

**THE BRITISH
HERPETOLOGICAL SOCIETY**

BULLETIN

No. 7 June 1983

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 Society does not, as a body, hold itself responsible for statements made or opinions expressed in the Bulletin; nor does the Editorial necessarily express the official opinion of the Society

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

REMAINING MEETINGS 1983

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

- JUNE 15th** *Amphibians and reptiles of the *New World*. A discussion on care and breeding organised by the Captive Breeding Committee.
- JULY 13th** *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 and guests should meet at the Fellows' Entrance in the Outer Circle of Regent's Park. If late, please tell the Gateman you are with Dr. S. Townson.
- SEPTEMBER 21st** *Amphibians and reptiles of the *Old World*. Details as for June 15th.
- OCTOBER 1st** Joint meeting between the BHS and the British Veterinary Zoological Society (BVZS) on the captive breeding, husbandry and veterinary care of reptiles and amphibians. To be held at the Centre for Life Studies, Regent's Park. See below for details.
- OCTOBER 8th** A joint Saturday meeting with ASRA (Association for the Study of Reptilia and Amphibia) at the Cotswold Wildlife Park, Oxon. Meeting starts at 5 pm. Enter via Tradesmens' Entrance and follow signs. There will be three speakers; at the time of going to press only one lecture is confirmed: "The Ecology of Mediterranean Tortoises: a Long Term Project", by Dr. Ian Swingland.
- NOVEMBER 22nd** Dr. A. Hailey (Zoology Dept., University of Nottingham): Ecology of the viperine snake, *Natrix maura*.

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

JOINT BHS CAPTIVE BREEDING COMMITTEE and BRITISH VETERINARY ZOOLOGICAL SOCIETY MEETING, SATURDAY OCTOBER 1st 1983

To be held in the Lecture Theatre of the Centre for Life Studies in the N.W. corner of London Zoo. Entrance in Prince Albert Road, opposite Ormond Terrace. All members and guests welcome, free of charge.

Programme

- 13.30-14.00 Arrival
- Chairman: Dr. S. TOWNSON
- 14.00 O.F. JACKSON
 Clinical examination of reptiles.
- 14.30 H.R. BUSTARD
 Nesting ecology of the Gharial (*Gavialis gangeticus*) in Narayan River, Nepal.
- 15.00 K. LAWRENCE.
 Introduction to haematology and blood chemistry in reptiles.
- 15.30 P.C. CURRY
 Recent advances in reptile and amphibian husbandry.
- 16.00 *Refreshments*
- Chairman: Mr. K. LAWRENCE, MRCVS

CONSERVING SEA TURTLES

by

Nicholas Mrosovsky

Published by the British Herpetological Society

Description:

"Conserving Sea Turtles" is a critical review of the current problems and controversies of sea turtle conservation. In the words of the author: "Sea turtles are beautiful complex creatures, mysterious enough to become addicting for the biologist, absorbing for anyone to watch, and of great value for their eggs, meat, shell and leather. This book is not concerned with demonstrating that sea turtles are worth preserving; that is taken for granted. It is concerned with the methods being used to achieve that end; it argues that much is wrong. If my criticisms can be refuted, then current activities on behalf of the turtles — and the turtles themselves — will emerge all the stronger. If my criticisms stand, then it is time that a strong light was shone into the dark corners of the conservation biology of these species — and of others too perhaps. I am also convinced that the intentions of those active in sea turtle conservation are irreproachable. It is only the means of proceeding that I wish to debate ..."

It is written in a clear and uncomplicated style, and will be of interest to the general reader as well as the specialist biologist. The principles discussed are currently of crucial political importance, not only for sea turtle conservation but applied generally to the conservation of the world's fauna.

Contents:

Foreword — Preface — Turtles are Big — A Brief Life History — The Tagging Reflex — Head Starting: The Heart Has Its Reasons — Operation Green Turtle — The Styrofoam Box Story — Kemp's Ridley in a Technological Fix — The Anathema of Farming — Four Thousand Unwanted Turtles — Dangerous Categories — The Alarmist Strategy — Problem Resolving — Splitting: Strategy or Science? — An Egg-Laying Machine — Abbreviations — References — Index.

Specifications:

176pp. Paper Cover. Lacquered.

ISBN 0 9507371 1 9

Publication date: February 1983.

To Order:

BHS Members: This volume is available free of charge to BHS Members for a limited period only — *orders must be received before 31st December 1983.* U.K. Members are asked to send a large and good quality stamped (75p), self-addressed envelope (the book is A5 in size) to the address below. Overseas Members should send a cheque or international money order (made payable to the BHS) for 75p or \$1.00 (U.S.).

Non-Members, and BHS Members after 31st December 1983:

Price: U.K. £5.00 + 75p postage (surface mail) or £2.80 (air mail)

U.S.A. \$10.00 + \$1.00 postage (surface mail) or \$5.00 (air mail)

International Money Orders and Cheques should be made payable to the British Herpetological Society. Orders should be addressed to:—

Dr. S. Townson,
British Herpetological Society,
c/o Zoological Society of London,
Regent's Park,
London NW1 4RY,
England.

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|-------|---|
| 16.30 | R.A. AVERY |
| | Heat requirements of reptiles and their care in captivity. |
| 17.00 | J.R. NEEDHAM and J.E. COOPER |
| | Isolation of bacteria from reptilian pathological material and their significance. (Combined presentation). |
| 18.00 | J.E. PICKETT |
| | Conservation and legislation: the need for a constructive approach. |

MALCOLM SMITH DINNER

B.H.S. Council announce that a *Malcolm Smith Dinner* will be held on the evening of Friday 16th December, 1983, in the Cholmondeley Room, House of Lords, Westminster, hosted by the Society's President. The occasion will be open to any B.H.S. member, alone or accompanied by spouse or one guest, at a cost of £20 per head (covering a three-course meal, with wine and coffee). Accommodation is limited, and invitations will be issued on a first-come basis. Will any member wishing to participate please write to Lord Cranbrook at Great Glemham House, Saxmundham, Suffolk IP17 1LP, not later than 30th September.

SUBSCRIPTIONS

Members are reminded that subscriptions became due on January 1st. Ordinary members £10.00, Juniors £3.00, Institution and Library rate £17.00.

CORRIGENDA

Equation 3, page 37 of *Bulletin 6* (R. Meek: Notes on the incubation of the eggs of the Grass Snake, *Natrix natrix natrix*) should have read

$$y = \sigma \times B^1 m^{B^2}$$

FACSIMILE OF *BRITISH JOURNAL OF HERPETOLOGY* VOLUME ONE 1948-55

The *British Journal of Herpetology* is published by the British Herpetological Society. The first eight numbers of Volume One, 1948-53, were edited by Prof. Angus Bellairs. Just thirty years since being the editor and on the occasion of his retirement, the Society wishes to honour Prof. Bellairs's contribution to herpetology and announces that *hard-bound* facsimile copies of Volume One of the *British Journal of Herpetology* will be made available at the end of 1983. At twelve numbers per volume (two yearly), Volume One consists of 228 pages. The facsimile will be approximately A5 in size. (Back numbers of the journal are at present sold at £3.00 (\$5.50 each).

Copies will be available at a special pre-publication price of £7.50 (\$11.50) to non-members of the British Herpetological Society and £5.00 (\$8.00) to members. After publication by 31st December, 1983, the price will be £12.50 (\$19.00) to non-members and £10.00 (\$15.50) to members. Prices do not include £0.50 (\$1.00) surface postage and packing. Should pre-publication requests be insufficient to cover production costs and the project fails, subscribers will be returned their contributions. But every effort will be made to avoid this.

The British Herpetological Society (founded 1947) is probably the first nationally formed society for the study of amphibians and reptiles in Europe, as well as in the Commonwealth. The *British Journal of Herpetology*, presently edited by Dr. R.A. Avery, is now in its sixth volume. The first volume, besides recording aspects of the early development of the society and herpetology in Britain, includes some classical papers and others of historical interest. The first distribution maps of the herpetofauna of Britain and Ireland compiled by vice-counties by Col. R.H.R. Taylor (1948) make up the first number. Subsequent numbers include a paper on hybridization

between the 'green frogs' *Rana esculenta* and *R. ridibunda* by L.C. Mandeville and Helen Spurway, phenological reports on frog (*Rana temporaria*) and toad (*Bufo bufo*) breeding in Britain and a note on the distribution of herpetofauna in the Channel Islands by Dr. J.F.D. Frazer (BHS President 1955-81), a review of snake limbs by Prof. A. d'A. Bellairs, a paper on the influence of the climate of Britain and Ireland on the habits and distribution of the herpetofauna and various notes by the Society's founding President, Dr. Malcolm Smith, and a pioneer paper on toad (*Bufo bufo*) migration by H.J. Moore at Clayesmore School, Dorset.

Orders, enclosing payment (cheques, postal orders and international money orders payable to 'British Herpetological Society' are acceptable) should be sent to:—

British Herpetological Society
c/o Zoological Society of London
Regent's Park
London NW1 4RY
U.K.

EDUCATION OFFICERS REPORT TO THE MEMBERSHIP

I am happy to be able to report that over the last twelve months membership of the Junior Section has continued to rise so that the Junior Newsletter is now read by over one hundred children both as individual members and as school groups. As can be seen from the financial statement which follows this report, total income for the year was £259.06 whilst total recorded expenditure was £141.71; however, this expenditure figure does not take into account the cost to the Society of the *B.H.S. Bulletin*. Once again thanks are due to Dudley Lucas for his help in the production of the Newsletter. Unfortunately he is unable to continue handling the Newsletter duplication which means that our expenditure over the next year will rise considerably, however provided that J. Herp. membership continues to rise we should still be in the black. Obviously we will not have as much money to plough into new projects since our priority must be to maintain the basic services which benefit all members equally.

Many members have made use of our S.A.E. Advisory Service and the Herp. pen pal facility would also seem to have served a useful function.

The most important development over the last year was the acceptance by B.H.S. Council of a submission that:

"Experience to date shows that the work of the Society would now benefit from the formation of an Education Committee which would be responsible for:

- a) the continued running of the Junior Section of the Society.
- b) the extension of Junior activities to involve school groups and teachers in both the Primary and Secondary sectors.
- c) the establishment of a panel to provide speakers for non specialist groups.
- d) general exhibition work on behalf of the Society."

This Education Committee has now been formed and has held several meetings. The Committee consists of myself as Chairman, Janet Pracey as Administration Secretary, Dr. Oliphant Jackson as Veterinary Adviser, Dr. Graham Waters as Secondary Adviser and Mr. and Mrs. Gook as ordinary members of the Society with a special interest in herpetological education. The responsibilities of the various Education Committee members are as follows: Administrative Secretary handles the registration of Junior members and school groups, banking of subscriptions, dispatch of publications and other routine matters. The Veterinary Adviser assists the Committee by providing professional and ethical advice in connection with the advisory function of our services to children and teachers. The Secondary Adviser has a special responsibility for the development of activities in secondary schools.

At this point in time we are looking for someone to undertake the position of Primary Adviser on the Committee. This person should be a BHS member who is a primary teacher interested in the development of herpetological activities in primary schools. Any members who might be interested please contact me direct.

We would also like to publish a list of specialists to whom J. Herps could write for advice and would like to hear from any members of the Society who might be willing to answer letters on their particular specialist interest.

The next year should prove to be very exciting. We have accepted invitations to put on displays at three major events each of which should result in membership recruitment for both the Junior Section and possibly the main Society. We are also hoping to get involved in the Duke of Edinburgh Award Scheme and to submit articles to several appropriate educational publications. J. Herps in the London area have already been "mobilised" on two occasions to carry out field work. It is now unusual for any BHS evening meeting not to be attended by at least one or two J. Herps and it is a sobering thought that as the years go by the membership of the Society will increasingly be composed of ex-members of the Junior Section. It is hoped that over the next year we will be able to offer some of the J. Herps at least the chance to attend meetings of their own — although Junior members in Wales, Ireland, Scotland, Belgium, Norway, and Israel are excused these events.

JUNIOR SECTION — FINANCIAL STATEMENT for year ending 22nd March 1983

Income:

Membership Subscriptions paid in cash	...	...	...	...	...	...	...	...	...	...	£30.00
Membership Subscriptions forwarded to Treasurer	...	...	...	...	...	...	...	...	...	...	£186.00
Membership Subscriptions forwarded to Ed.Com. a/c	***	***	***	***	***	...	...	...	...	...	£42.50
Misc. donations to funds	...	...	...	...	...	...	***	...	...	***	£0.56
Misc. donations to funds	...	...	...	...	...	...	...	...	...	...	£0.56

Total income for year: £259.06

Expenditure:

Envelopes for dispatch of Newsletters	...	...	...	...	...	...	...	...	...	...	£34.58
Envelopes for routine correspondence	...	...	...	...	...	...	...	...	...	...	£0.56
Receipt books	...	...	...	...	...	...	...	...	...	...	£0.46
Postage of routine correspondence	...	...	...	...	...	...	...	...	...	...	£26.08½
Postage of Newsletters	...	...	...	...	...	...	...	...	...	...	£79.02½
Total cost of postage	...	...	...	...	...	...	...	...	...	...	£105.11
Misc. J.Herp. Prizes	...	...	...	...	...	...	...	...	...	...	£1.00

Total expenditure for year: £141.71

From the above figures it seems that the Junior Section made a "profit" of £117.35 *but* this does not take into account the cost to the Society of the B.H.S. Bulletin.

Vic Taylor, 80 Curzon Avenue, Enfield, EN3 4UE

March, 1983

CONSERVATION COMMITTEE ANNUAL REPORT 1982

1. REPTILE CONSERVATION

Clearance work continued as usual at multiple heathland sand lizard/smooth snake sites during winter/early spring and again in the autumn. Our efforts were supplemented by those of various County Trust Conservation Corps as well as the BTCV, all supported by the World Wildlife Fund grant awarded late in 1981. In addition, the Committee received a grant of £544 from the Nature Conservancy Council during 1982 towards the purchase of items including herbicides (for bracken and birch control), back-pack sprayers, etc., in recognition of our work on heathland conservation. A new translocation of sand lizards to Thursley National Nature Reserve was approved by the NCC and instigated by BHS this year; one of our best Surrey sites near Farnham has been extended, and we are continuing to negotiate for a good heathland site near Witley, also in Surrey. On the other hand, the NCC have not agreed to our proposed translocations of sand lizards to sand dune systems in Devon and Cornwall at least at this stage. The dune vivarium established by Mike Preston has done well this year, with excellent survival of juveniles. The rearing programme of baby sand lizards (both heath and dune animals) based on Mike's cricket hatchery has again proved a great success, with heathland animals from it being used in the Thursley translocation. The NCC vivarium on Merseyside also had a good year, but the problem of erosion on the frontal dunes (the main natural habitat of the animal) still awaits attention; it is hoped that a site meeting planned for spring 1983 may help to resolve the matter, but this remains to be seen.

2. AMPHIBIAN CONSERVATION

In East Anglia the Norfolk Naturalists Trust with advice from John Buckley organised the creation of a large new natterjack breeding pool at the remaining inland heath site; there are some fears that this may be too deep, but this site has been very problematical with regard to water levels in recent years and some action was thought desirable. The introduction planned for a Norfolk Trust sand dune reserve also went ahead in 1982, being carried out by Tom Langton. This operation resulted in some quite unnecessary altercations with the local NCC with regard to licensing technicalities, a depressing reminder that tighter control of public expenditure has not lessened bureaucratic myopia in some quarters. The Conservation Committee and Ministry of Defence have carried out more work at the Hampshire Natterjack site, including an experimental pond-liming to raise pH. On Merseyside the Conservation Committee is again involved in discussion about the proposed golf course near Formby, which will involve a very large natterjack site and has been progressing slowly for the past 3 years. Keith Corbett has become a consultant to the developer company involved. In Cumbria, a further natterjack conservation strategy meeting was held in 1982 and Brian Banks has been involved in scrub clearance, herbicide applications and pond excavation. A small site (sand pit) for the natterjack in Cumbria was lost by accidental infilling in 1982, and the breeding area of a larger colony in the Duddon estuary drained; fortunately the land owners in both areas are showing some interest in providing compensatory breeding sites, and this will have to be pursued. The controversial holiday development at Millom has also started in 1982, already resulting in the partial destruction of one of the remaining natterjack pools though some attempts are being made to maintain natterjacks in the area. There is still plenty to straighten out with regard to the future of natterjacks in Cumbria.

The proposed infilling of the newly-discovered Surrey green-frog site was successfully prevented in 1982, at least partly due to BHS involvement. Also, Keith Corbett on behalf of BHS obtained a grant of £2,000 from World Wildlife for the restoration of delapidated ponds in the south London/NW Kent/NE Surrey area.

3. MONITORING AND RESEARCH

The usual monitoring of rare species sites continued as far as time allowed in 1982. Some notable points are: Keith Corbett visited the Hebridean island to which sand lizards were translocated in 1970, and discovered them still to be present. This certainly means that a colony has been established on dunes some 300 miles further north than their natural range limit in Merseyside. Tom Langton spent 2 weeks carrying out further sand lizard survey on Merseyside in the spring, funded by NCC. Geoff and Beth Haslewood made a series of reptile surveys on the new Holton Heath NNR in Dorset, and Dave and Marion Dolton put in a lot of work monitoring heathland

sites in Dorset and SW Hants. All of this work is of course crucial to establishing future conservation priorities. On the amphibian side, John Buckley observed what could be the first signs of success for the Sandy natterjack translocation; a number of males turned up to the artificial pool in which they were reared as tadpoles in 1980, and called for several nights in June. No spawn was laid, but since females may take longer to mature this was not surprising — 1983 will be a crucial test. Brian Banks and Trevor Beebee monitored the Hampshire natterjacks, and metamorphosis was the best since 1977 (several thousand toadlets) though numbers of adults remain fairly steady so far; the booster programme of partly-grown toadlets (carried out 1979-81 inclusive) has not yet manifested itself in the adult population. Brian Banks continued active monitoring of Cumbria natterjack sites. Numerous conservation committee members including Keith Corbett, John Gaughan, Brian Banks, Howard Inns and Trevor Beebee continued survey work on common species in 1982.

Brian Banks and Trevor Beebee started work on a 2 year project, funded by NCC, to investigate factors affecting tadpole development in the natterjack. It is hoped that the resulting observations will be useful in future conservation management, and the research is specifically orientated in that direction.

4. EDUCATION

The Conservation Committee was again represented at a display in the Queen Elizabeth Country Park in June, this time by Vic Taylor. Keith Corbett and Trevor Beebee also gave talks at the symposium on "introduced species" held at the Zoological Society buildings in November. The leaflets on "Being kind to snakes" and "Garden ponds as amphibian sanctuaries" were produced in 1982 as expected, and are available (free, but please send s.a.e.) from the chairman.

On a more disturbing note, a booklet issued by the Forestry Commission and written by Dr. I.F. Spellerberg (concerned with amphibians and reptiles in woodlands) has caused considerable consternation within the Conservation Committee. A widely held view is that it is in many places inaccurate and fails to address the major problems faced by our native species in conifer plantations. Correspondence with the FC has not as yet led to any recognition of these criticisms, and plans are being considered for a publication on the subject by the BHS which would present a rather different view.

5. POLITICS

The most notable event of 1982, from our point of view, was the effective resurrection of discussions with NCC on the National Policy for Herpetofauna Conservation. Members may recall that these discussions started back in 1977, but in recent years NCC has done its best to shelve the whole issue. The revival this autumn was due essentially to the combined efforts of Wildlife Link, a dramatic demonstration of the power of the voluntary conservation bodies when they act together on an issue (and also of the value of BHS belonging to Link). The result has been 2 meetings in November, with NCC committed to a tight timetable to finalise the document by March 1983.

6. INTERNAL MATTERS

The newly-approved terms of reference for the Conservation Committee require that a full membership list be published every year; that for 1982 is shown below. We still lack representation in the Merseyside area, and would welcome enquiries from anyone interested in helping out there. In 1982 we welcomed 4 new members to the Committee (Tony Braithwaite, John Gaughan, Richard Griffiths and Howard Inns). From January 1 1983 Geoff Haslewood takes over as chairman.

Full members 1982: Dr. H. Arnold, Mr. B. Banks, Dr. T. Beebee (chairman), Ms. M. Beebee, Mr. S. Bolwell, Mr. T. Braithwaite, Mr. J. Buckley, Mr. K. Corbett, Mr. D. Dolton, Ms. M. Dolton, Mr. J. Gaughan, Mr. R. Griffiths, Prof. G. Haslewood, Ms. E. Haslewood, Mr. H. Inns, Dr. M. Lambert, Mr. T. Langton, Mr. M. Preston, Mr. V. Taylor, Mr. E. Wade, Mr. J. Webster.

Advisors 1982: Dr. E. Arnold, Mr. J. Burton, Dr. A. Cooke, Mr. H. Ginn, Mr. J. Griffin, Mr. J. Sims, Dr. R. Stebbings, Dr. C. Tydeman, Mr. J. White, Dr. D. Yalden.

Finances in 1982 have been more complicated than usual. Four categories of income are listed:

1. General recurrent:	
carry-over from 1981	£27.30
Award from BHS Council for 1982	£925.00
Donations (Croydon Nat.Hist.Soc. & Holmesdale Nat.Hist.Soc.)	£16.00
Purchases of Marion Dolton-type toys, including 3 by T. Beebee	£34.50
	Total: £1012.80
2. NCC capital grant:	£544.50
3. Carry-over of World Wildlife heath clearance grant:	£875.20
4. World Wildlife grant for pond restoration:	£2000.00

Expenditure in each of these categories is summarised below:

1. General recurrent:	
Reprint of Conservation Committee leaflet	£55.50
Reprint of identification leaflet	£125.00
Purchase of ordnance survey maps	£14.00
Contribution to Wildlife Link	£60.00
Corfe Bluff lease	£25.00
Stand at Queen Elizabeth Country Park	£34.21
Scrub clearance in Cumbria (Cons. Corps)	£6.50
Pond fencing in Cumbria	£41.40
Contribution to Norfolk natterjack pond	£100.00
Cricket's postage from Xenopus Ltd.	£14.65
Running of Mike Preston's cricket hatchery	£75.00
Petrol for scrub cutter, herbicides, etc.	£34.47
Mileage contribution to Committee members*	£276.03
	Total £861.76

Remaining in account: + £151.04

2. NCC capital grant: Back-packs, saws, herbicides	£544.50
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Remaining in account: -

3. World Wildlife heath clearance grant: Payments to Cons. Corps.	£186.75
Contributions to capital items	£124.21

Total: £310.96

Remaining in account: £564.24

4. World Wildlife Pond clearance grant — Petrol for survey	£30.00
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Remaining in account: £1970.00

*BHS-CC members travelled about 19,000 miles altogether on BHS business in 1982, and reimbursement was at the rate of 1.45p/mile.

In addition to our usual supporters, the chairman would particularly like to thank the following for their assistance with conservation work in Cumbria: Brian Banks, Janet Banks, John Durkin, Gary Laverick, David O'Brien, Heather Robertson, John Tyson and Tony Warburton.

Trevor Beebee, January 1983.

BHS COMMITTEES AND THE RULES OF THE SOCIETY

It has recently been agreed by Council that Committees of the Society should be bound by agreed terms of reference. The Conservation Committee Terms have now been approved by Council and are represented below for general information. Those for the other two Committees (Captive Breeding and Education) are expected to follow in due course.

TERMS OF REFERENCE FOR THE CONSERVATION COMMITTEE OF THE BRITISH HERPETOLOGICAL SOCIETY

1. The Conservation Committee is appointed by Council under rule 10, and is the official representative of the Society on conservation matters.
2. The aims of the Conservation Committee are: to promote the conservation of all the native British species of amphibians and reptiles, with special emphasis on the most endangered forms; and to assist as far as possible with herpetofauna conservation in an international context.
3. Membership of the Committee shall consist of a Chairman, Ordinary Members and Advisors. There shall be no fixed number of members or advisors. Other Officers may be elected or employed as appropriate from time to time.
4. The Chairman shall be an Ordinary Member, and shall be elected or re-elected by a simple majority of Ordinary Members present and voting; the vote shall be by secret ballot if a majority of Ordinary Members present so request. A chairman may serve for a maximum term of 5 consecutive years, and may subsequently be re-elected after an interval of at least one year.
5. The rights and responsibilities of the Chairman shall be those of an Ordinary Member. In addition, until such time as other officers are appointed to undertake all or any of the duties specified, the Chairman shall:
 - (a) Appoint as Advisors, for such time as appears fit (not exceeding one year, but subject to re-appointment) any person or persons appearing suitable to serve in this capacity.
 - (b) Subject to the advice of the Committee, select the time and place of meetings and take charge of the conduct of business at meetings.
 - (c) Organise secretarial assistance and ensure that proper minutes of meetings are taken and circulated to members and advisors.
 - (d) Be the custodian of fieldwork and site management records, making these available for inspection by Committee members at any reasonable time.
 - (e) Represent the Committee on the British Herpetological Society Council.
 - (f) Produce an annual report for publication in the *Bulletin*.
 - (g) Be responsible for the administration of funds and the presentation of audited accounts of income and expenditure each year.
 - (h) Be responsible for production and distribution of headed notepaper.
6. Ordinary Members shall be appointed by the Council of the British Herpetological Society following proposal by any member of the Society but subject to approval by a majority of Council members. Ordinary Members shall:
 - (a) Have the right to vote at meetings of the Committee, and shall receive minutes of all meetings.
 - (b) Be entitled to a fair allocation of funds to cover expenses in agreed categories each year, subject to approved accounting procedures.
 - (c) Be expected to keep records of fieldwork and management and submit these to the Chairman at the end of each year.
 - (d) Be expected to assist with conservation work as appropriate.
 - (e) Be expected to liaise with appropriate bodies (Nature Conservancy Council, County Naturalists Trusts etc) as necessary and to apply for grant-aid for conservation work as inappropriate. Expenditure under external grants must be arranged in close liaison with the Chairman as soon as the award is confirmed.
 - (f) Be expected to act within the broad guidelines of Conservation Committee policy, and wherever this is uncertain to consult with the Chairman and at least 2 other Committee members before taking action.

