

#### 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

The Herpetological Journal, published each June and December, contains papers or original research in herpetology.

British Herpetological Society Bulletin, published quarterly, contains notices, news items, articles and original papers on all aspects of herpetology.

The Care and Breeding of Captive Reptiles, a 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  $\pounds 4.00 + \pounds 0.50$  postage. Applications to purchase should be made to the Chairman of the Captive Breeding Committee.

Conserving Sea Turtles, by Nicholas Mrosovsky. A critical review of the current problems and controversies of sea turtle conservation. Price U.K.  $\pounds 5.00 + \pounds 0.75$  postage (surface mail) or  $\pounds 2.80$  (air mail), U.S.A. \$10.00 + \$1.00 postage (surface mail) or  $\pounds 5.00$  (air mail).

#### Meetings

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

#### Subscriptions

Ordinary Members £15. Junior Members £5. (Junior Members do not receive the British Journal of Herpetology). Institution rates £25 (U.S. \$40).

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 John Pickett and Mike Matthewson

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

### **MEETINGS 1986**

The meetings are held in the Lecture Theatre of the Linnean Society of London, Burlington House, Piccadilly, London W1, starting at 7.00 and ending at 9.00 pm, unless indicated otherwise.

FEBRUARY 26th	Dr Andrew Gardner (Dept. of Zoology, Univ. Aberdeen, now Dept. Genetics & Biometry, University College London): Herpetofauna of the Seychelles (Indian Ocean).
MARCH 18th	A.G.M. (see separate Agenda), followed by Dr M.R.K. Lambert (Chairman, BHS): Some more herpetofauna of the Commonwealth. II. Ethiopian Zone (as time allows).
APRIL 24th	Dr Paul Verrell (Dept. Biology, Open University, Milton Keynes): Sexual cycles and breeding dynamics of smooth newts in southern England.

Details of the remaining meetings in 1986 will be published in the March 1986 issue of The Bulletin.

# PROVISIONAL MINUTES OF THE 38th ANNUAL GENERAL MEETING OF THE BRITISH HERPETOLOGICAL SOCIETY, held at 7.00 pm, March 19th 1985, in the Lecture Theatre of the Linnean Society of London, Burlington House, Piccadilly, London W1.

The President, the Earl of Cranbrook, took the Chair. The Attendance Sheet (in minutes) was signed by 58 members and seven guests. Apologies were received from Dr R.A. Avery, Dr H.R. Bustard, Dr S.P. Gittins and Mr K. Lawrence.

1. The provisional minutes of the 37th AGM held on March 13th, 1984, published in *BHS* Bulletin No. 10 (December 1984), were approved *nem. con.* (proposer: Dr C.J. McCarthy, seconder: Prof. G.A.D. Haslewood) and signed.

#### 2. Matters arising. None.

3. Auditors' report and discussion. Mrs Green (BHS Treasurer) gave a financial report which would be published in the Bulletin. A balance sheet was available for inspection. Mrs Green drew members' attention to the decrease by nearly £800 of the costs of printing the Bulletin compared with 1983, and the increase of nearly £600 from the subscriptions of Ordinary Members, whose numbers had increased notwithstanding the increase in subscription. It has thus been possible to produce the Bulletin quarterly. Lord Cranbrook put forward a vote of thanks on behalf of members for all the effort Mrs Green had put into the Society's accounting. This was applauded by all.

#### 4. Alterations to the Rules.

In a discussion of voting procedure, it was agreed that existing Rule 5(c), Family Membership, provided that any two members of a family in membership having attained the age of 18 could vote on behalf of the Family. The following alterations to the Rules were then approved:— **1. Rule 4, line 1:** after "SUBSCRIPTION", insert an indent followed by "(a)".

- 2. Rule 4, line 5, start of second para: indent, insert "(b)".
- 3. Rule 4, at end: insert new paragraph as below:

"(c) **Institutional and Library Subscriptions.** Institutional and Library subscribers may be unlimited in number and their annual subscription shall be greater than the Ordinary Membership subscription, as determined by Council from time to time."

4. Rule 5, title: delete "CONSTITUTION", substitute "CATEGORIES OF MEMBERSHIP". NB. New clause 5(c) was approved at the 1984 A.G.M., inserting the category Family Membership. As a consequence, existing Clause 5(c) becomes 5(d).

- 5. Rule 5(d): delete existing clause.
- 6. For existing Rule 5(e), substitute: "6. COUNCIL/(a) Composition."

7. Existing Rule 5(e), line 9: before "The Council ...", indent, insert new heading for paragraph: "(b) Powers".

8. Existing Rule 5(e), line 10: delete the words "The Council shall have the power ... majority voting.", and substitute the following: "The Council shall have the power to suspend any Officer by a majority vote of three-quarters of the Council membership, following which a decision shall be made at a General Meeting to be called within 30 days if requested by the Officer concerned."

9. Existing Rule 5(e), lines 14-15: delete the last sentence, "The Council shall also ... circumstances."

10. Existing Rule 5(f): to be retitled: "6(c)" The President.

11. Existing Rule 5(g): to be retitled: "6(d)" Other Council Members. NB. Changes in serial letter follow automatically as a consequence of the retitling of the COUNCIL paragraph.

- 12. Existing Rule 5(h): to be retitled: "6(e)" Deputies.
- 13. After existing Rule 5(h) = proposed 6(e): insert new clause:

"6(f) Officials. The Council shall have the power to appoint Officials (by a majority vote of two-thirds of Council membership) to undertake specified tasks on behalf of the Society. Such Officials may be honorary or paid. No Official shall ex officio have a seat on Council, but

"6(f) Officials. The Council shall have the power to appoint Officials (by a majority vote of two-thirds of Council membership) to undertake specified tasks on behalf of the Society. Such Officials may be honorary or paid. No Official shall ex officio have a seat on Council, but may be required to attend Council Meetings as part of his/her recognised duties."

14. Existing Rule 6: to be renumbered "7". DUTIES OF COUNCIL OFFICERS. NB. Renumbering of this and the remaining clauses will follow as a consequences of introducing the new Rule 5 (above).

15. Existing Rule 7: to be renumbered and retitled "8. MEETINGS".

Election of Officers and Members of Council. Dr Avery had resigned as Editor of the 5. Journal during 1984 and Dr Beebee had volunteered to replace him. Lord Cranbrook on behalf of members thanked Dr Avery for all the hard work he had put into editing the Journal. In the absence of alternative candidates, Dr Beebee was welcomed as the new Editor. Mr Pickett had resigned as Librarian and proposed Mr P.H. Eversfield (seconder: Dr Townson) as his replacement. In the absence of alternative candidates, Mr Eversfield was welcomed as the new Librarian. Dr Townson had resigned as a co-editor of the Bulletin and proposed Mr M.D. Matthewson (seconder: Mr Pickett) as his replacement. Prof. Haslewood pointed out the implication of this was that another Officer was being brought onto Council and that an unlimited number could be brought on as co-editors of the Bulletin in this way. Referring to the Rules, Lord Cranbrook noted that they allowed for co-editors, but proposed that an unlimited number should not in the future be put forward. Mr Matthewson was approved as co-editor. Also approved were the Representatives of the newly formed North-East and North-West England Groups, Messrs Laverick and Paul, respectively. Remaining Officers were also all reelected.

Before the paper ballot for the election of Ordinary Members of Council commenced, Dr Lambert announced that Dr Bustard, one of the candidates, had for domestic reasons had to tender his resignation and that his name should therefore be deleted from the list. Ballot paper scrutineers were Mr B. Banks (proposer: Dr Lambert, seconder: Dr Beebee) and Dr A Millwood (proposer: Mr Bessant, seconder: Dr Townson), who declared the following to be elected or reelected: Mr P.C. Curry, Mr J.G. Coote, Mr M.E. Nolan, Mr S. Norrie, Mr K. Lawrence and Mr N. Bessant. 6. Council's report and discussion. The report had been circulated. Dr Lambert pointed out that March, not April, should be the month of the first extra (Spring) number of the Bulletin. There was no further discussion.

7. **Report of the Education Committee — Junior Section.** Mr Taylor, the Education Officer, reported briefly. A full report would appear in the Bulletin.

8. Report of the Conservation Committee. Prof. Haslewood briefly reported on a successful meeting of negotiation with representatives of the Captive Breeding Committee. A full report on the Committee's work would appear in the Bulletin.

9. Report of the Captive Breeding Committee. Dr Townson said that a full report had appeared on the Committee's work in *BHS Bulletin* No. 10: 3-12, December 1984.

10. Progress in planning the first World Congress of Herpetology. Prof. Kraig Adler (Cornell University, U.S.A.), the Secretary General, while on sabbatical leave at the University of Cambridge, gave a report of progress to date. An outline of the report is being published separately in the Bulletin. Dr Lambert proposed a vote of thanks to Prof. Adler (a BHS member since 1975) for all the hard work he has put into organizing the Congress.

11. As time allowed, Dr Lambert showed some slides on a few of the herpetofauna in Commonwealth countries and covered the Oriental and Australasian Zones. Those of the Ethiopian Zone would have to be shown at some future date.

Dr Lambert also displayed a copy of the book, *The structure, development and evolution of reptiles* (edited by Prof. Mark Ferguson), that was published during 1984 by Academic Press as *Symposia of the Zoological Society of London, 52* (£47.50). This includes papers read at a joint symposium held with the Anatomical Society of Great Britain and Ireland and the BHS in May 1983.

The meeting ended at 9.00 pm.

# NORTH EASTERN GROUP MEETINGS SPRING 1986

- MARCH 25th Mr P Wisneiwski. Breeding amphibians in captivity. (with particular reference to newts and salamanders). At the Adult Education Centre, 32 Old Elvet, Durham at 7.00 pm.
- APRIL 4th Mr B. Banks. Conservation of the natterjack toad in Britain (based to a large extent on sites in northern England). A joint meeting with the Natural History Society of Northumbria The Hancock Museum, Newcastle upon Tyne, at 7.00 pm.

This is the first ever BHS talk in Newcastle. If attendance at the meeting is high more talks will be arranged at later dates.

