September this year a female slow worm I had been given a month earlier gave birth to 22 young, thus equalling the maximum recorded number for this species (Malcolm Smith).

The mother was 37 cm in overall length, and the young, which were all born alive and healthy, had an average length of 6 cm.

All the youngsters were released in a suitable locality nearby except 3 which were retained for observation. A month later these 3 individuals had doubled in length.

I would be pleased to hear from any member who knows of an instance of this species giving birth to extra-large numbers of young.

David R. Billings,
Red House Farm,
Brakefield Green,
Yaxham,
East Dereham,
Norfolk.

OPHIOPHAGY IN *NATRIX MAURA*

I recently witnessed the ingestion of a 60 g (55 cm SVL) viperine snake (*Natrix maura*) by its cage mate, a 210 g (75 cm SVL) female viperine snake which had mated two weeks previously. The incident occurred after routine feeding of the collection of viperine snakes kept in the zoology department at Nottingham University.

The victim caught a *Tilapia* and lifted it from the water dish, and was then bitten on the neck by the larger snake, which then worked its jaws over the head of the other snake to ingest the fish. So far nothing remarkable, this type of incident must be familiar to all who keep natricine snakes communally. The large snake then continued to work its jaws over the small one until it was completely ingested. This took about 10 minutes, the large snake lying stretched out straight to give room for its meal.

It was then noticed that the small one had turned round inside the gut of the large one, its head was seen exerting pressure inside the mouth of the large one, causing the chin scales to bulge out. For five minutes the situation remained like this, movements of the small one could be seen as it tried to force open the large one's mouth, and the body muscles of the large one periodically tensed, possibly to suppress the victim. The large one then opened its mouth and the head of the small one could be seen within, indeed it flicked its tongue twice. The large one then managed to close its mouth again for a further two minutes, then allowed the small one to crawl out, holding its jaws apart as in regurgitation. The small one settled down quickly and appeared undamaged, the large one was given another fish — it had retained the original fish as well.

The incident was repeated a week later, though this time the small one was not completely ingested and escaped after five minutes. Ophiophagy is known in the wild in a few European snakes, notably *Coronella austriaca* and *Coluber viridiflavus* (Vanni & Lanza, 1977), but is probably very rare in water snakes. It seems unlikely that the small snake was not recognised as such, possibly the feeding urge elicited by the fish was strong enough to overcome the inhibition of cannibalism. The recent mating of the large female may have increased its food requirements. Brown (1958) gives evidence for three cases of cannibalism in wild *Nerodia* (formerly *Natrix*) *sipedon* and states that these were possibly accidental. Had the victim of the above incident been smaller, I do not think it would have escaped, its release seemed more the result of sustained effort than sudden recognition of the meal as a snake.

The population from which both individuals came lived in a marsh around a salt works (see Patterson & Davies 1977) and eels were seen in some of the waterways earlier this year (Hailey & Davies, unpublished), so they may have experienced snake-shaped prey, though they had been in captivity for five or six years, living on goldfish.

Other prey items taken by viperine snakes in captivity at Nottingham are: fish, frogs, tadpoles, worms and a leech. I would be interested in hearing from anyone who can extend this list, or who has also experienced cannibalism in natricine snakes.

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