7. Advisors shall be appointed by the Chairman (Rule 5(a) above); advisors need not be members of the Society. Advisors shall:

- (a) Have the right to attend but not vote at Conservation Committee meetings, and will receive minutes of meetings.
- (b) Be expected to volunteer guidance and advice, and to provide these on request.
- (c) Be encouraged to assist with fieldwork, research and conservation management.

8. The rights and responsibilities of other officers appointed under rule 3 shall be decided by the Committee as and when posts arise.

9. A full list of members and advisors shall be published every year in the *Bulletin*.

10. There shall be at least 2 meetings of the Committee each year, and 5 members or 50% of the total membership (whichever the smaller) shall constitute a quorum.

11. In addition to any funds that may be allocated by Council, the Conservation Committee may seek additional funds from external sources. All such funds so obtained shall be shown separately in the Committee's annual accounts (see rule 5(a) above).

INTERNATIONAL CONFERENCE ON THE TERRESTRIAL AND FRESHWATER VERTEBRATES OF THE MEDITERRANEAN ISLANDS

(Origin, status, human influence and conservation)

EVISA, CORSICA, FRANCE. 10th to 16th October 1983

Organised by the Laboratoire de Zoogéographie, Paul Valéry University, Montpellier, and administered by the Regional Park of Corsica, the conference is sponsored by the French Department of the Environment and the French Federation of the Societies for Environmental Protection.

Programme suggestions will be taken into consideration by a scientific committee and fauna other than terrestrial and freshwater vertebrates (plus marine turtles and seals) may be proposed.

Registration fee: 50 French francs. Accommodation: about 120F francs per day, including meals.

Pre-registration is requested by 15th March 1983. Those wishing to present a paper will be asked for further details later. *A refund of travel expenses will be considered for speakers living outside France whose papers are accepted.*

PROPOSED PROGRAMME

Groups Concerned

Freshwater fishes;
Amphibians;
Reptiles (including marine Turtles);
Birds;
mammals (including Seals).

Subjects Involved

1. ORIGINALITIES AND STATUS OF THE TERRESTRIAL VERTEBRATE FAUNA (*Approach at the level of populations and population groups*).
Historical zoogéography (Positioning of the insular populations and/or population groups);
Endemism rate;
Evolution, microevolution (divergence with continental populations, divergence between different insular populations);
Population groups' structure: their organization in insular ecosystems;
Demographic strategies;
Population and/or population group status (recent history, present status, future perspectives, relict species, endangered species, extending species, etc.);
Inventory and mapping programs;
The monitoring of species.

2. HUMAN INFLUENCE ON THE TERRESTRIAL VERTEBRATE FAUNA AND CONSERVATION.

2.1. Direct influence

Fishing;
Hunting;
Genetic pollution;
Introduction of competitive species, of parasites;
Disturbances;
etc.

2.2. Indirect influence

Artificialization of natural environments (deforestation, reforestation, fires, drainage of humid zones, stream modification, urbanization and communication arteries, etc.);
Physical and chemical pollution of terrestrial ecosystems.

2.3. Conservation of the terrestrial vertebrate fauna

Presentation and comparison of the legislation in different countries (regulations for hunting, fishing, parks and reserves);
International legislation (Common market directives, international conventions);
Applications of these legislations in the islands (importance of habits, control, necessary improvements, etc.);
Parks, reserves (examples of achievements, evaluation and critical analysis of acquired results; proposals for the creation of parks and reserves, etc.).

3. CONCLUSIONS

Importance of the islands for the terrestrial vertebrate fauna;
Relation between scientific studies and conservation;
Legislation and protection measures to be installed in priority (State and International Authority responsibilities).

REMARKS

The conference will begin with a general introduction to the Mediterranean islands: physical and human geography, historical and present geology, geomorphology, climatology, phytogeography. For each faunistic group a presentator will introduce the concerned species and will give a summary of their status.

Conference venue: Parc naturel régional de Corse, Rue Général Fiorella, B.P. 417, 20184 Ajaccio Cedex, France.

Scientific organisation and registration: Laboratoire de Zoogéographie, Université Paul Valéry, Route de Mende, B.P. 5043, 34032 Montpellier Cedex. Telephone (67) 63.91.10.

For programme and other details, please contact Prof. Charles BLANC, Dr. Jean-Noël LHERITIER at the Paul Valéry University, address above.

1983 MEETING OF THE FRENCH HERPETOLOGICAL SOCIETY

The 1983 meeting of the Société herpétologie de France will be held from *Thursday 30th June to Sunday 3rd July in Montpellier* and organised by the Laboratoire de Biogéographie et Ecologie des Vertébrés, E.P.H.E., Montpellier. Sunshine in this part of southern France is guaranteed at this time of year!

The theme for the first day and Friday morning will be "Systematics and distribution (Amphibians and Reptiles of France)". Friday afternoon will be given to meetings of sub-committees; and because the main subject of the Meeting is distribution, most observers and coordinators for the enquiry on the distribution of herpetofauna in France will be present. The General Assembly will be held on Saturday morning and in the afternoon, there will be communications on species in terraria. An exhibition of the reptiles of France will also have been put together by Dr. M. Cheylan at the Museum of Aix-en-Provence. The final programme will be circulated in the second half of May.

For the evenings; the traditional banquet will be held on Friday, there will be a slide show and there will be a visit to Old Montpellier with its numerous architectural features, especially the fine buildings of the 17th and 18th centuries.

Applications to attend the Meeting should be made by 1st May 1983. For further information and accommodation, please contact:—

M. C.-P. Guillaume
Lab. Biogéographie et Ecologie des Vertébrés
E.P.H.E., 3e Section
Université des Sciences et Techniques du Languedoc
Place Eugene Bataillon
F-34060 Montpellier Cedex
France

BOID BREEDING SURVEY

The Institute for Herpetological Research has begun collecting data for the expanded and revised edition of the Python Breeding Manual. The new edition will include data on all genera of boas, as well as pythons. It will also include specialized data on the husbandry of boas and pythons. We are interested in corresponding with breeders of all species of boas and pythons. Breeders interesting in contributing data may write for survey forms to:

Institute for Herpetological Research
P.O. Box 2227, Stanford, California 94301, U.S.A.

It is anticipated that the revised edition will be completed in about 1 to 1½ years. Breeders who wish to be credited for contributions will be appropriately cited.

REQUEST FOR INFORMATION

THE 1983 INVENTORY OF LIVE REPTILES AND AMPHIBIANS IN CAPTIVITY

I am now preparing for receipt of information current as of January 1, 1983. If you keep live reptiles and/or amphibians in captivity, and are interested in breeding or knowing which of the species you hold are important to establishing long term captive self-sustaining populations, please respond with the information requested in this letter.

The 1983 edition will be the sixth of these surveys and I plan to produce one yearly for the next several years. Information is requested from all collections world wide. In addition to the inventory and breeding information, future publications will include a bibliography of books and articles on breeding and husbandry. General articles and references to specific species (as well as those relating to temperature, light cycle, hibernation, etc.) are of interest, and titles are requested. It may take more than one volume to bring all citations up to date, but ultimately this will result in one large bibliography with a yearly supplement to include new articles and books. If you know of any references pertaining to reproduction or specific needs of captive reptiles and amphibians, please send in the title with the appropriate bibliographic information. Everyone is asked to contribute by sending in those titles which you feel have helped you most and which would be beneficial to others.

Please send in the following information, current as of January 1 of each year, every year until further notice:

1. A complete inventory of all reptiles and amphibians held in your collection current as of January 1. Sexes should be included and can be listed male/female/unknown sex.
2. A list of all species which bred and produced young during 1982, including numbers of young for each species.
3. Any miscellaneous breeding information (use the information presented in the 1983 edition as a guide). Include detailed information.
4. A listing of any publications, including books, museum bulletins, journals, magazines,

etc., with reference to reproduction in reptiles and amphibians. References pertaining to the care of individual species as well as more general articles relating to temperature, light cycle, hibernation, etc., are of interest.

5. Telephone inventories cannot be accepted. When submitting inventories generic names must be used; if possible follow the taxonomic order listed in the 1982 edition. Type or print legibly and include your complete address as you want it listed. Deadline for receipt of information is March 1.

All information or inquiries should be sent to:

Frank L. Slavens
P.O. Box 30744
Seattle, Washington, 98103
U.S.A.

REPORT ON THE JOINT SSAR SILVER ANNIVERSARY AND HL 30TH ANNUAL MEETING, 1-6 AUGUST 1982, RALEIGH, NORTH CAROLINA, U.S.A.

The joint 25th Anniversary Meeting of the Society for the Study of Amphibians and Reptiles (SSAR) and 30th Annual Meeting of the Herpetologists' League (HL) was held in Meredith College, Raleigh, North Carolina, 1-6 August 1982, and organised by the North Carolina State Museum of Natural History, Raleigh. The Meeting was attended by about 600 herpetologists from most of the States of the U.S.A., and Canada, and included about 25 registrants from abroad — the largest number being from the U.K.: D.J. Ball (Zoological Society of London), T.R. Halliday (Open Univ., Milton Keynes), G.A.D. Haslewood (BHS), M.R.K. Lambert (BHS), H.C. Macgregor (Univ. Leicester) and J.M. Roberts (Open Univ., Milton Keynes) — in addition to British and other expatriate herpetologists working in the U.S.A. at the time. It was probably the largest herpetological meeting ever held. A full report will appear in *SSAR's Herpetological Review* 13 (4), December 1982.

Opening ceremony: The official opening ceremony on Monday, 2 August, included a welcome from Dr. Kraig Adler, SSAR President 1982, who introduced representatives of national and international herpetological societies and past and present SSAR Officers and Editors, and one from the HL President, Dr. R.F. Inger. The President of the American Society of Ichthyologists and Herpetologists (ASIH), Dr. Marvalee H. Wake, also attended. These introductions were followed by the HL's 'Distinguished Lecturer', Dr. T.M. Uzzell (Acad. Nat. Sciences, Philadelphia), speaking on 'In praise of common widespread frogs', which discussed the distribution and immunological taxonomy of W. Palearctic 'green frogs' and is to be published as a special paper. Announcements by the Meeting Chairman, Mr. Ray E. Ashton, Jr. of the N.C. State Museum of Nat. Hist., Raleigh, were followed by group photographs (to be published in *Herpetological Review*).

Foreign participants: Foreign participants were invited to a special dinner to discuss and offer suggestions regarding the establishment of an International Congress of Herpetology. An *ad hoc* committee (W.E. Duellman (Univ. Kansas, Lawrence), D.B. Wake (Univ. California, Berkeley) and J.W. Wright (Nat. Hist. Mus., Los Angeles)) had already made initial enquiries and recognised the need for the sanction of the International Union of Biological Sciences (IUBS) in such an undertaking. Nominations for an International Planning Committee were put forward and Kraig Adler proposed as General Secretary.

Paper sessions and other functions: 178 papers were contributed to the Meeting, including 37 from students in competition for HL's award, making up seven Sessions (A-G) and a Special Symposium. Abstracts of the papers are still available at \$6.50 (including overseas postage) from Douglas H. Taylor, Department of Zoology, Miami University, Oxford, Ohio 45056, U.S.A. Sessions took place in three lecture halls simultaneously.

SPECIAL SYMPOSIUM. A Special Symposium was organised by Dr. D.B. Wake entitled 'Molecular and genomic evolution of amphibians and reptiles'. The 22 papers were given in four sessions. Chairmen: D.B. Wake (Problems at the level of populations), H.C. Dessauer

(Problems in speciation and species interaction), W.R. Heyer (Phylogenetic inference), J.W. Wright (Analytical and technical advances). The speakers included:

H.C. Dessauer (Louisiana St. Univ., New Orleans): an introduction, 'Genetic inference from electrophoretic phenotypes of proteins';

J.M. Szymura (Jagellonian Univ., Krakow, Poland): 'Natural hybridization between *Bombina bombina* and *B. variegata* (Anura: Discoglossidae): a comparative study of hybrid zone structure in southern Poland and western Yugoslavia';

L.R. Maxson (Univ. Illinois, Urbana-Champaign): 'Molecular phylogenies: frameworks for addressing major evolutionary questions';

H.C. Macgregor: 'Chromosomes, DNA sequences and evolution in newts and salamanders', and E. Olmo (Univ. Naples, Italy): 'Genomic composition of reptiles: evolutionary perspectives'. The final session, chaired by D.B. Wake, discussed research opportunities and prospects.

SESSION A: Chairmen: J.R. Dixon (Texas A. & M. Univ., College Station), H.W. Greene (Univ. California, Berkeley), C. Gans (Univ. Michigan, Ann Arbor). The 20 papers in three subsessions included:—

P.C.H. Pritchard (Florida Audubon Soc.): an opener, 'Zoogeography of South American turtles';

C.H. Ernst (George Mason Univ., Manassas, Virginia): 'Geographic variation in the neotropical turtle, *Platemys platycephala*';

A.S. Rand (Smithsonian TRI, Panama), B.C. Bock (Univ. Tennessee, Knoxville) and a student, K. Troyer (Univ. California, Davis and Smithsonian TRI, Panama): papers on the green iguana, and

S.J. Arnold (Univ. Chicago): 'Are the scale counts used in snake systematics heritable?'

SESSION B: Chairmen: B.D. Valentine (Ohio St. Univ., Columbus), J. Christenson (Drake Univ., Des Moines, Iowa), J.P. Kennedy (Univ. Texas, Houston). The 20 papers in three subsessions included:—

P. Alberch (Mus. Comp. Zool., Harvard Univ., Cambridge, Mass.): an opener, 'Digital loss and reproduction in amphibians: an approach through ontogeny, phylogeny and experimental embryology';

H. Fukada (President, Herp. Assoc. Japan, Kyoto): 'Heart rate-temperature relationships in Japanese rat snakes';

P.E. Hertz (Barnard Coll., New York), R.B. Huey (Univ. Washington, Seattle), E. Nevo (Univ. Haifa, Israel): on work in Israel 'Evolution of thermal sensitivity of sprint speed in some agamid lizards';

M.H. Wake, W.E. Bemis, K. Schwenk (Univ. California, Berkeley): 'Morphology and function of the feeding apparatus in *Dermophis*', and

T.L. Taigen (Univ. Connecticut, Storrs), C.A. Beuchat (Univ. Arizona, Tucson): 'American toads and Swedish lumberjacks: a unified view of patterns in exercise physiology'!

SESSION C: Chairmen: S.R. Edwards (Univ. Kansas, Lawrence), J.T. Collins (Mus. Nat. Hist., Univ. Kansas, Lawrence), D.H. Taylor (Miami Univ., Oxford, Ohio), H. Seibert (Ohio Univ., Athens). The 27 papers in four subsessions included:—

D.M. Green (Univ. California, Berkeley): an opener, 'Mating call of hybrid toads at Long Point, Ontario';

J.P. Caldwell (Emory Univ., Atlanta, Georgia): 'A seasonal shift in choice of egg-laying sites in the southern leopard frog, *Rana utricularia*';

S.P. Hall (Univ. North Carolina, Chapel Hill): 'A comparison of the movements of eastern box turtles, *Terrapene c. carolina*, on and away from their home ranges';

T.R. Halliday, P.A. Verrell (Open Univ., Milton Keynes, England): 'Alternative mating strategies in amphibians';

G.M. Burghardt, B.G. Batts, B.C. Brock (Univ. Tennessee, Knoxville): 'An analysis of feeding behaviour in a bicephalic black rat snake', and

K. Miyata (USNM, Washington, D.C.): 'Species densities of snakes and their potential prey: a re-evaluation', which involved complex computer analysis of much data after the approach of S.J. Arnold.

SESSION D: Chairmen: G. Pisani (Univ. Kansas, Lawrence), J.L. Vial (Univ. Tulsa, Oklahoma), P.M. Daniel (Miami Univ., Oxford, Ohio), C. Hirschfield (Cincinnati, Ohio). The most interesting 27 papers in the four subsessions included:—

G.W. Schuett, J.C. Gillingham (Central Michigan Univ., Mt. Pleasant): an opener, 'Seasonal timing of mating, sperm storage and multiple paternity in single litters in the copperhead, *Agkistrodon contortrix*';

V.P.G. Gannon, D.M. Secoy (Univ. Regina, Saskatchewan, Canada): 'Ecology of prairie rattlesnake, *Crotalus viridis*, at the northern limit of its range';

N.B. Ford (Univ. Texas, Tyler): 'Geographical variation in the sex pheromone discrimination ability of the plains garter snake, *Thamnophis radix*';

J.A. MacMahon (Utah St. Univ., Logan): 'Mt. St. Helens: the surviving herpetofauna';

B. Lanza (Univ. Florence, Italy): 'Amphibians and reptiles of the Somali Democratic Republic';

A.E. Leviton (California Acad. Sciences, San Francisco), M.L. Alrich (American Assoc. Adv. Science, Washington, D.C.): 'A most regrettable tangle of names revisited; the Thompson-Van Deburgh feud in the early 20th Century';

F.J. Mazzotti (Pennsylvania St. Univ., University Park): 'Effects of temperature and salinity on growth rates of hatching crocodiles and alligators: implications for their distribution in southern Florida', and finally

J.C. Gillingham, C. Gans, D. Clark (Univ. Michigan, Ann Arbor): 'Courtship, mating and combat in the tuatara, *Sphenodon punctatus*'.

SESSION E: Chairmen: M.A. Nickerson (Milwaukee Public Mus., Wisconsin), R.A. Brandon (Southern Illinois Univ., Carbondale), R.E. Gordon (Univ. Notre Dame, Indiana), J.E. Huey (Univ. Maryland, College Park). The 27 papers in four subsections included:—

C.A. Ingersoll, R.F. Wilkinson (Southwest Missouri St. Coll., Springfield): an opener, 'Seasonal reproductive changes in *Cryptobranchus alleganiensis*';

J.E. Juterbock (Ohio St. Univ., Lima): 'Reproductive effort in the salamander, *Desmognathus fuscus*';

T.J. Papenfuss, D.B. Wake (Univ. California, Berkeley), K. Adler (Cornell Univ., Ithaca, New York): 'Salamanders of the genus *Bolitoglossa* from Oaxaca and Guerrero';

M.E. Feder (Univ. Chicago): 'The ecology of behavioural thermoregulation in neotropical salamanders';

R.C. Bruce (Highlands Biol. Stat., Western Carolina Univ.): 'Larval biology of *Eurycea* in the southern Appalachians', and

E.C. Houghtaling, D.C. Wilhoft (Rutgers Univ., Newark, New Jersey): 'Further studies of temperature dependent sex determination in *Chelydra serpentina*'.

SESSION F: Chairmen: M.M. Stewart (St. Univ. New York, Albany), S.A. Minton (Indiana Univ., Indianapolis). The 13 papers in two subsessions included:—

C.K. Dodd, Jr. (Off. Endangered Sp., US Fish & Wldf. Serv., Washington, D.C.): an opener, 'Nesting of the green turtle, *Chelonia mydas*, in Florida';

R.C. Vogt (Est. Biol. Trop. "Los Tuxtlas", Veracruz, Mexico): 'Reproductive ecology and population structure of three tropical turtle communities';

M.R.K. Lambert: 'Some factors influencing the distribution of *Testudo graeca* L. (Testudines, Testudinidae) in Morocco precluding its survival in cold, temperate Europe';

E.A. Standora, J.R. Spotilla, J.A. Keineth, R.C. Shoop (St. Univ. Coll., Buffalo, New York & Univ. Rhode Island, Kingston): 'Body temperatures, movement and diving cycles of a juvenile leatherback turtle, *Dermochelys coriacea*' and

J.-M. Exbrayat (Fac. Cath. Sc. Lyon, France): 'Reproductive cycle in *Typhlonectes*'.

SESSION G: Chairmen: G. Zug (USNM, Washington, D.C.), C.J. McCoy (Carnegie Mus. NH, Pittsburg, Pennsylvania). The 14 papers in two subsessions included:—

S.B. Hedges (Univ. Maryland, College Park): an opener, 'Genetic relationships of the chorus frogs, genus *Pseudacris*';

R.P. Elinson (Univ. Toronto, Ontario, Canada): 'Anuran sex-linked genes behave differently from mammalian ones';

S.M. Case (Salem St. Coll., Massachusetts), E.E. Williams (Mus. Comp. Zool., Harvard Univ., Cambridge, Mass.): 'Genetic isolation of two subspecies of *Anolis distichus*';

I. Gilboa (Computer Centre, City Univ. New York): 'Digitized herpetology', and finally W.R. Branch (Port Elizabeth Mus., South Africa): 'Chromosome morphology of African snakes'.

SPECIAL PAPER SESSION: Moderator: H.G. Dowling (New York Univ.). Five papers were presented under the title 'Controversial ideas in herpetology' and included:—

C. Gans: 'The amphisbaenia, an order of reptiles?!'

POSTER SESSION: Chairman: A. Echternacht (Univ. Tennessee, Knoxville). Nine posters included such contributions, whose excellence was judged for HL's \$100 cash prize, as:—

R.W. McDiarmid (USNM, Washington, D.C.): 'A useful color guide for field studies', and T. Scanlon (Univ. Michigan, Ann Arbor): 'Anatomy of the neck of the western painted turtle, *Chrysemys picta belli*'.

TECHNIQUES FOR SYSTEMATICS STUDIES FOCUSED AT THE CHROMOSOMAL AND MOLECULAR LEVELS: As part of the special symposium 'Molecular and genomic evolution of amphibians and reptiles', demonstrations of special techniques were organised by H.C. Dessauer, a paper contributor and chairman of one of the sessions.

ZOO LIAISON COMMITTEE: Chairman: G. Ferguson (Texas Christian Univ., Houston). Eight programmes were presented, followed by a panel discussion, on 'Grant possibilities for herpetological research in zoos, museums and universities' and included:—

C.K. Dodd, Jr.: U.S. Department of the Interior Programmes;

J. Behler (Bronx Zoo, New York): New York Zoological Society Grants Programme, and

K.H. Berry (Bureau of Land Management, California): Bureau of Land Management, California): Bureau of Land Management Purchase Orders and Contracts.

SSAR REGIONAL HERPETOLOGICAL SOCIETY LIAISON COMMITTEE: Co-sponsored with the North Carolina Herpetological Society (President: G. Woodyard (Goldsboro, N.C.)), the subject title of the 6th Annual Regional Society Workshop was "Exotic places, exotic herps: travels throughout the world". Chairman: Janice Perry (Dallas Zoo, Texas), Session I took place on Sunday evening, 1 August, and was held in Raleigh's Holiday Inn North. The Regional Society Social was followed by four talks, which included:—

S. McKeown (Honolulu Zoo, Hawaii): 'Captive breeding and the current status of the herpetofauna of the Indian Ocean', and

B.A. Langerwerf (Waspik, Netherlands): 'The successful breeding of lizards from temperate regions'. Four further talks were presented in Session II the next afternoon and included:—

R. Bader, E. Jacobson (Univ. Florida, Gainesville): 'Crocodile farms in Thailand', and

J. Behler: 'Goliath frogs in fact and fiction — hunting the World's largest frog' in the Camerouns, West Africa.

SOCIALS: After the International Congress Planning Committee meeting on Monday evening, 2 August, a 'Social and Auction' took place amongst the pinewoods of the N.C. State Fair Grounds at Cary, near Raleigh. An essential 'liquid' entertainment (!) (the Baptist Meredith College Campus was 'dry'!), a motorised tanker containing beer was provided for participants. On the Tuesday evening, participants were invited to a Carolina Pig Pickin' (a banquet, which = barbecue!), which was good fun as an outdoor summer activity (the beer tanker again!) and well attended. On the Wednesday and Thursday evenings, David Dennis (Ohio St. Univ., Delamare) and Eric Juterbrock gave a 'slide and music' show entitled 'Amphibians of the Appalachians' — superb colour slides shown as a three-screen panorama, magnetically synchronised with Aaron Copeland's 'Appalachian Spring'. This was followed by another slide show by David Dennis, also a three-screen panorama, entitled 'Herps past and present', in which Prof. Angus Bellairs featured among other well-known and distinguished European and American herpetologists, often in unsuspecting poses!

IUCN/SSC TORTOISE GROUP MEETING: In the absence of Dr. I.R. Swingland, the Chairman, who unfortunately could not make Raleigh (and read his paper in Session E, 'Sex determination and movement in tortoises'), Dr. Peter Pritchard took the Chair. Discussions included a consideration of tortoise breeding projects and a future one on the rarest of the World's tortoises, the Madagascar angulated tortoise (*Geochelone yniphora*), prepared by Dr. J.O. Juvik (Univ. Hawaii, Hilo). A brochure on the Gopher Tortoise Council (c/o Florida State Museum, Univ. Florida, Gainesville, Fl. 32611) was circulated by the GTC Chairman, R. Mount (Auburn Univ., Alabama), and Peter Pritchard then gave a slide show 'Tortoise of the World and the IUCN activities', Mediterranean species being commented on by M.R.K. Lambert.

LIVE ANIMAL EXHIBITS — A DAILY EVENT: Besides an art and photography show, a display of carving and sculptures, and such commercial exhibits as books and T-shirts, an outstanding feature of the meeting, especially to foreign visitors, was a collection of live specimens of the amphibians and reptiles native to North Carolina and adjacent areas. This exhibition, owing everything to devoted collectors and supervised by Jesse Perry of the N.C. State Museum of Natural History, comprised almost all the unique and wonderful salamanders (some of them rare) and many of the reptiles except venomous snakes, which are kept in the Museum itself. To an outsider, it was a great thrill to see and even handle these remarkable creatures and the exhibition was, in itself, a sufficient reason for making the trip to Raleigh. The field trip planned for Meeting Participants enabled foreign visitors in particular to encounter a few of these animals in their natural habitats.

THE FIELD OUTING TO SANDHILLS, S E NORTH CAROLINA (by G.A.D. Haslewood): It rained on the last meeting day but the following morning, Friday August 6, dawned sunny for the field trip. At 07.00, cars assembled at the main block of Meredith College and, led by Alvin Braswell of the N.C. State Museum of Natural History, drove south towards the Sandhills, a unique habitat in the S E of the State. The drive itself was delightful, little traffic on good roads through intensely green wooded country broken at intervals by attractive wooden homesteads with small fields of tobacco, maize and other crops. The sun shone, birds and butterflies flew, cicadas sang and herpetologists exchanged thoughts. Netherlanders (including Marinus Hoogmoed, the SEH General Secretary, and Bert Langerwerf and his wife, Hester), two English (the Haslewoods), a Japanese, Italians, a German, a young Pole and others from outside the U.S. were in the party of perhaps twenty. Our hosts brought nets and other collecting equipment, but only to show the animals: it had been the policy of the Meeting that no herps were to be removed.