# CONSERVATION COMMITTEE

At its last meeting, in August, the Committee asked us to publish in the *Bulletin* the hope that more BHS members might like to take part in the Committee's monitoring and practical management work, perhaps later joining the Committee. The clearance tasks are quite tough, but not beyond the powers of able-bodied men and women: the monitoring is sheer joy, taking one to some of the most beautiful and lonely places still to be found in the U.K.

If those interested will let the Chairman (address on the *Bulletin* cover) know, they will be sent at once a list of the 1985-6 tasks and made welcome indeed should they decide to help. Travel expenses (at 6.6p/mile) can be retrospectively refunded.

T.J.C. Beebee, G.A.D. Haslewood

# **HERPETOLOGY IN WALES MEETING**

All those with an interest in reptiles and amphibians are invited to attend a one-day meeting on herpetological activities in Wales and the border counties. It is hoped that the programme will include a number of talks and demonstrations by invited speakers, covering such topics as field studies, conservation, and husbandry and breeding. The meeting will probably be held on Saturday, November 30th at Llysdinam Field Centre, Newbridge-on-Wye, Further details will be available from Dr. Richard Griffiths, Llysdinam Field Centre, Newbridge-on-Wye, Llandrindod Wells, Powys (SAE appreciated).

# REPORT ON THE 3rd ORDINARY GENERAL MEETING OF SOCIETAS EUROPAEA HERPETOLOGICA AT PRAGUE, CZECHOSLOVAKIA, 19-23 AUGUST 1985

The 3rd O.G.M. of SEH was held at the Faculty of Natural Sciences of the ancient (founded 1348) Charles University, Prague in Czechoslovakia, 19-23rd August 1985. The meeting was organised by Dr Zbynek Rocek (Department of Palaeontology) and members of a local organizing committee of four with Academician Vladimir Pokorny (Head of the Department of Palaeontology and Vice-President of the Czechoslovak Academy of Sciences) as Honorary President. The European Herpetological Meeting 1985 was jointly held by SEH and the Organization of Herpetologists of the Socialist Countries (President: Dr Ilya S. Darevsky, Leningrad, USSR) as a result of communications during 1982 between Drs Josef Eiselt (Vienna), President of SEH, and Darevsky. There were 379 listed registrants from 28 countries:- USSR (73), Czechoslovakia (43), Spain (34), USA (31), FR Germany (29), Italy (23), France (19), DR Germany (18), UK (18), Austria (14), Netherlands (12), Poland (12), Sweden (10), Israel (7), Switzerland (6), Hungary (5), Greece (4), Australia (3), Belgium (3), Canada (3), Romania (3), Cuba (2), India (2), Denmark (1), Nigeria (1), Norway (1), Turkey (1) and Yugoslavia (1). Unfortunately, not all of the registrants were actually able to attend the meeting due to a variety of difficulties, including the time of the issuing of entry visas by the Czechoslovak authorities. The 73 registrants from the Soviet Union alone were from throughout the country (internal flights are very inexpensive); from as far south as Yerivan (Armenia), from Tbilisi (Georgia), Ashkhabad (Turkmenia), Tashkent (Uzbekistan) and Alma-Ata (Kazakhstan), and from as far east as Barnaul (Altai), although most were from Moscow and Leningrad, Herpetologists from Spain and North America (34), besides the host country, were also well represented, and the eighteen listed from UK compared to three at the previous SEH O.G.M. at Leon, Spain in 1983. A full report of the meeting will appear in SEH's Amphibia Reptilia, now published by E.J. Brill-Leiden, and the Proceedings are to be published in Summer 1986 by Charles University.

#### PROGRAMME

In addition to a social programme and field excursions, there were fifteen scientific sessions. An opening Address by the President of SEH, Dr Eiselt, was given in the main meeting hall at Emauzy in Vysehradska, Ulice on the Monday, 19th August. This was followed by the main scientific session on the origin and evolution of the Amphibia and Reptilia, which was held in honour of the life-long work of Prof. Z.V. Spinar, the morning session (seven papers) being chaired by H. Bjerring (Stockholm) and R. Carroll (Montreal, Canada) and the afternoon session (fourteen papers) by E. Gaffney (New York, USA) and R. Estes (San Diego, USA).

A total of 60 posters was listed, although those which did not appear during the course of the meeting were eagerly replaced by others that were unlisted.

The business session of the SEH Ordinary General Meeting was held on the Tuesday morning at Emauzy and a photograph of the meeting participants was taken afterwards (Plate I).

#### ORDINARY SCIENTIFIC SESSIONS

The remaining fourteen sessions of about 150 oral papers (too many to list in detail) were held on the Tuesday afternoon, Thursday and Friday. Unfortunately, not all of the papers programmed were read. Three sessions ran simultaneously in Emauzy, the Department of Zoology in Albertov, Ulice, and the National Museum on Wenceslas Square on Tuesday afternoon and Thursday, and two simultaneously (not in the Museum) on Friday. The papers were placed under subject headings:—

Systematics of the Amphibia. Chaired by W.E. Duellman (Lawrence, USA) and Z.V. Spinar (Prague).

Systematics of the Reptilia. Chaired by G. Nilson (Götborg) and I.S. Darevsky.

Physiology of the Amphibia and Reptilia. Chaired by H.I. Rosenberg (Calgary, Canada) and F. Kornalik (Prague).

Systematics of the Amphibia and Reptilia (continued). Chaired by M. Mlynarski (Cracow) and B. Sanchiz (Madrid).

Behaviour of the Amphibia and Reptilia. Chaired by C. Gans (Ann Arbor, USA) and A.S. Severtzov (Moscow).

Ecology of the Reptilia. Chaired by K. Adler (Ithaca, USA), J. Lescure (Paris), D. Dolmen (Trondheim) and R. Günther (E. Berlin).

Physiology and genetics of the Amphibia and Reptilia. Chaired by M.S. Goodmoed (Leiden).

Conservation of the Amphibia and Reptilia. Chaired by M.R.K. Lambert (London) and A. Salvador (Leon).

Ecology of the Amphibia. Chaired by J. Castanet (Paris) and A. Morescalchi (Naples).

Ecology and distribution of the Amphibia. Chaired by L. Berger (Poznan) and T.R. Halliday (Milton Keynes).

Podarcis "mini-symposium". Chaired by W. Böhme (Bonn).

Morphology and ontogeny of the Amphibia and Reptilia. Chaired by L. Trueb (Lawrence, USA). Regrettably, as so often has to happen at big meetings, the closely related topics, behaviour, ecology and conservation clashed on the Thursday and, to a lesser extent, on the Friday with the lecture halls, that in the Museum in particular, being separated by some distance from each other. This resulted in a difficult choice for those participants (a substantial number) interested in this range of topics.

### SOCIAL PROGRAMME

Since it is always important for herpetologists attending international meetings to meet socially (preferably over a drink or two!) and exchange experiences, social gatherings were held in the "Klub" of "Kajetanka", the international student hall of residence to the north-west of the city, where many of the participants stayed. The first was on the Sunday evening after the registration of participants; the second was on the Monday after the first day's working sessions.

On Tuesday evening, participants and their companions were invited to visit the Carolinum, the historical ceremonial building of Charles University in the centre of Prague, and attend a programme of old Czech music ("Music in the reign of Czech kings"). The concert was performed delightfully by the Rozmberk Ensemble, a group of musicians playing a great variety of mediaeval instruments. The Programme was opened with Addresses of welcome by Prof. F. Fabian, the Dean of the Faculty of Natural Sciences, and Academician Pokorny. The newly elected President of SEH (see SEH Business Meeting below), Prof. Benedetto Lanza (Florence) also addressed the assembly and on behalf of the Society thanked the organizers for the splendid concert.

On the Thursday evening, participants gathered at the famous Prague beer restaurant, U Fleku in Kremencora, with its special dark beer (most beer in Czechoslovakia is light) which is not unlike dark English mild.

#### DAY EXCURSIONS

Two whole-day excursions were organized on the Wednesday to give participants an opportunity to see some of the natural landscapes of Czechoslovakia. One to Bohemia, ending in beer tasting in the brewery cellar at Trebon, and the other to South Moravia, ending in wine tasting in a wine cellar not far south of Slavkov, the site of Napoleon's battle of Austerlitz; the choice in effect was the "beer trip" or the "wine trip"! The wine trip included visits to a fossil site not far north of Brno and to the subterranean Punkva Caves in the Moravian Karst country; the beer trip included visits to a primeval mountain forest and fish-rearing ponds near Trebon. During the wine tasting supper of the former, an excellent and lively five-man gypsy band played South Moravian folk music, the very music that inspired some of the music of the well known Czech composer, Leos Janacek, who lived in Brno and was born in the region.



Participants of the European Herpetological Meeting 1985, held 19-23 August in Prague, Czechoslovakia, and organized jointly by Societas Europea Herpetologica (3rd Ordinary General Meeting) and the Organization of Herpetologists of the Socialist Countries.

#### SEH BUSINESS MEETING

The business matters of the Society were discussed on the Tuesday morning, Dr Eiselt (President) was elected to take the Chair. Reports were given by the President, General Secretary (Dr Marinus Hoogmoed), the Treasurer (given by Dr Franz Tiedeman (Vienna), Vice-Treasurer, in the absence of Dr Heinz Wermuth (Ludwigsburg)) and auditors, and Co-Editors of *Amphibia-Reptilia* (given by Dr Jan van Gelder (Nijmegen), the second Co-Editor). An increased annual membership fee of DM 85 was approved for 1986 and 87. Elections resulted in Prof. B. Lanza, President, replacing Dr Eiselt; Dr G. Nilson, Vice-Secretary, replacing Prof. A. Salvador; Mrs Juhanna Wermuth (Ludwigsburg), Treasurer, replacing Dr H. Wermuth, and Dr

van Gelder re-elected as Co-Editor. Keith Corbett (London), Chairman of the SEH Conservation Committee, and Prof. J.P. Gasc (Paris), Chairman of the SEH Mapping Committee, also presented reports. Nijmegen (Netherlands) was voted as the venue of the next (4th) O.G.M. in 1987 against Berlin (FR Germany). Canterbury (UK), the elected venue of the first World Congress of Herpetology in September 1989, was approved for the 5th O.G.M. (business meeting only).

# MEETING OF THE SEH CONSERVATION COMMITTEE

A meeting of the SEH Conservation Committee was held by the Chairman, Keith Corbett, on the Monday, concurrently with the scientific sessions of that day. There was virtually a full attendance by members.

#### MEETING OF THE MEMBERS OF THE EXECUTIVE AND INTERNATIONAL HERPETOLOGICAL COMMITTEES OF THE FIRST WORLD CONGRESS OF HERPETOLOGY

Since 29 of the 67 members of the Executive and International Herpetological Committees of the first World Congress of Herpetology were registrants at the European Herpetological Meeting 1985, Prof. Kraig Adler (Secretary General) decided to hold an hour's meeting of the attendees in the Klub at Kajetanka immediately after the concert on the Tuesday. Topics discussed were the format of the Congress, date of the meeting, the main programme and Congress language. Those attending were the Treasurer: M.S. Hoogmoed, Members of the Executive Committee: R.L. Carroll, H.G. Cogger (Sydney, Australia), R. Günther (E Berlin), M.R.K. Lambert and B. Lanza with apologies from I.S. Darevsky and H. Saint Girons (Paris), and Members of the International Herpetological Committee: W. Böhme, W.E. Duellman, R. Estes, C. Gans, B. Groombridge (Cambridge), T.R. Halliday, J. Lescure, M. Mlynarski, G. Nilson, A. de Ricglès (Paris), B. Sanchiz, J.M. Savage (Miami, USA) and F. Tiedemann, with apologies from J.P. Martinez Rica (Jaca/Huesca), Z.V. Spinar, N.N. Szczerbak (Kiev, USSR) and P.L. Tatarinov (Moscow, USSR) and regrets later from Y.L. Werner (Jerusalem), whom, not being able to obtain a visa in time, was unable to enter Czechoslovakia and be in Prague. I. Baran (Izmir, Turkey) and K. Klemmer (Frankfurt) were registrants unable to attend the SEH meeting.

#### CONCLUSIONS

The main point in holding the European Herpetological Meeting 1985 in Prague was so that herpetologists from Eastern and Western Europe could meet and exchange ideas. This was achieved successfully, but regrettably, several renowned herpetologists, mostly in E European countries, despite this, either were not given funds or were unable to obtain passports or exit permits, or entry visas from the Czechoslovak authorities, for this purpose. A statement voted upon formally during the business meeting of SEH deplored this hindrance to freedom of mobility and impediment to the free exchange of ideas of benefit to all. Perhaps one also must say that it was regrettable that some of the arrangements were entrusted to the Czechoslovak State Travel Agency — Cedok, whose terms of reference for receiving visitors from the West would seem to be for the purpose of co-ordinating the entry of hard currency, a function scarcely conducive to cultural exchange with generally impoverished scientists from the West which was the whole point of the meeting taking place in Czechoslovakia in the first place. Notwithstanding this background of difficulties, Dr Rocek and his team of organisers did an excellent job and are to be congratulated on bringing off such a well attended meeting, with many more participants than expected. All herpetologists will look forward to seeing the Proceedings when they are published in 1986. Some of the ecologists and field herpetologists (most western European and North American herpetologists are!) may have been a little disappointed to have spent so much time on the bus during the field excursions without seeing more of the natural habitats. But the cultural entertainment provided, both the concert of ancient music in the Carolinum and the gypsy band on the South Moravian visit, were truly memorable and outstanding.

The standard of the papers presented during the scientific sessions varied greatly, but several reported conceptually new, often exciting findings. What greater function should an international scientific meeting have than to report new work! This bodes well for the first

World Congress of Herpetology to be held in Canterbury in 1989, which now being admitted as the Section of Herpetology by the International Union of Biological Sciences (IUBS) at the 22nd General Assembly in Budapest in September 1985, should allow the free attendance of herpetologists from the East and West, as well as from the developing countries of the "South".

This report is based on one prepared for the British Council, London, to whom thanks are due for providing a travel grant for the Chairman of the British Herpetological Society to represent the Society and attend the 1985 European Herpetological Meeting in Prague, and read a scientific paper there.

M.R.K. Lambert Chairman, British Herpetological Society

London, 15th October 1985

# A REPORT ON PLANNING FOR THE FIRST WORLD CONGRESS OF HERPETOLOGY

Other biological disciplines (e.g. entomology, ornithology, mammalogy) have enjoyed the advantage of congresses for many years, thus the need for a truly world-wide Congress of Herpetology is apparent. As the Section of Herpetology of the International Union of Biological Sciences\*\*, this would not only be an opportunity to exchange scientific information and to identify important directions for future research, but it would also provide a chance for personal contacts that are so important for progress. The format of the Congress is not yet decided, but it seems likely that it will include symposia and special invited (plenary) lectures on important current topics; workshops (such as laboratory techniques, photographic methods, etc.); displays; contributed papers (either oral or poster sessions); and various social activities (film and slide shows, etc.) and tours. The scope will include the full range of biological topics, including conservation and husbandry. Above all, the emphasis will be to take every advantage of the international participation to develop activities that are simply not possible at routine national herpetological meetings.

The preferred time for the Congress is late August or September, when inexpensive university housing and low off-peak travel rates can be obtained. The date could be 1987, 1988 or 1989. From an original list of nearly 50 venues, four finalists were decided: Barcelona, Canterbury, Florence and Prague. The site is currently being selected by vote of the 17-person Executive Committee\*.

British have been involved in planning this Congress from the very beginning. Dave Ball, Tim Halliday, Geoff Haslewood, Mike Lambert and Herb MacGregor were present at the August 1982 meeting which set up the Congress. Lambert and Halliday, together with Nick Arnold, Brian Groombridge and Garth Underwood, are now members of either the Executive Committee or the 50-person International Herpetological Committee — together representing some 35 countries — which established the guidelines for choosing a venue and which will decide the Congress format. Moreover, if it is decided to hold the Congress at Canterbury (University of Kent, with Ian Swingland as local organizer), then it will be essential to count on the assistance and goodwill of all British herpetologists, professional and amateur alike, both in the British Herpetological Society and in its sister societies, in order to conduct a truly successful meeting. Wherever the Congress is held, it will be a matter of considerable national pride to have hosted the very first World Congress and to set a high standard of organization as precedent for the future.

#### **KRAIG ADLER**

Secretary General, World Congress of Herpetology, Cornell University, Division of Biological Sciences, Section of Neurobiology and Behaviour, Seeley G. Mudd Hall, Ithaca, New York 14853-0240, U.S.A.

\* The Executive Committee by the end of April 1985 had selected Canterbury, U.K. The Congress will take place in September 1989. — Ed.

\*\* Admitted on September 6th, 1985 at the 22nd General Assembly of the I.U.B.S. in Budapest, Hungary. — Ed.

# RECORD YEAR FOR THE AMPHIBIAN POPULATIONS OF EPPING FOREST

1985 was a bumper year for frogs and toads in Epping Forest. As is usual after a severe winter such as we experienced in 1984/5, unusually large numbers of frogs (*Rana temporaria*) spawned in the forest ponds. The population seems to have reached a higher level than ever before in living memory. The rise has been especially marked in those parts of the forest set in suburban London, such as Snaresbrook and Wanstead. Enormous quantities of spawn were laid in the ponds and marshes there which, with the high level of human disturbance in these areas, is the opposite to which one would expect. The breeding season was successful at all stages; good numbers of metamorphosed juvenile frogs were seen around the ponds and in the forest glades and rides in the summer.

Rather less toads than usual were seen spawning, yet vast numbers of tadpoles were seen later in the season in several ponds in the northern part of the forest, and legions of baby toads could be seen throughout the woods of the Wake Valley and Blackweir Hill areas in late summer. It is not unusual to see very large numbers of metamorphisong toads dispersing into the woods around the ponds, but in 1985 I saw larger numbers than ever before.

These observations are contrary to a report made to the BHS Council that the frog and toad populations of the forest were nearing extinction due to collection. Collection is not a significant threat to amphibians in Epping Forest.

JOHN PICKETT

# CARAPACE COLORATION AND LATITUDINAL DISTRIBUTION IN TESTUDINAE

# J.L. CLOUDSLEY-THOMPSON, C. CONSTANTINOU & D.K. BUTT

Departments of Zoology and Physics, Birkbeck College, University of London

# SUMMARY

Land tortoises from equatorial regions tend to have more extensive black pigmentation in their carapaces than species from sub-tropical regions; while the latter, in turn, are darker than tortoises from regions with Mediterranean climates.

#### INTRODUCTION

The abdominal cavity of many diurnal alpine and desert lizards is lined with a black peritoneum. It has been postulated that this black lining may be related to the high incidence of shortwave radiation in the desert, and act as a shield preventing damage to the delicate internal organs. Only species with a black peritoneum seem to be capable of marked colour change. It appears not unlikely, therefore, that a black peritoneum may be important in absorbing the extra light which penetrates the body wall as the animal blanches when the radiation head load is increased during the day. (See discussion in Mayhew, 1968). Land tortoises are also day active but do not have black peritoneums, so it seemed possible that species inhabiting equatorial and tropical regions might possess carapaces of darker hue than those from sub-tropical and Mediterranean regions. This hypothesis is tested in the present article.

#### METHOD

The three authors independently assessed the percentage of black pigmentation (to the nearest 10%) in the carapaces of those land tortoises (Testudinidae) that are adequately illustrated by Wermuth & Mertens (1961). Where differences occurred in the assessment, the mean figure to the nearest 10% was adopted. The animals were then accorded numbers according to their latitudinal distribution as follows:— Equatorial and tropical (1); subtropical (2); Mediterranean (3). Finally, correlations were drawn between pigmentation and species distribution.