After about an hour, we stopped at a smallish stream running through a bridge below the road and were warned by Alvin in his pleasing Southern accent not to tangle with anything that might be a cottonmouth, *Agkistrodon piscivorus*, a highly venomous snake treated hereabouts with respect. Alvin caught a harmless black racer, *Coluber constrictor*, and Bert Langerwerf a small skink (probably *Scincella lateralis*) on the roadside verge before we went on to Aberdeen, a small town where we stocked up for lunch. Another short drive brought us to Sandhills country, the road running between low banks of sand bordering mixed pine and deciduous woodland. As soon as the party climbed into the woods it was clear that we were herpetologists, for every object on the ground was at once turned over; however with little result, for the season was wrong and the day too hot for such tactics to succeed. Soon a Fowler's toad, *Bufo woodhousei*, was caught and later, and at a second stop in the woodland, there were several lizards: five-lined skinks (*Eumeces fasciatus*), racerunners (*Cnemidophorus sexlineatus*) and fence lizards (*Sceloporus undulatus*). These woodland skinks and racerunners were beautiful reptiles indeed, the skinks with bright stripes and blue tails and the racerunners also striped and large-limbed for speed: they are easy to spot by the rustling they make amongst the fallen leaves. In this habitat, fence lizards climb the rough bark of pines and one must search this to see them. We caught no snakes and continued to a small village store for final supplies before driving to our main watery objective, a wide marshy creek a short distance from a roadside site set out with benches and tables as a picnic area, in typical U.S. style. Almost at once, one of our hosts caught a large mud snake, *Farancia abacura*, a daunting but essentially harmless reptile: when finally released this specimen made off with amazing speed into the water. Stake-and-drag netting of the creek produced numerous tadpoles, some probably of chorus frogs, *Pseudacris* sp., and a few small gilled sirens, *Siren* sp., which we were especially pleased to see in the wild. We also had a glimpse of a turtle, perhaps a cooter or slider, *Chrysemys* sp., disappearing as the net was drawn in.

Obviously we could have found more, for the number and variety of herptiles in this not very large wetland site were quite astounding. Time pressed, however, and we had only one more stop, where a roadside creek was netted for mudpuppies, *Necturus* sp., without success.

We thus saw wild a few of the 138 species of herpetofauna native to N Carolina, well described and photographed in *Amphibians and Reptiles of the Carolinas and Virginia* (1980) by Martof, Palmer, Bailey, Harrison and Dermid (The University of North Carolina Press, Chapel Hill).

Of other animals we met a fox, monarch and swallowtail butterflies and dragonflies.

As we came back to Meredith, fireflies were already about and a Carolina moon was rising in a cloudless sky. It had been a good day.

Some conclusions: The Raleigh Meeting was an undoubted success, enjoyable, and congratulations are due to Kraig Adler as SSAR 1982 President for the Society's Silver Anniversary Year and Ray Ashton as the organiser. It was attended by a large number of herpetologists, including most of the well known North American based herpetologists, whom, especially when coming from abroad, one had the opportunity of meeting or hearing for the first time. Meredith College also provided good facilities inexpensively (important for students, who will be the future herpetologists!) in an interesting (herpetologically!) part of the U.S.A. What can one learn from a large meeting of this kind?

With so many papers contributed, even only allowing 15 minutes for each, it was inevitable that over only a four-day period three should need to be presented simultaneously. Apart from papers of interest clashing with each other, the lecture halls were not adjacent and this meant walking between them, often resulting in parts of papers of interest being missed which abstracts alone did not really compensate for, in addition to some disturbance to the audience from the coming-and-going. The papers, moreover, covered such a wide range that classification under topics was difficult, if not impossible, except for the Special Symposium. Perhaps in the future, papers could be classified under a series of symposia of a specific subject range. Alternatively, although there is the danger of insidiousness, fewer, longer papers could perhaps be selected so that subjects can be treated at greater depth, and others presented as titles and abstracts only, perhaps for consideration under a specific subject at a subsequent Meeting Symposium.

These points should perhaps be taken into account if one is to anticipate with interest the organisation of a first International Congress of Herpetology, sanctioned by the IUBS, as discussed by international participants at the Raleigh Meeting.

G.A.D. Haslewood
M.R.K. Lambert

Footnote. A copy of the full programme of events at the Raleigh Meeting, including abstracts of papers, has been deposited with the BHS Library and is available to members on loan.

HERPETOLOGICAL SOCIETIES OF EUROPE AND THE COMMONWEALTH

Since all of the species of British herpetofauna also occur (together with many others!) on the Continent of Europe, BHS members on biogeographical, spatial and cultural grounds may wish to know of other European herpetological societies, possibly situated in their areas of interest. Moreover, since there are historical, linguistic and cultural links with Commonwealth (and other) countries outside Europe, often with expatriate British and other expatriate herpetologists working in them, BHS members may also be interested to know of the societies there. A preliminary list of the herpetological societies in North America was produced by Tom R. Johnson and published some years ago (September 1978) in the Society for the Study of Amphibians and Reptiles (SSAR)'s *Herpetological Review* 9 (3): 105-106. Since then, the list has been kept up-to-date under 'Regional Society News' in subsequent issues of that publication.

Just recently, largely as part of the organisation involved and the aftermath of the joint SSAR 25th Anniversary and Herpetologists' League (HL)'s 30th Annual Meeting in Raleigh, North Carolina, to which international representatives were invited, an up-to-date list of the World's

herpetological societies has been prepared provisionally by Ms. Janice Perry (Dallas Zoo, Texas, U.S.A.), who chairs the SSAR's Regional Herpetological Society Liaison Committee. This committee has concentrated on societies in the American States which report on their activities, organise a workshop and hold a social with the local herpetological society at SSAR/HL annual meetings. The World List is to be published as one of the SSAR's *Herpetological Circulars* (No. 13) in 1983. The list of societies in Europe and the Commonwealth below is based, with amendments, on those included by Janice Perry and her colleagues.

During the joint SSAR/HL Raleigh Meeting in August 1982, attended by nearly 600 people, including 25 representatives from abroad, it was enthusiastically agreed at a meeting of the international representatives, after discussion, that a planning committee should organise a first International Congress of Herpetology (sanctioned by the International Union of Biological Sciences — IUBS) in about 1987. Since the preparations will involve much coordination of interests, an appeal has been made to herpetologists and herpetological societies World-wide for their cooperation. Beyond national considerations and of benefit to the herpetological community as a whole, national and other societies in USA, Europe and elsewhere have been invited to assist by contributing up-to-date details on their societies for compiling the World List. This list is important in relation to making announcements about the Congress and in keeping the herpetological community informed of developments. Individual societies, incidentally, may well also benefit by gaining new members working within their areas of coverage.

In the provisional list below, the assistance of herpetologists in Europe and the Commonwealth is invited by their drawing attention to any inaccuracies or recent changes, and the names and addresses (including those of organising officers) of any further societies that have been formed or, for that matter, that have discontinued. Please inform Dr. M.R.K. Lambert, BHS Chairman, Centre for Overseas Pest Research, College House, Wrights Lane, London W8 5SJ, U.K. (William Holstrom, Department of Herpetology, New York Zoological Park, Bronx Zoo, Bronx, NY 10460, is specifically involved with Canada, Africa, Australia, Austria, Belgium, Hungary, India, Israel, New Zealand, Poland and USSR, and other countries for the SSAR RHSL Committee).

Doubtless by gaining further members, the SSAR has effectively agreed to fund this early administrative stage in the organisation involved with the Congress by using their publications to disperse information. News and information on activities from herpetological societies outside the USA, of probable interest to herpetologists (including foreign expatriates) based in North America, are also requested for publication in SSAR's *Herpetological Review* (HR), especially announcements of forthcoming symposia and meetings, national or multinational, whether specifically on amphibia and reptiles or of general interest to the herpetological community. The Editor of HR is Dr. Martin J. Rosenberg, Department of Biology, Case Western Reserve University, Cleveland, Ohio 44106, USA. Deadlines for submitting articles are:—

January 15 1983 for HR 14 (1), March 1983

March 1 1983 for HR 14 (2), June 1983

May 15 1983 for HR 14 (3), September 1983

September 1 1983 for HR 14 (4), December 1983

Corrections and amendments are invited to the list of European and Commonwealth herpetological societies that follows:—

EUROPE

Austria

SOCIETAS EUROPAEA HERPETOLOGICA (registered in Bonn, F.R. Germany)

Dr. J. Eiselt, President

Naturhistorisches Museum

Postfach 417

A-1014 Wien

AUSTRIA

Publication: *Amphibia-Reptilia*, published quarterly (360 pages yearly); SEH News, 32 pages yearly.

Belgium

CAMPAIGNE PROTECTION TORTUES

J. Bouvry
Rue de Pot d'Etain 13
B-7500 Tournai
BELGIUM

CENTRE D'OBSERVATION BELGE DES REPTILES ET AMPHIBIENS

Mr. A. Goethals, President
Avenue General Medecin Derache 153
B-1050 Bruxelles
BELGIUM

Publications: *Cobra*, bulletin published irregularly.

BELGISCHE BOND VOOR AQUARIUM EN TERRARIUMKUNDE

Mr. G. Rens
Musstraat 55
B-3530 Houthalen-Helchteren
BELGIUM

TERRA, HERPETOLOGIC SOCIETY

Mr. F. Vanderstraeten, Corresponding Secretary
Wolterslaan 93
B-9110 Gent/Sint-Amandsberg
BELGIUM

Publications: *Terranews Letter*, published monthly; *Terra* magazine, published bimonthly.

VERENIGING VOOR TERRARIUMKUNDE EN HERPETOLOGIE

Mr. L. de Belder
Neptunusstraat 62
B-2600 Berchem
BELGIUM

Czechoslovakia

HERPETOLOGICAL SECTION — CZECHOSLOVAK ZOOLOGICAL SOCIETY

Dr. E. Opatrny, President
Department of Zoology
Faculty of Science
Palacký's University
Leninova 26
77 146 Oloumouc
CZECHOSLOVAKIA

Denmark

NORDISK HERPETOLOGISK FORENING

c/o Ulf Olsen
Ornevej 6
4040 Jyllinge
DENMARK

Publications: Journal, published ten times a year; Newsletter, published ten times a year.

France

SOCIÉTÉ BATRACHOLOGIQUE DE FRANCE

(société pour l'étude et la protection des amphibiens)

Dr. A. Dubois, Secretary General
Laboratoire des Reptiles et Amphibiens
Muséum national d'Histoire naturelle
25 Rue Cuvier
75005 Paris
FRANCE

Dr. J.-J. Morère, President
Same address

Publications: *Alytes*, a journal published quarterly.

SOCIÉTÉ HERPÉTOLOGIQUE DE FRANCE

Headquarters (Secretariat):
Université de Paris VII
Laboratoire d'Anatomie Comparée
2 Place Jussieu
75230 Paris Cédex 05
FRANCE .

Dr. J. Lescure, President
Laboratoire des Reptiles et Amphibiens
Muséum national d'Histoire naturelle
25 Rue Cuvier
75005 Paris
FRANCE

M. Claude-P. Guillaume, Secretary
Laboratoire de Biogéographie et Ecologie des Vertébrés E.P.H.E.
U.S.T.L., Place E. Bataillon
34060 Montpellier Cedex
FRANCE

Publications: *Bulletin de la Société Herpétologique de France*, published quarterly
Miscellaneous publications, about yearly or at reduced cost.

Germany — Democratic Republic

KULTURBUND DER DDR — ABETEILUNG NATUR UND UMWELT ZENTRALER FACHAUSSCHUSS TERRARISTIK

DDR-1030 Berlin
PSF 34
D.R. Germany

Dipl. agr. Joachim Wolf, President
DDR-4019 Halle/S.
E.-Schuster-Strasse 18f
D.R. GERMANY

SEKTOR VIVARISTIK/FELDMERPETOLOGIE

Peter Hallman, Head of Sektor Vivaristik
ZFA Terraristik (address above)

ZENTRALEN ARBEITSGRUPPEN (ZAG) DER ZFA TERRARISTIK — HERPETOLOGIE

ZAG ECHSEN (lizards)

Dr. Klaus Richter
KMU Sekt. Biowiss.
Tax./Ökologie
DDR-7010 Leipzig
Talstrasse 33
D.R. GERMANY

ZAG SCHLANGEN (snakes)

Peter Hallman
DDR-1297 Zepernick
Wernigeroder Strasse 19
D.R. GERMANY

ZAG SCHILDKROTEN/PANZERECHSEN (tortoises/turtles)

Hans-Werner Rudloff
DDR-4602 Wittenberg-Piesteritz
Strasse der Neurerer 201
D.R. GERMANY

ZAG LURCHE (amphibia)

Joachim Hammermeister
DDR-1180 Berlin
Dahmestrasse 1
D.R. GERMANY

Publications: *Aquarian Terrarien — Monatsschrift für Vivarienkunde und Zierfischzucht*

Mr. H. Stallknecht, Executive Editor

(A journal published monthly by
Kulturbund der DDR)

DDR-1080 Berlin

PSF 57

D.R. GERMANY

Elaphe, published quarterly

Feldherpetologische Mitteilungen, published yearly.

Germany, Federal Republic of

DEUTSCHE GESELLSCHAFT FÜR HERPETOLOGIE UND TERRARIENKUNDE

Headquarters (Secretariat):
Natur-Museum Senckenberg
Senckenberganlage 25
D-600 Frankfurt 1
F.R. GERMANY

Dr. W. Böhme, President
Zoologisches Forschungsinstitut und
Museum Alexander Koenig
Adenauerallee 150-164
D-5300 Bonn 1
F.R. GERMANY

Publications: *Salamandra*, published quarterly.

Newsletter, published 4-5 times yearly; Tagungsführer, a program booklet, yearly.

HERPETOFAUNA

Postfach 1110
Stuttgarter Strasse 35
D-7056 Weinstadt 1
F.R. GERMANY

(a journal only — not to be confused with the
journal of the same name of the Australasian
Affiliation of Herpetological Societies).
Published six times yearly.

INTERESSEN-GEMEINSCHAFT SCHILDKROTENSCHUTZ

Mr. Raymund Windolf, Chairman
Katharina-Eberhard-Strasse 12-14
D-8013 Haar bei München
F.R. GERMANY

Publications: *Die Schildkröte*, published quarterly (Special Publications irregularly);
Newsletter, published quarterly.

ISIS GESELLSCHAFT FÜR BIOLOGISCHE AQUARIEN — UND TERRARIENKUNDE

Mr. J. Woolman
Schwanthalerstrasse 123
D-8000 München 2
F.R. GERMANY

Publications: Oas Aquarium, published quarterly.

SOCIETAS EUROPAEA HERPETOLOGICA

Prof. Dr. H. Hemmer, Co-Editor,
Institut für Zoologie
Johannes-Gutenberg-Universität
D-6500 Mainz
F.R. GERMANY
Amphibia-Reptilia

Dr. H. Wermuth, Treasurer
Museum für Naturkunde
Arsenalplatz 3
D-7140 Ludwigsburg
F.R. GERMANY

Publication: *Amphibia-Reptilia*, quarterly (360 pages yearly), SEH News, 32 pages yearly.

VERBAND DEUTSCHER VEREINE FÜR AQUARIEN — UND TERRARIENKUNDE

Mr. E. Somann
Burscheider Weg 11C
D-1000 Berlin 20
F.R. GERMANY

Hungary

FIRST HERPETOLOGICAL CONFERENCE OF THE SOCIALIST COUNTRIES

Dr. O. Gy. Dely, Chairman, Organising Committee
Zoological Department
Hungarian Natural History Museum
Baross u.13
H-1088 Budapest
HUNGARY

Publication: a herpetological number of *Vertebrata Hungarica*.

**HERPETOLOGICAL AND TERRARISTIC FACULTY ON THE SOCIETY OF
NATURAL SCIENCES**

Tit Természettud Studio
Bocskai ut 37
H-1113 Budapest
HUNGARY

Israel**REPTILE INFORMATION CENTER**

Mr. Amos Bouskila
c/o Prof. Y.L. Werner
Department of Zoology
Hebrew University
Jerusalem 91904
ISRAEL

Italy**UNIONE ERPETOLOGICA ITALIANA**

Dr. S. Bruno
Centro del Parco Nazionale d'Abruzzo "L'Aquila"
67032 Pescasseroli
ITALY

Netherlands**CHELONIAN DOCUMENTATION CENTER**

Mr. J.H. de Pon, Executive Director
P.O. Box 125
8700 AC Bolsward
NETHERLANDS

Publications: *CDC Newsletter*, published quarterly; Miscellaneous publications series, irregularly.

DOELGROEP SLAGEN VAN DE NVHT "LACERTA"

c/o L. Brand, Secretary
Teldersweg 151
3052 TD Rotterdam
NETHERLANDS

NEDERLANDSE BOND "AQUA TERRA"

c/o Mr. H.M.A. van Lier
V. Riebeecklaan 23
2024 AE Haarlem
NETHERLANDS

NEDERLANDSE DOELGROEP SLAGEN (Dutch Snake Society)

R. Verbeek, Secretary
Alholm 76
2133 DD Hoofddorp
NETHERLANDS

Mr. P.B. Stoel, President
Verlengde Hoogravenseweg 165
3525 BE Utrecht
NETHERLANDS

Publications: *Litteratura Serpantium*, published bimonthly.

NEDERLANDSE SCHILDPADDEN VERENIGING

Headquarters (Secretariat):
Papelaan 18
2522 EJ Voorschoten
NETHERLANDS

Mr. A.M. Kronenberg, President
Hollandseweg 362
6705 BD Wageningen
NETHERLANDS

Publications: *De Schildpad* (The Tortoise), published bimonthly.

NEDERLANDSE STUDIEGROEP ANOLISSEN

Mr. P.J. van Dijk, Secretary
Via Regia 190V
6217 RA Maastricht
NETHERLANDS

Mr. J. Findhammer, President
Galatea straat 97
5631 EC Eindhoven
NETHERLANDS

Publications: *Bulletin Nederlandse Studiegroep Anolissen*, published bimonthly.

**NEDERLANDSE VERENIGING VOOR HERPETOLOGIE EN TERRARIUMKUNDE
"LACERTA"**

Mr. E.F. Elzenga, Secretary

Drs. G.N.M. Wijngaards, President

Burg. H. van Konijnenburglaan 46
3925 XB Scherpenzeel
NETHERLANDS

Publications: *Lacerta*, published eleven times a year.

Koningsholster 64
6573 VV Beek-Ubbergen
NETHERLANDS

SOCIETAS EUROPAEA HERPETOLOGICA (registered in Bonn, F.R. Germany)

Dr. M.S. Hoogmoed, General Secretary
Rijksmuseum van Natuurlijke Historie
Postbus 9517
2300 RA Leiden
NETHERLANDS

Dr. J.J. van Gelder, Co-Editor,
Centrum van Oecologie
Katholieke Universiteit, Toernooijveld
NL-6525 ED Nijmegen
NETHERLANDS

Amphibia-Reptilia

Publications: *Amphibia-Reptilia*, quarterly (360 pages yearly), SEH News, 32 pages yearly.

Poland

HERPETOLOGICAL SECTION — POLISH ZOOLOGICAL SOCIETY

Prof. Leszek Berger, Secretary
Plac Wielkopolski 2/55
61-746 Poznań
POLAND

Spain

ASOCIACION IBERICA DE HERPETOFAUNA

Mr. C. Perez-Santos
Avenida de Logrono 23
Madrid 22
SPAIN

GRUPO ED ESTUDIO DE LOS ANFIBIOS Y REPTILES IBÉRICOS

c/o Mr. J.P. Martinez Rica or Dr. E. Balcells R.
Centro Pirenaico de Biología Experimental
Apartado 64
Jaca (Huesca)
SPAIN

SOCIETAT CATALANA D'ICTIOLOGIA I HERPETOLOGIA

Ms. N. Horta, Secretary
Apartat 27405
Barcelona
SPAIN

Publications: anticipated.

Sweden

GÖTEBORGS HERPETOLOGISKA FÖRENING

c/o Bo Petterson
Stratosfärsgatan 82
415 21 Go
SWEDEN

Mr. Mats Olsson, Chairman
Doktor Westrings gata 6
413 24 Göteborg
SWEDEN

LUNDS TERRARIEFÖRENING

c/o Pär Brannström
Köpingevägen 8
252 47 Helsingborg
SWEDEN

Bo Wikerstål, Chairman
Nypongränd 16
223 56 Lund
SWEDEN

ÖREBRO TERRARIEKLUBB

c/o Christer Kärling
Postmästaregatan 11
703 78 Ö
703 78 Örebro
SWEDEN

Håkan Molin, Chairman
Varbergagatan 21

703 52 Örebro
SWEDEN

STOCKHOLMS HERPETOLOGISKA FÖRENING

c/o Mikael Hooper
Herkulesvägen 16
181 63 Lidingö
SWEDEN

Sven Sandhaag, Chairman
Selmedalsgatan 24
126 55 Hägersten
SWEDEN

SVERIGES HERPETOLOGISKA RIKSFÖRENING

(includes GÖTEBORGS HERPETOLOGISKA FÖRENING, LUNDS
TERRARIEFÖRENING, STOCKHOLMS HERPETOLOGISKA FÖRENING, UPPSALA
HERPETOLOGISKA FÖRENING, VÄXJÖ HERPETOLOGISKA FÖRENING and
ÖREBRO TERRARIEKLUBB)

c/o Börje Flärdh, Secretary-President
Junkergatan 6
126 53 Hägersten
SWEDEN

Publications: *Snoken*, five issues yearly; Local papers, occasionally.

UPPSALA HERPETOLOGISKA FÖRENING

c/o Niclas Hellström
Stabby Alle 16 A
752 29 Uppsala
SWEDEN

Henrik Lundström, Chairman
Norbyvägen 67 C
752 39 Uppsala
SWEDEN

VÄXJÖ HERPETOLOGISKA FÖRENING

c/o Niklas Eliasson
Norrvägen 12 A
352 43 Växjö
SWEDEN

Switzerland

GROUPEMENT HERPÉTOLOGIQUE DE LAUSANNE

Case Postale
CH-1000 Lausanne
SWITZERLAND

KOORDINATIONSSTELLE FÜR AMPHIBIEN UND REPTILIENSCHUTZ IN DER SCHWEIZ

Dr. Kurt Grossenbacher
Naturhistorisches Museum
Bernastrasse 15
CH-3005 Bern
SWITZERLAND

LANDESGRUPPE SCHWEIZ DER DGHT

Mr. H. Kratzer, Secretary
Grosswiesenstrasse 80
CH-8051 Zürich
SWITZERLAND
STADTGRUPPE BASEL
STADTGRUPPE ZÜRICH

A Swiss subdivision of the Deutsche
Gesellschaft für Herpetologie und
Terrarienkunde.

SCHILDKRÖTEN — INFORMATIONSDIENST

c/o Mr. H.H.D. Falk
Bachserstrasse 10
CH-8174 Stadel b. Niederglatt/ZH
SWITZERLAND

Publications: *Schildkroeten Info*, irregularly published. Advisory service by correspondence.

SCHILDKRÖTEN — INFORMATIONSSTELLE

c/o Mr. Flach
Zoo Zürich
Zürichbergstrasse 221
CH-8044 Zürich
SWITZERLAND

SOCIÉTÉ HERPÉTOLOGIQUE DE GENÈVE

Case Postale 20
CH-1201 Genève — Care
SWITZERLAND

Publications: Annual report.

United Kingdom

ASSOCIATION FOR THE STUDY OF AMPHIBIA AND REPTILIA

Headquarters:

The ASRA Rooms
c/o Cotswold Wildlife Park
Burford
Oxon OX8 4JW
ENGLAND

Mr. Julian C.F. Sims, Chairman
94 Derwent Drive
Upper Stratton
Swindon
Wiltshire SN2 6NJ
ENGLAND

Publications: *The Rephiberary*, monthly newsletter; *ASRA Journal*, published yearly; *ASRA Monograph*, published with available material. Symposium reports/proceedings, published once or twice yearly.

BRITISH CHELONIA GROUP

Miss Fiona McGrattan, Correspondence Secretary
10 Clyde Park
Redland
Bristol BS6 6RR
ENGLAND

Publications: *Testudo*, a journal published twice yearly; Newsletter, irregularly, as necessary.

BRITISH HERPETOLOGICAL SOCIETY

Headquarters (Secretariat):
c/o Zoological Society of London
Regent's Park
London NW1 4RY
ENGLAND

The Earl of Cranbrook, President
Great Glemham House
Saxmundham
Suffolk IP17 1LP
ENGLAND

Dr. M.R.K. Lambert, Chairman

Publications: *British Journal of Herpetology*, published twice yearly; *British Herpetological Society Bulletin*, published quarterly; Miscellaneous publications, 1-2 yearly, at reduced cost.

CONSERVATION COMMITTEE OF SOCIETAS EUROPAEA HERPETOLOGICA (Society registered in Bonn, F.R. Germany)

Mr. K.F. Corbett, Chairman
136 Estcourt Road
Woodside
London SE25 4SA
ENGLAND

Publications: Circulars, once or twice yearly as necessary.

INTERNATIONAL HERPTOLOGICAL SOCIETY

Headquarters (Secretariat):
27 St. Thomas Close
Dartmouth Avenue
Walsall
West Midlands WS3 1SZ
ENGLAND

Mr. Jon' G. Coote, President
195B College Street
Long Eaton
Nottingham NG10 4GF
ENGLAND

Mr. A.J. Mobbs, Secretary

Publications: *The Herptile*, a journal published quarterly; Newsletter, monthly.

IUCN/SSC TORTOISE GROUP

Dr. Ian R. Swingland, Chairman
School of Continuing Education and Biological Laboratory
Rutherford College
University of Kent
Canterbury CT2 7NX
ENGLAND

Publications: Circulars, once or twice yearly as necessary.