#### RESULTS

Fig. in Wermuth & Mertens (1961)	Species	Distribution		% blackness of carapace
139	Chersine angulate	SW and S Africa	(2)	50
140	Geochelone carbonaria	Tropical S America	$(\mathbf{j})$	80
42	G. denticulata	Tropical S America	$(\mathbf{p})$	80
143	G. elegans	India and Ceylon	(2)	70
144	G. elephantopus	Galapagos Is	(p)	100
152	Psammobates geometricus	S Africa	(2)	50
154	Geochelone gigantea	Seychelles and Aldabra	$(\mathbf{p})$	100
56	Testudo graeca	S Europe, SW Asia, N Africa	(3)	40
<sup>1</sup> 61	T. kleinmanni	N Africa	(3)	30
62	T. marginata	SE Europe	(3)	40
<sup>1</sup> 63	Psammobates oculifer	SW and S Africa	(2)	30
<sup>1</sup> 64	Geochelone pardalis	Central and S Africa	(1)	40
65	Acinixys planicauda	Madagasca	(3)	30
67	Geochelone radiata	Madagasca	(2)	70
170	Psammobates tentorius	SW Africa	(2)	70
172	Geochelone travancorica	India	(1)	40

The results, expressed graphically, are shown in Fig. 1, to which are added Standard Errors of the Means (vertical bars) and a Regression Line. Although the differences between the means are not significant to P = 0.05 (when analysed using the t-test of significance for small samples) there is some indication that species from equatorial regions tend to have more extensive black pigmentations in their carapaces than species from sub-tropical regions which, in turn, are darker than tortoises from Mediterranean habitats.



Figure 1. Relationship between colour (% blackness) of carapace and latitudinal distribution of tortoises (1. Equatorial and tropical; 2. Sub-tropical; 3. Mediterranean). Estimates ... ● Means ... ● Standard Errors of the Means (vertical bars) and the Regression Line have been inserted.

#### DISCUSSION

In reptiles that are unable to change colour, the operation of its concealing and thermoregulatory functions are largely synergistic. When the two tend to produce opposing or antagonistic effects, the colour possessing the greater survival value is normally selected (Cloudsley-Thompson. 1979). Land tortoises do not change colour. The pigmentation of their carapaces therefore probably reflects a compromise between the functions of crypsis, the absorption of heat, and of protection from excess ultra-violet light. That aposematic coloration should appear among Testudinidae is improbable, although Hingston (1933) cites examples from the Emydidae and Trionychidae which bite, or forcibly close their shells. Thick-shelled tortoises might, conceivably, have bright colours that would indicate to predators that it would not be worthwhile to attack them. It would be reasonable to expect that cryptic and disruptive coloration should predominate in smaller more vulnerable species while, in giant tortoises which when adult are scarcely exposed to predation, physical factors such as ultra-violet light, are probably of greater adaptive importance. The two totally black species among those listed, G. elephantopus and G. gigantea, are also the two largest. G. denticulata, which was rated at 80% blackness of carapace, is one of the largest of the mainland tortoises. Although G. carbonaria whose carapace is as dark or darker, is somewhat, smaller, it may reach as much as 45 cm in length. Apparently exceptional in this context are G. pardalis and G. sulcata, both of which are large, yet relatively pale. (G. sulcata was not included in the survey, because it is not illustrated appropriately by Wermuth & Mertens (1961)). In general, however, there appears to be a general relationship between size and colour although a statistical relationship, even if significant, would not necessarily imply a causal connection. The correlation between colouration and latitudinal distribution although again not statistically significant, may indeed reflect a causal relationship - protection from short-wave radiation.

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# THE MIDWIFE TOAD, ALYTES OBSTETRICANS IN BRITAIN

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The introduction of the Midwife Toad, Alytes obstetricans, into Britain has been discussed by a number of authors. Fitter, 1959. Frazer, 1964. Laver, 1977. Smith, 1949-50. Taylor, 1948, 1963.

The related history is, briefly, that the introduction took place in the late 1800's, the exact date being in some doubt. Their presence was first noted in 1903 in a nursery garden in Bedford, where they were probably originally accidentally introduced with aquatic vegetation.

In 1922 the nucleus of a second colony was introduced into a walled garden in Bedford by a Mr. Brocklehurst where they subsequently established themselves. In 1950 a third colony was discovered in yet another Bedford garden.

In 1947 Mr. Brocklehurst's son Robert transferred some adult animals and tadpoles to his own garden in Worksop, Nottinghamshire where a colony was established. In 1933 another colony was introduced near York, and in 1954 two egg carrying males to Totnes in Devon.

A further chapter in the history of Alytes in Britain has now emerged.

In 1985 the Northamptonshire Federation of Women's Institutes decided to complete a pond survey of the county. This in conjunction with the Northamptonshire Trust for Nature Conservation for which I am recorder of Reptiles and Amphibians. A standard form was devised with 'tick' squares to indicate the presence or absence of aquatic and associated animals and plants, with provision for further notes and sketches. One completed form had the word midwife inserted before toad in the 'tick' square, and since the form had been filled in some detail complete with sketch map it was decided worthy of investigation. A small village in the north east of the county is the location of the garden pond and within a few hundred yards a disused gravel pit complex has recently been converted to a leisure area. The owner of the property who completed the form informed me that the toads were established when she purchased the house some ten years earlier and had been introduced by the previous owner. The previous owner, who still lives locally, was contacted and I learned that the colony was established in 1965 by this lady, a Mrs. Brocklehurst, who moved to Northamptonshire from Worksop.

It was thought that the colony had died out in the severe winter of 1982 since no calling was heard the following spring. However, several animals have been heard during 1985 but the size of the colony has not been determined.

There is no evidence to suggest that the animals have established in the gravel pit area.

The garden has a large, well vegetated pool which is surrounded by a rockery and trees with gravel and slabbed pathways. Mrs. Brocklehurst states that the animals frequented a stone trough which is sunk to path level, when first introduced. The pool has ornamental fish.

At the request of the present owner the actual site is not named but has been communicated to the editor. REFERENCES

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British Herpetological Society Bulletin, No. 14, 1985

# NOTES ON THE NATURAL HISTORY OF OLOLYGON RUBRA (LAURENTI)

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Banks (1985) recently reported on the occasional accidental importation of Daudins treefrog (*Ololygon rubra*) into the British Isles. He notes that he was unable to breed them in captivity. In this note I will present a summary of some of my field data on this species, which may be of some practical use to those herpetologists who are trying to breed lowland tropical frogs in temperate regions.

Notes on the ecology of *Ololygon rubra* from the savannas of southern Venezuela have been published by Hoogmoed and Gorzula (1979). *Ololygon rubra* are less common than the larger *Ololygon x-signata* and are most frequently found in perianthropic environments such as gardens and banana plantations. During the dry season they are frequently found in bathrooms and in toilet cisterns. Females with mature oviducal eggs have been found in April and June and it is assumed that they breed during the rainy season. A marked dry season occurs in southern Venezuela from January to the end of March, and *Ololygon rubra* possibly aestivate for part of this period. The rainy season begins in April. The mean annual rainfall can vary from under 1000mm to more than 2000mm. Rainfall during the rainy season is not daily. More than a week can pass without rain, but more than 100mm may fall in another week.

The mean minimum air temperature during the year is about  $24 \pm 2^{\circ}$ C. This temperature is reached just by about midnight and does not rise until after 06.00 am. Maximum air temperatures are reached about 2 pm, and can be anywhere from 29°C to above 40°C. The hottest months are from April to July. Although Venezuela is north of the equator there is little change (about 1 hour) in daylength between the summer and winter solstices.

Ololygon rubra probably breeds in shallow temporary pools or at the edge of large ponds or lagoons. It is most unlikely that it breeds in running water. Other savanna species that breed in temporary or shallow bodies of water are: Bufo granulosus, Bufo marinus, Pleurodema brachyops, Physalaemus enesefae, Leptodactylus fuscus, Elachistocleis ovalis, Hyla microcephala, Hyla minuscula, Ololygon x-signata, Phyllomedusa hypocondrialis and Phrynohyas venulosa. Although there is resource partitioning between these species some generalities about such bodies of water are pertinent here. The water is usually shallow (often only a few centimeters deep), muddy, and with aquatic plants. Surface temperatures of the water may reach about 35°C during the day, but do not usually drop below 25°C during the night. The waters are acidic with a pH of about 6 or slightly below, and are very low in electrolytes (compared to London tap water), with a conductivity of between 20 to 60 uS/cm.

If any members of the BHS find this type of information useful for their captive rearing studies I will be pleased to prepare short data sheets on other species of herpetofauna from this area.

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# A FEW OF THE HERPETOFAUNA IN THE COMMONWEALTH (ORIENTAL AND AUSTRALASIAN ZONES)

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#### This article is based on a talk given at the end of the A.G.M. on March 19th 1985.

The British Commonwealth and extant Colonies include over 50 countries, from Antigua and Barbuda to Zimbabwe, most of which (perhaps with the notable exception of the Falkland Is.) are in the tropics where the greatest number of herpetofauna occur. A full list of the countries can be found in the current (117th) edition of Whitaker's Almanack. Although arguably many now with little in common with Britain, there are nonetheless historical, linguistic (the U.S.A. excepted) and cultural ties that link us to this day. H.M. the Queen is, of course, head of the Commonwealth and the co-ordination of interests is undertaken by the Commonwealth Secretariat in London. The Commonwealth Foundation, also in London, promotes closer professional co-operation, and its mandate was extended in 1979 to include non-governmental organizations of a voluntary nature.\* The President and I placed down a few ideas in BHS Bulletin No. 8, December 1983, following on from a list of herpetological societies in Commonwealth countries that was included with BHS Bulletin No. 7, June 1983, together with those of Europe of which the U.K., Gibraltar, Malta and Cyprus are a part. H.M.G.'s then Ministry of Overseas Development gave me the opportunity in 1969 and 1971/72 to work in Australia to investigate the flight behaviour of the plague locust, Chortoicetes terminifera. Based with the CSIRO Division of Entomology, Canberra, a joint team investigated the ecology of this serious migratory insect pest. Between London and Sydney (in either direction), there are land masses that include Commonwealth countries. The slides to be shown will hopefully highlight some of the fascinating and most common species of herpetofauna that one might casually observe during a cursory inspection and have the chance to photograph.

# THE ORIENTAL ZOOGEOGRAPHICAL ZONE

#### India (September 1969)

Calotes versicolor, the Indian garden lizard is commonly seen on walls and bushes by many Indian homes. It was seen by the holy city of Benares (Varanasi) on the River Ganges.