SOUTH-WESTERN HERPETOLOGICAL SOCIETY

Headquarters:
59 St. Marychurch Road
Torquay
Devon TQ1 3HG
ENGLAND

Mr. Frank B. Gibbons, Secretary
Acanthus
59 St. Marychurch Road
Torquay
Devon TQ1 3HG
ENGLAND

Publications: Newsletter, monthly; Bulletin, published twice yearly.

THAMES AND CHILTERN HERPETOLOGICAL GROUP

Headquarters:
The Youth Club
Narcot Lane
Chalfont St. Giles
Buckinghamshire
ENGLAND

Mr. Nicholas Bessant, Chairman
5 Lauderdale Road
Kings Langley
Hertfordshire WD4 8QA
ENGLAND

Publications: Newsletter, monthly.

Union of Soviet Socialist Republics

UNION OF "HERPETOLOGISTS OF THE SOCIALIST COUNTRIES"

ALL UNION HERPETOLOGICAL CONGRESS (not a society — committee meets occasionally).

Dr. I.S. Darevsky, Chairman
Zoological Institute
USSR Academy of Sciences
Leningrad V-164
U.S.S.R.

COMMONWEALTH

Africa (southern and eastern)

THE HERPETOLOGICAL ASSOCIATION OF AFRICA

Dr. W.R. Branch, Secretary
Port Elizabeth Museum
P.O. Box 13147
Humewood 6013
SOUTH AFRICA

Dr. D.G. Broadley, President
Curator of Herpetology
The National Museum
P.O. Box 240
Bulawayo
ZIMBABWE

Publications: Journal, published twice or thrice yearly.

AUSTRALASIA

AUSTRALASIAN AFFILIATION OF HERPETOLOGICAL SOCIETIES

(includes AUSTRALIAN HERPETOLOGICAL SOCIETY, NEW ZEALAND HERPETOLOGICAL SOCIETY, SOUTH AUSTRALIAN HERPETOLOGY GROUP (INC.), VICTORIAN HERPETOLOGICAL SOCIETY and WESTERN HERPETOLOGY GROUP).

Dr. H. Ehmann, Convenor
School of Biological Sciences
Sydney Technical College
Broadway
N.S.W. 2007
AUSTRALIA

Publication: *Herpetofauna*, published twice yearly.

Australia

AUSTRALIAN HERPETOLOGICAL SOCIETY

Corresponding address:

Dr. T. Sheargold, President

P.O. Box R79

Royal Exchange

Sydney

N.S.W. 2000

AUSTRALIA

AUSTRALIAN HERPETOLOGISTS' LEAGUE

Corresponding address:

G.P.O. Box 864

Sydney

N.S.W. 2001

AUSTRALIA

Publications: *Australian Journal of Herpetology*, (Editor: Dr. R. Wells).

AUSTRALIAN SOCIETY OF HERPETOLOGISTS

Dr. Margaret Davies, Secretary-Treasurer

Dr. A.A. Martin, President

Department of Zoology

Zoology Department

University of Adelaide

University of Melbourne

Box 498, G.P.O.

Victoria

Adelaide

AUSTRALIA

South Australia 5001

AUSTRALIA

Publication: *The Australian Society of Herpetologists' Newsletter*, published biannually.

NORTH QUEENSLAND HERPETOLOGICAL SOCIETY

Mr. A. Taplin

25B Stanton Terrace

North Ward

Townsville

CLD. 4810

AUSTRALIA

SOUTH AUSTRALIAN HERPETOLOGY GROUP (INC.)

Corresponding address:

Mr. C. Harvey, President

c/o South Australia Museum

North Terrace

Adelaide

South Australia 5000

AUSTRALIA

Mr. Brian Robert, Secretary

VICTORIAN HERPETOLOGICAL SOCIETY

Mr. Brian Barnett, President

16 Suspension Street

Ardeer

Vic. 3022

AUSTRALIA

WESTERN HERPETOLOGY GROUP

Mr. G. Johnston, President

16 McEwin Street

Whyalla Playford

A.A. 5600

AUSTRALIA

CANADA

CANADIAN AMPHIBIAN AND REPTILE CONSERVATION SOCIETY

Corresponding address:
9 Mississauga Road North
Mississauga
Ontario
CANADA L6X 2C9

Dr. Barbara Froom, President
8 Preston Place
Toronto
CANADA M4N 259

Publication: CARCS Bulletin, published five times a year.

VENOMOUS ANIMALS SOCIETY

Mr. Scott Allen
11 Knightsbridge Road
No. 1010
Bramalea
Ontario
CANADA L6T 3X4

India

MADRAS SNAKEPARK TRUST

Guindy Deer Park
Madras 600 022
SOUTH INDIA

Publication: *Hamadryad*, published thrice yearly.

IUCN/SSC SNAKE GROUP

Mr. Romulus Whitaker, Chairman
Madras Snake Park
Guindy Deer Park
Madras 600 022
SOUTH INDIA

Publications: Newsletter, frequently.

New Zealand

NEW ZEALAND HERPETOLOGICAL SOCIETY (member of A.A.H.S.)

Mr. A.J. Harward, Secretary
143 Manuka Road
Glenfield
Auckland 10
NEW ZEALAND

Dr. R. Rowlands, President

Publication: *Moko*, a newsletter published quarterly.

United Kingdom

(see under Europe)

M.R.K. Lambert

HERPETOLOGICAL ACTIVITY IN BRITAIN : UNIVERSITIES 1

In view of a substantially increased interest in herpetological work in Britain in recent years, it would seem the time has come for herpetologists on the Continent of Europe, in the U.S.A. and in countries of the Commonwealth and elsewhere to become aware of the range of specialist activity in this country. When abroad, one becomes aware of the interest herpetologists are taking in the work their colleagues are doing in Britain and how little is generally known about it, although several individual specialists are highly successful, albeit in rather splendid isolation, and making substantial contributions. Approaches inevitably differ and amphibia and reptiles are sometimes simply used as research subjects, but notwithstanding these differences, it is hoped the dissemination of information through the media of BHS publications will lead to improved communication between specialists in similar fields at home and abroad.

Representatives of other Commonwealth countries have also been approached to write accounts of their herpetological activities and an account on Australian herpetology has already appeared in *BHS Bulletin* No. 5: 20-23 (June 1982). From Britain, Dr. A.S. Jayes described work in the University of Leeds in *BHS Bulletin* No. 2: 38-40 (December 1980) and earlier Dr. P.M.C. Davies talked on research in reptile biology at the University of Nottingham at a BHS Evening Meeting in 1977. Herpetologists in other Commonwealth countries, including New Zealand, India, Canada, Zimbabwe and Tanzania, have also been approached and hopefully in the future Kenya, the West Indies and Malaysia, and probably expatriate British and other workers elsewhere in the Tropics. If herpetologists in other Commonwealth countries are to give accounts of their activities, it would seem logical that we in Britain should do likewise to provide stimulation and motivation for further work where none has yet commenced.

Specialists in University departments have been contacted initially in Britain. Hopefully, they will lead the way for specialists in Museums and other organisations to contribute or volunteer articles later. A first series of accounts to date from University departments is reproduced here. Where references are given, they either follow the format laid down by *British Journal of Herpetology* or abbreviated to that in the *World List of Scientific Periodicals* (4th edition).

ABERDEEN (Department of Zoology, University of Aberdeen, Tillydrone Avenue, Aberdeen AB9 2TN, Scotland).

RESEARCH INTO THE EVOLUTION AND TAXONOMY OF SNAKES AND LIZARDS

Dr. R.S. Thorpe: Recent herpetological research in the Zoology Department of Aberdeen University has included studies of the Indian Ocean and Palearctic faunas. The most studied species are those from the genera *Natrix*^{4 5 6 8 9 10 12 13 14 16} and *Phelsuma*^{2 3 18 19} but species of *Mabuya*², *Podarcis*^{9 13}, *Boaedon*²¹ and *Thamnophis*¹ have also been investigated. This research has mainly been on modern taxonomy and evolution, although a little work has been carried out on ecology and thermo-regulation of lizards. Most of the research is computer based although some is supported by experimental research (biochemistry and breeding) and field work (Seychelles and Canary Islands).

Usually the primary aim of the research is not to increase herpetological knowledge for its own sake but to investigate evolution and taxonomic methods. To this end my reviews^{7 15} cover all organisms, and my collaborators, students and I use fish, laboratory mice^{11 20}, house mice^{11 17}, field mice and shrews as well as reptiles. Nevertheless, much of my research is based on snakes and lizards and I hope that it contributes to general herpetology.

The species complex in which I have most interest is the grass or ringed snake, *Natrix natrix* (L.). The nature and cause of the geographic variation in this species complex (i.e. incipient speciation, hybrid zones, lineage introgression, reticulate evolution and clines) has been investigated by multi-variate morphometrics^{4 5 6 8 9 10 13} and numerical phylogenetics^{14 16}. Much research on this species complex is yet to be published.

Green geckos (*Phelsuma*) on Indian Ocean islands are another area of interest. A SERC supported Ph.D. student has just finished a study of the geographic variation and ecology of green geckos in the Seychelles. Green geckos have also been used as a basis for developing a novel biochemical systematic technique¹⁹ for investigating reptilian skin keratin (supported by an SERC grant). I plan to continue using *Natrix* and *Phelsuma* for my research into evolution and taxonomic methods and also to initiate some research into the Canary Island fauna.

ACKNOWLEDGEMENTS

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BRISTOL (Department of Zoology, University of Bristol, Woodland Road, Bristol BS8 1UG)

Dr. R.A. Avery: Current research activity centres on the interface of physiology, ecology and

behaviour, and is primarily concerned with lacertid lizards. The following topics are being investigated in detail:

1. The role of the pineal/parietal complex in lizard physiology and behaviour. Preliminary experiments suggest that *Lacerta vivipara* may use photic information from the parietal eye as a cue to help modulate thermoregulatory behaviour patterns; the mechanisms are complex.
2. Growth dynamics. An investigation of the patterns of growth shown by lizards of various kinds, and their relationships to nutritional and environmental factors.
3. Population dynamics. This is a long term study whose aim is to answer the simple question "how long do individual *L. vivipara* survive in the field?"
4. Environmental influences in the initiation of spontaneous activity patterns. This work derives from the observation that the rate and duration of spontaneous foraging activity in *L. vivipara* is directly proportional to the 3-dimensional spatial complexity of the environment. There are unexpectedly large differences between this and other species in responses to changes in spatial complexity. In addition to its intrinsic interest, this work should be of interest to those who keep reptiles in captivity, because it quantifies the common impression that behaviour patterns seen in vivaria are often a travesty of the repertoire of behaviour seen in wild animals.

C.A. Rose: The role of basking in reptile biology. The main purpose of this work is to identify the adaptive advantages which accrue from basking to those reptiles which bask only sporadically, e.g. slow-worms, some geckos, many snakes, many terrapins. It involves the calculation of detailed energy budgets for animals exposed to a range of differing thermal regimes which mimic those which they encounter in the field.

Recent publications:

- Avery, R.A. (1982). Field studies of body temperatures and thermoregulation. In Gans, C., & Pough, F.H. (Eds.) *Biology of the Reptilia vol. 12, Physiological Ecology A*, pp 93-166. New York: Academic Press.
- Avery, R.A., Bedford, J.D. & Newcombe, C.P. (1982). The role of thermoregulation in lizard biology: predatory efficiency in a temperate diurnal basker. *Behavioral Ecology and Sociobiology* 11: 261-267.
- Avery, R.A., White, A.S., Martin, M.H. & Hopkin, S.P. (1983). Heavy metal concentrations in viviparous lizards and their food and environment at three contrasted sites. *Amphibia-Reptilia* in press.

Dr. Alan Roberts: Research on the nervous coordination of behaviour in amphibian embryos.

Since 1968 we have been studying the sensory systems and nervous system mainly of *Xenopus laevis* embryos. Our initial aim was to find out as much as possible about the behaviour and nervous system of the late embryo, just before hatching. We have therefore concentrated on embryos at stage 37/38 of Nieukoop and Faber (1956) and investigated how touching the skin and dimming the light can initiate swimming. The innervation of the skin and the neuroanatomy of the pineal eye have been described and their physiology and role in behaviour assessed (5, 7, 8, 9, 10, 15). In the course of this study we have also described the excitable properties of the skin, a very unusual and perhaps primitive feature (1, 2, 3, 4, 6).

In parallel with studies on the sensory capabilities of *Xenopus* embryos we have studied the function and neuroanatomy of the spinal cord (11, 12). Our aim here has been to try to understand how the spinal cord neurones coordinate the swimming movements that the embryos perform (17). By making recordings from the motor nerves and also from individual motor neurones in the spinal cord we are building up a picture of the activity of the spinal cord during swimming (13, 14, 16). We hope that the principles of operation that we discover will help understanding of spinal cord organization generally.

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KENT (School of Continuing Education and Biological Laboratory, Rutherford College, the University of Kent, Canterbury CT2 7NX):

Dr. I.R. Swingland and D. Stubbs: The ecology of *Testudo hermanni*

A three year study funded by the Natural Environment Research Council to examine the population structure, natural densities, reproduction, movement, growth, recruitment, mortality and habitat requirements, providing a practicable conservation and management tool.

All individuals are marked in the three study areas in the Massif des Maures (France), Macedonia (Greece) and Mallorca (Spain). Aspects of individual behaviour relating to nest site choice are also being investigated.

LEICESTER (Department of Zoology, School of Biological Sciences, University of Leicester, Adrian Building, University Road, Leicester LE1 7RH):

Prof: H.C. Macgregor, Dr. A.P. Swan and associates (Mrs. H.A. Horner, S. Sims): Current research on amphibians.

The genus *Triturus* is particularly valuable for studies in molecular cytogenetics mainly because it has relatively few very large chromosomes and its chromosomes assume a spectacular "lampbrush" form in the oocytes of the developing ovary. The amount of DNA per diploid cell in this genus ranges from 45-50 pg, and the diploid chromosome number for all species is 24. By comparison the amount of DNA in a diploid human cell is 7 pg distributed amongst 48

chromosomes. Studies are underway to characterize the chromosome sets of *Triturus* species through studies of lampbrush and mitotic chromosomes employing several systems of light microscopy and a variety of chromosome banding techniques. A long term breeding programme is in progress to check that the chromosome characteristics are consistent between parents and siblings.

In the species *T. cristatus* and *T. marmoratus*, the long arm of the largest chromosome (chromosome 1) has become heteromorphic, inhibiting synapsis and crossing-over at meiosis. This heteromorphism occurs consistently in both males and females, and we have shown that only the heteromorphic individuals survive beyond the late tail bud stage of embryogenesis. Accordingly, 50% of the progeny from all matings die at this stage. We have bred hybrids between *T. cristatus* and *T. marmoratus*, and established that this phenomenon occurs also in the hybrids. Further work is underway to investigate the difference between developing and arrested embryos by histology, by culturing cells of embryos, and by experimental microsurgery to see if the embryonic arrest of chromosome 1 homomorphic individuals can be overcome. The morphological difference between the chromosomes 1 are also visible in the lampbrush chromosomes of oocytes. The pattern of lampbrush loops is being carefully mapped to see if there is any connection between this and the pattern of bands seen in mitotic chromosomes.

The precise location of particular genes on the chromosomes of *Triturus* species is being determined by gene cloning and related techniques. A copy of the specific gene under investigation is put into a bacterium which then grows and divides as normal, yielding many copies of the gene. The gene is then removed from the bacterial culture and given a radioactive label. When it is incubated with a chromosome preparation it attaches only where it finds a copy of that gene on the chromosome. The site of attachment and therefore the position of the gene in question can then be detected by radioautography and light microscopy.

Up to 60% of the *Triturus* genome consists of highly repeated DNA in short sequences repeated many thousands of times. We hope to characterize some of these sequences and determine their organisation throughout the genome.

A collaborative project with Dr. David B. Wake and Ms. Monica Freelow of The Museum of Vertebrate Zoology, University of California at Berkeley, is in progress to assess the degrees of relatedness of different species of European *Triturus* in terms of genetic distances as determined by starch gel electrophoresis of tissue proteins.

A study of the relationship between C-values (amount of DNA per haploid chromosome set) and nuclear and cell volume in a range of amphibians has recently been completed, with a discussion on the effect of cell size on early development of the amphibian embryo.

We have established good connections with Dr. Eugenia del Pino of Pontificia Universidad Catolica del Ecuador. A joint study was initiated this year to investigate certain aspects of oogenesis in egg brooding hyloid frogs of Ecuador and Venezuela. Other matters relating to the cytology and taxonomy of these frogs are now being investigated in collaboration with Dr. Michael Schmid of the Institut für Humangenetik, Würzburg, West Germany.

Other projects at present being undertaken in The Leicester Department include the measurement of C-values in a wide range of South African frogs, and the characterization of a sex chromosome specific DNA sequence in the African bullfrog *Pyxicephalus adspersus*. These studies involve collaboration with Dr. Barry Fabian of the Department of Zoology, University of Witwatersrand.

Last but not least we have a major ongoing programme of research into the migration and movement characteristics of primordial germ cells and certain types of tissue culture cells from *Xenopus laevis*. This programme is led by Dr. Alma Swan.

A selection of recent publications:

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Macgregor, H.C. (1980) Recent developments in the study of lampbrush chromosomes. *Heredity* 44: 3-35.

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LONDON, BIRKBECK COLLEGE (Department of Zoology, Birkbeck College, University of London, Malet Street, London WC1E 7HX):

J. Attridge: Research on dinosaurs, and other fossils.

For the last three years I have been collaborating with my colleagues at Harvard, Fuzz Crompton and Farish Jenkins, on collecting and describing the vertebrate fauna of the Kayenta sediments of Arizona. Increasing evidence now points to an early Jurassic rather than Late Triassic age for the Kayenta. Our field work (financed by the National Geographic Society) has yielded a very rich fauna with many taxa new to North America for this age, notably a variety of minute mammal jaws and a rich turtle assemblage. Dinosaur remains are particularly common and splendid skull and postcranial material of early saurischians and ornithischians have been collected.

My particular concern has been the description of a very fine skull of a prosauropod dinosaur. The herbivorous prosauropods were not directly ancestral, as their name might imply, to the great sauropods of the later Jurassic. They first appear in the latter half of the Triassic but were extinct by the Middle Jurassic. The new skull from the Kayenta is very remarkable for it is unmistakably the genus *Massospondylus*, a form previously only known from rocks of equivalent age from southern Africa. This genus has leaf-like teeth but food maceration took place in the stomach where a gastric mill of large pebbles was present. One unusual feature of this new skull is the scatter of palatal teeth over the matrix in the palatine region. Some quirk of preservation has saved these for palatal teeth are unknown in any other dinosaur.

This new discovery of a dinosaur genus common to Africa and North America is important for correlating sediments on a world-wide basis. At this time the Kayenta fauna shows more parallels with southern Africa than to any other region (South America, China, Europe) yielding fossil vertebrates of early Jurassic age.

Needless to say much preparation and description remains to be done and the field work will continue over the next few years.

Prof. John Cloudsley-Thompson: For many years investigations have been undertaken on the activity rhythms, thermal and water relations of reptiles and, to a lesser extent, of amphibians. The results of his research have been published mainly in *Brit. J. Herpetol.*, *J. Zool.*, and, more recently, in *J. Arid Environ.*, of which journal he is the Editor. With his colleagues David Butt and

Costas Constantinou, he is just beginning an investigation of heat transfer through the carapace of tortoises and turtles so that the significance of sun basking may be evaluated. He is also interested in the effects of nutrition on behavioural thermoregulation in reptiles.

R.A. Griffiths: A Ph.D. thesis has been submitted after several years work entitled 'Rhythmic activity patterns in European urodele amphibians'. Abstract: Rhythmic activity patterns in the fire salamander *Salamandra salamandra*, the warty newt *Triturus cristatus* and the smooth newt *T. vulgaris* were studied with a view to elucidating the ecological significance of both exogenous and endogenous factors in regulating overt behaviour. As the daily light-dark cycle is the primary environmental synchronizer of circadian rhythms, some preliminary work was conducted on phototaxis in newts and salamanders. *T. vulgaris* displayed clear ontogenetic changes in phototactic behaviour, and a comparative study of phototaxis in adults of all three species confirmed that photonegativity increases in the order: *T. vulgaris*, *T. cristatus*, *S. salamandra*.

Circadian rhythms of locomotor activity were monitored in the laboratory using actograph apparatus. Although the signal:noise ratio of amphibian rhythms is low, newts and salamanders employed the LD cycle as the main "zeitgeber" or entraining agent, and the rhythms were weakly endogenous. *T. cristatus* was more nocturnal than *T. vulgaris*, but in *S. salamandra* the form of activity was dependent on light intensity. To a lesser extent than LD, cycles of temperature and humidity were also capable of synchronizing activity, and entrainment may be interpreted in terms of a two-oscillator model.

The diel and seasonal behaviour of *T. vulgaris* was also monitored in the field over a one year period. In the spring, aquatic newts displayed a clear bimodal diel activity pattern which was related to light intensity. The temporal organisation of courtship and feeding behaviour was also investigated in relation to the overall diel activity rhythm. On a seasonal basis, the number of *T. vulgaris* on land was correlated with temperature — newts disappeared from terrestrial refugia when the air temperature dropped below about 4°C. Males arrived at the breeding ponds before females and had a longer period of pond residency, but a discrepancy existed between the sex ratios of newts on land and in the ponds. The ecological implications of such phenomena are discussed. There was a limited degree of inter-pond movement during the breeding season and movements of terrestrial *T. vulgaris* were restricted to very short distances.

Additional interests include:

1. Recent work investigating circadian rhythms of activity in the sand boa, *Eryx conicus*,
2. the range of reptiles and amphibia kept in the Birkbeck Department of Zoology, and
3. some breeding successes eg garter snakes (*Thamnophis sirtalis parietalis*) and fire salamanders (*Salamandra salamandra*) can also be recorded for the Birkbeck Department of Zoology.

Dr. A.R. Milner: Three lines of research on fossil and living amphibians and squamate reptiles are currently being pursued. The principal area of study continues to be the systematics of Carboniferous amphibians, in particular the Order Temnospondyli. Andrew is gradually working through the Upper Carboniferous assemblages of temnospondyls and has recently published redescrptions of material from Jarrow, Ireland (1), Joggins, Nova Scotia (1), Parrsboro, Nova Scotia (2) and Mazon Creek, Illinois (3). This work is being continued with redescription of the genera *Macrerpeton* from Linton, Ohio and *Mordex* from Nýrany, Czechoslovakia as the two earliest members of the family Trematopsidae.

The second area of study has been the construction of a vicariance-cladistic hypothesis which accounts for the distribution of salamander families, both living and extinct. It is based on a new hypothesis of relationships for the families of living salamanders and relates this to past and present geographical barriers within the northern hemisphere. If correct, it suggests that the distribution of living salamanders is the result of much isolation and very little dispersal. This work is in press and should appear during 1983.

The third project is a joint one with Andrew's wife Angela (Department of Palaeontology, British Museum (Natural History)) and Richard Estes (Department of Zoology, San Diego

University, U.S.A.)). It is based on a magnificent collection of fossil amphibians and squamates from the Upper Eocene of Hampshire recently generously donated to the B.M.(N.H.) by Mr. Roy Gardner, an amateur collector from Fareham. The 40 million year old assemblage comprises at least 24 'herps' including four frogs, three salamanders, eight lizards, eight snakes and an amphisbaenian. Most are new records for the Caenozoic of the British Isles. A preliminary report has just been published (4). At present most identifications are to generic level; detailed systematic study will take several years.

Andrew's student Stafford Howse is working on the systematics and morphology of the pterodactyls of the British Cretaceous. At present Stafford is studying the relatively well preserved material of *Ornithodesmus* from the Wealden before moving on to the more fragmentary forms from the Greensand and the Chalk.

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THE OPEN UNIVERSITY (Department of Biology, The Open University, Walton Hall, Milton Keynes, MK7 6AA):

Dr. T.R. Halliday: Studies of Amphibia at the Open University Research team on animal behaviour:— Tim Halliday (Senior Lecturer in Biology), Paul Verrell (Research Assistant), Andrew Bielinski and Julie Roberts (Research Students).

Our work at the Open University is focussed on the sexual behaviour of newts (*Triturus* spp.), frogs (*Rana temporaria*) and toads (*Bufo bufo*). Current studies extend the work of Halliday (1975a, 1976, 1977a) on the courtship of *Triturus vulgaris*, and of Davies & Halliday (1977, 1978, 1979) on the dynamics of mating in a large population of toads near Oxford. Although the newt studies are aimed primarily at a detailed analysis of causal mechanisms, they have taken us into such areas as reproductive and respiratory physiology, ecology, evolutionary biology and genetics. Our work on both urodeles and anurans has also been designed to investigate the action of sexual selection in natural populations.

Causal analysis of the courtship of smooth newts (*Triturus vulgaris*) (Tim Halliday):

Newts have a very elaborate courtship ritual, in which the male is the more active partner (Halliday 1974a, 1975a). Individual male actions have been shown to be responses to an interacting set of factors that includes the behaviour of the female (Halliday 1975a), the male's sperm supply (Halliday 1976), and his need to breathe air from the water surface (Halliday & Sweatman 1976, Halliday 1977a). Current work is designed to investigate the role of the male's various respiratory mechanisms, aerobic and anaerobic, as a constraint on his sexual activity. These experiments involve males courting females in respirometers in which their oxygen supply is carefully controlled and manipulated. This work is being conducted within the framework of theoretical models of motivation in which conflicting activities interact (Houston *et al* 1977, Halliday 1980).

The reproductive cycle of the smooth newt (*Triturus vulgaris*) (Tim Halliday and Paul Verrell):

The dynamics of behavioural interactions between male and female newts can only be understood fully within the context of the breeding dynamics in natural populations and of their annual reproductive cycle. A recently started project is intended to investigate these two aspects of newt biology, about which little is known. We are monitoring newt movements into and out of a pond and are analysing a variety of gonadal and other physiological changes that occur over the course of the year.

Sperm uptake and storage in female newts (Paul Verrell, Julie Roberts and Tim Halliday):

The productive success of an individual male newt will be affected by whether or not he is the only male to inseminate a particular female. We have established that individual females will mate with more than one male and we intend to look at the duration of sperm storage and at how sperm from different males compete for access to a female's ova.

Comparative and evolutionary aspects of newt courtship (Tim Halliday and Julie Roberts):

Studies of the courtship of the palmate newt (*Triturus helveticus*), the alpine newt (*T. alpestris*), the crested newt (*T. cristatus*) and the marbled newt (*T. marmoratus*) that have already been conducted (Halliday 1977b) have revealed a number of interspecific differences in *Triturus* sexual behaviour. It is intended to extend these studies to other species, and sub-species, with a view to relating differences in newt sexual behaviour to reproductive isolation between species, and to taxonomic relationships between species based on karyotypes (Prof. Macgregor, Leicester) and on protein differences (Prof. Wake, Berkeley).

Interactions between males during the courtship of smooth newts (*Triturus vulgaris*) (Paul Verrell):

Halliday's studies of newt courtship looked only at dyadic (one ♀, one ♂) interactions. When other males are in the presence of the courting pair, they interfere with their courtship and, at a critical point in the courtship sequence may usurp the place of the courting male, by mimicking female behaviour, and thereby achieve insemination of the female, with whom they did not perform the lengthy and energetically expensive early phases of courtship (Verrell 1983a). This work is also investigating the possibility that both males and females exercise mate choice. Evidence to date suggests that, given a choice of mates, males choose larger, more fecund females, whereas females choose males of comparable size to themselves (Verrell 1983a).

The sexual behaviour of the North American red-spotted newt (*Notophthalmus viridescens*) (Paul Verrell):

Notophthalmus, a close relative of *Triturus*, shows three different forms of male courtship (Verrell 1982c). These are: amplexus, in which the male clasps the female, hula display, in which he displays briefly in front of her, and sexual interference in which he appropriates a female from another male. This study seeks to analyse the circumstances in which each type of courtship is adopted and to investigate a male's 'decision' as to which type to adopt in terms of the relative costs and benefits of each type of courtship. The three types vary in terms of the reliability with which sperm is transferred to the female, the time that they take, and, probably, in their energetic requirements.

Reproductive isolation between smooth (*Triturus vulgaris*) and palmate newts (*T. helveticus*) (Julie Roberts):

Smooth and palmate newts, though extensively sympatric, do not apparently hybridise in nature. This study is looking at the role of a variety of possible isolating mechanisms in maintaining reproductive isolation between these species, with particular emphasis on the possibility that differences in male morphology (Halliday 1976b) and courtship patterns, together with female discrimination, represent the principle isolating mechanism (Halliday 1977b). In addition, hybrids, which appear to be as viable as pure-bred progeny, are being created and reared in the laboratory. These will be used to investigate post-zygotic reproductive isolation, and should provide a basis for the recognition of hybrids, if they occur, in nature.

Population biology of crested (*Triturus cristatus*) and smooth (*Triturus vulgaris*) (Andrew Bielinski):

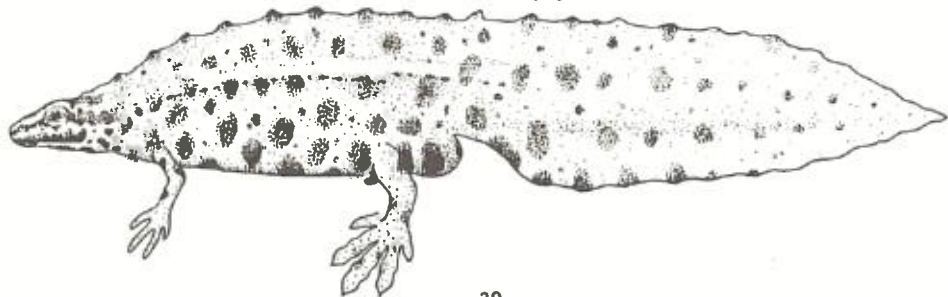
The crested newt, a larger species than smooth and palmate newts, has recently been afforded full legal protection because of its marked decline in recent years. This study of marked populations of crested and smooth newts seek to provide accurate estimates of the size and dynamics of their breeding populations in a pond near Milton Keynes. Investigations are also being made of annual growth rates in individuals and of the relationship between gonad size, fecundity and body size. An attempt is being made to age individuals using bone rings. It is apparent that the total size of a breeding population can vary markedly from one year to the next.

The mating dynamics of frogs (*Rana temporaria*) and toads (*Bufo bufo*) (Tim Halliday):

Davies and Halliday (1979) established that, in toad breeding aggregations, larger males are at an advantage in gaining access to females. This effect is much less marked in frogs, where mating tends to be assortative with respect to body size. Indeed, in toads there is size-assortative mating, as well as a large male advantage, in some breeding seasons. The aim of this study is to look at mating patterns in these two species over several years with a view to identifying both the factors that lead to differences between the two species, and the factors that cause differences between years within each species.

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OXFORD (Animal Ecology Research Group, Department of Zoology, South Parks Road, Oxford OX1 3PS):

Dr. Malcolm Coe: Herpetological work in Oxford.

1. **Aldabran Giant Tortoise (*Geochelone gigantea*)**
We still maintain an active interest in this area, and are planning further field work on the atoll in 1984. Dr. C.W.D. Gibson has three further papers in press on vegetation, primary production, availability of production to tortoises, and the effect of tortoises on available green matter. He is now working on a more exact description of growth patterns of Aldabra tortoises, and reproduction (using data from his 1981 field season).
2. **Lizards of Gibraltar (John Cortes)**
Completing his thesis on "The ecology of Lacertids of Gibraltar". The lizards of Gibraltar include *Tarentola mauritanica*, *Lacerta lepida*, *Podarcis hispanica*, *P. bocagei*. The work has concentrated on *Podarcis hispanica* since this is the most abundant on the study site on the "Rock". This includes laboratory studies of thermoregulatory behaviour, colour change and food preference. Field work has concentrated on distribution, activity, feeding ecology and behaviour.
3. **Reptiles and Amphibians of the Kora National Reserve, Kenya.**
I shall be leading the Joint/Royal Geographical Society — National Museums of Kenya Kora Research Project from 1983-84. We will study the ecology of the area with a view to producing a management plan.

The herpetological studies will relate to

1. Producing an inventory of the herpetofauna.
2. Studying activity and biomass of lizards.
3. Factors affecting the breeding and dry season activity of Amphibians.
4. Studying the distribution and activity of the pancake tortoise (*Malacochersus tornieri*) on rock outcrops of the Kora National Reserve.

We shall also mark and observe the activity of *Pelusios sinuatus* in the Tana River.

SUSSEX (Biochemistry Laboratory, Biology Building, University of Sussex, Falmer, Brighton BN1 9NQ)

Dr. T.J.C. Beebee: Conservation research on British amphibia.

Studies are in progress to try and identify habitat features important to the success of the native British species of amphibians in various parts of southern England. The work entails monitoring large numbers of ponds, identifying amphibian species which breed in them and correlating such observations with characters such as pH, conductivity, terrestrial habitat structure around the pond, etc.

More intense study by Brian Banks is being made of factors affecting reproductive success in British populations of the natterjack toad, *Bufo calamita*. This work is funded by the Nature Conservancy Council and involves monitoring survival rates of spawn and tadpole cohorts at several sites together with measurements of food supply, predator numbers, chemical features of the ponds and microclimatic factors.

Dr. S.P. Gittins: Amphibian ecology research at UWIST: A summary of five years work.

Llandrindod Wells Lake

Interest in amphibian ecology at UWIST originated in 1978 in response to a request by Powys County Council to investigate the effects of road mortalities on the toad population breeding in Llandrindod Wells Lake. The results of the first year's work showed that the population size of toads breeding at the lake was 5,700 males and 1,950 females (Ref 2). Studies continued in 1979 on intramigratory movements of the population (Ref 4), and on the emergence of young from the lake (Ref 5). In 1980 the effects of temperature on migratory movements were studied (Ref 6) and work continued in 1981 and 1982, giving a five year run of mark-recapture data for the lake. This allowed a detailed study of the population dynamics of the common toad, which showed: that the population size breeding at the lake remained constant over the five years study period; that the annual survival rate was around 0.52 for males and 0.40 for females; and that about 3,000 males and 1,400 females entered the breeding population each year (Ref 12). Studies of the population age structure from growth rings in phalanges showed that the maximum age reached in a sample of 51 toads from the lake was 8 years, and that males tended to mature a year earlier than females (Ref 8). The delay in maturation of females by one year, and an annual mortality rate of about 50% results in a much lower number of young females joining the population, consequently producing the imbalance in the sex ratio found at the lake (Ref 7).

Llysdyddin Pond

Despite the value of the lake for studies on toad population dynamics, public access to the site precludes more detailed ecological studies. Therefore, in 1981 Llysdyddin Pond, attached to the UWIST Field Centre, was chosen for investigations into the population dynamics of the toads, and in addition into the ecology of toads outside the breeding season. The pond was completely encircled by a barrier and toads were captured in pitfall-traps as they entered and left the pond.

The barrier was left in place for the whole year and monitored daily, allowing the complete annual cycle to be documented.

In the 1981 breeding season 865 toads were captured with a $\delta : \phi$ sex ratio of 4.7:1 (Ref 10). Relatively few toads visited the pond during the summer, but juveniles visited the pond at this time. In addition to the toads, 200 frogs, 800 palmate newts and 300 smooth newts were captured in 1981 (Ref 9) and females were more numerous than males in both newt species.

In 1982, data were collected in the same way and in addition data were collected on the diurnal pattern of activity of toads during the breeding migration, which showed that 28% of female and 8% of male toads were active during daylight (Ref 11).

The behaviour of the toads outside the breeding season has been investigated using several novel techniques. Activity and ranging patterns have been studied using radio-tracking and a non-destructive method for investigating diet has been developed, whereby the toad is stomach-pumped with a simple syringe system. Quantitative analysis of the foods eaten is underway, and this will be compared with the available food supply estimated from pitfall traps.

In 1982 a three-year Ph.D. study commenced to investigate the ecological segregation of the four species of larvae in the pond. The spatial distribution of spawn and larvae was measured regularly, and population size estimated, allowing mortality rates to be calculated. This work will continue over the next two years and extended to investigate larval gut contents and food availability.

There are several other ponds within the Field Centre containing four amphibian species. These have been studied on an *ad hoc* basis and this work will be extended to provide comparative data with Llysdyddin Pond.

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HERPETOLOGICAL NEWS IN THE TRAFFIC BULLETIN, 31st March 1983

TRAFFIC Bulletin is the publication of the IUCN Wildlife Trade Monitoring Unit (WTMU) and its production is funded by the People's Trust for Endangered Species. As a member of IUCN, the BHS receives *TRAFFIC Bulletin*, which is lodged in the Library. The information that follows was extracted from Volume 4 (6) with a special feature article on international trade in skins of monitor and tegu lizards, 1975-80.

Decree on lizard skin in Bangladesh. Since 23rd September 1982, all lizard skins have become the property of the Government of Bangladesh. From 1978 to 1979, before becoming a Party to CITES, an average of 950,000 skins were exported yearly. *CITES seizures in Hong Kong.* Since implementing CITES, seizures in Hong Kong for the years 1979 to the first quarter of 1982 have included several groups of reptiles and a species of amphibia. The latter included three live *Andrias davidianus* (Urodela, Cryptobranchidae). Of the reptiles, a substantial number of stuffed specimens (up to 189), eggs (up to 936), scales (up to 676 kg) and pieces of skin (up to 2065) of Cheloniidae spp. have been seized yearly. Of Crocodylia, up to 29 stuffed specimens and 424 skins of Alligatoridae spp., and up to 19 stuffed specimens and 30 skins of Crocodylidae spp. have been seized, and also one stuffed *Tomistoma schlegelii*, the endangered false or Malayan gharial. The Sauria included varanids (up to six stuffed specimens and 2559 skins of *Varanus* spp.) and the Serpentes boids (up to 337 skins, including *Python reticulatus*.)

Regulation of CITES implementation in the European Economic Community. A Regulation (EEC No. 3626/82) has been adopted, effective from 1st January 1984, which subjects trade in CITES species to stricter control than required even by the Convention. This obliges Belgium, Greece, Ireland, Luxembourg and the Netherlands, non-CITES party states, to implement the Convention. Except for captive bred specimens, and specimens intended for research or, in the case of plants, propagation purposes, Appendix I species may not be imported. The Regulation recognises in addition species of Part I Annex C, including the Mediterranean spur-thighed tortoise (*Testudo graeca*) and Hermann's tortoise (*Testudo hermanni*). From 1st January 1984, commercial trade in these species is prohibited. However, with limited exceptions, the Regulation only restricts species into and out of the EEC with intercommunity transfers not requiring permits. This aspect of the Regulation is causing conservationists concern for EEC member states with tight controls on trade in threatened species may now have difficulty in maintaining these controls. This means a CITES Appendix II species coming into, say, Greece accompanied by an export permit from, say, Indonesia, may be re-exported from Greece to another EEC country without a permit, effectively nullifying "export", "re-export" and "import" in terms of control between EEC member states.

International trade in skins of monitor and tegu lizards, 1975-1980. Monitors (*Varanus*): the estimated trade in the total number of whole skins of monitor lizards rose from 51,215 in 1975 to 1,032,782 in 1982. This increase is partly attributable to improved reporting by CITES party states and a rise in the number of Party states. The following species were included, figures in parentheses being the highest in one year during the period under consideration:— *Varanus* spp. (39,067 in 1978), *V. bengalensis* (7739 in 1977), *V. exanthematicus* (113,019 in 1980), *V. flavescens* (311,999 in 1976), *V. flavescens/griseus* (183,240 in 1979), *V. griseus* (73,997 in 1976), *V. indicus* (4641 in 1978), *V. niloticus* (772,894 in 1980), and *V. salvator* (259,888 in 1980). Tegus (*Tupinambis*): tegu skins were added to CITES appendices in early 1977, figures rising from 164,537 in 1977 to 1,881,384 in 1980. A similar figure of 1,894,273 skins in 1981 is from data from Argentina and Paraguay. Again, the increase in the trade in skins recorded can partly be attributed to the rise in the number of Party states and improved reporting. *Tupinambis* spp. increased from 154,537 in 1977 to 1,016,642 in 1980, and *T. teguixin* from 10,000 to 864,742.

WTMU Wildlife farming/ranching survey. There has been much controversy over the value to turtle conservation of turtle farming and ranching, and further complications are still arising. The CITES parties agreed at the New Delhi meeting (1981) to recommend that populations of Appendix I species that are not endangered and might benefit from ranching, with trade as the intention, should be included with Appendix II. "Ranching" was agreed to mean "the rearing in a controlled environment of specimens taken from the wild". So, at the Gaberone meeting (April 1983), Parties are considering transferring to Appendix II green turtle (*Chelonia mydas*), populations being ranched in both Surinam and Réunion. There could then be further problems in distinguishing farmed or ranched animals from those taken from the wild. But the green turtles are only one of a vast number of other species which are farmed or ranched.

M.R.K.L.

HERPETOLOGY VIS-À-VIS HERPETOLOGY

MICHAEL LAMBERT

An East Coast Herpetological Society in the U.S.A. had its number, until a year ago, in the State telephone directory. It became ex-directory when a somewhat embarrassing situation had arisen, through an understandable confusion, when a large number of enquiries were received from sufferers of an unfortunate incurable social disease seeking medical advice. Earlier this year, a curious journalist from the London evening newspaper, *The Standard*, also contacted me enquiring about the connection between herpes and herpetology. Until then, I was under the possibly mistaken impression that the herpes virus was so named after its serpentine or herpetiform appearance under an electron microscope. It might perhaps be worthwhile clarifying the terminological distinction more generally.

The Shorter Oxford English Dictionary on historical principles defines herpes "(Latin from the Greek *herpes*, shingles, literally 'creeping') a skin disease (or occasionally of a mucous membrane) characterized by the appearance of patches of distinct vesicles (applied to many cutaneous affections)". 'Cold sores' which 'creep' across the skin are presumably included. Hence herpetology, "that part of pathology which treats of herpes; a description of herpes". The ravages of this near epidemic 'social disease' have effectively admonished the city of New York! *Herpes* is also a genus within the coleopteran insect family Curculionidae (weevils). Herpetology "(from the Greek *herpeton*, creeping thing)", on the other hand, "is that part of zoology which treats of reptiles". Interestingly, Amphibia remain unmentioned!

The new French society, *La Société batrachologique de France*, has an aim, among others, to contribute to increasing the knowledge of amphibia (Morère, 1982) and has been formed partly on the grounds that herpetology should confine itself to reptiles. It is named "(from the Greek *batrakheia* (*batrachos*, frog))". Formerly "one of Brongniart's four orders of reptiles. Now restricted to an order of the class Amphibia, containing those animals only, as frogs and toads, which subsequently discard the gills and tail of their larval stage". It is perhaps not inappropriate that this society should have formed in France, being the first in the World to confine itself to Amphibia, for frogs' legs are famous and for a long time have traditionally been associated with France with being a food delicacy — another aim of the Society is to protect species and their habitats. Amusingly, the French went as far as nicknaming their motor car, the Citroën DS 19, a model manufactured some twenty years ago, 'la grenouille'. Like tortoises in Britain and with substances like 'Turtle Wax' being manufactured, perhaps such animal-name associations could help in encouraging the investment of funds into the successful captive breeding of threatened species, both as a commercial enterprise and conservation tool!

The recognition of Amphibia as a class, separate from and of equal rank with that of Reptilia, was not generally accepted until comparatively recently. Gadow (1901) provides an historical outline of the striving by authors for this recognition. In the 13th edition of Linnaeus's *Systema Naturae* (1767), the 'Amphibia' included:— 1. *Reptiles pedati*, with *Testudo*, *Draco*, *Lacerta* and *Rana* (*Lacerta* included crocodiles, lizards and newts!); 2. *Serpentes apodes*; 3. *Nantes pinnati*, with elasmobranchs, sturgeons, lampreys, and various other fishes. Linnaeus described the Amphibia as *pessima tetraque animalia* (foul and loathsome animals!), grouping amphibia and reptiles together, with some fish, despite the classifier, John Ray (1628-1705). They have arguably never been separated since as objects of study and observation. Brongniart (1800) distinguished *Batrachii*, frogs, toads and newts, from other reptile classes *Chelonii*, *Saurii* and *Ophidii*. Thus herpetology nomenclaturally became established traditionally to include both amphibia and reptiles (groups with mucous skin and scales!), and sometimes, no doubt through the influence of Linnaeus on 19th century workers, in conjunction with fish (also with mucous skin and scales), another cold-blooded group of beasts (sic). We thus have now, for example, the American Society of Ichthyologists and Herpetologists, which publishes *Copeia* (named after the great American investigator of the lower vertebrates, Edward Drinker Cope (1840-1897). It took a long time, over 100 years, for amphibia and reptiles to be separated out, in contrast to the warm-blooded creatures, birds and mammals (feathers and fur!).

It is an interesting line of etymological parallel evolution, therefore, that produced the two meanings of the word herpetology, which in the case of its zoological, rather than pathological, context has come to include both amphibia and reptiles, but not now fish. *Cave, literatores humaniores!*

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REPORT TO THE BRITISH HERPETOLOGICAL SOCIETY'S CONSERVATION COMMITTEE

NATTERJACK TOADS (*BUFO CALAMITA*) IN NORFOLK

Old Records

Sutton Fen (TG32), 1862; *Sparham* (TG01), 1869 & 1880. One record made in 1869 refers to a black specimen of natterjack toad. These observations come from the diaries of F. Norgate (Peter Lambley NCM).

Observations made on known colonies

Inland Site 1

The water table remained low throughout the season and none of the usual breeding areas held water. The Norfolk Naturalists Trust had pond 18 enlarged and deepened to provide a spawning site but it was not used to the extent which might have been expected under the circumstances. In contrast to 1981 the toads' breeding success was very poor or nil.

Extensive areas of the common were burned during the year but no heather was lost. Most, if not all, of the fires on the common seem to have been started deliberately to facilitate shooting by the removal of scrub.

On the northern part of the common, outside the N.N.T. reserve, a horse riding track was created by cutting through the vegetation approximately around the perimeter of the area.

1982 was due to be the last year for the transference of spawn to the reintroduction site at Sandy but no spawn could be found for this purpose.

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

On 27th December 1981 all the ponds on the common were dry with the exception of pond 6 which held a small body of ice-covered water about 2m in diameter. A burned area of gorse was noted south of ponds 4 & 5.

During the first couple of months of the year the water table did not rise to fill the pond basins as it had done in previous years. On 17th March concern was expressed that the water level was 4-5 feet below normal for the time of year.

On 4th April 47 pairs of Common Toads and 24 individuals were taken from the common and released elsewhere. All the ponds were dry.

A visit to the common on 15th April produced an adder sighting on the northern part of the common. The horse riding track was noticed with a jump incorporating part of the edge of pond 6. Great crested and common newts were found under damp rubbish near pond 8. A small area of vegetation north of ponds 14-16 had been burned. Common Toads had spawned in pond 17. Areas 19 and 20 each contained a small body of foetid water. The situation regarding the ponds was much the same on 18th and 25th April.

The results of a hydrological study by the U.E.A. enabled the N.N.T. to be confident that the low water table was due to lack of rain and not abstraction. It was considered unlikely that the pools would refill during the 1982 season even in the event of a high rainfall.

On about 27th April, after discussion with interested parties, the N.N.T. had pond 18 enlarged and deepened to produce a body of water of about 150m².

The U.E.A. and the Norfolk Cons. Corps spent much of the day regrading the edges of pond 18 on 2nd May. An extensive fire had just swept through the triangle of land bounded by the road, "Green Lane", and the track past ponds 13-15; the charred vegetation was still smouldering. An area of gorse north of pond 6, between the track and the arable land, had also been burned.

An evening visit on 6th May produced no natterjack sightings.

No natterjacks were seen or heard during a similar visit on 6th May. 12 pairs of common toads, 3 individual toads and 6 strings of spawn were seen in pond 18. All other ponds were dry except for the pools in areas 19 and 20.

Masses of Common Toad tadpoles were recorded in pond 18 on 31st May, some of them had developing hind legs. It was estimated that the water table had dropped 6 inches since 6th May.

On 3rd June it was estimated that 100,000-150,000 Common Toad tadpoles were in pond 18 with about 4,000 smaller (probably natterjack) tadpoles.

By 5th June the tadpoles in 18 were noticeably larger and feeding on weaker tadpoles. A 23mm toadlet was found in the heather near the secondary firebreak.

No natterjacks were calling on 14th June. Three adult toads (1 male and 2 females) were found inside a piece of folded scrap metal on the dried out bottom of pond 6. These toads were moved to a safer site nearby. Under a loose clod of turf in the basin of pond 5 three 1981 toadlets were found. Some of the smaller tadpoles collected from pond 18 developed rapidly and proved to be those of the natterjack.

The odd well advanced natterjack tadpole was recorded in pond 18 on 22nd June. It is suggested that perhaps one or two strings of natterjack spawn were deposited in pond 18 in the later part of May.

Common toadlets were emerging from pond 18 on 5th July. No natterjacks were seen.

Visits on 20th and 23rd August produced no more natterjack records.

Coastal Site 2

Observations have been made at this site by C. Green, T. Langton, H. Mendel, and myself.

2nd March:— Area D, all scrapes half full with depths of less than 15cm. One clump of frog spawn in D5. No toads found under the concrete blocks. Area C, half full, one clump of frog spawn. Area B, B7 marker at 25cm. B3 and B6 full, B4 dry, B5 almost dry. B1 half full, 8 clumps of frog spawn and two adult frogs.

18th April:— Two adult toads found under stones.

25th April:— All scrapes almost empty, small areas of water in scrape bottoms (area 1-5m², depth less than 15cm) still viable for toads. Three males calling around D3. Two toadlets found under concrete in area D (body lengths 17mm and 22mm).

2nd May:— Water level still low, no toads seen. A large oil drum had been left in C2. The concrete blocks had been left turned over by an earlier visitor.

16th May:— Water level still very low. Area D, one newly metamorphosed toadlet was found sitting on thick algal growth in D2. This specimen must have overwintered as a tadpole. Its tail was not fully absorbed (total length 12mm). Ten toads were found under concrete within area D (20, 21, 23, 24, 27, 28, 29, 31, 33mm; one adult male 49mm)f. Area C two adult frogs. Area B one toad (39mm) under piece of concrete.

3rd June:— Water level still low. Area D, one freshly deposited spawn string, 4-600 tadpoles of two distinct sizes. D3. One active male by D2 (53mm) and three toadlets (18, 19 and 24mm). 17 individuals under concrete blocks (21, 23, 23, 24, 24, 24, 25, 26, 28, 28, 30, 32, 34, 35, 35 and two males 49mm and 55mm). A male toad (60mm) was found 40m north of Area D in the scrub covered frontal dune. Area B, one active male near B6 (61mm). 600-1000 tadpoles of two size classes, 300-400 tadpoles just free swimming in B6.

5th June:— No new spawn strings. Area D, one male (55mm) by D3, one toadlet (24mm) seen leaving small burrow near D1. Toadlet (22mm) by D2 without a back left foot. 13 toadlets under concrete blocks. Tadpoles at same density as on 3rd. Two toadlets (24, 28mm) active by D5. One adult Common Toad seen near D5. Area C, one juvenile common frog. Area B, three toadlets (20, 32, 43mm) under concrete block. Common toad by B3. Algal growth on B6 covering most of the water surface.

23rd August:— Area D, D1, D2 and D4 dry. D3 with several hundred tadpoles in a small body of water, toadlets emerging. 19 toadlets were collected around the margin of D3 and measured (7, 7, 7, 8, 8, 9, 9, 9, 9.5, 9.5, 10, 10, 10.5, 10.5, 11, 11, 12, 12.5 and 13mm). 12 toads were found underneath concrete in Area D, these individuals were weighed and measured (22mm 0.75g,

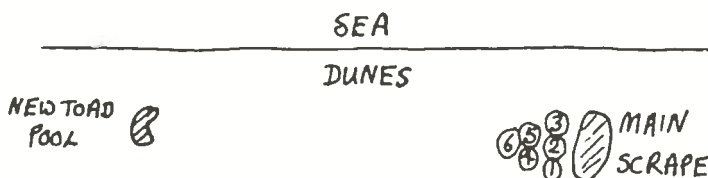
25mm 1.5g, 26mm 2.0g, 30mm 2.75g, 33mm 4.0g, 34mm 3.75g, 35mm 4.5g, 36mm 5.0g, 39mm 6.75g, 40mm 7.25g, 41mm 6.5g, 43mm 8.25g). No sightings were made in Area C. The most recently scraped out pool within Area B (?B6) contained tadpoles and emerging toadlets.