Geomyda sp., a pair of terrapins probably of this genus was basking at the edge of a pond in the village of Firozpur, lower Punjab, through which the main Delhi-Jaipur road passes. Many Indian villages have ponds frequented by cattle or flood pools left from the monsoon. Many species of Geomyda are listed in the book on Indian reptiles by Malcolm Smith (1931).

Rana tigrina, the Indian bull-frog. An adult basked by the edge of the pond in Firozpur. This is a very common and often abundant frog, which, together with *R. hexadactyla*, has been collected in millions for export to frog-leg eating countries of the World. The huge trade (see also the Fauna & Flora Preservation Society's journal, *Oryx 17*: 201, October 1984) has recently been highlighted by Rene Honegger, Chairman of the IUCN Amphibia-Reptilia Group. Also publicized in *The Sunday Times* (31 March 1985), a conservative estimate of 200 million frogs (each averages 35g) has yearly been exported from Bangladesh, India and Indonesia.

#### Singapore (September 1969)

Mabuya multifasciata rudis, the many-lined skink is listed by Loveridge (1945) as a very common species occurring from Sumatra to Papua New Guinea in the NE Pacific area. It was observed basking on the pale-coloured leaning trunk of a mangrove tree by a swamp just outside the town of Singapore.

\* This becomes particularly relevant now that the U.K. has been elected as the venue of the first World Congress of Herpetology (Canterbury, Univ. Kent; September 1989) and the participation of Commonwealth nationals from tropical developing countries is earnestly sought.

#### THE AUSTRALASIAN ZOOGEOGRAPHICAL ZONE

#### Canberra and central west New South Wales (October-December 1969)

Leiolopisma g. guichenoti, common grass-skink. One of the commonest lizards, it was observed around Canberra itself and in the Tidbinbilla Reserve just outside. Amphibolurus barbatus, the bearded dragon. This is a very common lizard in central west NSW and elsewhere in eastern Australia and was found in scrub and by gum forests in the Bogan-Macquarie outbreak area of the plague locust. Bearded dragons defensively erect their frills or beards (Plate I) and the mechanism has recently been described by Throckmorton et al. (1985) in the Journal of Morphology (presently edited by Carl Gans). One of the CSIRO entomologists, Dr Roger Bartell, who, sadly, has died since, delighted in "dragon taming" and had several animals scampering about on the linoleum floor and sunny window sill of his laboratory to which he threw plague locusts and other laboratory-bred insect pest species that were snapped up as titbits rather as small dogs would do. Some were road casualties with small splints attached to allow the repair of broken limb bones.

#### Eastern Australia, including Tasmania (October 1971-April 1972)

At the time, Eric Worrell's *Reptiles of Australia* (2nd edition, 1970) was just about the only reference book. In December 1969, Dr Harold Cogger of the Department of Reptiles and Amphibians, the Australian Museum, Sydney, had kindly let me have a photocopy of the key to the herpetofauna (over 660 species) publication of his book (Cogger, 1975). I also used a small handbook for the frogs (Clyne, 1969).

*Physignathus lesueurii howittii*, Gippsland water dragon, has a greenish body. An adult was found quietly basking in the early summer sunshine of October on a branch overleaning a small stream flowing amongst scrub adjacent to one of the formal picnic spots at Brindabella in NSW just outside the A.C.T. This place is much frequented by the local populace of Canberra.

Trachydosaurus rugosus, the stump-tailed skink, shingle-back or bolgali (aboriginal). A short visit (2-3.xi) to the Riverina (another plague locust outbreak area) of south-west N.S.W. yielded several animals on or by the road "beyond the black stump" between Hillston and Goolgowi. With the species' characteristic pine-cone appearance, several were basking or active at 27°C or more (12.00-14.30 h E.S.T. Aust.), often on gum tree stumps. Vegetable matter is incuded in the diet and interestingly, the pineal eye is better developed even than in the tuatara (Sphenodon punctatus) of New Zealand. A. barbatus were also seen in the area, often basking on stumps amidst Cassia-Callitris-Casuarina-Eucalyptus (poplar box) scrub.

Litoria (formerly Hyla) caerulea, the green tree frog, is the best known of Australia's amphibia and achieves 100mm in length. Several individuals of varying sizes lurked during dry weather after earlier rains in the eaves of an outbuilding of the Mitchell Laboratory on the Agricultural Research Station, Trangie, central west N.S.W. (9.xi). The Research Station formed a base for the start of a sortie into the 'Channel Country' of central western Queensland, where invasions by the plague locust start in eastern Australia.

*Pseudonaja t. textilis*, common brown snake. This venomous species was seen "back of Bourke" on a grassy flood plain 50 miles (81km) west of Bourke (9.xi), no doubt feeding on plague locusts that abounded in the area. It is a common, widespread snake in eastern Australia. As one proceeded through the bush, rosy-pink and grey galah parrots flitted in the scrubland and screeched from tree-tops. Like most parrots, these birds achieve a great age. The saying goes that if in the bush you try and eat a galah, you place it in a pot with a stone and boil; when the stone is soft, you eat that!

Varanus varius, the lace monitor; a four-foot adult was found dead on the road, no doubt killed by some vehicle, near Windorah in central Queensland. These great monitor lizards or goannas are conspicuous and not infrequent in Australia's bush. It was very warm in this part of Australia, and the night before (13.xi), camp had been pitched by Lake Yamma Yamma with the relief of the air temperature dropping to 93°F (34°C) at sunset after very much higher temperatures earlier. Great green flocks of budgerigars visited the lake's edge at sunset and sunrise to drink, and chattered and screeched in the surrounding scrub. A huge individual lace monitor was also seen later (21.xi) where rather cooler at Wee Jasper, N.S.W., 46km NW of Canberra and just outside the A.C.T., quietly basking on a rock outcrop amidst eucalypt and mulga scrub, and, confident in its size, not even trying to move from the photographer only 4m away. The colour of the adults dulls with age and a half-grown individual with splendid "laced" stippling dorsally was photographed while basking in the early morning sun (22.iii), in the Carnarvon National Park (whose gorge is renowned for aboriginal cave paintings) further east in Queensland between Rolleston and Injune.

Underwoodisaurus milii, the thick-tailed or barking gecko. A juvenile (adults achieve 150mm) was found under a pile of rotten logs amidst mulga scrub on the typical reddish lateritic soil, just 30 miles (48km) south of Quilpie, Queensland (15.xi). Not far from the Bulloo River, we had left behind the Thompson River into which Cooper's Creek flows at Windorah. It was on Cooper's Creek, which like the Bulloo River drains the Channel Country, that the ill-fated Bourke and Wills Expedition made its base at Nappa Merrie. This much publicised expedition of the late 19th century lead to the opening up of central Australia.

*Tiliqua scincoides*, the blue-tongued skink, was seen basking in the late afternoon sun (15.xi) at the edge of the track. The dirt track at Hungerford had just crossed the state border into N.S.W. (through a rickety gate and by a chipped State Border Notice). Perhaps with the exception of the frilled lizard (*Chlamydosaurus kingii*) of tropical northern Australia, this is the best known of the Australian lizards with its characteristic blue-coloured tongue. Viviparous, it achieves about 450mm in length.

*Pseudechis porphyriacus*, the common black snake is venomous and occurs near dampish places. It is often seen crawling across roads, usually with fatal results, and was seen one late afternoon further south-west in the Riverina of N.S.W. near Darlington Point on the Murrumbidgee River. (9.ii). Unlikely to be fatal to humans (unless intravenously injected), the venom is principally haemorrhagic. Several *Pseudonaja t. textilis* were also seen on the road at this locality; one one occasion, a marsh harrier flew away with a squirming brown snake held in its talons.

*Amphibolurus nuchalis*, a small dragon was seen on a sheep farming property, Toobrac, on the west side of Thompson's River channels not far from the Tropic of Capricorn (lat. 23°27'30"S), 40 miles (64km) south-west of Longreach in central western Queensland. The small (100mm long) lizard was perched high on a short, prickly mimosa (*Acacia farmesiana*) bush (19.ii) during the very warm (38°) late afternoon, probably seeking the cool of a 2-5 kph breeze.

*Litoria rubella.* Ten individuals of this medium-sized light brown or tan frog with well developed finger and toe discs were found adhering to the inside walls of an outbuilding on the Cunnamulla aerodrome in southern Queensland (19,20.iii). A camp was based here for radar observations on the flight activity of the plague locust.

Lymnodynastes dorsalis, banjo frog or pobblebonk. This leptodactylid burrowing frog of eastern Australia, named after its call (a single twanging note), burrows in the sand and emerges at night in damp weather. It was on the track, picked out by our vehicle's head lamps, and was included with the collection of frogs made one wet evening (9.iii) in the company of Prof. Nicolai Drozdov (on detachment from the Moscow State University to the Australian National University. Canberra) at the Tallaganda State Forest (part of the Great Dividing Range) at about 1000m near Captain's Flat, N.S.W. (42km SW of Canberra). The specimen is now in the Zoological Museum of the Moscow State University.

Litoria aurea, the green and golden bell frog. A large frog (up to 100mm) of splendid appearance with granular-sided body, the species is aquatic, floating on the water surface day and night, and is predatory upon other (smaller) frogs. It was found in a small sheep dip near Captain's Flat. An individual, probably of an endemic subspecies, had also been seen near Royal George township (1.i) in northern Tasmania. It was also green with a yellowish strip running from the nostril, over the top of the eye and back to the groin, bordered below by a narrower dark stripe. Primarily southern Australian, the species also occurs in Victoria, eastern South Australia and southwestern Western Australia.

Litoria dentata, Keferstein's frog, a medium-sized brown frog resembling L. rubella, which occurs in the coast and mountains of N.S.W. Its range ends in northern N.S.W. and is taken over by L. rubella in southern Queensland. It has a long drawn-out, tremulous bleat for a call, which was very evident from several nocturnally calling individuals by the flooded sheep's dip near Captain's Flat.