12th September:— A single specimen seen.

Coastal Site 1

All observations made by T. Langton.

16th May:— New small scrapes numbered for reference as follows:—



Main scrape: 7 strings of spawn hatching, 2 with developing eggs. Two pairs of adults in amplexus and two single males in the shallow water at the scrape margin. One smooth newt was seen.

Scrape 1: 4 strings of developing spawn and one freshly deposited string. Frog tadpoles were eating the spawn.

Scrape 2: 3 strings of developing spawn with frog tadpoles feeding on them.

Scrape 3: No spawn strings, 1 large female (60+mm) at edge of scrape.

Scrape 4: No spawn, 200-300 frog tadpoles.

Scrape 5: 4 strings of hatching tadpoles.

Scrape 6: 2 freshly deposited spawn strings. One male (50-60mm) calling at 12.30pm. One adult common toad with a freshly made wound (15 by 5mm) was found in grass by scrape. The remains of two adult frogs were found beside the scrape.

5th June:— Main scrape 14-16,000 tadpoles of different sizes.

Scrape 1: About 100 tadpoles.

Scrape 2: 1 freshly deposited spawn string, few tadpoles visible.

Scrape 3: 4-5,000 well developed tadpoles.

Scrape 4: 1 freshly deposited string of spawn, no tadpoles.

Scrape 5: 8-10,000 tadpoles of different sizes.

Scrape 6: 12,000 well developed tadpoles, 5,000 smaller ones.

"New toad pool" scrape: 2 strings of hatching spawn, 15-20,000 tadpoles of different sizes. Two smooth newts seen and two damselfly nymphs with predated tadpoles.

12th June:— Main scrape 8-10,000 tadpoles.

Scrape 1: About 100 tadpoles.

Scrape 2: No tadpoles visible.

Scrape 3: 2-3,000 tadpoles, 2-300 with fore and hind limbs.

Scrape 4: 1 freshly deposited spawn string. No tadpoles.

Scrape 5: 5-6,000 tadpoles.

Scrape 6: 12,000 tadpoles.

"New toad pool" scrape: 5-10,000 tadpoles. One new emerged toadlet (9mm) on wet sand beside pool. Slight drop in water level noticed. Two predations by Odonata nymphs were noticed during a 5 minute visit.

Holme Introduction TF74

The possibility of introducing the natterjack toad to the N.N.T.'s reserve at Holme next Sea was first discussed in 1978. In the following year five possible scrape sites were identified, the pH of the water at each place was suitable for tadpole development.

Three scrapes were created during June in 1981, two being in sites identified two years previously. The best looking one was improved by the U.E.A. Conservation Corps on 28th April 1982 and on 12th June some 2,500 tadpoles from Coastal Site 1 were released into the pool. About 2% of the tadpoles did not survive the move and the remaining ones developed rapidly and metamorphosed. It is thought that a few hundred toadlets successfully left the scrape.

John Buckley,
77 Janson Road, Shirley, Southampton SO1 5GL
December 1982

COLOUR TRANSPARENCIES OF PIT VIPERS (*AGKISTRODON*) NEEDED

Prof. ROGER CONANT
(BHS Honorary Member 1983)

Purpose: To obtain the best possible photographs to serve as illustrations in "A Review of the Genus *Agkistrodon* and Its Allies", a lengthy monograph by the late Howard K. Gloyd and Roger Conant, which is now nearing completion, with funds available for the publication of a number of colour plates.

Subjects: Any of the Old World taxa of the genus *Agkistrodon* and the allied genera of *Calloselasma* (*rhodostoma*), *Deinagkistrodon* (*acutus*), and *Hypnale* (*hypnale*, *nepa* and *walli*). Exceptionally good transparencies of New World taxa are also requested.

Sizes: 35mm slides are best, but larger transparencies are also acceptable.

Poses: Portraits are desired showing the entire snake. The tail should be visible and the head preferably in profile. All important pattern and colour characteristics should be plainly indicated. None of the snake should be hidden by vegetation or other objects. The pictures are to show readers what each snake looks like, and habitat backgrounds, natural or artificial, should not interfere with the subject. Close-ups of heads or other distinctive features are also desired.

Quality: Original transparencies are necessary. Engravers cannot obtain good results from "duplicate" slides. The snake should fill most of the space, so it will be as large as possible. Only good clear pictures in sharp focus can be used.

Credit: Full credit will be given to all persons whose slides are published and, when requested, every effort will be made to return the transparencies in good condition to their owners. No funds are available to buy pictures. They will appear in a strictly non-profit scientific publication.

Data: Information on the approximate total length of the snake portrayed, its sex, and the locality from which it originated are desirable for caption material whenever such data are available.

Send transparencies to: Dr. Roger Conant, Adjunct Professor, Department of Biology, The University of New Mexico, Albuquerque, New Mexico 87131, U.S.A.

TURTLE NEWS

The following articles have been reprinted from the Marine Turtle Newsletter No. 23, December 1982, with kind permission of the Editor.

Editorial

Readers of this newsletter receive it free; nothing is asked except an interest in the subject. This time, however, we ask readers not to give money but to write to Mrs. Ghandi about the slaughter of turtles in India.

Huge numbers of olive ridleys nest along the coast of Orissa and West Bengal. At Digha, West Bengal, thousands of animals are killed each year (Bobb, D. 1982, *India Today*, 31, 64-65) and this has been confirmed by reliable sources. Not only are the turtles being killed despite legislation against commercial use, but in some cases unnecessary suffering is caused by cutting up the turtles before killing them (Dilip, op. cit.; see also "Turtle Slaughter in India", below). Off Gahirmatha, Orissa, "annually about 500 Ridley carcasses, the flippers of most of which are securely tied by iron, plastic or nylon wires are being washed ashore within our study area. This of course, represents a tiny fraction of the actual offshore catch" (Kar, C.S., ms.).

However, the situation is not straightforward. Meat from these turtles, and eggs from the beaches also, find their way into the markets in Calcutta. Here they go to feed, if not the very poorest people, at least people who need better nutrition. The price of turtle meat and eggs is not especially high; they are not just luxury items. Moreover additional nesting beaches for olive ridleys in Orissa have recently been discovered (see article by Kar, below).

We have here a classic clash between the immediate needs of people and the conservation of resources. In the long run, of course, these are compatible. There will be less food available if these ridley arribadas go the way of those at Tlacoyunque and Mismaloya in Mexico.

What is needed is not total prohibition but rational, or at least controlled, utilization. For instance, it might be better to concentrate on harvesting quotas of eggs, and leave the adults alone. During arribadas turtles often dig up eggs of other turtles. Many eggs are also destroyed by predators. A combination of protecting some of the eggs while taking others could leave as many or more hatchlings entering the water as if no intervention had occurred.

Other people will doubtless have different views about what should be done. But we feel that because this issue is complex the Marine Turtle Newsletter should remain silent about it. So we urge you, whatever your conservation philosophy, to write to Mrs. Ghandi, even if it is just a short letter asking her to look into the matter, and devote more research funds to devising ways of improving the situation. Nearly anything would be better than the present uncontrolled inhumane slaughter.

Letters should be respectfully worded for greatest impact, and should be addressed to:

Shrimati Indira Ghandi
Prime Minister of India
South Block
Central Secretariat
New Delhi 110011 India

There are still many olive ridleys left in the world. There is still great scope for conservation initiative and wise management to be effective now — before the species is reduced to a remnant. If you have found this newsletter useful, whatever your views, please write to Mrs. Ghandi. And please send a copy of your letter to the editor of this newsletter. Please write now. The next arribadas of olive ridleys will soon be arriving on the west coast of Bengal.

N. Mrosovsky
P.C.H. Pritchard
H.F. Hirth

Turtle Slaughter in India

During the winter months, fish markets in West Bengal become turtle slaughter houses. Both freshwater and marine turtles arrive by train, lorry and bicycle in the early morning by the hundreds. Turtle meat is relished by Bengalis: nowhere else in India (except at Tuticorin in the southern state of Tamil Nadu) is there such a scramble for turtles.

At 7am on a Thursday morning in January, 1982, we arrived at a market in Calcutta, carrying out routine survey work for the Freshwater Chelonian Group of the IUCN. Several Pacific Ridleys were on their backs, eyes bulged from the pressure of being overturned for several days with flippers wired together. Three or four customers wanted sea turtle meat so a female was slid across the slippery, gouged concrete floor next to the scales. The young cutter drained his tea cup, and picked up the just sharpened knife. He bent over and deftly cut around the margin of the plastron, avoiding the flailing flippers and the sudden desperate attempts to reach and bite the knife hand. The dark blood overflowed onto the cement as the plastron was ripped off, all of the pulsating innards exposed. The flapping and biting action continued, but feebler now as the reptile was eviscerated and the important meat carved out for weighing. The female ridley didn't die for 10 minutes. The mounds of fully formed but unshelled eggs were put in a basket for separate sale. Only the carapaces were thrown away. No one was concerned about the suffering, nor was there any worry about the Indian Wildlife Act, under which sea turtles receive the "highest" protection!

J. Vijaya

Madras Snake Park Trust, Deer Sanctuary, Guindy, Madras 600022, India.

Discovery of second mass nesting ground for Pacific Ridley Sea Turtles in Orissa, India

Bustard (1974, 1976) reported on an enormous Pacific ridley sea turtle rookery at Gahirmatha Orissa, where over 150,000 nesting females were estimated to have laid in the 1975-76 nesting season. Subsequent nesting figures for this beach for the years 1977-79 were provided by Kar (1980) and Kar and Bhaskar (in press). Bustard pointed out that this was only one of a number of potentially important nesting areas for the Pacific ridley in Orissa. A second mass nesting ground has now been discovered during the 1981 nesting season at the other end of Cuttack District of Orissa, between Nadiakhia muhana and Akasia muhana (lat. 19° 98' N — 20° 1' N and long. 86° 4' E — 86° 45' E) approximately about 100km south of the Gahirmatha rookery. This nesting ground extends over about 3 to 4km and about 100,000 female ridleys have been estimated to lay annually.

The addition of this nesting population to the area already discovered at Gahirmatha, which has been monitored by me since 1977 together with important areas of nesting beaches between Hukitola Island, Paradeep, Astaranga, Konark (Chandravaga beach), Puri, Paluru and Gopalpur on sea, brings the nesting population of this species in Orissa alone to 300,000 per annum, conservatively estimated. The Gahirmatha population is protected by its inclusion in the Bhitarkanika Wild Life Sanctuary declared by the Government of India/FAO/UNDP Project, Crocodile Breeding and Management in 1975.

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Chandra Sekhar Kar

Gahirmatha Marine Turtle Research and Conservation Centre,
Forest Department, Government of Orissa, P.O.: Satabhaya-754 225,
Via: Rajnagar Dist: Cuttack, Orissa, India.

MISCELLANEOUS NOTES ON EUROPEAN TREE FROGS, EDIBLE FROGS, CRESTED NEWTS AND WALL LIZARDS

CHARLES SNELL

76 Birdbrook Road, Kidbrooke, London SE3 9QP

(i) SEXUAL MATURITY IN 12-13 MONTHS IN THE EUROPEAN TREE FROG (*HYLA ARBOREA*) AND EDIBLE FROG (*RANA ESCULENTA/LESSONAE*)

I read with interest T. Beebee's account of sexual maturity in the Common Frog (*R. temporaria*) & Common Toad (*B. bufo*) 2 years after spawning. This would bear out my own observations.

Even more dramatically I would like to report sexual maturity after only 12-13 months (from spawn date) for the European tree frog (*H. arborea*) and the Edible Frog (*R. esculenta*).

(a) Edible Frog.

I was given a pair of these in June 1981 and passed them on to someone else after 2 weeks. In the meantime, however, they had spawned in a garden pond. This would have been in the last week of June 1981. The offspring of this mating measured between 2½cm and 4cm on emergence from hibernation. The biggest on the 18th July 1982 was about 7cm (nose to anus), the largest being females. The males had been sexually mature and calling since late May. On the 18th July I noticed the first spawn. However, this was the first day I made a thorough search of likely places in the garden ponds. This was, however, only about 10 months from the time of metamorphosis.

(b) Tree frogs (*Hyla arborea*)

These are a free living colony in wasteland & gardens. The young of 1981 left hibernation in early May 1982 at 1cm to 3cm in length. The 3cm individuals reached sexual maturity in mid-June and have spawned regularly since in 2 separate ponds. Some 1981 young were put in an escape proof vivarium and have similarly achieved rapid maturation.

Females kept in a vivarium spawn approx. every 1½ to 2 weeks dependent upon day temperatures: warm spells produce spawn about every 10 days from the same female (from May to August). Some females originate from different localities but show the same polyseasonal activity.

Many books suggest that *H. arborea* are full-grown and sexually mature after 3 years. This is certainly not the case with free living individuals in S.E. London!

The books I have so far read also suggest that *H. arborea* mates only once in the early Spring. This is also not the case.

Much literature also suggests that Edible Frogs need 2-3 years to mature.

Perhaps they are all quoting some original source.

(ii) BOMBINA MYSTERY

Are *Bombina variegata*, *Bombina bombina* and *Bombina orientalis* separate species or a cline of subspecies?

I ask this question as B.H.S. member Dr. A. Millwood has hybridized *B. variegata* with *B. orientalis*. These hybrids produced fertile spawn in the care of D. Billings of Norfolk.

Dr. Millwood kindly passed on some female hybrids to me, as my 5 *B. orientalis* were all males.

I now have a fair number of *B. orientalis* x (*B. orientalis* x *B. variegata* hybrids) tadpoles and toadlets.

Surely, a main criterion of separate species status is the fact that hybrids should not be able to breed?

A look at the distribution maps would suggest that a cline of sub-species is not out of the question. Or is it another peculiar mechanism as in *Rana lessonae/ridibunda/esculenta*? Trouble here is that no 2 hybrids look alike to be able to fall into anything like a European green frog genetic mechanism where the 3 can be distinguished.

(iii) TREE FROGS, GREAT CRESTED NEWTS, 50,000 SLOW-WORMS PER HECTARE AND A CONSERVATION POND

A pond has been built by volunteers from Friends of the Earth (Greenwich) and Greenwich Nature Conservation Society on British Telecom property (with their permission!), Birdbrook Road, Kidbrooke, London S.E.3.

The pond will replace a pond destroyed in the past. Funding for the venture came from local people, Greenwich F.O.E. and Greenwich N.C.S.

The pond measures 26 foot x 24 foot with a 24" maximum depth and is ideally suited for the site's unique collection of amphibia (using garden ponds for breeding since the original pond loss). The site contains native species of amphibia including the protected Great Crested Newt as well as introduced and breeding (since 1977) Edible Frog, European Tree Frog (*Hyla arborea*) and Yellow-Bellied Toad.

It has been reported that the only tree frog colony in Britain is in the New Forest and consists of a maximum of 20 individuals (Sir Christopher Lever, British Herpetological Society Bulletin. 1982).

As the 1982 population on the "Telecom" site exceeded this, it would seem to rate as the largest in the country for this species at the moment.

Another surprising find on the site was the discovery of 31 Slow-Worms during the excavation, which were all buried between 4" and 1 foot (10 to 30cm) below ground level in an area of 1½ x 4 metres. (The excavation was in November — hibernation time — 1982). This was the only area of top soil removed in creating the pond as for the most part it was in a natural hollow. If the density is similar elsewhere in suitable places on the site (i.e. approx. 5 Slow-Worm per square metre although presumably the figure must be far lower on average), the potential population is enormous. The soil was in fact removed from the top of a bank facing W.S.W. — which runs for over 100 metres.

Also uncovered in the same area were 3 Smooth, 2 Palmate Newts and 2 Common Frogs. The week following this a further excavation of approximately one square metre revealed 2 more Slow-Worms, a Great Crested Newt (male) and a Tree Frog. All were of course in the ground for hibernation purposes. The breeding success in Spring is now more secure for the amphibia.

(iv) WALL LIZARD COLONY IN S.E. LONDON (SOME OBSERVATIONS)

Readers may recall mention of this breeding colony of *Podarcis muralis* in Kidbrooke, London S.E.3 in previous articles. The colony is now about 5 years old and thriving. Favoured habitats are low walls with a canopy of herbage at the base in which to retreat, dead tree stumps (result of Dutch Elm disease) and the hot favourite which is a brick and slate rubble covered area with low and sparse vegetation.

A thing these places have in common is dryness and elevation into the sun with little or no shading.

Hibernation quarters for the majority is a mystery, but certainly some hibernate above ground in stag beetle tunnels in elm stumps (quarters they share with numerous Slow-Worms and young toads!). They can be seen entering and leaving these in early Spring and late Autumn to bask. Some individuals even appeared on New Year's Day 1982 to cash in on winter sun between the snow showers of that winter.



Plate 1. Tree Frog (*Hyla arborea*) at Kidbrook, S.E. London, June 1982.



Plate 2. Wall Lizards in Kidbrook, S.E. London. Communal basking in spring sunshine.

The origin of this colony is N. Italy and both males and females have a ground colour of bright green with the usual black & white reticulations and occasionally a row of blue scales laterally. As well as occasionally appearing in mid-winter they show other opportunistic and "adventurous" traits. When the sun is low, such that trees cause the only direct sunshine to be high on buildings or houses, it is possible to see the occasional lizard under the eaves of buildings or even on the roof. Another took up residence under a wall mounted security light (temporarily) when its automatic switching was faulty and it stayed on by day and provided the individual with free light and heat.

The agility is also surprising. They spend a great deal of time in the warmer summer days exploring their territory, climbing is a particularly favoured activity and no post, stake, fence, shed, etc., is left unexplored. In fact, I occasionally obtain specimens in outdoor vivaria this way as entrance via shrubs is possible but exit more difficult. However, some have managed and I still cannot discover how. When on such forays of "exploration" I have often seen them jump from post to post horizontally across gaps of up to 1 foot.

One particular male took up residence both inside and outside my garden shed this year (1982) occasionally basking inside when sun came through a window.

Eggs obtained from a female kept in one of the vivaria hatched after only 31 days at 24°—27°C. This short incubation time must provide a key to part of their success here. 2 clutches per year are normal, specimens in captivity seem to consistently lay 5-6 eggs per clutch.

The wild colony was subject to some disturbance during Midsummer 1982 when their favoured rubble and slate site was cleared for re-fencing and eventual building of an industrial estate.

This disturbance caused migration away from this area. My rear garden is some 60 yards from the nearest part of the site, and during this period lizards passed through the garden at the rate of a few a week. They were visible for a few days and then their places were taken by others. Sometimes 5 were visible at one time. As the lizards are so variable in hue and markings, and vary in age from brownish juveniles to full grown greenish adults, telling them apart is relatively easy. This made it a simple task to tell that, during the period of disturbance, the garden population changed. To estimate the total population is, however, not possible as their range extends over one public (the once favoured area) two private government owned areas and numerous gardens. It must be added that during the hottest weather, even without disturbance, some lizards made passage through the garden to reach outlying areas (in respect of the main colony) but these are predominantly very young individuals or mature males that have possibly been driven out by more dominant ones.

Whether the new areas they eventually colonise will be as beneficial to their survival as their original remains to be seen. Because of cats, the gardens are not really suitable. Railway banks (about ½ km away) should prove suitable if they can extend that far before a motorway, planned to start in Autumn 1983, cuts them off!

The photograph shows the Wall Lizards basking communally on an Elm stump in Spring.

WILDLIFE, THE LAW AND YOU

TREVOR BEEBEE

434 Falmer Road, Woodingdean, Brighton

Members will by now be well aware of the Wildlife & Countryside Act, 1981, and its general implications for our herpetofauna. Two particular issues arising from this legislation seemed to me to pose specific questions of detail that required clarification, and in an attempt to do this I have been in correspondence with the Nature Conservancy Council and the Department of the Environment over the past few months. For the information of members I describe below the outcome of these interchanges, including a few specific quotations from letters I have received.

1. Licenses and great crested newts.

Triturus cristatus is now on the strictly protected list in Britain, together with the natterjack, sand lizard and smooth snake. It is, of course, much more widely distributed than any of these other three species and the first point I raised was whether anybody netting randomly in ponds, not specifically looking for crested newts and without knowing whether or not the species occurred in the ponds, would need a license *just in case* he/she happened to catch one. The issue did not relate to the *keeping* of any newts thus caught (which would clearly need a license), the assumption being that the creature would be returned immediately to the water. The reply from the NCC was that ... "the intentional taking of this species is licensable. I presume that in netting ponds it will be your intention to catch and record this species if it is present, and in these circumstances we would consider a license is required". This reply seems somewhat equivocal, hinging as it does on the establishment of motive. Presumably it means that accidental catching of crested newts is not licensable, but if anyone records it they could be in trouble!

Pursuing the crested newt situation further, I enquired as to whether searching ponds by torchlight at night (an excellent way of locating this species) required a license on account of the disturbance caused. The reply in this case was clear: ... "we do not feel that the pond itself constitutes a 'structure or place (used) for shelter or protection' by great crested newts. The pond is the animals' habitat, but not specifically a place of shelter comparable to a bat roost or otterholt. So any disturbance connected with shining torches into ponds is in our view lawful — always provided there is no attempt to catch or handle protected species".

Finally with regard to crested newts I enquired about the legal status of colonies already established in garden ponds. I reproduce the NCC response verbatim:

"As regards your garden pond, the point at issue is whether the newts in it are 'living wild' within the meaning of Section 27(1) of the Act. No doubt this could be argued either way, but as (I assume) they are not in any sense kept captive in the pond, I am inclined to classify them as 'wild animals' as defined by the Act. This means that any taking or handling of eggs, larvae or newts would be licensable unless it is an 'incidental result of lawful activity and could not reasonably be avoided'. We would not consider it necessary to license normal garden maintenance, such as cleaning out the pond or removing unwanted weed; any incidental handling of animals (including their larvae or eggs) in the course of this would in our view be lawful. But intentionally taking the animals for a scientific or conservation purpose (e.g. introduction to other garden ponds) would be licensable".

2. Introduction of alien species.

It is now against the law to release into the wild any animal not native to the British Isles. However, as with most aspects of the new Act provision is made for the licensing of such ventures and I have made enquiries into the possibility of releasing edible frogs into my garden ponds under such a license.

For this aspect of the law it is necessary to deal with the Department of the Environment (Bristol office), though as it turned out the matter was referred to NCC (Wildlife advisory branch) for advice. My application seemed to cause some consternation, and I had the impression that procedures for this aspect of the Act have not yet been properly thought through. Firstly it was confirmed that license would be needed, under Section 14(1)(b) of the Act, but that there were no formal application forms for such a license. I was later asked by NCC to state: (a) the location of the release site (= my garden in Brighton); (b) the numbers and sex of animals involved (= a few adults and juveniles); (c) the purpose of release (= personal enjoyment). I was surprised to note that no enquiry was made as to the prospective source of the frogs. Finally (3 months after my first enquiry) I received a reply from the DoE:

“On the assumption that your garden is of the conventional variety and you take sufficient measures to ensure that there is no possibility of escape of the edible frog from your garden so far as the Department is concerned you will not require a license. I should add however that it would have been most unlikely that our scientific advisers would have advised us to grant a license for “release into the wild” on the information provided and in these circumstances it becomes even more necessary that you take stringent steps to ensure that the frogs do not escape”.

I *think* I read this reply as permission to put edible frogs in my garden pond, but the issue of preventing escape is clearly a perplexing one. The practicalities of confining the frogs or of proving/disproving the success of any measures taken do not appear to have been considered very seriously. If an edible frog was to be found by somebody a mile or so away from my garden, it is unclear as to how its origins could be established. It remains to be seen how any requests to release other species in gardens will be treated, and it has been made clear to me in the correspondence that the views expressed by the authorities are just that — views which, strictly speaking, will need to be tested in the courts before anything completely definite can be said. Nevertheless, it seems most likely that any such court case would be heavily influenced by NCC/DoE opinions and that to all intents and purposes the replies I have received reflect the law of the land at this time.

OBSERVATIONS ON THE AMPHIBIANS AND REPTILES OF THE ALGARVE, PORTUGAL

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INTRODUCTION

The herpetofauna of Portugal resembles very closely that of adjacent Spain and a number of works have been published describing the amphibians and reptiles of the Iberian Peninsula (e.g. Bosca 1877, Palaus and Schmidler 1969, Crespo 1972, Salvador 1974). This paper reports on a collection of amphibians and reptiles made during a field trip in September 1982 in the Algarve region of southern Portugal. Brief comments on the biotope and behaviour in the field are given where possible on those species listed. All captured animals were released at the site of capture after photographic records were made.

The region investigated was the lowland area situated to the south of the Serra de Monchique and the Serra do Caldeira which approximates the southern limits of the geological Meseta (Fig. 1). The summers in this area have a low rainfall and large numbers of days with clear skies; the rainfall principally a feature of the short winter months.

BIOTOPE

Plates 1, 2, 3 and 4 show features of the habitats of the main areas investigated. Plate 1 shows a pool formed out of a partially dried up river system bordered on both sides by densely bushed areas. The water in this and other pools was extremely murky. This was a product of the loose reddish soil which dominated the whole region. Plates 2 and 3 were sites very close to each other consisting of rather open areas with low bush (Plate 2) and a large pond in which the water was moderately clear (Plate 3). Records of the temperature at this site showed air temperatures to vary from 23-9°C (cloudy) to 28°C (clear skies). The water temperatures averaged at 22°C and the substrate temperature (5mm into the soil) 22.4°C. Plate 4 was principally a gecko habitat consisting of large rocks bordering a partially dried up stream.

LIST OF SPECIES

Amphibia

Anura

Discoglossidae

Discoglossus pictus (Otth 1837)

One adult and several recently metamorphosed froglets found at the area shown in Plates 2 and 3. The adult was located at a puddle about 30 metres from the pond; the juveniles at the banks of the pond and in the vicinity of the drystone wall.

Ranidae

Rana perezi (Seonae, 1885)

Found in most of the habitats investigated often at distances from standing water. Some individuals were observed basking at the banks of the pond in Plate 3. Only a few large individuals were captured or observed and the densities of the various populations appeared to be much lower than that recorded in North Africa (Meek in press). Basking behaviour and body temperatures in a North African population have been described (Meek, 1983).

Reptilia

Chelonia

Emydidae

Emys orbicularis (Linnaeus, 1758)

Several individuals observed basking at the site shown in Plate 1, but were very alert and quickly dived when aware of our presence. Basking was observed on an overcast day on bunches of flattened reeds. Found here in much larger bodies of water than those observed in Yugoslavia where they inhabited very small ditches (Meek and Inskip, 1979).

Sauria

Gekkonidae

Tarentola mauritanica (Linnaeus, 1758)

Found living in rocky places, disused buildings and under bridges but most abundant at the area shown in Plate 4. Several individuals were further found in this area, but under a bridge which crossed the partially dried up stream. Other individuals were located near the coast under bridges. Several animals were observed active in the shade during the daylight hours.

Hemidactylus turcicus (Linnaeus, 1758)

One individual found in association with *Tarentola mauritanica* at the area shown in Plate 4.

Lacertidae

Podarcis hispanica (Laurenti 1768)

One individual, an adult, observed close to thick bushes in association with *P. algirus* at the area shown in Plate 1. When approached too closely it quickly retreated into the bushes.

Psammodromus hispanicus (Fitzinger 1826)

Several of these small lizards were found at an open unshaded grassy area which was close to a drystone wall surrounded by denser vegetation (Plate 2). When initially located they were usually active on the open area but headed for the wall when chased and one adult lizard shed a portion of its tail when captured. All specimens examined at close hand had the white striped pattern with blackish bars and white undersides described by Arnold *et al* (1978).

Psammodromus algirus (Linnaeus, 1758)

Found in densely bushed areas which formed the perimeter of the pools shown in Plate 1. Several juveniles were found in leaf litter at the base of a spiny shrub plant, where a large adult (Plate 5) was also caught. Several individuals were seen running across clearings between the bushes.

Acanthodactylus erythrurus (Schinz 1833)

One individual, one adult, observed at close quarters at the drystone wall shown in Plate 2 where it eventually retreated down amongst the rocks.

Serpentes

Colubridae

Natrix maura (Linnaeus 1758)

Very common at the pond shown in Plate 3. Both adults and juveniles found. One particular part of the pond margin appeared to be a favourite haul-out site and was observed to be regularly used as a basking area; Plate 6 shows a juvenile located at this site, the substrate consisting of shale. Other favourite sites for basking were between the tall reeds which bordered the pond's edge. Large numbers of fish inhabited the pond in addition to *R. perezii* and *D. picta*. These snakes were much more wary than those previously encountered in North Africa (Meek, in press), but similar to the North African population, did not attempt to bite when captured; Linley (1981) has also commented on this passive behaviour. One individual, in the sloughing process, was found several hundred metres from the pond at the drystone wall shown in Plate 2, where several shed snake skins were also found.

TABLE 1. Summary of the site locations of Algarve amphibians and reptiles. Site numbers refer to habitats described in the figures (i.e. Site 1 = Plate 1). Details are also given if species were located at areas other than those illustrated.

	Site Number				Found at areas not illustrated
	1	2	3	4	
<i>Discoglossus pictus</i>		x	x		
<i>Rana perezi</i>	x	x	x		x
<i>Emys orbicularis</i>	x				
<i>Tarentola mauritanica</i>				x	x
<i>Hemidactylus turcicus</i>				x	
<i>Podarcis hispanica</i>	x				
<i>Psammodromus hispanicus</i>		x			
<i>Psammodromus algirus</i>	x				
<i>Acanthodactylus erythrurus</i>		x			
<i>Natrix maura</i>		x	x		

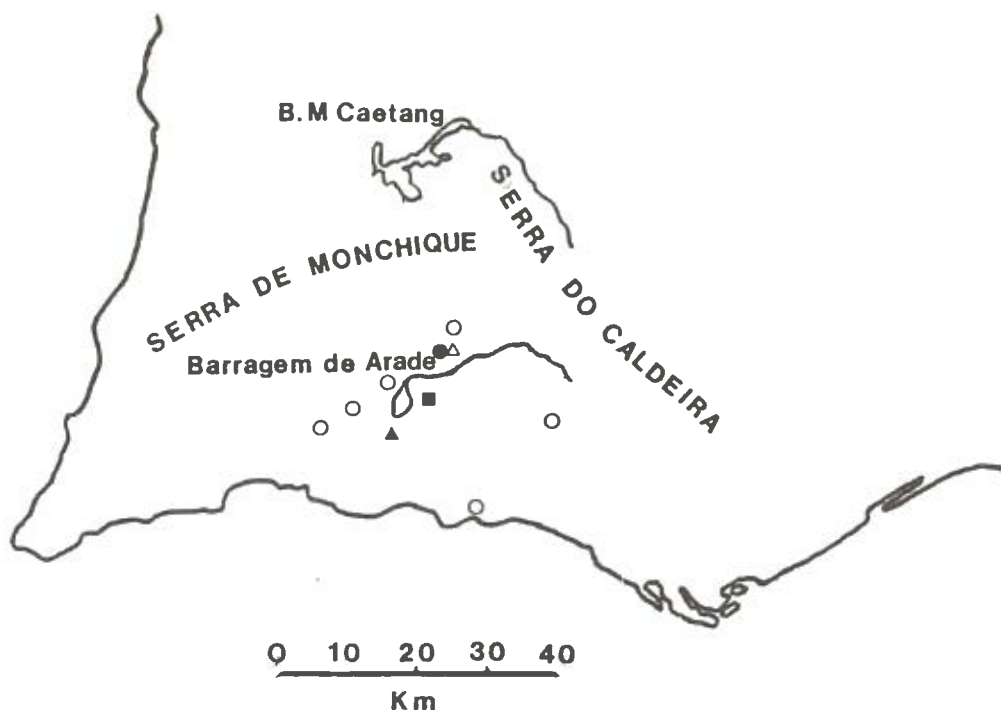


Fig. 1. Map of the Algarve showing the localities of Plate 1 (■), Plate 2 (●), Plate 3 (Δ), Plate 4 (▲), and other sites where amphibians or reptiles were found (O).



Plate 1. Area of scrub terrain surrounding a partially dried up river system. A habitat for several species of amphibian and reptiles including the pond turtle *Emys orbicularis*.



Plate 2. Area of scrub surrounding a drystone wall which was central to a large open grass covered area. The most abundant species here was the lizard *Psammodromus hispanicus*.



Plate 3. A pond which was habitat for water snakes (*Natrix maura*) and amphibians. This view shows the gradual sloping banks used by *N. maura* as basking sites.



Plate 4. Habitat where two species of gecko were found. Deep crevices in these rocks were used as homesites.



Plate 5. Adult male *Psammodromus algirus* found 5km east of Silves (See Fig. 1).



Plate 6. Juvenile *Natrix maura* found 10km south of San Marcos de Serra (See Fig. 1)

DISCUSSION

A total of eight species of reptile and two species of amphibian were located on this field trip. All those forms observed were among the commoner species of the Iberian peninsula. The most frequently observed species, both in terms of numbers and individuals and presence in the habitats surveyed, was the frog, *Rana perezi* which was found in all the moist areas (see Table 1) although Honegger (1978) has recorded that in Portugal this species is in decline. The areas where the lizards *Psammodromus algirus* and *P. hispanicus* were found agree well with the habitat description given for these species generally by Arnold et al (1978) but the inability to locate any of the snake species from the region, other than *N. maura*, was possibly due to the particular types of habitat investigated, which were mainly moist areas, usually with standing water present.

ACKNOWLEDGEMENTS

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STRIPELESS NATTERJACKS IN ENGLAND

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The yellow vertebral stripe of the natterjack (*Bufo calamita*) is the main diagnostic feature over most of the species' range (Beebee, 1979). Occasionally, however, the stripe is weakly marked or absent (Arnold, Burton and Ovendon, 1978) and, for instance may be deficient in 50% of Spanish natterjacks (Flindt and Hemmer, 1972). From Britain, only one stripeless natterjack appears to have been described in the literature: an adult male was discovered on the Dumfriesshire coast, Scotland, in August 1970 (Boyd, 1979). In this article we report on the occurrence of three stripeless specimens found at different sites in England during 1982. One of these animals was melanistic. The only other record of such an animal was at Sutton Fen in 1869 (recorded in the diaries of F. Norgate: J. Buckley, pers. comm.).

Specimen 1. While collecting natterjacks for measurement from beneath sheets of tin discarded at a site in north Cumbria on 25 May 1982, A.S.C. caught a stripeless male. There was no doubt that it was a natterjack as it (1) had typical colouring elsewhere on the body, (2) moved like a natterjack, (3) gave the characteristic release call on being handled, and (4) had parallel paratoid glands and paired tubercles on the longest hind toe (refer to Arnold *et al.*, 1978). It was 50mm in total length. It was photographed (Plate 1) and released. In the same sample of 19 natterjacks, a female (length 58mm) was noticed which had a yellow stripe only 5mm in length.



Plate 1. Stripeless male natterjack, north Cumbria, 25.5.82 (specimen 1).

Specimen 2. In mid-June 1982, S.E.D. found a stripeless toadlet on the edge of a heathland scrape in southern England. The toadlet was 8mm in length and, apart from having no yellow stripe, was identical in every respect to 'normal' natterjack toadlets emerging from the pool at the same time.

Specimen 3. In early August 1982, B.B. found a stripeless melanistic natterjack at a site on the south Cumbrian coast. Except for its unusual coloration, it was identical to another young natterjack of the same size (15mm).

We have studied natterjacks at these sites in previous years without noticing stripeless individuals. Doubtless other stripeless natterjacks will turn up occasionally in the future.

Thanks are due to Henry Arnold for printing the photograph from a colour slide.

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THE SECOND GENERATION OF CAPTIVE BRED *RHADOPHIS TIGRINUS*

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Two males and one female hatched at the beginning of August 1980 and raised together successfully reproduced in 1982, but sexual activity had already occurred one year after hatching (on 10 August 1981) when the female reached about 70cm in length. Both males were smaller and one of them started to court the female by flicking his tongue over her dorsum and pressing his lower jaw against her body in order to stimulate her to crawl, and coiling his tail around hers. The movement of the female induced increased activity in the male. This behaviour continued until the end of September. However, in October the snakes became apathetic and stopped feeding, so I decided to put them into the refrigerator (on 1 November).

They were removed on 18 February, 1982 and courtship occurred the next day. A week later the second male also showed interest in the female — its interest increased noticeably after the female shed its skin. Mating activity was continuous until the end of February, and was not interrupted even when the female was swallowing frogs. The female ate the last frog 10 days before egg laying. Twelve eggs were laid on 20 April (age of female 1 year 8 months and 17 days) between 5.30 pm and 7.00 pm. The mean size of the eggs was 29.0 x 16.0mm. All of them were fertile. Courtship behaviour and mating recommenced immediately after egg laying and continued until the end of April. At the beginning of June the eggs reached their maximum size. The largest one reached 39 x 27, \bar{x} = 35.0 x 24.7mm, so their volume increased about three times (max 3.8). Seven young of about 180mm in length emerged from the eggs on 4-7 June after 35-38 days of incubation. A further 5 died just before hatching (their lengths were: 183, 187, 181, 166, 187mm (\bar{x} = 180.8mm). Shedding occurred a week later (compare Sura, 1981).

The second clutch of 9 eggs was laid in the afternoon on 8 June, of which one was infertile and another not properly developed. Their sizes: 36 x 16, 33 x 17, 33 x 16, 33 x 17, 34 x 17, 31 x 17, 34 x 18, 35 x 17 (\bar{x} = 33.6 x 16.9mm) and 22 x 14mm (undeveloped), a little larger than the previous clutch. The period of incubation was slightly longer because I had to leave Kraków for some time and the heating was switched off. Two juveniles only hatched on 21 July, after 43 days; the others died before hatching. Their sizes: 152, 160, 190, 181 and 177 (\bar{x} = 172.0mm). The last one was removed from the biggest egg on 19 July. It measured 42 x 25mm (the egg volume increased 2.7 times). This low reproductive success may have been caused by inbreeding and/or vitamin deficiency. In spite of this, the hatchlings were in good condition and started to eat without difficulties — they prefer “jumping” frogs — tadpoles did not stimulate them in the same way.

In August courtship commenced again, but with less intensity, and continued with intervals until the end of October. The female's last ecdysis occurred on 18 October, when she was noticeably gravid. Oviposition took place at night on 2 November but only 8 eggs were found (one abnormal — 7 with \bar{x} = 30.6 x 17.7mm). Unfortunately the female was very weak and died in the afternoon of the following day. Her oviduct contained a further 13 eggs of similar size, so the total number of eggs produced in 1982 was 42. The total length of the female was 870mm (SVL 735mm); growth rate 558mm in the first year and 142mm in the second. The eggs failed to develop, only one contained an embryo in an early stage of development.

According to the literature known to me *Rhabdophis tigrinus* produces one clutch of eggs in one season, at the end of July. However, it is quite possible that the period of reproductive activity may be extended or at least this may happen in captivity. Male snakes determine the productive stage of the female on the basis of an estrogen-dependent pheromone produced by glands in the dorsal skin (Crews, 1976). However, it was stated recently that the sex attractant pheromone of the female red-sided garter snake (*Thamnophis sirtalis parietalis*) is produced in an active form in the liver under the control of estrogen and is present there and in the circulation, reaching its active site on the skin by passing through the keratinized outer skin cells in an active process

associated with courtship (Garstka and Crews, 1981; Crews and Garstka, 1982). Female *Thamnophis* are not attractive to other males after copulation and this change of female attractivity is a consequence of the deposition of a mating plug by the male (Crews, 1979; Crews and Garstka, 1982).

It is difficult to ascertain the reasons for the last unsuccessful clutch. The female apparently produced sex pheromone for an abnormally long time, and in the light of the above facts this may not have resulted in the deposition of a seminal plug. Such a situation is probably caused by lower testicular activity by the males in autumn. However, the asynchronisation of the time when eggs could be fertilised with the time of insemination should not be excluded. Of course, the physiological factors regulating reproductive function and behaviour of *Thamnophis* may differ from those in other snakes, even closely related, so these noteworthy discoveries of American herpetologists could be extended to other species after special research. But one thing can be pointed out now. A striking correlation exists in European *Natrix natrix* between the size of the ovaries and the abdominal fat body. In females with undeveloped ovaries the fat bodies are very large. When ovaries increase in size the fat bodies show an opposite reaction, so after ovulation only rudimentary fat body can be found. This may be explained with the theory of Crews and Garstka. Gonadotropic hormone causes the follicles in the ovary to secrete an estrogen which in turn causes the abdominal fat bodies to release fatty molecules incorporated in the liver into vitellogenin. The vitellogenin is deposited (with other fatty molecules) deep in the skin, serving as the pheromone that attracts the male for mating. Not going into details, after mating an increased production of vitellogenin is noted. Now it is gathering in the ovary being a precursor of yolk. Thus, a smaller size of fat body is correlated with advanced development of eggs.

Summing up, *Rhabdophis tigrinus* is a very attractive species, simple to maintain in captivity where it readily reproduces. Some failures described here could be avoided though the reproductive cycle of this snake and possible endocrinologic anomalies are still not satisfactorily known.

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THE CARE AND BREEDING OF *SAUROMALUS OBESUS OBESUS* IN CAPTIVITY

BILL CROOKS

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INTRODUCTION

The Chuckwalla is a large herbivorous lizard from the desert regions of Mexico and south-west U.S. where water is scarce and temperatures extreme. They are very territorial and a given territory would contain a dominant male, adult females, subordinate males and juveniles. Its breeding habits are largely unknown and there are few recorded cases of it having bred in captivity.

A pair of sub-adults were acquired in 1980 in order to attempt captive reproduction.

DESCRIPTION

Adult males are of larger build than females with broader heads and heavier jowls. The tail is thicker and shorter than in females of similar snout-vent length. Females tend to have lighter colouration and often show faint crossbands across the back. Males are normally darker, especially around the head and often have speckles of red on the flanks.

The colouration may vary from light grey to black giving it a drab appearance but this blends in well with the habitat in which they are found.

Maximum SV lengths are around 220mm in males and 205mm in females.

When acquired the male measured 155mm SV and the female 150mm and had probably just reached sexual maturity (Berry 1974).

HOUSING

The Chuckwallas were housed in a 75 x 37 x 37cm vivarium which was illuminated by 3 Trulite tubes situated 35cm above the surface. These were controlled to give a daylight period which ranged from 14.5 hrs in the summer to 10 hrs in the winter. In addition, a spotlight was situated in one corner above a basking rock and was switched on for 6 hrs each day.

The floor was covered with a layer of sand about 5cm deep and numerous rocks were provided for cover. Supplementary heating was provided by an underfloor heater if required. A nominal day-time temperature of 28C in winter and 36C summer was maintained but this was allowed to rise several degrees while the spotlight was on. At night heating was only used if the temperature dropped below 18C.

The Chuckwallas were fed mainly on a vegetarian diet. The main foods being peas, green beans, brussel sprouts and lettuce. This was supplemented from time to time with broken grapes, sweet corn, bananas, grated carrot, mealworms and rice. Vionate was added to the food 3 times a week.

Both animals were healthy when acquired except for Nematode infestation. This was cured in each case by a single dose of Fenbendazole (Panacur-Hoerst Pharmaceuticals) at a dose rate of 200mg/kg.

Chuckwallas derive their moisture from the food they eat and do not require a water bowl. Because of this they can rapidly deteriorate if they do not eat for sustained periods.

As with all animals deprived of natural sunlight a well-balanced diet supplemented with multivitamins, especially vitamin D3, and calcium is essential. Trulite is also beneficial due to its ultra-violet element promoting vitamin D synthesis in the skin, which helps the body absorb the calcium needed to sustain sturdy bone growth and for egg production during gestation.

BREEDING

During early April 1982 there was a marked increase in courtship activity culminating with mating on the 20th. Courtship display was typical of iguanids with much head-bobbing. Egg-laying was expected about midday and trays of damp sand and vermiculite were placed in the vivarium but ignored. By the beginning of June the female began to look very heavy with eggs but still showed no sign of looking for a suitable laying place. On June 9th food was offered, as normal, in a 19cm plastic bowl. This was commandeered by the female who emptied it of food and sat inside. She began head-bobbing which the male seemed to take as his cue to disappear and so retreated under cover. After about an hour she began to lay her eggs. The first five were laid in the bowl and the next five on a wooden platform next to the bowl. The period between each leg laid varied from 3-37 minutes. Three of the eggs were very soft and she tried to eat one of these but it was removed before the shell was broken.

At no time did the female make any attempt to cover or conceal the eggs and once laid she showed very little interest in them. After all the eggs had been laid the female attempted to gain access to the cover where the male was. Each attempt was met with an attack by the male which drove her off. She eventually spent the night out in the open, something she had never done before.

The eggs were removed and placed in an incubator at 32°C on damp vermiculite and covered to a depth of 2cm to allow moisture absorption. The following day the top covering of vermiculite was removed. The eggs measured approx. 35mm x 20mm and weighed 10g, there was no noticeable increase in size during development.

During incubation seven eggs were lost, these were probably infertile.

After 67 days the first egg hatched and movement could be seen inside the remaining two. The hatchling took 15 hours to completely emerge from the shell by which time movement had ceased in the others. The following morning the remaining eggs were opened to reveal two fully-formed dead embryos. There was no apparent reason why they had failed to break out of their shells.

SUMMARY OF BREEDING DATA

Mating — 20th April
Egg-laying — 9th June
Gestation — 50 days
Hatching — 15th August
Incubation Period — 67 days
Incubating Temperature — 32°C
Eggs Laid — 10
Fertile/Developed — 3
Hatched — 1

CARE OF YOUNG

At birth the hatchling measured 100mm total length (53mm SV) and was extremely active, managing to escape on the third day and remaining at large for 20 hours despite an extensive search. On recapture it was healthy but sluggish due to the low temperature.

All food was ignored for three weeks although the hatchling would lap at a broken grape for moisture. Eventually some cress was eaten and once feeding, lettuce, grated carrot and peas were also accepted, but as yet no interest has been shown in insects.

In mid-February, the young Chuckwalla was transferred to the adult vivarium and, apart from a little head-bobbing, was readily accepted.

In eight months the hatchling has grown 87mm, and now measures 187mm total length, 105mm SV.



Plate 1. Adult female and baby Chuckwalla.



Plate 2. Captive-bred baby Chuckwalla.

DISCUSSION

After mating the adult diet was supplemented with a vionate/crushed eggshell/Brewer's yeast/calcium & vitamin D mixture. Although 3 of the 10 eggs were soft the shell was not easily broken and the remaining eggs were very tough. It may well be that this was the reason why the other two embryos failed to break out of their shells.

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- * *Advertisements for livestock are accepted on the understanding that the animals in question have been legally obtained.*
- * **Homes offered:** I am willing to look after unwanted tortoises. Matthew Beggs, 8 Carlton Road, Sidcup, Kent, DA14 6AH.
- * **Wanted:** Pair of captive bred Common Lizards (*Lacerta vivapara*). Helen Mayne, 85 Leam Terrace, Leamington Spa, Warwickshire. Tel: 0926 26987.
- * **Wanted:** males of the following gecko species: *Phelsuma dubia*, *P. v-nigra*, *P. cepediana*, *Ptychozoon lionatum* and *Hemidactylus mabouia*. Also pairs of other species. D. Garthwaite, 16 Brill Close, Luton, Beds, LU2 9RL. Tel: Luton 415548.
- * **Wanted:** Green Toads, male and female, between 1 and 2 years old, or metamorphosed young. European Tree Frogs, male and female 1-3 years old or metamorphosed young. Michael Gent, 104 Curzon Street, Long-Eaton, Notts., NG10 4FS. Tel: Long-Eaton 65446.
- * **Wanted:** Juvenile *S. salamandra*, (a) all yellow; (b) predominantly yellow with black stripes (like Arnold & Burton, Field Guide to R. & A., plate 1, 1b); with red (not orange) markings. Robert Bustard, Airlie Brae, Alyth, Perthshire, PH11 8AX, Scotland.
- * **Homes wanted:** for 3 adult *Ophisaurus apodus* (3 males, 1 female), 1 Bell's Hinged Tortoise from Natal, and a large collection of Slow-Worms. Deirdre F. Randell, 153 Colwyn Road, Northampton, NN1 3PU.
- * **For Sale:** Florida Kings, Scarlet Kings, Corn Snakes, and Yellow Ratsnakes. Mice of all ages available. Also, good homes wanted (garden ponds) for Common Toad tadpoles and adult Smooth Newts. Simon Townson, tel: 01-989 9570.
- * New World tortoise eggs. Available for *Terrapene carolina* (Carolina box turtle) and *Geochelone carbonaria* (S. American red-foot tortoise) to BHS members with incubation facilities. Enquire of Dr. Caroline Pond, Department of Biology, Open University, Walton Hall, Milton Keynes MK7 6AA. Tel: (0908) 74066.
- * Juvenile tree frogs (*Hyla arborea*), newly metamorphosed, and Edible Frogs (*Rana esculenta/lessonae*). £0.50 each, plus carriage; minimum order 8. Charles Snell, 76 Birdbrook Road, Kidbrooke, London SE3 9QP. Tel: 01-856 9852.

CHONDROS — AU NATUREL

R.D. BARTLETT

Director, The Reptilian Breeding and Research Institute, 1421 Olmeda Way, Fort Myers, Florida 33901, U.S.A.

While the breeding biology of the Green Tree Python, *Chondrophython viridis*, is now amongst that most thoroughly documented, numerous perplexities yet remain. This is especially true in the area pertaining to the incubation of the eggs. For the edification of husbandrists I wish to here document the program in effect at the R.B.R.I., which is, because of the area of the country in which we are situated, considerably different from that practiced by most other institutions.

During the latter part of 1981 a pair of Green Tree Pythons were acquired to accompany a lone female which had been long in my collection. Additionally, in mid-1982 a second male was acquired. A perusal of the literature indicated that the species should be well able to withstand the vagaries of the weather in south western Florida with the exception of those few winter days during which the low temperatures associated with passing of cold fronts prevailed. Upon such rare days the temperature may occasionally plummet to the mid-twenties but more frequently it hovers near 40°F. The remaining 10 months of the year, February through November inclusive, should produce a weather pattern not seriously dissimilar to that within the natural range of the species. Considering the portions of the literature which correlated the changes in barometric pressure often associated with the formation of showers to the breeding activities of the snakes, it was decided to house the two pairs out-of-doors under existing conditions in a manner which would fully expose them to the stimuli offered by the changing weather conditions.

Although I seldom use cages of wire construction for the maintenance of any reptile, it was decided to do so in this case. The material chosen as the enclosure was a galvanized welded wire measuring $\frac{1}{2}$ x 1 inch and of this a cage of some 30 x 30 x 36 inches was constructed. It was affixed firmly between the horizontal limbs of a Powder-Puff (*Calliandra*) bush. Beneath, a tangle of foliage plants, and along the limbs the aroid Creeper *Syngonium podyphyllum*, added to the tropical aspect. Within the cage, limbs were firmly anchored at various levels which would allow the snakes to choose their desired height and positions. Above the front of the cage the foliage of the shrub was thinned, the intent being to allow access of the early morning sunlight, hence providing an area for thermoregulation should the serpents so desire. A large and deep water dish was provided.

Into this, initially, the trio of chondros were introduced. After a day or so of nearly incessant prowling they settled in well, each choosing a different limb as their own. From this day they seldom strayed, returning to what appeared to be the very same spot after each session of movement or basking.

The activity patterns of the trio were similar. Early evening and at dawn they would usually be actively prowling unless digesting a recent meal. They usually coiled upon their chosen perches throughout the hours of full darkness but occasionally remained active long into the night. The earliest rays of the sun drew all to the front of the cage where they would bask in its increasing warmth for varying durations, longer in cool weather, and for correspondingly lesser periods as the temperatures increased. Daylight activity was not uncommon during the summer rainy season. The advent of showers, either real or through the use of a sprinkler system, would bring about an increased degree of alertness. In keeping with the reports of others it was found that during storm activity defecation and breeding activity were stimulated. Also, drinking usually occurred at this time, the snakes drinking the beads of moisture as they formed upon their coils. Feeding seldom occurred during periods of rain, the snakes preferring to await the coming of darkness for this.