*Litoria citropa*, Blue Mountain's tree frog, a variably patterned pale green and light brown frog of the coast and mountains of N.S.W. and mountains of Victoria completed the frog collection from around Captain's Flat.

Amphibolurus sp., a small dragon, possibly a half-grown A. muricatus, the Jacky lizard or tree dragon, was found in N.S.W. not far from Canberra. It occurs in eastern Australia and runs on its hind legs to the safety of trees, which are actively climbed, when the lizard is disturbed on the ground.

Leiolopisma ocellata, green skink. This Tasmanian endemic was found at 1000m on Tower Hill (2.i) behind the sheep farming property, Malahide, near Fingal.

Leiolopisma metallica, metallic skink. Two were found basking together on a log in a grey-gum forest also at around 1000m on Tower Hill, near Fingal (2.i). Returning to Malahide, a big (1.5m long) Tasmanian tiger snake, Notechis ater ssp., was crawling across the road. This highly venomous and fearsome creature inflated the sides of its body and neck and hissed menacingly when confronted. The venom is one of the most potent known and the tiger snake is responsible for most of the human snake-bite deaths in Australia.

#### Fiji (December 1969)

Laticauda colubrina, common banded sea snake. An individual with its vertically flattened tail was caught swimming in the light surf at the edge of a small sandy cove not far from overleaning mangrove trees on a small islet of the north-west coast of Viti Levu, the main Fijian island. This highly venomous Pacific Ocean species sometimes goes onto land to bask. It has been caught in seine nets in large numbers. The individual's colour between the black bands was a dirty ochreyellow (often bluish-grey). The taxonomy of the sea snakes has recently been worked out by Dr Colin McCarthy (the B.M. (N.H.) Representative on BHS Council). The upper lip is yellow in L. colubrina as against brown in the closely related L. laticaudata.

Representative material of many of the species photographed have been included with the spirit collection of the Reptile and Amphibian Section. British Museum (Natural History), London.

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# COLLECTION QUOTAS AND THE CONSERVATION OF MEDITERRANEAN TORTOISES

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Drastic population declines have been noted for many species of tortoises worldwide and have led to the establishment of the IUCN Species Survival Commission Tortoise Group, whose inaugural meeting was held in Oxford, England, in 1981 (Swingland, 1981). Conservation measures seem long overdue for the Mediterranean tortoise species (Swingland, 1984) and numerous workers are gathering the information necessary for implementing such measures effectively. At the 2nd European Chelonian Symposium, Proceedings A of which were published in *Amphibia-Reptilia* 5(1), March 1984 (the journal of Societas Europaea Herpetologica), habitat destruction was not surprisingly identified as the major threat to tortoises. Hopefully, the various herpetological and conservation groups will be effective in persuading governments to set aside tortoise preserves.

The secondary issue of bulk trade collection has been addressed by Lambert (1984), Cheylan (1984) and in the Concluding Remarks of the chelonian symposium, a ban was called on collecting, an extreme measure which may not be justifiable, especially since the intermediate step — the establishment of harvesting quotas as with game animals — seems not to have been and frequently are more beneficial to the protected species. Establishment of quotas would reduce availability and drive prices up. With a much greater value placed on the animals, concern for their quality (health) is correspondingly greater, and shippers can be expected to and required to provide proper care. Similarly, buyers will be much more concerned with the welfare of their charges. Educational potential is not only preserved but enhanced by greater public interest.

Concurrent with quotas is the establishment of very harsh penalties for smuggling, so as to make smuggling unattractive when legal trade is available. This is often more effective in halting black market trade than is a total ban. Shippers recognize that it is in their best interest to ship legally and discourage smuggling, since they have the option (why take the risk?), and thus protect their livelihood by ensuring tortoise availability.

Finally, quotas allowing limited trade do not impede the establishment of captive breeding populations, while trade bans usually do. Captive populations benefit wild populations most obviously be making animals available for re-introduction into protected habitats, research and education. Cheylan (1984) pointed out the need for breeding measures and the high reproductive potential of tortoises. This conservation tool is often precluded by regulations surrounding trade prohibitions which include captive born animals in restrictions on movement, sale and exchange. Where total bans on live trade are not coupled with *effective* habitat preservation, such bans can actually be deleterious to species survival, causing an overall population decline because of reduction or elimination of captive breeding populations. Such an effect has already been noted by many United States' breeders.

Some tortoise populations may already be reduced to the point where any collecting will be injurious and total bans are necessary. But the use of quotas before such critical population declines occur in other species should be considered before total bans on live trade, with their accompanying negative implications, are enacted. It must be emphasized that habitat protection is of the utmost importance, habitat destruction being by far the major cause of population declines. Socio-economic conditions, however, often make habitat preservation extremely difficult. This makes other safeguards, such as the establishment of captive breeding populations and a halt to injurious collecting, paramount. These safeguards can be developed simultaneously

under quota systems, but total trade bans often merely drive trade underground, whilst precluding captive breeding populations which may represent the very last hope of survival for species vanishing from the wild.

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# OBSERVATIONS ON THE BREEDING OF A MARSUPIAL FROG, GASTROTHECA MARSUPIATA

#### BARRY R. KIRK

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In early January 1985 I obtained two tropical frogs complete with vivarium through an advertisement in the local paper. The previous owner had housed the frogs in her kitchen, the background heat of which provided the animals with an adequate living temperature. This was supplemented each evening by a 150w spotlight mounted inside the 460mm x 300mm x 300mm vivarium. The frogs had been sprayed twice daily with water and a constant supply of crickets had been provided. The owner commented that one of the animals had been heard calling on several occasions and that an attempted mating had been observed. She could not provide any details regarding the identification of the frogs, only that she had purchased them as Brazilian Tree Frogs.

The animal presumed to be the female was 60mm from nose to vent and some 10mm larger than the male. Both frogs had an overall buff background colour with two bright green bands running from vent to head. The bands on the male were wider than the female's. The male also had more green on the snout, head and flanks than did the female. The flanks of the male were speckled green while the female had an irregular dark green stripe on her flanks. The male possessed a throat sack of considerable size which inflated when he called.

When the female produced young I then realised that the animals were in fact a species of South American marsupial frog and I identified them as *Gastrotheca marsupiata* from Ecuador and Peru.

I installed the frogs in their vivarium which was sited, with my collection of amphibians and fish, in a space heated room. As the previous owner had observed an attempted mating I tried to follow a similar routine to her. I did however stop using the spotlight in the vivarium for fear that the frogs might climb onto it while it was in use. The temperature was an average of 24°C in the room with a temperature drop of about 2°C at night. The frogs proved to be nocturnal and spent all day together on a piece of cork bark in the top corner of the vivarium. A constant supply of crickets was provided of which a surprisingly large number a day were consumed. Two water containers were provided, one of which the frogs could fully submerge in. Shortly after I obtained them the male was heard calling.

When I inspected the frogs on the morning of the 11th February 1985 the female was observed sitting in the smaller of the two water containers, a coffee jar lid, surrounded by 50+ tadpoles each of 15mm length. She was observed using her longest rear toe to empty the young out of the pouch on her back. The opening to the pouch was sited near the vent. At no time whilst I had these animals had there been any visible indication that the female had been carrying young. It may be that she was already carrying the young when I obtained her. Due to shortage of tank space the majority of tadpoles were placed in fish tanks which had recently held young fish. These tanks were situated high in the space heated building and had a temperature of 28-30°C which was higher than I would have liked. The tanks were filtered by undergravel biological filters. Unfortunately all the tadpoles in these tanks died before metamorphising. They appeared to fill up with fluid in the body cavity. This resulted in their death.

These losses may have been due to one of the following factors, a) the high water temperature, b) the fish wastes already present in the tank water or c) the salinity of the water. One teaspoon of sodium chloride per gallon had been added to the tank water when it held fish.

Luckily I had also placed about 20 tadpoles in an aquarium, 350mm x 200mm x 200mm, containing fresh tap water which in my area is hard and alkaline. The tank was provided with light aeration and maintained at a temperature of 25°C. The tadpoles were fed with crushed lettuce, tropical fish flake food and fish fry food. All food offered was readily consumed and regular water changes had to be carried out because of the amount of waste produced. The tadpoles grew quickly and the back legs began to appear after only one week.



Plate 1. Adult pair of Gastrotheca marsupiata. The female is the large frog on the right.



Plate 2. Young Gastrotheca marsupiata, four months old.

After 3 weeks the back legs were well developed and some colouring on the tadpoles backs began to show. At the same time the front legs emerged complete.

On 5 March 1985 the first froglets started to climb out of the water onto a rock provided above water level. These still had a considerable amount of tail remaining. Once this had been absorbed the froglets were placed in a vivarium with a covering of peat and gravel.

Initially the young frogs were fed hatchling crickets and fruitflies but these proved rather small and a larger size of young cricket was found to be more satisfactory. Cleaned anglers maggots, first pricked with a pin, were provided when no crickets were available.

The young frogs have proved to be delicate and at four months of age only eight have been raised but these appear to be strong and healthy and are consuming large numbers of small and medium sized crickets.

A further attempt will be made to breed these frogs again in the hope of improving the survival rate among tadpoles and young frogs.

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# FROZEN FROGS — A NATURAL OCCURRENCE?

# CHARLES A. SNELL

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While making garden and vivarium alterations during the 1984-85 winter, I unearthed edible and tree frogs (*Rana esculenta* and *Hyla arborea* respectively) at a soil depth of 1-4 centimetres. While working in an outside vivarium (4 x 3 metres) I removed six tree frogs and one immature *Bombina orientalis* by placing them in a bucket containing about 15cm of soil and leaf mould and transferring this to a garden shed for one week until alterations were complete. During this period air temperatures hovered between  $-4^{\circ}$ C and  $-14^{\circ}$ C.

When the vivarium was ready to receive the frogs once more, I removed the bucket from the shed only to discover that soil, leaves and frogs were frozen rigid.

The frogs had a body surface temperature of  $-4^{\circ}$ C. In this rigid condition no external respiration was possible and tissue respiration was presumably also at or near zero. I assumed these individuals had probably expired.

It then occurred to me that those individuals I had found in the garden 1-4 centimetres underground had also experienced similar or lower temperatures as the ground was frozen to a depth of 5cm. I reasoned that such ground freezing is a regular event in Central and Northern Europe where these creatures are naturally found. There seemed a good chance, therefore, that such total freezing was an occurrence the organisms could withstand, and would have to withstand in fact, in order to survive at all. For instance, I write this article from Sweden where tree and edible frogs and fire bellied toads (*B. bombina*) are native and where ground frost extends to some considerable depth (night temperatures here at the moment are between  $-10^{\circ}$ C and  $-35^{\circ}$ C). For Swedish herps to dig themselves in below the depth of ground frost is, in some places, impossible as the last glaciation removed much of the soil. In fact, some of the more barren rocky coastal areas and rocky offshore islands are the best places for herptiles. Natterjack and green toads (*Bufo calamita* and *B. viridis*) have, in fact, been found hibernating in crevices in rocks.

In spite of this reasoning the sight of my rigid, rock-hard specimens gave me great cause to doubt. They had even frozen with their eyes wide open, a most bizarre sight. I placed the frozen bucket and contents in the attic of the house which had an air temperature of  $\pm 10^{\circ}$ C and, after two days, reasoning won the day. Slowly on the afternoon of the second day five out of the six tree frogs had recovered all visible body functions and were even able to jump. The remaining tree frog and *Bombina orientalis* did not show loss or change of pigmentation normally associated with dead frogs and showed no signs of deterioration or decomposition. I could not continue observation as I had to return to Sweden and all were returned that same afternoon to a suitably sheltered spot in the vivarium where the air temperature had risen to  $\pm 5^{\circ}$ C.

This seems to reinforce many of my past observations. For example, as mentioned in a previous BHS "Bulletin" article, and at the illustrated talk I gave for the Society in 1984, survival from hibernation in the European tree frog seems greatest after severe winters than after mild or changeable ones. I suggested this may be because a lower metabolic rate makes less demands on fat reserves and the absence of large temperature fluctuations also might prevent the metabolic rate increasing too early in readiness to leave hibernation.

Some of my worst disasters in vivarium keeping have concerned my considering that certain of my amphibia or reptiles had not hibernated properly and then moving them "for their own good" with disastrous results.

Most of us become too anthropomorphic, or in this case "homoiothermically minded" when we consider the effect of cold on poikilotherms. We assume that they feel the same pain and discomforts as ourselves. It must be remembered that to us a drop in body temperature of 10°C would lead to great discomfort and eventual death if sustained, but is perfectly acceptable and even a regular occurrence, in cold-blooded creatures.

I recall reading in a great many biology books that homoiothermy (warm-bloodedness) is one of the great triumphs of evolution that has allowed homoiotherm (and of course this includes man!) to be independent of ambient temperatures and therefore to be more successful in the colder regions of the world. I would strongly question the complete accuracy of this. From where I stand in the world at the moment (central Sweden) one quickly reaches the opposite view. Snow has covered the ground and branches of trees since December. The mortality among insectivorous birds and herbivorous hares has been enormous. Most of their body fat has, of course, been used up simply in the effort of keeping warm while trying to exist at a time of the year when food is scarce. Even in milder Britain it has been estimated that well over half of the young of small insectivorous birds die in their first winter.

While all the suffering and death is going on above ground the amphibians and reptiles are below in a state of torpid oblivion but ready to emerge in the Spring hardly the worse for the experience! Another clear advantage related to cold-bloodedness is the ability to survive in situations where food is scarce. This, of course, is related to the fact that they do not "burn up" the calorific value of their prey in producing body heat. This being so a little bit of food goes a long way. In fact there are occasions where the biomass of amphibians can excede that of its prey species per unit area where the latter are faster breeding and/or growing.

To return again to frozen frogs, the northerly position of Sweden does not seem to have prevented colonization by amphibia. Common Frogs (Rana temporaria) are found even above the Arctic Circle. Sweden has six native frogs and five native toads (Britain has one native frog and two toads). These are the Common Frog (Rana temporaria), Agile Frog (Rana dalmatina), Moor Frog (Rana arvalis), Edible Frog (R. esculenta), Pool Frog (Rana lessonae), Tree Frog (Hyla arborea), Common Toad (Bufo bufo), Natterjack Toad (Bufo calamita), Green Toad (Bufo viridis). Fire Bellied Toad (Bombing bombing) and Spadefoot Toad (Pelobates fuscus). I have just read that ground frost this year in Sweden extends down one metre from the soil surface. If the amphibians were mortally affected by freezing one would expect almost a mass extinction of land hibernating species in Sweden (most of those mentioned above). It must be added that many of the species mentioned above are restricted to southern Sweden. There could be many reasons for this; i) some species could be more frost sensitive than others, ii) the length of the summer may be critical, iii) colonization of Sweden by herptiles has mainly been via Denmark in the South after the retreat of ice at the end of the last ice age, iv) Southern Sweden offers different habitats. Unlike the rocky, thin-soiled north with its predominating pine/birch tree cover, the south is flatter, deeper soiled and has more deciduous tree cover (including beech). Unfortunately, this flatter topography and deeper soil has made it popular for agriculture which has destroyed, and continues to destroy, habitats that favoured herptiles.

Of the foregoing I consider that ii) length of summer, may be the critical factor for many species, and that the main reason for this is the amount or duration of heat required to take an egg through to metamorphosis as a young frog or toad. This being true one would expect species that have the ability to overwinter as tadpoles to be able to extend further north. The green frog complex (R. ridibunda/esculenta/lessenae) have this ability and, in fact, the Edible Frog is found from south to central Sweden; the Pool Frog is concentrated in an area of central Sweden whilst the Marsh Frog has the strangest distribution of all. Absent from Sweden and mainland Denmark, it first appears in the Danish island of Bornholm in the Baltic, then reappears again in far more northerly Finland. I have found some amusement considering how they have found this island and reached Finland. The "Field Guide" by Arnold & Burton has a question mark for Marsh Frog in Finland. Scandinavian experts have since confirmed its presence. I consider it could have arrived by sea! I have found the Marsh Frog living and breeding on the Isle of Sheppey in Britain in quite salty water. In fact, in the dry summer of 1983 some pools were so brackish as to seem saltier than the sea as the waters had been condensed by evaporation. The surface waters of the Baltic sea are surprisingly non-salty. Far less salt, to the taste, in fact, than some brackish water used by the Marsh Frog. I was not aware of just how fresh the Baltic was until I watched some anglers last week (February 22nd, 1985). The majority of the Baltic was frozen over and the local anglers were taking advantage by boring holes in the ice and fishing with "spinners". Some anglers were doing very well and I was amazed to see that the main catch from the "sea" was freshwater pike and very large perch. To the taste, salt was hardly discernible. It is conceivable then that in cases of coastal salt marshes being flooded, washed out tadpoles could reach islands or other Baltic lands without loosing water osmotically to over-salty water and therefore dying.

The ability to overwinter at the tadpole stage must help to explain the success of the Midwife Toad (*Alytes obstetrians*) in Britain where it is found quite far north of its usual range (e.g. the colony in York).

The distribution of species which have tadpoles which do not have the ability to overwinter show differing trends in Sweden. The Common Frog, the Moor Frog (*Rana arvalis*), and the Common Toad (*B. bufo*) extend from southern Scandinavia to beyond the Arctic Circle. The climatic tolerance of tadpole and adult must be considerable in these wide-ranging species — certainly they have earlier spawning times than the following species. Both the Green Toad (*Bufo viridis*) and the Natterjack Toad (*Bufo calamita*) have more temperature sensitive eggs and larvae, and spawn later. Their range in Sweden does, in fact, follow the climatically optimal regions.

In conclusion, what I have been suggesting so far is that the Achilles heel for many species may not be winter cold but cool summers. This is an important distinction as most people I meet are surprised to discover that tree frogs can exist in Britain, adding "But aren't our winters too cold for them?". Forgetting, of course, that over a great part of its range in Europe it has to suffer much harsher winters. Britain, in fact, has mild winters because of the influence of the Gulf Stream. Unfortunately, this same factor can cause "mild" summers at a time when the reptiles and amphibians need heat most. And, therein, of course, lies one of the main disadvantages of coldbloodedness at high latitudes.

Since writing this article (January '85), an article has appeared in the "New Scientist" relating to frogs surviving the winter. Apparently there are only four vertebrate species that are known to survive freezing and that these are all frogs. It confirms my observations that breathing and heartbeat are suspended and that the animals are literally "frozen stiff". Apparently they protect their body cells from frost damage by boosting blood glucose to 60 times its normal value, but only if during hibernation the hibernation temperature drops below freezing. I would like to know which species are included in the four. I have a suspicion that the tree frog and edible frog may not be, but clearly should be, included. In fact, most amphibians in northern temperate to sub-arctic regions (has anyone tested newts?) may have this capability.

This phenomenon was also well known to the Chinese for goldfish — these could be frozen solid and survive. I have, in fact, witnessed this minor miracle myself, having thawed out solid blocks of ice containing goldfish simply to witness their unbelievable recovery. I add this last aside as the authors of the article mention that only four species of vertebrate, and all of those frogs, are known to survive freezing.

# **CAPTIVE BREEDING v. PET KEEPING**

# CHARLES A. SNELL

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As I wrote in a previous article, captive breeding can produce far greater success in terms of survival (eggs to adult) which is many thousands of times higher than the survival rate in the wild. Such numbers could aid numbers in the wild, reintroduction schemes, or provide sufficient numbers to make unnecessary the taking of specimens from the wild. In terms of wildlife conservation, captive breeding should necessarily take second place to habitat protection, creation and management: the role of captive breeding, however, should in my opinion, not be underestimated.

In the whole of Sweden it has been estimated that there are only about 3,000 European Tree Frog *(Hyla arborea)* left in the wild. My captive breeding of this species produced in excess of that number in 1983 alone.

The import of all reptiles has been banned for some time in Sweden. Rather than a decline in the interest, the number of people interested in keeping and breeding reptiles has increased. I have been told that self sufficiency in captive bred specimens has been achieved and exceeded such that some are now exported or returned to their native habitats.