Although I initially worried about feeding or striking chondros engaging their teeth in the wire of the cage, I soon found that such concern was without basis. In the year that they have been so caged, upon but one occasion have I seen a specimen mis-strike when grasping a food animal and

these particular specimens are not at all inclined to strike in aggression. Another potential cause for striking, I thought, would be the presence of birds in the scrub. Neither did this problem materialise for as soon as the birds discovered the snakes, with the exception of an occasional scolding bluejay, all vacated the shrub.

While the high temperatures of summer were of no concern whatever, I wondered how low a temperature could be sustained safely by the snakes? By accident, during one unheralded cold front, I found that temperatures in the mid to low forties in no way debilitated them. In fact, one female caught, constricted, and consumed a rat soon after sundown on a day when the thermometer never read above the low fifties. It is possible that her body temperature was a few degrees warmer for she had basked in the sunlight until shortly before the food was offered. No longer do I concern myself that the snakes are out on winter evenings when a 30° drop from the days high in the 70° is possible.

Mating activity was sporadic throughout the spring and early summer prior to the introduction of the second male. After his introduction moderate aggression between him and the original male became apparent and mating activities became incessant. Although some rather deep lacerations resulted from the hostilities of the males towards each other it was decided to allow the colony to remain as it was and, luckily, no serious injuries occurred. Eventually their mutual antagonism waned somewhat but mating activity continued unabated throughout the summer.

One of the female snakes seemed more acceptable than the other, and usually both males were busily engaged in courtship of her simultaneously. At this time their aggressive attitudes peaked. This particular female, besides sporadic couplings during the daylight hours, was mated by one or other of the males for more than forty consecutive nights during the months of July and August. The second female, while of lesser interest, was also mated on several occasions.

For a period of several weeks at summer's end and as mating activities were waning, both females, which unlike the males had continued to feed regularly, began to fast. After approximately four weeks they, and the males, neither of which had fed for a full three months, began again to feed, easing some of my anxieties.

Although neither looked gravid, I decided in mid-November to place both females indoors so that I might better monitor their conditions. Both they and the males continued to feed ravenously. On 1 December the female that had been mated the most began to actively prowl the floor and perimeters of her cage. Little significance was attributed this as both had done so before and she certainly did not appear gravid. It was, however, decided to insert a sphagnum tray within a hiding box. On 4 December the prowling female entered the box upon numerous occasions only to emerge moments later. Upon the morning of 6 December I found her coiled in the hiding box, head buried in the centre of her coils. She there remained through the morning of 8 December when she produced 17 eggs, all but three of which were clustered. Around these she remained coiled in a tight conical position, exhibiting periodic muscle contractions (brooding behavior). As temperatures were fluctuating due to the passage of a cold front as it was decided to remove the eggs to an incubator. After removal of the eggs, although the female remained coiled tightly in the box for more than 2 weeks, the brooding contractions ceased.

It was decided that the incubation of the eggs should be attempted in the medium with which I am most familiar: dampened, unmilled sphagnum moss. Along with the benefit of my familiarity it was thought that this medium would offer the best support for the clustered eggs. The sphagnum was prepared in the usual manner, this being to soak it thoroughly and then to wring from it every drop of water. What remained was slightly dampened moss, evenly moist throughout, a medium which I have used over the decades to hatch innumerable reptile eggs. The moss was placed in a warmed (85°F) crockery bowl and upon this were placed both the cluster and the single eggs, all of which were then covered liberally with more moss. Finally a covering of clear plastic was placed over all and affixed securely, rendering the compartment capable of attaining and sustaining a relative humidity of 100%, seemingly a very important consideration in the successful incubation of chondro eggs. The egg compartment was then placed in an incubator which had been preset to maintain a temperature of 85°F ($\pm 1^\circ$ F).

Ten days later the eggs were checked. All appeared good, having chalky though pliant shells and having become turgid during the days since deposition. On December 22 the heat strip which controlled the temperature of the incubator burned out, allowing temperatures to drop far below the normal level. Repairs were immediate, and incubation continued. On 1 October 1983, a check of the eggs disclosed that one on the outer perimeter of the cluster had died and dehydrated. All others looked well, being chalk white and turgid with minimal windowing.

By 22 January 1983 dimpling was noticeable on several eggs. On the morning of 1 February, after 55 days of incubation, the first hatching slit the shell and protruded its head. It (as all others subsequently proved to be) was of the yellow color phase (Plate 1). It was not until the morning of the following day that any additional eggs were slit. At that time nine hatchlings were in evidence. By noontime of 2 February all remaining eggs had been slit and the first to do so had emerged completely from the shell, to be followed within several hours by its 15 siblings.

It should be noted that the female which deposited the eggs fasted a second time for a substantial period, refusing food the day prior to deposition and not again accepting a meal for an additional 52 days.

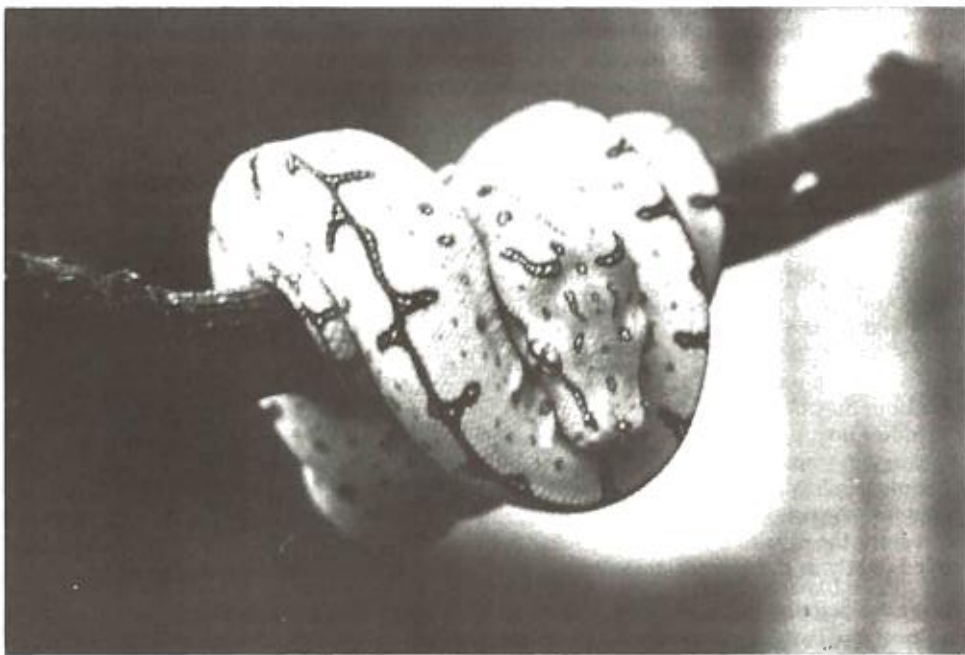


Plate 1. Newly hatched *Chondropython* at the R.B.R.I. Photo by S. Townson.

BOOK REVIEWS

INDIAN CROCODILE — CONSERVATION AND RESEARCH, L.A.K. Singh & B.C. Choudhury (Eds.). Proceedings of the First Indian Crocodile Researchers' Symposium, held at Katarniaghat, Uttar Pradesh, India, 21-25 January 1979, and published December 1982. i-xv + 1-48pp. Price £1.80 post paid by sea, for airmail add 80p extra. Available from: Mr. B.C. Choudhury, Nehru Zoological Park, Hyderabad (A.P.) India.

The Proceedings, which provides the Abstracts of 62 papers read at the Symposium, is a mine of information not available elsewhere. It covers the very extensive programmes of pure research and conservation management-orientated research on the Indian gharial (*Gavialis gangeticus*) (31 papers), the saltwater or estuarine crocodile (*Crocodylus porosus*) (12 papers), the mugger or swamp crocodile (*C. palustris*) (13 papers) together with a further six papers on general topics.

This work forms the backbone of the Government of India large-scale Crocodile Breeding and Management Project which for nearly eight years received financial and technical assistance from the United Nations Development Programme and the Food and Agriculture Organisation of the United Nations, and for which I was the Chief Technical Adviser, appointed by F.A.O.

While carrying out my duties in India, and realising that I would be there for many years, I undertook to supervise Indian Zoology students holding good M.Sc. degrees through their Ph.D. in the field of crocodile ecology and population studies. Although strictly not part of the Project of assistance under UNDP/FAO, this was realised by the Government of India to be one of the most important aspects of the entire project and has ensured continuation of scientific advice and expertise after the end of the international assistance phase. Hence the main participants at the meeting were my own research students.

The Government had founded a Crocodile Institute — long an ambition of mine — the Central Crocodile Breeding and Management Training Institute, at Hyderabad, the word 'Central' meaning that it was an Institute of the Central Government, i.e. the Government of India, in some other countries known as the Federal Government, and not (merely) a State institution. As such it is funded direct by the Government of India. Also present at the Symposium were the staff of the Institute (other than the Director who did not attend), the Institute trainees, and Special Invitee Mr. V.B. Singh, (Conservator of Forests and Chief Wild Life Warden of Uttar Pradesh, in which state the Symposium was held) who has done so very much to save the gharial from extinction, both in his home state of U.P. and by playing a leading role in the development of the 12,500 sq. km. tri-State Chambal sanctuary extending about 250km from East to West on the Chambal river, one of the best remaining gharial habitats in India and which was created under the Project.

For each species there is a general status paper plus further papers detailing the status in various parts of the country where it is known (individual States of the Indian Union). There is also a paper on the Project programme for each species. The scope of the Symposium is brought out by a listing of the Sessions. In each case the number of papers in that session is bracketed:

Status (25)
Rehabilitation (8)
Captive Breeding (3)
Parental Care (7)
Captive Growth (4)
Nesting & Population Studies (6)
Techniques in Crocodile Rearing & Management (4)
Other Research Papers (5)

The Proceedings concludes with two pages of detailed 'Recommendations and Future Programme' and has two invaluable Appendices. Whereas the papers deal with the work up to 1979, the Appendices have been brought fully up to date (1982) making them especially useful.

The first Appendix lists all the crocodile sanctuaries by name and gives their size. It also states the number of crocodilians, by species, which have been rehabilitated in that sanctuary. This Appendix gives an idea of the enormity of the special crocodile sanctuary creation programme under this Project. Success here has been a major source of satisfaction to me since I personally

have borne most of the brunt of it at least at Central level. There are two errors in this Appendix. Neither of the sanctuaries Kinnersani (Andhra Pradesh) nor Pakkal (also in Andhra) were created by the Project. They were pre-existing sanctuaries which we have used as mugger rehabilitation areas.

This Appendix also shows the impressive number of animals released back into these protected areas. These total, up to the 1982 release season, 855 gharial, 278 saltwater crocodiles and 490 mugger. These are all captive-reared individuals of 1m size so this represents a tremendous effort by the various rearing stations and, together with the sanctuary programme, is a massive achievement by the Project.

The second Appendix lists (a) the crocodile rearing centres set up in the country, which now number 22, gives details of the species reared, and the year in which this was commenced; (b) the same information for the captive breeding centres in which breeding size crocodilians are maintained for actual captive breeding programmes. The most famous of these is the one at Nandankanan in Orissa for the gharial, which bred the species for the first time in captivity anywhere in the world in 1980 and where captive breeding is now a regular event.

It would have been nice to have the full papers in published form, not just the Abstracts. Perhaps they will be published later? Also the time delay is unfortunate, but the fully up-to-date Appendices make up for this to some extent.

The Proceedings are a must for anyone who is interested in crocodile conservation. India has the (conservation) advantage of being a huge land area under stable Government. It has also seen the largest series of crocodilian conservation projects initiated anywhere. Unfortunately, even today there are all too few 'competitors'!

H.R. Bustard

REPTILES AND AMPHIBIANS IN WOODLANDS, by I.F. Spellerberg (1982). 23pp with 11 photographs, 2 figures and 1 table. Forestry Commission. Forest Record 123. HMSO, £1.40.

This booklet is a product of collaboration between the author and members of the Forestry Commission. A brief summary of the physiology and ecology of amphibians and reptiles is followed by a short account of the supposed history of these creatures in Britain and then by a table giving descriptions and some biological details of each species, pictured and considered in more detail in the subsequent text. Mention is made of naturalised species. The rest of the booklet is concerned with the relationship of woodlands to amphibian and reptile habitats.

Much of the writing is factual and helpful and inasmuch as it expresses concern for conservation will be welcomed. However, there are numerous errors and passages that will cause astonishment and dismay to those who are already familiar with British herptiles. One of the worst examples is the detailed account of the sand lizard. The photograph on p.4 shows a female of the red-backed form, which does not occur in Britain, and the accompanying text is almost as misleading to English observers. The author simply does not seem to accept our present understanding that in England as elsewhere in North western Europe, *Lacerta agilis* is essentially confined to two habitats: sand dunes and dry heathland and just does not occur in open woodland. Directly contrary to the text, it is *not* difficult to identify the most suitable kind of habitat in Britain; indeed one can recognise at once areas in which it is conceivable that sand lizards will be found. These inaccuracies are quite remarkable from a scientist of Dr. Spellerberg's standing; more seriously, they have grave implications for the conservation of our rarest lizard. What is not said is that afforestation of heathland, particularly by coniferous trees, is one of the most serious threats to the survival of *Lacerta agilis* in Britain. BHS members and other volunteers spend much time and energy every winter removing from heaths some of those very tree species which the Forestry Commission has so widely planted in recent years; it is almost tragic that this new publication should threaten to undo the highly successful methods of heathland management, based on years of practical experience and scientific study, advocated and carried out by the British Herpetological Society and others. Discussing the sand lizard further, the author writes: "Many introductions or attempts to relocate the sand lizard have been

made, with small or no success and such measures have recently been discouraged". This statement could scarcely be further from the truth, since multiple successful translocations resulting in established new colonies of sand lizards have been carried out over the last 12 years and are widely known about in conservation circles. One of these has even resulted in a new nature reserve being established, and as recently as 1982 a license was issued for a further sand lizard translocation.

Other parts of Dr. Spellerberg's text will cause raised eyebrows: for example he is lucky to have seen the smooth snake so often climbing in trees and we are relieved to learn that the sand lizard is not its major prey. We are not so ignorant of the ecology of "most of our reptiles and amphibians" as suggested (p. 20), and much of our knowledge has been put to good use in lessening their declines. If Dr. Spellerberg and the Forestry Commission are, as they state, concerned with conservation then it is sad that in this instance they have not paid more attention to the experiences, painfully gained over many years, of (among others) members of the British Herpetological Society and individual staff of the Nature Conservancy Council.

T.J.C. Beebee,
for Conservation Committee

LETTERS TO THE EDITORS

BODY TEMPERATURE AND DEFENCE IN *UROMASTIX MICROLEPIS*

Dear Sirs,

Body temperature plays an important rôle in determining reptile behaviour. For instance, Avery *et al.* (1982) have recently established a correlation between body temperature and predatory efficiency in *Lacerta agilis*. Again, Bustard (1968) found that gekkonid lizards autotomize larger portions of their tails at low temperatures than they do when their bodies are warmer. Hertz *et al.* (1982) showed that the defensive responses of *Agama savignyi* and *A. pallida* change as a function of body temperature. At high temperatures the lizards flee rapidly from predators while, at lower temperatures when their flight speed is reduced, they seldom run but hold their ground and fight aggressively. The same is probably true of *Uromastix microlepis* Blanford, as the following observation suggests.

On 31 March, 1983, I released two *U. microlepis* at As Saquayah in the extreme west of Kuwait on the frontier with Saudi Arabia and Iraq. They had been given to me by Dr. David A. Clayton of the University of Kuwait. *U. microlepis* is noteworthy for its dramatic thermoregulatory colour change — from almost black to a deep yellowish brown — as its body warms up. In order to demonstrate this, one of the lizards had been kept in an ice box for some hours, while the other was at ambient temperature (c. 32°C). The former was a dark slate grey in colour, the latter deep yellow. Both showed a death-feigning reflex on release, with the legs clawed beneath the body so that they appeared almost dead. Within a minute or two, the warmer lizard recovered itself and ran off quickly. Not so the dark grey individual: instead, when stroked at the base of the spine, it puffed itself up, exhaling a loud hiss and swinging its scaly tail — a most effective weapon. Then it lay spreadeagled on the hot sand for several minutes before walking unhurriedly away.

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J.L. Cloudsley-Thompson,
Dept. of Zoology, Birkbeck College, University of London.

NEWTS IN GARDEN PONDS

Dear Sirs,

I was interested to read the article on the Crested Newt Bank in the BHS Bulletin of December, 1982. My father and I constructed a small fibreglass pond (130cm x 150cm x 50cm deep) in our garden in 1980. Thirteen adult Palmate, seven adult Smooth and ten Crested Newt larvae were introduced to it later in that year. Ever since they have been flourishing and there seems to be a well established, though small, population in the pond. On a mild evening on 20th April, this year (1983), I counted 35 adult newts (plus 5 Common Frogs). These consisted of: 1 male and 2 female Crested Newts; 3 male and 5 female Smooth Newt, and 10 male and 14 female Palmate Newts. Both of the female Crested Newts were laying eggs — which I was very pleased to observe — on Water Starwort and Water Forget-Me-Not. They seem to like laying their eggs on the latter very much, folding the submerged leaf tips around the individual eggs. They appear to dislike Canadian Pondweed and Water Milfoil, both of which are very abundant in the pond. The female Smooth and Palmate Newts were also laying eggs. It must be remembered that the newts counted were only those that could be seen and so the total number in this one small pond probably exceeds 35. It seems incredible that such a small pond can support such a density of newts. There are, however, large quantities of pond snails, freshwater lice and shrimps which they must prey upon. They also voraciously devour any frog tadpoles as soon as they hatch from the spawn, and undoubtedly also feed on their own larvae. I intend to rear some frog and newt larvae separately this year, in the safety of tanks, and release them in suitable ponds in the area. Hopefully, also, I will be making another larger pond fairly close to the present one.

Dave Showler,
12 Wedgwood Drive, Hughenden Valley, High Wycombe, Bucks, HP14 4PA.

A RIVERINE SPAWNING SITE FOR THE COMMON TOAD (*BUFO BUFO*) IN NORTHERN ENGLAND

Dear Sirs,

We should like to make a contribution to the breeding biology of the Common Toad (*Bufo bufo*) by describing a riverine spawning site for the species in northern England. This follows a request by Dr. S.P. Gittins (pers. comm.) and the UWIST amphibian research group for information on such occurrences.

Our observations concern the river Wharfe, in West Yorkshire, where it passes the south west corner of Grass Woods (SD 982 652 c. 300 m O.D.). The river here is approximately 20 metres wide and although midstream current velocities exceed 25cm s⁻¹ during normal flows, it has considerable marginal areas of slack water.

Our attention was first drawn to the site in late July, 1978, when 100-200 toad 'hoppers' were seen leaving the river. Subsequent visits in late April of both 1980 and 1981 revealed in each year 7-8 strands of toad spawn over the same 10 metre long stretch of the river margin.

On a further visit, May 30th, 1982, numerous toad tadpoles were seen, again at the river margin. Toad spawning was thus apparent in four years and had been successful in producing young toads in at least one year.

With toads presently the centre of conservational and ecological concern, we hope that the above information may help stimulate interest in this apparently neglected aspect of toad biology.

S.J. Ormerod and D. Crossley,
Dept. of Applied Biology, UWIST, King Edward VII Avenue, Cardiff, CF1 3NU.

WINTER ACTIVITY IN THE SAND LIZARD

Dear Sirs,

I would like to pass on the following observations.

(i) A male Sand Lizard (ex-Bert Langerwerf) in an outside vivarium disappeared in mid-September to emerge again at the end of December (i.e. mid-Winter). It has emerged on every warmish day since, even if the temperature is only 5°C. Recently it fell into a pond (at 2°C) and spent some time at this low temperature clinging to water weed. When I fished it out by hand, it treated me to a surprisingly strong and enduring (3 mins.) bite. It hung from my finger while shaking from side to side in the manner of a "terrier with a rat". The effect of this thrashing (which I've noticed before with Sand Lizard biting behaviour) is to cause more pain and penetration from the needle-like teeth (these are too small to draw blood). I relate this story as I was surprised to find so much vitality in a lizard that is supposed to be torpid at those temperatures and because of the eccentric hibernation period.

B.H.S. member David Billings of Norfolk has related how his Sand Lizard entered hibernation with regularity in the first week of September. These times seem early to my mind. Has any B.H.S. member observations of the hibernation times of wild *L. agilis*?

C.A. Snell,

76 Birdbrook Road, Kidbrooke, London, SE3 9QP.

BREEDING THE MIDWIFE TOAD

After capture and during importation the Midwife Toads I obtained were kept for some days in a 9" x 6" plastic tub with ventilation. I released them (after they were passed on to me) into a 2' x 4' outside vivarium. They "called" the same evening. Spawn appeared on the males hind quarters 3 days later. When this was released (as tadpoles approx $\frac{3}{4}$ in. long), some weeks later I assumed "calling" would commence again (as they are polyseasonal). Instead, the toads seemed restless and tried to scale the walls of the vivarium continuously.

I assumed that (and I'm going to be ashamedly "anthropomorphic" here) they had become "bored" with their environment and would benefit from the psychological boost provided by new or larger surroundings (this is a phenomenon I've noticed during years of breeding animals).

I moved them to a 4' x 9' open air vivarium where calling commenced 4 hours later (at dusk). The following evening I was lucky enough to observe the very interesting mating and spawning of this species, which takes place on dry land. Once again, after the male's release of the tadpoles, I expected him to call again and mate. However, all I observed was the restless behaviour so once again I moved them to fresh quarters; a 9' x 12' open air vivarium where the male "called" the next evening. Four days later he was carrying spawn. Presumably the restlessness does not prevent the females from becoming gravid, only the males desire to call and attract a female.

These observations may be of interest or importance to many other B.H.S. members trying to breed reptiles and amphibians and of possible interest to persons conducting captive breeding programmes. The importance of "newness" may be relevant to the fact that breeding success was only obtained in the captive turtle breeding programme on Grand Cayman when the males were released with the females after a period of separation (i.e. there was the newness of female company and environment). I also recall an article from B.H.S. member David Billings on breeding the Green Toad. He said that he had no success with greenhouse kept Green Toads until he moved and placed his stock in a new greenhouse whereafter the male Green Toads "called" and mating occurred. Have any other B.H.S. members similar experiences (or objections to this idea?).

C.A. Snell,

76 Birdbrook Road, Kidbrooke, London SE3 9QP.

AN ABERRANT BIRTH IN *SALAMANDRA SALAMANDRA TERRESTRIS* LACEPEDE

Dear Sirs,

The European Fire Salamander gives birth to as many as seventy-five live young in water, each larva being about 2.5cm long and having four well-developed legs.

Two pairs of young adult Banded Fire Salamander were obtained during October and November 1982 and housed in a 60 x 30 x 30cm glass aquarium furnished with a sedge peat floor, hiding places constructed of elm logs and a pool 18 x 18 x 11cm containing a 7cm depth of matured water. During the night of 2/4/83 one of the females produced an aberrant brood of youngsters consisting of twelve under-developed embryos, some with a considerable amount of yolk material but definable heads and forelegs, others with grossly bloated bodies but no legs. A further youngster was however very advanced, being 4.5cm in length, having the full adult colouration, no gills or tail fin. This youngster was also dead but it is conceivable that mortality occurred after birth due to drowning. A considerable amount of tissue debris was present in the pool and this may suggest that the advanced youngster had fed upon its less advanced peers.

Live birth of fully formed terrestrial young occurs in the closely related Alpine Salamander (*Salamandra atra*) and these observations suggest a similar phenomenon, albeit in exceptional circumstances, may occasionally occur in the Fire Salamander.

P.J. Wisniewski, Manager,
Glamorgan Nature Centre, Fountain Road, Tondur, Nr. Bridgend, Mid Glamorgan.

LONGEVITY IN THE COMMON LIZARD (*LACERTA VIVIPARA*)

Dear Sirs,

In 1973 I caught a very large female Common Lizard in Perthshire. It was well developed and heavily gravid.

After I got it home it laid eight large eggs which I hid under a slate. At the end of four days the young ones emerged and when I measured them they were all 1½ins. long.

I kept the female for eight years in my house, sunning it in the porch and hibernating it in a suitable place! Although it ate flies and bluebottles vigorously from my fingers it would never allow me to handle it or tame it, which was a great disappointment to me as I am usually very good at this. When the normal food was not available, I trained it to eat red meat from stamp-tweezers. It died peacefully in the spring of 1981 at the ripe old age of 13! (my estimate).

It would be interesting to know if anyone else has had a similar experience.

W.K. Stove,
37 Stamperland Avenue, Clarkston, Glasgow, G76 8EX.

JUMPING IN THE COMMON LIZARD

Dear Sirs,

I once had a Wall Lizard which had the unique ability to jump six inches into the air, turn round and land upside down on a piece of perforated zinc which I used for ventilation. When it felt good and ready it dropped down to the bottom of the tank, landing like a cat on all fours. This is the prelude to my main story.

Some years ago I caught two Common Lizards near Callander, Perthshire. One was male, the other female. I had them hand-tame in about five minutes and now comes the interesting bit. I was sitting on a large rock beside a loch, enjoying the sun, with the male on my left thigh and the female on my right thigh. All was going well when all of a sudden the male leapt like a grasshopper from one thigh to the other, a distance of about a foot, landed on top of the female and indulged in the most vigorous mating behaviour! To save the female from possible harm I separated the two lizards, and put each into a plastic bag on its own.

Although I have been working with Common Lizards for more years than I care to mention I have never had an experience to equal this.

W.K. Stove,

37 Stamperland Avenue, Clarkston, Glasgow, G76 8EX.

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Articles, new items, notes and letters on any aspect of herpetology are needed for the Bulletin. Contributions should, if possible, be typed. Handwritten items should be clear and legible. All contributions should be double spaced and on one side of the paper only. They should be sufficiently presentable to be given directly to the printer. Contributors are urged wherever possible to follow the "Instructions to Authors" printed on the inside back cover of the British Journal of Herpetology. Photographs can be reproduced only from good quality black and white prints. Reprints of articles can be supplied to authors. These must be ordered from the Editors before the Bulletin goes to press.

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