Curiously, after publishing its breeding successes by the membership, the Dutch Herpetological Society, was approached by the authorities so that they could confiscate stock and prosecute members who bred native species as this violated the law. In 1979 for example 1,800 *Hyla arborea* were bred by the membership. I wonder what would happen to confiscated stock. If returned to wild habitats, which in general are deteriorating, they may not be as successful as if a number were kept for further captive breeding. The Dutch Society have, so far as I am aware, managed to keep names from the authorities.

Keeping reptiles or amphibia in tanks simply for the personal satisfaction of having them is, of course, an entirely different kettle of fish. Such specimens are ofen doomed not to add to numbers of their species and are lost from the general pool. In such cases the original captive was a loss for the species. Somehow the law needs to be able to distinguish between casual pet keeping and the more serious keepers. Such, of course, could be managed with the aid of Herpetological Societies who could assess the knowledge of husbandry and facilities of potential keepers. A problem here is that a pet keeper as a child can convert to a serious captive breeder and/or conservationist in later life.

Finally, I would once more like to come back to the major importance of habitat protection. Captive breeding loses its fun and its point if once bred in large numbers the animals have nowhere to go.

# HYLA ARBOREA: WORTH PROTECTING OR NOT?

# CHARLES A. SNELL

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The Kidbrooke site for the European Tree frog has been the subject of many of my past articles, as regular "Bulletin" readers will be aware. Up until now my articles have been positive and optimistic. Numbers of observed calling males have been steadily rising (e.g. average amount in 1984 was 22, in May this year it was 37). This made it, as far as I am aware, the largest G.B. colony. Unfortunately, the site has in June suffered two nocturnal raids. As I (and occasionally others) inspect the site, I know that in both cases the offending person or persons entered the site after 11.30 pm and left before 8.30 am. The raids were fairly organised: the last raider(s) even left the remains of sandwiches. After the second raid the number of male *Hyla arborea* was down to two. I have moved the two males for their own safety and to call the females out of the "danger zone". I have no idea of the motive for such raids, whether obsessive collection (what the hell can you do with 35 male frogs?) or for profit. Either way I am disgusted at such a mentality. What makes it worse is that the site is not really well-known outside BHS membership.

Security has since been stepped up with a volunteer dog patrol and a pond-side electronic-eye security system.

The next problem is what does anyone do when they catch an offender? Certainly they are trespassing but that is all. If they have captured tree frogs on them it seems from the existing wildlife protection laws that I can only wish an offender bon voyage and good hunting next time. By this I mean that under the terms of the 1981 Wildlife and Countryside Act there is not much I can do. As Keith Corbett pointed out ("Report on the Berne Convention", Bulletin No. 11, March 1985) non-native species, no matter how threatened here or elsewhere in their ranges "... receive no protection and in fact quite the opposite." He went on to point out that possible backing by Berne could change this. Let us hope so, for I have just learned that the Hyla arborea site in the New Forest has, in the last few years, also suffered from raids such that the long lived colony there is now threatened. I have been asked to assist with a captive breeding scheme to regenerate numbers. Even that may be illegal as the laws are so discouraging about non-native species. The present laws, by virtually legalising collection and discouraging attempts at salvation of species numbers may conceivably lead to the extinction of these species which is sad as many — such as Hyla arborea — are already in rapid decline in N.W. Europe. In parts of Europe captive breeding is being used constructively to turn back the clock (e.g. the reintroduction of Bombina bombina into Sweden from laboratory reared tadpoles from Danish stock). Let's hope something can be done for Hyla arborea here.

I have, as a result of my interest and articles, heard from many scientists studying the European Tree Frog at home and abroad. Most recently I have heard of studies being done on the British population. My studies have revealed a great deal about the wild population as regard age at sexual maturity, the fact that females spawn every 10-21 days depending on food/temperature, the fact that they do not enter trees, only low thorny scrub, facts about seasonal and diurnal behaviour, hibernation, etc., (see previous articles). None of this information was available in the literature that I have encountered so far (or has proved some existing literature to be misleading) and much (e.g. habitat preference) is of great conservation value here and in the rest of N. Europe. In short, the site has been of great scientific interest to me as the other British site is proving to be for others. Both sites could soon, however, be history and not available for anyone to study. The Wildlife and Countryside Act's Laws were drawn up by scientists in appropriate fields. The position that these laws leave established non-native species colonies in, suggests the creation of a new category of wildlife site; an S.S.S.D. or Site of Special Scientific Disinterest) (or so it would seem!). The question arises: should any of these species, discouraged by the Act, become extinct here, would there, in certain quarters, be much rubbing of hands in satisfaction?

Let's hope that the backing from Berne that Keith Corbett talks about is forthcoming and that someone, somewhere tries for an amendment of the Act.

# Editorial comment on the protection, or not, of Hyla Arborea

Unfortunately, protective legislation in Europe is usually unreasonably inflexible. The protection of a species almost invariably leads to prohibition of import and export, often the prohibition of the possession of the species concerned in captivity, so we have such bizarre situations as that referred to by Charles Snell in his previous article (Captive Breeding v. Pet Keeping), when the Dutch Government wished to prosecute members of the Dutch Herpetological Society for breeding Hyla arborea in captivity. Had H. arborea been protected in this way in England. Charles Snell would never have been able to legally obtain, keep or breed the species, and no English colonies would exist today. Lawmakers seem to suffer from rigidity of the brain when wording Laws or Conventions. Can it not be possible to draft a law which affords reasonable and effective protection where necessary, yet still permits people to keep and breed them in captivity, move them across state borders, and trade in captive bred stock? Why do laws so often have to be negative in their effect? However, we have to realise that there are some people who would prefer absolute "protection", including the prohibition of the keeping and breeding of the species in captivity. Protection of Hyla arborea in the form to which we are becoming accustomed (and as laid down in the flawed Berne Convention) would no doubt (to misuse Charles Snell's words) cause, in certain quarters, much rubbing of hands in satisfaction. but not for reasons Charles would approve of. Protective laws, in the way they are generally implemented in the European countries, should be regarded with foreboding.

# SWEDISH LADIES AVOID THE MEN IN WINTER

# CHARLES A. SNELL

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I have noticed for a great many years now that in the ponds I know of in Britain, the males of the Common Frog hibernate in the pond-bottom mud whereas the females hibernate on land. This observation is not reflected in the literaturee that I have read from Britain where it is normally stated simply that Common frogs hibernate in pond mud. In Sweden, however, much reading clearly states that in the common species, *Rana temporaria* and *Rana arvalis* (Field or Moor Frog), the male hibernates in the pond whereas the females spend the winter on land. They also say that the Edible Frog (*Rana esculenta*) is an exception to this and both males and females hibernate in the pond. This, strangely, is contrary to my own observations of a garden colony of this species, where either sex can be found on land in the winter.

# **MEMBERS' ADVERTISEMENTS**

Wanted: Any dead reptiles for research project on reptile adaptive radiation. Will refund any expenses. Also interested in purchase or exchange of living specimens of *Lacertidae* — particularly African forms. Please send dead specimens to (or write): Rob Davies, University of Liverpool, Dept. of Zoology, Brownlow Street, Liverpool L69 3BX. Tel.

Rob Davies, University of Liverpool, Dept. of Zoology, Brownlow Street, Liverpool L69 3BX. 1el. Shrewsbury (0743) 246576 weekends.

Wanted: Striped Fire Salamanders, Salamandra salamandra fastuosa or Salamandra salamandra terrestris.

John Pickett, 84 Pyrles Lane, Loughton, Essex IG10 2NW. Tel. 01-508 6624.

# **LETTERS TO THE EDITORS**

Dear Sirs,

#### More about aggressive Salamanders

I read with interest Graham Walters' letter in the B.H.S. Bulletin No. 10, December 1984 about his Fire Salamanders (*Salamandra salamandra*) displaying aggressive behaviour towards one another. I had not witnessed similar behaviour in my own Fire Salamanders until quite recently when the following incident occurred:—

On the morning of 26th September (1985) I had placed a plastic box containing crickets with the lid removed in my outdoor enclosure for the resident Green Toads (*Bufo viridis*) and Natterjacks (*B. calamita*). Within minutes the entire population of Green Toads and most of the Natterjacks had assembled by the box, catching and eating the crickets as they poured out of the box in all directions.

Quite suddenly I became aware of one of my Fire Salamanders which had emerged from hiding nearby and was successfully catching crickets by stalking them steadily in slow-motion before rapidly flicking out its tongue from close range. Sometimes a cricket was dextrous enough to escape but the Salamander had eaten four or five when it began to stalk one that a Green Toad was also after.

The Green Toad however, caught the cricket first, causing the Salamander to pause momentarily before lunging forward angrily at the Toad, biting one of its rear legs and obliging the Toad to beat a hasty retreat. Afterwards the Salamander retired again to its hiding place showing no further interest in the crickets which were still dispersing all over the enclosure.

Quite apart from the show of aggression, I was also very surprised to see a Salamander showing interest in such fast-moving creatures as crickets. The only prey I had actually seen my adult ones feeding on before was slow-moving invertebrates such as worms, slugs and the occasional mealworm.

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

Dear Sirs,

# Longevity in Edible Frogs

I purchased my first three Edible Frogs (Rana esculenta) in May 1972, two females and a male which from the outset were kept in a greenhouse in the garden.

During the intervening years I have added many more adults to my colony as well as several captive-bred youngsters.

The original trio having bred almost every year since acquisition were all thriving until the winter of 1984/85 when one of the females failed to emerge from hibernation in the spring. The male, although appearing in April, later became lethargic and looked generally unwell, refusing food and eventually succumbing in May.

The remaining female however, spawned successfully during June and at the time of writing (October 1985) is still feeding well and in good health.

In view of the fact that all three of these Frogs were fully grown when obtained, my surviving female is now at least  $15\frac{1}{2}$  years old, probably older. Is this a record for an Edible Frog in captivity or does anyone know of any that have lived longer than this?

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

# **REPTILES**

# Breeding, behaviour, and veterinary aspects Edited by

# SIMON TOWNSON

and

# **KEITH LAWRENCE**

# A new book published by the British Herpetological Society. Publication date : January 1985.

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